2024 Groundwater and Soil Vapour Monitoring Report
Former Montfort Landfill Site
NE 20-038-27 W4M

PRESENTED TO

City of Red Deer

JANUARY 6, 2026
ISSUED FOR USE – REV01
FILE: 704-SWM.SWOP04071-04.007

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EXECUTIVE SUMMARY

The City of Red Deer (the City) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2024 groundwater and vapour monitoring programs at the former Montfort landfill, within Lot S1 Plan 3762 NY and Block Z Plan 982-0142, within the northeast portion of section 20-38-27 W4M, in Red Deer, Alberta, hereafter referred to as "the Site".

The objectives of the monitoring program are to assess the environmental condition of the Site and evaluate potential impacts to the environment and adjacent receptors related to the presence of the historical landfill. The evaluations will be used to provide recommendations related to risk management activities at the Site. These objectives also include assessing whether existing groundwater conditions at the Site meet the 2024 Alberta Environment and Protected Areas (AEPA) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (Tier 1 Guidelines), and whether soil vapour conditions meet site-specific soil vapour screening levels.

Groundwater monitoring wells 24MW-01 and 24MW-02 were installed in September 2024 north of the Site and the nearby residences to assess volatile organic compounds (VOCs) in migrating groundwater. Soil vapour monitoring wells 24SVP15, 24SVP16, and 24SVP17 were installed in November 2024 between the north edge of the Site and the nearby residences to check for the migration of landfill gas (LFG) in the immediate vicinity of the residences. Soil vapour monitoring well 25XCG-4 was installed in January 2025 to replace the damaged XCG-4 (SVP).

During the 2024/2025 field season, the following monitoring wells were sampled:

- Groundwater - 24MW-01, 24MW-02, 25XCG-4, XCG-5, XCG-6, XCG-13, XCG-14, and MW-05.
- Soil Vapour - VW-05, 25XCG-4, XCG-6, XCG-13, 24SVP15, 24SVP16, and 24SVP17.

The results of the 2024/2025 groundwater and vapour monitoring program and the historical sampling results have identified evidence of residual impacts in the groundwater and soil vapour at several locations. Key results are as follows:

- The direction of groundwater migration in the deeper groundwater wells was determined to be westerly in December 2024 and April 2025 under an average horizontal hydraulic gradient of 0.01 m/m, and in a northwesterly direction in the shallow groundwater wells in April 2025 under an average horizontal hydraulic gradient of 0.009 m/m. This is consistent with previous years.
- Routine groundwater chemistry parameters and dissolved metals concentrations that exceeded the Alberta Tier 1 Guidelines at one or more monitoring wells in 2024 and 2025, included total dissolved solids (TDS), nitrate, and dissolved arsenic, iron, manganese and uranium. The elevated TDS and dissolved uranium concentrations are attributed to the dissolution of naturally-occurring uranium compounds in the soils at the Site. The exceedances for dissolved manganese, iron, and arsenic are likely related to anoxic conditions and biodegradation within the landfill wastes. Similarly, the exceedance for nitrate at XCG-6 to the south may be leachate related.
- Chloride concentrations measured in groundwater samples collected at the Site in 2024 and 2025 ranged between 16.2 mg/L to the south and 188 mg/L to the north. The measured concentrations are not uncommon for groundwater in an urban setting.
- Concentrations of benzene, toluene, ethylbenzene, and xylene (BTEX) and petroleum hydrocarbon (PHC) fractions F1 to F2 were less than the analytical detection limits at all groundwater monitoring wells in 2024 and 2025.
- Concentrations of VOCs in groundwater samples were less than the analytical detection limits for most wells in 2024 and 2025, with the exception of XCG-13(MW). The concentration of vinyl chloride at XCG-13(MW) in April 2025 (0.0066 mg/L) exceeded the Tier 1 Guideline of 0.0011 mg/L, which is consistent with historical results for this well, and is the same order of magnitude as the Tier 1 guideline. Cis-1,2, DCE was also detected

at XCG-13(MW) in April 2025, however, there is currently no Tier 1 Guideline for this parameter. Several VOC parameters detected in the past at XCG-13(MW) were not detected in 2025.

- Field-assessed concentrations of methane ranged from 21.1% in VW-02 in December 2024 and 12.1% in VW-02 in February 2025. The first is above the lower explosive level (LEL) of 5-15% for methane, and the second falls within the LEL range. Methane concentrations were non-detectable at all other monitoring locations, which is consistent with historical results.
- Concentrations of BTEX and PHC fractions F1 to F2 in all soil vapour samples were less than the soil vapour screening criteria. Concentrations of VOCs in soil vapour samples were less than the soil vapour screening criteria in 2024 and 2025. The vinyl chloride exceedances reported at XCG-13(SVP) in 2023 were not noted in 2025.
- The 2021 concentrations of tetrachloroethene and trichloroethene exceeded the soil vapour screening criteria at VW-04, situated on the southeast edge of the waste and within the waste footprint. Vapour well VW-04 was sampled in November 2021 to replace XCG-5 as XCG-5 could not be sampled. Vapour well XCG-5 is located 33 m south of VW-04, outside the waste footprint and is more representative of conditions to proximate receptors. In 2018 and 2023, XCG-5 did not have any parameters exceed the soil vapour criteria, indicating a low risk to proximate receptors in the area of XCG-5. However, groundwater and soil vapour should continue to be monitored. XCG-5(SVP) was frozen in December 2024 and February 2025 and a vapour sample was not collected.
- The cumulative hazard levels for non-carcinogens in vapour samples collected in 2024 and 2025 ranged between 0.008 and 0.15, which is less than the target cumulative hazard level of 1.00. The individual hazard levels for each compound were also below the individual target hazard level of 0.20.
- The cumulative risk levels for carcinogens in vapour samples collected in 2024 and 2025 ranged between 9.5×10^{-8} and 4.2×10^{-6}, below the target cumulative risk level of 1×10^{-5}. The individual risk levels for each compound were also below the target level of 1×10^{-5} in 2025.

Ongoing Monitoring and Vapour Risk Management Strategy

Based upon the results of the groundwater, surface water, and soil vapour monitoring and sampling conducted in 2024/2025 and previous years, the following is recommended.

- The current monitoring program includes semi-annual groundwater and vapour monitoring and annual groundwater and soil vapour sampling at select locations along the Site's perimeter to monitoring groundwater and soil vapour quality trends.
- As groundwater quality is well characterized and consistent, it is recommended to reduce the monitoring and sampling frequency to bi-annually in the summer. The groundwater monitoring program focuses on the perimeter monitoring locations near potential receptors, as well as at XCG-13(MW) located at the north-central side of the former landfill.
- Furthermore, it is recommended that soil vapour monitoring and sampling frequency be reduced to yearly, being carried out in the spring or fall. The vapour monitoring program focuses on locations near potential receptors to support the vapour risk management strategy discussed below.
- Finally, a site walkover should be conducted yearly when there is no snow cover to assess the condition of the landfill cover.

Based on the above, the following monitoring program is proposed:

Table E-1: Proposed Site Condition, Groundwater, Surface Water, and Vapour Monitoring Program

Activity	2025	2026	2027	2028
Annual site walkover (summer)	X	X	X	X
Annual groundwater monitoring of 11 wells (summer) (XCG-1(MW), XCG-2(MW), XCG-4(MW), XCG-5(MW), XCG-6(MW), XCG-12(MW), XCG-13(MW), XCG-14(MW), 24MW01, 24MW02, and MW-05		X		X
Initial groundwater sampling (fall) of two new groundwater wells 24MW01, 24MW02[1]	X			
Annual groundwater sampling of 8 wells (summer) (XCG-4(MW), XCG-5(MW), XCG-6(MW), XCG-13(MW), XCG-14, 24MW01, 24MW02, and MW-05[1]		X		X
Annual soil vapour monitoring of 17 locations (spring or fall) (XCG-1(SVP), XCG-2(SVP), 25XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-9(SVP), XCG-10(SVP), XCG-12(SVP), XCG-13(SVP), 24SVP15, 24SVP16, 24SVP17, VW-01, VW-02, VW-03, VW-04, and VW-05)	X	X	X	X
Annual soil vapour sampling of 8 locations (spring or fall) (25XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, 24SVP17, and VW-05)[2]	X	X	X	X

Notes:

[1.] Analysis for routine water chemistry, ammonia, dissolved metals, and VOCs including BTEX compounds.

[2.] Analysis for VOCs, matrix gases (oxygen, carbon dioxide, carbon monoxide, methane, and nitrogen), BTEX, and petroleum hydrocarbons (PHCs).

Any proposed modifications to the groundwater monitoring program should describe contingency responses and should be verified with the AEPA in consideration of the concurrent management strategy for vapours. Potential contingency responses (to address potential risks associated with concentrations greater than guidelines or screening values or increasing trends in concentrations) include:

- Resampling to confirm concentrations;
- Increasing frequency of monitoring and/or sampling; and
- Assessing and implementing risk management and mitigative measures.

Administrative Actions

- Utilize the revised generic mitigative measures as a guide when evaluating applications for sensitive development within the setback.
- Ensure that the Site is clearly identified within the City's Zoning Bylaw 3357/2024 and appropriate administrative requirements are met for the Site in accordance with City policies and Provincial Regulations.
- Ensure that the Site is clearly identified within the City's utility mapping system. Elevated methane concentrations have been recorded at VW-02, within the north-central boundary of the Site. Future activities in this vicinity (e.g., utility work, repairs, paving) should consider the potential presence of LFG and a site-specific safety plan should be developed for work undertaken to limit the potential for exposure to site workers.

Further to the above recommendations, as noted, the Site remains an historical landfill. It presently appears to be well maintained and capped. It is recommended that the City review this status on an ongoing basis to ensure that the cover remains intact and drainage remains positive; repairs or maintenance should be undertaken as required to maintain the Site.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of The City of Red Deer and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than The City of Red Deer, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

The City of Red Deer (the City) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2024/2025 groundwater and soil vapour monitoring program at the former Montfort landfill, within Lot S1 Plan 3762 NY and Block Z Plan 982 0142, within the northeast portion of section 20-38-27 W4M, in Red Deer, Alberta, hereafter referred to as "the Site". The objectives of the monitoring program are to assess the environmental condition of the Site and potential impacts on the environment and adjacent receptors from risks related to the Site's former use as a landfill and to provide recommendations related to risk management activities at the Site.

The field components of the monitoring program were completed under Tetra Tech's detailed work plans encompassing the scope of work outlined in Section 1.1 below. The current report was completed under Tetra Tech's Limitations on the Use of this Document for conducting environmental work. A copy of these conditions is provided in Appendix A.

1.1 Scope of Work

The scope of work for the 2024/2025 monitoring programs was based on the findings of the 2023 summary report (Tetra Tech 2024a) and were outlined in the 2024 Work Scope and Cost Estimate (Tetra Tech 2024b). Monitoring and sampling events were conducted at different times than those proposed due to delays in the installation of new monitoring wells that were to be incorporated into the sampling program, and due to weather issues encountered during monitoring events conducted in the winter.

The 2024/2025 monitoring and sampling program was conducted between December 2024 and April 2025 and included:

- Conducting vapour monitoring events, which included measuring headspace vapours and groundwater levels within each vapour monitoring well and observing monitoring well integrity.
- Conducting groundwater monitoring events, which included measuring methane concentrations in headspace vapours and groundwater levels within each groundwater monitoring well and observing monitoring well integrity.
- Collecting groundwater samples from eight monitoring wells: MW-05, 25XCG-4(MW), XCG-05(MW), XCG-06(MW), XCG-13(MW), XCG-14(MW), 24MW-01, and 24MW-02.
- Collecting vapour samples from seven soil vapour wells/probes: VW-05, 25XCG-4(SVP), XCG-06(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17.
- Installing two groundwater monitoring wells, 24MW-01 and 24MW-02, within the right of way of Hermary street, north of the Site boundary.
- Installing soil vapour probes adjacent to the building foundations of three private residences to the north of the Site boundary.
- Installing a soil vapour probe to replace XCG-4(SVP) as it was suspected to be damaged.
- Surveying all groundwater monitoring well locations to assist in determining the direction of groundwater migration at the Site.
- Conducting monitoring well repairs, as required.

- Preparing a report summarizing the field activities undertaken and interpreting the groundwater and soil vapour monitoring and analytical results.
- Updating the hazard quotients prepared during previous reports using the monitoring and sampling results collected in 2024 and 2025 and updated toxicity reference value (TRV) information.

2.0 BACKGROUND INFORMATION

2.1 General Information

The Site is located within the NE 20-38-27 W4M, within Lot S1 Plan 3762 NY and Block Z Plan 982 0142. The western portion of the Site is zoned PS (public service district), and the eastern portion is zoned A1 (future urban development). The City does not own either portion of the Site.

The Site is located within the community of Highland Green Estates. It is located southwest of Hermary Street and 52 Avenue in the City and consists of two baseball diamonds and a grassed field. Single-unit residential houses are located on the north and west side of the Site and multi-unit homes are on the east side. Montfort Centre (including Red Deer Catholic Regional Schools board) and multi-family homes are south of the Site. A municipal right-of-way (ROW) crosses the Site with an inactive 500 mm water main within the south area of the waste material. The location of the Site is presented on Figure 1. The Site plan and surrounding land use as well as the monitoring locations are presented on Figure 2. Additional information on the Site history, historical groundwater monitoring and soil vapour investigations, geology, and hydrogeology is contained in Appendix C. Cross-sections of the Site were prepared by XCG Environmental Engineers & Scientists (XCG) as part of a previous assessment are included in Appendix D (XCG 2018). The available borehole logs for the Site are included in Appendix E.

2.2 Conceptual Site Model Summary

The selection of comparative guidelines is based on the conceptual site model (CSM) first described in the 2021 groundwater and soil vapour monitoring report (Tetra Tech 2022) and updated in the 2023 groundwater and soil vapour monitoring reports (Tetra Tech 2024a). The CSM outlines the rationale for the selection of applicable exposure pathways and receptors at the Site, based on guidance from the Alberta Tier 1 Soil and Groundwater Remediation Guidelines (Alberta Environment and Parks [AEP] 2019), as amended in 2023 and 2024 by Alberta Environment and Protected Areas (AEPA). The CSM included the following items:

- Description of any identified environmental issues including a description of processes or activities undertaken at or near the Site and a listing of contaminants of potential concern (COPCs) identified in earlier investigations.
- Description of known and reported historical releases, including locations and status of any subsequent environmental site assessments (ESAs) and remediation.
- Identification of applicable exposure pathways and receptors.

The following table presents a summary of the relevant receptors and exposure pathways identified in the CSM.

Table 2-1: Summary of Exposure Pathways and Receptors for Soil and Groundwater

Release Mechanism	COPC	Migration / Exposure Pathway	Potential Receptor
Leaching from buried waste to groundwater.	▪ Nitrate ▪ Vinyl chloride	Ingestion of groundwater	Human users of the Site.
Leaching from buried waste to groundwater, followed by upward or lateral migration of vapour from impacted groundwater.	▪ Nitrate ▪ Vinyl Chloride	Vapour inhalation via vapour intrusion/collection into/in confined spaces.	▪ Workers in excavations/trenches ▪ Inhabitants of houses and buildings near the Site.
Human Direct Soil Contact	▪ Various	Prolonged contact of affected soil with exposed skin Prolonged contact of waste with exposed skin.	▪ Workers in excavations/trenches;
Landfill Gas (LFG) Emissions	▪ Methane	Vapour intrusion/collection in confined spaces in presence of ignition source. Potentially explosive at a 5-15% concentration.	▪ Workers in excavations/trenches ▪ Inhabitants of houses and buildings near the Site.
	▪ Tetrachloroethene (TCE) ▪ Trichloroethene ▪ Vinyl Chloride	Vapour inhalation via vapour intrusion/collection into/in confined spaces.	▪ Workers in excavations/trenches. ▪ Inhabitants of houses and buildings near the Site.

2.2.1 Data Evaluation

To establish the appropriate guidelines for the Site, residential land use criteria were used. The receptors were determined by a combination of the degree of potential exposure, the exposure pathway, and the contaminants of concern. Human receptor exposures applicable to the Site include the potable water and direct soil contact and inhalation pathways. The ecological receptor exposures applicable to the Site include direct soil contact and nutrient and energy cycling. Through previous investigations, Tetra Tech has determined that the dominant soil stratigraphy governing potential contaminant transport at the Site is coarse grained.

As recommended by AEPA, the soil vapour results obtained during the investigation were compared to generic soil vapour criteria developed from information contained in the Tier 1 Guidelines as well as documents by the Canadian Council of Ministers of the Environment (CCME 2014), Health Canada (2021), and the United States Environmental Protection Agency (US EPA 2024). To determine the appropriate guidelines for comparison against the vapour sampling results, indoor air risks were calculated, and methane explosive risks were evaluated.

Based on the CSM, the most applicable guidelines for groundwater, surface water, and vapour results for the Site included the following:

- Groundwater concentrations at the Site were compared to the Tier 1 Guidelines (AEPA 2024a) under residential and parkland land uses for coarse-grained soils with the FAL pathway excluded as the distance to the nearest surface waterbody was greater than 300 m from the Site.
- Soil vapour analytical results were compared to soil vapour screening criteria under residential land use for both slab-on-grade and basement for coarse-grained soils, developed from the CCME document. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures Via Inhalation of Vapours (CCME 2014). Soil vapour screening criteria for vapour intrusion into indoor air spaces were updated as of

2024, using current TRVs from Health Canada (2021) and the United States Environmental Protection Agency (US EPA 2024).

- Cumulative target risk and hazard levels for the hazard quotient evaluation were determined in accordance with Alberta Tier 2 Guidelines (Tier 2 AEPA 2024b). For carcinogens, the target risk level is 1 x 10^{-5}, as this value is considered by Health Canada to represent a negligible risk. This risk level applies to both individual compounds and a summation (i.e., cumulative) of individual compounds risks. For non-carcinogens, a cumulative target hazard level of 1.0 is used as potential exposures that result in cumulative hazard indices equal to or less than 1.0 signify negligible potential for adverse health effects. For individual compounds, a hazard index of 0.2 was used. Each sampling location was screened individually for every chemical detected, and the results evaluated relative to both individual and cumulative risks and hazard levels. For some compounds, both carcinogenic and non-carcinogenic effects required calculation.

2.3 Groundwater and Soil Vapour Monitoring Network

The groundwater monitoring network at the Site consists of 11 monitoring wells: MW-05, XCG-1(MW), XCG-2(MW), XCG-4(MW) to XCG-6(MW), XCG-12(MW) to XCG-14(MW), 24MW-01 and 24MW-02. The vapour monitoring network includes soil vapour probes and soil vapour wells and consists of 17 monitoring locations: (VW-01 to VW-05, XCG-1(SVP), XCG-2(SVP), 25XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-9(SVP), XCG-10(SVP), XCG-12(SVP), and XCG-13(SVP), 24SVP15, 24SVP16, 24SVP17.

Based on the results of the 2023 Groundwater and Soil Vapour Monitoring Report prepared by Tetra Tech (2024a), it was recommended that two additional groundwater monitoring wells be installed to the north of XCG-13(MW) to determine VOC concentrations in the groundwater and to evaluate the risk to receptors from vapour inhalation via groundwater migration. It was also recommended that three soil vapour monitoring probes be installed near the building foundations of private properties north of the Site, in the vicinity of XCG-13(SVP), to determine VOC concentrations within the soil vapour and to evaluate the potential risk to receptors from inhalation of soil vapours. Finally, soil vapour probe XCG-4(SVP) was suspected be damaged and it was recommended that it be replaced.

On September 27, 2024, two groundwater monitoring wells, 24MW-01 and 24MW-02, were installed north of the Site boundary. The wells were completed as flush mounts within the sidewalk on the southern side of Hermary Street. Monitoring well 24MW-01 is screened from 3.0 to 6.1 metres below grade (mbg) and 24MW-02 from 5.2 to 8.2 mbg.

On November 15, 2024, three soil vapour probes, 24SVP15, 24SVP16, and 24SVP17, were installed adjacent to the building foundations of private residences located to the north of the Site. The soil vapour probes were completed as flush mounts and consisted of a perforated stainless steel probe fitted with 6 mm Teflon tubing running to a flow control nozzle at ground surface. The probes were installed to depth of approximately 2.0 mbg.

On January 10, 2025, soil vapour probe XCG-4(SVP) was decommissioned and soil vapour probe 25XCG-4(SVP) was installed in the immediate vicinity of the former well at a depth of 1 mbg. The soil vapour probe was completed as a flush mount and consisted of a perforated stainless steel probe fitted with 6 mm Teflon tubing running to a flow control nozzle at ground surface.

Groundwater monitoring well completion details are summarized in Table 1, and soil vapour monitoring well detailed in Table 4A to Table 4I. Borehole logs from 2013 (Tiamat 2014a), 2016 (XCG 2018) and 2024-2025 (Tetra Tech, this document) borehole logs are presented in Appendix E. Groundwater and vapour monitoring well locations are presented on Figure 2.

3.0 MONITORING AND SAMPLING PROGRAM

A discussion of the methods used for the fieldwork, laboratory testing, and data evaluation is presented in the following sections.

3.1 Groundwater Monitoring and Sampling Program

Tetra Tech conducted groundwater monitoring events on December 11 and 12, 2024, February 25, 2025, and April 23, 2025. Groundwater monitoring included the measurement of groundwater levels within each well using a portable electronic interface probe. Groundwater wells that required sampling were subsequently purged using dedicated bailers or Waterra tubing with foot valves until approximately three volumes of standing groundwater were removed, or until the well was practically dry. Groundwater samples were collected on December 13, 2024, and April 24, 2025, after allowing groundwater levels within the monitoring wells to recover. Monitoring well XCG-13(MW) could not be accessed in December 2024 as the resident could not be contacted. Due to a lack of groundwater within the well, a full sample suite was unable to be collected at XCG-6(MW) in April 2025. It should be noted that XCG-6(MW) and XCG-14(MW) were located during the April 2025 event and not in earlier events due to snow cover.

The methodology for groundwater monitoring and sampling included the following:

- Observing the integrity of each well and noting drainage and site conditions near the well that may have an effect on monitoring results or groundwater quality.
- Measuring the methane headspace concentrations in December 2024 and February 2025 at each well using an RKI Eagle Hydrocarbon Surveyor II (RKI Eagle) calibrated to methane.
- Measuring liquid levels in each monitoring well with an interface probe.
- Recording of field data on standardized forms.
- Purging each monitoring well requiring sampling of at least three well volumes of water, or until the well was practically dry, using dedicated polyethylene bailers or Waterra tubing with inertial pump foot valves.
- Collecting groundwater samples from each well once field parameters stabilized.
- Collecting groundwater samples from four monitoring wells in December 2024 [MW-05, XCG-5(MW), 24MW-01 and 24MW-02] and four monitoring wells in April 2025 [25XCG-4(SVP)(MW), XCG-6(MW), XCG-13(MW) and XCG-14(MW)]. Samples were placed into the appropriate laboratory-supplied containers and were filtered and/or preserved in the field when required. At the time of sampling, field measurements for electrical conductivity (EC), pH, and temperature were recorded.
- Collecting a blind duplicate groundwater sample during the December 2024 event.
- Submitting samples in coolers with ice to ALS Laboratory Group (ALS) in Calgary, Alberta for laboratory analysis under chain-of-custody (COC) documentation.

The groundwater monitoring well locations are shown on Figure 2.

3.1.1 Groundwater Analytical Program

The analytical program for the groundwater monitoring wells included the following:

- Routine water chemistry;

- Dissolved metals;
- Total Ammonia;
- BTEX; and
- VOCs.

3.2 Vapour Monitoring and Sampling Program

Tetra Tech conducted vapour monitoring and sampling on December 11 and 12, 2024, February 25, 2025, and April 23, 2025. It should be noted that several soil vapour monitoring points were frozen in ice or were noted to have blocked or damaged tubing during the December 2024 and February 2025 events, preventing them from being monitored or sampled. Additionally, several vapour monitoring locations were unable to be located due to snow coverage at the Site, and XCG-13(SVP) was unable to be accessed in December 2024 as the resident could not be contacted. Repairs were made to the soil vapour probes during the April 2025 event. Soil vapour probe XCG-5(SVP) was frozen in December 2024 and February 2025, and a vapour sample was not collected.

Monitoring at the soil vapour monitoring locations consisted of recording soil gas pressure, gas composition (methane, carbon dioxide, oxygen, hydrogen sulphide, and balance), and groundwater elevation. Soil vapour monitoring wells VW-01 to VW-05 are constructed with a 020 (0.5 mm) machine slotted 25 mm diameter PVC screen, and the soil vapour probes consist of a perforated stainless steel probe fitted with 6 mm Teflon tubing running to a flow control nozzle at ground surface. Soil vapour monitoring wells XCG-1(SVP), XCG-2(SVP), XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-9(SVP), XCG-10(SVP), XCG-12(SVP), XCG-13(SVP) are constructed of 0.63 cm diameter Teflon tubing connected to a 15 cm long stainless steel mesh screen, with the screened interval above the water table. Swagelok ball valves were placed at the ground surface end of the Teflon tubing.

Each soil vapour probe was inspected for visible signs of damage and the position of the sampling labcock was noted. Soil gas pressure was recorded using a digital manometer. Once the soil gas pressure measurement was recorded, the soil gas probe was purged of three well volumes of air, or until readings stabilized. The soil vapour probes were purged directly with the GEM landfill gas analyzer (GEM analyzer).

After purging, gas composition measurements for methane, carbon dioxide, oxygen, balance gas, and hydrogen sulphide were recorded using the GEM analyzer. After recording soil gas concentrations, the probe/well depths and water levels were measured and recorded to confirm the water level within the probe was beneath the screen portion of the soil gas probe (i.e., the probe was not blinded).

A leak detection test was completed prior to sampling to ensure the vapour probes and sampling train were sealed properly. The test was completed using a helium gas tracer to inspect the testing probe and apparatus for any leaks.

Four soil vapour samples were collected in December 2024 (VW-05, 24SVP15, 24SVP16, and 24SVP17), six samples were collected in February 2025 (VW-05, 25XCG-4[SVP], XCG-13[SVP], 24SVP15, 24SVP16, and 24SVP17) and one sample was collected in April 2025 at XCG-6(SVP).

Sampling of the soil vapour wells was based on the methodology of the CCME sampling guidelines (CCME 2016a, 2016b), and is summarized as follows:

- Prior to collecting the soil vapour well samples, the well was purged of three well volumes, or until headspace readings stabilized.
- A 1.4 L Summa vacuum canister was used for sample collection at the soil vapour probe monitoring location.

- Sample data was recorded on the provided sample tag for each canister.
- Sample tubing that was used to connect the canister to the soil vapour well was low in VOCs and only used once to prevent sample contamination.
- When beginning sample collection, the end cap was removed, and a 60-minute flow controller was attached to the canister. Start time and starting pressure were recorded on the sample tag.
- When sampling was complete, the valve was closed, and the flow controller was removed. The end time and final pressure were recorded on the sample tag.
- The protective end cap was replaced back on the canister.
- Canisters, flow controllers, and pressure gauges were placed in the original shipping container and returned to the laboratory under COC documentation.
- The soil vapour probe sampling port was returned to the closed position, and the well was securely locked.

The Summa canisters were sent to ALS in Calgary, Alberta for laboratory analysis under COC documentation. A duplicate sample was collected during the vapour sampling event for quality assurance/quality control (QA/QC) purposes.

The vapour monitoring locations are shown on Figure 2.

3.2.1 Vapour Analytical Program

The analytical program for the vapour monitoring probes is summarized below:

- VOCs;
- Matrix gases including oxygen, carbon dioxide, methane, and nitrogen; and
- BTEX and PHCs.

4.0 RESULTS AND DISCUSSION

This section presents the results of the fieldwork conducted in fall 2024 and winter/spring 2025 at the former Montfort Landfill and discussions of these results.

4.1 Groundwater Well Headspace Monitoring

In December 2024 and February 2025, Tetra Tech recorded methane measurements in the headspace of the groundwater monitoring using an RKI Eagle calibrated to methane. The RKI Eagle detection limit ranges from 5 parts per million (ppm) to 100% of the lower explosive limit (LEL). The LEL for methane is 5% gas by volume, or 50,000 ppm, and the upper explosive limit (UEL) is 15% gas by volume, or 150,000 ppm. Thus, 1% LEL is equivalent to 500 ppm or 0.05% and 20% LEL is equivalent to 10,000 ppm, or 1% gas by volume.

In December 2024, methane headspace concentrations at the groundwater wells ranged from non-detections at several wells to 420 ppm at XCG-12(MW). In February 2025, methane concentrations ranged from non-detections at several wells to 180 ppm at 25XCG-4(MW). The results of the headspace vapour monitoring are presented in Table 1 and are further discussed further in Section 4.5.

Based on the screened intervals and measured depths to groundwater, none of the groundwater monitoring wells were blinded during the monitoring events; however, it is noted that the screen interval for MW-05 is unknown.

4.2 Groundwater Elevations

The measured groundwater levels and calculated groundwater elevations for fall 2024 and winter/spring 2025 are presented in Table 1.

During the groundwater monitoring events in fall 2024 and winter/spring 2025, no measurable thicknesses of non-aqueous phase liquids (NAPL) were observed at any locations. Figure 3 presents the groundwater elevation trends for the groundwater monitoring wells from 2013 to 2025. Groundwater elevations decreased at MW-05, XCG-5(MW), and XCG-6(MW) to the south and XCG-13(MW) to the north throughout 2024 and 2025, and historical low elevations were measured at each well. Measured groundwater elevations increased, but remained within the range of historical elevations, at XCG-4(MW) and XCG-12(MW) in the southeast and northwest corners, respectively. Groundwater elevations at the remaining monitoring well locations varied marginally and remained within their respective historical ranges.

The monitoring wells at the Site are either approximately 5 m deep (XCG-4(MW), XCG-5(MW), XCG-6(MW), and XCG-13(MW)) or between 6 m and 12 m deep (MW-05, XCG-1(MW), XCG-2(MW), XCG-12(MW), XCG-14(MW), 24MW-01 and 24MW-02). Tetra Tech refers to the former wells as “shallow” and the latter as “deeper”. The shallow wells are located mainly in the south and east of the Site, while the deeper wells are located mainly in the north and northwest.

The average depth to groundwater in the shallow monitoring wells was 3.46 mbg in December 2024 and 3.66 mbg in April 2025, while the average depth to groundwater in the deeper monitoring wells was 6.50 mbg in December 2024 and 6.39 mbg in April 2025.The groundwater elevations measured in December 2024 and April 2025, as well as groundwater contours, are shown on Figure 4 and Figure 5, respectively. Separate groundwater contours were drawn for the shallow and deep wells. The direction of groundwater migration in the deeper wells was determined to be westerly in December 2024 and April 2025 under an average horizontal hydraulic gradient of 0.01 m/m, and in a northwesterly direction in the shallow wells in April 2025 under an average horizontal hydraulic gradient of 0.009 m/m. It is noted that groundwater contours could not be drawn for the shallow monitoring wells in December 2024 as several wells could not be located.

4.3 Groundwater Field Parameters

Field measurements for pH, EC, and temperature recorded when collecting groundwater samples in 2024 and 2025 are presented in Table 2.

Groundwater sample temperatures ranged from 1.0°C at MW-05 to 8.0°C at 24MW-02 in December 2024, and from 3.6°C at XCG-4(MW) to 6.9°C at XCG-14(MW) in April 2025.

Field pH values ranged from 6.63 at MW-05 to 6.84 at 24MW-01 in December 2024, and from 6.50 at XCG-13(MW) to 7.10 at XCG-4(MW) in February 2025. Field pH values were generally less than the laboratory pH values. This is usually the result of the loss of carbon dioxide from the samples and is normal.

Field EC measurements ranged from 604 µs/cm at XCG-5(MW) to 1,830 µs/cm at MW-05 in December 2024, and from 659 µs/cm at XCG-4(MW) to 2,020 at XCG-13(MW) in February 2025. Field EC results were slightly higher than the laboratory measured EC results, which may be due to differences in sample temperatures and limitations of field equipment.

4.4 Groundwater Analytical Results

The groundwater analytical data for fall 2024 and winter/spring 2025 is summarized in Table 2. The laboratory analytical reports are included in Appendix F. Groundwater QA/QC results are included in Table 3. Historical analytical results are included in Appendix G.

4.4.1 Background Water Chemistry

Background water quality in the shallow groundwater is interpreted to be represented by XCG-5(MW), located approximately 40 m southeast of the Site's south boundary, immediately north of the Red Deer Catholic Regional Schools building, (cross-gradient) and outside the waste footprint. BTEX, PHC fraction F1 and F2, and VOCs were not detected at XCG-5(MW) in December 2024, and the chloride concentration was measured at 19.2 mg/L. The dissolved manganese concentration of 0.0802 mg/L exceeded, but was within the same order of magnitude as, the Tier 1 Guideline value of 0.02 mg/L. This result is interpreted to be naturally occurring and not related to the presence of the landfill.

Background water quality in the deeper groundwater is interpreted to be represented by XCG-14 (MW), located approximately 30 m northwest of the Site's northwest corner (up-gradient) and outside of the waste footprint. BTEX, PHC fraction F1 and F2, and VOCs were not detected at XCG-14(MW) in April 2025, and the chloride concentration was measured at 27.3 mg/L. Concentrations of total dissolved solids (TDS), dissolved iron, and dissolved manganese exceeded the Tier 1 Guideline. The marginal exceedances for the TDS concentration are interpreted to be naturally occurring, and the elevated dissolved iron and manganese concentrations are likely due to naturally suboxic conditions in the deeper groundwater.

4.4.2 Routine Water Chemistry Parameters

TDS concentrations ranged from 363 mg/L at XCG-4(MW) in April 2025 to 1,110 mg/L at XCG-6(MW) and XCG-13(MW) in April 2025. TDS concentrations at most monitoring wells were greater than the Alberta Tier 1 Guideline value of 500 mg/L with the exception of 24MW-01 in December 2024 and XCG-4(MW) in April 2024. Elevated TDS concentrations often occur in groundwater as a result of the dissolution of naturally occurring salts in the glacial tills of Alberta, and do not necessarily indicate groundwater quality impact related to the presence of the historical landfill.

Chloride is often considered a useful parameter to assess groundwater quality impacts associated with landfills as chloride is generally present in elevated concentrations in leachate and is highly mobile. Chloride is also a conservative ion, meaning it is non-reactive and does not adsorb significantly onto mineral surfaces or form complexes with other ions. Chloride concentrations measured for samples collected in fall 2024 and spring 2025 were below the Tier 1 Guideline value of 250 mg/L at all monitoring well locations, ranging between 16.2 mg/L at XCG-6(MW) in April 2025 to 188 mg/L at XCG-13(MW) in April 2025. Nearly all measured concentrations were below 50 mg/L except those at XCG-13(MW) and MW-05, which were 188 mg/L and 177 mg/L, respectively. The chloride concentrations measured at the Site are typical for groundwater in an urban setting which is often affected by road salt.

Concentrations of ammonia ranged from 0.0099 mg-N/L at 24MW01 in December 2024 to 0.976 mg-N/L at XCG-13(MW) in April 2025. Ammonia concentrations at most monitoring wells have remained low and stable throughout the history of the Site. The 2025 ammonia concentration at XCG-5(MW) decreased to 0.339 mg-N/L after being measured at 1.61 mg-N/L in 2022, whereas ammonia concentrations at XCG-13(MW) have increased overall since 2021, reaching a historical high in April 2025. The reason for the 2025 peak is unknown, but it likely indicates the northward migration of groundwater affected by buried waste. With the FAL pathway excluded, there is currently no Tier 1 Guideline for ammonia. Under the Guidelines for Canadian Drinking Water Quality, while there

is no specific guideline, it is recommended that ammonia be kept to concentrations below 0.1 mg/L (Health Canada, 2016). It is worth noting that all of the residences within the 300 m landfill setback around the Site are supplied by City water and do not use local groundwater..

The nitrate concentration of 61.6 mg-N/L at XCG-6(MW) in April 2025 exceeded the Tier 1 Guideline of 10 mg-N/L. Nitrate concentrations at this well began increasing significantly in 2021 and reached a historical high of 72.4 mg-N/L in 2022. Figure 10 in Appendix D shows the borehole BH4 (Appendix E) approximately 15-20 m north of XCG-6(MW). Rather than the usual mix of buried waste, approximately 2.6 m of wood debris was encountered in this borehole. The decay of this large quantity of wood debris is thought to be the reason for the high nitrate concentrations. Elevated nitrate concentrations in groundwater are not uncommon near older landfills due to natural attenuation; when redox conditions change from anoxic to oxic, reduced nitrogen compounds including ammonia may oxidize and convert into nitrate (nitrification). As shallow groundwater is not used for drinking water and there are no surface water bodies within 300 m, the high nitrate concentrations are not thought to pose a significant risk.

Concentrations of all other routine chemistry parameters were less than the Tier 1 Guidelines and were generally consistent with historical results.

4.4.3 Metals

Concentrations of dissolved boron, often present in landfill leachate, have been at least an order of magnitude less than the Tier 1 Guideline of 5 mg/L at all monitoring wells since 2019.

The dissolved iron concentration exceeded the Tier 1 Guideline of 0.3 mg/L at MW-05 in December 2024, and at XCG-13(MW) and XCG-14(MW) in April 2025. The dissolved iron concentration at XCG-13(MW) has increased significantly in recent years, reaching a historical high of 26.9 mg/L in April 2025. Concentrations at XCG-5(MW) and XCG-4(MW) have exhibited a decreasing trend in recent years.

Dissolved manganese concentrations exceeded the Tier 1 Guideline of 0.02 mg/L at all monitoring wells sampled in 2024 and 2025, except at XCG-4(MW) in April 2025. Trends in the dissolved manganese concentrations are similar to those observed for dissolved iron concentrations. The 2024 and 2025 results for these parameters are generally consistent with historical results.

Iron and manganese are redox-sensitive parameters that can help determine whether groundwater quality is being affected by biodegradation reactions, which could be related to landfill leachate. The biodegradation process leads to a low redox status (anoxic conditions), which causes iron and manganese oxides present in soil to dissolve, resulting in an increase in the concentration of these dissolved metals in groundwater.

The dissolved arsenic concentration of 0.0148 mg/L at MW-05 in December 2024 and 0.0312 mg/L at XCG-13(MW) in April 2025 were greater than the Tier 1 Guideline of 0.010 mg/L. The dissolved arsenic concentration at XCG-13(MW) has increased consistently since 2019 and reached a historical high in April 2025 while the concentration at MW-05 has remained stable since 2021. Arsenic is known to be strongly adsorbed onto iron(hydr)oxides, and when these compounds dissolve under anoxic conditions, arsenic will also be released into solution (Hem 1992). The arsenic concentrations are, therefore, likely related to the dissolution of iron in the subsurface.

The increased in dissolved iron and arsenic in XCG-13(MW) in recent years indicates the influence of an increasingly anoxic environment on groundwater immediate north of the landfill, indicating the continuing degradation of buried waste. Elevated concentrations of iron, secondary arsenic, and manganese in groundwater are not uncommon near older landfills due to natural attenuation; when redox conditions change from anoxic to oxic, the reducing environment allowing these metals to desorb from the soil into groundwater.

The dissolved uranium concentration at MW-05 marginally exceeded the Tier 1 Guideline value of 0.02 mg/L in December 2024. Tetra Tech has often observed elevated dissolved uranium concentrations at sites in Alberta with elevated TDS concentrations, and the measured concentrations are interpreted to be naturally occurring.

4.4.4 Organic Parameters

Concentrations of BTEX and PHC fractions F1 and F2 in groundwater samples were less than the analytical detection limits at all monitoring wells in 2024 and 2025, which is consistent with historical results.

Concentrations of VOCs in groundwater samples were less than the analytical detection limits for most wells, with the exception of XCG-13(MW). The concentration of vinyl chloride at XCG-13(MW) in April 2025, 0.0066 mg/L, was greater than the Tier 1 Guideline of 0.0011 mg/L, which is consistent with historical results for this well. VOC parameter 1,2-dichloroethene (cis) has been detected at the well frequently since 2019 and measured 0.011 mg/L at XCG-13(MW) in April 2025, however, there is currently no Tier 1 Guideline for this parameter. The concentrations of all other VOCs were below the detection limit in 2024 and 2025. Notably, several VOC parameters detected in the past at XCG-13(MW) were not detected in 2025. The VOC concentrations at XCG-13(MW) should be confirmed during future sampling events.

Monitoring wells 24MW-01 and 24MW-02 were installed north of XCG-13(MW) to determine VOC concentrations in the groundwater and to evaluate the risk to receptors from groundwater driven vapour inhalation. BTEX, PHC fractions F1 and F2, and VOCs were not detected at these wells in December 2024.

4.5 Vapour Monitoring Results

The soil vapour monitoring results from 2019 through 2025 are presented in Table 4A to Table 4I.

Pressures at most vapour monitoring locations were negligible during the 2024 and 2025 monitoring events, except for slightly negative pressures recorded at XCG-2(SVP) and XCG-6(SVP) in April 2025. The negative pressures are likely due to water within the tubing of the soil vapour probes due to thawing conditions.

Concentrations of methane were less than the instrument detection limits in 2024 and 2025 at most vapour monitoring locations, except at VW-02, where concentrations of 21.1% and 12.1% were recorded in December 2024 and February 2025, respectively. VW-02 is near the north-central limit of the waste, and these results are consistent with historical data. Concentrations of carbon dioxide, oxygen, and the balance gas have been consistent during all monitoring events.

4.6 Soil Vapour Analytical Results

Table 5 summarizes the soil vapour chemical results for samples collected in 2024 and 2025, as well as historical results, and compares them to the calculated generic soil vapour screening criteria protective of vapour intrusion into indoor air, as well as the *de minimis* soil vapour screening criteria from XCG (2018). The generic soil vapour screening criteria have been calculated using the 2014 CCME protocols as described in Appendix C. The 2024 and 2025 laboratory analytical reports are included in Appendix F.

BTEX and PHC fractions F1 and F2 (parameters with a TRV for inhalation) were compared against the screening criteria for residential land use, coarse-grained soils. In 2024 and 2025, BTEX and/or PHC fractions F1 and F2 were detected at concentrations greater than the analytical detection limit in samples collected at VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17. However, concentrations of these parameters were at least an order of magnitude less than the soil vapour screening criteria, which are protective of vapour intrusion into indoor air.

VOCs (parameters with a TRV for inhalation) were compared against the soil vapour screening criteria for residential land use, coarse-grained soil. In 2024 and 2025, several VOC parameters were detected at concentrations greater than the analytical detection limit in samples collected at VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17. However, concentrations of these parameters were at least an order of magnitude less than the soil vapour screening criteria, which are protective of vapour intrusion into indoor air.

In 2023, vinyl chloride was measured at concentrations exceeding the soil vapour screening criteria and/or the *de minimis* soil vapour criteria at XCG-13(SVP) in June and July. The sample collected from XCG-13(SVP) in February 2025 had a vinyl chloride concentration less than the analytical detection limit. It should be noted that the 2017 vinyl chloride concentration at XCG-13 was 114 µg/m^3, exceeding both the soil vapour guideline of 70 µg/m^3 and the *de minimis* screening criterion of 114 µg/m^3. Vinyl chloride concentrations were non-detect from 2019 to 2021, and exceedances were again observed in 2023, decreasing again to non-detect in 2025. The differences in concentrations do not appear to be the result of seasonal changes as samples have been collected from February through to November of a given year. It is more likely that while soil vapour is produced by the breakdown of organic matter, both the production of soil vapour and its migration do not occur at steady rates, being greater at some times than others.

During the previous monitoring program in 2021, tetrachloroethene and trichloroethene were detected at concentrations exceeding the soil vapour screening criteria and/or the *de minimis* soil vapour criteria in the sample from soil vapour well VW-04. Vapour well VW-04, located within the waste footprint, was sampled in November 2021 to replace XCG-5(SVP) as XCG-5(SVP) could not be sampled. Vapour well XCG-5(SVP) is located approximately 33 m south of VW-04 and is more representative of conditions to proximate receptors. Vapour well XCG-5(SVP) was last sampled in June 2023, and no concentrations exceeded the soil vapour screening criteria or the *de minimis* soil vapour criteria at this location. XCG-5(SVP) was frozen in December 2024 and February 2025, and a vapour sample was not collected.

Overall concentrations of BTEX, PHC fractions F1 and F2, and VOCs measured at the soil vapour wells in 2024 and 2025 decreased from those measured in 2023, however, they should continue to be monitored during future events.

4.7 Quality Assurance/Quality Control Methods

4.7.1 Methods

Tetra Tech's QA/QC procedures include reviewing the data collected for precision and accuracy and following the appropriate field protocols.

The field procedures for QA/QC involved:

- Changing nitrile gloves between sample collections;
- Using sample containers provided by the laboratory;
- Cleaning monitoring and sampling tools between sample locations;
- Filling sample containers for PHC analysis with no headspace (air) when the containers were closed;
- Conducting leak testing at vapour wells prior to the collection of vapour samples;
- Collecting duplicate groundwater and vapour samples during the sampling program; and
- Documenting field procedures and sampling activities.

4.7.2 Results

The groundwater QA/QC results are included in Table 3, and the soil vapour QA/QC results are included in Table 6. The duplicate sample was submitted for analysis of the same parameters as the original sample.

The duplicate analysis is compared by relative percent difference (RPD). The RPD is calculated using the following equation:

$$\text{RPD} = \frac{(V_1 - V_2)}{\frac{(V_1 + V_2)}{2}} * 100\%$$

Where:

V_1 = Parent Sample

V_2 = Duplicate Sample

Chemical parameters were considered as having passed the QA/QC reproducibility procedure if the RPD was less than or equal to 20% in groundwater or 50% in soil vapour, indicating a close correlation between the sample-duplicate pair.

RPD values were not calculated if one or both of the sample-duplicate concentrations were between the reportable detection limit (RDL) and five times the RDL. In these cases, chemical parameters were still considered as having passed the QA/QC reproducibility procedure if the sample duplicate concentration difference was less than one RDL value.

For the groundwater duplicate collected at 24MW-02 in December 2024, RPDs were less than or equal to 20% for all reported parameters. Based on the QA/QC results, the sample methods and groundwater analytical results are considered acceptable.

For the soil vapour duplicate collected at VW-05 in December 2024, a RPD of 63% for benzene and 58% for toluene was calculated. For the soil vapour duplicate collected at XCG-13(SVP) in February 2025, a RPD of 68% for total xylenes, 65% for 1,2-dichlorotetrafluoroethane, and 163% for dichlorodifluoromethane were calculated. When analyzing parameters at exceedingly low concentrations, even minor variations will lead to large RPD values. As such, based on the QA/QC results, the sample methods and soil vapour analytical results are considered acceptable.

5.0 UPDATED HAZARD QUOTIENT CALCULATIONS

Estimated cancer risks (for carcinogens) and estimated hazard quotients (for non-carcinogens) for the soil vapour analytical results were calculated as described in the 2023 Groundwater and Soil Vapour Report (Tetra Tech 2024a), summarized in Appendix C. Table 7 summarizes the properties of the compounds being assessed, Table 8 summarizes the soil properties used for the calculations, Table 9 summarizes the building properties used for the calculations, and Table 10 presents the generic soil vapour criteria calculated. Table 11 presents the estimated individual and cumulative risks and hazards for the volatile compounds that were detected in soil vapour samples since

For this evaluation, cumulative target risk and hazard levels were determined in accordance with Alberta Tier 2 Guidelines (AEPA 2024b). For carcinogens, the target risk level is 1 x 10^{-5}, as this value is considered by Health Canada to represent a negligible risk. This risk level applies to both individual compounds and a summation (i.e., cumulative) of individual compounds risks. For non-carcinogens, a cumulative target hazard level of 1.0 is used as potential exposures that result in cumulative hazard indices equal to or less than 1.0 signify negligible

potential for adverse health effects. For individual compounds, a hazard index of 0.2 was used. Each sampling location was screened individually for every chemical detected, and the results evaluated relative to both individual and cumulative risks and hazard levels.

The cumulative hazard levels for non-carcinogens in samples collected from VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17 in 2025 ranged between 0.008 (24SVP15) and 0.15 [XCG-13SVP)], which is less than the target cumulative hazard level of 1.00. The individual hazard levels for each compound were also below the individual target hazard level of 0.20.

In 2023, individual hazard levels for non-carcinogenic compounds in samples collected at XCG-13(SVP) exceeded the target individual hazard level of 0.2 for dichlorodifluoromethane (0.29 in June 2023 and 0.22 in July 2023). In February 2025, the individual hazard level for dichlorodifluoromethane decreased to 0.14.

The cumulative risk levels for carcinogens in samples collected from VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17 in 2025 ranged between 9.5 x 10^{-8} (VW-05) and 4.2 x 10^{-6} [24SVP17]. All carcinogenic compounds had individual and cumulative risk levels below the target level of 1 x 10^{-5} in 2025.

In 2023, the individual risk level for carcinogenic compound vinyl chloride was equal to or exceeded the target individual risk level of 1 x 10^{-5} for samples collected at XCG-13(SVP) in June (1.0 x 10^{-5}) and July (3.4 x 10^{-5}). In February 2025, vinyl chloride was not detected (<0.51 µg/m^3) at XCG-13(SVP).

Soil vapour well VW-05 is located in the southwest corner of the Site and is bounded by residential buildings to the west and south. It is approximately 20 m from the apartment building parking lot and above ground parking garages, 65 m from the nearest residential apartment, and approximately 40 m from the edge of the houses along Hill Crescent. The sample from VW-05 had an individual hazard level of 0.24 for cis-1,2-dichloroethene in March 2017; however, it decreased to less than the individual hazard level of 0.20 by September 2019 (0.09). In 2025, the individual and cumulative risk and hazard level in the sample collected at VW-05 did not exceed the corresponding target risk and hazard level.

Soil vapour well VW-04 is located in the southeast portion of the Site and is bounded by parking lots to the west and east. It is approximately 50 m from the nearest residential building and approximately 40 m from the nearest commercial building. The cumulative hazard level identified in sample VW-04 in 2021 collected for the non-carcinogens was 7.7, which is significantly greater than the target hazard level of 1. This hazard was due to tetrachloroethene with an individual hazard of 6.4 and trichloroethene with an individual hazard of 1.3. The potential risk identified in soil vapour well VW-04 may be expected based on it being located directly adjacent to the waste footprint. XCG-5(SVP) is located 33 m south of VW-04, away from the limit of waste and closer to potential receptors. Based on the 2021 results at VW-04 (located within the waste footprint) and the 2023 results for XCG-5 (located near potential receptors), migrations of vapours to the south in this area of the Site appear limited and there is no immediate concern to receptors at this time. Soil vapour well XCG-5(SVP) was frozen in December 2024 and February 2025 and a vapour sample was not collected.

Soil vapour well XCG-13(SVP) is located on the north side of the Site and is bounded by residential buildings to the north. It is approximately 13 m from the nearest residential building. In 2023, individual hazard levels for non-carcinogenic compounds in samples collected at XCG-13(SVP) exceeded the target individual hazard level of 0.2 for dichlorodifluoromethane (0.29 in June 2023, and 0.22 in July 2023). The individual risk level for carcinogenic compound vinyl chloride was equal to or exceeded the target individual risk level of 1 x 10^{-5} for samples collected at XCG-13(SVP) in June 2023 (1.0 x 10^{-5}) and July 2023 (3.4 x 10^{-5}). In winter 2025, the individual and cumulative risk and hazard levels in the sample collected at XCG-13(SVP) in 2025 did not exceed the corresponding target risks and hazard levels. The very low hazard levels in 2025 and the sudden change from concentrations which

exceeded the individual target hazard and risk levels in 2023 are the result of the intermittent production of soil vapour and its migration as stated in Section 4.6.

Three soil vapour probes (24SVP15, 24SVP16, 24SVP17) are located adjacent to the building foundations at residences north of the Site, in the vicinity of XCG-13(SVP), to evaluate VOC concentrations within the soil vapour and the potential risk to receptors from inhalation of soil vapours. The individual and cumulative risk and hazard level in the samples collected at these locations in 2024 and 2025 did not exceed the corresponding target risk and hazard level. These sample results suggest acceptable concentrations with regard to nearby residential receptors as of the 2024/2025 sampling events. Monitoring will continue in order to confirm the initial results from the new soil vapour probes.

6.0 EVALUATION OF SITE CONDITIONS

6.1 Summary of Site Conditions

Based on findings from the 2024 and 2025, groundwater and soil vapour monitoring and sampling events and historical data for the Site, there are concerns related to the presence of the former historical landfill.

The waste at the Site is present near the backyards of residential units on the northern portion of the Site, and based on groundwater analytical results, VOCs are present in the groundwater at XCG-13(MW), located near the north-central border of the landfill footprint. Concentrations of vinyl chloride in the groundwater at XCG-13(MW) have been greater than the Tier 1 Guideline since September 2019, however, the concentration measured in 2025 decreased from the 2023 concentration. The VOC Cis-1,2-DCE has been detected at the well during most events since 2019, however, there is currently no Tier 1 Guideline for this parameter. The concentrations of all other VOCs were below the detection limit in 2024 and 2025. Notably, several VOC parameters detected in the past at XCG-13(MW) were not detected in 2025.

In 2023, the concentration of vinyl chloride at XCG-13(SVP) exceeded the Tier 1 Guideline. In 2025, the vinyl chloride concentration decreased to less than the detection limit.

Based upon feedback from AEPA in 2023 two additional groundwater monitoring wells were installed in 2024 to assist in delineation of the groundwater chemistry in the northern portion of the Site, 24MW-01 and 24MW02, situated northwest and northeast, respectively of XCG-13(MW). At these new wells, concentrations of VOCs were non-detectable in the December 2024 sampling. These results suggest improved delineation of VOCs in groundwater in this area of the Site; however, ongoing sampling is required to confirm results, and concentrations at XCG-13(MW) remain. As described in Section 5.0, understanding of potential impact to residents by VOCs is aided by sampling of vapour in this area of the Site, including XCG-13(SVP) and three new probes installed adjacent to building foundations in its proximity (24SVP15, 24SVP16 and 24SVP17). Samples from these wells did not identify VOC concentrations greater than corresponding target risks and hazard levels in 2024 and 2025. Groundwater and soil vapour analytical results are further discussed in Section 4.0.

At this time, the identified risks and hazards do not indicate a change in impacts at the Site and the recommended mitigative measures for new developments still fall within the Passive Level B measures (Appendix C). Previous sampling of methane, vinyl chloride, and cis-1,2-dichloroethene in indoor air at select adjacent residences (XCG 2018) did not detect concentrations of these parameters and detection limits were set below acceptable risk levels. It should be emphasized here that methane has not been detected at any of the perimeter wells adjacent to the residences. Headspace monitoring continues to identify methane at concentrations greater than the LEL at VW-02, which is situated within the waste footprint.

Based on the proximity of the potential receptors and the presence of waste, ongoing risk management is required and is further discussed in Section 7.0.

6.2 Summary of Hazard Quotient Results

A summary of the hazard quotients from the 2014 Environmental Risk Management Plan (ERMP) for the Site that was completed by Tiamat Environmental Consultants Ltd. (Tiamat 2014b) is attached in Section 4.0 of Appendix C. In summary, when the hazard quotient is greater than the target risk value, the scenario poses a potential concern and requires further evaluation or risk management. It is important to note that hazard quotients greater than the target risk value do not necessarily indicate that adverse health effects will occur. This is because of the conservative assumptions used in estimating concentrations and in setting the target values. Hazard quotients that are less than the target risk value indicate that exposure is within acceptable levels and no further risk management is necessary in relation to those results. Hazard quotients greater than the target risk value suggest that further investigation or risk management (e.g., remediation) may be warranted in relation to those results.

The cumulative hazard levels for non-carcinogens in samples collected from VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17 in 2025 ranged between 0.008 and 0.15, which is less than the target cumulative hazard level of 1.00. The individual hazard levels for each compound were also below the individual target hazard level of 0.20.

The cumulative risk levels for carcinogens in samples collected from VW-05, 25XCG-4(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, and 24SVP17 in 2025 ranged between 9.5×10^{-8} and 4.2×10^{-6}, below the target cumulative risk level of 1×10^{-5}. The individual risk levels for each compound were also below the target level of 1×10^{-5} in 2025.

Based on the hazard assessment conducted by XCG in 2018, the risks to indoor air associated with the measured soil vapour concentrations identified a worst-case cancer risk, which corresponded to Passive Level B mitigation measures (synthetic liner with type of material, thickness, and installation details dependent on the design professional). Based on the current and historical site data, and in consideration of limitations on available site data, Tetra Tech continues to recommend that the Passive Level B mitigation measures be considered in the interim for applications for development of sensitive land use within the 300 m landfill setback. Based on the ongoing monitoring and development of an overall vapour management strategy for the Site in consultation with the Regulators, the appropriate generic mitigative measures should continue to be reviewed and updated. The mitigative measures presented above are generic and can be used as a general guide for expectations by the City; ultimately, the developer's design engineer would be responsible for developing measures specific to the intended development based on the above or an appropriate equivalent.

Future applications for development of sensitive land use within the setback are subject to review and approval by the City. The developer's team would be responsible for reviewing and verifying the available data relative to their proposed development. Protection of workers (e.g., construction and utility) should form part of any development plan.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the 2024/2025 groundwater and vapour monitoring program and the historical sampling results have identified evidence of residual impacts in the groundwater and soil vapour at several locations. Key results are as follows:

- The direction of groundwater migration in the deeper groundwater wells was determined to be westerly in December 2024 and April 2025 under an average horizontal hydraulic gradient of 0.015 m/m, and in a

northwesterly direction in the shallow groundwater wells in April 2025 under an average horizontal hydraulic gradient of 0.009 m/m. This is consistent with previous years.

- Routine groundwater chemistry parameters and dissolved metals concentrations that exceeded the Alberta Tier 1 Guidelines at one or more monitoring wells in 2024 and 2025 included TDS, nitrate, and dissolved arsenic, iron, manganese and uranium. The elevated TDS and dissolved uranium concentrations are attributed to the dissolution of naturally occurring uranium compounds in the soils at the Site. The exceedances for dissolved manganese, iron, and arsenic are likely related to anoxic conditions and biodegradation within the landfill wastes. Similarly, the exceedance for nitrate at XCG-6 to the south is likely related to the decay of nearby buried waste consisting of over 2 m of wood debris.

- Chloride concentrations measured in groundwater samples collected at the Site in 2024 and 2025 ranged between 16.2 mg/L to the south and 188 mg/L to the north. The measured concentrations are not uncommon for groundwater in an urban setting.

- Concentrations of BTEX and PHC fractions F1 to F2 were less than the analytical detection limits at all groundwater monitoring wells in 2024 and 2025.

- Concentrations of VOCs in groundwater samples were less than the analytical detection limits for most wells in 2024 and 2025, with the exception of XCG-13(MW). The concentration of vinyl chloride at XCG-13(MW) in April 2025 (0.0066 mg/L) exceeded the Tier 1 Guideline of 0.0011 mg/L, which is consistent with historical results for this well, and is the same order of magnitude as the Tier 1 Guideline. Cis-1,2, DCE was also detected at XCG-13(MW) in April 2025, however, there is currently no Tier 1 Guideline for this parameter. Several VOC parameters detected in the past at XCG-13(MW) were not detected in 2025.

- Field-assessed concentrations of methane ranged from 21.1% in VW-02 in December 2024 and 12.1% in VW-02 in February 2025. The first is above the lower explosive limit (LEL) of 5-15% for methane, and the second falls within the LEL range.

- Concentrations of BTEX and PHC fractions F1 to F2 in all soil vapour samples were less than the soil vapour screening criteria. Concentrations of VOCs in soil vapour samples were less than the soil vapour screening criteria in 2024 and 2025. The vinyl chloride exceedances reported at XCG-13(SVP) in 2023 were not noted in 2025.

- The 2021 concentrations of tetrachloroethene and trichloroethene exceeded the soil vapour screening criteria at VW-04, situated on the southeast edge of the waste and within the waste footprint. Vapour well VW-04 was sampled in November 2021 to replace XCG-5 as XCG-5 could not be sampled. Vapour well XCG-5 is located 33 m south of VW-04 outside the waste footprint and more representative of conditions to proximate receptors. In 2018 and 2023, XCG-5 did not have any parameters exceed the soil vapour criteria indicating a low risk to proximate receptors in the area of XCG-5. However, groundwater and soil vapour should continue to be monitored. XCG-5(SVP) was frozen in December 2024 and February 2025 and a vapour sample was not collected.

- The cumulative hazard levels for non-carcinogens in vapour samples collected in 2024 and 2025 ranged between 0.008 and 0.15, which is less than the target cumulative hazard level of 1.00. The individual hazard levels for each compound were also below the individual target hazard level of 0.20.

- The cumulative risk levels for carcinogens in vapour samples collected in 2024 and 2025 ranged between 9.5×10^{-8} and 4.2×10^{-6}, below the target cumulative risk level of 1×10^{-5}. The individual risk levels for each compound were also below the target level of 1×10^{-5} in 2025.

Ongoing Monitoring and Vapour Risk Management Strategy

Based upon the results of the groundwater, surface water, and soil vapour monitoring and sampling conducted in 2024/2025 and previous years, the following is recommended:

- The current monitoring program includes semi-annual groundwater and vapour monitoring and annual groundwater and soil vapour sampling at select locations along the Site's perimeter to monitoring groundwater and soil vapour quality trends.
- As groundwater quality is well characterized and consistent, it is recommended to reduce the monitoring and sampling frequency to bi-annually in the summer. The groundwater monitoring program focuses on the perimeter monitoring locations near potential receptors, as well as at XCG-13(MW) located at the north-central side of the former landfill.
- Furthermore, it is recommended that soil vapour monitoring and sampling frequency be reduced to yearly, being carried out in the spring or fall. The vapour monitoring program focuses on locations near potential receptors to support the vapour risk management strategy discussed below.
- Finally, a site walkover should be conducted yearly when there is no snow cover to assess the condition of the landfill cover.

Based on the above, the following monitoring program is proposed:

Table 7-1: Proposed Site Condition, Groundwater, Surface Water, and Vapour Monitoring Program

Activity	2025	2026	2027	2028
Annual site walkover (summer)	X	X	X	X
Annual groundwater monitoring of 11 wells (summer) (XCG-1(MW), XCG-2(MW), XCG-4(MW), XCG-5(MW), XCG-6(MW), XCG-12(MW), XCG-13(MW), XCG-14(MW), 24MW01, 24MW02, and MW-05)		X		X
Initial groundwater sampling (fall) of two new groundwater wells 24MW01, 24MW021	X			
Annual groundwater sampling of 8 wells (summer) (XCG-4(MW), XCG-5(MW), XCG-6(MW), XCG-13(MW), XCG-14, 24MW01, 24MW02, and MW-05)[1]		X		X
Annual soil vapour monitoring of 17 locations (spring or fall) (XCG-1(SVP), XCG-2(SVP), 25XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-9(SVP), XCG-10(SVP), XCG-12(SVP), XCG-13(SVP), 24SVP15, 24SVP16, 24SVP17, VW-01, VW-02, VW-03, VW-04, and VW-05)	X	X	X	X
Annual soil vapour sampling of 8 locations (spring or fall) (25XCG-4(SVP), XCG-5(SVP), XCG-6(SVP), XCG-13(SVP), 24SVP15, 24SVP16, 24SVP17, and VW-05)[2]	X	X	X	X

Notes:

1. Analysis for routine water chemistry, ammonia, dissolved metals, and VOCs including BTEX compounds.
2. Analysis for VOCs, matrix gases (oxygen, carbon dioxide, carbon monoxide, methane, and nitrogen), BTEX, and petroleum hydrocarbons (PHCs).

Any proposed modifications to the groundwater monitoring program should describe contingency responses and should be verified with the Regulators in consideration of the concurrent management strategy for vapours. Potential contingency responses (to address potential risks associated with concentrations greater than guidelines or screening values or increasing trends in concentrations) include:

- Resampling to confirm concentrations;
- Increasing frequency of monitoring and/or sampling; and
- Assessing and implementing of risk management measures.

Administrative Actions

- Utilize the revised generic mitigative measures as a guide when evaluating applications for sensitive development within the setback.
- Ensure that the Site is clearly identified within the City's Zoning Bylaw 3357/2024 and appropriate administrative requirements are met for the Site in accordance with City Policies and Provincial Regulations.
- Ensure that the Site is clearly identified within the City's utility mapping system. Elevated methane concentrations have been recorded at VW-02, within the north-central boundary of the Site. Future activities in this vicinity (e.g., utility work, repairs, paving) should consider the potential presence of LFG and a site-specific safety plan should be developed for work undertaken to limit the potential for exposure to site workers.
- The City should review the Site condition on an ongoing basis to ensure that the cover remains intact and drainage remains positive. Repairs or maintenance should be undertaken as required to maintain the Site.

Further to the above recommendations, as noted, the Site remains an historical landfill. It presently appears to be well maintained and capped. The City should review this status on an ongoing basis to ensure that the cover remains intact and drainage remains positive; repairs or maintenance should be undertaken as required to maintain the Site.

8.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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2026-03-18

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RM SIGNATURE:
RM APEGA ID #: 98256
DATE: 2026-03-18
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The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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TABLES

Table 1: Groundwater Monitoring Results

Monitoring Well ID	Monitoring Date	Stickup (m)	Top of Pipe Elevation*** (mASL)	Screened Interval**** (mbg)	Total Depth (mbTPC)	Depth to Groundwater (mbTPC)	Depth to Groundwater (mbg)	Groundwater Elevation (mASL)	Field Parameters			Methane Concentrations[2] (ppm)	Combustible Vapour Concentrations[1] (ppm)	Volatile Organic Compound Concentrations[1] (ppm)
									pH	Electrical Conductivity (µS/cm)	Temperature (ºC)			
MW-01*	19-Sep-19	-0.06	880.51	3.1 - 9.1	9.01	7.28	7.34	873.22	-	-	-	-	5	ND
	01-Apr-20					7.35	7.41	873.16	-	-	-	-	ND	ND
MW-02	19-Sep-19	-0.14	878.87	1.5 - 6.1	6.06	2.33	2.47	876.54	-	-	-	-	35	ND
	01-Apr-20					2.45	2.59	876.42	-	-	-	-	15	ND
MW-03*	19-Sep-19	-0.06	879.35	1.5 - 4.6	4.54	2.55	2.612	876.79	-	-	-	-	320	ND
	01-Apr-20					CNL								
MW-04*	19-Sep-19	-0.03	879.48	1.5 - 4.6	3.86	2.72	2.75	876.76	-	-	-	-	55	ND
	01-Apr-20					CNL	CNL	CNL	-	-	-	-	CNL	CNL
MW-05	19-Sep-19	-0.02	879.98	Unknown	7.17	5.81	5.83	874.17	6.58	1976	8.9	-	ND	ND
	01-Apr-20					CNL								
	08-Jul-21					CNL								
	10-Sep-21					5.80	5.82	874.18	6.62	1336	7.2	120	-	-
	20-Nov-21					5.66	5.68	874.32	-	-	-	160	-	-
	06-Dec-22					5.80	5.82	870.74	6.62	1336	7.2	-	-	-
	02-Jun-23					5.92	5.94	870.62	-	-	-	900	-	-
	11-Dec-24					6.08	6.10	873.90				ND	-	-
	25-Feb-25	-0.04	879.97			6.23	6.27	873.74				ND	-	-
	23-Apr-25					6.32	6.36	873.65				Not measured	-	-
MW-06*	19-Sep-19	0.69	879.88	Unknown	4.99	3.24	2.55	876.64	-	-	-	-	ND	ND
	01-Apr-20					3.61	2.92	876.27	-	-	-	-	20	ND
MW-07*	19-Sep-19	0.85	880.53	Unknown	6.64	4.53	3.68	876.00	-	-	-	-	55	ND
	01-Apr-20					4.71	3.86	875.82	-	-	-	-	25	2
XCG-1(MW)	19-Sep-19	-0.06	881.15	6.1 - 9.1	8.98	7.45	7.51	873.70	-	-	-	-	50	ND
	01-Apr-20					FROZEN	FROZEN	FROZEN	-	-	-	-	-	-
	08-Jul-21					7.83	7.89	873.32	-	-	-	130	-	-
	20-Nov-21					7.86	7.92	873.29	-	-	-	5	-	-
	06-Dec-22					7.89	7.95	873.26	-	-	-	-	-	-
	02-Jun-23					7.92	7.98	873.23	-	-	-	250	-	-
	11-Dec-24					7.93	7.99	873.22				ND	-	-
	25-Feb-25		881.12			7.94	8.00	873.18				ND	-	-
	23-Apr-25					Dry	Dry	Dry				Not measured	-	-
XCG-2(MW)	19-Sep-19	1.05	882.22	7.3 -10.3	11.58	9.25	8.20	872.97	-	-	-	-	ND	ND
	01-Apr-20					9.16	8.11	873.06	-	-	-	-	ND	ND
	08-Jul-21					9.48	8.43	872.74	-	-	-	160	-	-
	20-Nov-21					9.37	8.32	872.85	-	-	-	35	-	-
	06-Dec-22					Dry	Dry	Dry	-	-	-	-	-	-
	02-Jun-23					Dry	Dry	Dry	-	-	-	250	-	-
	11-Dec-24					9.36	8.31	872.86				5	-	-
	25-Feb-25		882.19			9.32	8.27	872.87				45	-	-
	23-Apr-25					9.29	8.24	872.87				Not measured	-	-
XCG-4(MW)	19-Sep-19	1.04	880.28	1.5 - 3.0	4.07	3.61	2.57	876.68	6,76	1363	11.8	-	380	ND
	01-Apr-20					3.98	2.94	876.31	7.34	685	-1.0	-	ND	ND
	07-Jul-21					3.28	2.24	877.00	-	-	-	460	-	-
	10-Sep-21					3.61	2.57	876.67	6.81	892	10.0	55	-	-
	20-Nov-21					3.80	2.76	876.48	-	-	-	120	-	-
	06-Dec-22					3.74	2.70	876.54	6.81	892	10.0	-	-	-
	02-Jun-23					3.59	2.55	876.69	-	-	-	40	-	-
	11-Dec-24					4.04	3.00	876.25				ND	-	-
	25-Feb-25		880.26			Dry	Dry	Dry				180	-	-
	23-Apr-25					3.51	2.47	876.75				Not measured	-	-
XCG-5(MW)	19-Sep-19	-0.10	880.19	1.5 - 4.6	4.15	3.38	3.48	876.81	-	-	-	-	15	ND
	01-Apr-20					3.97	4.07	876.22	-	-	-	-	ND	ND
	08-Jul-21					3.34	3.44	876.85	-	-	-	140	-	-
	10-Sep-21					3.30	3.40	876.89	6.98	485	9.6	70	-	-
	20-Nov-21					3.54	3.64	876.65	-	-	-	320	-	-
	06-Dec-22					3.45	3.55	876.74	6.98	485	9.6	-	-	-
	02-Jun-23					3.52	3.62	876.67	-	-	-	25	-	-
	11-Dec-24					3.83	3.93	876.36				ND	-	-
	25-Feb-25		879.97			3.98	4.08	875.99				ND	-	-
	23-Apr-25					3.94	4.04	876.03				Not measured	-	-
XCG-6(MW)	19-Sep-19	-0.09	879.90	1.5 - 4.6	3.92	3.11	3.20	876.79	6.64	1079	9.6	-	50	ND
	01-Apr-20					3.59	3.68	876.31	7.12	605	2.7	-	ND	ND
	08-Jul-21					3.09	3.18	876.81	-	-	-	310	-	-
	10-Sep-21					2.97	3.06	876.93	6.53	922	9.9	300	-	-
	20-Nov-21					3.20	3.29	876.70	-	-	-	ND	-	-
	06-Dec-22					3.15	3.24	876.75	6.53	922	9.9	-	-	-
	02-Jun-23					3.23	3.32	876.67	-	-	-	120	-	-
	11-Dec-24					CNL								
	25-Feb-25		879.94			CNL								
	23-Apr-25					3.68	3.77	876.26				Not measured	-	-
XCG-12(MW)	19-Sep-19	-0.09	880.76	4.9 - 8.0	7.80	5.47	5.56	875.29	-	-	-	-	30	ND
	01-Apr-20					FROZEN	FROZEN	FROZEN	-	-	-	-	-	-
	07-Jul-21					Dry	Dry	Dry	-	-	-	410	-	-
	20-Nov-21					7.51	7.60	873.25	-	-	-	125	-	-
	06-Dec-22					7.53	7.62	873.23	-	-	-	-	-	-
	02-Jun-23					No Access								
	11-Dec-24					7.50	7.89	872.96				420		
	25-Feb-25		880.79			7.50	7.59	873.29				ND	-	-
	23-Apr-25					7.53	7.62	873.26				Not measured	-	-
XCG-13(MW)	19-Sep-19	-0.09	879.61	2.1 -5.2	5.33	3.37	3.46	876.25	6.49	2054	9.5	-	ND	ND
	01-Apr-20					4.07	4.16	875.54	6.68	1106	3.6	-	ND	ND
	07-Jul-21					3.76	3.85	875.86	-	-	-	40% LEL	-	-
	10-Sep-21					3.93	4.02	875.68	6.48	1430	9.3	350	-	-
	20-Nov-21					4.02	4.11	875.59	-	-	-	5	-	-
	06-Dec-22					3.84	3.93	875.77	6.48	1430	9.3	-	-	-
	02-Jun-23					3.92	4.01	875.69	-	-	-	100	-	-
	11-Dec-24					No access								
	25-Feb-25		879.64			4.37	4.46	875.27				10	-	-
	23-Apr-25					4.26	4.35	875.38				Not measured	-	-
XCG-14(MW)	19-Sep-19	-0.02	880.67	5.5 - 8.5	8.66	7.15	7.17	873.52	-	-	-	-	110	ND
	01-Apr-20					CNL								
	11-Dec-24					CNL								
	25-Feb-25		880.71			CNL								
	23-Apr-25					7.26	7.28	873.45				Not measured	-	-
24MW-01	11-Dec-24	-0.15	878.93	3.0 - 6.0	6.14	4.64	4.79	874.14				210.00	-	-
	25-Feb-25					4.83	4.83	874.10				5.00	-	-
	23-Apr-25					4.74	4.89	874.04				Not measured	-	-
24MW-02	11-Dec-24	-0.12	878.15	5.2 - 8.2	8.17	3.78	3.90	874.37				55.00	-	-
	25-Feb-25					3.87	3.99	874.28				10.00	-	-
	23-Apr-25					3.80	3.92	874.35				Not measured	-	-

Notes:

mASL - Metres above sea level.
Top of casing elevations from XCG Consultants Ltd. (2017).
* Monitoring well decommissioned on May 3, 2021.
** Unable to calculate groundwater elevation as no surveyed elevation available.
*** Groundwater monitoring wells resurveyed in April 2025.
**** Screened intervals are based on installation details,
Tetra Tech notes that well depths measured in 2025 are shallower than the total screen depths at some wells.

[1]Measured using an RKI Eagle operated in methane elimination mode.
[2]Measured using an RKI Eagle II calibrated to methane.
mbTPC - Metres below top of pipe casing.
mbg - Metres below grade.
CNL - Could not locate.
FROZEN - Monitoring wells frozen closed.
ND - Less than instrument detection limit.
ppm - Parts per million.

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline[1]	24MW-01	24MW-02		XCG-4 (MW)					XCG-5 (MW)			XCG-6 (MW)						XCG-13 (MW)						XCG-14 (MW)	MW-05			
			13-Dec-2024	13-Dec-2024	13-Dec-2024 DUP	19-Sep-2019	19-Sep-2019	10-Sep-2021	6-Dec-2022	24-Apr-2025	10-Sep-2021	6-Dec-2022	13-Dec-2024	20-Sep-2019	1-Apr-2020	10-Sep-2021	10-Sep-2021 DUP	6-Dec-2022	24-Apr-2025	19-Sep-2019	1-Apr-2020	10-Sep-2021	6-Dec-2022	6-Dec-2022 DUP	24-Apr-2025	24-Apr-2025	19-Sep-2019	10-Sep-2021	6-Dec-2022	13-Dec-2024
Field																														
Field Electric Conductivity	µS/cm	-	807	1066	-	1363	-	892	727	659	485	689	604	1079	605	922	-	1,196	-	2054	1106	1430	1,327	-	2,020	1,029	1976	1336	1,115	1830
Field Temperature	°C	-	5.6	8.0	-	11.8	-	9.95	3.88	3.6	9.60	4.43	4.6	9.60	2.70	9.92	-	3.96	-	9.5	3.56	9.34	5.09	-	6.8	6.9	8.9	7.17	3.48	1.0
Field Hydrocarbon Vapour	ppm	-	-	-	-	380	-	55	-	-	70	-	-	50	0	300	-	-	-	0	0	350	-	-	-	-	0	120	-	-
Field pH	pH Units	6.5 to 8.5	6.84	6.43	-	6.76	-	6.81	6.88	7.1	6.98	7.14	6.42	6.64	7.12	6.53	-	6.90	-	**6.49**	6.68	**6.48**	**6.44**	-	6.5	6.91	6.58	6.62	6.81	6.63
Routine																														
pH	pH Units	6.5 to 8.5	7.76	7.71	7.71	7.54	7.60	7.97	7.29	8.22	8.16	7.23	7.71	7.36	7.51	7.75	7.67	7.82	8.24	7.41	7.20	7.51	6.94	6.90	7.20	7.89	7.35	7.58	6.97	7.12
Electrical Conductivity (EC)	µS/cm	-	758	991	996	1400	1400	1180	1,180	595	628	589	567	1100	1100	1270	1260	18,000	1,550	2100	2000	1980	1,920	1,960	1,800	954	2000	1870	1,790	1,680
Total Dissolved Solids (TDS)	mg/L	500	444	**619**	**612**	**750**	**760**	**716**	**777**	363	359	388	370	**610**	**610**	**819**	**822**	**1,440**	**1,110**	**1,100**	**980**	**1,110**	**1,260**	**1,250**	**1,110**	**589**	**1,100**	**1,060**	**1,140**	**1,060**
Hardness as $CaCO_3$	mg/L	-	387	522	516	630	630	581	634	204	348	336	311	550	530	660	675	1,040	866	980	890	1050	1,170	1,160	994	554	1000	979	1,080	998
Alkalinity (total as $CaCO_3$)	mg/L	-	357	536	532	560	560	613	651	288	334	350	298	520	510	573	570	822	556	840	800	877	920	921	818	487	720	760	802	790
Alkalinity (pp as $CaCO_3$)	mg/L	-	-	-	-	<1.0	<1.0	-	-	-	-	-	-	<1.0	<1.0	-	-	-	-	<1.0	<1.0	-	-	-	-	-	<1.0	-	-	-
Bicarbonate	mg/L	-	436	654	650	690	690	747	794	351	407	427	363	630	620	699	695	1,000	678	1000	980	1070	1,120	1,120	998	594	880	927	979	964
Carbonate	mg/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.6	<5.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<0.6	<1.0	<1.0	<5.0	<1.0	<1.0	<0.6	<0.6	<1.0	<5.0	<1.0	<1.0
Hydroxide	mg/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.3	<5.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<0.3	<1.0	<1.0	<5.0	<1.0	<1.0	<0.3	<0.3	<1.0	<5.0	<1.0	<1.0
Calcium	mg/L	-	92.7	132	130	190	180	171	186	67.9	90.2	84.7	71.8	160	140	201	207	307	234	180	160	188	218	210	174	119	240	227	253	233
Magnesium	mg/L	-	37.8	46.7	46.6	42	41	37.4	41.1	8.39	29.9	30.2	31.9	37	41	38.5	38.4	67.4	68.4	130	120	140	152	155	136	62.4	100	100	109	101
Potassium	mg/L	-	5.15	6.02	5.96	23.0	23.0	24.7	27.2	5.51	6.47	4.34	3.25	4.6	6.3	8.91	8.65	6.5	4.8	3.1	3.0	3.11	3.83	3.8	4.43	2.92	4.7	4.43	5.56	5.53
Sodium	mg/L	200	13.2	28.3	28.3	42.0	43.0	51.4	40.0	48.1	5.3	3.7	3.8	19.0	22.0	33.8	33.9	53.4	17.5	35.0	26.0	38.4	55.1	55.4	42.4	10.1	25.0	22.5	25.8	24.0
Chloride	mg/L	250	44.3	22.8	21.1	110	-	49.6	59.8	46.4	13.0	6.1	19.2	11.0	11.0	9.4	9.5	18.9	16.2	200	180	205	231	231	188	27.3	230	235	222	177
Fluoride	mg/L	1.5	0.154	0.121	0.126	-	-	<0.10	0.11	0.155	0.106	0.16	0.166	-	-	0.10	0.10	0.113	<0.10	-	-	<0.10	0.108	0.108	0.166	0.162	-	<0.10	<0.10	<0.10
Sulphate	mg/L	500	14.9	33.0	33.1	12.0	-	11.3	7.4	3.36	8.06	5.08	12.9	66.0	72.0	60.6	60.1	144	136	9.3	15.0	6.6	3.33	2.76	19.5	50.8	11.0	10.4	12.4	14.1
Anions Total	meq/L	-	8.74	12	11.9	15	15	-	-	7.15	-	-	6.99	12	12	-	-	-	18.8	23	21	-	-	-	22.1	11.6	21	-	-	21.1
Cations Total	meq/L	-	8.44	11.8	11.7	15	15	-	-	6.31	-	-	6.49	12	12	-	-	-	18.2	21	19	-	-	-	23	11.6	22	-	-	21.3
Ionic Balance	%	-	96.6	98.3	-0.85	100	1	104	102	-6.24	101	97.8	92.8	100	100	100	102	93.2	-1.62	102	102	96.6	105	105	2	0	99	93.8	102	101
Cation - Anion Balance	N/A	-	-1.75	-0.84	98.3	1.8	1	-	-	88.2	-	-	-3.71	0.55	1.3	-	-	-	96.8	2.9	5.4	-	-	-	104	100	1.4	-	-	0.47
Nutrients																														
Ammonia as N	mg/L	0.1[2]	0.0099	**0.305**	**0.305**	**0.20**	**0.22**	**0.267**	0.0614	0.0385	**0.181**	**1.61**	**0.339**	0.098	0.089	**1.09**	**1.09**	**0.209**	-	**0.18**	0.075	0.067	**0.339**	**0.324**	**0.976**	**0.168**	**0.46**	**0.408**	**0.424**	**0.432**
Nitrate (as NO_3)	mg/L	-	-	-	-	<0.044	<0.044	-	-	-	-	-	-	7.8	6.5	-	-	-	-	<0.044	<0.044	-	-	-	-	-	<0.044	-	-	-
Nitrate (as NO_3-N)	mg/L	10	0.517	<0.100	<0.100	<0.010	<0.010	0.69	<0.100	0.109	1.32	0.608	2.98	1.8	1.5	**27.7**	**27.6**	**72.4**	**61.6**	<0.010	<0.010	0.13	0.124	<0.100	<0.100	0.152	<0.010	<0.10	<0.100	<0.100
Nitrite (as NO_2)	mg/L	-	-	-	-	<0.033	<0.033	-	-	-	-	-	-	0.19	<0.033	-	-	-	-	<0.033	<0.033	-	-	-	-	-	<0.033	-	-	-
Nitrite (as NO_2-N)	mg/L	1	<0.010	<0.050	<0.112	<0.010	<0.010	<0.050	<0.050	<0.010	<0.010	<0.010	0.018	0.057	<0.010	0.096	0.106	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050
Nitrate and Nitrate (as N)	mg/L	-	0.517	<0.112	<0.050	<0.014	<0.014	0.69	<0.112	0.109	1.32	0.608	3	1.8	1.5	27.8	27.7	72.4	61.6	<0.014	<0.014	0.13	0.124	<0.112	<0.112	0.152	<0.014	<0.11	<0.112	<0.112
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	-	-	0.55	0.58	-	-	-	-	-	-	1.2	-	-	-	-	-	1.7	1.1	-	-	-	-	-	1.1	-	-	-
Total Phosphorus	mg/L	-	-	-	-	0.034	0.027 - 0.12	-	-	-	-	-	-	0.19	-	-	-	-	-	0.39	0.16	-	-	-	-	-	0.078	-	-	-
Dissolved Metals																														
Aluminum	mg/L	2.9	0.0014	0.0033	0.0034	<0.0030	0.0036	0.0013	0.0052	0.0020	0.0095	0.0024	0.0277	0.0033	-	0.0069	0.0049	0.0052	-	0.0051	0.037	0.0039	0.0083	<0.0050	0.291	0.0024	0.0037	<0.0050	0.0019	0.0045
Antimony	mg/L	0.006	0.00018	0.00023	0.00023	<0.00060	<0.00060	0.00059	0.00133	0.00057	0.00068	0.00065	0.00074	<0.00060	-	0.00039	0.00039	<0.00050	-	<0.00060	<0.00060	0.00015	<0.00050	<0.00050	<0.00020	<0.00010	<0.00060	<0.0005	<0.00010	<0.00010
Arsenic	mg/L	0.01	0.00057	0.00287	0.00298	0.0011	0.0011	0.00066	0.00135	0.00042	0.00226	0.00129	0.00079	0.00076	-	0.00168	0.0017	0.00128	-	0.0033	0.0012	0.00259	0.00569	0.0054	**0.0312**	0.00858	0.0075	**0.0103**	**0.0147**	**0.0148**
Barium	mg/L	2	0.275	0.127	0.123	0.21	0.22	0.260	0.318	0.0665	0.246	0.198	0.245	0.25	-	0.351	0.352	0.418	-	0.83	0.64	1.00	0.899	0.9	1.12	0.49	0.50	0.525	0.516	0.549
Beryllium	mg/L	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	-	<0.0010	-	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	<0.0010	-	-	-
Boron	mg/L	5	0.048	0.169	0.163	0.045	0.061	0.042	0.056	<0.010	0.037	0.034	0.026	0.48	-	0.341	0.351	0.221	-	0.044	0.048	0.051	0.068	0.056	0.066	0.061	0.12	0.113	0.111	0.123
Cadmium	mg/L	0.007	0.0000141	0.0000901	0.0000850	<0.000020	<0.000020	0.000016	0.0000716	0.0000454	0.000023	<0.0000050	0.000008	0.000097	-	0.000117	0.000111	0.000188	-	<0.000020	0.00011	<0.000005	<0.0000250	<0.0000250	0.0000419	<0.0000050	0.000025	<0.000025	0.0000136	0.0000071
Chromium	mg/L	0.05	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00010	<0.00050	<0.00050	<0.00010	<0.00050	<0.00050	0.0010	-	<0.00010	<0.00010	<0.00050	-	<0.0010	<0.0010	0.00013	<0.00050	<0.00050	<0.00100	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	-	-	-	-	0.0033	0.0034	-	-	-	-	-	-	0.00063	-	-	-	-	-	0.0062	0.0046	-	-	-	-	-	0.0032	-	-	-
Copper	mg/L	0.07	0.00081	0.00195	0.00214	0.00068	0.00058	0.0017	0.00265	0.00351	0.00217	0.00144	0.00083	0.0034	-	0.00443	0.00364	0.00499	-	0.0013	0.0018	0.00056	<0.00100	<0.00100	0.00165	0.00021	0.0005	<0.0010	0.00098	0.00066
Iron	mg/L	0.3	<0.010	<0.010	0.031	**0.59**	**0.67**	0.146	0.046	<0.010	**0.425**	**1.75**	0.142	<0.060	0.16	0.096	0.092	<0.050	-	**3.4**	**0.79**	**3.68**	**11.1**	**11.1**	**26.9**	**0.787**	**2.2**	**2.19**	**2.49**	**2.75**
Lead	mg/L	0.005	<0.000050	<0.000050	<0.000050	<0.00020	<0.00020	<0.000050	0.000328	0.000416	<0.000050	<0.000050	0.000055	<0.00020	-	0.000056	<0.000050	<0.000250	-	<0.00020	0.00022	<0.000050	<0.000250	<0.000250	0.00058	<0.000050	<0.00020	<0.000205	<0.000050	0.000058
Lithium	mg/L	-	-	-	-	<0.020	<0.020	-	-	-	-	-	-	<0.020	-	-	-	-	-	0.049	0.055	-	-	-	-	-	0.077	-	-	-
Manganese	mg/L	0.02	**0.0251**	**0.505**	**0.501**	**0.48**	**0.49**	**0.144**	**0.241**	0.00041	**0.292**	**0.0422**	**0.0802**	**0.13**	**0.32**	**0.29**	**0.286**	**0.218**	-	**0.87**	**1.1**	**0.668**	**0.828**	**0.828**	**1.59**	**0.219**	**0.85**	**0.689**	**0.754**	**0.785**

Notes:

[1] Alberta Environment and Protected Areas (AEPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for coarse textured soils under Residential/Parkland land use with the freshwater aquatic life pathway removed.

[2] Recommendation only--not official guideline. Canadian Drinking Water Quality Guideline (Health Canada, 2016)

"-" No applicable guideline or not analyzed.

BOLD Greater than Tier 1 Guideline.

Italics Detection limit is greater than the guideline.

UNDERLINE Greater than recommmended limit

N/A Not applicable.

TETRA TECH

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline[1]	24MW-01	24MW-02		XCG-4 (MW)					XCG-5 (MW)			XCG-6 (MW)						XCG-13 (MW)						XCG-14 (MW)	MW-05			
			13-Dec-2024	13-Dec-2024	13-Dec-2024 DUP	19-Sep-2019	19-Sep-2019	10-Sep-2021	6-Dec-2022	24-Apr-2025	10-Sep-2021	6-Dec-2022	13-Dec-2024	20-Sep-2019	1-Apr-2020	10-Sep-2021	10-Sep-2021 DUP	6-Dec-2022	24-Apr-2025	19-Sep-2019	1-Apr-2020	10-Sep-2021	6-Dec-2022	6-Dec-2022 DUP	24-Apr-2025	24-Apr-2025	19-Sep-2019	10-Sep-2021	6-Dec-2022	13-Dec-2024
Dissolved Metals																														
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	-	<0.0000050	<0.0000050	<0.0000050	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	-	-	-	-	0.00071	0.00078	-	-	-	-	-	-	0.00096	-	-	-	-	-	0.00071	0.00085	-	-	-	-	-	0.00054	-	-	-
Nickel	mg/L	0.17	0.00176	0.0037	0.00375	0.011	0.011	0.00724	0.00931	0.0025	0.0044	0.00238	0.00229	0.0068	-	0.011	0.0109	0.0119	-	0.013	0.0086	0.013	0.0128	0.0132	0.0227	0.00099	0.0091	0.0084	0.00888	0.0101
Phosphorus	mg/L	-	-	-	-	<0.10	<0.10	-	-	-	-	-	-	<0.10	-	-	-	-	-	<0.10	<0.10	-	-	-	-	-	<0.10	-	-	-
Selenium	mg/L	0.05	0.0014	0.000171	0.000174	<0.00020	<0.00020	0.00159	0.000248	0.000125	0.000264	0.000435	0.00015	0.00054	-	0.000705	0.000714	0.000424	-	<0.00020	0.00029	0.000663	0.00153	0.00132	0.000161	<0.000050	<0.00020	0.00056	0.000222	<0.000050
Silicon	mg/L	-	-	-	-	8.2	8.4	-	-	-	-	-	-	8.9	-	-	-	-	-	8.6	7.8	-	-	-	-	-	9.9	-	-	-
Silver	mg/L	-	<0.000010	<0.000010	<0.000010	<0.00010	<0.00010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00010	-	<0.000010	<0.000010	<0.000050	-	<0.00010	<0.00010	<0.000010	<0.000050	<0.000050	<0.000020	<0.000010	<0.00010	<0.000050	<0.000010	<0.000010
Strontium	mg/L	-	-	-	-	0.54	0.54	-	-	-	-	-	-	0.38	-	-	-	-	-	1.8	1.7	-	-	-	-	-	2.1	-	-	-
Sulphur	mg/L	-	-	-	-	4.2	4.2	-	-	-	-	-	-	19	-	-	-	-	-	3.2	4.3	-	-	-	-	-	4.0	-	-	-
Thallium	mg/L	-	-	-	-	<0.00020	<0.00020	-	-	-	-	-	-	<0.00020	-	-	-	-	-	<0.00020	<0.00020	-	-	-	-	-	<0.00020	-	-	-
Tin	mg/L	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	-	<0.0010	-	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	<0.0010	-	-	-
Titanium	mg/L	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	-	<0.0010	-	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	<0.0010	-	-	-
Uranium	mg/L	0.02	0.00624	0.0102	0.0101	0.0024	0.0023	0.00207	0.00346	0.00339	0.000982	0.000866	0.00114	0.0024	-	0.00171	0.00168	0.00307	-	0.015	0.018	0.0109	0.0112	0.0111	0.0154	0.0176	0.017	0.0124	0.0147	**0.0231**
Vanadium	mg/L	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	-	<0.0010	-	-	-	-	-	<0.0010	<0.0010	-	-	-	-	-	<0.0010	-	-	-
Zinc	mg/L	5	0.0024	0.0222	0.0234	<0.0030	<0.0030	0.0049	0.0055	0.0047	0.0291	0.069	0.0458	0.028	-	0.187	0.185	0.0901	-	0.096	0.89	0.0073	0.0053	<0.0050	0.382	0.0018	0.015	<0.0050	0.0066	0.0071
Carbon																														
Total Organic Carbon (TOC)	mg/L	-	-	-	-	5.4	5.6	-	-	-	-	-	-	7.8	-	-	-	-	-	13	10	-	-	-	-	-	8.6	-	-	-
Demand Parameters																														
Biochemical Oxygen Demand (BOD)	mg/L	-	-	-	-	<2.0	<2	-	-	-	-	-	-	<2.0	-	-	-	-	-	<2.0	3.2	-	-	-	-	-	2.3	-	-	-
Chemical Oxygen Demand (COD)	mg/L	-	-	-	-	17	33	-	-	-	-	-	-	61	-	-	-	-	-	96	50	-	-	-	-	-	33	-	-	-
Organics																														
Organic halogen	mg/L	-	-	-	-	0.32	0.1	-	-	-	-	-	-	0.01	-	-	-	-	-	0.12	0.04	-	-	-	-	-	0.01	-	-	-
Hydrocarbons																														
Benzene	mg/L	0.0050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	0.00055	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00040	<0.00050	<0.00050	<0.00050
Xylene (o)	mg/L	-	<0.00030	<0.00030	<0.00030	<0.00040	<0.00040	<0.00050	<0.00030	<0.00030	<0.00050	<0.00030	<0.00030	<0.00040	<0.00040	<0.00050	<0.00050	<0.00030	<0.00030	<0.00040	<0.00040	<0.00050	<0.00030	<0.00030	<0.00030	<0.00030	<0.00040	<0.00050	<0.00030	<0.00030
Xylenes (m & p)	mg/L	-	<0.00040	<0.00040	<0.00040	<0.00080	<0.00080	<0.00050	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040	<0.00080	<0.00080	<0.00050	<0.00050	<0.00040	<0.00040	<0.00080	<0.00080	<0.00050	<0.00040	<0.00040	<0.00040	<0.00040	<0.00080	<0.00050	<0.00040	<0.00040
Xylenes Total	mg/L	0.020	<0.00050	<0.00050	<0.00050	<0.00089	<0.00089	<0.00071	<0.00050	<0.00050	<0.00071	<0.00050	<0.00050	<0.00089	<0.00089	<0.00071	<0.00071	<0.00050	<0.00050	<0.00089	<0.00089	<0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<0.00089	<0.00071	<0.00050	<0.00050
Styrene	mg/L	2.8	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
F1 (C_6-C_{10})	mg/L	-	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	-	-	<0.10	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	-
F1 (C_6-C_{10}) - BTEX	mg/L	2.2	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	-	-	<0.10	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	-
F2 (C_{10}-C_{16})	mg/L	1.1	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	-	-	<0.10	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-	-
Total BTEX	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-	-	-	-	<0.0010	<0.0010	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010
Volatile Organic Compounds (VOCs)																														
2,4,5-Trichlorophenoxy-propanoic acid	mg/L	-	-	-	-	<0.50	<0.50	-	-	-	-	-	-	<0.50	<0.50	-	-	-	-	<0.50	<0.50	-	-	-	-	-	<0.50	-	-	-
Acetic Acid	mg/L	-	-	-	-	<0.50	<0.50	-	-	-	-	-	-	<0.50	<0.50	-	-	-	-	<0.50	<0.50	-	-	-	-	-	<0.50	-	-	-
Formic Acid	mg/L	-	-	-	-	<0.50	<0.50	-	-	-	-	-	-	<0.50	<0.50	-	-	-	-	<0.50	<0.50	-	-	-	-	-	<0.50	-	-	-
Bromobenzene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Bromochloromethane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Bromodichloromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Bromoform	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Bromomethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
sec-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
tert-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Carbon tetrachloride	mg/L	0.00156	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0146	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Chloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	0.0023	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Protected Areas (AEPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for coarse textured soils under Residential/Parkland land use with the freshwater aquatic life pathway removed.

[2] Recommendation only--not official guideline. Canadian Drinking Water Quality Guideline (Health Canada, 2016)

"-"	No applicable guideline or not analyzed.
BOLD	Greater than Tier 1 Guideline.
Italics	Detection limit is greater than the guideline.
UNDERLINE	Greater than recommmended limit
N/A	Not applicable.

TETRA TECH

Table 2: Groundwater Analytical Results

Parameter	Unit	Tier 1 Guideline[1]	24MW-01	24MW-02		XCG-4 (MW)					XCG-5 (MW)			XCG-6 (MW)						XCG-13 (MW)						XCG-14 (MW)	MW-05			
			13-Dec-2024	13-Dec-2024	13-Dec-2024 DUP	19-Sep-2019	19-Sep-2019	10-Sep-2021	6-Dec-2022	24-Apr-2025	10-Sep-2021	6-Dec-2022	13-Dec-2024	20-Sep-2019	1-Apr-2020	10-Sep-2021	10-Sep-2021 DUP	6-Dec-2022	24-Apr-2025	19-Sep-2019	1-Apr-2020	10-Sep-2021	6-Dec-2022	6-Dec-2022 DUP	24-Apr-2025	24-Apr-2025	19-Sep-2019	10-Sep-2021	6-Dec-2022	13-Dec-2024
Volatile Organic Compounds (VOCs)																														
Chloroform	mg/L	0.080	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Chloromethane	mg/L	-	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020	<0.0010	<0.0050	<0.0050	<0.0010	<0.0050	<0.0050	<0.0020	-	<0.0010	<0.0010	<0.0050	<0.0050	<0.0020	<0.0020	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0010	<0.0050	<0.0050
2-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
4-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.196	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	-	<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00020	<0.00020	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00020	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00020	<0.00020	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<0.00050	<0.0010	<0.0010
Dibromomethane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	-	<0.00050	<0.00050	<0.0010	<0.0010	-	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.00300	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.0050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	0.014	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,2-Dichloroethene (cis)	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	0.11	0.033	<0.0010	0.066	0.0636	0.011	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (trans)	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	0.0021	<0.00050	0.00186	0.0015	0.0014	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	-	<0.00050	<0.00050	<0.0010	<0.0010	-	-	0.00153	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
1,3-Dichloropropene	mg/L	-	<0.0015	<0.0015	<0.0015	-	-	-	<0.0015	<0.0015	<0.0015	-	<0.0015	-	-	-	-	<0.0015	<0.0015	-	-	-	<0.0015	<0.0015	<0.0015	<0.0015	-	-	<0.0015	<0.0015
1,3-Dichloropropene [cis]	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,3-Dichloropropene [trans]	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.00136	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
Methyl t-Butyl Ether (MTBE)	mg/L	0.015	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050
Methylene Chloride	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010
Methyl Methacrylate	mg/L	116	-	-	-	<0.00050	<0.00050	-	-	-	-	-	-	<0.00050	-	-	-	-	-	<0.00050	<0.00050	-	-	-	-	-	<0.00050	-	-	-
iso-Propylbenzene (cumene)	mg/L	-	<0.0010	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
n-Propylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.0020	<0.0020	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0020	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.0020	<0.0020	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.00050	<0.0010	<0.0010
Tetrachloroethene	mg/L	0.01	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	0.014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3,5-Trichlorobenzene	mg/L	0.014	-	-	-	<0.00050	<0.00050	<0.00050	-	-	-	-	-	<0.00050	-	-	-	-	-	<0.00050	<0.00050	-	-	-	-	-	-	<0.00050	-	-
1,1,1-Trichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Trichloroethene	mg/L	0.00386	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	0.00072	<0.00050	0.00066	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010
Trihalomethanes	mg/L	0.1	<0.0020	<0.0020	<0.0020	<0.00103	<0.00103	-	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.00103	-	-	-	<0.0020	<0.0020	<0.00103	<0.00103	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.00103	-	<0.0020	<0.0020
1,2,3-Trichloropropane	mg/L	-	<0.0010	<0.0010	<0.0010	-	-	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	-	-	<0.00050	<0.00050	<0.0010	<0.0010	-	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.00050	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/L	0.0011	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.00050	-	<0.00050	<0.00050	<0.0010	<0.0010	**0.025**	**0.0041**	**0.0275**	**0.024**	**0.0235**	**0.0066**	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010

Notes:

[1] Alberta Environment and Protected Areas (AEPA). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 198 pp. Referenced guidelines are for coarse textured soils under Residential/Parkland land use with the freshwater aquatic life pathway removed.

[2] Recommendation only--not official guideline. Canadian Drinking Water Quality Guideline (Health Canada, 2016)

"-"	No applicable guideline or not analyzed.
BOLD	Greater than Tier 1 Guideline.
Italics	Detection limit is greater than the guideline.
UNDERLINE	Greater than recommmended limit
N/A	Not applicable.

TETRA TECH

Table 3: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	XCG-13 (MW)	DUPLICATE	RPD (%)	24MW-02	DUPLICATE	RPD (%)
			6-Dec-2022	6-Dec-2022		13 Dec 2024	13 Dec 2024	
Routine								
pH	pH Units	0.1	6.94	6.90	0.6	7.71	7.71	0
Electrical Conductivity (EC)	µS/cm	1	1,920	1,960	2	991	996	0.5
Total Dissolved Solids (TDS)	mg/L	1	1,260	1,250	0.8	619	612	1
Hardness as $CaCO_3$	mg/L	0.5	1,170	1,160	0.9	522	516	1
Alkalinity (total as $CaCO_3$)	mg/L	1	920	921	0.1	536	532	0.7
Bicarbonate	mg/L	1	1,120	1,120	0	654	650	0.6
Carbonate	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-
Hydroxide	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-
Calcium	mg/L	0.05	218	210	4	132	130	2
Magnesium	mg/L	0.005	152	155	2	46.7	46.6	0.2
Potassium	mg/L	0.05	3.83	3.8	0.8	6.02	5.96	1.0
Sodium	mg/L	0.05	55.1	55.4	0.5	28.3	28.3	0
Chloride	mg/L	0.5	231	231	0	22.8	21.1	8
Fluoride	mg/L	0.02	0.108	0.108	0	0.121	0.126	4
Sulphate	mg/L	0.3	3.33	2.76	19	33	33.1	0.3
Ionic Balance	%		105	105	0			
Nutrients								
Ammonia as N	mg/L	0.005	0.339	0.324	5	0.305	0.305	0
Nitrate (as NO_3-N)	mg/L	0.02	0.124	<0.100	-	<0.100	<0.100	-
Nitrite (as NO_2-N)	mg/L	0.01	<0.050	<0.050	-	<0.050	<0.050	-
Nitrate and Nitrate (as N)	mg/L	0.0224	0.124	<0.112	-	<0.112	<0.112	-
Dissolved Metals								
Aluminum	mg/L	0.001	0.0083	<0.0050	-	0.0033	0.0034	-
Antimony	mg/L	0.0001	<0.00050	<0.00050	-	0.00023	0.00023	-
Arsenic	mg/L	0.0001	0.00569	0.0054	5	0.00287	0.00298	4
Barium	mg/L	0.0001	0.899	0.900	0.1	0.127	0.123	3
Boron	mg/L	0.01	0.068	0.056	19	0.169	0.163	4
Cadmium	mg/L	0.000005	<0.0000250	<0.0000250	-	0.0000901	0.000085	6
Chromium	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Copper	mg/L	0.0002	<0.00100	<0.00100	-	0.00195	0.00214	9
Iron	mg/L	0.01	11.1	11.1	0	<0.010	0.031	-
Lead	mg/L	0.00005	<0.000250	<0.000250	-	<0.000050	<0.000050	-
Manganese	mg/L	0.0001	0.828	0.828	0	0.505	0.501	0.8
Mercury	mg/L	0.000005	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Nickel	mg/L	0.0005	0.0128	0.0132	3	0.0037	0.00375	1
Selenium	mg/L	0.00005	0.00153	0.00132	15	0.000171	0.000174	-
Silver	mg/L	0.00001	<0.000050	<0.000050	-	<0.000010	<0.000010	-
Uranium	mg/L	0.00001	0.0112	0.0111	0.9	0.0102	0.0101	1
Zinc	mg/L	0.001	0.0053	<0.0050	-	0.0222	0.0234	5
Hydrocarbons								
Benzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Toluene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Xylene (o)	mg/L	0.0003	<0.00030	<0.00030	-	<0.00030	<0.00030	-
Xylenes (m & p)	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Xylenes Total	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Total BTEX	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Volatile Organic Compounds (VOCs)								
Bromobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromochloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromodichloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromoform	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Bromomethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
n-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
sec-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
tert-Butylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Carbon tetrachloride	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Chlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Chloroethane	mg/L	0.001	<0.0020	<0.0020	-	<0.0010	<0.0010	-
Chloroform	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Chloromethane	mg/L	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	-
2-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
4-Chlorotoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Dibromochloromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-

Notes:

RDL - Reportable detection limit.

RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100

where V1,V2 = concentrations of parent and duplicate sample, respectively.

"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL.

N/A - Not applicable.

BOLD - RPD value greater than 20%.

Table 3: Groundwater Quality Assurance/Quality Control Analytical Results

Parameter	Unit	RDL	XCG-13 (MW)	DUPLICATE	RPD (%)	24MW-02	DUPLICATE	RPD (%)
			6-Dec-2022	6-Dec-2022		13 Dec 2024	13 Dec 2024	
Volatile Organic Compounds (VOCs)								
1,2-Dibromo-3-chloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dibromoethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Dibromomethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichlorobenzene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
1,3-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,4-Dichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloroethene (cis)	mg/L	0.001	0.066	0.0636	4	<0.0010	<0.0010	-
1,2-Dichloroethene (trans)	mg/L	0.001	0.0015	0.0014	-	<0.0010	<0.0010	-
Dichlorodifluoromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
2,2-Dichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1-Dichloropropene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropene	mg/L	0.0015	<0.0015	<0.0015	-	<0.0015	<0.0015	-
1,3-Dichloropropene [cis]	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3-Dichloropropene [trans]	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Hexachlorobutadiene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
p-Isopropyltoluene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Methyl t-Butyl Ether (MTBE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Methylene Chloride	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
iso-Propylbenzene (cumene)	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
n-Propylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,1,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Tetrachloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,3-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,4-Trichlorobenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,1-Trichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,1,2-Trichloroethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trichloroethene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trichlorofluoromethane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Trihalomethanes	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-
1,2,3-Trichloropropane	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,2,4-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
1,3,5-Trimethylbenzene	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Vinyl chloride	mg/L	0.001	0.024	0.0235	2	<0.0010	<0.0010	-

Notes:

RDL - Reportable detection limit.

RPD - Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100

where V1,V2 = concentrations of parent and duplicate sample, respectively.

"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL.

N/A - Not applicable.

BOLD - RPD value greater than 20%.

Table 4A: Soil Vapour Monitoring Results (September 2019)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (pascals)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.0	0.0	3.5	17.4	79.1
VW-02	4.0 - 4.3	N	0.0	30.0	28.2	0.1	41.7
VW-03	1.7 - 2.0	N	0.0	0.0	20.5	3.5	76.1
VW-04	1.8 - 2.1	N	0.0	0.0	4.4	17.5	78.1
VW-05	4.1 - 4.4	N	0.0	0.0	7.5	13.7	78.8
XCG-1	3.65 - 3.80	Y			5.2		
XCG-2	2.75 - 2.80	Y			2.1		
XCG-4	0.70 - 0.85	N	0.0	0.0	5.1	15.0	80.0
XCG-5	1.70 - 1.85	N	0.0	0.0	3.6	17.0	79.4
XCG-6	1.40 - 1.55	N	0.0	0.0	16.3	5.1	78.6
XCG-9	1.20 - 1.35	Y			3.4		
XCG-10	1.50 - 1.65	N	0.0	0.0	6.5	16.3	77.2
XCG-12	1.70 - 1.85	N	0.1	0.0	0.3	20.0	79.7
XCG-13	1.75 - 1.90	N	0.0	0.0	0.1	20.8	79.1

Notes:

Blank - Not measured because probe was blinded.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4B: Soil Vapour Monitoring Results (April 2020)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	Frozen					
VW-02	4.0 - 4.3	CNL					
VW-03	1.7 - 2.0	N	0.0	0.0	18.2	2.4	79.4
VW-04	1.8 - 2.1	CNL					
VW-05	4.1 - 4.4	N	0.0	0.0	0.1	21.0	79.0
XCG-1	3.65 - 3.80	Frozen					
XCG-2	2.75 - 2.80	Frozen					
XCG-4	0.70 - 0.85	N	0.0	0.0	2.0	11.1	86.3
XCG-5	1.70 - 1.85	N	0.1	0.0	1.4	19.6	79.0
XCG-6	1.40 - 1.55	N	0.0	0.0	0.1	21.8	78.2
XCG-9	1.20 - 1.35	CNL					
XCG-10	1.50 - 1.65	N	0.0	0.0	5.8	18.4	75.8
XCG-12	1.70 - 1.85	N	0.1	0.0	0.1	23.6	76.2
XCG-13	1.75 - 1.90	N	0.0	0.1	4.1	19.4	77.3

Notes:

Blank - Not measured because probe was blinded.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4C: Soil Vapour Monitoring Results (July 2021)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.0	0.0	2.2	18.2	79.6
VW-02	4.0 - 4.3	N	0.03	18.7	20.3	3.3	57.8
VW-03	1.7 - 2.0	N	0.0	0.0	12.6	7.3	80.1
VW-04	1.8 - 2.1	N	0.0	0.0	2.6	18.8	78.6
VW-05	4.1 - 4.4	N	0.0	0.0	11.4	13.2	75.3
XCG-1	3.65 - 3.80	Y	-0.0462				
XCG-2	2.75 - 2.80	Y	-0.0641				
XCG-4	0.70 - 0.85	N	0.0	0.0	3.3	6.9	89.8
XCG-5	1.70 - 1.85	N	0.0	0.0	2.3	18.8	79.0
XCG-6	1.40 - 1.55	N	0.0	0.0	12.3	4.6	83.0
XCG-9	1.20 - 1.35	Y	-0.1121				
XCG-10	1.50 - 1.65	N	0.1	0.0	6.5	14.5	79.0
XCG-12	1.70 - 1.85	Y	0.107				
XCG-13	1.75 - 1.90	Y	0.150				

Notes:

Blank - Not measured because probe was blinded.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4D: Soil Vapour Monitoring Results (September 2021)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
XCG-1	3.65 - 3.80	N	0.0	0.0	0.1	19.9	80.0
XCG-12*	1.70 - 1.85	Y			0.58		
XCG-13	1.75 - 1.90	N	0.40	1.0	16.8	9.1	73.2

Notes:

Blank - Not measured because probe was blinded.

* Sample was taken with a Tedlar bag and vacuum pump as water was present.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4E: Soil Vapour Monitoring Results (November 2021)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.08	0.0	3.5	18.8	77.7
VW-02	4.0 - 4.3	N	-0.05	0.0	0.6	22.1	77.3
VW-03	1.7 - 2.0	N	0.0	0.0	11.0	12.6	76.4
VW-04	1.8 - 2.1	N	0.05	0.0	2.5	19.6	77.9
VW-05	4.1 - 4.4	N	-0.04	0.0	0.2	21.5	78.3
XCG-1	3.65 - 3.80	Frozen					
XCG-2	2.75 - 2.80	N	0.05	0.0	0.5	20.9	78.6
XCG-4	0.70 - 0.85	N	0.0	0.0	2.5	18.4	79.0
XCG-5	1.70 - 1.85	N	*	*	*	*	*
XCG-6	1.40 - 1.55	N	0.0	0.0	0.1	22.3	77.6
XCG-9	1.20 - 1.35	Y					
XCG-10	1.50 - 1.65	N	0.0	0.0	2.8	19.4	77.9
XCG-12	1.70 - 1.85	N	0.0	0.0	0.1	21.8	78.1
XCG-13	1.75 - 1.90	N	0.0	0.0	10.4	13.6	76.0

Notes:

Blank - Not measured because probe was blinded.

*Soil vapour probe was frozen and an accurate measurement could not be taken.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4F: Soil Vapour Monitoring Results (June 2023)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.0063	0.0	2.4	18.8	78.8
VW-02	4.0 - 4.3	N	0.0106	10.4	12.5	9.3	67.7
VW-03	1.7 - 2.0	N	0.0	0.0	8.1	11.7	80.3
VW-04	1.8 - 2.1	N	0.001	0.0	3.0	17.0	80.1
VW-05	4.1 - 4.4	N	0.0	0.0	7.5	15.4	77.1
XCG-1	3.65 - 3.80	N	-0.0931	0.0	1.8	19.0	79.3
XCG-2	2.75 - 2.80	N	0.0074	0.0	1.5	19.7	78.7
XCG-4	0.70 - 0.85	Y	-0.0406				
XCG-5	1.70 - 1.85	N	0.0	0.0	1.7	18.1	80.2
XCG-6	1.40 - 1.55	N	-0.1	0.0	7.9	7.8	84.3
XCG-9	1.20 - 1.35	N	-0.0025	0.0	1.0	20.2	78.8
XCG-10	1.50 - 1.65	N	0.0	0.0	2.5	17.8	79.6
XCG-12**	1.70 - 1.85	Y	0.1457	0.0	0.0	19.3	80.6
XCG-13	1.75 - 1.90	N	0.0	0.5	12.8	6.4	80.3

Notes:

Blank - Not measured because probe was blinded.

*Soil vapour probe damaged.

**Soil vapour probe could not be accessed in June, measurements from July 2023.

CNL - Could not locate.

NM - Not measured.

Bold - Greater than trigger level.

Table 4G: Soil Vapour Monitoring Results (December 2024)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.0	0.0	3.6	18.4	78.0
VW-02	4.0 - 4.3	N	0.0	21.1	23.4	0.2	54.9
VW-03	1.7 - 2.0	N	0.0	0.0	9.1	14.1	76.9
VW-04	1.8 - 2.1	N	0.0	0.0	0.3	20.3	79.4
VW-05	4.1 - 4.4	N	0.0	0.0	11.1	16.3	72.6
XCG-1	3.65 - 3.80	*	*	*	*	*	*
XCG-2	2.75 - 2.80	*	*	*	*	*	*
XCG-4	0.70 - 0.85	*	*	*	*	*	*
XCG-5	1.70 - 1.85	*	*	*	*	*	*
XCG-6	1.40 - 1.55	CNL	CNL	CNL	CNL	CNL	CNL
XCG-9	1.20 - 1.35	*	*	*	*	*	*
XCG-10	1.50 - 1.65	N	0.0	0.0	2.2	20.5	77.3
XCG-12	1.70 - 1.85	*	*	*	*	*	*
XCG-13	1.75 - 1.90	**	**	**	**	**	**
24SVP15	1.75 - 1.95	N	0.0	0.0	1.9	20.4	77.7
24SVP16	1.80 - 1.96	N	0.0	0.0	2.3	20.1	77.7
24SVP17	1.40 - 1.55	N	0.0	0.0	1.9	19.9	78.2

Notes:

Blank - Not measured because probe was blinded.

*Soil vapour probe tubing frozen and or damaged.

**Soil vapour probe could not be accessed.

CNL - Could not locate.

Bold - Greater than trigger level.

Table 4H: Soil Vapour Monitoring Results (February 2025)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	N	0.0	0.0	3.1	20.0	76.9
VW-02	4.0 - 4.3	N	0.0	12.1	19.3	0.3	68.2
VW-03	1.7 - 2.0	N	0.0	0.0	4.7	18.7	76.6
VW-04	1.8 - 2.1	**	**	**	**	**	**
VW-05	4.1 - 4.4	N	0.0	0.0	8.6	17.5	73.9
XCG-1	3.65 - 3.80	*	*	*	*	*	*
XCG-2	2.75 - 2.80	*	*	*	*	*	*
25XCG-4	0.23 - 0.35	N	0.0	0.0	1.6	20.0	78.4
XCG-5	1.70 - 1.85	*	*	*	*	*	*
XCG-6	1.40 - 1.55	CNL	CNL	CNL	CNL	CNL	CNL
XCG-9	1.20 - 1.35	*	*	*	*	*	*
XCG-10	1.50 - 1.65	*	*	*	*	*	*
XCG-12	1.70 - 1.85	*	*	*	*	*	*
XCG-13	1.75 - 1.90	N	0.0	0.0	8.5	15.7	75.8
24SVP15	1.75 - 1.95	N	0.0	0.0	1.4	20.9	77.6
24SVP16	1.80 - 1.96	N	0.0	0.0	1.9	20.8	77.3
24SVP17	1.40 - 1.55	N	0.0	0.0	1.5	21.1	77.4

Notes:

Blank - Not measured because probe was blinded.

*Soil vapour probe tubing frozen and or damaged.

**Soil vapour probe could not be accessed.

CNL - Could not locate.

Bold - Greater than trigger level.

Table 4I: Soil Vapour Monitoring Results (April 2025)

Location	Screened Interval (mbgs)	Blinded (Y/N)	Soil Gas Pressure (mmHg)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance Gas (%)
VW-01	5.8 - 6.1	-	-	-	-	-	-
VW-02	4.0 - 4.3	-	-	-	-	-	-
VW-03	1.7 - 2.0	-	-	-	-	-	-
VW-04	1.8 - 2.1	N	0.0	0.0	2.1	18.4	79.5
VW-05	4.1 - 4.4	-	-	-	-	-	-
XCG-1	3.65 - 3.80	N	0.0	0.0	1.7	19.5	78.8
XCG-2	2.75 - 2.80	N	-0.6	0.0	0.8	20.5	78.7
25XCG-4	0.23 - 0.35	-	*	*	*	*	*
XCG-5	1.70 - 1.85	N	0.0	0.0	1.0	19.5	79.5
XCG-6	1.40 - 1.55	N	-2.3	0.0	4.1	14.2	CNL
XCG-9	1.20 - 1.35	N	0.0	0.0	0.6	19.3	80.1
XCG-10	1.50 - 1.65	N	0.0	0.0	2.0	19.0	78.9
XCG-12	1.70 - 1.85	N	NM	0.0	1.2	19.6	79.2
XCG-13	1.75 - 1.90	-	-	-	-	-	-
24SVP15	1.75 - 1.95	-	-	-	-	-	-
24SVP16	1.80 - 1.96	-	-	-	-	-	-
24SVP17	1.40 - 1.55	-	-	-	-	-	-

Notes:

Blank - Not measured because probe was blinded.

*Soil vapour probe tubing frozen and or damaged.

**Soil vapour probe could not be accessed.

CNL - Could not locate.

Location not monitored.

Bold - Greater than trigger level.

Table 5: Soil Vapour Analytical Results

Parameter	Unit	Generic Soil Vapour Guidelines - Residential Coarse-Grained [1]	De Minimus Screening Soil Vapour Criteria	VW-04	VW-05							XCG-4 (SVP)				25XCG-4 (SVP)	XCG-5 (SVP)	
				VW-04	VW05	VW-05	DUPLICATE (21DUPVW MONTFORT)	VW-05	VW-05	VAPOUR DUPLICATE	VW-05	XCG-4 (SVP)	19DUP SVP01	XCG-4 (SVP)	XCG-4 (SVP)	25XCG-4 (SVP)	XCG-5 (SVP)	DUPLICATE
				23-Nov-2021	19-Sep-2019	20-Nov-2021	20-Nov-2021	2-Jun-2023	12 Dec 2024	12 Dec 2024	25 Feb 2025	19-Sep-2019	19-Sep-2019	1-Apr-2020	20-Nov-2021	25 Feb 2025	2-Jun-2023	2-Jun-2023
Vapour Pressure																		
Pressure on receipt	Inches Hg	-	-	7.6	-8.6	-11.2	-11.4	-10.2	-10	-10.4	-6.54	-9.2	-7.3	-	-12.4	-7.97	-11.4	-11.2
Hydrocarbons																		
Benzene	µg/m^3	41	303	<0.32	0.43	<0.32	0.35	0.7	3.51	1.82	<0.32	<0.32	<0.32	<0.32	<0.32	1.34	0.89	1.76
Toluene	µg/m^3	75,190	190,000	<0.75	2.7	<0.75	0.82	1.62	4.94	2.71	1.58	<0.38	<0.38	<0.38	<0.75	3.77	3.02	5.2
Ethylbenzene	µg/m^3	68,650	50,000	<0.87	0.52	<0.87	<0.87	<0.43	1.22	0.74	1.17	<0.43	<0.43	<0.43	<0.87	1.3	<0.52	0.87
Xylene (o)	µg/m^3	-	9,000	<0.87	0.89	<0.87	<0.87	<0.43	1.04	0.87	1.61	<0.43	<0.43	<0.43	<0.87	1.87	<0.52	1.65
Xylenes (m & p)	µg/m^3	-	9,000	<1.7	2.02	<1.7	<1.7	1.39	3.17	2.65	4.73	<0.87	<0.87	<0.87	<1.7	4.91	1.95	5.51
Xylenes Total	µg/m^3	3,520	9,000	<2	2.9	<2	<2	1.4	4.2	3.5	1.46	<1.3	<1.3	<1.3	<2	1.56	2	7.2
Styrene	µg/m^3	3,500	4,600	<0.85	<0.43	<0.85	<0.85	<0.85	<0.85	<0.89	1.62	<0.43	<0.43	<0.43	<0.85	<0.85	<0.98	<0.94
F1 (C_6-C_{10})	µg/m^3	867,383	59,532	6,800	-	<15	19	133	122	34	109	-	-	-	1,520	137	151	192
F1 (C_6-C_{10}) - BTEX	µg/m^3	867,383	59,532	-	176	-	-	129	0.108	0.025	0.1	99.2	95.2	39.6	-	0.124	145	177
F2 (C_{10}-C_{16})	µg/m^3	52,495	27,778	40.0	136	<15	30	302	20	<15	<100	11.3	7.8	<5	<15	<100	251	265
F2 (C_{10}-C_{16}) - Napthalene	µg/m^3	52,495	27,778	-	-	-	-	302	20	<15	<100	-	-	-	-	<100	251	264
Total BTEX	µg/m^3	-	-	-	-	-	-	3.7	0.0139	0.0088	2.15	-	-	-	-	3.28	5.9	15
CWS TVOC (C>10-C12)	µg/m^3	-	-	-	-	-	-	112	<15	<15	47	-	-	-	-	<15	112	124
CWS TVOC (C>12-C16)	µg/m^3	-	-	-	-	-	-	99	<30	<30	<30	-	-	-	-	<30	60	60
CWS TVOC (C>8-C10)	µg/m^3	-	-	-	-	-	-	84	59	15	78	-	-	-	-	107	104	104
CWS TVOC (C6-C8)	µg/m^3	-	-	-	-	-	-	54	70	21	36	-	-	-	-	40	54	110
TRH >C6 - C8 Aliphatic	µg/m^3	-	-	-	-	-	-	54	70	21	36	-	-	-	-	40	54	80
TRH >C8 - C10 Aliphatic	µg/m^3	-	-	-	-	-	-	84	59	15	78	-	-	-	-	107	104	104
TRH >C10 - C12 Aliphatic	µg/m^3	-	-	-	-	-	-	112	<15	<15	47	-	-	-	-	<15	112	124
TRH >C12 - C16 Aliphatic	µg/m^3	-	-	-	-	-	-	99	<30	<30	<30	-	-	-	-	<30	60	60
TRH >C6 - C8 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<15	<15	<15	-	-	-	-	<15	<15	30
TRH >C8 - C10 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<15	<15	<15	-	-	-	-	<15	<15	<15
TRH >C10 - C12 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<15	<15	<15	-	-	-	-	<15	<15	<15
TRH >C12 - C16 Aromatic	µg/m^3	-	-	-	-	-	-	<30	<30	<30	<30	-	-	-	-	<30	<30	<30
Alcohols																		
Ethanol (ethyl alcohol)	µg/m^3	-	1,900,000	-	7.6	-	-	-	-	-	-	<1.9	<1.9	38.2	-	-	-	-
Isoropanol (2-propanol)	µg/m^3	6,219	491,000	-	<2.5	-	-	-	-	-	-	<2.5	<2.5	<2.5	-	-	-	-
Compressed Gas Parameters																		
Carbon Dioxide	% v/v	-	-	1.45	12.8	7.67	7.7	7.85	7.26	7.23	7.86	4.8	5.5	2.3	1.15	1.51	1.6	1.6
Carbon Monoxide	% v/v	-	-	<0.05	<0.2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.2	<0.2	<0.2	<0.050	<0.050	<0.050	<0.050
Methane	% v/v	-	0.1 to 0.5	<0.05	*<0.2*	0.00023	<0.050	-	<0.050	<0.050	<0.050	*<0.2*	*<0.2*	*<0.2*	<0.050	<0.050	-	-
Nitrogen	% v/v	-	-	76.2	76.1	73.6	71.9	74.7	69.5	68.4	73.3	77.5	77.5	86.2	77.5	76.7	78.9	75.6

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

[1] Canadian Council of Ministers of the Environment (CCME). 2014. *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours. Refer to Tables 7 to 10 for further information.*

TETRA TECH

Table 5: Soil Vapour Analytical Results

Parameter	Unit	Generic Soil Vapour Guidelines - Residential Coarse-Grained [1]	De Minimus Screening Soil Vapour Criteria	VW-04	VW-05							XCG-4 (SVP)				25XCG-4 (SVP)	XCG-5 (SVP)	
				VW-04	VW05	VW-05	DUPLICATE (21DUPVW MONTFORT)	VW-05	VW-05	VAPOUR DUPLICATE	VW-05	XCG-4 (SVP)	19DUP SVP01	XCG-4 (SVP)	XCG-4 (SVP)	25XCG-4 (SVP)	XCG-5 (SVP)	DUPLICATE
				23-Nov-2021	19-Sep-2019	20-Nov-2021	20-Nov-2021	2-Jun-2023	12 Dec 2024	12 Dec 2024	25 Feb 2025	19-Sep-2019	19-Sep-2019	1-Apr-2020	20-Nov-2021	25 Feb 2025	2-Jun-2023	2-Jun-2023
Air Analyses																		
Acetylene	ppm	-	-	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Ethane	ppm	-	1,000	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Ethene	ppm	-	200	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
n-Butane	ppm	-	-	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
n-Pentane	ppm	-	-	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Propane	ppm	-	1,000	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Propene	ppm	-	35	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Methane	ppm	-	1,000 to 5,000	-	<4.9	-	-	-	-	-	-	<3.9	<4.4	<3.6	-	-	-	-
Propyne	ppm	-	-	-	<0.24	-	-	-	-	-	-	<0.19	<0.22	<0.18	-	-	-	-
Volatile Organic Compounds (VOCs)																		
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m^3	566,335	7,000,000	15.6	188	40.5	37.5	36.6	38.9	40.3	29.2	77.7	81.1	86.3	12	42.2	<1.6	<1.5
1,3-Butadiene	µg/m^3	17	-	<0.44	<1.1	<0.44	<0.44	<0.44	<0.44	<0.46	<0.44	<1.1	<1.1	<1.1	<0.44	<0.44	<0.51	<0.49
1,4-Dioxane	µg/m^3	105	-	<0.72	<3.6	<0.72	<0.72	<0.72	<0.72	<0.76	<0.72	<3.6	<3.6	<3.6	<0.72	<0.72	<0.83	<0.79
1-Methyl-4 ethyl benzene (4-ethyltoluene)	µg/m^3	14,461	-	<0.98	<2.5	<0.98	<0.98	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<0.98	<1.0	<1.1	<1.1
Benzyl chloride	µg/m^3	34	-	<1	<2.6	<1	<1	<1.0	<1.0	<1.1	<1.0	<2.6	<2.6	<2.6	<1	<1.0	<1.2	<1.1
Carbon disulfide	µg/m^3	21,713	2,000	<0.62	58.2	3.6	3.68	3.1	<1.6	<1.6	<1.6	2.6	<1.6	<1.6	<0.62	<1.6	11.3	8.9
Cyclohexane	µg/m^3	201,510	120,000	<0.69	<0.69	<0.69	<0.69	<0.69	4.4	1.2	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.79	0.76
Ethyl acetate	µg/m^3	2,509	-	<0.72	<3.6	<0.72	<0.72	0.97	1.4	<0.76	<5.95	<3.6	<3.6	<3.6	<0.72	1.8	<0.83	2.78
Heptane	µg/m^3	14,461	8,000	<0.82	<1.2	<0.82	<0.82	<0.82	4.22	1.31	1.02	<1.2	<1.2	<1.2	<0.82	<0.82	<0.94	1.39
Hexane	µg/m^3	18,839	14,000	<0.7	<0.7	<0.7	1	<0.70	6.66	2.04	<0.70	<0.7	<0.7	<0.7	0.75	<0.70	0.92	1.16
Isooctane (2,2,4-Trimethylpentane)	µg/m^3	14,917	64,173	<0.93	<0.93	<0.93	<0.93	<0.9	<0.9	<1.0	<0.9	<0.93	<0.93	<0.93	<0.93	<0.9	<1.1	<1.0
Propene	µg/m^3	91,723	60,000	<0.34	<0.86	<1.7	<1.7	<0.86	<1.03	<0.96	<0.55	<0.86	<0.86	<0.86	<2.1	<0.65	<2.58	<2.72
Tetrahydrofuran	µg/m^3	62,828	40,000	<0.59	<1.2	<0.59	<0.59	13.4	<0.59	<0.62	<0.59	<1.2	<1.2	<1.2	<0.59	<0.59	1.09	1.86
Vinyl acetate	µg/m^3	6,586	-	<1.8	<0.7	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<0.7	<0.7	<0.7	<1.8	<1.8	<12.7	<11.4
Vinyl bromide (bromoethene)	µg/m^3	40	-	<0.87	<0.87	<0.87	<0.87	<0.9	<0.9	<0.9	<0.9	<0.87	<0.87	<0.87	<0.87	<0.9	<1.0	<1.0
Acetone (2-propanone)	µg/m^3	918,788	618,000	1.6	15.7	3.5	3.5	15.7	9.3	3.8	6.9	3.7	3.7	5.8	10	20	39	42
Allyl chloride (3-Chloropropene)	µg/m^3	32	-	<0.63	-	<0.63	<0.63	<0.63	<0.63	<0.66	<0.63	-	-	-	<0.63	<0.63	<0.72	<0.69
Bromodichloromethane	µg/m^3	28	-	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.4	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.5	<1.5
Bromoform	µg/m^3	1,494	-	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.2	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.4	<2.3
Bromomethane	µg/m^3	173	-	<0.78	<0.39	<0.78	<0.78	<0.78	<0.78	<0.82	<0.78	<0.39	<0.39	<0.39	<0.78	<0.78	<0.89	<0.85
Methyl Ethyl Ketone (MEK; 2-Butanone)	µg/m^3	167,364	100,000	<0.59	1.62	0.96	0.77	6.93	1.09	<0.62	0.71	0.73	0.97	1.24	0.91	0.97	6.55	9.35
Carbon tetrachloride	µg/m^3	113	-	<1.3	<0.63	<1.3	<1.3	<1.26	<1.26	<1.32	<1.26	<0.63	<0.63	<0.63	<1.3	<1.26	<1.45	<1.38
Chlorobenzene	µg/m^3	1,733	-	<0.92	<0.46	<0.92	<0.92	<0.92	<0.92	<0.97	<0.92	<0.46	<0.46	<0.46	<0.92	<0.92	<1.06	<1.01
Chloroethane	µg/m^3	124,080	200,000	<0.53	<0.79	<0.53	<0.53	<0.53	<0.53	<0.55	<0.53	<0.79	<0.79	<0.79	<0.53	<0.53	<0.61	<0.58
Chloroform	µg/m^3	72	560	6.52	<0.49	<0.98	<0.98	<0.98	<0.98	<1.02	<0.98	0.61	0.74	<0.49	<0.98	<0.98	<1.12	<1.07
Chloromethane	µg/m^3	2,657	1,800	<0.41	<0.62	<0.41	0.54	0.74	<0.41	<0.43	<0.41	<0.62	<0.62	<0.62	0.49	<0.41	<0.47	<0.45
Dibromochloromethane	µg/m^3	6,070	-	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.8	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<2.0	<1.9

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

[1] Canadian Council of Ministers of the Environment (CCME). 2014. *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours. Refer to Tables 7 to 10 for further information.*

Table 5: Soil Vapour Analytical Results

Parameter	Unit	Generic Soil Vapour Guidelines - Residential Coarse-Grained [1]	De Minimus Screening Soil Vapour Criteria	VW-04	VW-05							XCG-4 (SVP)				25XCG-4 (SVP)	XCG-5 (SVP)	
				VW-04	VW05	VW-05	DUPLICATE (21DUPVW MONTFORT)	VW-05	VW-05	VAPOUR DUPLICATE	VW-05	XCG-4 (SVP)	19DUP SVP01	XCG-4 (SVP)	XCG-4 (SVP)	25XCG-4 (SVP)	XCG-5 (SVP)	DUPLICATE
				23-Nov-2021	19-Sep-2019	20-Nov-2021	20-Nov-2021	2-Jun-2023	12 Dec 2024	12 Dec 2024	25 Feb 2025	19-Sep-2019	19-Sep-2019	1-Apr-2020	20-Nov-2021	25 Feb 2025	2-Jun-2023	2-Jun-2023
Volatile Organic Compounds (VOCs)																		
1,2-Dibromoethane (Ethylene Dibromide)	µg/m^3	2.2	-	<1.5	<0.77	<1.5	<1.5	<1.5	<1.5	<1.6	<1.5	<0.77	<0.77	<0.77	<1.5	<1.5	<1.8	<1.7
1,2-Dichlorobenzene	µg/m^3	7,072	-	<1.2	<0.6	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<0.6	<0.6	<0.6	<1.2	<1.2	<1.4	<1.3
1,3-Dichlorobenzene	µg/m^3	64	-	<1.2	<2.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	3.2	3.2	<2.4	<1.2	<1.2	3	2.9
1,4-Dichlorobenzene	µg/m^3	64	1,900	<1.2	<0.6	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<0.6	<0.6	<0.6	<1.2	<1.2	<1.4	<1.3
1,1-Dichloroethane	µg/m^3	430	3,300	<0.81	0.77	<0.81	<0.81	<0.81	<0.81	<0.85	<0.81	<0.4	<0.4	<0.4	<0.81	<0.81	<0.93	<0.89
1,2-Dichloroethane	µg/m^3	24	-	<0.81	<0.4	<0.81	<0.81	<0.81	<0.81	<0.85	<0.20	<0.4	<0.4	<0.4	<0.81	<0.20	<0.93	<0.89
1,1-Dichloroethene	µg/m^3	128	4,000	<0.79	<0.4	<0.79	<0.79	<0.79	<0.79	<0.83	<0.79	<0.4	<0.4	<0.4	<0.79	<0.79	<0.91	<0.87
1,2-Dichloroethene (cis)	µg/m^3	1,382	179	<0.79	46.7	54.6	57.8	30.7	25.7	25.2	<0.79	<0.4	<0.4	<0.4	1.32	30.2	<0.91	<0.87
1,2-Dichloroethene (trans)	µg/m^3	1,400	179	<0.79	4.5	7.78	7.81	6.7	6.34	6.34	<0.79	<0.4	<0.4	<0.4	<0.79	7.61	<0.91	<0.87
Dichlorodifluoromethane (FREON 12)	µg/m^3	3,584	17,800	76.1	309	110	109	120	122	127	53.4	11.1	11.9	45.7	50.7	122	222	214
1,2-Dichloropropane	µg/m^3	135	-	<0.92	<0.46	<0.92	<0.92	<0.9	<0.9	<1.0	<0.9	<0.46	<0.46	<0.46	<0.92	<0.9	<1.1	<1.0
1,3-Dichloropropene	µg/m^3	-	-	-	-	-	-	<1.8	<1.8	<1.9	<1.8	-	-	-	-	<1.8	<2.1	<2.0
1,3-Dichloropropene [cis]	µg/m^3	163	-	<0.91	<0.45	<0.91	<0.91	<0.9	<0.9	<1.0	<0.9	<0.45	<0.45	<0.45	<0.91	<0.9	<1.0	<1.0
1,3-Dichloropropene [trans]	µg/m^3	149	-	<0.91	<0.45	<0.91	<0.91	<0.9	<0.9	<1.0	<0.9	<0.45	<0.45	<0.45	<0.91	<0.9	<1.0	<1.0
Hexachlorobutadiene	µg/m^3	51	-	<2.1	<5.3	<2.1	<2.1	<2.1	<2.1	<2.2	<2.1	<5.3	<5.3	<5.3	<2.1	<2.1	<2.4	<2.3
Methyl Butyl Ketone (MBK; 2-Hexanone)	µg/m^3	1,053	-	<4.1	<4.1	<4.1	<4.1	<4.10	<4.10	<4.10	<4.10	<4.1	<4.1	<4.1	<4.1	<4.10	<4.92	<4.51
Methyl tert-Butyl Ether (MTBE)	µg/m^3	1,153	-	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.76	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.83	<0.79
Methylene Chloride (Dichloromethane)	µg/m^3	18,764	-	<0.69	<2.1	<0.69	<0.69	<0.69	<0.69	<0.73	<0.69	<2.1	<2.1	<2.1	<0.69	<0.69	<0.80	0.94
Methyl Isobutyl Ketone (MIBK; 4-Methyl-2-pentanone)	µg/m^3	102,977	-	<0.82	<0.82	<0.82	<0.82	<0.82	<0.82	<0.86	<0.82	<0.82	<0.82	<0.82	<0.82	<0.82	<0.94	<0.90
Naphthalene	µg/m^3	380	-	<1	<1	<1	<1	<0.52	<0.52	<0.52	<0.52	<1	<1	<1	<1	<0.52	<0.63	0.94
Iso-Propylbenzene (cumene)	µg/m^3	14,461	-	<0.98	-	<0.98	<0.98	<1.0	<1.0	<1.0	<1.0	-	-	-	<0.98	<1.0	<1.1	<1.1
1,1,2,2-Tetrachloroethane	µg/m^3	11	-	<1.4	<0.69	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69	<0.69	<0.69	<1.4	<1.4	<1.6	<1.5
Tetrachloroethene	µg/m^3	1,390	800	**8,950**	0.82	2.2	2.2	2.4	1.8	1.8	4.5	33.4	34.3	6.18	40.5	<1.4	<1.6	<1.5
1,2,4-Trichlorobenzene	µg/m^3	104	-	<1.5	<3.7	<1.5	<1.5	<1.5	<1.5	<1.6	<1.5	<3.7	<3.7	<3.7	<1.5	<1.5	<1.7	<1.6
1,1,1-Trichloroethane	µg/m^3	1,693,510	20,000	1.7	<0.55	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<0.55	<0.55	<0.55	<1.1	<1.1	<1.2	<1.2
1,1,2-Trichloroethane	µg/m^3	7	-	<1.1	<0.55	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<0.55	<0.55	<0.55	<1.1	<1.1	<1.2	<1.2
Trichloroethene	µg/m^3	70	800	**85.6**	3.36	<1.1	<1.1	<1.1	1.8	1.7	1.2	<0.54	<0.54	0.89	<1.1	22.5	<1.2	<1.2
Trichlorofluoromethane (FREON 11)	µg/m^3	34,325	20,000	19.6	7.3	7.6	7.4	6.4	8.4	8.7	<1.1	1.5	1.5	1.1	1.3	7.9	1.7	1.7
Trichlorotrifluoroethane (FREON 113)	µg/m^3	230,627	-	<1.5	<1.2	<1.5	<1.5	<1.5	<1.5	<1.6	<1.5	<1.2	<1.2	<1.2	<1.5	<1.5	<1.8	<1.7
1,2,4-Trimethylbenzene	µg/m^3	2,235	400	<0.98	<2.5	<0.98	<0.98	<1.0	1	<1.0	1.9	<2.5	<2.5	<2.5	<0.98	2.1	<1.1	<1.1
1,3,5-Trimethylbenzene	µg/m^3	2,235	400	<0.98	<2.5	<0.98	<0.98	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<0.98	<1.0	<1.1	<1.1
Vinyl chloride	µg/m^3	70	114	<0.51	3.72	<0.51	<0.51	<0.51	<0.51	<0.54	<0.51	<0.26	<0.26	<0.26	2.07	<0.51	<0.59	<0.56

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

[1] Canadian Council of Ministers of the Environment (CCME). 2014. *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.* *Refer to Tables 7 to 10 for further information.*

TETRA TECH

Table 5: Soil Vapour Analytical Results

Parameter	Unit	Generic Soil Vapour Guidelines - Residential Coarse-Grained [1]	De Minimus Screening Soil Vapour Criteria	XCG-6 (SVP)						XCG-8 (SVP)	XCG-13 (SVP)							24SVP15		24SVP16		24SVP17	
				XCG-6 (SVP)	XCG-6 (SVP)	DUPLICATE - AIR	XCG-6 (SVP)	XCG-6 (SVP)	XCG-6 (SVP)	XCG-8 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	VAPOUR DUPLICATE	24SVP13H	24SVP13H	24SVP31H	24SVP31H	24SVP35H	24SVP35H
				20-Sep-2019	1-Apr-2020	1-Apr-2020	20-Nov-2021	2-Jun-2023	23-Apr-2025	20-Nov-2021	19-Sep-2019	1-Apr-2020	20-Nov-2021	2-Jun-2023	7-Jul-2023	25-Feb-2025	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025
Vapour Pressure																							
Pressure on receipt	Inches Hg	-	-	-5.9	-	-	-	-11	-9.8	-11.4	-12.4	-	-12.9	-7.97	-9.74	-8.38	-8.17	-9.8	-5.11	-1.44	-6.54	-7.15	-7.36
Hydrocarbons																							
Benzene	µg/m^3	41	303	0.99	0.61	0.51	1.47	0.61	0.64	1.47	0.62	0.48	1.38	1.4	4.7	0.64	<0.32	2.81	<0.32	3.35	1.15	4.18	0.54
Toluene	µg/m^3	75,190	190,000	6.47	<0.38	0.51	<0.75	3.09	3.62	<0.75	0.92	0.53	<0.75	0.68	8.37	3.47	1.58	16	4.6	16.8	4.52	33.8	8.97
Ethylbenzene	µg/m^3	68,650	50,000	0.64	<0.43	<0.43	9.4	<0.48	1.39	9.4	<0.78	<0.43	<0.87	<0.43	4.04	0.43	1.13	9.77	3	17.7	10.8	61.6	24.4
Xylene (o)	µg/m^3	-	9,000	0.77	<0.43	<0.43	<0.87	1.08	2.52	<0.87	<0.78	<0.43	<0.87	<0.43	5.99	0.96	1.48	9.81	4.21	11.1	13.1	40.2	25.3
Xylenes (m & p)	µg/m^3	-	9,000	2.1	<0.87	<0.87	12.6	4.12	5.34	12.6	<1.6	0.95	<1.7	<0.87	14.6	2.08	4.6	47.8	17.4	53.4	39.8	257	105
Xylenes Total	µg/m^3	3,520	9,000	2.9	<1.3	<1.3	12.6	5.2	7.8	12.6	<2.3	<1.3	<2	<1.3	20.6	0.7	1.4	57.6	4.99	64.5	12.2	297	30
Styrene	µg/m^3	3,500	4,600	<0.43	<0.43	<0.43	<0.85	<0.94	<.85	<0.85	<0.77	<0.43	<0.85	<0.85	4.09	<0.85	1.66	<0.85	<0.85	0.89	<0.85	<0.85	<0.85
F1 (C_6-C_{10})	µg/m^3	867,383	59,532	-	-	-	154	96	<15	154	-	-	49	1,700	5,990	67	40	206	72	371	122	545	268
F1 (C_6-C_{10}) - BTEX	µg/m^3	867,383	59,532	58.1	25.8	6.4	-	87	<15	-	34.8	8.4	-	1,700	5,950	0.059	0.031	0.12	0.043	0.269	0.053	0.148	0.104
F2 (C_{10}-C_{16})	µg/m^3	52,495	27,778	19.9	<5	<5	75	274	<80	75	17.6	<5	<15	514	<375	<100	<100	79	<100	130	<100	122	107
F2 (C_{10}-C_{16}) - Napthalene	µg/m^3	52,495	27,778	-	-	-	-	274	<80	-	-	-	-	514	<375	<100	<100	78	<100	129	<100	121	107
Total BTEX	µg/m^3	-	-	-	-	-	-	8.9	13.5	-	-	-	-	<2.4	37.7	1.92	2.08	0.0861	6.9	0.102	16.2	0.397	38.2
CWS TVOC (C>10-C12)	µg/m^3	-	-	-	-	-	-	152	<77	-	-	-	-	329	458	21	<15	52	18	89	37	60	75
CWS TVOC (C>12-C16)	µg/m^3	-	-	-	-	-	-	40	<30	-	-	-	-	<30	<750	<30	<30	<30	<30	<30	<30	<30	<30
CWS TVOC (C>8-C10)	µg/m^3	-	-	-	-	-	-	59	35	-	-	-	-	1,250	2,270	42	35	132	60	180	110	452	245
CWS TVOC (C6-C8)	µg/m^3	-	-	-	-	-	-	40	<15	-	-	-	-	591	4,120	32	<15	78	16	212	20	95	41
TRH >C6 - C8 Aliphatic	µg/m^3	-	-	-	-	-	-	40	<15	-	-	-	-	574	4,120	32	<15	78	16	196	20	65	41
TRH >C8 - C10 Aliphatic	µg/m^3	-	-	-	-	-	-	59	35	-	-	-	-	1,250	2,270	42	35	73	36	108	51	141	105
TRH >C10 - C12 Aliphatic	µg/m^3	-	-	-	-	-	-	152	<23	-	-	-	-	329	458	21	<15	52	18	89	37	60	75
TRH >C12 - C16 Aliphatic	µg/m^3	-	-	-	-	-	-	40	<30	-	-	-	-	<30	<369	<30	<30	<30	<30	<30	<30	<30	<30
TRH >C6 - C8 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<15	-	-	-	-	17	<375	<15	<15	<15	<15	16	<15	30	<15
TRH >C8 - C10 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<15	-	-	-	-	<15	<375	<15	<15	59	24	72	59	311	140
TRH >C10 - C12 Aromatic	µg/m^3	-	-	-	-	-	-	<15	<71	-	-	-	-	<15	<375	<15	<15	<15	<15	<15	<15	<15	<15
TRH >C12 - C16 Aromatic	µg/m^3	-	-	-	-	-	-	<30	<30	-	-	-	-	<30	<750	<30	<30	<30	<30	<30	<30	<30	<30
Alcohols																							
Ethanol (ethyl alcohol)	µg/m^3	-	1,900,000	14.3	19.6	13.6	-	-	-	-	<3.4	17.8	-	-	-	-	-	-	-	-	-	-	-
Isoropanol (2-propanol)	µg/m^3	6,219	491,000	<2.5	<2.5	<2.5	-	-	-	-	<4.4	<2.5	-	-	-	-	-	-	-	-	-	-	-
Compressed Gas Parameters																							
Carbon Dioxide	% v/v	-	-	0.4	<0.2	<0.2	0.257	0.38	4.40	0.26	<0.3	<0.2	11.1	11.3	14.4	6.5	1.25	1.89	1.29	0.704	1.35	1.33	1.04
Carbon Monoxide	% v/v	-	-	<0.2	<0.2	<0.2	<0.050	<0.050	<0.050	<0.05	<0.3	<0.2	<0.050	0.088	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050
Methane	% v/v	-	0.1 to 0.5	*<0.2*	*<0.2*	*<0.2*	<0.050	-	<0.050	<0.05	*<0.3*	*<0.2*	<0.050	-	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050
Nitrogen	% v/v	-	-	76.9	77.1	77.1	75.4	70.6	75	75.4	77	77	72.6	71.3	72.3	75.1	73.7	72.5	75.4	72.9	70	73.5	72.7

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

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Table 5: Soil Vapour Analytical Results

Parameter	Unit	Generic Soil Vapour Guidelines - Residential Coarse-Grained [1]	De Minimus Screening Soil Vapour Criteria	XCG-6 (SVP)						XCG-8 (SVP)	XCG-13 (SVP)							24SVP15		24SVP16		24SVP17	
				XCG-6 (SVP)	XCG-6 (SVP)	DUPLICATE - AIR	XCG-6 (SVP)	XCG-6 (SVP)	XCG-6 (SVP)	XCG-8 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	VAPOUR DUPLICATE	24SVP13H	24SVP13H	24SVP31H	24SVP31H	24SVP35H	24SVP35H
				20-Sep-2019	1-Apr-2020	1-Apr-2020	20-Nov-2021	2-Jun-2023	23-Apr-2025	20-Nov-2021	19-Sep-2019	1-Apr-2020	20-Nov-2021	2-Jun-2023	7-Jul-2023	25-Feb-2025	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025
Air Analyses																							
Acetylene	ppm	-	-	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Ethane	ppm	-	1,000	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Ethene	ppm	-	200	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
n-Butane	ppm	-	-	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
n-Pentane	ppm	-	-	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Propane	ppm	-	1,000	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Propene	ppm	-	35	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Methane	ppm	-	1,000 to 5,000	<4.3	<3.5	<3.6	-	-	-	-	<6	<4.2	-	-	-	-	-	-	-	-	-	-	-
Propyne	ppm	-	-	<0.21	<0.17	<0.18	-	-	-	-	<0.3	<0.21	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (VOCs)																							
1,2-Dichlorotetrafluoroethane (FREON 114)	µg/m^3	566,335	7,000,000	3.2	<1.2	<1.2	7.5	10.6	118	7.5	<2.1	<1.2	330	413	297	57.5	29.2	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
1,3-Butadiene	µg/m^3	17	-	<1.1	<1.1	<1.1	<0.44	<0.49	<0.44	<0.44	<2	<1.1	<0.44	<1.11	<2.26	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.62
1,4-Dioxane	µg/m^3	105	-	<3.6	<3.6	<3.6	<0.72	<0.79	<0.72	<0.72	<6.5	<3.6	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72
1-Methyl-4 ethyl benzene (4-ethyltoluene)	µg/m^3	14,461	-	<2.5	<2.5	<2.5	<0.98	<1.1	1.1	<0.98	<4.4	<2.5	<0.98	<1.0	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0
Benzyl chloride	µg/m^3	34	-	<2.6	<2.6	<2.6	<1	<1.1	<1.0	<1	<4.7	<2.6	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon disulfide	µg/m^3	21,713	2,000	1.9	<1.6	<1.6	<0.62	1.8	<1.6	<0.62	<2.8	<1.6	<0.62	<1.6	33	<1.6	<1.6	8.8	4.8	12	20.1	48.3	28.8
Cyclohexane	µg/m^3	201,510	120,000	1.14	<0.69	<0.69	1.2	<0.76	<0.69	1.2	<1.2	<0.69	9.18	28.8	65.4	<0.69	<0.69	2.86	<0.69	4.27	<0.69	1.1	<0.69
Ethyl acetate	µg/m^3	2,509	-	<3.6	<3.6	<3.6	<0.72	<0.79	<0.72	<0.72	<6.5	<3.6	<0.72	<0.72	<2.16	1.01	<0.72	<0.72	1.37	245	<0.72	<0.72	<0.72
Heptane	µg/m^3	14,461	8,000	1.3	<1.2	<1.2	3.14	<0.90	<0.82	3.14	<2.2	<1.2	<0.82	5.12	4.96	<0.82	<0.82	3.77	<0.82	6.72	<0.82	3.03	2.13
Hexane	µg/m^3	18,839	14,000	1.8	<0.7	<0.7	2.08	<0.78	<0.70	2.08	1.5	<0.7	<0.7	14.1	27.1	<0.70	<0.70	4.34	<0.70	7.76	<0.70	2.01	0.78
Isooctane (2,2,4-Trimethylpentane)	µg/m^3	14,917	64,173	<0.93	<0.93	<0.93	<0.93	<1.0	2	<0.93	<1.7	<0.93	<0.93	<4.5	10.3	<0.9	<0.9	<0.9	<0.9	1	<0.9	<0.9	<0.9
Propene	µg/m^3	91,723	60,000	<6	<1.5	<1.7	2.63	1.44	11.8	2.63	<6	<1.4	0.62	20.8	<86.7	<4.65	<0.34	<1.03	<0.34	<5.34	<0.55	4.54	<0.58
Tetrahydrofuran	µg/m^3	62,828	40,000	<1.2	<1.2	<1.2	<0.59	1	<0.59	<0.59	<2.1	<1.2	<0.59	0.88	3,240	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59	<0.59
Vinyl acetate	µg/m^3	6,586	-	<0.7	<0.7	<0.7	<1.8	<3.9	<1.8	<1.8	<1.3	<0.7	<1.8	<3.0	<17.8	<1.8	<1.8	<1.8	<1.8	7.8	<1.8	<1.8	<1.8
Vinyl bromide (bromoethene)	µg/m^3	40	-	<0.87	<0.87	<0.87	<0.87	<1.0	<0.9	<0.87	<1.6	<0.87	<0.87	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Acetone (2-propanone)	µg/m^3	918,788	618,000	10.7	5.9	5.2	5.3	34.2	37	5.3	8.6	4.9	2.6	11.2	240	17.6	7.6	5.2	10	17.8	5.9	4.8	10.9
Allyl chloride (3-Chloropropene)	µg/m^3	32	-	-	-	-	<0.63	<0.69	<0.63	<0.63	-	-	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63
Bromodichloromethane	µg/m^3	28	-	<1.3	<1.3	<1.3	<1.3	<1.5	<1.3	<1.3	<2.4	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Bromoform	µg/m^3	1,494	-	<2.1	<2.1	<2.1	<2.1	<2.3	<2.1	<2.1	<3.7	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Bromomethane	µg/m^3	173	-	<0.39	<0.39	<0.39	<0.78	<0.85	<0.78	<0.78	<0.7	<0.39	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
Methyl Ethyl Ketone (MEK; 2-Butanone)	µg/m^3	167,364	100,000	1.65	0.72	0.75	1.42	5.31	3.42	1.42	<1.1	0.91	<0.59	1.92	1,060	2.33	<0.59	0.59	0.65	1.74	<0.59	0.65	0.62
Carbon tetrachloride	µg/m^3	113	-	<0.63	<0.63	<0.63	<1.3	<1.38	<1.26	<1.3	<1.1	<0.63	<1.3	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26	<1.26
Chlorobenzene	µg/m^3	1,733	-	<0.46	<0.46	<0.46	<0.92	<1.01	<0.92	<0.92	<0.83	<0.46	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92	<0.92
Chloroethane	µg/m^3	124,080	200,000	<0.79	<0.79	<0.79	<0.53	<0.58	<0.53	<0.53	<1.4	<0.79	<0.53	1.53	5.22	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53
Chloroform	µg/m^3	72	560	<0.49	<0.49	<0.49	<0.98	<1.07	2.49	<0.98	<0.88	<0.49	<0.98	<0.98	1.42	<0.98	<0.98	3.91	1.46	3.91	1.81	10.4	4.1
Chloromethane	µg/m^3	2,657	1,800	1.2	0.94	0.95	0.72	0.83	<0.41	0.72	<1.1	1.04	1.04	<0.41	<0.41	1.32	<0.41	<0.41	<0.41	0.64	<0.41	<0.41	<0.41
Dibromochloromethane	µg/m^3	6,070	-	<1.7	<1.7	<1.7	<1.7	<1.9	<1.7	<1.7	<3.1	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

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				XCG-6 (SVP)	XCG-6 (SVP)	DUPLICATE - AIR	XCG-6 (SVP)	XCG-6 (SVP)	XCG-6 (SVP)	XCG-8 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	XCG-13 (SVP)	VAPOUR DUPLICATE	24SVP13H	24SVP13H	24SVP31H	24SVP31H	24SVP35H	24SVP35H
				20-Sep-2019	1-Apr-2020	1-Apr-2020	20-Nov-2021	2-Jun-2023	23-Apr-2025	20-Nov-2021	19-Sep-2019	1-Apr-2020	20-Nov-2021	2-Jun-2023	7-Jul-2023	25-Feb-2025	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025	11-Dec-2024	25-Feb-2025
Volatile Organic Compounds (VOCs)																							
1,2-Dibromoethane (Ethylene Dibromide)	µg/m^3	2.2	-	<0.77	<0.77	<0.77	<1.5	<1.7	<1.5	<1.5	<1.4	<0.77	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,2-Dichlorobenzene	µg/m^3	7,072	-	<0.6	<0.6	<0.6	<1.2	<1.3	<1.2	<1.2	<1.1	<0.6	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,3-Dichlorobenzene	µg/m^3	64	-	4.6	<2.4	<2.4	<1.2	<1.3	<1.2	<1.2	8.6	<2.4	3	2.3	3.5	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,4-Dichlorobenzene	µg/m^3	64	1,900	<0.6	<0.6	<0.6	<1.2	<1.3	<1.2	<1.2	<1.1	<0.6	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
1,1-Dichloroethane	µg/m^3	430	3,300	<0.4	<0.4	<0.4	<0.81	<0.89	<0.81	-	<0.73	<0.4	<0.81	<0.81	0.89	<0.81	<0.81	<0.81	<0.81	<0.81	<0.81	<0.81	<0.81
1,2-Dichloroethane	µg/m^3	24	-	<0.4	<0.4	<0.4	<0.81	<0.89	<0.81	<0.81	<0.73	<0.4	<0.81	<0.81	<0.81	<0.20	<0.20	<0.81	<0.20	<0.81	<0.20	<0.81	<0.20
1,1-Dichloroethene	µg/m^3	128	4,000	<0.4	<0.4	<0.4	<0.79	<0.87	<0.79	-	<0.71	<0.4	<0.79	3.29	8.09	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
1,2-Dichloroethene (cis)	µg/m^3	1,382	179	<0.4	<0.4	<0.4	<0.79	<0.87	<0.79	<0.79	<0.71	<0.4	3.14	15.8	71.4	2.46	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
1,2-Dichloroethene (trans)	µg/m^3	1,400	179	<0.4	<0.4	<0.4	<0.79	<0.87	<0.79	<0.79	<0.71	<0.4	<0.79	<0.79	3.09	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79	<0.79
Dichlorodifluoromethane (FREON 12)	µg/m^3	3,584	17,800	4.61	2.36	2.67	16.4	14.3	202	16.4	3.3	2.76	1,890	1,050	806	519	52.9	3.3	3.1	2.4	3.1	12	9
1,2-Dichloropropane	µg/m^3	135	-	<0.46	<0.46	<0.46	<0.92	<1.0	<0.9	<0.92	<0.83	<0.46	<0.92	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichloropropene	µg/m^3	-	-	-	-	-	-	<2.0	<1.8	-	-	-	-	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
1,3-Dichloropropene [cis]	µg/m^3	163	-	<0.45	<0.45	<0.45	<0.91	<1.0	<0.9	<0.91	<0.82	<0.45	<0.91	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
1,3-Dichloropropene [trans]	µg/m^3	149	-	<0.45	<0.45	<0.45	<0.91	<1.0	<0.9	<0.91	<0.82	<0.45	<0.91	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Hexachlorobutadiene	µg/m^3	51	-	<5.3	<5.3	<5.3	<2.1	<2.3	<2.1	<2.1	<9.6	<5.3	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1
Methyl Butyl Ketone (MBK; 2-Hexanone)	µg/m^3	1,053	-	<4.1	<4.1	<4.1	<4.1	<4.51	<4.10	<4.1	<7.4	<4.1	<4.1	<7.78	<10.6	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10
Methyl tert-Butyl Ether (MTBE)	µg/m^3	1,153	-	<0.72	<0.72	<0.72	<0.72	<0.79	<0.72	<0.72	<1.3	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72	<0.72
Methylene Chloride (Dichloromethane)	µg/m^3	18,764	-	<2.1	<2.1	<2.1	<0.69	<0.76	<0.69	<0.69	<3.8	<2.1	<0.69	<0.69	39.6	<0.69	<0.69	<0.69	<0.69	14.3	<0.69	<0.69	<0.69
Methyl Isobutyl Ketone (MIBK; 4-Methyl-2-pentanone)	µg/m^3	102,977	-	<0.82	<0.82	<0.82	<0.82	<0.90	<0.82	<0.82	<1.5	<0.82	<0.82	<0.82	1.56	<0.82	<0.82	<0.82	<0.82	<0.82	<0.82	<0.82	<0.82
Naphthalene	µg/m^3	380	-	<1	<1	<1	<1	<0.58	1.78	<1	<1.9	<1	<1	<0.52	2.1	<0.52	<0.52	0.63	<0.52	0.84	<0.52	0.63	<0.52
Iso-Propylbenzene (cumene)	µg/m^3	14,461	-	-	-	-	<0.98	<1.1	<1.0	<0.98	-	-	<0.98	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	µg/m^3	11	-	<0.69	<0.69	<0.69	<1.4	<1.5	<1.4	-	<1.2	<0.69	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethene	µg/m^3	1,390	800	<0.68	<0.68	<0.68	50.4	<1.5	1.9	50.4	<1.2	<0.68	8.3	4.6	134	1.4	4.3	2.5	<1.4	1.9	1.8	4.6	3.3
1,2,4-Trichlorobenzene	µg/m^3	104	-	<3.7	<3.7	<3.7	<1.5	<1.6	<1.5	<1.5	<6.7	<3.7	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m^3	1,693,510	20,000	<0.55	<0.55	<0.55	<1.1	<1.2	<1.1	<1.1	<0.98	<0.55	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
1,1,2-Trichloroethane	µg/m^3	7	-	<0.55	<0.55	<0.55	<1.1	<1.2	<1.1	-	<0.98	<0.55	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethene	µg/m^3	70	800	0.86	<0.54	<0.54	<1.1	<1.2	24.3	<1.1	<0.97	1.56	6.7	3.8	7.5	2	1.2	14.3	3	9	5	25.9	8.7
Trichlorofluoromethane (FREON 11)	µg/m^3	34,325	20,000	1.1	1.3	1.2	1.2	<1.2	<1.1	1.2	<2	1.2	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	1.2	1.1	<1.1	<1.1
Trichlorotrifluoroethane (FREON 113)	µg/m^3	230,627	-	<1.2	<1.2	<1.2	<1.5	<1.7	<1.5	<1.5	<2.1	1.4	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,2,4-Trimethylbenzene	µg/m^3	2,235	400	<2.5	<2.5	<2.5	3.01	<1.1	5.3	3.01	<4.4	<2.5	<0.98	<1.0	7.7	1.6	1.7	2.4	<1.0	2.1	1.1	2.8	2
1,3,5-Trimethylbenzene	µg/m^3	2,235	400	<2.5	<2.5	<2.5	1.94	<1.1	<1.0	1.94	<4.4	<2.5	<0.98	<1.0	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	µg/m^3	70	114	<0.26	<0.26	<0.26	<0.51	<0.56	<0.51	<0.51	<0.46	<0.26	<0.51	**72.3**	**241**	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51

Notes:

BOLD - Greater than De Minimus Screening Soil Vapour Criteria (XCG 2017).

RED - Greater than CCME soil vapour screening criteria.

Italic - Detection limit greater than De minimus Screening Soil Vapour Criteria (XCG 2017).

[1] Canadian Council of Ministers of the Environment (CCME). 2014. *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours. Refer to Tables 7 to 10 for further information.*

Table 6: Soil Vapour Quality Assurance/Quality Control Analytical Results

			Location	VW-05		RPD (%)	XCG-13 (SVP)		RPD (%)
			Field ID	VW-05	VAPOUR DUPLICATE		XCG-13 (SVP)	VAPOUR DUPLICATE	
			Sample Date	12 Dec 2024	12 Dec 2024		25 Feb 2025	25 Feb 2025	
			Laboratory Report Number	CG2418421	CG2418421		CG2502146	CG2502146	
			Laboratory Sample ID	CG2418421-001	CG2418421-005		CG2502146-003	CG2502146-007	
Parameter	**Unit**	**RDL**							
Hydrocarbons									
Benzene	µg/m^3	0.32	3.51	1.82	**63**	0.64	<0.32	-
Toluene	µg/m^3	0.38	4.94	2.71	**58**	3.47	1.58	-
Ethylbenzene	µg/m^3	0.43	1.22	0.74	-	0.43	1.13	-
Xylene (o)	µg/m^3	0.43	1.04	0.87	-	0.96	1.48	-
Xylenes (m & p)	µg/m^3	0.87	3.17	2.65	-	2.08	4.6	-
Xylenes Total	µg/m^3	1.3	4.2	3.5	-	0.7	1.4	-
Styrene	µg/m^3	0.43	<0.85	<0.89	-	<0.85	1.66	-
F1 (C_6-C_{10})	µg/m^3	15	122	34	-	67	40	-
F1 (C_6-C_{10}) - BTEX	µg/m^3	5	0.108	0.025	-	0.059	0.031	-
F2 (C_{10}-C_{16})	µg/m^3	5	20	<15	-	<100	<100	-
F2 (C_{10}-C_{16}) - Napthalene	µg/m^3	15	20	<15	-	<100	<100	-
Total BTEX	µg/m^3	2.4	0.0139	0.0088	-	1.92	2.08	-
CWS TVOC (C>10-C12)	µg/m^3	15	<15	<15	-	21	<15	-
CWS TVOC (C>12-C16)	µg/m^3	30	<30	<30	-	<30	<30	-
CWS TVOC (C>8-C10)	µg/m^3	15	59	15	-	42	35	-
CWS TVOC (C6-C8)	µg/m^3	15	70	21	-	32	<15	-
TRH >C10 - C12 Aliphatic	µg/m^3	-	<15	<15	-	21	<15	-
TRH >C10 - C12 Aromatic	µg/m^3	-	<15	<15	-	<15	<15	-
TRH >C12 - C16 Aliphatic	µg/m^3	-	<30	<30	-	<30	<30	-
TRH >C12 - C16 Aromatic	µg/m^3	-	<30	<30	-	<30	<30	-
TRH >C6 - C8 Aliphatic	µg/m^3	-	70	21	-	32	<15	-
TRH >C6 - C8 Aromatic	µg/m^3	-	<15	<15	-	<15	<15	-
TRH >C8 - C10 Aliphatic	µg/m^3	-	59	15	-	42	35	-
TRH >C8 - C10 Aromatic	µg/m^3	-	<15	<15	-	<15	<15	-
Compressed Gas Parameters									
Carbon Dioxide	% v/v	0.05	7.26	7.23	0	6.5	1.25	**135**
Carbon Monoxide	% v/v	0.05	<0.050	<0.050	-	<0.050	<0.050	-
Methane	% v/v	0.2	<0.050	<0.050	-	<0.050	<0.050	-
Nitrogen	% v/v	0.2	69.5	68.4	2	75.1	73.7	
Volatile Organic Compounds (VOCs)									
1,2-Dichlorotetrafluoroethane (Freon 114)	µg/m^3	1.4	38.9	40.3	4	57.5	29.2	**65**
1,3-Butadiene	µg/m^3	0.44	<0.44	<0.46	-	<0.44	<0.44	-
1,4-Dioxane	µg/m^3	0.72	<0.72	<0.76	-	<0.72	<0.72	-
1-Methyl-4 ethyl benzene	µg/m^3	1	<1.0	<1.0	-	<1.0	<1.0	-
2,2,4-Trimethylpentane (isooctane)	µg/m^3	0.93	-	-	-	-	-	-
Benzyl chloride	µg/m^3	1	<1.0	<1.1	-	<1.0	<1.0	-
Carbon disulfide	µg/m^3	1.6	<1.6	<1.6	-	<1.6	<1.6	-
Cyclohexane	µg/m^3	0.69	4.4	1.2	-	<0.69	<0.69	-
Ethyl acetate	µg/m^3	0.72	1.4	<0.76	-	1.01	<0.72	-
Heptane	µg/m^3	0.82	4.22	1.31	-	<0.82	<0.82	-
Hexane	µg/m^3	0.7	6.66	2.04	-	<0.70	<0.70	-
Isooctane	µg/m^3	0.9	<0.9	<1.0	-	<0.9	<0.9	-
Propene	µg/m^3	0.34	<1.03	<0.96	-	<4.65	<0.34	-
Tetrahydrofuran	µg/m^3	0.59	<0.59	<0.62	-	<0.59	<0.59	-
Vinyl acetate	µg/m^3	1.8	<1.8	<1.8	-	<1.8	<1.8	-
Vinyl bromide (bromoethene)	µg/m^3	0.9	<0.9	<0.9	-	<0.9	<0.9	-
Acetone	µg/m^3	2.4	9.3	3.8	-	17.6	7.6	-
Allyl chloride	µg/m^3	0.63	<0.63	<0.66	-	<0.63	<0.63	-
Bromodichloromethane	µg/m^3	1.3	<1.3	<1.4	-	<1.3	<1.3	-
Bromoform	µg/m^3	2.1	<2.1	<2.2	-	<2.1	<2.1	-
Bromomethane	µg/m^3	0.78	<0.78	<0.82	-	<0.78	<0.78	-
2-Butanone (MEK)	µg/m^3	0.59	1.09	<0.62	-	2.33	<0.59	-
Carbon tetrachloride	µg/m^3	1.26	<1.26	<1.32	-	<1.26	<1.26	-
Chlorobenzene	µg/m^3	0.92	<0.92	<0.97	-	<0.92	<0.92	-
Chloroethane	µg/m^3	0.53	<0.53	<0.55	-	<0.53	<0.53	-
Chloroform	µg/m^3	0.98	<0.98	<1.02	-	<0.98	<0.98	-

Notes:
RDL - Reportable detection limit.
RPD - RPD is Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where:
V1,V2 = concentrations of parent and duplicate sample, respectively.
"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL and neither concentration is below the reported detection limit.
BOLD - RPD value greater than 50%.

Table 6: Soil Vapour Quality Assurance/Quality Control Analytical Results

		Location	VW-05		RPD (%)	XCG-13 (SVP)		RPD (%)
		Field ID	VW-05	VAPOUR DUPLICATE		XCG-13 (SVP)	VAPOUR DUPLICATE	
		Sample Date	12 Dec 2024	12 Dec 2024		25 Feb 2025	25 Feb 2025	
		Laboratory Report Number	CG2418421	CG2418421		CG2502146	CG2502146	
		Laboratory Sample ID	CG2418421-001	CG2418421-005		CG2502146-003	CG2502146-007	
Parameter	**Unit**	**RDL**						
Volatile Organic Compounds (VOCs)								
Chloromethane	µg/m^3	0.41	<0.41	<0.43	-	1.32	<0.41	-
Dibromochloromethane	µg/m^3	1.7	<1.7	<1.8	-	<1.7	<1.7	-
1,2-Dibromoethane	µg/m^3	1.5	<1.5	<1.6	-	<1.5	<1.5	-
1,2-Dichlorobenzene	µg/m^3	1.2	<1.2	<1.3	-	<1.2	<1.2	-
1,3-Dichlorobenzene	µg/m^3	1.2	<1.2	<1.3	-	<1.2	<1.2	-
1,4-Dichlorobenzene	µg/m^3	1.2	<1.2	<1.3	-	<1.2	<1.2	-
1,1-Dichloroethane	µg/m^3	0.81	<0.81	<0.85	-	<0.81	<0.81	-
1,2-Dichloroethane	µg/m^3	0.81	<0.81	<0.85	-	<0.20	<0.20	-
1,1-Dichloroethene	µg/m^3	0.79	<0.79	<0.83	-	<0.79	<0.79	-
1,2-Dichloroethene (cis)	µg/m^3	0.79	25.7	25.2	2	2.46	<0.79	-
1,2-Dichloroethene (trans)	µg/m^3	0.79	6.34	6.34	-	<0.79	<0.79	-
Dichlorodifluoromethane	µg/m^3	1	122	127	4	519	52.9	**163**
1,2-Dichloropropane	µg/m^3	0.9	<0.9	<1.0	-	<0.9	<0.9	-
1,3-Dichloropropene	µg/m^3	1.8	<1.8	<1.9	-	<1.8	<1.8	-
1,3-Dichloropropene [cis]	µg/m^3	0.9	<0.9	<1.0	-	<0.9	<0.9	-
1,3-Dichloropropene [trans]	µg/m^3	0.9	<0.9	<1.0	-	<0.9	<0.9	-
Hexachlorobutadiene	µg/m^3	2.1	<2.1	<2.2	-	<2.1	<2.1	-
2-Hexanone (MBK)	µg/m^3	4.1	<4.10	<4.10	-	<4.10	<4.10	-
Methyl t-Butyl Ether (MTBE)	µg/m^3	0.72	<0.72	<0.76	-	<0.72	<0.72	-
Methylene Chloride	µg/m^3	0.69	<0.69	<0.73	-	<0.69	<0.69	-
4-Methyl-2-pentanone (MIBK)	µg/m^3	0.82	<0.82	<0.86	-	<0.82	<0.82	-
Naphthalene	µg/m^3	0.52	<0.52	<0.52	-	<0.52	<0.52	-
iso-Propylbenzene (cumene)	µg/m^3	1	<1.0	<1.0	-	<1.0	<1.0	-
1,1,2,2-Tetrachloroethane	µg/m^3	1.4	<1.4	<1.4	-	<1.4	<1.4	-
Tetrachloroethene	µg/m^3	1.4	1.8	1.8	-	1.4	4.3	-
1,2,4-Trichlorobenzene	µg/m^3	1.5	<1.5	<1.6	-	<1.5	<1.5	-
1,1,1-Trichloroethane	µg/m^3	1.1	<1.1	<1.1	-	<1.1	<1.1	-
1,1,2-Trichloroethane	µg/m^3	1.1	<1.1	<1.1	-	<1.1	<1.1	-
Trichloroethene	µg/m^3	1.1	1.8	1.7	-	2	1.2	-
Trichlorofluoromethane	µg/m^3	1.1	8.4	8.7	4	<1.1	<1.1	-
Trichlorotrifluoroethane (Freon 113)	µg/m^3	1.5	<1.5	<1.6	-	<1.5	<1.5	-
1,2,4-Trimethylbenzene	µg/m^3	1	1	<1.0	-	1.6	1.7	-
1,3,5-Trimethylbenzene	µg/m^3	1	<1.0	<1.0	-	<1.0	<1.0	-
Vinyl chloride	µg/m^3	0.51	<0.51	<0.54	-	<0.51	<0.51	-

Notes:

RDL - Reportable detection limit.

RPD - RPD is Relative Percentage Difference calculated as RPD(%)=(|V1-V2|)/[(V1+V2)/2])*100 where:

V1,V2 = concentrations of parent and duplicate sample, respectively.

"-" Indicates RPD not calculated. RPDs have only been considered where both concentrations are greater than 5 times the RDL and neither concentration is below the reported detection limit.

BOLD - RPD value greater than 50%.

Table 7: Chemical, Physical, and Toxicological Properties

Parameter		TC	RsC	H'	D_{air}	D_{water}	BAF	MF		
		Tolerable Concentration	Risk-Specific Concentration	Unitless Henry's Law Constant	Pure Component Molecular Diffusivity in Air	Pure Component Molecular Diffusivity in Water	Bioattenuation Factor	Mass Fraction in Soil (Coarse and Fine)	Mass Fraction in Soil Vapour - Coarse Soil	Mass Fraction in Soil Vapour - Fine Soil
Units		mg/m^3	mg/m^3	unitless	cm^2/s	cm^2/s	unitless	unitless	unitless	unitless
Benzene		--	0.00063	0.23	0.088	0.000010	10	--	--	--
Toluene		2.3	--	0.27	0.087	0.0000092	10	--	--	--
Ethylbenzene		2.0	--	0.36	0.075	0.0000085	10	--	--	--
Xylenes		0.10	--	0.25	0.078	0.0000099	10	--	--	--
Naphthalene		0.010	--	0.017	0.059	0.0000075	10	--	--	--
F1	Aliphatic C>6-C8	18	--	50	0.050	0.000010	10	0.55	0.85	0.84
	Aliphatic C>8-C10	1.0	--	80	0.050	0.000010	10	0.36	0.14	0.15
	Aromatic C>8-C10	0.20	--	0.48	0.050	0.000010	10	0.090	0.0050	0.0050
F2	Aliphatic C>10-C12	1.0	--	120	0.050	0.000010	10	0.36	0.77	0.77
	Aliphatic C>12-C16	1.0	--	520	0.050	0.000010	10	0.44	0.21	0.21
	Aromatic C>10-C12	0.20	--	0.14	0.050	0.000010	10	0.090	0.023	0.023
	Aromatic C>12-C16	0.20	--	0.053	0.050	0.000010	10	0.11	0.0050	0.0050
1,1,1-Trichloroethane		5.0	--	0.69	0.078	0.0000088	10	--	--	--
1,1,2,2-Tetrachloroethane		--	0.00017	0.019	0.071	0.0000079	10	--	--	--
1,1,2-Trichloroethane		0.00020	0.00063	0.038	0.078	0.0000088	10	--	--	--
1,1-Dichloroethane		--	0.0063	0.24	0.074	0.000011	10	--	--	--
1,1-Dichloroethene		0.00396	--	0.94	0.090	0.000010	10	--	--	--
1,2,4-Trichlorobenzene		0.0020	--	0.11	0.030	0.0000082	10	--	--	--
1,2,4-Trimethylbenzene		0.060	--	0.23	0.061	0.0000079	10	--	--	--
1,2-Dibromoethane		0.0093	0.000017	0.027	0.022	0.000012	10	--	--	--
1,2-Dichlorobenzene		0.20	--	0.072	0.069	0.0000079	10	--	--	--
1,2-Dichloroethane		0.0070	0.00038	0.049	0.10	0.0000099	10	--	--	--
1,2-Dichloropropane		0.0040	0.0027	0.11	0.078	0.0000087	10	--	--	--
1,3,5-Trimethylbenzene		0.060	--	0.36	0.060	0.0000079	10	--	--	--
1,3-Butadiene		0.0020	0.00033	3.0	0.25	0.000011	10	--	--	--
1,3-Dichlorobenzene		0.095	0.00091	0.13	0.069	0.0000079	10	--	--	--
1,4-Dichlorobenzene		0.800	0.00091	0.098	0.069	0.0000079	10	--	--	--
1,4-Dioxane		0.030	0.0020	0.00030	0.23	0.000010	10	--	--	--
2-Hexanone		0.030	--	0.0038	0.070	0.0000084	10	--	--	--
Acetone		31	--	0.0016	0.12	0.000011	10	--	--	--
Allyl chloride		0.0010	--	0.45	0.094	0.000011	10	--	--	--
Benzyl chloride		0.0010	--	0.017	0.075	0.0000078	10	--	--	--
Bromodichloromethane		--	0.00027	0.098	0.030	0.000011	10	--	--	--
Bromoform		--	0.0091	0.024	0.015	0.000010	10	--	--	--
Bromomethane		0.0050	--	0.25	0.073	0.000012	10	--	--	--
Carbon Disulfide		0.70	--	0.71	0.10	0.000010	10	--	--	--
Carbon Tetrachloride		0.10	0.0017	1.2	0.078	0.0000088	10	--	--	--
Chlorobenzene		0.050	--	0.15	0.073	0.0000087	10	--	--	--
Chloroethane		4.0	--	0.073	0.27	0.000012	10	--	--	--
Chloroform		0.300	0.00116	0.15	0.10	0.000010	10	--	--	--
Chloromethane		0.090	--	0.39	0.13	0.0000065	10	--	--	--
cis-1,2-Dichloroethene		0.04	--	0.30	0.074	0.000011	10	--	--	--
cis-1,3-Dichloropropene		0.020	0.0025	0.053	0.087	0.0000096	10	--	--	--
Cyclohexane		6.0	--	7.6	0.080	0.0000090	10	--	--	--
Dibromochloromethane		0.089	--	0.040	0.020	0.000011	10	--	--	--
Dichlorodifluoromethane		0.10	--	16	0.067	0.0000099	10	--	--	--
4-Ethyltoluene		0.40	--	0.21	0.065	0.0000071	10	--	--	--

Notes:

cm^2/s Square centimetres per second.
F1 Fraction 1 (C6-C10).
F2 Fraction 2 (C>10-C16).
mg/m^3 Milligrams per cubic metre.
PHC Petroleum hydrocarbon.
-- Not applicable.

References:

Canadian Council of Ministers of the Environment (CCME). 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.
Alberta Environment and Protected Areas (EPA). 2024b. Alberta Tier 2 Soil and Groundwater Remediation Guidelines.
Health Canada. 2021. Federal contaminated site risk assessment in Canada: Toxicological reference values (TRVs), Version 3.0.
United States Environmental Protection Agency (US EPA). 2024. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 7: Chemical, Physical, and Toxicological Properties

Parameter	TC	RsC	H'	D_{air}	D_{water}	BAF	MF		
	Tolerable Concentration	Risk-Specific Concentration	Unitless Henry's Law Constant	Pure Component Molecular Diffusivity in Air	Pure Component Molecular Diffusivity in Water	Bioattenuation Factor	Mass Fraction in Soil (Coarse and Fine)	Mass Fraction in Soil Vapour - Coarse Soil	Mass Fraction in Soil Vapour - Fine Soil
Units	mg/m^3	mg/m^3	unitless	cm^2/s	cm^2/s	unitless	unitless	unitless	unitless
Ethyl acetate	0.070	--	0.0055	0.067	0.0000099	10	--	--	--
Freon 113	5.0	--	21.5	0.038	0.0000086	10	--	--	--
Freon 114	17	--	115	0.082	0.0000086	10	--	--	--
Heptane	0.40	--	84	0.065	0.0000070	10	--	--	--
Hexachlorobutadiene	--	0.00045	0.42	0.027	0.0000070	10	--	--	--
Isooctane	0.40	--	31	0.060	0.0000073	10	--	--	--
Isopropyl alcohol	0.20	--	0.00033	0.10	0.000011	10	--	--	--
Isopropylbenzene	0.40	--	0.59	0.065	0.0000071	10	--	--	--
Methyl ethyl ketone	5.0	--	0.0015	0.081	0.0000098	10	--	--	--
Methyl isobutyl ketone	3.0	--	0.0062	0.075	0.0000078	10	--	--	--
Methylene chloride	0.60	1.0	0.15	0.10	0.000012	10	--	--	--
MTBE	0.037	--	0.028	0.10	0.000011	10	--	--	--
n-Hexane	0.70	--	74	0.20	0.0000078	10	--	--	--
Propylene	3.0	--	8.0	0.11	0.000011	10	--	--	--
Styrene	1.000	--	0.13	0.071	0.0000080	10	--	--	--
Tetrachloroethylene	0.040	0.038	1.1	0.072	0.0000082	10	--	--	--
Tetrahydrofuran	2.0	--	0.0029	0.099	0.000011	10	--	--	--
trans-1,2-Dichloroethene	0.040	--	0.28	0.071	0.000012	10	--	--	--
trans-1,3-Dichloropropene	0.020	0.0025	0.053	0.087	0.0000096	10	--	--	--
Trichloroethylene	0.0020	0.0024	0.48	0.079	0.0000091	10	--	--	--
Trichlorofluoromethane	1.05	--	5.2	0.087	0.0000097	10	--	--	--
Vinyl acetate	0.20	--	0.024	0.085	0.0000092	10	--	--	--
Vinyl bromide	0.0030	0.00067	0.26	0.10	0.000012	10	--	--	--
Vinyl chloride	0.10	0.0011	3.2	0.11	0.000012	10	--	--	--
Hydrogen Sulfide	0.0020	--	0.35	0.19	0.000022	10	--	--	--

Notes:

cm^2/s Square centimetres per second.
F1 Fraction 1 (C6-C10).
F2 Fraction 2 (C>10-C16).
mg/m^3 Milligrams per cubic metre.
PHC Petroleum hydrocarbon.
-- Not applicable.

References:

Canadian Council of Ministers of the Environment (CCME). 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.
Alberta Environment and Protected Areas (EPA). 2024b. Alberta Tier 2 Soil and Groundwater Remediation Guidelines.
Health Canada. 2021. Federal contaminated site risk assessment in Canada: Toxicological reference values (TRVs), Version 3.0.
United States Environmental Protection Agency (US EPA). 2024. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 8: Soil Properties for Evaluation of Vapour Transport

Parameter		Units	Coarse-Grained Soil	Fine-Grained Soil
θ_a	Vapour-filled porosity	unitless	0.31	0.303
ρ_b	Dry bulk density	g/cm^3	1.7	1.4
n	Total soil porosity	unitless	0.36	0.47
θ_w	Moisture-filled porosity	unitless	0.05	0.167
Q_{soil}	Soil gas flow rate	cm^3/s	167	16.7

Notes:

Values from CCME (2014).

cm Centimetre.

cm^2 Square centimetre.

g/cm^3 Grams per cubic centimetre.

PHC Petroleum hydrocarbon.

References: Canadian Council of Ministers of the Environment (CCME). 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.

Alberta Environment and Protected Areas (EPA). 2024b. Alberta Tier 2 Soil and Groundwater Remediation Guidelines.

Table 9: Building Properties for Evaluation of Vapour Transport

Parameter		Units	Residential Land Use
			Basement
L_B	Building length	cm	1,225
W_B	Building width	cm	1,225
A_B	Building area exposed to soil, including basement wall area	cm^2	2.7E+06
H_B	Building height	cm	360
L_{crack}	Thickness of the foundation	cm	11.25
A_{crack}	Area of cracks through which contaminant vapours enter the building	cm^2	994.5
ACH	Air exchanges per hour	h^{-1}	0.5

Notes:

Values taken from CCME (2014).

cm Centimetre.

cm^2 Square centimetre.

h^{-1} Per hour.

References: Canadian Council of Ministers of the Environment (CCME). 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.

Alberta Environment and Protected Areas (EPA). 2024b. Alberta Tier 2 Soil and Groundwater Remediation Guidelines.

Table 10: Generic Soil Vapour Criteria

Parameter	Units	Residential Land Use		
		Basement and Slab-on-Grade		
		Coarse-Grained	Units	Coarse-Grained
Benzene	mg/m^3	0.041	µg/m^3	41
Toluene		75		75,190
Ethylbenzene		69		68,650
Xylenes		3.5		3,520
PHC F1		867		867,380
PHC F2		53		52,500
Naphthalene		0.38		380
Isopropanol		6.2		6,219
1,1,1-Trichloroethane		1,694		1,693,510
1,1,2,2-Tetrachloroethane		0.011		11
1,1,2-Trichloroethane		0.0070		7.0
1,1-Dichloroethane		0.43		430
1,1-Dichloroethene		0.1		128
1,2,4-Trichlorobenzene		0.10		104
1,2,4-Trimethylbenzene		2.2		2,235
1,2-Dibromoethane		0.0022		2.2
1,2-Dichlorobenzene		7.1		7,072
1,2-Dichloroethane		0.020		24
1,2-Dichloroethene (cis)		1.38		1,382
1,2-Dichloroethene (trans)		1.4		1,400
1,2-Dichloropropane		0.14		135
1,3,5-Trimethylbenzene		2.2		2,235
1,3-Butadiene		0.020		17
1,3-Dichlorobenzene		0.060		64
1,3-Dichloropropene [cis]		0.16		163
1,3-Dichloropropene [trans]		0.15		149
1,4-Dichlorobenzene		0.064		64
1,4-Dioxane		0.11		105
1-Methyl-4 ethyl benzene		14		14,461
2-Butanone (MEK)		167		167,364
2-Hexanone (MBK)		1.1		1,053
4-Methyl-2-pentanone (MIBK)		103		102,977
Acetone		919		918,788
Allyl chloride		0.030		32
Benzyl chloride		0.030		34
Bromodichloromethane		0.030		28
Bromoform		1.5		1,494
Bromomethane		0.17		173
Carbon disulfide		22		21,713
Carbon tetrachloride		0.11		113
Chlorobenzene		1.73		1,733
Chloroethane		124		124,080
Chloroform		0.070		72
Chloromethane		2.7		2,657
Cyclohexane		202		201,510
Dibromochloromethane		6.1		6,070
Dichlorodifluoromethane		3.6		3,584
Ethyl acetate		2.5		2,509
Freon 113		231		230,627
Freon 114		566		566,335
Heptane		14		14,461
Hexachlorobutadiene		0.050		51
Hexane		19		18,839
Isooctane		15		14,917
iso-Propylbenzene (cumene)		14		14,461
Methyl t-Butyl Ether (MTBE)		1.2		1,153
Methylene Chloride		19		18,764
Propylene		92		91,723
Styrene		3.5		3,500
Tetrachloroethene		1.4		1,390
Tetrahydrofuran		63		62,828
Trichloroethene		0.070		70
Trichlorofluoromethane		34		34,325
Vinyl acetate		6.6		6,586
Vinyl bromide (bromoethene)		0.040		40
Vinyl chloride		0.070		70

Notes:

mg/m^3 milligrams per cubic metre.

µg/m^3 micrograms per cubic metre.

References:

[1] Canadian Council of Ministers of the Environment (CCME). 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours.

[2] Alberta Environment and Protected Areas (EPA). 2019. Alberta Tier 1 Soil and Groundwater Remediation Guidelines.

[3] Health Canada. 2021. Federal contaminated site risk assessment in Canada: Toxicological reference values (TRVs), Version 3.0.

[4] United States Environmental Protection Agency (US EPA). 2022. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 11: Soil Vapour Risk Evaluation

Parameter	Unit	Soil Vapour Screening Criteria [a]	Comparisons of Soil Vapour Measurements to Soil Vapour Criteria															
			Estimated Cancer Risk [b]															
			VW04	VW05					XCG-4 (SVP)			25XCG-4 (SVP)	XCG-5 (SVP)	XCG-6 (SVP)				
			20-Nov-21	19-Sep-19	20-Nov-21	2-Jun-23	12-Dec-24	25-Feb-25	19-Sep-19	1-Apr-20	20-Nov-21	25-Feb-25	2-Jun-23	19-Sep-19	1-Apr-20	20-Nov-21	2-Jun-23	23-Apr-25
Benzene	µg/m^3	41	ND	1.0E-07	8.5E-08	1.7E-07	8.6E-07	ND	ND	ND	ND	3.3E-07	2.2E-07	2.4E-07	1.5E-07	3.6E-07	1.5E-07	1.6E-07
Toluene	µg/m^3	75,190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/m^3	68,650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes Total	µg/m^3	3,520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/m^3	3,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10})	µg/m^3	867,383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C_{10}-C_{16})	µg/m^3	52,495	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/m^3	1,693,510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/m^3	430	ND	1.8E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	µg/m^3	128	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/m^3	2,235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (cis)	µg/m^3	1,382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (trans)	µg/m^3	1,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorotetrafluoroethane (Freon 114)	µg/m^3	566,335	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/m^3	2235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/m^3	3359 / 64 [e]	ND	ND	ND	ND	ND	ND	5.0E-07	ND	ND	ND	4.7E-07	7.2E-07	ND	ND	ND	ND
1-Methyl-4 ethyl benzene	µg/m^3	14,461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	µg/m^3	167,364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/m^3	918,788	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/m^3	21,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/m^3	124,080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/m^3	9,306 / 72 [e]	9.1E-07	ND	ND	ND	ND	ND	8.5E-08	ND	ND	ND	ND	ND	ND	ND	ND	3.5E-07
Chloromethane	µg/m^3	2,657	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/m^3	201,510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/m^3	3,584	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl acetate	µg/m^3	2,509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorotrifluoroethane (Freon 113)	µg/m^3	230,627	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptane	µg/m^3	14,461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	µg/m^3	18,839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2,4-Trimethylpentane (Isooctane)	µg/m^3	14,917	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	µg/m^3	18764 / 62,545 [e]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5E-10	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	µg/m^3	102,977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/m^3	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propene	µg/m^3	91,723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/m^3	1392 / 2679 [e]	**3.3E-05**	3.1E-09	8.2E-09	9.0E-09	6.7E-09	1.7E-08	1.2E-07	2.3E-08	1.5E-07	ND	ND	ND	ND	1.9E-07	ND	7.1E-09
Tetrahydrofuran	µg/m^3	62,828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/m^3	67.5 / 153 [e]	5.6E-06	2.2E-07	ND	ND	1.2E-07	7.8E-08	ND	5.8E-08	ND	1.5E-06	ND	5.6E-08	ND	ND	ND	1.6E-06
Trichlorofluoromethane	µg/m^3	34,325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	µg/m^3	6,586	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/m^3	3,086 / 70[e]	ND	5.3E-07	ND	ND	ND	ND	ND	ND	3.0E-07	ND	ND	ND	ND	ND	ND	ND
Cumulative Risk			**4.0E-05**	8.8E-07	9.4E-08	1.8E-07	9.8E-07	9.5E-08	7.1E-07	8.1E-08	4.5E-07	1.8E-06	6.9E-07	1.0E-06	1.5E-07	5.5E-07	1.5E-07	2.1E-06
Target Risk			**1.0 x 10^{-5}**															

Notes:

The greater of the concentrations measured in the parent and duplicate sample collected was selected for use in subsequent calcuations.

ND = Not detected

- = screening criteria not calculated as appropriate toxicity data not available.

Bold = identifies estimated risks and hazards that exceed the individual hazard quotient 0.2 and target risk level of 1 x 10^{-5} or target hazard level of 1.

* = Detection limit raised above the criteria.

[a] Listed soil vapour screening criteria derived in accordance with CCME, 2014.

[b] Estimated cancer risk = (soil vapour concentration/cancer soil vapour screening level) x 10^{-5}.

[c] Estimated hazard quotient = (soil vapour concentration/non-cancer soil vapour screening level).

[d] Cumulative risk and hazard index represent the sum of chemical-specific cancer risks and hazard quotients.

[e] Soil vapour screening criteria shows both the threshold criteria and non-threshold criteria.

. Target risk and hazard levels are calculated with the appropriate criteria.

Table 11: Soil Vapour Risk Evaluation

Parameter	Unit	Soil Vapour Screening Criteria [a]	Comparisons of Soil Vapour Measurements to Soil Vapour Criteria												
			Estimated Cancer Risk [b]												
			XCG-8 (SVP)	XCG-13 (SVP)						24SVP13H		24SVP31H		24SVP35H	
			20-Nov-21	19-Sep-19	1-Apr-20	20-Nov-21	2-Jun-23	7-Jul-23	25-Feb-25	11-Dec-24	25-Feb-25	11-Dec-24	25-Feb-25	11-Dec-24	25-Feb-25
Benzene	µg/m^3	41	3.6E-07	1.5E-07	1.2E-07	3.4E-07	3.4E-07	1.1E-06	1.6E-07	6.9E-07	ND	8.2E-07	2.8E-07	1.0E-06	1.3E-07
Toluene	µg/m^3	75,190	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/m^3	68,650	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes Total	µg/m^3	3,520		-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/m^3	3,500		-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10})	µg/m^3	867,383		-	-	-	-	-	-	-	-	-	-	-	-
F2 (C_{10}-C_{16})	µg/m^3	52,495	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/m^3	1,693,510	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/m^3	430	-	ND	ND	ND	ND	2.1E-08	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	µg/m^3	128	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/m^3	2,235	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (cis)	µg/m^3	1,382	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (trans)	µg/m^3	1,400	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorotetrafluoroethane (Freon 114)	µg/m^3	566,335	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/m^3	2235	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/m^3	3359 / 64 [e]	ND	1.3E-06	ND	4.7E-07	3.6E-07	5.5E-07	ND	ND	ND	ND	ND	ND	ND
1-Methyl-4 ethyl benzene	µg/m^3	14,461	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	µg/m^3	167,364	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/m^3	918,788	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/m^3	21,713	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/m^3	124,080	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/m^3	9,306 / 72 [e]	ND	ND	ND	ND	ND	2.0E-07	ND	5.4E-07	2.0E-07	5.4E-07	2.5E-07	1.4E-06	5.7E-07
Chloromethane	µg/m^3	2,657	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/m^3	201,510	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/m^3	3,584	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl acetate	µg/m^3	2,509	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorotrifluoroethane (Freon 113)	µg/m^3	230,627	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptane	µg/m^3	14,461	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	µg/m^3	18,839	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2,4-Trimethylpentane (Isooctane)	µg/m^3	14,917	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	µg/m^3	18764 / 62,545 [e]	ND	ND	ND	ND	ND	6.3E-09	ND	ND	ND	2.3E-09	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	µg/m^3	102,977	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/m^3	380	-	-	-	-	-	-	-	-	-	-	-	-	-
Propene	µg/m^3	91,723	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/m^3	1392 / 2679 [e]	1.9E-07	ND	ND	3.1E-08	1.7E-08	5.0E-07	1.6E-08	9.3E-09	ND	7.1E-09	6.7E-09	1.7E-08	1.2E-08
Tetrahydrofuran	µg/m^3	62,828		-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/m^3	67.5 / 153 [e]	ND	ND	1.0E-07	4.4E-07	2.5E-07	4.9E-07	1.3E-07	9.3E-07	2.0E-07	5.9E-07	3.3E-07	1.7E-06	5.7E-07
Trichlorofluoromethane	µg/m^3	34,325		-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	µg/m^3	6,586		-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/m^3	3,086 / 70[e]	ND	ND	ND	ND	**1.0E-05**	**3.4E-05**	ND	ND	ND	ND	ND	ND	ND
Cumulative Risk			5.5E-07	1.5E-06	2.2E-07	1.3E-06	**1.1E-05**	**3.7E-05**	3.0E-07	2.2E-06	4.0E-07	2.0E-06	8.7E-07	4.2E-06	1.3E-06
Target Risk				**1.0 x 10^{-5}**											

Notes:

The greater of the concentrations measured in the parent and duplicate sample collected was selected for use in subsequent calcuations.

ND = Not detected

- = screening criteria not calculated as appropriate toxicity data not available.

Bold = identifies estimated risks and hazards that exceed the individual hazard quotient 0.2 and target risk level of 1 x 10^{-5} or target hazard level of 1.

* = Detection limit raised above the criteria.

[a] Listed soil vapour screening criteria derived in accordance with CCME, 2014.

[b] Estimated cancer risk = (soil vapour concentration/cancer soil vapour screening level) x 10^{-5}.

[c] Estimated hazard quotient = (soil vapour concentration/non-cancer soil vapour screening level).

[d] Cumulative risk and hazard index represent the sum of chemical-specific cancer risks and hazard quotients.

[e] Soil vapour screening criteria shows both the threshold criteria and non-threshold criteria.

. Target risk and hazard levels are calculated with the appropriate criteria.

Table 11: Soil Vapour Risk Evaluation

Parameter	Unit	Soil Vapour Screening Criteria [a]	Comparisons of Soil Vapour Measurements to Soil Vapour Criteria															
			Estimated Hazard Quotients [c]															
			VW04	VW05					XCG-4 (SVP)			25XCG-4(SVP)	XCG-5 (SVP)	XCG-6 (SVP)				
			20-Nov-21	19-Sep-19	20-Nov-21	2-Jun-23	12-Dec-24	25-Feb-25	19-Sep-19	1-Apr-20	20-Nov-21	25-Feb-25	2-Jun-23	19-Sep-19	1-Apr-20	20-Nov-21	2-Jun-23	23-Apr-25
Benzene	µg/m^3	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/m^3	75,190	ND	3.6E-05	1.1E-05	2.2E-05	6.6E-05	2.1E-05	ND	ND	ND	5.0E-05	4.0E-05	8.6E-05	ND	ND	4.1E-05	4.8E-05
Ethylbenzene	µg/m^3	68,650	ND	7.6E-06	ND	ND	1.8E-05	1.7E-05	ND	ND	ND	1.9E-05	ND	9.3E-06	ND	1.4E-04	ND	2.0E-05
Xylenes Total	µg/m^3	3,520	ND	8.2E-04	ND	4.0E-04	1.2E-03	1.8E-03	ND	ND	ND	1.9E-03	5.7E-04	8.2E-04	ND	3.6E-03	1.5E-03	2.2E-03
Styrene	µg/m^3	3,500	ND	ND	ND	ND	ND	4.6E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
F1 (C_6-C_{10})	µg/m^3	867,383	7.8E-03	2.0E-04	2.2E-05	1.5E-04	1.4E-04	1.3E-04	1.1E-04	4.6E-05	1.8E-03	1.6E-04	1.7E-04	6.7E-05	3.0E-05	1.8E-04	1.1E-04	ND
F2 (C_{10}-C_{16})	µg/m^3	52,495	7.6E-04	2.6E-03	5.7E-04	5.8E-03	3.8E-04	ND	2.2E-04	ND	ND	ND	4.8E-03	3.8E-04	ND	1.4E-03	5.2E-03	ND
1,1,1-Trichloroethane	µg/m^3	1,693,510	1.0E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	µg/m^3	430	-	-	-	-	-	ND	ND	-	-	ND	-	-	-	-	-	-
1,1-Dichloroethene	µg/m^3	128	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	µg/m^3	2,235	ND	ND	ND	ND	4.5E-04	8.5E-04	ND	ND	ND	9.4E-04	ND	ND	ND	1.3E-03	ND	2.4E-03
1,2-Dichloroethene (cis)	µg/m^3	1,382	ND	**0.034**	**0.042**	**0.022**	**0.019**	ND	ND	ND	9.6E-04	**0.02**	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (trans)	µg/m^3	1,400	ND	3.2E-03	5.6E-03	4.8E-03	4.5E-03	ND	ND	ND	ND	5.4E-03	ND	ND	ND	ND	ND	ND
1,2-Dichlorotetrafluoroethane (Freon 114)	µg/m^3	566,335	2.8E-05	3.3E-04	7.2E-05	6.5E-05	7.1E-05	5.2E-05	1.4E-04	1.5E-04	2.1E-05	7.5E-05	ND	5.7E-06	ND	1.3E-05	1.9E-05	2.1E-04
1,3,5-Trimethylbenzene	µg/m^3	2235	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.7E-04	ND	ND
1,3-Dichlorobenzene	µg/m^3	3359 / 64 [e]	ND	ND	ND	ND	ND	9.5E-04	ND	ND	ND	ND	8.9E-04	1.4E-03	ND	ND	ND	ND
1-Methyl-4 ethyl benzene	µg/m^3	14,461	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6E-05
2-Butanone (MEK)	µg/m^3	167,364	ND	9.7E-06	5.7E-06	4.1E-05	6.5E-06	4.2E-06	4.4E-06	7.4E-06	5.4E-06	5.8E-06	3.9E-05	9.9E-06	4.3E-06	8.5E-06	3.2E-05	2.0E-05
Acetone	µg/m^3	918,788	1.7E-06	1.7E-05	3.8E-06	1.7E-05	1.0E-05	7.5E-06	4.0E-06	6.3E-06	1.1E-05	2.2E-05	4.2E-05	1.2E-05	6.4E-06	5.8E-06	3.7E-05	4.0E-05
Carbon disulfide	µg/m^3	21,713	ND	2.7E-03	1.7E-04	1.4E-04	ND	ND	1.2E-04	ND	ND	ND	5.2E-04	8.8E-05	ND	ND	8.3E-05	ND
Chloroethane	µg/m^3	124,080	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	µg/m^3	9,306 / 72 [e]	7.0E-04	ND	ND	ND	ND	ND	6.6E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	µg/m^3	2,657	ND	ND	2.0E-04	3.5E-04	ND	ND	ND	ND	1.8E-04	ND	ND	4.5E-04	3.5E-04	2.7E-04	3.1E-04	ND
Cyclohexane	µg/m^3	201,510	ND	ND	ND	ND	2.2E-05	ND	ND	ND	ND	ND	ND	5.7E-06	ND	6.0E-06	ND	ND
Dichlorodifluoromethane	µg/m^3	3,584	2.1E-02	8.6E-02	3.1E-02	3.3E-02	3.5E-02	1.5E-02	3.1E-03	1.3E-02	1.4E-02	3.4E-02	6.2E-02	1.3E-03	6.6E-04	4.6E-03	4.0E-03	5.6E-02
Ethyl acetate	µg/m^3	2,509	ND	ND	ND	3.9E-04	5.6E-04	ND	ND	ND	ND	7.2E-04	1.1E-03	ND	ND	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	µg/m^3	230,627	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptane	µg/m^3	14,461	ND	ND	ND	ND	2.9E-04	7.1E-05	ND	ND	ND	ND	ND	9.0E-05	ND	2.2E-04	ND	ND
Hexane	µg/m^3	18,839	ND	ND	5.3E-05	ND	3.5E-04	ND	ND	ND	4.0E-05	ND	4.9E-05	9.6E-05	ND	1.1E-04	ND	ND
2,2,4-Trimethylpentane (Isooctane)	µg/m^3	14,917	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3E-04
Methylene Chloride	µg/m^3	18764 / 62,545 [e]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0E-05	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	µg/m^3	102,977	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	µg/m^3	380	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5E-03	ND	ND	ND	ND	4.7E-03
Propene	µg/m^3	91,723	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9E-05	1.6E-05	1.3E-04
Tetrachloroethene	µg/m^3	1392 / 2679 [e]	**6.43**	5.9E-04	1.6E-03	1.7E-03	ND	3.2E-03	2.4E-02	4.4E-03	2.9E-02	ND	ND	ND	ND	3.6E-02	ND	ND
Tetrahydrofuran	µg/m^3	62,828	ND	ND	ND	2.1E-04	ND	ND	ND	ND	ND	ND	3.0E-05	ND	ND	ND	1.6E-05	ND
Trichloroethene	µg/m^3	67.5 / 153 [e]	**1.27**	5.0E-02	ND	ND	2.7E-02	1.8E-02	ND	1.3E-02	ND	ND	ND	1.3E-02	ND	ND	ND	ND
Trichlorofluoromethane	µg/m^3	34,325	5.7E-04	2.1E-04	2.2E-04	1.9E-04	2.5E-04	ND	4.4E-05	3.2E-05	3.8E-05	2.3E-04	5.0E-05	3.2E-05	3.8E-05	3.5E-05	ND	ND
Vinyl acetate	µg/m^3	6,586	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µg/m^3	3,086 / 70[e]	ND	1.2E-03	ND	ND	ND	ND	ND	ND	6.7E-04	ND	ND	ND	ND	ND	ND	ND
Cumulative Risk			**7.73**	0.18	0.081	0.070	0.089	4.0E-02	2.8E-02	3.1E-02	4.7E-02	0.065	7.3E-02	1.8E-02	1.1E-03	4.9E-02	1.1E-02	6.6E-02
Target Risk			**1.00**															

Notes:

The greater of the concentrations measured in the parent and duplicate sample collected was selected for use in subsequent calcuations.

ND = Not detected

- = screening criteria not calculated as appropriate toxicity data not available.

Bold = identifies estimated risks and hazards that exceed the individual hazard quotient 0.2 and target risk level of 1 x 10^{-5} or target hazard level of 1.

* = Detection limit raised above the criteria.

[a] Listed soil vapour screening criteria derived in accordance with CCME, 2014.

[b] Estimated cancer risk = (soil vapour concentration/cancer soil vapour screening level) x 10^{-5}.

[c] Estimated hazard quotient = (soil vapour concentration/non-cancer soil vapour screening level).

[d] Cumulative risk and hazard index represent the sum of chemical-specific cancer risks and hazard quotients.

[e] Soil vapour screening criteria shows both the threshold criteria and non-threshold criteria.

. Target risk and hazard levels are calculated with the appropriate criteria.

Table 11: Soil Vapour Risk Evaluation

Parameter	Unit	Soil Vapour Screening Criteria [a]	Comparisons of Soil Vapour Measurements to Soil Vapour Criteria												
			Estimated Hazard Quotients [c]												
			XCG-8 (SVP)	XCG-13 (SVP)						24SVP15		24SVP16		24SVP17	
			20-Nov-21	19-Sep-19	1-Apr-20	20-Nov-21	2-Jun-23	7-Jul-23	25-Feb-25	11-Dec-24	25-Feb-25	11-Dec-24	25-Feb-25	11-Dec-24	25-Feb-25
Benzene	µg/m^3	41	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/m^3	75,190	ND	1.2E-05	7.0E-06	ND	9.0E-06	1.1E-04	4.6E-05	2.1E-04	6.1E-05	2.2E-04	6.0E-05	4.5E-04	1.2E-04
Ethylbenzene	µg/m^3	68,650	1.4E-04	ND	ND	ND	ND	5.9E-05	1.6E-05	1.4E-04	4.4E-05	2.6E-04	1.6E-04	9.0E-04	3.6E-04
Xylenes Total	µg/m^3	3,520	3.6E-03	ND	ND	ND	ND	5.9E-03	1.7E-03	1.6E-02	6.2E-03	1.8E-02	1.5E-02	8.4E-02	3.7E-02
Styrene	µg/m^3	3,500	ND	ND	ND	ND	ND	1.2E-03	ND	ND	ND	2.5E-04	ND	ND	ND
F1 (C_6-C_{10})	µg/m^3	867,383	1.8E-04	4.0E-05	9.7E-06	5.6E-05	2.0E-03	6.9E-03	7.7E-05	2.4E-04	8.3E-05	4.3E-04	1.4E-04	6.3E-04	3.1E-04
F2 (C_{10}-C_{16})	µg/m^3	52,495	1.4E-03	3.4E-04	ND	ND	9.8E-03	ND	ND	1.5E-03	ND	2.5E-03	ND	2.3E-03	2.0E-03
1,1,1-Trichloroethane	µg/m^3	1,693,510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	µg/m^3	430	-	-	-	-	-	-	ND	-	ND	-	ND	-	ND
1,1-Dichloroethene	µg/m^3	128	-	ND	ND	ND	2.6E-02	6.3E-02	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	µg/m^3	2,235	1.3E-03	ND	ND	ND	ND	3.4E-03	7.6E-04	1.1E-03	ND	9.4E-04	4.9E-04	1.3E-03	8.9E-04
1,2-Dichloroethene (cis)	µg/m^3	1,382	ND	ND	ND	2.3E-03	1.1E-02	**0.05**	1.8E-03	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (trans)	µg/m^3	1,400	ND	ND	ND	ND	ND	2.2E-03	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorotetrafluoroethane (Freon 114)	µg/m^3	566,335	1.3E-05	ND	ND	5.8E-04	7.3E-04	5.2E-04	1.0E-04	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	µg/m^3	2235	8.7E-04	ND	ND	ND	ND	8.5E-04	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	µg/m^3	3359 / 64 [e]	ND	2.6E-03	ND	8.9E-04	6.8E-04	1.0E-03	ND	ND	ND	ND	ND	ND	ND
1-Methyl-4 ethyl benzene	µg/m^3	14,461	ND	ND	ND	ND	ND	1.7E-04	ND	ND	ND	ND	ND	9.0E-05	ND
2-Butanone (MEK)	µg/m^3	167,364	8.5E-06	ND	5.4E-06	ND	1.1E-05	6.3E-03	1.4E-05	3.5E-06	3.9E-06	1.0E-05	ND	3.9E-06	3.7E-06
Acetone	µg/m^3	918,788	5.8E-06	9.4E-06	5.3E-06	2.8E-06	1.2E-05	2.6E-04	1.9E-05	5.7E-06	1.1E-05	1.9E-05	6.4E-06	5.2E-06	1.2E-05
Carbon disulfide	µg/m^3	21,713	ND	ND	ND	ND	ND	1.5E-03	ND	4.1E-04	2.2E-04	5.5E-04	9.3E-04	2.2E-03	1.3E-03
Chloroethane	µg/m^3	124,080	ND	ND	ND	ND	1.2E-05	4.2E-05	ND	ND	ND	ND	ND	ND	ND
Chloroform	µg/m^3	9,306 / 72 [e]	ND	ND	ND	ND	ND	1.5E-04	ND	ND	ND	ND	ND	ND	ND
Chloromethane	µg/m^3	2,657	2.7E-04	ND	3.9E-04	3.9E-04	ND	ND	5.0E-04	ND	ND	2.4E-04	ND	ND	ND
Cyclohexane	µg/m^3	201,510	6.0E-06	ND	ND	4.6E-05	1.4E-04	3.2E-04	ND	1.4E-05	ND	2.1E-05	ND	5.5E-06	ND
Dichlorodifluoromethane	µg/m^3	3,584	4.6E-03	9.2E-04	7.7E-04	**0.53**	**0.29**	**0.22**	**0.14**	9.2E-04	8.6E-04	6.7E-04	8.6E-04	3.3E-03	2.5E-03
Ethyl acetate	µg/m^3	2,509	ND	ND	ND	ND	ND	ND	4.0E-04	ND	5.5E-04	9.8E-02	ND	ND	ND
Trichlorotrifluoroethane (Freon 113)	µg/m^3	230,627	ND	ND	6.1E-06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptane	µg/m^3	14,461	2.2E-04	ND	ND	ND	3.5E-04	3.4E-04	ND	2.6E-04	ND	4.6E-04	ND	2.1E-04	1.5E-04
Hexane	µg/m^3	18,839	1.1E-04	8.0E-05	ND	ND	7.5E-04	1.4E-03	ND	2.3E-04	ND	4.1E-04	ND	1.1E-04	4.1E-05
2,2,4-Trimethylpentane (Isooctane)	µg/m^3	14,917	-	ND	ND	ND	ND	6.9E-04	ND	ND	ND	6.7E-05	ND	ND	ND
Methylene Chloride	µg/m^3	18764 / 62,545 [e]	ND	ND	ND	ND	ND	2.1E-03	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	µg/m^3	102,977	ND	ND	ND	ND	ND	1.5E-05	ND	ND	ND	ND	ND	ND	ND
Naphthalene	µg/m^3	380	ND	ND	ND	ND	ND	5.5E-03	ND	1.7E-03	ND	2.2E-03	ND	1.7E-03	ND
Propene	µg/m^3	91,723	2.9E-05	ND	ND	6.8E-06	2.3E-04	ND	ND	ND	ND	ND	ND	4.9E-05	ND
Tetrachloroethene	µg/m^3	1392 / 2679 [e]	3.6E-02	ND	ND	6.0E-03	3.3E-03	9.6E-02	ND	ND	ND	ND	ND	ND	ND
Tetrahydrofuran	µg/m^3	62,828	ND	ND	ND	ND	1.4E-05	5.2E-02	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	µg/m^3	67.5 / 153 [e]	ND	ND	2.3E-02	9.9E-02	5.6E-02	**0.11**	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	µg/m^3	34,325	3.5E-05	ND	3.5E-05	ND	ND	ND	ND	ND	ND	3.5E-05	3.2E-05	ND	ND
Vinyl acetate	µg/m^3	6,586	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µg/m^3	3,086 / 70[e]	ND	ND	ND	ND	2.3E-02	7.8E-02	ND	ND	ND	ND	ND	ND	ND
Cumulative Risk			4.9E-02	4.0E-03	2.4E-02	0.64	0.43	0.72	0.15	2.3E-02	8.0E-03	0.13	1.8E-02	0.10	4.5E-02
Target Risk				**1.00**											

Notes:

The greater of the concentrations measured in the parent and duplicate sample collected was selected for use in subsequent calcuations.

ND = Not detected

- = screening criteria not calculated as appropriate toxicity data not available.

Bold = identifies estimated risks and hazards that exceed the individual hazard quotient 0.2 and target risk level of 1 x 10^{-5} or target hazard level of 1.

* = Detection limit raised above the criteria.

[a] Listed soil vapour screening criteria derived in accordance with CCME, 2014.

[b] Estimated cancer risk = (soil vapour concentration/cancer soil vapour screening level) x 10^{-5}.

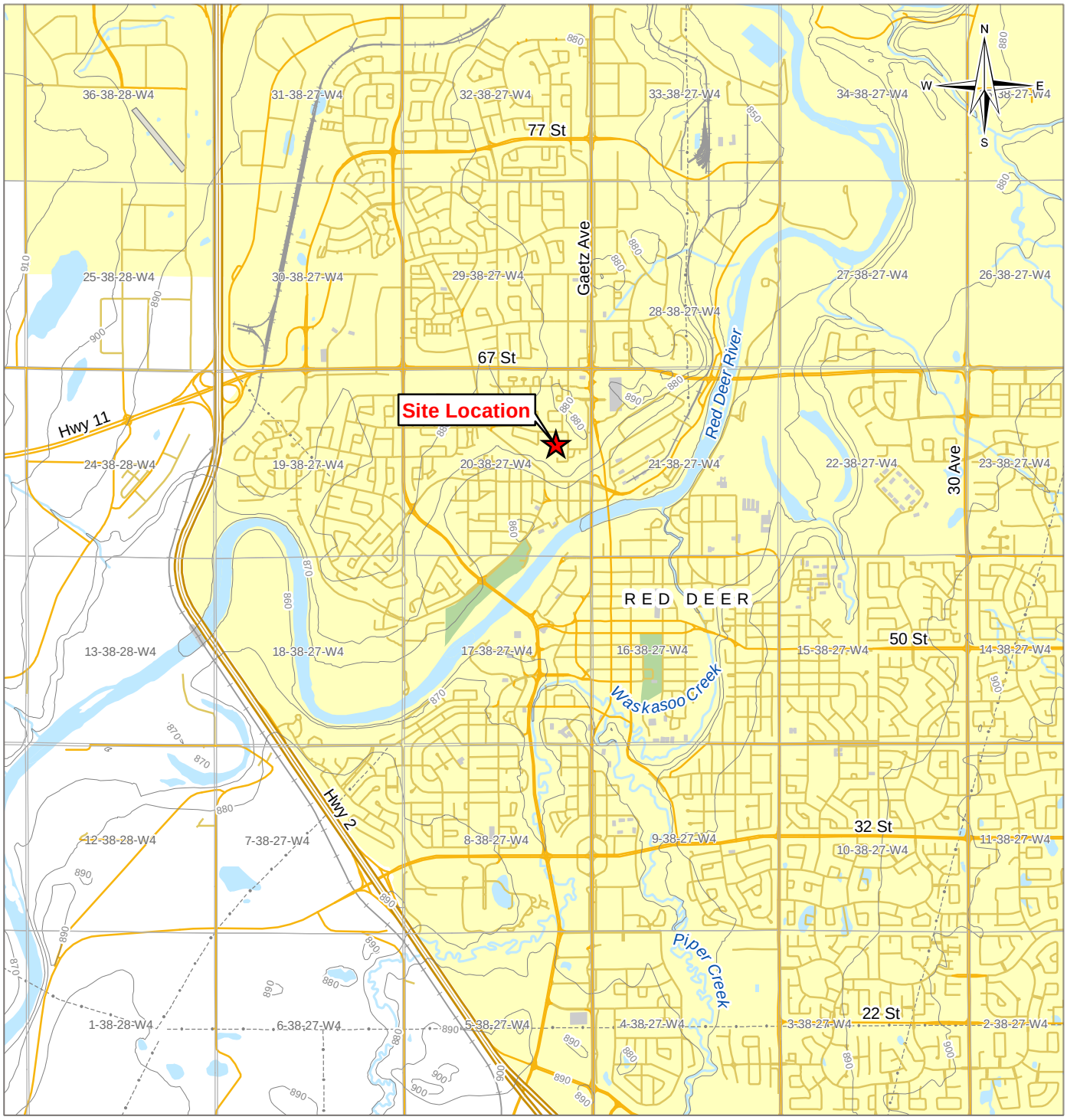
[c] Estimated hazard quotient = (soil vapour concentration/non-cancer soil vapour screening level).

[d] Cumulative risk and hazard index represent the sum of chemical-specific cancer risks and hazard quotients.

[e] Soil vapour screening criteria shows both the threshold criteria and non-threshold criteria.

. Target risk and hazard levels are calculated with the appropriate criteria.

FIGURES



LEGEND

- Site Location
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Railway
- Power Line
- Runway
- Building
- Park
- Contour (10 m)
- Watercourse
- Waterbody
- Urban Area

NOTES
Base data source: CanVec 1:50,000.

STATUS
ISSUED FOR USE

2024 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT FORMER MONTFORT LANDFILL SITE

Site Location Plan

PROJECTION	DATUM	CLIENT
3TM 114	NAD83	The City of Red Deer

Scale: 1:50,000
1 0.5 0 1
Kilometres

FILE NO. SWOP04071-05_Figure01_SiteLocation.mxd

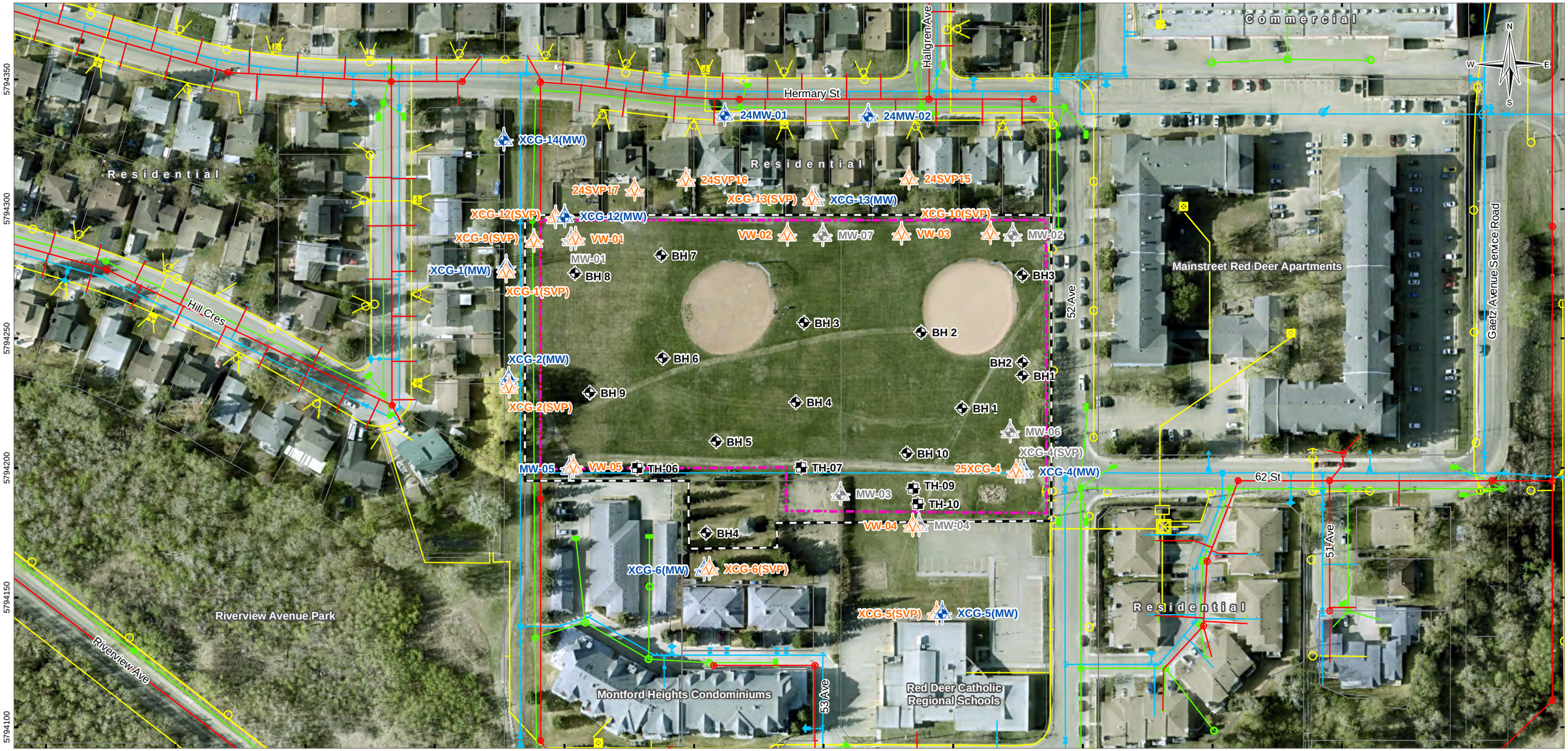
OFFICE	DWN	CKD	APVD	REV
Tt-EDM	MRB	SL	WC	0

DATE November 26, 2025
PROJECT NO. SWM.SWOP04071-05.007

TETRA TECH

Figure 1

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Mapsl\007_MontfortSWOP04071-05_Figure01_SiteLocation.mxd modified 11/26/2025 by Britney.Bietz



LEGEND

- Borehole
- Monitoring Well
- Decommissioned Monitoring Well
- Testhole
- Vapour Well
- Decommissioned Vapour Well
- Site Boundary
- Historic Waste Disposal (Provided by Tiamat, 2014)
- Lot Boundary

Utilities

- Electrical
- Sanitary
- Storm
- Water

NOTES

Base data source: Imagery provided by ESRI; Red Deer County (2024)
Utilities provided by City of Red Deer.
Locations have not been field verified, and should not be used for construction or other intrusive field activities.

24MW-01 was previously 24BH-01
24MW-02 was previously 24BH-02

STATUS
ISSUED FOR USE

2024 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT FORMER MONTFORT LANDFILL SITE

Site Plan and Surrounding Land Use

PROJECTION	DATUM	CLIENT
3TM 114	NAD83	The City of Red Deer

Scale: 1:1,500
25 12.5 0 25
Metres

FILE NO. SWOP04071-05_Figure02_LandUse.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	BB	SL	WV	0

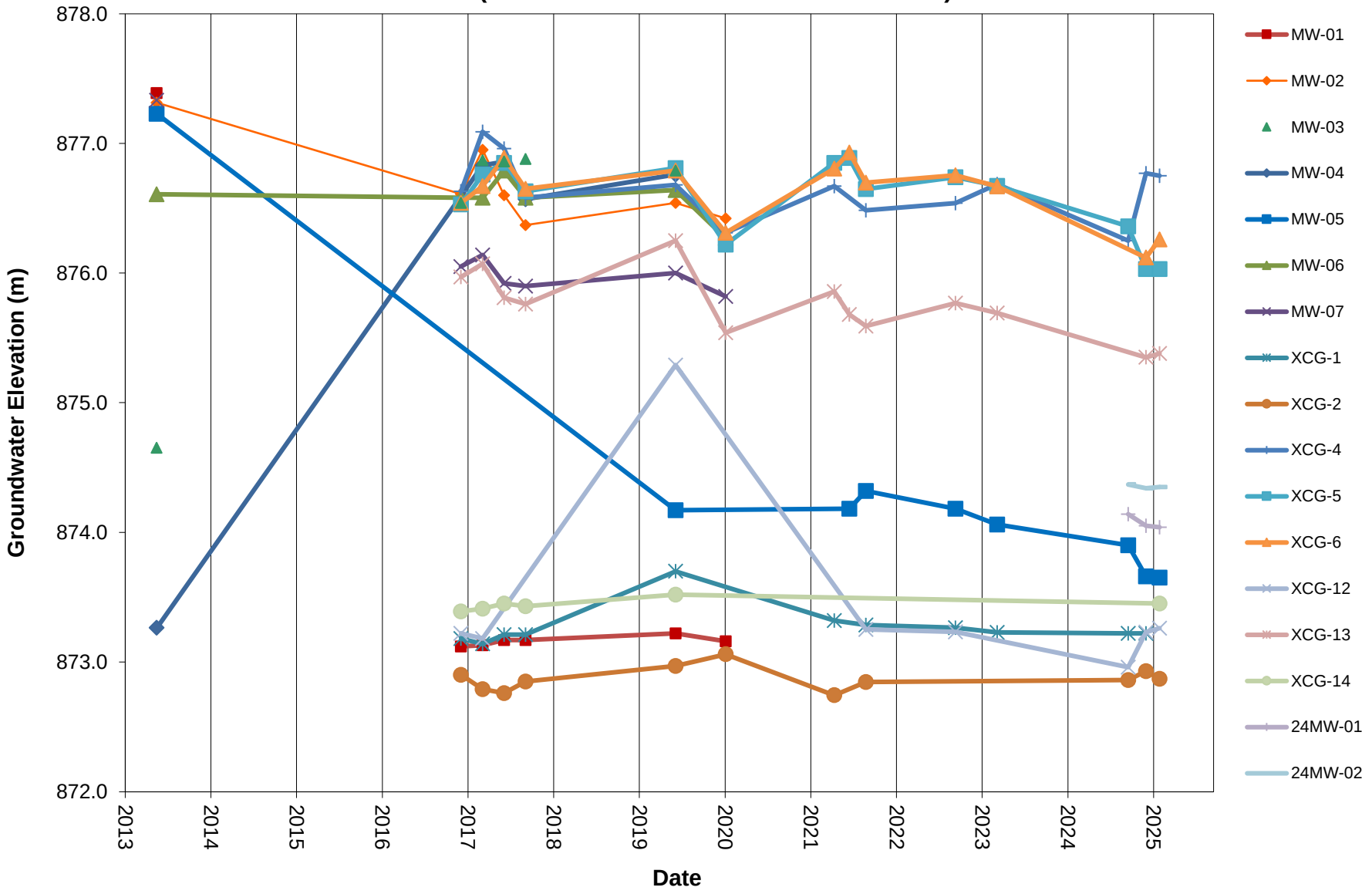
DATE	PROJECT NO.
November 26, 2025	SWM.SWOP04071-05.007

TETRA TECH

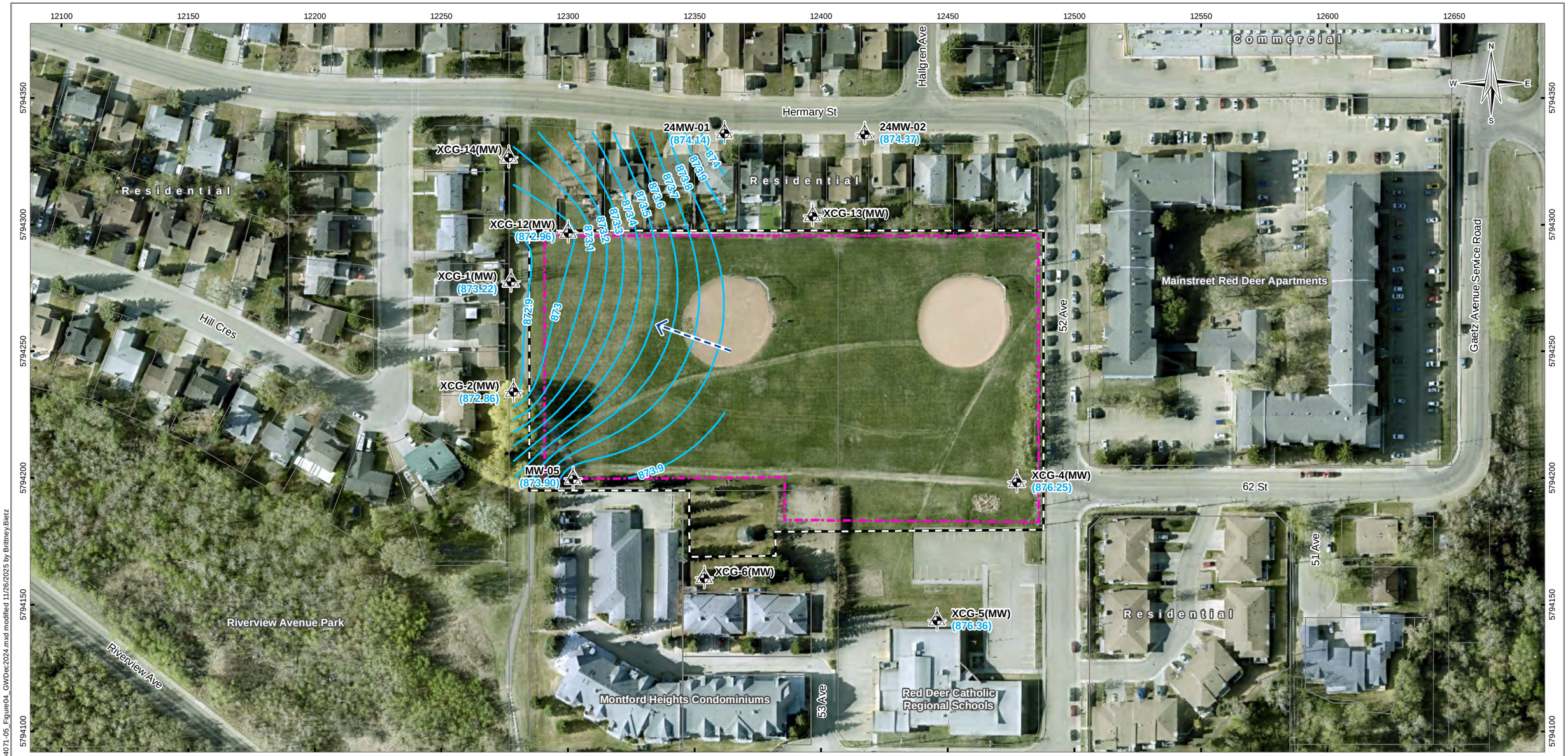
Figure 2

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\007_MontfortSWOP04071-05_Figure02_LandUse.mxd modified 11/26/2025 by Brittney.Bietz

FIGURE 3
HISTORICAL GROUNDWATER ELEVATIONS
(GROUNDWATER MONITORING WELLS)



TETRA TECH



LEGEND

- Monitoring Well
- (87X.XX) Groundwater Elevation (masl)
- Deep Well Contour (0.1 masl)
- Inferred Groundwater Flow Direction
- Site Boundary
- Historic Waste Disposal (Provided by Tiamat, 2014)
- Lot Boundary

NOTES

Base data source: Imagery provided by ESRI; Red Deer County (2024)

24MW-01 was previously 24BH-01
24MW-02 was previously 24BH-02

masl - metres above sea level

STATUS
ISSUED FOR USE

2024 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT FORMER MONTFORT LANDFILL SITE

Groundwater Elevation Contours December 2024

PROJECTION 3TM 114	**DATUM** NAD83	**CLIENT** The City of Red Deer
Scale: 1:1,500 — 25 12.5 0 25 Metres		TETRA TECH
FILE NO. SWOP04071-05_Figure04_GWDec2024.mxd		
OFFICE Tt-EDM	**DWN** BB / **CKD** SL / **APVD** WV / **REV** 0	**Figure 4**
DATE November 26, 2025	**PROJECT NO.** SWM.SWOP04071-05.007	

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G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\007_MontfortSWOP04071-05_Figure05_GWApril2025.mxd modified 11/26/2025 by Brittney.Bietz

LEGEND

- Monitoring Well
- (87X.XX) Groundwater Elevation (masl)
- Shallow Well Contour (0.1 masl)
- Deep Well Contour (0.1 masl)
- Inferred Groundwater Flow Direction
- Site Boundary
- Historic Waste Disposal (Provided by Tiamat, 2014)
- Lot Boundary

NOTES

Base data source: Imagery provided by ESRI; Red Deer County (2024)

24MW-01 was previously 24BH-01
24MW-02 was previously 24BH-02

masl - metres above sea level

STATUS
ISSUED FOR USE

2024 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT FORMER MONTFORT LANDFILL SITE

Groundwater Elevation Contours April 2025

PROJECTION 3TM 114	**DATUM** NAD83	**CLIENT** THE CITY OF Red Deer	
Scale: 1:1,500 — 25 12.5 0 25 Metres			
FILE NO. SWOP04071-05_Figure05_GWApril2025.mxd		TETRA TECH	
OFFICE Tt-EDM	**DWN** BB / **CKD** SL / **APVD** WV / **REV** 0		**Figure 5**
DATE November 26, 2025	**PROJECT NO.** SWM.SWOP04071-05.007		

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

ALBERTA ENVIRONMENT AND PROTECTED AREAS REVIEW LETTER

Environment and Protected Areas

Contaminated Sites and Remediation Program
Deerfoot Square
2938 11 St NE
Calgary, AB T2E 7L7
Telephone 403-297-7602
www.alberta.ca

October 6, 2023

File No. 00448509

Janet Whitesell
Waste Management Superintendent
City of Red Deer
Box 5008
Red Deer, Alberta T4N 3T4
Delivered by email: janet.whitesell@reddeer.ca

Dear Janet Whitesell,

Subject: Re: Review of 2021 Groundwater and Soil Vapour Monitoring Report
Former Montfort Landfill
Red Deer, Alberta

Alberta Environment and Protected Areas (EPA) has received the 2021 Groundwater and Soil Vapour Monitoring Report prepared by Tetra Tech dated August 02, 2022 for the property listed above.

Based on the information provided in this submission including data available from previous reports, EPA provides the following comments:

1. Please provide further characterization of VOC contamination in groundwater around XCG-13(MW) to assess risk to receptors from groundwater driven vapour inhalation. If the groundwater samples cannot be obtained within private property, alternate locations to the north of residences may be considered.
2. Please provide further information on potential risk from VOCs in soil vapour at residence units between Hermary Street and the northern boundary of the historic landfill in the vicinity of XCG-13(MW).
3. Provide copies of correspondence to homeowners regarding sampling to be carried out in private property, with respect to the above comment.
4. Please provide comment on PFOS and PFOA as a contaminant of concern in groundwater.
5. Concentrations of Zinc, Manganese and Nitrate in groundwater at XCG-6 indicate the need for further monitoring of leachate downstream. Please provide concentrations of contaminants in groundwater further downstream to assess leachate behaviour or achieve delineation.

Please note that given the change in guidelines and further assessment required towards achieving a robust the conceptual side mode for the site, the current risk management plan (Tiamat, November 2014) is outdated. EPA recommends development of an updated risk management plan once the additional investigations at the site are completed. The above noted comments may be addressed in the next due annual environmental monitoring report or a separate correspondence.

Please provide a response to EPA at AEP.EASCommunications@gov.ab.ca quoting the above noted file number by February 2, 2024.

If you have any questions or require clarification with respect to this letter, please contact me at Neil.Monteiro@gov.ab.ca or 403-297-5418.

Yours truly,

Neil Monteiro, M.Sc., P.Geo.
Contaminant Hydrogeologist

Enclosure

cc: Tracy Seppala
Tracy.Seppala@reddeer.ca

THE CITY OF Red Deer

UTILITIES

February 2, 2024

Neil Monteiro
Contaminant Hydrogeologist
Contaminated Sites and Remediation
Alberta Environment and Protected Areas
Delivered by email to: AEP.EASCommunications@gov.ab.ca

Dear Neil Monterio

Subject: **File No. 00448509 - Response to comments from the review of the 2021 Groundwater and Soil Vapour Monitoring Report for the former Montfort Landfill Site**

The City of Red Deer (The City) received a letter from Alberta Environment and Protected Areas (EPA) on October 6, 2023 containing comments from their review of the 2021 Groundwater and Soil Vapour Monitoring Report – Former Montfort Landfill (File No. 00448509).

As the operator of the former landfill, which was authorized under Permit # M 131 issued by the Provincial Board of Health, The City is happy to submit the below information in response to EPA's comments and as an update on The City's ongoing environmental monitoring of this former landfill site. Responses to questions 4 and 5 have been prepared by Tetra Tech Canada Inc (Tetra Tech), The City's current environmental consultant for the monitoring at the Montfort landfill site.

1. *Please provide further characterization of VOC contamination in groundwater around XCG-13(MW) to assess risk to receptors from groundwater driven vapour inhalation. If the groundwater samples cannot be obtained within private property, alternate locations to the north of residences may be considered.*

   The City proposes to install additional groundwater monitoring wells to the north of XCG-13(MW) to provide further characterization of the Volatile Organic Compound (VOC) concentrations within the groundwater around XCG-13(MW). In order to minimize disturbance to private property owners and ensure access to the monitoring wells in the future, these locations are planned to be installed within the City-owned boulevard directly south of Hermary Street and will be triangulated with respect to existing location XCG-13(MW).

   The City plans to have the additional groundwater monitoring locations installed in the Spring of 2024 and once installed will monitor them under the same program as XCG-13(MW) which includes semi-annual groundwater elevation and headspace monitoring as well as annual groundwater sampling in June/July for routine water chemistry, ammonia, dissolved metals and VOCs. The findings will be used to update the overall conceptual site model for the former Montfort landfill and be reported in a subsequent Groundwater and Soil Vapour Monitoring Report which will be submitted to EPA upon completion.

2. *Please provide further information on potential risk from VOCs in soil vapour at residence units between Hermary Street and the northern boundary of the historic landfill in the vicinity of XCG-13(MW).*

Sampling location XCG-13 was installed as part of the Vapour Intrusion Assessment completed by XCG Consulting Limited (XCG) in 2017. Initial monitoring of this location identified select VOCs (vinyl chloride and cis-1,2-dichloroethene (DCE)) as well as low level concentrations of methane that could have a potential impact on indoor air quality. To evaluate the potential risk on indoor air quality, The City worked with EPA and Alberta Health Services (AHS) to develop site specific, health based indoor air criteria for each parameter and then conducted indoor air sampling at select residence units directly adjacent to the former landfill site for vinyl chloride, cis-1,2-DCE and methane. None of the parameters that were analyzed during the indoor air sampling completed in 2017 were detected in the samples, indicating that the former landfill site was not impacting the indoor air quality at adjacent residence units. However, knowing that landfill gases can migrate through soil, The City has continued to take a risk management approach and monitor the groundwater and soil vapour concentrations at this site and specifically at XCG-13 in subsequent years.

Concentrations of these parameters in the soil vapour at XCG-13 remained below the screening criteria in 2019, 2020 and 2021. The sample collected in 2023 showed concentrations of select VOCs including vinyl chloride, cis-1,2-DCE and dichlorodifluoromethane slightly above the screening criteria, which could indicate a potential risk to receptors from the inhalation of soil vapours in the area of XCG-13. In order to evaluate the extent of these concentrations and better quantify the potential risk to residence units in the area, The City is currently in the process of requesting access from private property owners to install additional soil vapour monitoring probes in close proximity to building foundations on private properties directly north of the site in the vicinity of XCG-13. As with the additional groundwater monitoring locations mentioned in the response above, once these locations are installed, they will be monitored in conjunction with the existing site locations. The proposed monitoring program for 2024 includes semi-annual monitoring of groundwater elevations, headspace methane concentrations and pressures as well as annual vapour sampling in November/December for VOCs. The findings will be used to update the overall conceptual site model for the former Montfort landfill and be reported in a subsequent Groundwater and Soil Vapour Monitoring Report which will be submitted to EPA upon completion.

The City posts the monitoring reports for all of our historic landfill sites on our Landfill Risk Assessment Project webpage for public view. Depending on the findings from the additional soil vapour monitoring probes, specific to the evaluation of the potential risk from VOCs in soil vapour, The City may communicate results directly to private property owners as well.

3. *Provide copies of correspondence to homeowners regarding sampling to be carried out in private property, with respect to the above comment.*

The City is currently in the process of drafting correspondence to homeowners updating them on the project and requesting access to private property for the purpose of installing additional soil vapour monitoring probes.

While The City is happy to provide environmental monitoring data and other project information to EPA, The City also has an obligation to protect personal information under the Freedom of Information and Protection of Privacy (FOIP) Act. Prior to sharing potentially personal information with EPA, The City would need further information on how EPA plans to use that information so we can ensure we continue to meet our obligations under the FOIP Act. Specifically, The City wishes to understand EPA's policy on which correspondence is posted to ESAR and how EPA ensures personal information is redacted prior to posting.

4. *Please provide comment on PFOS and PFOA as a contaminant of concern in groundwater.*

   The presence of per- and polyfluoroalkyl substances (PFAS), specifically perfluorooctane sulfonate (PFOS) and/or perfluorooctanoic acid (PFOA) in landfills is expected as these compounds were widely used in the past including in 3M's Scotchgard™ treatment, in upholstery, carpet, and various textiles, in personal care products, construction materials, etc. Published information indicates that PFAS have been widely detected in both historical and active landfills, although older landfill sites appear to have lower concentrations of these substances in the leachate than more recent landfill sites.

   Tetra Tech recently tested undiluted (full strength) leachate at a closed municipal landfill that is roughly of the same age as the former Montfort landfill site but contains approximately five times as much waste as the Montfort landfill. Although the analytical results of this testing showed detectable concentrations of several PFAS compounds, the measured concentrations were low (in the nanogram/L range). The two compounds that currently have Tier 1 Guidelines (PFOS and PFOA) were measured at concentrations between 0% (non-detect) and 45% of their respective Guideline values.

   Based on the mentioned results from undiluted leachate as well as the consideration that all residences near the former Montfort landfill site are connected to potable water supplied by The City, and that the freshwater aquatic life (FAL) pathway is considered not applicable due to the distance to the nearest surface water receptor (the Red Deer River is located approximately 600 m south of the site and approximately 30 m below the elevation of the site), PFOS and PFOA are not considered to be a potential contaminant of concern in the groundwater at this time.

5. *Concentrations of Zinc, Manganese and Nitrate in groundwater at XCG-6 indicate the need for further monitoring of leachate downstream. Please provide concentrations of contaminants in groundwater further downstream to assess leachate behaviour or achieve delineation.*

   Related to the results from XCG-6 for the three parameters identified above:

   - The previously reported dissolved zinc concentrations that were above the Tier 1 Guideline (0.03 mg/L) were based on the FAL pathway being applicable. With the FAL pathway considered not applicable due to the distance to the nearest surface water receptor, the Tier 1 Guideline for the next limiting pathway (potable water) becomes 5.0 mg/L and the measured zinc concentrations since 2019 are considerably below this value (0.0901 mg/L to 0.187 mg/L).
   - Dissolved manganese concentrations at XCG-6 are elevated with respect to the Tier 1 Guideline of 0.020 mg/L. However, concentrations have remained relatively stable since 2017 (0.15 mg/L to 0.32 mg/L) and are consistent with concentrations measured at background/upgradient location XCG-14 in 2017 (0.26 mg/L).
   - While nitrate concentrations at XCG-6 have been elevated above the Tier 1 Guideline of 10 mg-N/L (with the FAL pathway excluded) since 2021 (27.6 mg-N/L to 72.4 mg-N/L), results from 2019 and 2020 were less than the Guideline. Elevated nitrate concentrations are not uncommon downgradient from historical landfills especially under oxic conditions, when ammonium present in landfill leachate oxidizes.

   Other useful leachate indicators in groundwater include mobile routine water chemistry compounds like chloride, inferred redox conditions based on redox sensitive parameters (like nitrate, ammonia, sulphate, dissolved manganese and dissolved iron), and boron, which is a relatively mobile metal. Based on the observed concentrations of ammonia, nitrate, dissolved manganese, dissolved iron and sulphate, the inferred

redox condition at XCG-6 is either oxic or sub-oxic. Redox conditions within leachate are typically deeply anoxic.

Chloride concentrations at XCG-6 have been consistently low with the highest chloride concentration observed since 2017 being 18.9 mg/L. Ammonia and boron concentrations in December 2022 (0.209 mg/L and 0.221 mg/L, respectively) were considerably below guidelines, and in addition, the only volatile organic compound (VOC) detected at this location to date was a trace concentration (1.2 µg/L) of cis-1,2-dichloroethene (cis-1,2-DCE) that was measured in 2017. There is currently no Tier 1 Guideline for cis-1,2-DCE.

Based on the above information, additional groundwater assessment activities downstream of this location are not considered warranted at this time.

Tetra Tech is currently in the process of finalizing the 2022/2023 monitoring report for the Montfort landfill site, and we anticipate being able to share the finalized report with EPA by the end of March. The additional monitoring conducted in 2022 and 2023, and the interpretation of the results may further assist in addressing some of the questions EPA has raised.

Within the October 6, 2023 letter, EPA also noted that the current Environmental Risk Management Plan (ERMP) completed for this site in 2014 is outdated and recommended the development of an updated risk management plan for the site once the additional investigations are completed. The original ERMP recommended reviewing and updating the ERMP every 5 years, based on aligning with timelines that standards and codes from regulatory agencies are generally updated. The 2021 Groundwater and Soil Vapour Monitoring Report also recommended additional assessment and risk management. The City is planning to address the recommendations from these reports, and is considering the strategy we will use to accomplish this. The current contract for the investigative work at The City's historic landfill sites has expired and once the final deliverables have been received for the 2022/2023 monitoring, the City will begin scoping the next phase of the project. Timelines will be refined based on the recommendations in the 2022/2023 monitoring reports and the procurement process to hire a consultant to conduct the next phase on the project. Once these timelines are firmed up, The City will be happy to provide EPA with a further update.

If there are any further questions, please don't hesitate to contact me.

Regards,

Janet Whitesell, P.Eng
Waste Management Superintendent
The City of Red Deer

Alberta Environment and Protected Areas

Contaminated Sites and Remediation Program
Deerfoot Square
2938 11 St NE
Calgary, AB T2E 7L7
Telephone 403-297-7602
www.alberta.ca

May 14, 2024

File No. 00448509

Janet Whitesell
Waste Management Superintendent
City of Red Deer
Box 5008
Red Deer, Alberta T4N 3T4
Delivered by email: janet.whitesell@reddeer.ca

Dear Janet Whitesell,

Subject: Re: City of Red Deer Response dated February 2, 2024
Former Montfort Landfill
Red Deer, Alberta

Alberta Environment and Protected Areas (EPA) has received the Letter dated February 2, 2024 prepared by The City of Red Deer (the City) for the property listed above.

Based on the information provided in the Letter:

1. EPA acknowledges that the City is taking reasonable steps to assess potential risk from VOCs in soil vapour at residence units in the vicinity of XCG-13.
2. Thank you for your comments regarding PFOS and PFOA. At this time, EPA does not consider these COPCs as excluded from your site, but we do acknowledge that risks from these contaminants can be controlled through adequate control of the applicable pathways.
3. EPA is also obligated to protect personal information under the Freedom of Information and Protection of Privacy (FOIP) Act. We do not seek copies of every correspondence with individual homeowner details. We are seeking confirmation from the City that those impacted have been informed about the situation, and have access to information about risks and proposed actions. A sample of the correspondence or a brief description would be adequate.
4. Considering the additional information provided, EPA concurs that there is currently no necessity for further groundwater assessment activities downstream of XCG-6. The situation may be reviewed based on data from future monitoring reports or the proposed risk management plan.

We look forward to receiving updates with regards to the development of the RMP as described in the Letter.

If you have any questions or require clarification with respect to this letter, please contact me at Neil.Monteiro@gov.ab.ca or 403-297-5418.

Yours truly,

Neil Monteiro, M.Sc., P.Geo.
Contaminant Hydrogeologist

Enclosure

cc: Tracy Seppala
Tracy.Seppala@reddeer.ca

APPENDIX C

SITE SETTING, HISTORICAL INFORMATION

1.0 SITE HISTORY

The following section summarizes the history of the Former Montfort Landfill (Montfort) site as developed for the 2019 groundwater and soil vapour monitoring report[1].

Municipal records indicate that the waste disposal at the site occurred between approximately 1968 and 1969 (approximately two years). This would indicate that the estimated age of the waste material would be approximately 55 years old. After the landfill was closed, it was transformed into a park space in the 1970s. Residential development in the area began between 1950 and 1962.

Historical municipal solid waste (MSW) disposal was identified during the Phase I environmental site assessment[2] (ESA) to be located within two subdivided land parcels at the site. The first is south of the residences on Hermary Street and the second is along the west side of 52 Avenue. The estimated waste area is identified on Figure 2. The MSW ranged in thickness from 3 m at the south side of the site to 4.3 m on the north side. The waste was bedded on a native clay or sand layer. During the investigation, bedrock was not encountered. The estimated footprint of the waste is 21,300 m^2 [2] [3].

Results of the 2014 Phase II ESA[4] indicated that the north limit of the waste is near the property boundaries of the residential homes along Hermary Street, the east limit is the sidewalk along 52 Avenue, and the west limit is the pedestrian pathway in the park. The south limit on the west side of site is the property line and the south limit on the east side is within the parking lot at Montfort Centre.

2.0 HISTORICAL MONITORING AND INVESTIGATION SUMMARY

Several historical investigations have been undertaken at the site, including by Tiamat Environmental Consultants Ltd. (Tiamat) in 2013 and 2014, and XCG Consulting Limited (XCG) in 2017 and 2018. Previous reports prepared by Tiamat for the site include the following:

- Phase I Environmental Site Assessment, Historic Waste Disposal Site, Montfort Site, The City of Red Deer. September 24, 2013[2].
- Phase II Environmental Site Assessment, Historic Waste Disposal Site, Montfort Landfill, The City of Red Deer. February 26, 2014[4].
- Environmental Risk Management Plan, Historic Waste Disposal Site, Montfort Landfill Site, The City of Red Deer. November 21, 2014[3].

The Phase II ESA consisted of advancing 13 testholes. The testholes ranged in depths from 3.0 m to 9.1 m. Seven monitoring wells (MW-01 to MW-07) and five vapour wells (VW-01 to VW-05) were installed in the testholes. Waste was observed in nine of the testholes during the drilling program. In August 2013, groundwater monitoring and sampling was completed at all monitoring wells. The results of the Phase II ESA[4] indicated the following:

[1] Tetra Tech Canada Inc. 2020. 2019 and 2020 Groundwater and Soil Vapour Monitoring Report – Former Montfort Landfill Site. Prepared for The City of Red Deer. December 2020. Project Number: 704-SWM.SWOP04071-01.004.
[2] Tiamat Environmental Consultants Ltd. 2013. Phase I Environmental Site Assessment, Historic Waste Disposal Site, Montfort Landfill, The City of Red Deer. September 24, 2013.
[3] Tiamat Environmental Consultants Ltd. 2014. Environmental Risk Management Plan, Historic Waste Disposal Sites, Montfort Landfill, The City of Red Deer. November 21, 2014.
[4] Tiamat Environmental Consultants Ltd. 2014. Phase II Environmental Site Assessment, Historic Waste Disposal Site, Montfort Landfill, The City of Red Deer. February 26, 2014.

- Groundwater sampling confirmed that there were impacts to the quality by leachate. Contamination from petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), and chlorinated hydrocarbons exceeded the 2010 Alberta Tier 1 Guidelines.
- Soil vapour samples taken from four vapour wells indicated that VOCs, non-petroleum organics, aliphatic and aromatic hydrocarbons, and siloxanes had mild to moderate concentrations. Tiamat indicated that these concentrations could lead to adverse exposure levels to nearby homes.

The recommendations of the program were as follows, as identified in the Phase II ESA[4]:

- Continue to monitor groundwater elevations and soil vapour data quarterly for one hydrogeological cycle.
- Collect an additional set of soil vapour and groundwater analytical data, groundwater elevations, and volatile headspace measurement during the winter months to determine seasonal changes in soil vapour concentrations.
- Collect indoor air samples from the basement of two to three homes adjacent to the site. Samples should be analyzed for carcinogenic VOCs and benzene. Based on the results of these samples, additional sampling may need to occur.
- Develop a risk management plan (RMP) addressing environmental concerns in conjunction with future land use. The RMP should focus on lands down-gradient of the historical waste disposal area.
- Review all new data and update the site RMP with all new information and findings.

The RMP was subsequently prepared[3] and provided the following recommendations:

- The RMP identified the primary concerns for the site as leachate and landfill gas (LFG), including PHCs and VOCs in the groundwater and vapours.
- Passive and active risk management strategies should be implemented for properties within 100 m of the landfill, and passive risk management strategies should be implemented for properties greater than 100 m from the site.
- Information presented in the preliminary quantitative risk assessment (PQRA) should be updated with new site-specific information. Once the PQRA is updated, the environmental RMP should be reviewed.
- Reviews and amendments to the environmental RMP should be completed at five years (or less) intervals. The review should confirm that the levels of acceptable risk to human exposure to LFG are still within the reasonable limit.

The City subsequently retained XCG to assess the environmental recommendations from Tiamat's previous reports and address the current site conditions, delineate impacts, and analyze the risk to indoor air receptors. During the investigation, XCG advanced eight monitoring wells and nine vapour probes in December 2016. Quarterly groundwater and vapour monitoring were completed, as well as soil vapour sampling and indoor air monitoring at select locations. Site specific vapour screening criteria were developed after the monitoring and sampling programs and data review and delineation.

The conclusions of the vapour intrusion assessment and environmental monitoring report[5] were as follows:

[5] XCG Consultants Ltd. 2018. Vapour Intrusion Assessment and Environmental Monitoring Report, Montfort Landfill, Red Deer, Alberta. April 23, 2018.

- The groundwater monitoring results indicated a perched water table above the clay layer and a shallow groundwater unit present in the deeper clay. It is noted that Tetra Tech refers to the XCG perched water table as “shallow” and the XCG shallow groundwater unit as “deeper”.
- The groundwater flow direction was north to south in the shallow groundwater within the clay layer, and the wells above the clay showed radial flow outwards from the previous landfill area.
- Methane was detected at concentrations up to 39% Gas (v/v) at seven of fourteen vapour probes in 2017. Methane was detected within the waste limit as well as outside of the waste area on the north side (Hermary Street) and south side (Montfort Heights) of the site.
- XCG-14 (MW) is located northwest of the site. It is expected to represent background conditions and is located hydraulically up-gradient of the former waste area. In 2017, concentrations of most parameters at this well were less than the 2016 Alberta Tier 1 Guidelines except for total dissolved solids (TDS) and manganese.
- Monitoring wells located within the MSW footprint were found to have impacts with parameters related to leachate.
- XCG-5 (MW) is located south of the landfill’s east side and did not exhibit leachate characteristics and had no concentrations of parameters greater than the 2016 Alberta Tier 1 Guidelines. XCG-6 (MW) located on the south side of the landfill’s west side had leachate indicator impacts (TDS, manganese, nitrate) greater than the 2016 Tier 1 Guidelines. XCG-13 (MW) located north of the MSW area also had leachate indicator parameter exceedances of TDS, chloride, and manganese. XCG-12 (MW), also along the north of the MSW area was also interpreted to be likely impacted based on elevated dissolved metals concentrations greater than the 2016 Tier 1 Guidelines. XCG-1 (MW) and XCG-2 (MW) had no indications of leachate impacts.
- Soil vapour results indicated methane, vinyl chloride, and cis-1,2-dichloroethylene concentrations greater than the screening criteria were present at four locations. Two were located within the limit of waste material (southeast and southwest) and two were outside of the waste (north and south).
- Indoor air quality testing completed at ten residences immediately adjacent to the site indicated no detectable concentrations of the above reported parameters indicating the impacted soil vapour was likely not migrating into the residences in close proximity to the site.
- Risk characterization was completed for commercial, industrial, and residential receptors based on groundwater and soil vapour exposures, which confirmed risks above acceptable levels for each of the receptors. However, based on the worst-case scenario (frozen conditions) directly measured indoor air results, the risk levels were considered acceptable. Risk characterization based on the worst-case vapour concentrations were identified as a potential risk to utility workers exposed to soil vapours during utility excavations.
- Methane was detected at XCG-13 (SVP), XCG-6 (SVP), and XCG-4 (SVP) at concentrations up to 1% Gas (v/v); therefore, additional monitoring was recommended for soil vapour probes XCG-1, XCG-2, XCG-4, XCG-5, XCG-6, XCG-9, XCG-10, XCG-12. and XCG-13 to be monitored semi-annually in September and March. If methane was detected above 2.5% Gas (v/v), it was recommended an indoor air sample be collected at the nearest residence. The semi-annual program was recommended to continue for three years.
- Select historically installed monitoring wells were recommended to be decommissioned since they are screened across the waste layer. The wells hydraulically connect the leachate impacted groundwater to the deeper groundwater unit on site.

A meeting was held between Alberta Environment and Parks (AEP), Alberta Health Services (AHS), and The City in June 2019 to discuss the results and recommendations from the XCG report. An updated recommendation was agreed upon and included groundwater monitoring and handheld vapour monitoring at all soil vapour probes along

with soil vapour and groundwater sampling at targeted locations (XCG-4, XCG-6, XCG-13, and VW-05/MW-05) during the September monitoring event.

Recently, in August 2019, The City conducted a drilling assessment consisting of 10 shallow boreholes to assess the thickness and nature of soils covering the waste, in response to inquiries from AEP. The investigation confirmed that the waste across the site is on average at a depth greater than 0.6 m below grade (mbg) and that the waste footprint has been covered with sandy silt fill material overlain by topsoil and grass.

In January 2020, a follow-up meeting was held between AEP, AHS, Tetra Tech Canada Inc. (Tetra Tech), and The City to discuss the results from the September 2019 monitoring and decide upon next steps. It was recommended during the meeting that additional groundwater and soil vapour monitoring wells be installed in the vicinity of XCG-13 to better evaluate the potential risk from low level concentrations of VOC parameters at this location. However, after reaching out to owners of the properties directly north of the site in February 2020 and March 2020, The City was not granted permission to access private properties to install the additional monitoring locations. Therefore, a round of monitoring at the existing selected locations was completed on April 1, 2020, to satisfy the recommendation for monitoring and sampling under frozen ground conditions.

3.0 SITE SETTING

The following section presents an overview of the regional and local setting for the site.

3.1 Geology

The following sections summarize the regional and local geology.

3.1.1 Geological Setting and Stratigraphy

The site is located above the Red Deer River Valley. The Red Deer River is located approximately 700 m south of the site. The topography on site has a slight slope to the south and eventually a large decrease in elevation to the river valley. The Red Deer River is approximately 30 m below the elevation of the site.

Key elements of the geological setting are presented below from Tiamat's 2013 Phase I ESA[2]:

"The structural integrity of the site (Paskapoo Formation) is closely related to the Rocky Mountains, which generated regional stresses and subsequent fracturing of the Paskapoo Formation. The fracture patterns are predominantly oriented perpendicular to the trend of the Rocky Mountains and are expressed as southwest to northeast trending vertical fractures. The fracture patterns may also be accompanied by sub-horizontal fractures. Overlying the bedrock in the Red Deer River Valley is pre-glacial gravel and sand. The gravel sediments range in thickness from 6 to 12 m and are a groundwater source."

3.1.2 Local Geology

The municipal solid waste is approximately 3 m thick at the south portion of the site and 4.3 m thick on the north side. Waste material is bedded on native clay or sand. The area of historical waste is estimated to be 21,300 m^2.

Key elements of the geological setting are presented below from XCG's 2018 Vapour Intrusion and Environmental Monitoring Report[5]:

"The geology underlying the site is characterized by Tertiary bedrock units overlain by Quaternary surficial deposits of clay, silt, sand and gravel. The bedrock is from the Mid-Late Paleocene-aged Paskapoo Formation and is at approximately 20 meters below ground in areas around the site. The Paskapoo Formation is comprised of layers of mudstone, siltstone and sandstone."

During the 2016 drilling on site, XCG encountered regular topsoil, overlying clay, clayey silt, and or sand. Some fill material was also encountered consisting of dry topsoil with clay components. Topsoil was primarily dark brown with silt and sand, with some oxidation present. The clay layers had high plasticity, were dark brown to black in color and had reduced (blue pockets). The silty sand layer had pockets of red and blue striations amongst the overall medium to dark brown coloring. Sand intervals had fine silt contents[5].

3.2 Hydrogeology

The following sections summarize the regional and local hydrogeology.

3.2.1 Regional Hydrogeology

The regional hydrogeology is most influenced by the presence of the river sediments situated within the valley along the Red Deer River and a bedrock valley trending north-northeast in the vicinity of the site.

Key elements of the hydrogeological setting are presented below from Tiamat's 2013 Phase I ESA report[2]:

"A significant buried valley and aquifer resource trending northeastward through the city has been partially mapped and lies in the SE 28-38-27 W4M (east of Montfort). This buried valley extends to a depth of 21 m, more or less and may extend to the south into north portions of 21-28-27 W4M." Mapping by the Alberta Geological Survey[6] shows the valley approximately 1,500 m southeast of the site, trending in a north-northeast direction; however, the width of the valley is not defined.

"The dominant type of near-surface groundwater in the Paskapoo Formation in the area of assessment is sodium bicarbonate. Notable concentrations of sodium sulphate type groundwater have also been reported. The quality of groundwater for potable use is generally suitable to depths of 300 m on the west side of Red Deer and decreases to 90 m, more or less in the east.

Areas of recharge (downward flow) in unsaturated heterogeneous sediments include most areas above the river and creek valleys, whereas; the river valleys will generally exhibit discharge. The distribution of groundwater in the area can also be influenced by the local geology, topographic relief, areas of artesian flow, springs and reasonable yielding water source wells.

Numerous permanent surface water features within The City of Red Deer and vicinity include Red Deer River, Waskasoo Creek, Gaetz Lakes, Hazlett Lake, Bower Ponds (result of formerly mining gravel resources), various sloughs in the fringe areas of the city and an assortment of other smaller creeks and springs."

The regional groundwater flow is expected to follow the bedrock topography and will be influenced by the varying distribution of sediments in the river valley, which will have been deposited in various historical channels since filled in under varying depositional environments.

[6] Andriashek, L. comp. 2018. Thalwegs of Bedrock Valleys, Alberta (GIS data, line features); Alberta Energy Regulator, AER/AGS Digital Data 2018-0001.

3.2.2 Local Hydrogeology

The Red Deer River is located 700 m south of the site. Shallow groundwater is assumed to flow towards the river in a southeasterly direction. Seasonal variations influence the groundwater flow levels. At the site there are two aquifers that were encountered during the Phase II ESA drilling. According to Tiamat, an upper aquifer of the Paskapoo Formation and glacial drift deposits exists as well as a lower aquifer belonging to the lower Paskapoo Formation sandstone. The lower layer is confined by thick layers of shale and clays and silts[2].

XCG identified in 2017 that the site contained two groundwater tables; a shallow groundwater table (which includes monitoring wells XCG-1, XCG-2, XCG-12, and XCG-14) and a perched groundwater table near the waste area (which includes XCG-4, XCG-5, XCG-6, XCG-13, MW-02, MW-03, and MW-04). Monitoring wells MW-01, MW-05, MW-06, and MW-07 were not identified as belonging to either unit. The shallow groundwater wells are located in the northwest portion of the site and are installed in clay and clayey silt material. The perched water table wells are located on the east, northeast, and south portions of the site, and are installed in sand, clayey silt, and clay material, depending on the location. Some MSW was identified on the borehole log for MW-03.

3.3 Groundwater Resource Usage

A search of the Alberta Water Well Database in 2019 for groundwater users within a 1 km radius of the site, identified eight groundwater wells; seven of the wells are listed as for domestic use and one is listed for investigation use[7].

The nearest water well is located 275 m northwest (up-gradient) of the site and is drilled to 58 mbg. The well was drilled in 1969. The proposed well use is listed as domestic; however, the current status and use of this well is not known. The water wells within a 1 km radius of site range from 24 mbg to 58 mbg. The status and use of the surrounding groundwater wells were not confirmed and they were not field verified.

4.0 HAZARD QUOTIENTS

4.1 2021 Hazard Quotient Calculations

Using the soil vapour screening levels described in the report and the soil vapour sampling results, estimated cancer risks (for carcinogens) and estimated hazard quotients (for non-carcinogens) were calculated for the site.

Estimated risks were calculated by dividing the soil vapour concentration by the corresponding soil vapour screening level for carcinogenic effects and multiplying the ratio by the target risk level of 1 x 10^{-5}. Similarly, the estimated hazard quotients represent the soil vapour concentration divided by the corresponding soil vapour screening level for non-carcinogenic effects.

Risk estimates for non-carcinogenic chemicals of potential concern (COPCs) are defined as hazard quotients. Hazard quotients are calculated based on a ratio of the estimated exposure and the toxicity reference values (TRVs) identified as the tolerable daily intake (TDI) or Tolerable Concentration (TC) according to the following equation:

$$\text{Hazard Quotient} = \frac{\text{Estimated Daily Dose (mg/kg-day or mg/m}^3\text{)}}{\text{Tolerable Daily Intake (mg/kg-day) or Tolerable Concentration (mg/m}^3\text{)}}$$

Non-carcinogenic risk characterization in the assessment was completed for all COPCs.

[7] Alberta Environment and Parks. 2019. Water Well Database. http://www.telusgeomatics.com/tgpub/ag_water/.

When the hazard quotient is greater than the target risk value, the scenario poses a potential concern and requires further evaluation or risk management. It is important to note that hazard quotients greater than the target risk value do not necessarily indicate that adverse health effects will occur. This is because of the conservative assumptions used in estimating concentrations and in setting the target values. Hazard quotients that are less than the target risk value indicate that exposure is within acceptable levels and no further risk management is necessary in relation to those results. Hazard quotients greater than the target risk value suggest that further investigation or risk management (e.g., remediation) may be warranted in relation to those results.

For non-carcinogens, the individual target risk value used is 0.2 and the cumulative target risk value used is 1.0. This cumulative target risk value accounts for additional exposure to the chemicals of concern from sources other than the site. Therefore, the cumulative target risk value of 1.0 represents an allocation of 20% (the 0.2 target risk value from the individual compound) of a person's daily exposure from site sources and the remaining 80% would come from other sources. Other sources of exposure include ambient air, household products, and soil and water contact from locations other than the site.

For carcinogens, the risk of cancer is assumed to be proportional to dose with the assumption that any exposure results in a nonzero probability of risk. Carcinogenic risk probabilities were calculated by multiplying the estimated exposure level by the route-specific cancer slope factor (SF) or unit risk factor (URF) for each carcinogen:

$$R = E \times SF \text{ (or URF)}$$

Where:

R = Estimated individual excess lifetime cancer risk

E = Exposure level for each chemical of potential concern (mg/kg/day or mg/m^3)

SF = Route- and chemical-specific SF $((mg/kg/day)^{-1}$ or URF $((mg/m^3)^{-1})$

Risk probabilities determined for each carcinogen were also considered to be additive over all exposure pathways so that an overall risk of cancer was estimated for each group of potentially exposed receptors.

When assessing risks posed by exposure to carcinogenic substances, Health Canada and other regulatory agencies assume that any level of exposure is associated with some hypothetical cancer risk. As a result, it is necessary for regulatory agencies to specify an acceptable risk level. Per Health Canada guidance[8][9], cancer risks are deemed essentially negligible where the estimated cumulative incremental lifetime cancer risk is less than or equal to 1 in 100,000 (1×10^{-5}).

4.2 Review of the 2014 Hazard Quotients from the Risk Management Plan

The 2014 RMP presented a proposed site-specific environmental RMP as a tool to assist with the review of future subdivision applications on lands lying within the regulated setback distance from the site (300 m). The focus was on potential ingress of soil gas for COPCs with a hazard quotient greater than 1.0. Residential land use was considered most sensitive, and exposure ratings for other land uses (e.g. school, public institutions, commercial complexes) were considered to not be greater than residential; however, unique exceptions would have to be

[8] Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada: Guidance on Human Health Preliminary Quantitative Risk Assessment, Version 3.0.

[9] Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRAchem).

reviewed and addressed on a site-specific basis[4]. Further, underground utility workers and subsurface utility infrastructure were considered relevant to potential exposure.

The RMP applied a 10x factor of safety to the hazard quotients to address uncertainties. Hazard quotients from the RMP ranged up to 27,742 (including the 10x factor of safety). Based on these, the RMP then provided recommended generic mitigative measures based on the calculated hazard quotients, ranging from passive to active measures, recognizing that the ultimate approach would require a design professional for the proposed development.

Following the 2014 RMP, the Canadian Council of Ministers of the Environment (CCME) released the document "A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures Via Inhalation of Vapours"[10], designed to provide guidance for developing site-appropriate soil vapour quality guidelines. The guidelines developed using the methods outlined in the CCME document were used for this current study and are included with the vapour sampling results in Table 5. Hazard quotients were calculated using estimated dose (based on concentrations measured at the site) and divided by tolerable daily intake. Soil vapour concentrations from the Phase II ESA conducted in 2013 were not compared to soil vapour quality guidelines; however, spot checks of five target compounds with the highest hazard quotients in the 2013 work (cis-1,2-dichloroethene, 1,2,4-trimethylbenzene, vinyl chloride, tetrachloroethene, and 1,3,5-trimethylbenzene) identified that vinyl chloride would have unacceptable hazard quotients using the updated CCME methodology in samples VW-03 and VW-05. Soil vapour concentrations from the 2017 vapour assessment and monitoring report from XCG identified that concentrations of vinyl chloride in samples VW-05 and XCG-6 were greater than the soil vapour screening criteria and above target risk and hazard levels calculated using the updated CCME methodology.

The 2014 RMP was prepared concurrent to RMPs at several other former City landfills, and a common set of mitigative measures was applied based on the hazard quotients. Subsequent to the 2014 RMP and to the release of the CCME Protocol document, XCG revised the 2014 RMP criteria ranges for each generic mitigative measure category to include a Cancer Risk range to allow comparison of the 2014 RMP ranges with the individual hazard quotients and Cancer Risks calculated by XCG[5]. From that work, XCG identified the following generic mitigative measures for developments within a 300 m setback of these landfills (based on Tiamat 2014), and these have been adopted for this site:

Passive Measures

1. Passive Measures – Level A: for Cancer Risk of > $1E^{-5}$ and < $5E^{-5}$ and/or HQ >0.2 and <1.

   Compacted clay liner with a minimum thickness of 1m and confirmed maximum hydraulic conductivity of 10^{-6} cm/sec.

2. Passive Measures – Level B: for Cancer Risk of > $5E^{-5}$ and < $5E^{-4}$ and/or HQ >1 and <5.

   Synthetic liner with type of material, thickness and installation details dependent on the design professional.

3. Passive Measures – Level C: for Cancer Risk of > $5E^{-4}$ and < $1E^{-3}$ and/or HQ >5 and <50.

   Passive sub-slab depressurization (SSD) system with a minimum depressurization of 4 Pa to 10 Pa. In some instances (such as a pervious subgrade), the actual depressurization necessary may require an active SSD or alternative active ventilation system.

Active Measures

[10] Canadian Council of Ministers of the Environment. 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Exposure Protection of Human Exposures via Inhalation of Vapours. Available online: http://ceqg-rcqe.ccme.ca/en/index.html#void.

Field verify the presence of the identified chemicals of concern and other potential chemicals in the soil gas state at the development site. If confirmed, determine the most appropriate manner to prevent soil vapour intrusion.

1. Active Measures – Level D: for Cancer Risk of > $1E^{-3}$ and < $2E^{-3}$ and/or HQ values >50 and <100.

   Active SSD must be configured to compensate for depressurization of the building and have adequate negative pressure gradients across the entire footprint of the foundation.

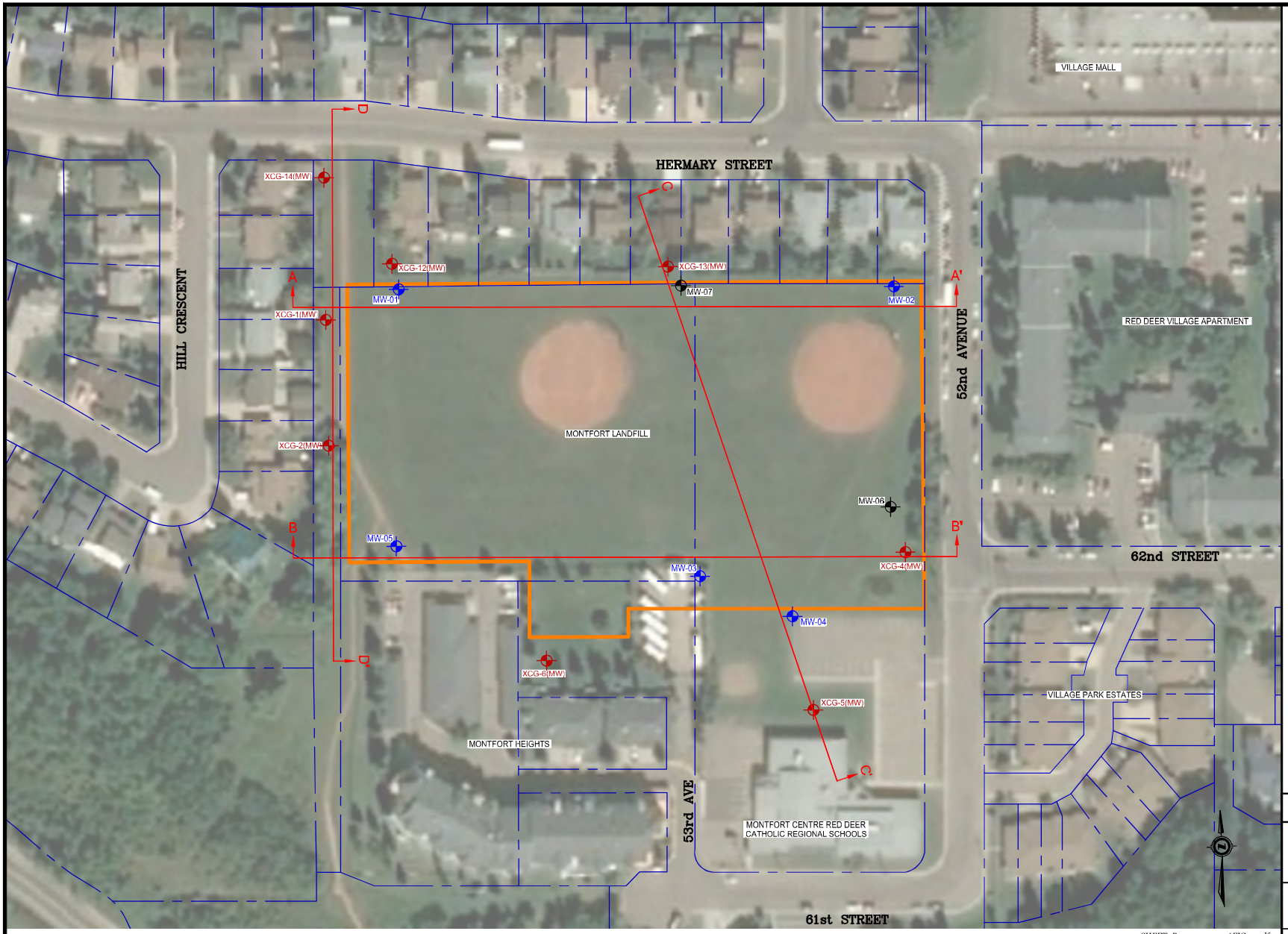
2. Active Measures - Level E: for Cancer Risk of >$2E^{-3}$ and/or HQ values >100.

   Installation of geomembrane and active soil vapour extraction with system fault notification alarm.

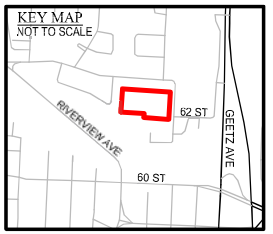
The sampling in 2013 and 2017 had identified several concentrations greater than the target risks, relating to implementation of either Passive Measures Level A or B. The soil vapour concentrations measured in 2019 and 2020 were overall lower than those data. Based on the 2022 soil vapour data, the greatest individual hazard quotient calculated for the site was 0.30 (vs target individual hazard level of 0.2) and the greatest cumulative hazard quotient was 0.90 (vs target cumulative hazard level of 1.0). The greatest estimated cancer risk (individual or cumulative) was 3.8×10^{-5} (vs target Risk of 1.0×10^{-5}). The current soil data suggest Passive Measures – Level B are adequate to mitigate potential risk.

APPENDIX D

CROSS-SECTIONS (XCG 2018)



KEY MAP
NOT TO SCALE



LEGEND:

- APPROXIMATE PROPERTY BOUNDARIES
- SANITARY LINE
- STORM LINE
- GAS LINE
- UNDERGROUND ELECTRICAL TRENCH
- APPROXIMATE LIMIT OF WASTE
- GROUNDWATER MONITORING WELL LOCATION (TIAMAT, 2014)
- GROUNDWATER MONITORING WELL LOCATION (OTHERS)
- SOIL VAPOUR MONITORING WELL
- MONITORING WELL LOCATION (XCG, JAN. 2017)
- SOIL VAPOUR MONITORING LOCATION (XCG, JAN. 2017)
- BOREHOLE LOCATION (XCG, JAN. 2017)
- SECTION LOCATION

0 25 50m

CROSS SECTION LOCATIONS

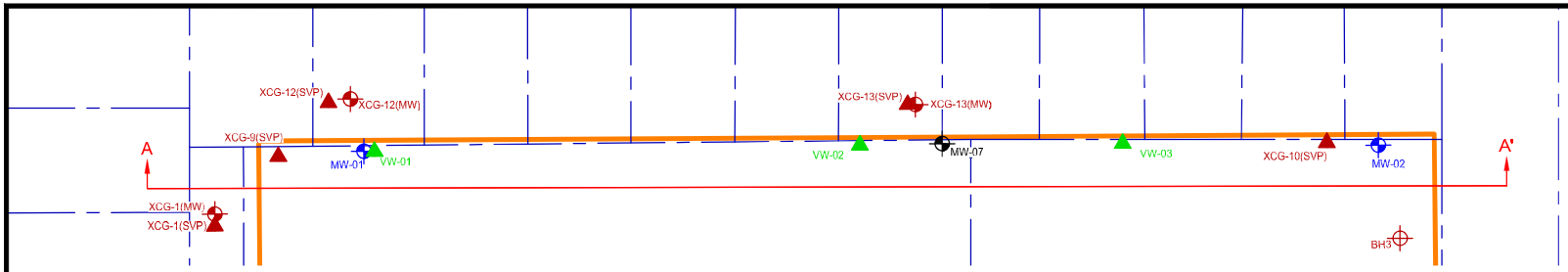
VAPOUR INTRUSION ASSESSMENT
ENVIRONMENTAL MONITORING REPORT
FORMER MONTFORT LANDFILL SITE
CITY OF RED DEER, ALBERTA

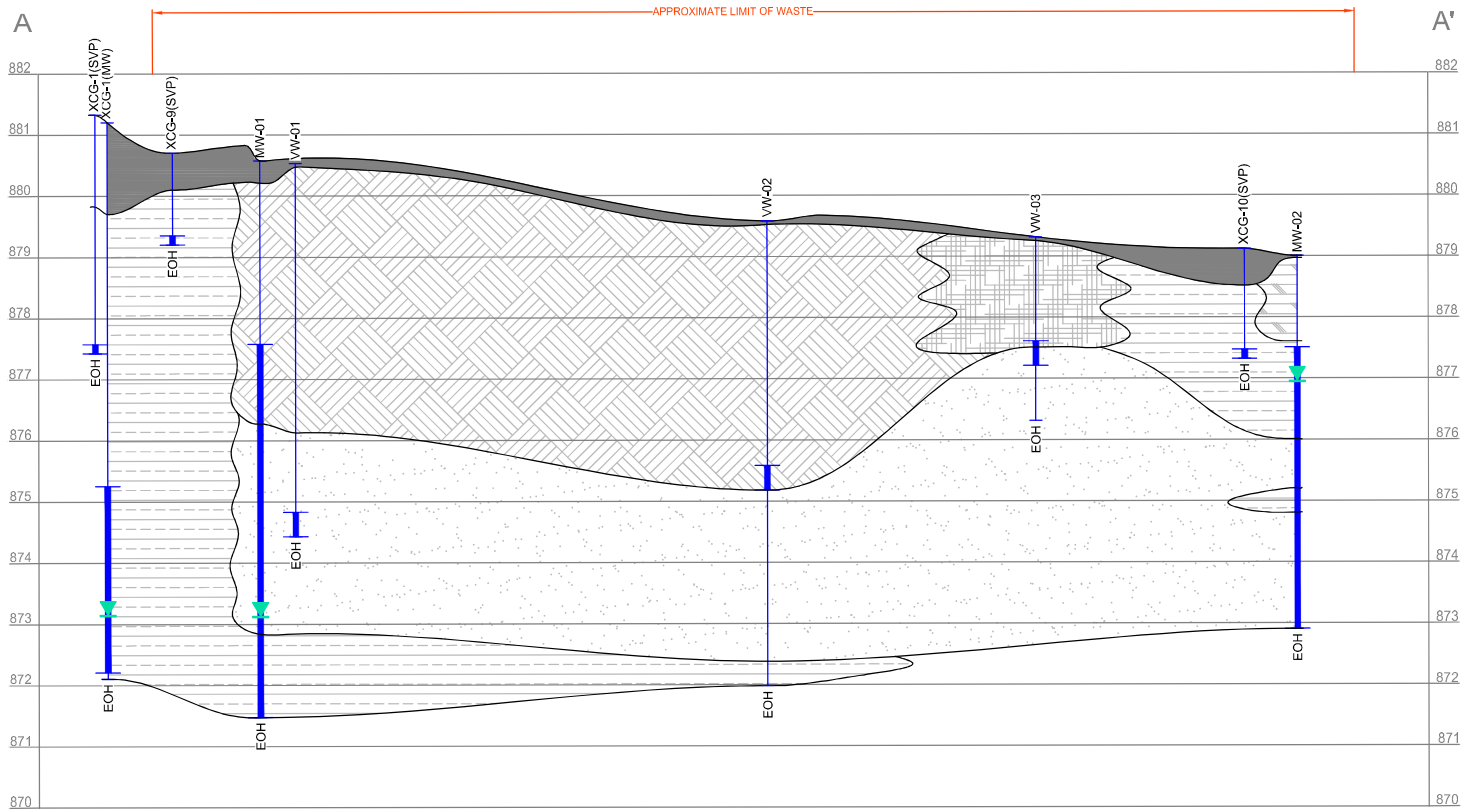
XCG Environmental Engineers & Scientists

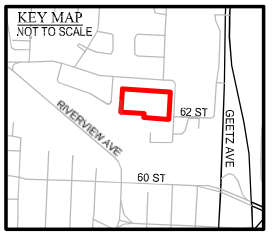
DATE	JOB NO.	FIGURE NO.
JAN. 2018	4-2352-04-03	2

DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

SHEET: R423520403006FIG02.pdf
FILE: R423520403006.dwg







LEGEND:

- MONITORING WELL / BOREHOLE
- MONITORING WELL SCREEN INTERVAL
- WATER LEVEL (MEASURED JUNE 2017)
- TOPSOIL
- MUNICIPAL SOLID WASTE
- SILT FILL
- SAND / LOAM FILL
- NATIVE SAND
- CLAY

0 2 4m
VERTICAL SCALE

0 20 40m
HORIZONTAL SCALE

SECTION A – A'
RESULTS

VAPOUR INTRUSION ASSESSMENT AND
ENVIRONMENTAL MONITORING REPORT
FORMER MONTFORT LANDFILL SITE
CITY OF RED DEER, ALBERTA

XCG
Environmental Engineers & Scientists

DATE	JOB NO.	FIGURE NO.
FEB. 2018	4–2352–04–03	3

DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

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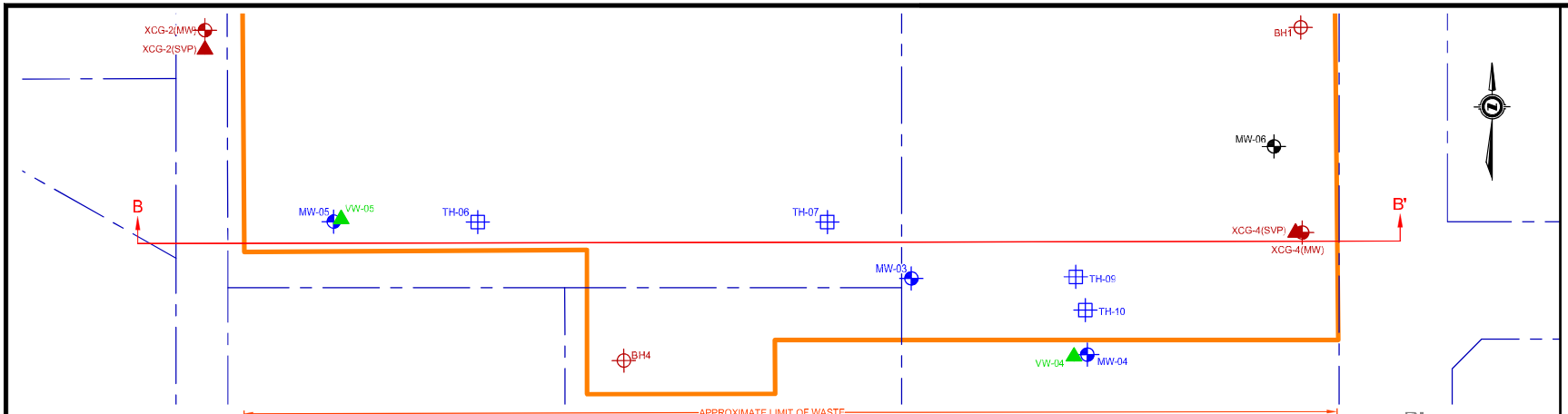
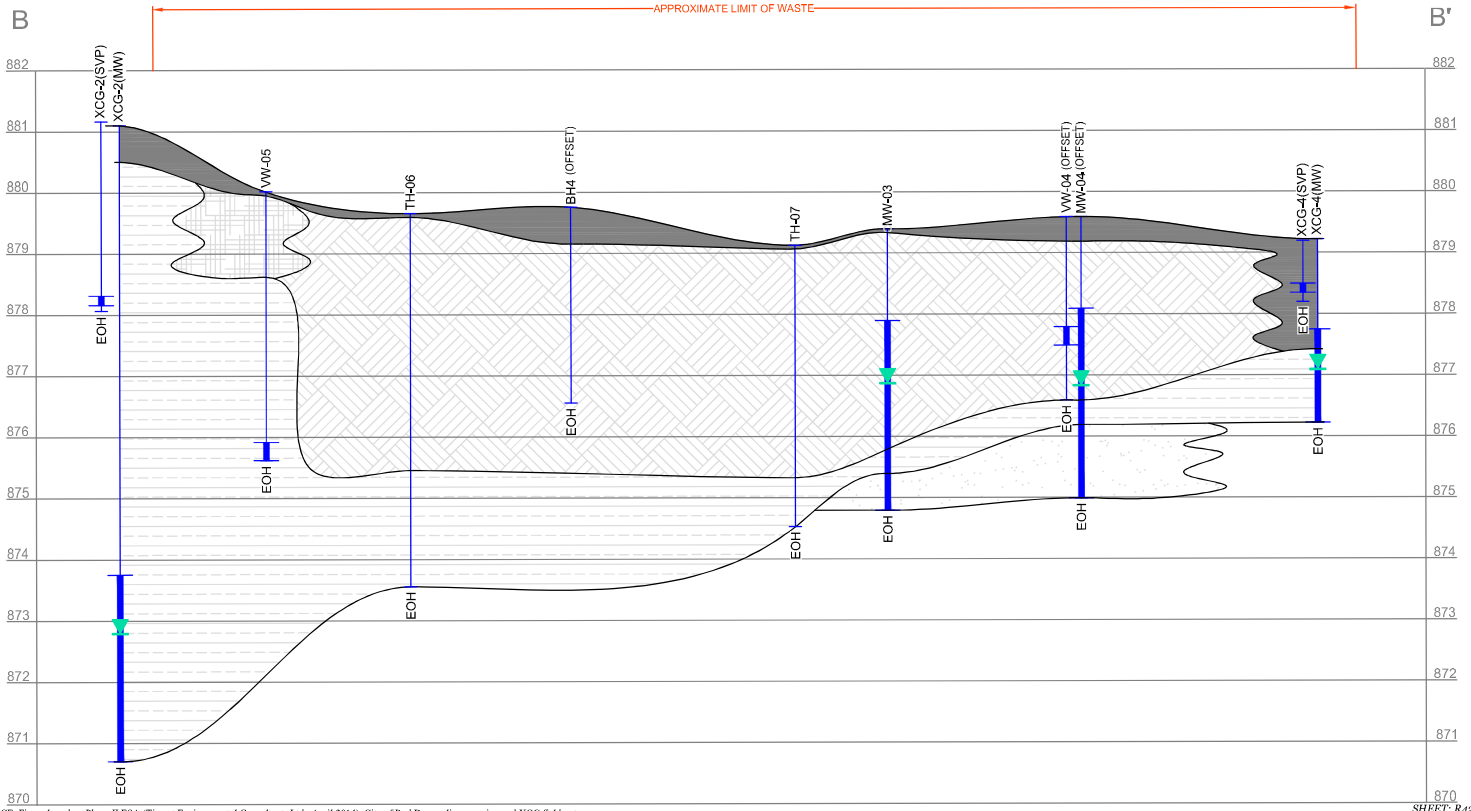
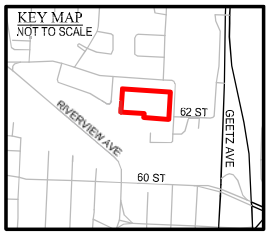






LEGEND:

- MONITORING WELL / BOREHOLE
- MONITORING WELL SCREEN INTERVAL
- WATER LEVEL (MEASURED JUNE 2017)
- TOPSOIL
- MUNICIPAL SOLID WASTE
- SAND / LOAM FILL
- NATIVE SAND
- CLAY

0 2 4m
VERTICAL SCALE

0 20 40m
HORIZONTAL SCALE

SECTION B – B'
RESULTS

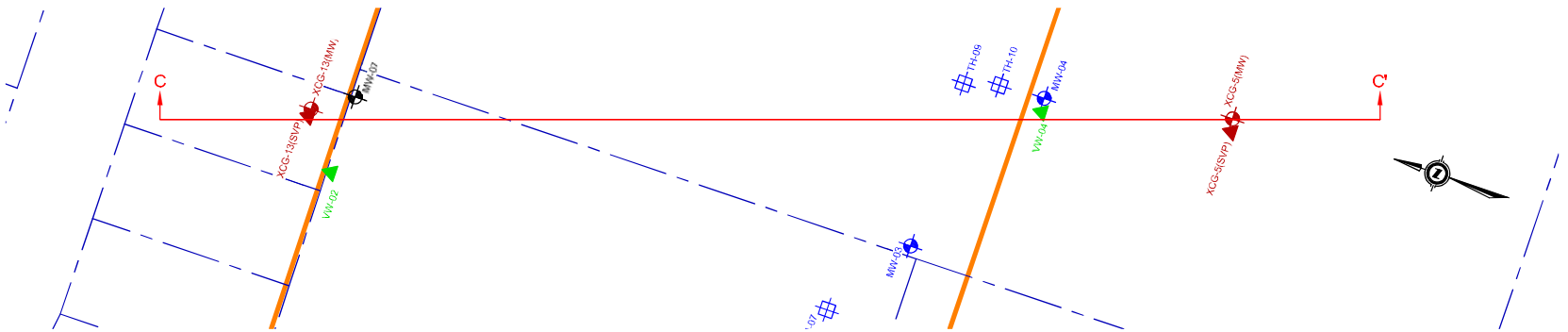
VAPOUR INTRUSION ASSESSMENT AND ENVIRONMENTAL MONITORING REPORT
FORMER MONTFORT LANDFILL SITE
CITY OF RED DEER, ALBERTA

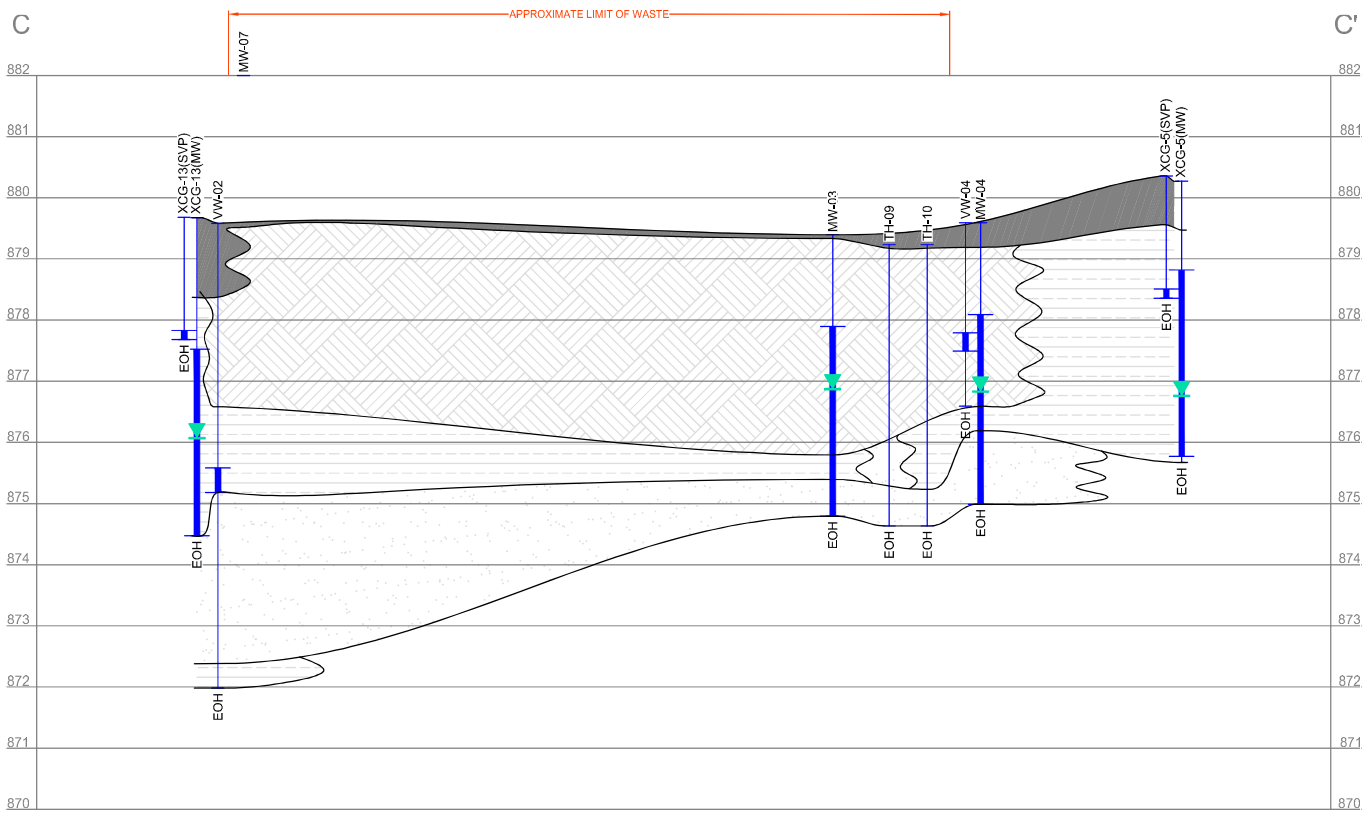
XCG Environmental Engineers & Scientists

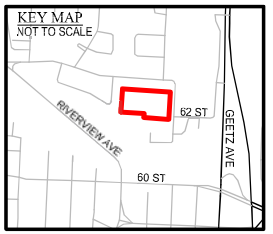
DATE	JOB NO.	FIGURE NO.
FEB. 2018	4–2352–04–03	4

DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

SHEET: R423520403003FIG04.pdf
FILE: R423520403006.dwg







LEGEND:

- MONITORING WELL / BOREHOLE
- MONITORING WELL SCREEN INTERVAL
- WATER LEVEL (MEASURED JUNE 2017)
- TOPSOIL
- MUNICIPAL SOLID WASTE
- SILT FILL
- NATIVE SAND
- CLAY

0 2 4m
VERTICAL SCALE

0 20 40m
HORIZONTAL SCALE

SECTION C – C'
RESULTS

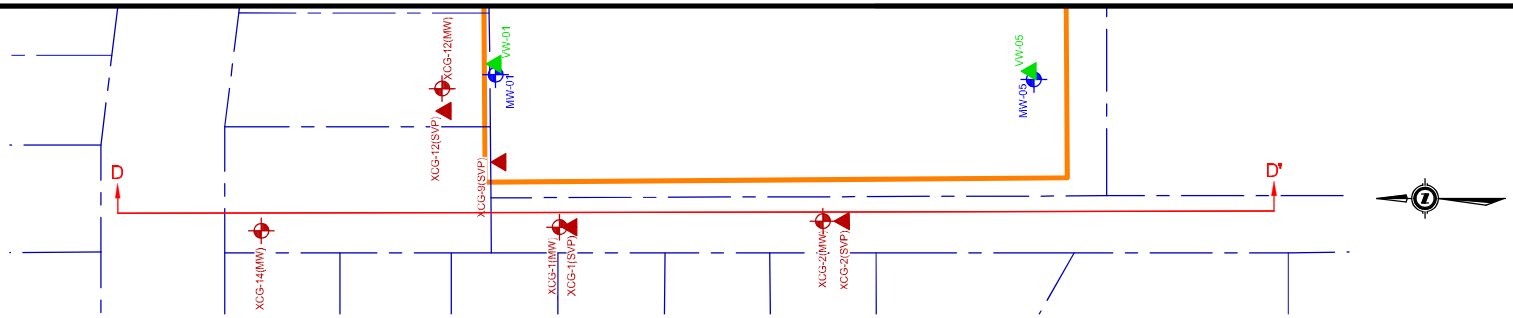
VAPOUR INTRUSION ASSESSMENT AND
ENVIRONMENTAL MONITORING REPORT
FORMER MONTFORT LANDFILL SITE
CITY OF RED DEER, ALBERTA

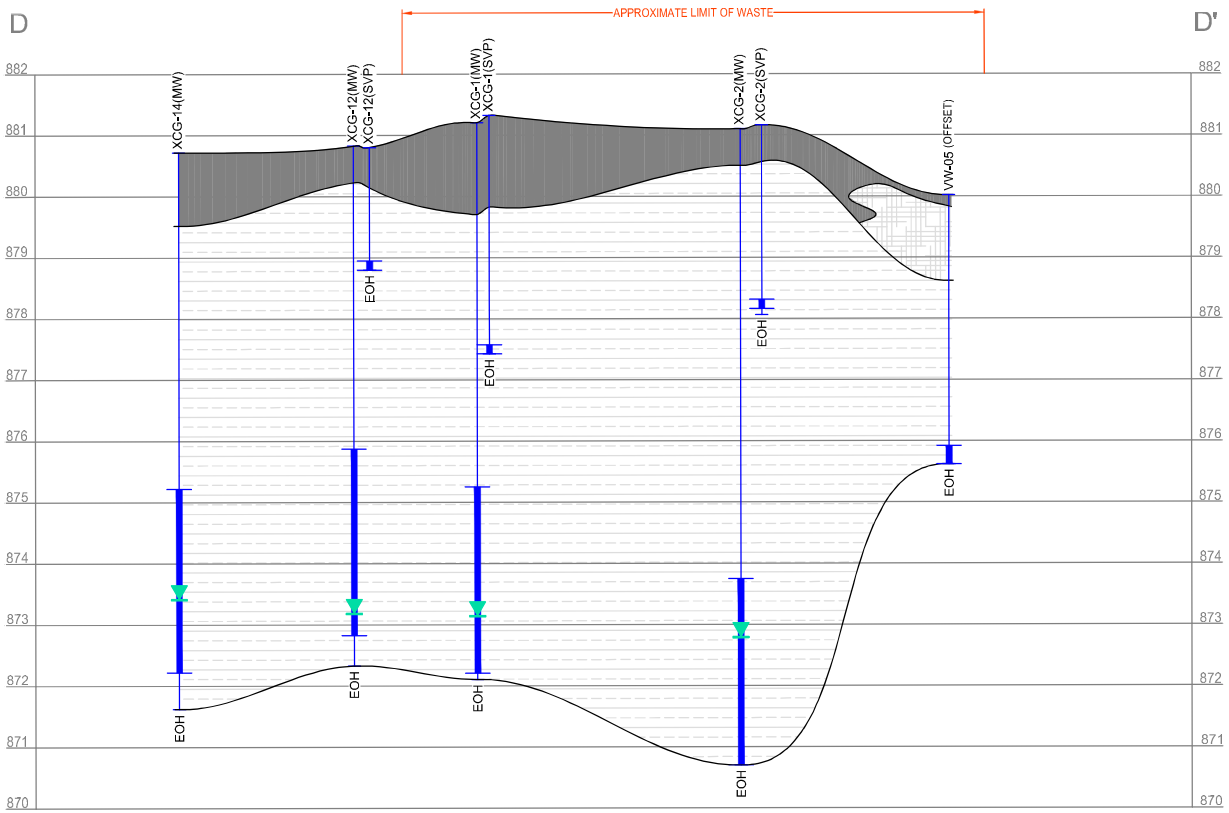
XCG Environmental Engineers & Scientists

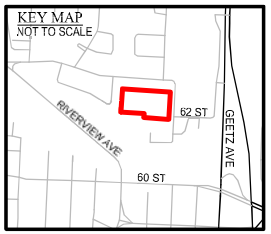
DATE	JOB NO.	FIGURE NO.
FEB. 2018	4–2352–04–03	5

DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

SHEET: R423520403003FIG05.pdf
FILE: R423520403006.dwg







LEGEND:

- MONITORING WELL / BOREHOLE
- MONITORING WELL SCREEN INTERVAL
- WATER LEVEL (MEASURED JUNE 2017)
- TOPSOIL
- SAND / LOAM FILL
- CLAY

0 2 4m
VERTICAL SCALE

0 20 40m
HORIZONTAL SCALE

SECTION D – D'

VAPOUR INTRUSION ASSESSMENT AND ENVIRONMENTAL MONITORING REPORT
FORMER MONTFORT LANDFILL SITE
CITY OF RED DEER, ALBERTA

XCG Environmental Engineers & Scientists

DATE	JOB NO.	FIGURE NO.
FEB. 2018	4–2352–04–03	6

DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes.
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

SHEET: R423520403003FIG06.pdf
FILE: R423520403006.dwg

APPENDIX E

BOREHOLE LOGS

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** MW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 880.576 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/24/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Groundwater Monitoring Well is near the northwest corner of the site, next to the rear fence of 39 Hermary Street.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick).					
	Silt (fill) mixed with MSW - organics, paper, plastic, wire, glass, moderate pungent odour, soft to firm, clayey, trace sand, damp to moist, light olive brown.					
1.0						
2.0						
3.0	becomes moist at 3.2 m.					
4.0						
	Sand (native) - compact, silty, some clay, wet, olive grey.					
	No obvious waste material.					
5.0						
6.0	coal fragments at 6.2 m.					
7.0	becomes clayey at 7.4 m.					
8.0						
9.0	End of hole at 9.1 m.					
	3.0 m PVC installed with threaded cap.					
	6.1 m threaded 010 machine slotted screen.					
	Completed with flush mount casing set in concrete.					
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 9.1
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** MW-02
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.027 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/25/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Groundwater Monitoring Well is near the northeast corner of site behind 1 Hermary Street.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick).					
	Silt (fill) - compact, trace silt, damp, light olive.					
	No obvious waste material.					
1.0	becomes wet at 1.5 m.					
	Clay (native) - firm, silty, trace sand, moist, light olive brown.					
2.0						
3.0	Sand (native) - compact, silty, wet, light olive brown.					
	Clay - firm, silty, wet, light olive brown.					
4.0						
5.0						
6.0	End of hole at 6.1 m.					
	1.5 m PVC installed with threaded cap.					
	4.6 m threaded 010 machine slotted screen.					
	Completed with flush mount casing set in concrete.					
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 6.1
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** MW-03
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.400 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/25/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Groundwater Monitoring Well is near the northeast corner of the Montfort Heights Property.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick).						
	Sand (fill) mixed with MSW - glass, wood debris, plastic, metal, compact, some pebbles, trace rootlets, damp, olive brown to olive black.						
1.0							
2.0	becomes wet at 2.9 m.						
3.0							
	Clay (native) - firm, silty, wet, light olive. No obvious waste material.						
4.0	Sand (native) - compact, silty, wet, light olive.						
	End of hole at 4.6 m. 1.6 m PVC installed with threaded cap. 3.0 m threaded 010 machine slotted screen. Completed with flush mount casing set in concrete.						
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							

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Slough :	Completion Depth (m): 4.6
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** MW-04
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.622 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/25/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Groundwater Monitoring Well is near the northwest corner of the parking lot of Montfort Centre Red Deer Catholic Regional Schools.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Sod and loam (fill) - soft to firm, silty, sandy, trace rootlets, moist, dark olive. (~ 40 cm thick).						
	Sand (fill) - loose to compact, silty, masonry brick, moist, light olive brown.						
1.0							
2.0							
3.0	Clay (native) - firm, silty, trace sand, moist, light olive. No obvious waste material.						
	Sand (native) - loose, silty, trace clay, wet, light olive.						
4.0							
	End of hole at 4.6 m. 1.6 m PVC installed with threaded cap. 3.0 m threaded 010 machine slotted screen. Completed with flush mount casing set in concrete.						
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							

Tiamat Environmental Consultants Ltd.

Slough :	Completion Depth (m): 4.6
Depth to Groundwater :	Checked By: LTM

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 880.531 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/24/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Soil Vapour Well is about 1.2 m east of MW-01, near fence at 39 Hermary Street.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick). Silt (fill) mixed with MSW - organics, paper, plastic, wire, glass, moderate pungent odour, soft to firm, clayey, trace sand, damp to moist, light olive brown.					
1.0						
2.0						
3.0						
4.0	Sand (native) - compact, silty, some clay, wet, olive grey. No obvious waste material.					
5.0	trace coal at 5.9 m.					
6.0	End of hole at 6.1 m. 5.8 m PVC installed with threaded cap. 0.3 m threaded 020 machine slotted screen. Completed with flush mount casing set in concrete.					
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

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Slough :	Completion Depth (m): 6.1
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-02
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.582 m.
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/24/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Soil Vapour Well is about 5 m west of MW-07, near the fence at 21 Hermary Street.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick).					
	Sand (fill) mixed with MSW - wood fragments, paper, plastic bags, plastic, sharp pungent odour, compact, silty, some organic loam, trace clay, trace rootlets, damp, olive grey. becomes moist at 0.4 m.					
1.0						
2.0						
3.0	Clay (fill) mixed with MSW - firm, silty, moist, olive.					
4.0						
	Sand (native) - loose, silty, wet, olive. No obvious waste material.					
5.0						
6.0						
7.0	Clay (native) - stiff to firm, silty, wet, olive.					
	End of hole at 7.6 m. 4.0 m PVC installed with threaded cap. 0.3 m threaded 020 machine slotted screen. Completed with flush mount casing set in concrete.					
8.0						
9.0						
10.0						
11.0						
12.0						

Tiamat Environmental Consultants Ltd.

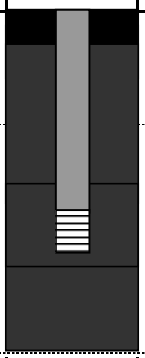
Slough :	Completion Depth (m): 7.6
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-03
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.313 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/25/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Soil Vapour Well is at north side of the site near rear fence, southeast corner of 13 Hermary Street.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick). Loam (fill) - compact, silty, sandy, trace rootlets, trace pebbles, trace clay, damp, olive black.						
1.0	Sand (fill) - compact, silty, organics, moist, light to dark olive brown.						
2.0	Sand (native) - compact, silty, clayey, moist, light yellow. becomes grey at 1.8 m. becomes wet at 2.4 m.						
3.0	End of hole at 3.0 m. 2.7 m PVC installed with threaded cap. 0.3 m threaded 020 machine slotted screen. Completed with flush mount casing set in concrete.						
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							

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Slough :	Completion Depth (m): 3.0
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

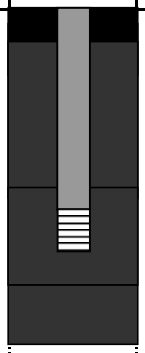
PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-04
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 879.590 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/25/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Soil Vapour Well is about 3 m west of MW-04, near the northeast corner of the parking lot of Montfort Centre Red Deer Catholic Regional Schools.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick).						
	Sand (fill) mixed with MSW - plastic, metal, brick, loose, silty, damp, olive brown.						
1.0							
2.0	becomes wet at 2.4 m.						
3.0	End of hole at 3.0 m. 1.8 m PVC installed with threaded cap. 0.3 m threaded 020 machine slotted screen. Completed with flush mount casing set in concrete.						
4.0							
5.0							
6.0							
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							



Tiamat Environmental Consultants Ltd.

Slough :	Completion Depth (m): 3.0
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-05
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Montfort Landfill Site	**GROUND ELEVATION:** 880.019 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/26/2013

Sample Type: Shelby Tube | Split Spoon | Core | Disturbed | No Recovery

Backfill Type: Bentonite | Silica Sand | Grout | Pea Gravel | Drill Cuttings | Bentonite : Sand

Notes: Soil Vapour Well is about 2 m south of MW-05 near the southwest corner of the site.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Sod and loam (fill) - soft, trace rootlets, moist, dark olive. (~ 3 cm thick). Sand (fill) - compact, sillty, loamy, trace clay, trace organics, damp, light olive. No obvious waste material.					
1.0	Clay (native) - stiff, silty, trace sand, moist, light grey. sand lense at 1.8 m, about 10 cm thick.					
2.0						
3.0						
4.0	End of hole at 4.4 m. 4.1 m PVC installed with threaded cap. 0.3 m threaded 020 machine slotted screen. Completed with flush mount casing set in concrete.					
5.0						
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						

Tiamat Environmental Consultants Ltd.

Slough :	Completion Depth (m): 4.4
Depth to Groundwater :	Checked By: LTM
Logged By: JAL/LTM	Page: 1 of 1

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-1(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth (ft / m)	Geology Description	Depth/Elev (m)
0 / 0	Ground Surface	881.2
0 – 4 / 0 – 2	***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	879.7
4 – 30 / 2 – 8	***Clay*** Dark brown. High plasticity. No staining or odour. Wet at 7.5 metres bgs.	872.1
30 / 8	End of Borehole	

Well Completion: Flush Mount Steel Casing; Bentonite; Sand; 2" Slot 10 Screen

Groundwater Elevation: N/A
T.O.C. Elevation: 881.206
Ground Surface Elevation: 881.206

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

Project #: 4-2352-04-03

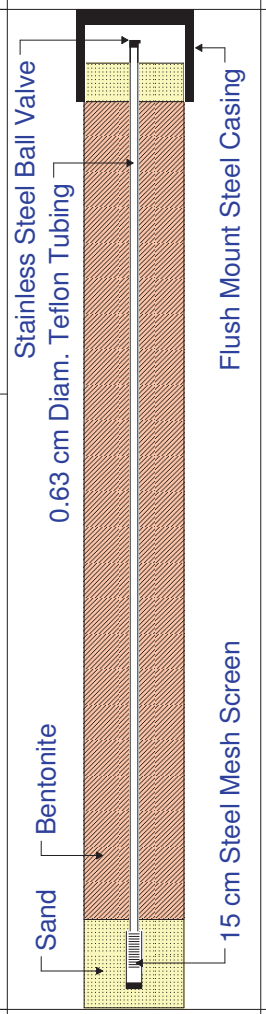
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-1(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
ft / m		Ground Surface	881.3		
0 / 0		***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	879.8		
6 / 2		***Clay*** Dark brown. High plasticity. No staining or odour.	877.4		
14 / 4		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 881.326
Ground Surface Elevation: 881.326

Monitoring Well Log
For Environmental Purposes Only

Screening Tool: N/A

XCG
Environmental Engineers & Scientists

Project #: 4-2352-04-03

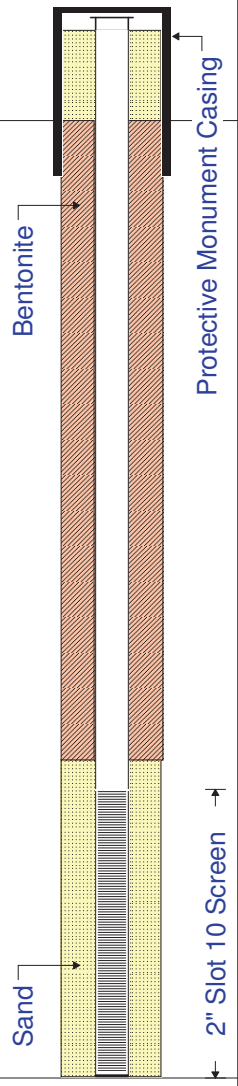
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-2(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
ft / m		Ground Surface	881.1		
1		***Topsoil*** Dark brown with some sand and silt. Dry. No staining or odour.	880.5		
3 / 1		***Clayey Silt*** Medium brown with some fine sand. No staining or odour.			
5					
7					
9 / 3					
11					
13					
15					
17 / 5					
19					
21					
23 / 7		Moist at 7.5 metres bgs.			
25					
27					
29 / 9		Wet at 9.0 metres bgs. Increasing clay content at 9.0 metres bgs.			
31					
33			870.7		
35		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 882.328
Ground Surface Elevation: 881.101

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-2(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	881.2		
		Topsoil Dark brown with some sand and silt. Dry. No staining or odour.	880.6		
2		***Clayey Silt*** Medium brown with some fine sand. No staining or odour.			
4					
6 / 2					
8					
10			878.1		
		End of Borehole			
12					

Well Completion: Stainless Steel Ball Valve; Flush Mount Steel Casing; 0.63 cm Diam. Teflon Tubing; Bentonite; Sand; 15 cm Steel Mesh Screen

Groundwater Elevation: N/A
T.O.C. Elevation: 881.163
Ground Surface Elevation: 881.163

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

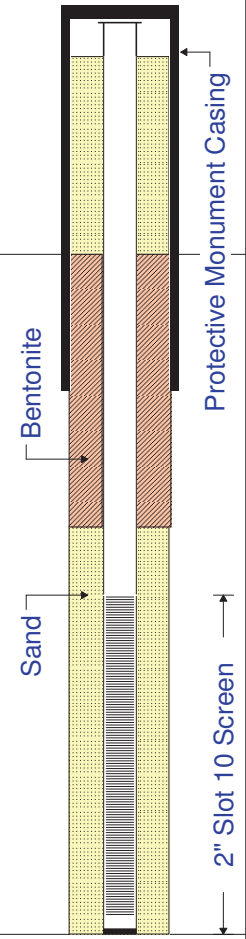
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-4(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
-5 / -1		Ground Surface	879.2		
1 / 3 (1)		***Topsoil*** Dark brown with pockets of red oxidation. High silt and sand content. Dry. No staining or ordour.			
5		Clay content and moisture levels increasing starting at 1.5 metres bgs.	877.4		
7 / 9 (3)		***Clay*** Dark brown with blue reduced pockets. High plasticity. Moist. No staining or odour.	876.2		
11		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 880.342
Ground Surface Elevation: 879.22

Monitoring Well Log
For Environmental Purposes Only

Screening Tool: N/A

Project #: 4-2352-04-03

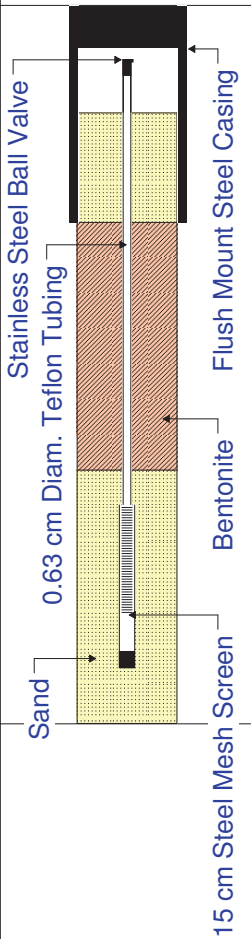
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-4(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	879.2		
		Topsoil Dark brown with pockets of red oxidation. High sand and silt content. Dry. No staining or odour.			
2			878.2		
		End of Borehole			
4					



Groundwater Elevation: N/A
T.O.C. Elevation: 879.194
Ground Surface Elevation: 879.194

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

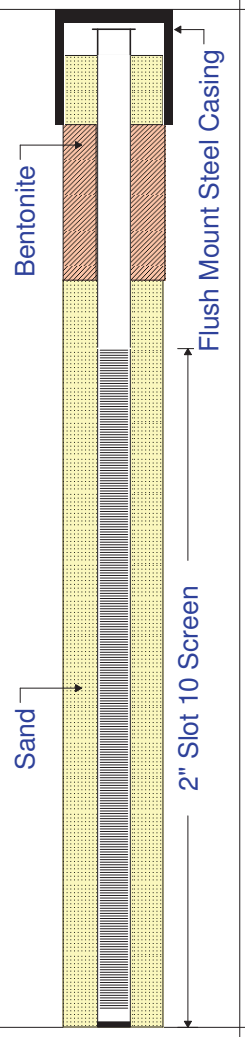
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-5(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 7, 2016 **Checked By:** EM
Completed: December 7, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	880.3		
0 – 2		***Topsoil*** Dark brown with pockets of red oxidation. High silt and sand content. Dry. No staining or odour.	879.5		
2 – 10 / 0 – 2		***Sand*** Medium brown. Very fine with some silt. Moist at 2.8 metres bgs. No staining or odour.	877.2		
10 – 14 / 2 – 4		***Clayey Silt*** Dark brown. Wet at 3.2 metres bgs. No staining or odour.	875.7		
14 – 16 / 4		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 880.27
Ground Surface Elevation: 880.27

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

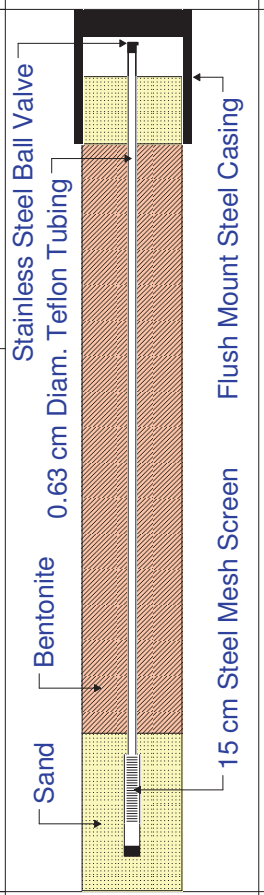
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-5(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 7, 2016 **Checked By:** EM
Completed: December 7, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	880.4		
		Topsoil Dark brown with pockets of red oxidation. High silt and sand content. Dry. No staining or odour.	879.6		
		Sand Medium brown. Very fine with some silt. Moist at 2.8 metres bgs. No staining or odour.	878.4		
2		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 880.356
Ground Surface Elevation: 880.356

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-6(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 7, 2016 **Checked By:** EM
Completed: December 7, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	880.0		
0 – 2		***Topsoil*** Dark brown with pockets of red oxidation. High silt and sand content. Dry. No staining or odour.	879.2		
2 – 14 / 0 – 4		***Sand*** Medium brown. Fine with some silt. Some redox (red/blue) striations. No staining or odour. Moist at 2.3 metres bgs. Wet at 3.0 metres bgs.	875.4	Bentonite; Flush Mount Steel Casing; Sand; 2" Slot 10 Screen	
14 / 4		End of Borehole			
16					

Groundwater Elevation: N/A
T.O.C. Elevation: 879.971
Ground Surface Elevation: 879.971

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

Project #: 4-2352-04-03

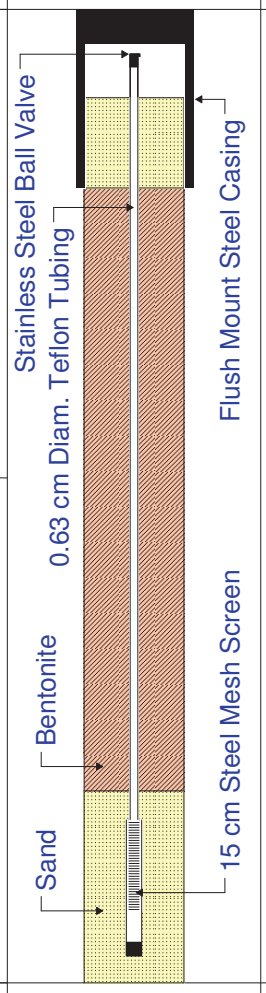
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-6(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 7, 2016 **Checked By:** EM
Completed: December 7, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	879.9		
		Topsoil Dark brown with pockets of red oxidation. High silt and sand content. Dry. No staining or odour.	879.1		
2		***Sand*** Medium brown. Fine with some silt. Some redox (red/blue) striations. No staining or odour.	878.3		
4					
6		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 879.903
Ground Surface Elevation: 879.903

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-9(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	880.7		
		Topsoil Dark brown with silt and sand content. Dry. No staining or odour.			
2			880.1		
		Clay Dark brown. High plasticity. Mixed with some topsoil. No staining or odour. Clay was disturbed and had been packed back around utilities.			
4			879.2		
		End of Borehole			
6 / 2					

Well Completion: Stainless Steel Ball Valve; 0.63 cm Diam. Teflon Tubing; Flush Mount Steel Casing; Bentonite; Sand; 15 cm Steel Mesh Screen

Groundwater Elevation: N/A
T.O.C. Elevation: 880.703
Ground Surface Elevation: 880.703

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG
Environmental Engineers & Scientists

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-10(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth (ft / m)	Geology Description	Depth/Elev (m)
0 / 0	Ground Surface	879.1
	Topsoil Dark brown with silt and sand content. Dry. No staining or odour.	
2		878.5
	Clay Dark brown. High plasticity. No staining or odour.	
4	Increasing moisture starting at 1.5 metres bgs.	
6		877.3
	End of Borehole	
2 / 8		

Well Completion: Stainless Steel Ball Valve; 0.63 cm Diam. Teflon Tubing; Flush Mount Steel Casing; Bentonite; Sand; 15 cm Steel Mesh Screen

Well Details

Groundwater Elevation: N/A
T.O.C. Elevation: 879.122
Ground Surface Elevation: 879.122

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG
Environmental Engineers & Scientists

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-12(MW)

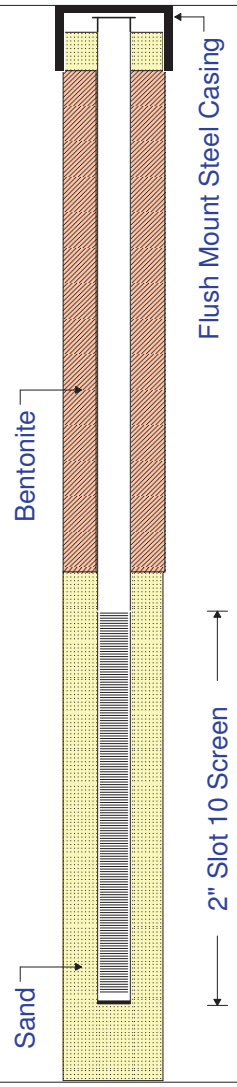
Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth (ft / m)	Geology Description	Depth/Elev (m)
0 / 0	Ground Surface	880.8
0 / 0	***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	880.2
2 /	***Clayey Silt*** Medium brown. Not plastic. No staining or odour.	
2 /	Moisture increasing at 7.0 metres bgs.	
2 /	Note that it would have been preferred to install the screen deeper, but the bottom of the hole collapsed.	
28 / 8		872.3
28 / 8	End of Borehole	

Graphic Log

Well Completion



Well Details

Groundwater Elevation: N/A
T.O.C. Elevation: 880.799
Ground Surface Elevation: 880.799

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

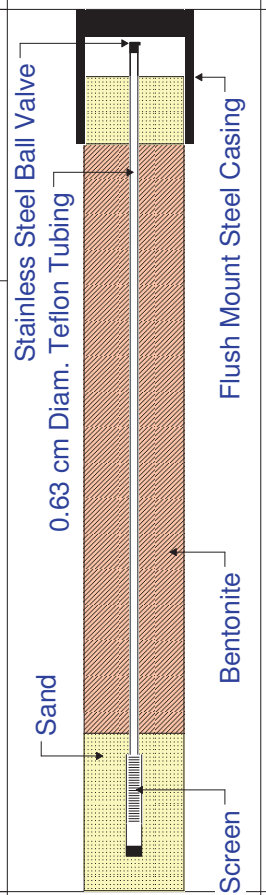
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-12(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
ft / m		Ground Surface	880.8		
0 / 0		***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	880.2		
2		***Clayey Silt*** Medium brown. Not plastic. No staining or odour.	878.8		
4					
6					
2		End of Borehole			
8					



Groundwater Elevation: N/A
T.O.C. Elevation: 880.799
Ground Surface Elevation: 880.799

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

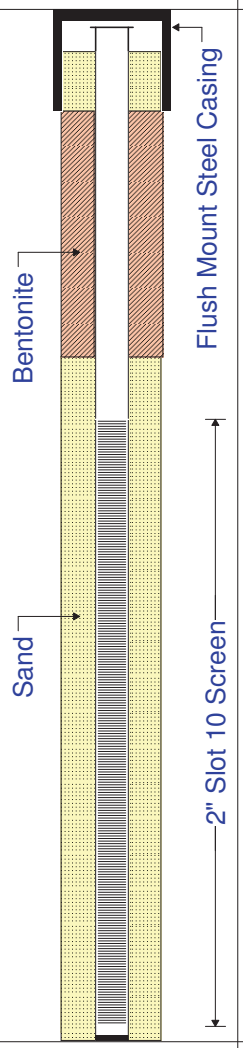
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-13(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
ft / m		Ground Surface	879.7		
0 / 0		***Topsoil*** Some clay. Dry. No staining or odour. Different from topsoil across the site. Homeowner brought additional topsoil in.	878.9		
4		***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	878.4		
6 / 2		***Clay*** Dark brown / black. No staining or odour. Wet at 3.7 metres bgs.			
16 / 4			874.5		
18		End of Borehole			



Groundwater Elevation: N/A
T.O.C. Elevation: 879.672
Ground Surface Elevation: 879.672

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

XCG Environmental Engineers & Scientists

Project #: 4-2352-04-03

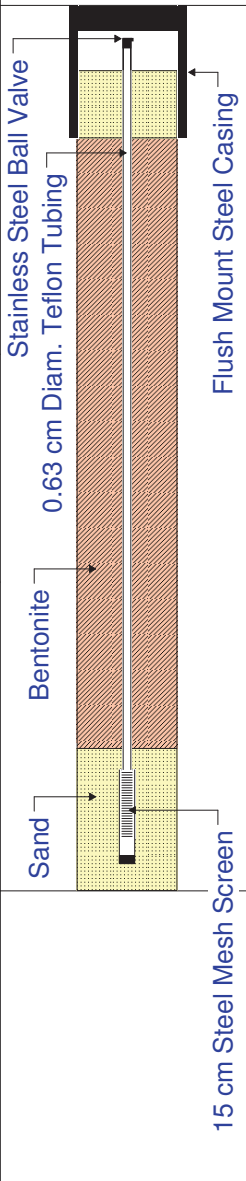
Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-13(SVP)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 6, 2016 **Checked By:** EM
Completed: December 6, 2016 **Logged By:** MCL

Depth (ft / m)	Graphic Log	Geology Description	Depth/Elev (m)	Well Completion	Well Details
0 / 0		Ground Surface	879.7		
		Topsoil Some clay. Dry. No staining or odour. Different from topsoil across the site. Homeowner brought topsoil in.	878.9		
2		***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	878.4		
4		***Clay*** Dark brown / black. No staining or odour. Wet at 3.7 metres bgs.	877.7		
6 / 2		End of Borehole			
8					



Groundwater Elevation: N/A
T.O.C. Elevation: 879.679
Ground Surface Elevation: 879.679

Monitoring Well Log
For Environmental Purposes Only

Screening Tool: N/A

Project #: 4-2352-04-03

Project: Montfort
Client: City of Red Deer
Location: Red Deer, AB

Privileged and Confidential
LOG OF WELL: XCG-14(MW)

Driller: JED Anchors & Environmental
Drill Method: Solid Stem
Sample Method: N/A

Borehole Diameter: 0.15 m
Start Date: December 5, 2016 **Checked By:** EM
Completed: December 5, 2016 **Logged By:** MCL

Depth (ft / m)	Geology Description	Depth/Elev (m)
Ground Surface		880.7
0 / 0	***Topsoil*** Dark brown with some silt and sand. Dry. No staining or odour.	879.5
4 / 2	***Clay*** Dark brown. Decreasing sand starting at 1.4 metres bgs. Increasing moisture starting at 1.5 metres bgs. No staining or odour.	
18 / 6	Wet at 5.5 metres bgs.	
28 / 8	Unstable at 8.5 metres bgs. Note that hole collapsed at 8.5 to 9 metres bgs.	871.6
30 / 9	End of Borehole	

Well Completion: Bentonite; Flush Mount Steel Casing; Sand; 2" Slot 10 Screen

Groundwater Elevation: N/A
T.O.C. Elevation: 880.719
Ground Surface Elevation: 880.719

Screening Tool: N/A

Monitoring Well Log
For Environmental Purposes Only

Borehole No: **24MW01**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 27 Hermary Street	Ground Elev: 878.934 m
Red Deer, Alberta	UTM: 307687 E; 5795213 N; Z 12

Depth (m)	Method	Soil Description	Moisture Content (%)
0	Hydrovac	Hydrovacced	
2	Solid Stem Auger	CLAY - some silt, trace sand, trace gravel, gravel to 15 mm diameter, well graded, moist, soft, medium to high plastic, brown	
		SAND - some silt, trace clay, fine grained sand, poorly graded, damp, loose, brown	
		SILT - some sand, trace clay, fine grained sand, moist to wet, soft, brown, trace grey mottling	
		CLAY - trace sand, trace silt, moist, firm, medium to high plastic, brown	
5		- some silt	
		- trace silt, firm to stiff	
		SILT some sand, trace clay, fine grained sand, moist to wet, soft, brown	
6		CLAY - trace sand, trace silt, moist, stiff, medium to high plastic, brown	
		END OF BOREHOLE (6.10 metres) slough - none at 0 hrs. water - 5.94 metres at 0 hrs. Monitoring well installed to 6.10 metres	
10			

Plastic Limit — Moisture Content — Liquid Limit: 20 40 60 80

Pocket Pen. (kPa): 100 200 300 400

24MW-01

Elevation (m): 878 877 876 875 874 873 872 871 870 869

TETRA TECH

Contractor: Ernco	Completion Depth: 6.1 m
Equipment Type: GeoProbe 782205	Start Date: 2024 September 27
Logged By: LL	Completion Date: 2024 September 27
Reviewed By:	Page 1 of 1

Borehole No: **24MW02**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 27 Hermary Street	Ground Elev: 878.146 m
Red Deer, Alberta	UTM: 307785 E; 5796323 N; Z 12

Depth (m)	Method	Soil Description	Moisture Content (%)	Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80)	Pocket Pen. (kPa) (100 200 300 400)	24MW-02	Elevation (m)
0	Hydrovac	Hydrovacced					878
1							877
2	Solid Stem Auger	CLAY - some silt, trace sand, poorly graded sand, moist, firm, medium to high plastic, brown, grey mottling			▲		876
		SAND - some silt, trace clay, fine grained sand, poorly graded, damp, loose, brown					
		CLAY - some silt, trace sand, poorly graded sand, moist, firm to stiff, medium to high plastic, brown, grey mottling			▲		
3		- trace silt, brown					875
		- stiff					
4		- firm					874
		- some silt, soft to firm					
		- trace silt			▲		
5		- firm to stiff, grey			▲		873
6					▲		872
7		- soft					871
		- soft to firm			▲		
8					▲		870
		- stiff					
9		END OF BOREHOLE (8.61 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 8.23 metres					869
10							

Contractor: Ernco	Completion Depth: 8.61 m
Equipment Type: GeoProbe 782205	Start Date: 2024 September 27
Logged By: LL	Completion Date: 2024 September 27
Reviewed By:	Page 1 of 1

Borehole No: **24SVP15**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 13 Hermary Street	
Red Deer, Alberta	UTM: 307798.42 E; 5796297.67 N; Z 12

Depth (m)	Method	Soil Description	Depth (m)
0	Hand Auger	TOPSOIL AND ORGANICS - (75 mm thick)	
		CLAY - silty, dry, firm, dark greyish brown	
		SILT - sandy, fine grained sand, dry, soft, light brown	
1		CLAY - trace silt, moist, firm, dark grey	
		- grey, some yellowish brown staining	
2		END OF BOREHOLE (1.96 metres) slough - none at 0 hrs water - dry at 0 hrs. Soil Vapour Probe installed at 1.75 metres	
3			
4			
5			
6			
7			
8			
9			
10			

Moisture Content (%)

Plastic Limit | Moisture Content | Liquid Limit
20 40 60 80

24SVP15

Contractor:	Completion Depth: 1.96 m
Equipment Type: Hand Auger	Start Date: 2024 November 15
Logged By: LL	Completion Date: 2024 November 15
Reviewed By:	Page 1 of 1

Borehole No: **24SVP16**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 31 Hermary Street	
Red Deer, Alberta	UTM: 307711.94 E; 5796300.9 N; Z 12

Depth (m)	Method	Soil Description	Moisture Content (%)	Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80)	24SVP16	Depth (ft)
0		TOPSOIL AND ORGANICS - (75 mm thick)				0
	Hand Auger	SILT - some sand, trace clay, dry, soft, dark brown				1
		CLAY - silty, moist, firm, light brown				2
1		SILT - sandy, fine grained sand, dry, soft, light brown - clayey, no visible sand, moist, firm				3 4 5
		CLAY - some silt, moist, firm, light brown				6
2		END OF BOREHOLE (2.01 metres) slough - none at 0 hrs. water - dry at 0 hrs. Soil Vapour Probe installed at 1.96 metres				7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
3 4 5 6 7 8 9 10						

TETRA TECH

Contractor:	Completion Depth: 2.01 m
Equipment Type: Hand Auger	Start Date: 2024 November 15
Logged By: LL	Completion Date: 2024 November 15
Reviewed By:	Page 1 of 1

Borehole No: **24SVP17**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 35 Hermary Street	
Red Deer, Alberta	UTM: 307694.35 E; 5796296.83 N; Z 12

Depth (m)	Method	Soil Description	Moisture Content (%)	Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80)	24SVP17	Depth (ft)
0		TOPSOIL AND ORGANICS - (100 mm thick)				0
	Hand Auger	CLAY - silty, trace sand, fine grained sand, moist, firm, brown				
		- light grey				
1		SILT - clayey, moist, firm, light brownish grey				
		CLAY - trace silt, moist, firm, light brown				
		END OF BOREHOLE (1.60 metres) slough - none at 0 hrs. water - dry at 0 hrs. Soil Vapour Probe installed at 1.55 metres				
2						5
3						10
4						15
5						20
6						25
7						30
8						35
9						40
10						45

Contractor:	Completion Depth: 1.6 m
Equipment Type: Hand Auger	Start Date: 2024 November 15
Logged By: LL	Completion Date: 2024 November 15
Reviewed By:	Page 1 of 1

Borehole No: **25XCG-4 (SVP)**

Project: CoRD AB 2024 Activity	Project No: SWM.SWOP04071-04.007
Location: 52 Avenue and 62 Street	
Red Deer, Alberta	UTM: 307841 E; 5796190 N; Z 12

Depth (m)	Method	Soil Description	Moisture Content (%)	Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80)	31-25SCCG-4	Depth (ft)
0						0
	Solid Stem Auger	TOPSOIL AND ORGANICS - (150 mm thick)				1
		SILT - sandy, poorly graded sand, dry, firm, brown				2
1						3
		END OF BOREHOLE (1.01 metres)				4
		slough - none at 0 hrs.				5
		water - dry at 0 hrs.				6
2		Soil Vapour Probe installed at 0.23 metres				7
						8
3						9
						10
						11
4						12
						13
						14
5						15
						16
						17
6						18
						19
						20
7						21
						22
						23
8						24
						25
						26
9						27
						28
						29
10						30
						31
						32

Contractor: Ernco	Completion Depth: 1.01 m
Equipment Type: GeoProbe 3230DT	Start Date: 2025 January 15
Logged By: LL	Completion Date: 2025 January 15
Reviewed By:	Page 1 of 1

APPENDIX F

LABORATORY ANALYTICAL REPORTS

CERTIFICATE OF ANALYSIS

Work Order	: **CG2418420**		
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 14-Dec-2024
C-O-C number	: ----	Issue Date	: 20-Dec-2024 10:20
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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
- Surrogate Control Limits

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*
Gurvinder Kour	Lab Assistant	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Organics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta

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*
-	no units
%	percent
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre

<: 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.

Qualifiers

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

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
						CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L		964	363	436	654	650
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L		790	298	357	536	532
Conductivity	----	E100/CG	1.0	µS/cm		1680	567	758	991	996
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		998	311	387	522	516
pH	----	E108/CG	0.10	pH units		7.12	7.71	7.76	7.71	7.71
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		1060	370	444	619	612
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/CG	0.0050	mg/L		0.432	0.339	0.0099	0.305	0.305
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		177	19.2	44.3	22.8	21.1
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		<0.100 DLDS	0.166	0.154	0.121	0.126
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		<0.100 DLDS	2.98	0.517	<0.100 DLDS	<0.100 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L		<0.112	3.00	0.517	<0.112	<0.112
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		<0.050 DLDS	0.018	<0.010	<0.050 DLDS	<0.050 DLDS
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		14.1	12.9	14.9	33.0	33.1
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		21.1	6.99	8.74	12.0	11.9
Cation sum	----	EC101/CG	0.10	meq/L		21.3	6.49	8.44	11.8	11.7
Ion balance (APHA)	----	EC101/CG	0.01	%		0.47	-3.71	-1.75	-0.84	-0.85
Ion balance (cations/anions)	----	EC101/CG	0.010	%		101	92.8	96.6	98.3	98.3

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
						CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L		0.0045	0.0277	0.0014	0.0033	0.0034
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L		<0.00010	0.00074	0.00018	0.00023	0.00023
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L		0.0148	0.00079	0.00057	0.00287	0.00298
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L		0.549	0.245	0.275	0.127	0.123
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L		0.123	0.026	0.048	0.169	0.163
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L		0.0000071	0.0000080	0.0000141	0.0000901	0.0000850
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L		233	71.8	92.7	132	130
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L		0.00066	0.00083	0.00081	0.00195	0.00214
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L		2.75	0.142	<0.010	<0.010	0.031
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L		0.000058	0.000055	<0.000050	<0.000050	<0.000050
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L		101	31.9	37.8	46.7	46.6
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L		0.785	0.0802	0.0251	0.505	0.501
Mercury, dissolved	7439-97-6	E509/CG	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L		0.0101	0.00229	0.00176	0.00370	0.00375
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L		5.53	3.25	5.15	6.02	5.96
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L		<0.000050	0.000150	0.00140	0.000171	0.000174
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L		24.0	3.78	13.2	28.3	28.3
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L		0.0231	0.00114	0.00624	0.0102	0.0101
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L		0.0071	0.0458	0.0024	0.0222	0.0234

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
						CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Dissolved mercury filtration location	----	EP509/CG	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/CG	-	-		Field	Field	Field	Field	Field
Volatile Organic Compounds										
Benzene	71-43-2	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Bromobenzene	108-86-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	74-97-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	75-27-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	75-25-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	74-83-9	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, n-	104-51-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, sec-	135-98-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Butylbenzene, tert-	98-06-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	56-23-5	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	108-90-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	75-00-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	67-66-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	74-87-3	E611E/CG	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Chlorotoluene, 2-	95-49-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chlorotoluene, 4-	106-43-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Cymene, p-	99-87-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
						CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromoethane, 1,2-	106-93-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	74-95-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,2-	95-50-1	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	541-73-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorobenzene, 1,4-	106-46-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	75-71-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	75-34-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethane, 1,2-	107-06-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, 1,1-	75-35-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, cis-1,2-	156-59-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloroethylene, trans-1,2-	156-60-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	75-09-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,2-	78-87-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 1,3-	142-28-9	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropane, 2,2-	594-20-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, 1,1-	563-58-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis-1,3-	10061-01-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/CG	1.5	µg/L		<1.5	<1.5	<1.5	<1.5	<1.5
Dichloropropylene, trans-1,3-	10061-02-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	100-41-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
						CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Hexachlorobutadiene	87-68-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Propylbenzene, n-	103-65-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	100-42-5	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	127-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	108-88-3	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorobenzene, 1,2,3-	87-61-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorobenzene, 1,2,4-	120-82-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,1-	71-55-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethane, 1,1,2-	79-00-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	79-01-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	75-69-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trichloropropane, 1,2,3-	96-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,2,4-	95-63-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	75-01-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, m+p-	179601-23-1	E611E/CG	0.40	µg/L		<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, o-	95-47-6	E611E/CG	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	<0.30

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

					Client sample ID	MW-05	XCG-5 (MW)	24BH-01	24BH-02	GW DUPLICATE
					Client sampling date / time	13-Dec-2024 10:40	13-Dec-2024 10:45	13-Dec-2024 10:10	13-Dec-2024 09:35	13-Dec-2024 00:00
Analyte	CAS Number	Method/Lab	LOR	Unit		CG2418420-001	CG2418420-002	CG2418420-003	CG2418420-004	CG2418420-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Xylenes, total	1330-20-7	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	<0.50
BTEX, total	----	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611E/CG	1.0	%		87.4	88.7	86.6	88.7	88.3
Difluorobenzene, 1,4-	540-36-3	E611E/CG	1.0	%		99.4	99.0	97.9	98.6	102

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2418420**	Page	: 1 of 14
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Issue Date	: 20-Dec-2024 10:20
C-O-C number	: ----		
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

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) 24BH-01	E298	13-Dec-2024	15-Dec-2024	28 days	2 days	✓	15-Dec-2024	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) 24BH-02	E298	13-Dec-2024	15-Dec-2024	28 days	2 days	✓	15-Dec-2024	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) GW DUPLICATE	E298	13-Dec-2024	15-Dec-2024	28 days	2 days	✓	15-Dec-2024	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW-05	E298	13-Dec-2024	15-Dec-2024	28 days	2 days	✓	15-Dec-2024	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) XCG-5 (MW)	E298	13-Dec-2024	15-Dec-2024	28 days	2 days	✓	15-Dec-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 24BH-01	E235.Cl	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 24BH-02	E235.Cl	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 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 GW DUPLICATE	E235.Cl	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-05	E235.Cl	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE XCG-5 (MW)	E235.Cl	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 24BH-01	E235.F	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 24BH-02	E235.F	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE GW DUPLICATE	E235.F	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-05	E235.F	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE XCG-5 (MW)	E235.F	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 24BH-01	E235.NO3	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 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 : Nitrate in Water by IC										
HDPE										
24BH-02	E235.NO3	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
GW DUPLICATE	E235.NO3	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
MW-05	E235.NO3	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
XCG-5 (MW)	E235.NO3	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
24BH-01	E235.NO2	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
24BH-02	E235.NO2	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
GW DUPLICATE	E235.NO2	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
MW-05	E235.NO2	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
XCG-5 (MW)	E235.NO2	13-Dec-2024	14-Dec-2024	3 days	1 days	✓	14-Dec-2024	3 days	1 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										
24BH-01	E235.SO4	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
24BH-02	E235.SO4	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
GW DUPLICATE	E235.SO4	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MW-05	E235.SO4	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
XCG-5 (MW)	E235.SO4	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
24BH-01	E509	13-Dec-2024	18-Dec-2024	28 days	5 days	✓	18-Dec-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
24BH-02	E509	13-Dec-2024	18-Dec-2024	28 days	5 days	✓	18-Dec-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
GW DUPLICATE	E509	13-Dec-2024	18-Dec-2024	28 days	5 days	✓	18-Dec-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW-05	E509	13-Dec-2024	18-Dec-2024	28 days	5 days	✓	18-Dec-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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
XCG-5 (MW)	E509	13-Dec-2024	18-Dec-2024	28 days	5 days	✓	18-Dec-2024	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
24BH-01	E421	13-Dec-2024	18-Dec-2024	180 days	5 days	✓	19-Dec-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
24BH-02	E421	13-Dec-2024	18-Dec-2024	180 days	5 days	✓	19-Dec-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
GW DUPLICATE	E421	13-Dec-2024	18-Dec-2024	180 days	5 days	✓	19-Dec-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-05	E421	13-Dec-2024	18-Dec-2024	180 days	5 days	✓	19-Dec-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
XCG-5 (MW)	E421	13-Dec-2024	18-Dec-2024	180 days	5 days	✓	19-Dec-2024	180 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
24BH-01	E290	13-Dec-2024	14-Dec-2024	14 days	1 days	✓	14-Dec-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
24BH-02	E290	13-Dec-2024	14-Dec-2024	14 days	1 days	✓	14-Dec-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
GW DUPLICATE	E290	13-Dec-2024	14-Dec-2024	14 days	1 days	✓	14-Dec-2024	14 days	1 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 MW-05	E290	13-Dec-2024	14-Dec-2024	14 days	1 days	✓	14-Dec-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE XCG-5 (MW)	E290	13-Dec-2024	14-Dec-2024	14 days	1 days	✓	14-Dec-2024	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 24BH-01	E100	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 24BH-02	E100	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE GW DUPLICATE	E100	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE MW-05	E100	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE XCG-5 (MW)	E100	13-Dec-2024	14-Dec-2024	28 days	1 days	✓	14-Dec-2024	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE GW DUPLICATE	E108	13-Dec-2024	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-05	E108	13-Dec-2024	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM

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										
XCG-5 (MW)	E108	13-Dec-2024	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
24BH-01	E108	13-Dec-2024	14-Dec-2024	0.25 hrs	23 hrs	× EHTR-FM	14-Dec-2024	0.25 hrs	24 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
24BH-02	E108	13-Dec-2024	14-Dec-2024	0.25 hrs	24 hrs	× EHTR-FM	14-Dec-2024	0.25 hrs	24 hrs	× EHTR-FM
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial dissolved (hydrochloric acid)										
24BH-01	E611E	13-Dec-2024	18-Dec-2024	14 days	5 days	✓	18-Dec-2024	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial dissolved (hydrochloric acid)										
24BH-02	E611E	13-Dec-2024	18-Dec-2024	14 days	5 days	✓	18-Dec-2024	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial dissolved (hydrochloric acid)										
GW DUPLICATE	E611E	13-Dec-2024	18-Dec-2024	14 days	5 days	✓	18-Dec-2024	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-05	E611E	13-Dec-2024	18-Dec-2024	14 days	5 days	✓	18-Dec-2024	14 days	5 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial dissolved (hydrochloric acid)										
XCG-5 (MW)	E611E	13-Dec-2024	18-Dec-2024	14 days	5 days	✓	18-Dec-2024	14 days	5 days	✓

Legend & Qualifier Definitions

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

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	1809621	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	1810336	1	21	4.7	5.0	✘
Chloride in Water by IC	E235.Cl	1809935	1	12	8.3	5.0	✓
Conductivity in Water	E100	1809620	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1814272	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1813164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1809931	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1809932	1	9	11.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1809933	1	9	11.1	5.0	✓
pH by Meter	E108	1809619	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1809934	1	12	8.3	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1814447	1	6	16.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1809621	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	1810336	1	21	4.7	5.0	✘
Chloride in Water by IC	E235.Cl	1809935	1	12	8.3	5.0	✓
Conductivity in Water	E100	1809620	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1814272	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1813164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1809931	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1809932	1	9	11.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1809933	1	9	11.1	5.0	✓
pH by Meter	E108	1809619	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1809934	1	12	8.3	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1814447	1	6	16.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1809621	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	1810336	1	21	4.7	5.0	✘
Chloride in Water by IC	E235.Cl	1809935	1	12	8.3	5.0	✓
Conductivity in Water	E100	1809620	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1814272	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1813164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1809931	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1809932	1	9	11.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1809933	1	9	11.1	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*
Method Blanks (MB) - Continued							
Sulfate in Water by IC	E235.SO4	1809934	1	12	8.3	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1814447	1	6	16.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1810336	1	21	4.7	5.0	✗
Chloride in Water by IC	E235.Cl	1809935	1	12	8.3	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1814272	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1813164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1809931	1	9	11.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1809932	1	9	11.1	5.0	✓
Nitrite in Water by IC	E235.NO2	1809933	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1809934	1	12	8.3	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1814447	1	6	16.6	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 - Calgary	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 - Calgary	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.
Chloride in Water by IC	E235.Cl ALS Environmental - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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.
Ammonia by Fluorescence	E298 ALS Environmental - Calgary	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)

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Calgary	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.
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Calgary	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.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Calgary	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Calgary	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved 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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Calgary	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).
TDS in Water (Calculation)	EC103 ALS Environmental - Calgary	Water	APHA 1030E (mod)	Total Dissolved Solids is 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.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Calgary	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

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

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Calgary	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

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QUALITY CONTROL REPORT

Work Order	: **CG2418420**	Page	: 1 of 14
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 14-Dec-2024
C-O-C number	: ----	Issue Date	: 20-Dec-2024 10:20
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Gurvinder Kour	Lab Assistant	Calgary Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta

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: 1809619)											
CG2418413-001	Anonymous	pH	----	E108	0.10	pH units	8.19	8.18	0.122%	4%	----
Physical Tests (QC Lot: 1809620)											
CG2418413-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	341	343	0.585%	10%	----
Physical Tests (QC Lot: 1809621)											
CG2418413-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	146	150	3.10%	20%	----
Anions and Nutrients (QC Lot: 1809931)											
CG2418408-002	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	1.52	1.52	0.440%	20%	----
Anions and Nutrients (QC Lot: 1809932)											
CG2418408-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1809933)											
CG2418408-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1809934)											
CG2418408-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	76.1	76.1	0.0628%	20%	----
Anions and Nutrients (QC Lot: 1809935)											
CG2418408-002	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1810336)											
CG2418410-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.100	0.0927	8.07%	20%	----
Dissolved Metals (QC Lot: 1814272)											
CG2418410-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1814447)											
CG2418388-001	Anonymous	Benzene	71-43-2	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	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*
Volatile Organic Compounds (QC Lot: 1814447) - continued											
CG2418388-001	Anonymous	Carbon tetrachloride	56-23-5	E611E	1.00	µg/L	<0.00100 mg/L	<1.00	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1000	µg/L	<1.00 mg/L	<1000	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<0.0050 mg/L	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	1.00	µg/L	<0.00100 mg/L	<1.00	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	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*
Volatile Organic Compounds (QC Lot: 1814447) - continued											
CG2418388-001	Anonymous	Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<0.0010 mg/L	<1.0	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.50	µg/L	<0.00050 mg/L	<0.50	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: 1809620)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1809621)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1809931)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1809932)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1809933)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1809934)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1809935)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1810336)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Dissolved Metals (QCLot: 1813164)						
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	----
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	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
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	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1813164) - continued						
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 1814272)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 1814447)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1814447) - continued						
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----

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: 1809619)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1809620)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 1809621)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 1809931)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 1809932)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1809933)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1809934)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1809935)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1810336)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Dissolved Metals (QCLot: 1813164)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	104	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.6	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	95.5	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	93.7	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.6	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.7	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.0	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	113	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.8	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	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: 1813164) - continued									
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.2	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	95.9	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	95.7	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.4	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.2	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	92.4	80.0	120	----
Volatile Organic Compounds (QCLot: 1814447)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	101	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	98.0	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	92.2	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	97.8	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	99.3	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	105	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	94.5	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	101	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	95.2	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	117	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	90.1	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	94.7	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	92.6	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	100.0	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	92.0	60.0	140	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1814447) - continued									
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	94.9	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	90.1	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	94.8	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	98.3	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	89.6	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	98.3	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	93.4	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	87.5	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	96.7	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	95.6	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	80.2	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	104	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	91.4	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	96.4	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	103	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	98.0	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	99.1	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	90.7	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	95.5	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	94.3	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	94.9	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	99.1	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	98.1	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	98.2	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	96.6	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	112	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	106	70.0	130	----

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: 1809931)										
CG2418408-003	Anonymous	Fluoride	16984-48-8	E235.F	1.05 mg/L	1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1809932)										
CG2418408-003	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.51 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1809933)										
CG2418408-003	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1809934)										
CG2418408-003	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 1809935)										
CG2418408-003	Anonymous	Chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1810336)										
CG2418412-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0995 mg/L	0.1 mg/L	99.5	75.0	125	----
Dissolved Metals (QCLot: 1813164)										
CG2418428-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	2.08 mg/L	2 mg/L	104	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.205 mg/L	0.2 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.193 mg/L	0.2 mg/L	96.4	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.938 mg/L	1 mg/L	93.8	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.405 mg/L	0.4 mg/L	101	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.194 mg/L	0.2 mg/L	96.9	70.0	130	----
		Iron, dissolved	7439-89-6	E421	19.3 mg/L	20 mg/L	96.7	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.198 mg/L	0.2 mg/L	99.3	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.201 mg/L	0.2 mg/L	101	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.401 mg/L	0.4 mg/L	100	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	40.6 mg/L	40 mg/L	102	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.386 mg/L	0.4 mg/L	96.6	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	20.3 mg/L	20 mg/L	102	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0396 mg/L	0.04 mg/L	99.1	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	4.06 mg/L	4 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 1814272)										
CG2418420-001	MW-05	Mercury, dissolved	7439-97-6	E509	0.0000881 mg/L	0 mg/L	88.1	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
Volatile Organic Compounds (QCLot: 1814447)										
CG2418388-001	Anonymous	Benzene	71-43-2	E611E	104 µg/L	100 µg/L	104	70.0	130	----
		Bromobenzene	108-86-1	E611E	96.8 µg/L	100 µg/L	96.8	70.0	130	----
		Bromochloromethane	74-97-5	E611E	94.3 µg/L	100 µg/L	94.3	70.0	130	----
		Bromodichloromethane	75-27-4	E611E	98.7 µg/L	100 µg/L	98.7	70.0	130	----
		Bromoform	75-25-2	E611E	96.4 µg/L	100 µg/L	96.4	70.0	130	----
		Bromomethane	74-83-9	E611E	109 µg/L	100 µg/L	109	60.0	140	----
		Butylbenzene, n-	104-51-8	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Butylbenzene, sec-	135-98-8	E611E	115 µg/L	100 µg/L	115	70.0	130	----
		Butylbenzene, tert-	98-06-6	E611E	118 µg/L	100 µg/L	118	70.0	130	----
		Carbon tetrachloride	56-23-5	E611E	97.8 µg/L	100 µg/L	97.8	70.0	130	----
		Chlorobenzene	108-90-7	E611E	104 µg/L	100 µg/L	104	70.0	130	----
		Chloroethane	75-00-3	E611E	107 µg/L	100 µg/L	107	60.0	140	----
		Chloroform	67-66-3	E611E	98.4 µg/L	100 µg/L	98.4	70.0	130	----
		Chloromethane	74-87-3	E611E	122 µg/L	100 µg/L	122	60.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Chlorotoluene, 4-	106-43-4	E611E	100 µg/L	100 µg/L	100	70.0	130	----
		Cymene, p-	99-87-6	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		Dibromochloromethane	124-48-1	E611E	95.4 µg/L	100 µg/L	95.4	70.0	130	----
		Dibromoethane, 1,2-	106-93-4	E611E	92.5 µg/L	100 µg/L	92.5	70.0	130	----
		Dibromomethane	74-95-3	E611E	100 µg/L	100 µg/L	100	70.0	130	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Dichlorodifluoromethane	75-71-8	E611E	128 µg/L	100 µg/L	128	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	98.5 µg/L	100 µg/L	98.5	70.0	130	----
		Dichloroethane, 1,2-	107-06-2	E611E	91.8 µg/L	100 µg/L	91.8	70.0	130	----
		Dichloroethylene, 1,1-	75-35-4	E611E	98.6 µg/L	100 µg/L	98.6	70.0	130	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	109 µg/L	100 µg/L	109	70.0	130	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	96.6 µg/L	100 µg/L	96.6	70.0	130	----
		Dichloromethane	75-09-2	E611E	91.8 µg/L	100 µg/L	91.8	70.0	130	----
		Dichloropropane, 1,2-	78-87-5	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dichloropropane, 1,3-	142-28-9	E611E	93.2 µg/L	100 µg/L	93.2	70.0	130	----
		Dichloropropane, 2,2-	594-20-7	E611E	89.4 µg/L	100 µg/L	89.4	70.0	130	----
		Dichloropropylene, 1,1-	563-58-6	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	82.0 µg/L	100 µg/L	82.0	70.0	130	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	89.3 µg/L	100 µg/L	89.3	70.0	130	----
		Ethylbenzene	100-41-4	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Hexachlorobutadiene	87-68-3	E611E	84.2 µg/L	100 µg/L	84.2	70.0	130	----
		Isopropylbenzene	98-82-8	E611E	110 µg/L	100 µg/L	110	70.0	130	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	96.6 µg/L	100 µg/L	96.6	70.0	130	----
		Propylbenzene, n-	103-65-1	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Styrene	100-42-5	E611E	99.0 µg/L	100 µg/L	99.0	70.0	130	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	98.9 µg/L	100 µg/L	98.9	70.0	130	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	98.4 µg/L	100 µg/L	98.4	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
Volatile Organic Compounds (QCLot: 1814447) - continued										
CG2418388-001	Anonymous	Tetrachloroethylene	127-18-4	E611E	93.2 µg/L	100 µg/L	93.2	70.0	130	----
		Toluene	108-88-3	E611E	95.5 µg/L	100 µg/L	95.5	70.0	130	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	86.9 µg/L	100 µg/L	86.9	70.0	130	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	87.8 µg/L	100 µg/L	87.8	70.0	130	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Trichloroethylene	79-01-6	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Trichlorofluoromethane	75-69-4	E611E	110 µg/L	100 µg/L	110	60.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	112 µg/L	100 µg/L	112	70.0	130	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	100 µg/L	100 µg/L	100	70.0	130	----
		Vinyl chloride	75-01-4	E611E	128 µg/L	100 µg/L	128	60.0	140	----
		Xylene, m+p-	179601-23-1	E611E	221 µg/L	200 µg/L	110	70.0	130	----
		Xylene, o-	95-47-6	E611E	105 µg/L	100 µg/L	105	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division Calgary
Work Order Reference
CG2418420

Telephone : +1 403 407 1800

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Darby Madalena
Phone:	403-723-6867
	Company address below will appear on the final report
Street:	110, 140 Quarry Park Blvd SE
City/Province:	Calgary, AB
Postal Code:	T2C 2X5
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	darby.madalena@tetratech.com
Email 2	jaymes.going@tetratech.com
Email 3	

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	EBA.Accounts.Payable@tetratech.com
Email 2	

Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekends, st
Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm
For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information	
ALS Account # / Quote #:	CG22-EBAE100-0021
Job #:	SWM.SWOP04071-04.007
PO / AFE:	SWM.SWOP04071-04.007
LSD:	Monfort Pre-1972 Landfill

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Wendy Sears Sampler: Willem Verduyn

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	S5421B - Routine + Diss Metals	E509 - Dissolved Hg	E611E - VOC	E298 - Ammonia	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
					Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below							
	MW-05	13Dec24	10:40	water		R	R	R	R			
	~~XCG-4 (MW)~~					~~R~~	~~R~~	~~R~~	~~R~~			
	XCG-5 (MW)	13Dec24	11:45	water		R	R	R	R			
	~~XCG-6 (MW)~~					~~R~~	~~R~~	~~R~~	~~R~~			
	~~XCG-13 (MW)~~					~~R~~	~~R~~	~~R~~	~~R~~			
	~~XCG-14 (MW)~~					~~R~~	~~R~~	~~R~~	~~R~~			
	24BH-01	13Dec24	10:10	water		R	R	R	R			
	24BH-02	13Dec24	9:35	water		R	R	R	R			
	GW DUPLICATE	13Dec24		water		R	R	R	R			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	XCG-5 (MW) limited sample volumes 8-9
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Wadelago	13Dec24		FG	13-12-2024	3:12			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water [DW] System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **CG2418421**		
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 403 203 3355	Telephone	: +1 519 886 6910
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 24-Dec-2024
C-O-C number	: ----	Issue Date	: 31-Dec-2024 08:28
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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
- Surrogate Control Limits

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*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Air Quality, 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*
-	no units
%	percent
inches Hg	inches of mercury
ppbv	parts per billion (volume/volume)
µg/m³	micrograms per cubic metre

<: 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

RRR - Result may be biased high due to possible contamination.

Qualifiers

Qualifier	Description
AI	Analytical interferences may be present. Result may be biased high.
DLQ	Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion ratio did not meet acceptance criteria.
RRR	Refer to report comments for issues regarding this analysis.

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Field Tests										
ID, batch proof	----	EF001/WT	-	-		241124.226	241108.131	241114.215	241122.108	241108.132
ID, canister	----	EF001/WT	-	-		01400-0100	01400-0005	01400-0133	01400-0475	01400-0236
ID, regulator	----	EF001/WT	-	-		G353	G192	G383	G279	G353
Pressure on receipt	----	EF001/WT	0.10	inches Hg		-10.0	-9.80	-1.44	-7.15	-10.4
Permanent Gases										
Carbon dioxide	124-38-9	E629B-H/WT	0.050	%		7.26	1.89	0.704	1.33	7.23
Carbon monoxide	630-08-0	E629B-H/WT	0.050	%		<0.050	<0.050	<0.050	<0.050	<0.050
Methane	74-82-8	E629B-H/WT	0.050	%		<0.050	<0.050	<0.050	<0.050	<0.050
Nitrogen	7727-37-9	E629B-H/WT	1.0	%		69.5	72.5	72.9	73.5	68.4
Oxygen	7782-44-7	E629B-H/WT	0.10	%		16.1	19.1	19.7	18.6	15.9
Volatile Organic Compounds										
Acetone	67-64-1	EC621B/WT	2.4	µg/m³		9.3	5.2	17.8	4.8	3.8
Acetone	67-64-1	E621B/WT	1.0	ppbv		3.9 RRR	2.2 RRR	7.5 RRR	2.0 RRR	1.6 RRR
Allyl chloride	107-05-1	EC621B/WT	0.63	µg/m³		<0.63	<0.63	<0.63	<0.63	<0.66
Allyl chloride	107-05-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Benzene	71-43-2	EC621B/WT	0.32	µg/m³		3.51	2.81	3.35	4.18	1.82
Benzene	71-43-2	E621B/WT	0.10	ppbv		1.10 RRR	0.88 RRR	1.05 RRR	1.31 RRR	0.57 RRR
Benzyl chloride	100-44-7	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.1
Benzyl chloride	100-44-7	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Bromodichloromethane	75-27-4	EC621B/WT	1.3	µg/m³		<1.3	<1.3	<1.3	<1.3	<1.4
Bromodichloromethane	75-27-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
Client sample ID									
Client sampling date / time					12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
					CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Bromoform	75-25-2	EC621B/WT	2.1	µg/m³	<2.1	<2.1	<2.1	<2.1	<2.2
Bromoform	75-25-2	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Bromomethane	74-83-9	EC621B/WT	0.78	µg/m³	<0.78	<0.78	<0.78	<0.78	<0.82
Bromomethane	74-83-9	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Butadiene, 1,3-	106-99-0	EC621B/WT	0.44	µg/m³	<0.44	<0.44	<0.44	<0.44	<0.46
Butadiene, 1,3-	106-99-0	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Carbon disulfide	75-15-0	EC621B/WT	1.6	µg/m³	<1.6	8.8	12.0	48.3	<1.6
Carbon disulfide	75-15-0	E621B/WT	0.50	ppbv	<0.50	2.83	3.86	15.5	<0.52
Carbon tetrachloride	56-23-5	EC621B/WT	1.30	µg/m³	<1.26	<1.26	<1.26	<1.26	<1.32
Carbon tetrachloride	56-23-5	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Chlorobenzene	108-90-7	EC621B/WT	0.92	µg/m³	<0.92	<0.92	<0.92	<0.92	<0.97
Chlorobenzene	108-90-7	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Chloroethane	75-00-3	EC621B/WT	0.53	µg/m³	<0.53	<0.53	<0.53	<0.53	<0.55
Chloroethane	75-00-3	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Chloroform	67-66-3	EC621B/WT	0.98	µg/m³	<0.98	3.91	3.91	10.4	<1.02
Chloroform	67-66-3	E621B/WT	0.20	ppbv	<0.20	0.80	0.80	2.14	<0.21
Chloromethane	74-87-3	EC621B/WT	0.41	µg/m³	<0.41	<0.41	0.64	<0.41	<0.43
Chloromethane	74-87-3	E621B/WT	0.20	ppbv	<0.20	<0.20	0.31	<0.20	<0.21
Cyclohexane	110-82-7	EC621B/WT	0.69	µg/m³	4.40	2.86	4.27	1.10	1.20
Cyclohexane	110-82-7	E621B/WT	0.20	ppbv	1.28	0.83	1.24	0.32	0.35
Dibromochloromethane	124-48-1	EC621B/WT	1.7	µg/m³	<1.7	<1.7	<1.7	<1.7	<1.8

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
Client sample ID									
Client sampling date / time					12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
					CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Dibromochloromethane	124-48-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dibromoethane, 1,2-	106-93-4	EC621B/WT	1.5	µg/m³	<1.5	<1.5	<1.5	<1.5	<1.6
Dibromoethane, 1,2-	106-93-4	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichlorobenzene, 1,2-	95-50-1	EC621B/WT	1.2	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.3
Dichlorobenzene, 1,2-	95-50-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichlorobenzene, 1,3-	541-73-1	EC621B/WT	1.2	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.3
Dichlorobenzene, 1,3-	541-73-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichlorobenzene, 1,4-	106-46-7	EC621B/WT	1.2	µg/m³	<1.2	<1.2	<1.2	<1.2	<1.3
Dichlorobenzene, 1,4-	106-46-7	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichlorodifluoromethane	75-71-8	EC621B/WT	1.0	µg/m³	122	3.3	2.4	12.0	127
Dichlorodifluoromethane	75-71-8	E621B/WT	0.20	ppbv	24.7	0.66	0.48	2.43	25.7
Dichloroethane, 1,1-	75-34-3	EC621B/WT	0.81	µg/m³	<0.81	<0.81	<0.81	<0.81	<0.85
Dichloroethane, 1,1-	75-34-3	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichloroethane, 1,2-	107-06-2	EC621B/WT	0.81	µg/m³	<0.81	<0.81	<0.81	<0.81	<0.85
Dichloroethane, 1,2-	107-06-2	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichloroethylene, 1,1-	75-35-4	EC621B/WT	0.79	µg/m³	<0.79	<0.79	<0.79	<0.79	<0.83
Dichloroethylene, 1,1-	75-35-4	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.21
Dichloroethylene, cis-1,2-	156-59-2	EC621B/WT	0.79	µg/m³	25.7	<0.79	<0.79	<0.79	25.2
Dichloroethylene, cis-1,2-	156-59-2	E621B/WT	0.20	ppbv	6.49	<0.20	<0.20	<0.20	6.36
Dichloroethylene, trans-1,2-	156-60-5	EC621B/WT	0.79	µg/m³	6.34	<0.79	<0.79	<0.79	6.34
Dichloroethylene, trans-1,2-	156-60-5	E621B/WT	0.20	ppbv	1.60	<0.20	<0.20	<0.20	1.60

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Dichloromethane	75-09-2	EC621B/WT	0.69	µg/m³		<0.69	<0.69	14.3	<0.69	<0.73
Dichloromethane	75-09-2	E621B/WT	0.20	ppbv		<0.20	<0.20	4.11	<0.20	<0.21
Dichloropropane, 1,2-	78-87-5	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<1.0
Dichloropropane, 1,2-	78-87-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Dichloropropylene, cis-1,3-	10061-01-5	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<1.0
Dichloropropylene, cis-1,3-	10061-01-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Dichloropropylene, cis+trans-1,3-	542-75-6	EC621B/WT	1.3	µg/m³		<1.8	<1.8	<1.8	<1.8	<1.9
Dichloropropylene, cis+trans-1,3-	542-75-6	E621B/WT	0.30	ppbv		<0.30	<0.30	<0.30	<0.30	<0.30
Dichloropropylene, trans-1,3-	10061-02-6	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<1.0
Dichloropropylene, trans-1,3-	10061-02-6	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	EC621B/WT	1.4	µg/m³		38.9	<1.4	<1.4	<1.4	40.3
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B/WT	0.20	ppbv		5.57	<0.20	<0.20	<0.20	5.76
Dioxane, 1,4-	123-91-1	EC621B/WT	0.72	µg/m³		<0.72	<0.72	<0.72	<0.72	<0.76
Dioxane, 1,4-	123-91-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Ethyl acetate	141-78-6	EC621B/WT	0.72	µg/m³		1.40	<0.72	245	<0.72	<0.76
Ethyl acetate	141-78-6	E621B/WT	0.20	ppbv		0.39	<0.20	68.1	<0.20	<0.21
Ethylbenzene	100-41-4	EC621B/WT	0.43	µg/m³		1.22	9.77	17.7	61.6	0.74
Ethylbenzene	100-41-4	E621B/WT	0.10	ppbv		0.28	2.25	4.08	14.2	0.17
Ethyltoluene, 4-	622-96-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	1.3	<1.0
Ethyltoluene, 4-	622-96-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	0.26	<0.21
Heptane, n-	142-82-5	EC621B/WT	0.82	µg/m³		4.22	3.77	6.72	3.03	1.31

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Heptane, n-	142-82-5	E621B/WT	0.20	ppbv		1.03	0.92	1.64	0.74	0.32
Hexachlorobutadiene	87-68-3	EC621B/WT	2.1	µg/m³		<2.1	<2.1	<2.1	<2.1	<2.2
Hexachlorobutadiene	87-68-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Hexane, n-	110-54-3	EC621B/WT	0.70	µg/m³		6.66	4.34	7.76	2.01	2.04
Hexane, n-	110-54-3	E621B/WT	0.20	ppbv		1.89 RRR	1.23 RRR	2.20 RRR	0.57 RRR	0.58 RRR
Hexanone, 2-	591-78-6	EC621B/WT	4.10	µg/m³		<4.10	<4.10	<4.10	<4.10	<4.10
Hexanone, 2-	591-78-6	E621B/WT	1.0	ppbv		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Methyl ethyl ketone [MEK]	78-93-3	EC621B/WT	0.59	µg/m³		1.09	0.59	1.74	0.65	<0.62
Methyl ethyl ketone [MEK]	78-93-3	E621B/WT	0.20	ppbv		0.37	0.20	0.59	0.22	<0.21
Methyl isobutyl ketone [MIBK]	108-10-1	EC621B/WT	0.82	µg/m³		<0.82	<0.82	<0.82	<0.82	<0.86
Methyl isobutyl ketone [MIBK]	108-10-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Methyl-tert-butyl ether [MTBE]	1634-04-4	EC621B/WT	0.72	µg/m³		<0.72	<0.72	<0.72	<0.72	<0.76
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Naphthalene	91-20-3	EC621B/WT	0.52	µg/m³		<0.52	0.63	0.84	0.63	<0.52
Naphthalene	91-20-3	E621B/WT	0.10	ppbv		<0.10	0.12	0.16	0.12	<0.10
Propylene	115-07-1	EC621B/WT	0.34	µg/m³		<1.03	<1.03	<5.34	4.54	<0.96
Propylene	115-07-1	E621B/WT	0.20	ppbv		<0.60 DLQ	<0.60 DLQ	<3.10 DLQ	2.64 AI	<0.56 DLQ
Styrene	100-42-5	EC621B/WT	0.85	µg/m³		<0.85	<0.85	0.89	<0.85	<0.89
Styrene	100-42-5	E621B/WT	0.20	ppbv		<0.20	<0.20	0.21	<0.20	<0.21

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Tetrachloroethane, 1,1,2,2-	79-34-5	EC621B/WT	1.4	µg/m³		<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Tetrachloroethylene	127-18-4	EC621B/WT	1.4	µg/m³		1.8	2.5	1.9	4.6	1.8
Tetrachloroethylene	127-18-4	E621B/WT	0.20	ppbv		0.26	0.37	0.28	0.68	0.26
Tetrahydrofuran	109-99-9	EC621B/WT	0.59	µg/m³		<0.59	<0.59	<0.59	<0.59	<0.62
Tetrahydrofuran	109-99-9	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Toluene	108-88-3	EC621B/WT	0.38	µg/m³		4.94	16.0	16.8	33.8	2.71
Toluene	108-88-3	E621B/WT	0.10	ppbv		1.31 RRR	4.24 RRR	4.46 RRR	8.96 RRR	0.72 RRR
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	EC621B/WT	1.5	µg/m³		<1.5	<1.5	<1.5	<1.5	<1.6
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Trichlorobenzene, 1,2,4-	120-82-1	EC621B/WT	1.5	µg/m³		<1.5	<1.5	<1.5	<1.5	<1.6
Trichlorobenzene, 1,2,4-	120-82-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Trichloroethane, 1,1,1-	71-55-6	EC621B/WT	1.1	µg/m³		<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethane, 1,1,1-	71-55-6	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Trichloroethane, 1,1,2-	79-00-5	EC621B/WT	1.1	µg/m³		<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethane, 1,1,2-	79-00-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Trichloroethylene	79-01-6	EC621B/WT	1.1	µg/m³		1.8	14.3	9.0	25.9	1.7
Trichloroethylene	79-01-6	E621B/WT	0.20	ppbv		0.34	2.67	1.68	4.82	0.32
Trichlorofluoromethane	75-69-4	EC621B/WT	1.1	µg/m³		8.4	<1.1	1.2	<1.1	8.7
Trichlorofluoromethane	75-69-4	E621B/WT	0.20	ppbv		1.50	<0.20	0.21	<0.20	1.55
Trimethylbenzene, 1,2,4-	95-63-6	EC621B/WT	1.0	µg/m³		1.0	2.4	2.1	2.8	<1.0

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Trimethylbenzene, 1,2,4-	95-63-6	E621B/WT	0.20	ppbv		0.21	0.48	0.42	0.56	<0.21
Trimethylbenzene, 1,3,5-	108-67-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Trimethylpentane, 2,2,4-	540-84-1	EC621B/WT	0.9	µg/m³		<0.9	<0.9	1.0	<0.9	<1.0
Trimethylpentane, 2,2,4-	540-84-1	E621B/WT	0.20	ppbv		<0.20	<0.20	0.21	<0.20	<0.21
Vinyl acetate	108-05-4	EC621B/WT	1.8	µg/m³		<1.8	<1.8	7.8	<1.8	<1.8
Vinyl acetate	108-05-4	E621B/WT	0.50	ppbv		<0.50	<0.50	2.22	<0.50	<0.52
Vinyl bromide	593-60-2	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Vinyl bromide	593-60-2	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Vinyl chloride	75-01-4	EC621B/WT	0.51	µg/m³		<0.51	<0.51	<0.51	<0.51	<0.54
Vinyl chloride	75-01-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.21
Xylene, m+p-	179601-23-1	EC621B/WT	0.87	µg/m³		3.17	47.8	53.4	257	2.65
Xylene, m+p-	179601-23-1	E621B/WT	0.20	ppbv		0.73	11.0	12.3	59.2	0.61
Xylene, o-	95-47-6	EC621B/WT	0.43	µg/m³		1.04	9.81	11.1	40.2	0.87
Xylene, o-	95-47-6	E621B/WT	0.10	ppbv		0.24	2.26	2.56	9.25	0.20
Xylenes, total	1330-20-7	EC621B/WT	1.3	µg/m³		4.2	57.6	64.5	297	3.5
Xylenes, total	1330-20-7	E621B/WT	0.30	ppbv		0.97	13.3	14.9	68.4	0.81
BTEX, total	----	EC621B/WT	1.2	µg/m³		13.9	86.1	102	397	8.8
BTEX, total	----	E621B/WT	0.30	ppbv		3.66	20.6	24.4	92.9	2.27
Hydrocarbons										
Aliphatic (C10-C12)	----	E593C/WT	15	µg/m³		<15	52	89	60	<15

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	24SVP13H	24SVP31H	24SVP35H	VAPOUR DUPLICATE
					Client sampling date / time	12-Dec-2024 11:28	11-Dec-2024 10:20	11-Dec-2024 10:53	11-Dec-2024 11:20	12-Dec-2024 00:00
						CG2418421-001	CG2418421-002	CG2418421-003	CG2418421-004	CG2418421-005
						Result	Result	Result	Result	Result
Hydrocarbons										
Aliphatic (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
Aliphatic (C6-C8)	----	E593C/WT	15	µg/m³		70	78	196	65	21
Aliphatic (C8-C10)	----	E593C/WT	15	µg/m³		59	73	108	141	15
Aromatic (C10-C12)	----	E593C/WT	15	µg/m³		<15	<15	<15	<15	<15
Aromatic (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
Aromatic (C6-C8)	----	E593C/WT	15	µg/m³		<15	<15	16	30	<15
Aromatic (C8-C10)	----	E593C/WT	15	µg/m³		<15	59	72	311	<15
F1 (C6-C10)	----	E593A/WT	15	µg/m³		122	206	371	545	34
F1-BTEX	----	EC592A/WT	15	µg/m³		108	120	269	148	25
F2 (C10-C16)	----	E593A/WT	15	µg/m³		20	79	130	122	<15
F2-Naphthalene	----	EC593D/WT	15	µg/m³		20	78	129	121	<15
TVOC (C10-C12)	----	E593C/WT	15	µg/m³		<15	52	89	60	<15
TVOC (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
TVOC (C6-C8)	----	E593C/WT	15	µg/m³		70	78	212	95	21
TVOC (C8-C10)	----	E593C/WT	15	µg/m³		59	132	180	452	15
Hydrocarbons Surrogates										
Bromofluorobenzene, 4-	460-00-4	E593C/WT	1	%		101	105	102	108	101
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E621B/WT	0.20	%		107	111	104	111	107

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2418421**	Page	: 1 of 9
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Issue Date	: 31-Dec-2024 08:28
C-O-C number	: ----		
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- 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)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Air**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Hydrocarbons	QC-1822157-002	----	Aromatic (C12-C16)	----	E593C	166 % LCS-H	50.0-150%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	*Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

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: **Air**

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*
Field Tests : Air Canister Information										
Air Canister VAPOUR DUPLICATE	EF001	12-Dec-2024	----	----	----		24-Dec-2024	----	12 days	
Field Tests : Air Canister Information										
Air Canister VW-05	EF001	12-Dec-2024	----	----	----		24-Dec-2024	----	12 days	
Field Tests : Air Canister Information										
Air Canister 24SVP13H	EF001	11-Dec-2024	----	----	----		24-Dec-2024	----	13 days	
Field Tests : Air Canister Information										
Air Canister 24SVP31H	EF001	11-Dec-2024	----	----	----		24-Dec-2024	----	13 days	
Field Tests : Air Canister Information										
Air Canister 24SVP35H	EF001	11-Dec-2024	----	----	----		24-Dec-2024	----	13 days	
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister VAPOUR DUPLICATE	E593C	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister VW-05	E593C	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓

Matrix: **Air**

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
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP13H	E593C	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP31H	E593C	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP35H	E593C	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister VAPOUR DUPLICATE	E593A	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister VW-05	E593A	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP13H	E593A	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP31H	E593A	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP35H	E593A	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister VAPOUR DUPLICATE	E629B-H	12-Dec-2024	----	----	----		27-Dec-2024	30 days	15 days	✓

Matrix: **Air**

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
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister VW-05	E629B-H	12-Dec-2024	----	----	----		27-Dec-2024	30 days	15 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP13H	E629B-H	11-Dec-2024	----	----	----		27-Dec-2024	30 days	16 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP31H	E629B-H	11-Dec-2024	----	----	----		27-Dec-2024	30 days	16 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP35H	E629B-H	11-Dec-2024	----	----	----		27-Dec-2024	30 days	16 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister VAPOUR DUPLICATE	E621B	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister VW-05	E621B	12-Dec-2024	----	----	----		24-Dec-2024	30 days	12 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP13H	E621B	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP31H	E621B	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP35H	E621B	11-Dec-2024	----	----	----		24-Dec-2024	30 days	13 days	✓

Legend & Qualifier Definitions

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: **Air**

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)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1823351	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1822157	1	5	20.0	5.0	✓
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1822156	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1822159	1	5	20.0	5.0	✓
Laboratory Control Samples (LCS)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1823351	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1822157	1	5	20.0	5.0	✓
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1822156	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1822159	1	5	20.0	5.0	✓
Method Blanks (MB)							
Air Canister Information	EF001	1821902	1	20	5.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1823351	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1822157	1	5	20.0	5.0	✓
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1822156	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1822159	1	5	20.0	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
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Volatile Organic Compounds (VOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
F1-BTEX in Canisters or Bags GC-MS (µg/m3)	EC592A ALS Environmental - Waterloo	Air	unit conversion	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
F2-Naphthalene in Canisters by GC-MS (ug/m3)	EC593D ALS Environmental - Waterloo	Air	CCME PHC	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ug/m3)	EC621B ALS Environmental - Waterloo	Air	unit conversion	Convert ppbV to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **CG2418421**	Page	: 1 of 11
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 13-Dec-2024 15:32
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 24-Dec-2024
C-O-C number	: ----	Issue Date	: 31-Dec-2024 08:28
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 5		
No. of samples analysed	: 5		

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
- 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*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo Air Quality, 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: **Air**

					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*
Permanent Gases (QC Lot: 1823351)											
CG2418421-001	VW-05	Carbon dioxide	124-38-9	E629B-H	0.050	%	7.26	7.11	2.06%	20%	----
		Carbon monoxide	630-08-0	E629B-H	0.050	%	<0.050	<0.050	0	Diff <2x LOR	----
		Methane	74-82-8	E629B-H	0.050	%	<0.050	<0.050	0	Diff <2x LOR	----
		Nitrogen	7727-37-9	E629B-H	1.0	%	69.5	67.3	3.11%	20%	----
		Oxygen	7782-44-7	E629B-H	0.10	%	16.1	15.6	3.16%	20%	----
Volatile Organic Compounds (QC Lot: 1822159)											
CG2418421-001	VW-05	Acetone	67-64-1	E621B	1.0	ppbv	3.9	3.9	0.01	Diff <2x LOR	----
		Allyl chloride	107-05-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Benzene	71-43-2	E621B	0.10	ppbv	1.10	1.13	2.59%	30%	----
		Benzyl chloride	100-44-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromoform	75-25-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Butadiene, 1,3-	106-99-0	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E621B	0.50	ppbv	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chloroform	67-66-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Cyclohexane	110-82-7	E621B	0.20	ppbv	1.28	1.29	0.01	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E621B	1.00	ppbv	24.7	25.1	1.69%	30%	----
		Dichloroethane, 1,1-	75-34-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1822159) - continued											
CG2418421-001	VW-05	Dichloroethylene, cis-1,2-	156-59-2	E621B	1.00	ppbv	6.49	6.65	0.16	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E621B	0.20	ppbv	1.60	1.54	3.80%	30%	----
		Dichloromethane	75-09-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropylene, cis+trans-1,3-	542-75-6	E621B	0.3	ppbv	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	1.00	ppbv	5.57	5.69	0.12	Diff <2x LOR	----
		Dioxane, 1,4-	123-91-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Ethyl acetate	141-78-6	E621B	0.20	ppbv	0.39	0.39	0.003	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E621B	0.10	ppbv	0.28	0.28	0.0006	Diff <2x LOR	----
		Ethyltoluene, 4-	622-96-8	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Heptane, n-	142-82-5	E621B	0.20	ppbv	1.03	1.05	0.02	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E621B	0.20	ppbv	1.89	1.94	2.68%	30%	----
		Hexanone, 2-	591-78-6	E621B	1.0	ppbv	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E621B	0.20	ppbv	0.37	0.40	0.03	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E621B	0.10	ppbv	<0.10	<0.10	0	Diff <2x LOR	----
		Propylene	115-07-1	E621B	0.62	ppbv	<0.60	<0.62	0.02	Diff <2x LOR	----
		Styrene	100-42-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E621B	0.20	ppbv	0.26	0.27	0.004	Diff <2x LOR	----
		Tetrahydrofuran	109-99-9	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Toluene	108-88-3	E621B	0.10	ppbv	1.31	1.26	4.05%	30%	----
		Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E621B	0.20	ppbv	0.34	0.33	0.004	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E621B	0.20	ppbv	1.50	1.52	1.69%	30%	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1822159) - continued											
CG2418421-001	VW-05	Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.20	ppbv	0.21	<0.20	0.006	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trimethylpentane, 2,2,4-	540-84-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Vinyl acetate	108-05-4	E621B	0.50	ppbv	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl bromide	593-60-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E621B	0.20	ppbv	0.73	0.72	0.006	Diff <2x LOR	----
		Xylene, o-	95-47-6	E621B	0.10	ppbv	0.24	0.24	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1822156)											
CG2418421-001	VW-05	F1 (C6-C10)	----	E593A	15	µg/m³	122	119	2.66%	30%	----
		F2 (C10-C16)	----	E593A	15	µg/m³	20	17	2	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1822157)											
CG2418421-001	VW-05	Aromatic (C10-C12)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		Aromatic (C12-C16)	----	E593C	30	µg/m³	<30	<30	0	Diff <2x LOR	----
		Aromatic (C6-C8)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		Aromatic (C8-C10)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		TVOC (C10-C12)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		TVOC (C12-C16)	----	E593C	30	µg/m³	<30	<30	0	Diff <2x LOR	----
		TVOC (C6-C8)	----	E593C	15	µg/m³	70	70	0.0824%	50%	----
		TVOC (C8-C10)	----	E593C	15	µg/m³	59	55	4	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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1821902)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Permanent Gases (QCLot: 1823351)						
Carbon dioxide	124-38-9	E629B-H	0.05	%	<0.050	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	<0.050	----
Methane	74-82-8	E629B-H	0.05	%	<0.050	----
Nitrogen	7727-37-9	E629B-H	1	%	<1.0	----
Oxygen	7782-44-7	E629B-H	0.1	%	<0.10	----
Volatile Organic Compounds (QCLot: 1822159)						
Acetone	67-64-1	E621B	1	ppbv	<1.0	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	<0.20	----
Benzene	71-43-2	E621B	0.1	ppbv	<0.10	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	<0.20	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	<0.20	----
Bromoform	75-25-2	E621B	0.2	ppbv	<0.20	----
Bromomethane	74-83-9	E621B	0.2	ppbv	<0.20	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	<0.20	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	<0.50	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	<0.20	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	<0.20	----
Chloroethane	75-00-3	E621B	0.2	ppbv	<0.20	----
Chloroform	67-66-3	E621B	0.2	ppbv	<0.20	----
Chloromethane	74-87-3	E621B	0.2	ppbv	<0.20	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	<0.20	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	<0.20	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	<0.20	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1822159) - continued						
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	<0.20	----
Dichloromethane	75-09-2	E621B	0.2	ppbv	<0.20	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	<0.20	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	<0.20	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	<0.20	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	<0.20	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	<0.10	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	<0.20	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	<0.20	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	<0.20	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	<0.20	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	<1.0	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	<0.20	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	<0.20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	<0.20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	<0.20	----
Naphthalene	91-20-3	E621B	0.1	ppbv	<0.10	----
Propylene	115-07-1	E621B	0.2	ppbv	<0.20	----
Styrene	100-42-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	<0.20	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	<0.20	----
Toluene	108-88-3	E621B	0.1	ppbv	<0.10	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	<0.20	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	<0.20	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	<0.20	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	<0.20	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1822159) - continued						
Vinyl acetate	108-05-4	E621B	0.5	ppbv	<0.50	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	<0.20	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	<0.20	----
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	<0.20	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	<0.10	----
Hydrocarbons (QCLot: 1822156)						
F1 (C6-C10)	----	E593A	15	µg/m³	<15	----
F2 (C10-C16)	----	E593A	15	µg/m³	<15	----
Hydrocarbons (QCLot: 1822157)						
Aromatic (C10-C12)	----	E593C	15	µg/m³	<15	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	<30	----
Aromatic (C6-C8)	----	E593C	15	µg/m³	<15	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	<15	----
TVOC (C10-C12)	----	E593C	15	µg/m³	<15	----
TVOC (C12-C16)	----	E593C	30	µg/m³	<30	----
TVOC (C6-C8)	----	E593C	15	µg/m³	<15	----
TVOC (C8-C10)	----	E593C	15	µg/m³	<15	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Permanent Gases (QCLot: 1823351)									
Carbon dioxide	124-38-9	E629B-H	0.05	%	4.98 %	96.9	70.0	130	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	0.747 %	95.6	70.0	130	----
Methane	74-82-8	E629B-H	0.05	%	15 %	101	70.0	130	----
Nitrogen	7727-37-9	E629B-H	1	%	50.4 %	98.8	70.0	130	----
Oxygen	7782-44-7	E629B-H	0.1	%	7.41 %	104	70.0	130	----
Volatile Organic Compounds (QCLot: 1822159)									
Acetone	67-64-1	E621B	1	ppbv	1.06 ppbv	97.6	70.0	130	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	1.04 ppbv	95.5	70.0	130	----
Benzene	71-43-2	E621B	0.1	ppbv	1.06 ppbv	95.9	70.0	130	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	1.06 ppbv	79.1	70.0	130	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	1.02 ppbv	99.2	70.0	130	----
Bromoform	75-25-2	E621B	0.2	ppbv	1.06 ppbv	99.6	70.0	130	----
Bromomethane	74-83-9	E621B	0.2	ppbv	1.04 ppbv	102	70.0	130	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	1.06 ppbv	86.1	70.0	130	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	1.06 ppbv	98.3	70.0	130	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	1.06 ppbv	99.0	70.0	130	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	1.07 ppbv	100	70.0	130	----
Chloroethane	75-00-3	E621B	0.2	ppbv	1.01 ppbv	95.3	70.0	130	----
Chloroform	67-66-3	E621B	0.2	ppbv	1.05 ppbv	94.9	70.0	130	----
Chloromethane	74-87-3	E621B	0.2	ppbv	1.01 ppbv	91.8	70.0	130	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	1.06 ppbv	92.8	70.0	130	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	1.07 ppbv	96.0	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	1.08 ppbv	93.4	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	1.06 ppbv	94.7	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	1.06 ppbv	95.7	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	1.05 ppbv	92.6	70.0	130	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	1.02 ppbv	91.7	70.0	130	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	1.04 ppbv	94.1	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	1.04 ppbv	102	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	1.04 ppbv	99.1	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	1.06 ppbv	97.7	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	1.06 ppbv	93.8	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1822159) - continued									
Dichloromethane	75-09-2	E621B	0.2	ppbv	1.04 ppbv	97.4	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	1.05 ppbv	94.0	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	1.05 ppbv	95.2	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	1.07 ppbv	90.1	70.0	130	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	0.97 ppbv	92.3	70.0	130	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	1.07 ppbv	91.5	70.0	130	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	1.05 ppbv	99.8	70.0	130	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	1.09 ppbv	97.9	70.0	130	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	1.06 ppbv	99.7	70.0	130	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	1.06 ppbv	94.1	70.0	130	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	1.09 ppbv	90.6	70.0	130	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	1.07 ppbv	93.4	70.0	130	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	1.09 ppbv	84.8	70.0	130	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	1.04 ppbv	99.0	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	1.07 ppbv	91.2	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	1.07 ppbv	85.7	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	1.07 ppbv	92.1	70.0	130	----
Naphthalene	91-20-3	E621B	0.1	ppbv	1.12 ppbv	78.5	70.0	130	----
Propylene	115-07-1	E621B	0.2	ppbv	1.08 ppbv	91.4	70.0	130	----
Styrene	100-42-5	E621B	0.2	ppbv	1.06 ppbv	96.3	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	1.07 ppbv	97.8	70.0	130	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	1.04 ppbv	108	70.0	130	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	1.04 ppbv	89.9	70.0	130	----
Toluene	108-88-3	E621B	0.1	ppbv	1.09 ppbv	94.2	70.0	130	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	1.03 ppbv	98.8	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	1.07 ppbv	86.3	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	1.05 ppbv	96.7	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	1.08 ppbv	92.1	70.0	130	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	1.08 ppbv	99.3	70.0	130	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	1.07 ppbv	95.2	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	1.07 ppbv	99.2	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	1.06 ppbv	100	70.0	130	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	1.06 ppbv	93.9	70.0	130	----
Vinyl acetate	108-05-4	E621B	0.5	ppbv	1.1 ppbv	90.2	70.0	130	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	1.04 ppbv	97.5	70.0	130	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	1.01 ppbv	96.9	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike: Target Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 1822159) - continued									
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	2.12 ppbv	101	70.0	130	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	1.07 ppbv	98.9	70.0	130	----
Hydrocarbons (QCLot: 1822156)									
F1 (C6-C10)	----	E593A	15	µg/m³	815 µg/m³	81.7	50.0	150	----
Hydrocarbons (QCLot: 1822157)									
Aromatic (C10-C12)	----	E593C	15	µg/m³	60.8 µg/m³	103	50.0	150	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	60.1 µg/m³	# 166	50.0	150	LCS-H
Aromatic (C6-C8)	----	E593C	15	µg/m³	60.1 µg/m³	101	50.0	150	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	59.6 µg/m³	107	50.0	150	----
TVOC (C10-C12)	----	E593C	15	µg/m³	121 µg/m³	103	50.0	150	----
TVOC (C12-C16)	----	E593C	30	µg/m³	120 µg/m³	144	50.0	150	----
TVOC (C6-C8)	----	E593C	15	µg/m³	120 µg/m³	106	50.0	150	----
TVOC (C8-C10)	----	E593C	15	µg/m³	119 µg/m³	108	50.0	150	----

Qualifiers

Qualifier	Description
LCS-H	*Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

ALS www.alsglobal.com

Environmental Division Calgary
Work Order Reference
CG2418421

Telephone : +1 403 407 1800

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Darby Madalena
Phone:	403-723-6867
	Company address below will appear on the final report
Street:	110, 140 Quarry Park Blvd SE
City/Province:	Calgary, AB
Postal Code:	T2C 2X5
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax darby.madalena@tetratech.com
Email 2 jaymes.going@tetratech.com
Email 3

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax EBA.Accounts.Payable@tetratech.com
Email 2

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges appl
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharg
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharg
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharg
☐ Same day [E2] if received by 10am M-S - 200% rush s
Additional fees may apply to rush requests on
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested,

Project Information

ALS Account # / Quote #:	CG22-EBAE100-0021
Job #:	SWM.SWOP04071-04.007
PO / AFE:	SWM.SWOP04071-04.007
LSD:	Monfort Pre-1972 Landfill

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Wendy Sears Sampler: Willem Verduyn

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	EP592	S621E - Aliphatic and Aromatics	S629B - Methane,CO2,CO,N2,O2	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	VW-05	12 Dec 24	11:28	AIR		R	R	R			
	~~XGG-5 (SVP)~~	—	—	~~AIR~~		~~R~~	~~R~~	~~R~~			
	~~XGG-6 (SVP)~~	—	—	~~AIR~~		~~R~~	~~R~~	~~R~~			
	~~XGG-18 (SVP)~~	—	—	~~AIR~~		~~R~~	~~R~~	~~R~~			
	24SVP13H	11 Dec 24	10:20	AIR		R	R	R			
	24SVP31H	11 Dec 24	10:53	AIR		R	R	R			
	24SVP35H	11 Dec 24	11:20	AIR		R	R	R			
	VAPOUR DUPLICATE	12 Dec 24		AIR							

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

19-1

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)

Released by: W Cadelago Date: 13 Dec 24 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: FG Date: 13-12-2024 Time: 3:27

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

If any samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

FEB 2022 FRONT

CERTIFICATE OF ANALYSIS

Work Order	: **CG2502146**		
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 403 203 3355	Telephone	: +1 519 886 6910
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 26-Feb-2025 15:15
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 05-Mar-2025
C-O-C number	: ----	Issue Date	: 12-Mar-2025 15:25
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
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
- Surrogate Control Limits

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*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Air Quality, 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*
-	no units
%	percent
inches Hg	inches of mercury
ppbv	parts per billion (volume/volume)
µg/m³	micrograms per cubic metre

<: 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.

Qualifiers

Qualifier	Description
AI	Analytical interferences may be present. Result may be biased high.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLQ	Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion ratio did not meet acceptance criteria.

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
Client sample ID									
Client sampling date / time					25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
					CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
					Result	Result	Result	Result	Result
Field Tests									
ID, batch proof	----	EF001/WT	-	-	241208.217	241121.109	250102.117	241202.127	250102.102
ID, canister	----	EF001/WT	-	-	01400-0321	01400-0481	01400-0407	01400-0107	01400-0313
ID, regulator	----	EF001/WT	-	-	G383	G96	G151	G105	G158
Pressure on receipt	----	EF001/WT	0.10	inches Hg	-6.54	-7.97	-8.38	-5.11	-6.54
Permanent Gases									
Carbon dioxide	124-38-9	E629B-H/WT	0.050	%	7.86	1.51	6.50	1.29	1.35
Carbon monoxide	630-08-0	E629B-H/WT	0.050	%	<0.050	<0.050	<0.050	<0.050	<0.050
Methane	74-82-8	E629B-H/WT	0.050	%	<0.050	<0.050	<0.050	<0.050	<0.050
Nitrogen	7727-37-9	E629B-H/WT	1.0	%	73.3	76.7	75.1	75.4	70.0
Oxygen	7782-44-7	E629B-H/WT	0.10	%	17.3	19.5	16.3	20.4	19.4
Volatile Organic Compounds									
Acetone	67-64-1	EC621B/WT	2.4	µg/m³	6.9	20.0	17.6	10.0	5.9
Acetone	67-64-1	E621B/WT	1.0	ppbv	2.9	8.4	7.4 AI	4.2	2.5
Allyl chloride	107-05-1	EC621B/WT	0.63	µg/m³	<0.63	<0.63	<0.63	<0.63	<0.63
Allyl chloride	107-05-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	71-43-2	EC621B/WT	0.32	µg/m³	<0.32	1.34	0.64	<0.32	1.15
Benzene	71-43-2	E621B/WT	0.10	ppbv	<0.10	0.42	0.20	<0.10	0.36
Benzyl chloride	100-44-7	EC621B/WT	1.0	µg/m³	<1.0	<1.0	<1.0	<1.0	<1.0
Benzyl chloride	100-44-7	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	75-27-4	EC621B/WT	1.3	µg/m³	<1.3	<1.3	<1.3	<1.3	<1.3
Bromodichloromethane	75-27-4	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Bromoform	75-25-2	EC621B/WT	2.1	µg/m³		<2.1	<2.1	<2.1	<2.1	<2.1
Bromoform	75-25-2	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Bromomethane	74-83-9	EC621B/WT	0.78	µg/m³		<0.78	<0.78	<0.78	<0.78	<0.78
Bromomethane	74-83-9	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Butadiene, 1,3-	106-99-0	EC621B/WT	0.44	µg/m³		<0.44	<0.44	<0.44	<0.44	<0.44
Butadiene, 1,3-	106-99-0	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Carbon disulfide	75-15-0	EC621B/WT	1.6	µg/m³		<1.6	<1.6	<1.6	4.8	20.1
Carbon disulfide	75-15-0	E621B/WT	0.50	ppbv		<0.50	<0.50	<0.50	1.56	6.46
Carbon tetrachloride	56-23-5	EC621B/WT	1.30	µg/m³		<1.26	<1.26	<1.26	<1.26	<1.26
Carbon tetrachloride	56-23-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	108-90-7	EC621B/WT	0.92	µg/m³		<0.92	<0.92	<0.92	<0.92	<0.92
Chlorobenzene	108-90-7	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Chloroethane	75-00-3	EC621B/WT	0.53	µg/m³		<0.53	<0.53	<0.53	<0.53	<0.53
Chloroethane	75-00-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	67-66-3	EC621B/WT	0.98	µg/m³		<0.98	<0.98	<0.98	1.46	1.81
Chloroform	67-66-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	0.30	0.37
Chloromethane	74-87-3	EC621B/WT	0.41	µg/m³		<0.41	<0.41	1.32	<0.41	<0.41
Chloromethane	74-87-3	E621B/WT	0.20	ppbv		<0.20	<0.20	0.64	<0.20	<0.20
Cyclohexane	110-82-7	EC621B/WT	0.69	µg/m³		<0.69	<0.69	<0.69	<0.69	<0.69
Cyclohexane	110-82-7	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	124-48-1	EC621B/WT	1.7	µg/m³		<1.7	<1.7	<1.7	<1.7	<1.7

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dibromoethane, 1,2-	106-93-4	EC621B/WT	1.5	µg/m³		<1.5	<1.5	<1.5	<1.5	<1.5
Dibromoethane, 1,2-	106-93-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorobenzene, 1,2-	95-50-1	EC621B/WT	1.2	µg/m³		<1.2	<1.2	<1.2	<1.2	<1.2
Dichlorobenzene, 1,2-	95-50-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorobenzene, 1,3-	541-73-1	EC621B/WT	1.2	µg/m³		<1.2	<1.2	<1.2	<1.2	<1.2
Dichlorobenzene, 1,3-	541-73-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorobenzene, 1,4-	106-46-7	EC621B/WT	1.2	µg/m³		<1.2	<1.2	<1.2	<1.2	<1.2
Dichlorobenzene, 1,4-	106-46-7	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorodifluoromethane	75-71-8	EC621B/WT	1.0	µg/m³		53.4	122	519	3.1	3.1
Dichlorodifluoromethane	75-71-8	E621B/WT	0.20	ppbv		10.8	24.6	105	0.63	0.62
Dichloroethane, 1,1-	75-34-3	EC621B/WT	0.81	µg/m³		<0.81	<0.81	<0.81	<0.81	<0.81
Dichloroethane, 1,1-	75-34-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloroethane, 1,2-	107-06-2	EC621B/WT	0.81	µg/m³		<0.81	<0.81	<0.81	<0.81	<0.81
Dichloroethane, 1,2-	107-06-2	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloroethylene, 1,1-	75-35-4	EC621B/WT	0.79	µg/m³		<0.79	<0.79	<0.79	<0.79	<0.79
Dichloroethylene, 1,1-	75-35-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloroethylene, cis-1,2-	156-59-2	EC621B/WT	0.79	µg/m³		<0.79	30.2	2.46	<0.79	<0.79
Dichloroethylene, cis-1,2-	156-59-2	E621B/WT	0.20	ppbv		<0.20	7.61	0.62	<0.20	<0.20
Dichloroethylene, trans-1,2-	156-60-5	EC621B/WT	0.79	µg/m³		<0.79	7.61	<0.79	<0.79	<0.79
Dichloroethylene, trans-1,2-	156-60-5	E621B/WT	0.20	ppbv		<0.20	1.92	<0.20	<0.20	<0.20

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Dichloromethane	75-09-2	EC621B/WT	0.69	µg/m³		<0.69	<0.69	<0.69	<0.69	<0.69
Dichloromethane	75-09-2	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloropropane, 1,2-	78-87-5	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Dichloropropane, 1,2-	78-87-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloropropylene, cis-1,3-	10061-01-5	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Dichloropropylene, cis-1,3-	10061-01-5	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichloropropylene, cis+trans-1,3-	542-75-6	EC621B/WT	1.3	µg/m³		<1.8	<1.8	<1.8	<1.8	<1.8
Dichloropropylene, cis+trans-1,3-	542-75-6	E621B/WT	0.30	ppbv		<0.30	<0.30	<0.30	<0.30	<0.30
Dichloropropylene, trans-1,3-	10061-02-6	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Dichloropropylene, trans-1,3-	10061-02-6	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	EC621B/WT	1.4	µg/m³		29.2	42.2	57.5	<1.4	<1.4
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B/WT	0.20	ppbv		4.18	6.04	8.23	<0.20	<0.20
Dioxane, 1,4-	123-91-1	EC621B/WT	0.72	µg/m³		<0.72	<0.72	<0.72	<0.72	<0.72
Dioxane, 1,4-	123-91-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Ethyl acetate	141-78-6	EC621B/WT	0.72	µg/m³		<5.95	1.80	1.01	1.37	<0.72
Ethyl acetate	141-78-6	E621B/WT	0.20	ppbv		<1.65 DLQ	0.50	0.28	0.38	<0.20
Ethylbenzene	100-41-4	EC621B/WT	0.43	µg/m³		1.17	1.30	0.43	3.00	10.8
Ethylbenzene	100-41-4	E621B/WT	0.10	ppbv		0.27	0.30	0.10	0.69	2.48
Ethyltoluene, 4-	622-96-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.0
Ethyltoluene, 4-	622-96-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Heptane, n-	142-82-5	EC621B/WT	0.82	µg/m³		1.02	<0.82	<0.82	<0.82	<0.82

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Heptane, n-	142-82-5	E621B/WT	0.20	ppbv		0.25	<0.20	<0.20	<0.20	<0.20
Hexachlorobutadiene	87-68-3	EC621B/WT	2.1	µg/m³		<2.1	<2.1	<2.1	<2.1	<2.1
Hexachlorobutadiene	87-68-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Hexane, n-	110-54-3	EC621B/WT	0.70	µg/m³		<0.70	<0.70	<0.70	<0.70	<0.70
Hexane, n-	110-54-3	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Hexanone, 2-	591-78-6	EC621B/WT	4.10	µg/m³		<4.10	<4.10	<4.10	<4.10	<4.10
Hexanone, 2-	591-78-6	E621B/WT	1.0	ppbv		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	98-82-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Methyl ethyl ketone [MEK]	78-93-3	EC621B/WT	0.59	µg/m³		0.71	0.97	2.33	0.65	<0.59
Methyl ethyl ketone [MEK]	78-93-3	E621B/WT	0.20	ppbv		0.24	0.33	0.79	0.22	<0.20
Methyl isobutyl ketone [MIBK]	108-10-1	EC621B/WT	0.82	µg/m³		<0.82	<0.82	<0.82	<0.82	<0.82
Methyl isobutyl ketone [MIBK]	108-10-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Methyl-tert-butyl ether [MTBE]	1634-04-4	EC621B/WT	0.72	µg/m³		<0.72	<0.72	<0.72	<0.72	<0.72
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Naphthalene	91-20-3	EC621B/WT	0.52	µg/m³		<0.52	<0.52	<0.52	<0.52	<0.52
Naphthalene	91-20-3	E621B/WT	0.10	ppbv		<0.10	<0.10	<0.10	<0.10	<0.10
Propylene	115-07-1	EC621B/WT	0.34	µg/m³		<0.55	<0.65	<4.65	<0.34	<0.55
Propylene	115-07-1	E621B/WT	0.20	ppbv		<0.32 DLQ	<0.38 DLQ	<2.70 DLQ	<0.20	<0.32 DLQ
Styrene	100-42-5	EC621B/WT	0.85	µg/m³		1.62	<0.85	<0.85	<0.85	<0.85
Styrene	100-42-5	E621B/WT	0.20	ppbv		0.38	<0.20	<0.20	<0.20	<0.20

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
Client sample ID					VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
Client sampling date / time					25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
					CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds									
Tetrachloroethane, 1,1,2,2-	79-34-5	EC621B/WT	1.4	µg/m³	<1.4	<1.4	<1.4	<1.4	<1.4
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethylene	127-18-4	EC621B/WT	1.4	µg/m³	4.5	<1.4	1.4	<1.4	1.8
Tetrachloroethylene	127-18-4	E621B/WT	0.20	ppbv	0.66	<0.20	0.20	<0.20	0.26
Tetrahydrofuran	109-99-9	EC621B/WT	0.59	µg/m³	<0.59	<0.59	<0.59	<0.59	<0.59
Tetrahydrofuran	109-99-9	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	108-88-3	EC621B/WT	0.38	µg/m³	1.58	3.77	3.47	4.60	4.52
Toluene	108-88-3	E621B/WT	0.10	ppbv	0.42	1.00	0.92	1.22	1.20
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	EC621B/WT	1.5	µg/m³	<1.5	<1.5	<1.5	<1.5	<1.5
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorobenzene, 1,2,4-	120-82-1	EC621B/WT	1.5	µg/m³	<1.5	<1.5	<1.5	<1.5	<1.5
Trichlorobenzene, 1,2,4-	120-82-1	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	71-55-6	EC621B/WT	1.1	µg/m³	<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethane, 1,1,1-	71-55-6	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,2-	79-00-5	EC621B/WT	1.1	µg/m³	<1.1	<1.1	<1.1	<1.1	<1.1
Trichloroethane, 1,1,2-	79-00-5	E621B/WT	0.20	ppbv	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	79-01-6	EC621B/WT	1.1	µg/m³	1.2	22.5	2.0	3.0	5.0
Trichloroethylene	79-01-6	E621B/WT	0.20	ppbv	0.22	4.19	0.38	0.55	0.93
Trichlorofluoromethane	75-69-4	EC621B/WT	1.1	µg/m³	<1.1	7.9	<1.1	<1.1	1.1
Trichlorofluoromethane	75-69-4	E621B/WT	0.20	ppbv	<0.20	1.41	<0.20	<0.20	0.20
Trimethylbenzene, 1,2,4-	95-63-6	EC621B/WT	1.0	µg/m³	1.9	2.1	1.6	<1.0	1.1

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Volatile Organic Compounds										
Trimethylbenzene, 1,2,4-	95-63-6	E621B/WT	0.20	ppbv		0.39	0.42	0.32	<0.20	0.23
Trimethylbenzene, 1,3,5-	108-67-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	<1.0	<1.0	<1.0
Trimethylbenzene, 1,3,5-	108-67-8	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Trimethylpentane, 2,2,4-	540-84-1	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Trimethylpentane, 2,2,4-	540-84-1	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl acetate	108-05-4	EC621B/WT	1.8	µg/m³		<1.8	<1.8	<1.8	<1.8	<1.8
Vinyl acetate	108-05-4	E621B/WT	0.50	ppbv		<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl bromide	593-60-2	EC621B/WT	0.9	µg/m³		<0.9	<0.9	<0.9	<0.9	<0.9
Vinyl bromide	593-60-2	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl chloride	75-01-4	EC621B/WT	0.51	µg/m³		<0.51	<0.51	<0.51	<0.51	<0.51
Vinyl chloride	75-01-4	E621B/WT	0.20	ppbv		<0.20	<0.20	<0.20	<0.20	<0.20
Xylene, m+p-	179601-23-1	EC621B/WT	0.87	µg/m³		4.73	4.91	2.08	17.4	39.8
Xylene, m+p-	179601-23-1	E621B/WT	0.20	ppbv		1.09	1.13	0.48	4.02	9.17
Xylene, o-	95-47-6	EC621B/WT	0.43	µg/m³		1.61	1.87	0.96	4.21	13.1
Xylene, o-	95-47-6	E621B/WT	0.10	ppbv		0.37	0.43	0.22	0.97	3.01
Xylenes, total	1330-20-7	EC621B/WT	1.3	µg/m³		6.3	6.8	3.0	21.7	52.9
Xylenes, total	1330-20-7	E621B/WT	0.30	ppbv		1.46	1.56	0.70	4.99	12.2
BTEX, total	----	EC621B/WT	1.2	µg/m³		9.1	13.2	7.6	29.3	69.3
BTEX, total	----	E621B/WT	0.30	ppbv		2.15	3.28	1.92	6.90	16.2
Hydrocarbons										
Aliphatic (C10-C12)	----	E593C/WT	15	µg/m³		47	<15	21	18	37

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	VW-05	25XCG-4 (SVP)	XCG-13 (SVP)	24SVP13H	24SVP31H
					Client sampling date / time	25-Feb-2025 15:26	25-Feb-2025 14:36	25-Feb-2025 12:30	25-Feb-2025 09:22	25-Feb-2025 09:45
						CG2502146-001	CG2502146-002	CG2502146-003	CG2502146-004	CG2502146-005
						Result	Result	Result	Result	Result
Hydrocarbons										
Aliphatic (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
Aliphatic (C6-C8)	----	E593C/WT	15	µg/m³		36	40	32	16	20
Aliphatic (C8-C10)	----	E593C/WT	15	µg/m³		78	107	42	36	51
Aromatic (C10-C12)	----	E593C/WT	15	µg/m³		<15	<15	<15	<15	<15
Aromatic (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
Aromatic (C6-C8)	----	E593C/WT	15	µg/m³		<15	<15	<15	<15	<15
Aromatic (C8-C10)	----	E593C/WT	15	µg/m³		<15	<15	<15	24	59
F1 (C6-C10)	----	E593A/WT	15	µg/m³		109	137	67	72	122
F1-BTEX	----	EC592A/WT	15	µg/m³		100	124	59	43	53
F2 (C10-C16)	----	E593A/WT	15	µg/m³		<100 DLB	<100 DLB	<100 DLB	<100 DLB	<100 DLB
F2-Naphthalene	----	EC593D/WT	15	µg/m³		<100	<100	<100	<100	<100
TVOC (C10-C12)	----	E593C/WT	15	µg/m³		47	<15	21	18	37
TVOC (C12-C16)	----	E593C/WT	30	µg/m³		<30	<30	<30	<30	<30
TVOC (C6-C8)	----	E593C/WT	15	µg/m³		36	40	32	16	20
TVOC (C8-C10)	----	E593C/WT	15	µg/m³		78	107	42	60	110
Hydrocarbons Surrogates										
Bromofluorobenzene, 4-	460-00-4	E593C/WT	1	%		97.0	94.8	96.9	95.9	97.8
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E621B/WT	0.20	%		98.3	93.8	95.9	94.3	93.8

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

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

					Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
					Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		CG2502146-006	CG2502146-007	----	----	----
						Result	Result	----	----	----
Field Tests										
ID, batch proof	----	EF001/WT	-	-		241215.116	241213.303	----	----	----
ID, canister	----	EF001/WT	-	-		01400-0041	01400-0269	----	----	----
ID, regulator	----	EF001/WT	-	-		G363	NR	----	----	----
Pressure on receipt	----	EF001/WT	0.10	inches Hg		-7.36	-8.17	----	----	----
Permanent Gases										
Carbon dioxide	124-38-9	E629B-H/WT	0.050	%		1.04	1.25	----	----	----
Carbon monoxide	630-08-0	E629B-H/WT	0.050	%		<0.050	<0.050	----	----	----
Methane	74-82-8	E629B-H/WT	0.050	%		<0.050	<0.050	----	----	----
Nitrogen	7727-37-9	E629B-H/WT	1.0	%		72.7	73.7	----	----	----
Oxygen	7782-44-7	E629B-H/WT	0.10	%		19.8	19.1	----	----	----
Volatile Organic Compounds										
Acetone	67-64-1	EC621B/WT	2.4	µg/m³		10.9	7.6	----	----	----
Acetone	67-64-1	E621B/WT	1.0	ppbv		4.6	3.2	----	----	----
Allyl chloride	107-05-1	EC621B/WT	0.63	µg/m³		<0.63	<0.63	----	----	----
Allyl chloride	107-05-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Benzene	71-43-2	EC621B/WT	0.32	µg/m³		0.54	<0.32	----	----	----
Benzene	71-43-2	E621B/WT	0.10	ppbv		0.17	<0.10	----	----	----
Benzyl chloride	100-44-7	EC621B/WT	1.0	µg/m³		<1.0	<1.0	----	----	----
Benzyl chloride	100-44-7	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Bromodichloromethane	75-27-4	EC621B/WT	1.3	µg/m³		<1.3	<1.3	----	----	----
Bromodichloromethane	75-27-4	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
					Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
						CG2502146-006	CG2502146-007	----	----	----
						Result	Result	----	----	----
Volatile Organic Compounds										
Bromoform	75-25-2	EC621B/WT	2.1	µg/m³		<2.1	<2.1	----	----	----
Bromoform	75-25-2	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Bromomethane	74-83-9	EC621B/WT	0.78	µg/m³		<0.78	<0.78	----	----	----
Bromomethane	74-83-9	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Butadiene, 1,3-	106-99-0	EC621B/WT	0.44	µg/m³		<0.62	<0.44	----	----	----
Butadiene, 1,3-	106-99-0	E621B/WT	0.20	ppbv		<0.28 DLQ	<0.20	----	----	----
Carbon disulfide	75-15-0	EC621B/WT	1.6	µg/m³		28.8	<1.6	----	----	----
Carbon disulfide	75-15-0	E621B/WT	0.50	ppbv		9.26	<0.50	----	----	----
Carbon tetrachloride	56-23-5	EC621B/WT	1.30	µg/m³		<1.26	<1.26	----	----	----
Carbon tetrachloride	56-23-5	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Chlorobenzene	108-90-7	EC621B/WT	0.92	µg/m³		<0.92	<0.92	----	----	----
Chlorobenzene	108-90-7	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Chloroethane	75-00-3	EC621B/WT	0.53	µg/m³		<0.53	<0.53	----	----	----
Chloroethane	75-00-3	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Chloroform	67-66-3	EC621B/WT	0.98	µg/m³		4.10	<0.98	----	----	----
Chloroform	67-66-3	E621B/WT	0.20	ppbv		0.84	<0.20	----	----	----
Chloromethane	74-87-3	EC621B/WT	0.41	µg/m³		<0.41	<0.41	----	----	----
Chloromethane	74-87-3	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Cyclohexane	110-82-7	EC621B/WT	0.69	µg/m³		<0.69	<0.69	----	----	----
Cyclohexane	110-82-7	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dibromochloromethane	124-48-1	EC621B/WT	1.7	µg/m³		<1.7	<1.7	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
					Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
						CG2502146-006	CG2502146-007	----	----	----
						Result	Result	----	----	----
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dibromoethane, 1,2-	106-93-4	EC621B/WT	1.5	µg/m³		<1.5	<1.5	----	----	----
Dibromoethane, 1,2-	106-93-4	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichlorobenzene, 1,2-	95-50-1	EC621B/WT	1.2	µg/m³		<1.2	<1.2	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichlorobenzene, 1,3-	541-73-1	EC621B/WT	1.2	µg/m³		<1.2	<1.2	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichlorobenzene, 1,4-	106-46-7	EC621B/WT	1.2	µg/m³		<1.2	<1.2	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichlorodifluoromethane	75-71-8	EC621B/WT	1.0	µg/m³		9.0	52.9	----	----	----
Dichlorodifluoromethane	75-71-8	E621B/WT	0.20	ppbv		1.83	10.7	----	----	----
Dichloroethane, 1,1-	75-34-3	EC621B/WT	0.81	µg/m³		<0.81	<0.81	----	----	----
Dichloroethane, 1,1-	75-34-3	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichloroethane, 1,2-	107-06-2	EC621B/WT	0.81	µg/m³		<0.81	<0.81	----	----	----
Dichloroethane, 1,2-	107-06-2	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichloroethylene, 1,1-	75-35-4	EC621B/WT	0.79	µg/m³		<0.79	<0.79	----	----	----
Dichloroethylene, 1,1-	75-35-4	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	EC621B/WT	0.79	µg/m³		<0.79	<0.79	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	EC621B/WT	0.79	µg/m³		<0.79	<0.79	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	24SVP35H	VAPOUR DUPLICATE	----	----	----
Client sampling date / time					25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
					CG2502146-006	CG2502146-007	----	----	----
					Result	Result	----	----	----
Volatile Organic Compounds									
Dichloromethane	75-09-2	EC621B/WT	0.69	µg/m³	<0.69	<0.69	----	----	----
Dichloromethane	75-09-2	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Dichloropropane, 1,2-	78-87-5	EC621B/WT	0.9	µg/m³	<0.9	<0.9	----	----	----
Dichloropropane, 1,2-	78-87-5	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	EC621B/WT	0.9	µg/m³	<0.9	<0.9	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	EC621B/WT	1.3	µg/m³	<1.8	<1.8	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E621B/WT	0.30	ppbv	<0.30	<0.30	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	EC621B/WT	0.9	µg/m³	<0.9	<0.9	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	EC621B/WT	1.4	µg/m³	<1.4	29.2	----	----	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B/WT	0.20	ppbv	<0.20	4.17	----	----	----
Dioxane, 1,4-	123-91-1	EC621B/WT	0.72	µg/m³	<0.72	<0.72	----	----	----
Dioxane, 1,4-	123-91-1	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Ethyl acetate	141-78-6	EC621B/WT	0.72	µg/m³	<0.72	<0.72	----	----	----
Ethyl acetate	141-78-6	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Ethylbenzene	100-41-4	EC621B/WT	0.43	µg/m³	24.4	1.13	----	----	----
Ethylbenzene	100-41-4	E621B/WT	0.10	ppbv	5.62	0.26	----	----	----
Ethyltoluene, 4-	622-96-8	EC621B/WT	1.0	µg/m³	<1.0	<1.0	----	----	----
Ethyltoluene, 4-	622-96-8	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Heptane, n-	142-82-5	EC621B/WT	0.82	µg/m³	2.13	<0.82	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

					Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
					Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		CG2502146-006	CG2502146-007	----	----	----
						Result	Result	----	----	----
Volatile Organic Compounds										
Heptane, n-	142-82-5	E621B/WT	0.20	ppbv		0.52	<0.20	----	----	----
Hexachlorobutadiene	87-68-3	EC621B/WT	2.1	µg/m³		<2.1	<2.1	----	----	----
Hexachlorobutadiene	87-68-3	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Hexane, n-	110-54-3	EC621B/WT	0.70	µg/m³		0.78	<0.70	----	----	----
Hexane, n-	110-54-3	E621B/WT	0.20	ppbv		0.22	<0.20	----	----	----
Hexanone, 2-	591-78-6	EC621B/WT	4.10	µg/m³		<4.10	<4.10	----	----	----
Hexanone, 2-	591-78-6	E621B/WT	1.0	ppbv		<1.0	<1.0	----	----	----
Isopropylbenzene	98-82-8	EC621B/WT	1.0	µg/m³		<1.0	<1.0	----	----	----
Isopropylbenzene	98-82-8	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	EC621B/WT	0.59	µg/m³		0.62	<0.59	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	E621B/WT	0.20	ppbv		0.21	<0.20	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	EC621B/WT	0.82	µg/m³		<0.82	<0.82	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	EC621B/WT	0.72	µg/m³		<0.72	<0.72	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Naphthalene	91-20-3	EC621B/WT	0.52	µg/m³		<0.52	<0.52	----	----	----
Naphthalene	91-20-3	E621B/WT	0.10	ppbv		<0.10	<0.10	----	----	----
Propylene	115-07-1	EC621B/WT	0.34	µg/m³		<0.58	<0.34	----	----	----
Propylene	115-07-1	E621B/WT	0.20	ppbv		<0.34 DLQ	<0.20	----	----	----
Styrene	100-42-5	EC621B/WT	0.85	µg/m³		<0.85	1.66	----	----	----
Styrene	100-42-5	E621B/WT	0.20	ppbv		<0.20	0.39	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
					Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
						CG2502146-006	CG2502146-007	----	----	----
						Result	Result	----	----	----
Volatile Organic Compounds										
Tetrachloroethane, 1,1,2,2-	79-34-5	EC621B/WT	1.4	µg/m³		<1.4	<1.4	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Tetrachloroethylene	127-18-4	EC621B/WT	1.4	µg/m³		3.3	4.3	----	----	----
Tetrachloroethylene	127-18-4	E621B/WT	0.20	ppbv		0.49	0.63	----	----	----
Tetrahydrofuran	109-99-9	EC621B/WT	0.59	µg/m³		<0.59	<0.59	----	----	----
Tetrahydrofuran	109-99-9	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Toluene	108-88-3	EC621B/WT	0.38	µg/m³		8.97	1.58	----	----	----
Toluene	108-88-3	E621B/WT	0.10	ppbv		2.38	0.42	----	----	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	EC621B/WT	1.5	µg/m³		<1.5	<1.5	----	----	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	EC621B/WT	1.5	µg/m³		<1.5	<1.5	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Trichloroethane, 1,1,1-	71-55-6	EC621B/WT	1.1	µg/m³		<1.1	<1.1	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Trichloroethane, 1,1,2-	79-00-5	EC621B/WT	1.1	µg/m³		<1.1	<1.1	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Trichloroethylene	79-01-6	EC621B/WT	1.1	µg/m³		8.7	1.2	----	----	----
Trichloroethylene	79-01-6	E621B/WT	0.20	ppbv		1.62	0.23	----	----	----
Trichlorofluoromethane	75-69-4	EC621B/WT	1.1	µg/m³		<1.1	<1.1	----	----	----
Trichlorofluoromethane	75-69-4	E621B/WT	0.20	ppbv		<0.20	<0.20	----	----	----
Trimethylbenzene, 1,2,4-	95-63-6	EC621B/WT	1.0	µg/m³		2.0	1.7	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	24SVP35H	VAPOUR DUPLICATE	----	----	----
Client sample ID					24SVP35H	VAPOUR DUPLICATE	----	----	----
Client sampling date / time					25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
					CG2502146-006	CG2502146-007	----	----	----
					Result	Result	----	----	----
Volatile Organic Compounds									
Trimethylbenzene, 1,2,4-	95-63-6	E621B/WT	0.20	ppbv	0.41	0.35	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	EC621B/WT	1.0	µg/m³	<1.0	<1.0	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Trimethylpentane, 2,2,4-	540-84-1	EC621B/WT	0.9	µg/m³	<0.9	<0.9	----	----	----
Trimethylpentane, 2,2,4-	540-84-1	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Vinyl acetate	108-05-4	EC621B/WT	1.8	µg/m³	<1.8	<1.8	----	----	----
Vinyl acetate	108-05-4	E621B/WT	0.50	ppbv	<0.50	<0.50	----	----	----
Vinyl bromide	593-60-2	EC621B/WT	0.9	µg/m³	<0.9	<0.9	----	----	----
Vinyl bromide	593-60-2	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Vinyl chloride	75-01-4	EC621B/WT	0.51	µg/m³	<0.51	<0.51	----	----	----
Vinyl chloride	75-01-4	E621B/WT	0.20	ppbv	<0.20	<0.20	----	----	----
Xylene, m+p-	179601-23-1	EC621B/WT	0.87	µg/m³	105	4.60	----	----	----
Xylene, m+p-	179601-23-1	E621B/WT	0.20	ppbv	24.2	1.06	----	----	----
Xylene, o-	95-47-6	EC621B/WT	0.43	µg/m³	25.3	1.48	----	----	----
Xylene, o-	95-47-6	E621B/WT	0.10	ppbv	5.83	0.34	----	----	----
Xylenes, total	1330-20-7	EC621B/WT	1.3	µg/m³	130	6.1	----	----	----
Xylenes, total	1330-20-7	E621B/WT	0.30	ppbv	30.0	1.40	----	----	----
BTEX, total	----	EC621B/WT	1.2	µg/m³	164	8.8	----	----	----
BTEX, total	----	E621B/WT	0.30	ppbv	38.2	2.08	----	----	----
Hydrocarbons									
Aliphatic (C10-C12)	----	E593C/WT	15	µg/m³	75	<15	----	----	----

Analytical Results

Sub-Matrix: Canister (Matrix: Air)				Client sample ID	24SVP35H	VAPOUR DUPLICATE	----	----	----
				Client sampling date / time	25-Feb-2025 10:16	25-Feb-2025 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	CG2502146-006	CG2502146-007	----	----	----
					Result	Result	----	----	----
Hydrocarbons									
Aliphatic (C12-C16)	----	E593C/WT	30	µg/m³	<30	<30	----	----	----
Aliphatic (C6-C8)	----	E593C/WT	15	µg/m³	41	<15	----	----	----
Aliphatic (C8-C10)	----	E593C/WT	15	µg/m³	105	35	----	----	----
Aromatic (C10-C12)	----	E593C/WT	15	µg/m³	<15	<15	----	----	----
Aromatic (C12-C16)	----	E593C/WT	30	µg/m³	<30	<30	----	----	----
Aromatic (C6-C8)	----	E593C/WT	15	µg/m³	<15	<15	----	----	----
Aromatic (C8-C10)	----	E593C/WT	15	µg/m³	140	<15	----	----	----
F1 (C6-C10)	----	E593A/WT	15	µg/m³	268	40	----	----	----
F1-BTEX	----	EC592A/WT	15	µg/m³	104	31	----	----	----
F2 (C10-C16)	----	E593A/WT	15	µg/m³	107	<100 DLB	----	----	----
F2-Naphthalene	----	EC593D/WT	15	µg/m³	107	<100	----	----	----
TVOC (C10-C12)	----	E593C/WT	15	µg/m³	75	<15	----	----	----
TVOC (C12-C16)	----	E593C/WT	30	µg/m³	<30	<30	----	----	----
TVOC (C6-C8)	----	E593C/WT	15	µg/m³	41	<15	----	----	----
TVOC (C8-C10)	----	E593C/WT	15	µg/m³	245	35	----	----	----
Hydrocarbons Surrogates									
Bromofluorobenzene, 4-	460-00-4	E593C/WT	1	%	98.7	96.4	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E621B/WT	0.20	%	99.0	94.5	----	----	----

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2502146**	Page	: 1 of 10
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 26-Feb-2025 15:15
PO	: SWM.SWOP04071-04.007	Issue Date	: 12-Mar-2025 15:25
C-O-C number	: ----		
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
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 Duplicate outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- 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)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Air**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Hydrocarbons	QC-1899961-001	----	F2 (C10-C16)	----	E593A	19 µg/m³	15 µg/m³	Blank result exceeds permitted value
Laboratory Control Sample (LCS) Recoveries								
Hydrocarbons	QC-1899962-002	----	Aromatic (C12-C16)	----	E593C	161 % LCS-H	50.0-150%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	*Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

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: **Air**

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
Field Tests : Air Canister Information										
Air Canister 24SVP13H	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister 24SVP31H	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister 24SVP35H	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister 25XCG-4 (SVP)	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister VAPOUR DUPLICATE	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister VW-05	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	
Field Tests : Air Canister Information										
Air Canister XCG-13 (SVP)	EF001	25-Feb-2025	----	----	----		06-Mar-2025	----	9 days	

Matrix: **Air**

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
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP13H	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP31H	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 24SVP35H	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister 25XCG-4 (SVP)	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister VAPOUR DUPLICATE	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister VW-05	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister XCG-13 (SVP)	E593C	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP13H	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP31H	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓

Matrix: **Air**

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
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 24SVP35H	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister 25XCG-4 (SVP)	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister VAPOUR DUPLICATE	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister VW-05	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister XCG-13 (SVP)	E593A	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP13H	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP31H	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 24SVP35H	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister 25XCG-4 (SVP)	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓

Matrix: **Air**

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
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister VAPOUR DUPLICATE	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister VW-05	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister XCG-13 (SVP)	E629B-H	25-Feb-2025	----	----	----		05-Mar-2025	30 days	8 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP13H	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP31H	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 24SVP35H	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister 25XCG-4 (SVP)	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister VAPOUR DUPLICATE	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister VW-05	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓

Matrix: **Air**

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
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister										
XCG-13 (SVP)	E621B	25-Feb-2025	----	----	----		07-Mar-2025	30 days	10 days	✓

Legend & Qualifier Definitions

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: **Air**

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)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1899961	1	8	12.5	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1899962	1	8	12.5	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1899960	1	8	12.5	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1895649	1	10	10.0	5.0	✓
Laboratory Control Samples (LCS)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1899961	1	8	12.5	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1899962	1	8	12.5	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1899960	1	8	12.5	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1895649	1	10	10.0	5.0	✓
Method Blanks (MB)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1899961	1	8	12.5	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1899962	1	8	12.5	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1899960	1	8	12.5	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1895649	1	10	10.0	5.0	✓
Air Canister Information	EF001	1898002	1	10	10.0	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
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Volatile Organic Compounds (VOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
F1-BTEX in Canisters or Bags GC-MS (µg/m3)	EC592A ALS Environmental - Waterloo	Air	unit conversion	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
F2-Naphthalene in Canisters by GC-MS (ug/m3)	EC593D ALS Environmental - Waterloo	Air	CCME PHC	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ug/m3)	EC621B ALS Environmental - Waterloo	Air	unit conversion	Convert ppbV to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **CG2502146**	Page	: 1 of 11
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 26-Feb-2025 15:15
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 05-Mar-2025
C-O-C number	: ----	Issue Date	: 12-Mar-2025 15:25
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
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
- 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*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo Air Quality, 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: **Air**

					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
Permanent Gases (QC Lot: 1895649)											
CG2502145-001	Anonymous	Carbon dioxide	124-38-9	E629B-H	0.050	%	5.56	5.13	7.94%	20%	----
		Carbon monoxide	630-08-0	E629B-H	0.050	%	<0.050	<0.050	0	Diff <2x LOR	----
		Methane	74-82-8	E629B-H	0.050	%	0.648	0.615	5.14%	20%	----
		Nitrogen	7727-37-9	E629B-H	1.0	%	79.4	72.5	9.07%	20%	----
		Oxygen	7782-44-7	E629B-H	0.10	%	14.0	13.0	7.17%	20%	----
Volatile Organic Compounds (QC Lot: 1899960)											
CG2502145-001	Anonymous	Acetone	67-64-1	E621B	5.4	ppbv	<5.4	<5.4	0	Diff <2x LOR	----
		Allyl chloride	107-05-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Benzene	71-43-2	E621B	0.54	ppbv	9.02	9.12	1.14%	30%	----
		Benzyl chloride	100-44-7	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Bromoform	75-25-2	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Butadiene, 1,3-	106-99-0	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E621B	2.70	ppbv	<2.70	<2.70	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Chloroform	67-66-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Cyclohexane	110-82-7	E621B	48.1	ppbv	730	736	0.712%	30%	----
		Dibromochloromethane	124-48-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E621B	1.08	ppbv	2.09	2.09	0.004	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E621B	4.98	ppbv	28.7	28.6	0.06	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E621B	1.08	ppbv	1.60	1.62	0.02	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1899960) - continued											
CG2502145-001	Anonymous	Dichloroethylene, cis-1,2-	156-59-2	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E621B	1.08	ppbv	1.20	1.17	0.03	Diff <2x LOR	----
		Dichloromethane	75-09-2	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichloropropylene, cis+trans-1,3-	542-75-6	E621B	1.53	ppbv	<1.53	<1.53	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	1.08	ppbv	8.29	8.34	0.637%	30%	----
		Dioxane, 1,4-	123-91-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Ethyl acetate	141-78-6	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E621B	0.54	ppbv	11.6	11.7	0.987%	30%	----
		Ethyltoluene, 4-	622-96-8	E621B	1.08	ppbv	12.6	12.3	2.62%	30%	----
		Heptane, n-	142-82-5	E621B	48.1	ppbv	357	359	0.583%	30%	----
		Hexachlorobutadiene	87-68-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E621B	48.1	ppbv	338	341	0.922%	30%	----
		Hexanone, 2-	591-78-6	E621B	77.0	ppbv	<76.0	<77.0	1.0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E621B	1.08	ppbv	2.20	2.21	0.01	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E621B	0.54	ppbv	1.19	0.96	0.23	Diff <2x LOR	----
		Propylene	115-07-1	E621B	13.2	ppbv	<13.4	13.2	0.15	Diff <2x LOR	----
		Styrene	100-42-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Tetrahydrofuran	109-99-9	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Toluene	108-88-3	E621B	0.54	ppbv	1.08	1.04	0.04	Diff <2x LOR	----
		Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1899960) - continued											
CG2502145-001	Anonymous	Trimethylbenzene, 1,2,4-	95-63-6	E621B	1.08	ppbv	20.7	20.8	0.0469%	30%	----
		Trimethylbenzene, 1,3,5-	108-67-8	E621B	4.98	ppbv	88.7	88.7	0.00487%	30%	----
		Trimethylpentane, 2,2,4-	540-84-1	E621B	4.98	ppbv	60.3	60.6	0.441%	30%	----
		Vinyl acetate	108-05-4	E621B	22.5	ppbv	<22.5	<22.5	0	Diff <2x LOR	----
		Vinyl bromide	593-60-2	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E621B	1.08	ppbv	<1.08	<1.08	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E621B	4.98	ppbv	61.0	61.7	1.06%	30%	----
		Xylene, o-	95-47-6	E621B	2.49	ppbv	52.6	52.7	0.252%	30%	----
Hydrocarbons (QC Lot: 1899961)											
CG2502145-001	Anonymous	F1 (C6-C10)	----	E593A	75	µg/m³	44600	44200	0.810%	30%	----
		F2 (C10-C16)	----	E593A	75	µg/m³	10700	10700	0.277%	30%	----
Hydrocarbons (QC Lot: 1899962)											
CG2502145-001	Anonymous	Aromatic (C10-C12)	----	E593C	75	µg/m³	1090	1090	0.118%	50%	----
		Aromatic (C12-C16)	----	E593C	149	µg/m³	<149	<149	0	Diff <2x LOR	----
		Aromatic (C6-C8)	----	E593C	75	µg/m³	137	134	3	Diff <2x LOR	----
		Aromatic (C8-C10)	----	E593C	75	µg/m³	1760	1750	0.633%	50%	----
		TVOC (C10-C12)	----	E593C	75	µg/m³	8120	8060	0.654%	50%	----
		TVOC (C12-C16)	----	E593C	149	µg/m³	202	237	36	Diff <2x LOR	----
		TVOC (C6-C8)	----	E593C	75	µg/m³	24900	24800	0.638%	50%	----
		TVOC (C8-C10)	----	E593C	75	µg/m³	26000	25700	0.923%	50%	----

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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1898002)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-29.8	----
Permanent Gases (QCLot: 1895649)						
Carbon dioxide	124-38-9	E629B-H	0.05	%	<0.050	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	<0.050	----
Methane	74-82-8	E629B-H	0.05	%	<0.050	----
Nitrogen	7727-37-9	E629B-H	1	%	<1.0	----
Oxygen	7782-44-7	E629B-H	0.1	%	<0.10	----
Volatile Organic Compounds (QCLot: 1899960)						
Acetone	67-64-1	E621B	1	ppbv	<1.0	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	<0.20	----
Benzene	71-43-2	E621B	0.1	ppbv	<0.10	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	<0.20	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	<0.20	----
Bromoform	75-25-2	E621B	0.2	ppbv	<0.20	----
Bromomethane	74-83-9	E621B	0.2	ppbv	<0.20	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	<0.20	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	<0.50	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	<0.20	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	<0.20	----
Chloroethane	75-00-3	E621B	0.2	ppbv	<0.20	----
Chloroform	67-66-3	E621B	0.2	ppbv	<0.20	----
Chloromethane	74-87-3	E621B	0.2	ppbv	<0.20	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	<0.20	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	<0.20	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	<0.20	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1899960) - continued						
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	<0.20	----
Dichloromethane	75-09-2	E621B	0.2	ppbv	<0.20	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	<0.20	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	<0.20	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	<0.20	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	<0.20	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	<0.10	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	<0.20	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	<0.20	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	<0.20	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	<0.20	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	<1.0	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	<0.20	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	<0.20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	<0.20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	<0.20	----
Naphthalene	91-20-3	E621B	0.1	ppbv	<0.10	----
Propylene	115-07-1	E621B	0.2	ppbv	<0.20	----
Styrene	100-42-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	<0.20	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	<0.20	----
Toluene	108-88-3	E621B	0.1	ppbv	<0.10	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	<0.20	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	<0.20	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	<0.20	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	<0.20	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1899960) - continued						
Vinyl acetate	108-05-4	E621B	0.5	ppbv	<0.50	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	<0.20	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	<0.20	----
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	<0.20	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	<0.10	----
Hydrocarbons (QCLot: 1899961)						
F1 (C6-C10)	----	E593A	15	µg/m³	<15	----
F2 (C10-C16)	----	E593A	15	µg/m³	# 19	----
Hydrocarbons (QCLot: 1899962)						
Aromatic (C10-C12)	----	E593C	15	µg/m³	<15	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	<30	----
Aromatic (C6-C8)	----	E593C	15	µg/m³	<15	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	<15	----
TVOC (C10-C12)	----	E593C	15	µg/m³	<15	----
TVOC (C12-C16)	----	E593C	30	µg/m³	<30	----
TVOC (C6-C8)	----	E593C	15	µg/m³	<15	----
TVOC (C8-C10)	----	E593C	15	µg/m³	<15	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Permanent Gases (QCLot: 1895649)									
Carbon dioxide	124-38-9	E629B-H	0.05	%	4.98 %	98.9	70.0	130	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	0.747 %	107	70.0	130	----
Methane	74-82-8	E629B-H	0.05	%	15 %	96.6	70.0	130	----
Nitrogen	7727-37-9	E629B-H	1	%	50.4 %	98.2	70.0	130	----
Oxygen	7782-44-7	E629B-H	0.1	%	7.41 %	105	70.0	130	----
Volatile Organic Compounds (QCLot: 1899960)									
Acetone	67-64-1	E621B	1	ppbv	1.06 ppbv	100	70.0	130	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	1.02 ppbv	92.4	70.0	130	----
Benzene	71-43-2	E621B	0.1	ppbv	1.04 ppbv	99.6	70.0	130	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	1.05 ppbv	79.2	70.0	130	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	1.07 ppbv	96.4	70.0	130	----
Bromoform	75-25-2	E621B	0.2	ppbv	1.04 ppbv	96.0	70.0	130	----
Bromomethane	74-83-9	E621B	0.2	ppbv	1.01 ppbv	97.7	70.0	130	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	1.05 ppbv	92.1	70.0	130	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	1.05 ppbv	88.7	70.0	130	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	1.07 ppbv	98.9	70.0	130	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	1.05 ppbv	95.5	70.0	130	----
Chloroethane	75-00-3	E621B	0.2	ppbv	1 ppbv	99.4	70.0	130	----
Chloroform	67-66-3	E621B	0.2	ppbv	1.02 ppbv	102	70.0	130	----
Chloromethane	74-87-3	E621B	0.2	ppbv	0.99 ppbv	107	70.0	130	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	1.06 ppbv	98.9	70.0	130	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	1.06 ppbv	98.4	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	1.05 ppbv	96.9	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	1.05 ppbv	72.0	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	1.05 ppbv	77.3	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	1.04 ppbv	74.6	70.0	130	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	1.01 ppbv	99.1	70.0	130	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	1.03 ppbv	101	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	1.08 ppbv	95.6	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	1.04 ppbv	90.7	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	1.04 ppbv	100	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	1.04 ppbv	98.7	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1899960) - continued									
Dichloromethane	75-09-2	E621B	0.2	ppbv	1.03 ppbv	95.7	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	1.02 ppbv	102	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	1.02 ppbv	97.8	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	1.04 ppbv	89.7	70.0	130	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	0.96 ppbv	102	70.0	130	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	1.04 ppbv	93.9	70.0	130	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	1.02 ppbv	104	70.0	130	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	1.06 ppbv	92.2	70.0	130	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	1.04 ppbv	80.7	70.0	130	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	1.04 ppbv	99.1	70.0	130	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	1.09 ppbv	86.1	70.0	130	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	1.05 ppbv	97.8	70.0	130	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	1.04 ppbv	93.0	70.0	130	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	1.02 ppbv	95.7	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	1.04 ppbv	97.5	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	1.02 ppbv	90.2	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	1.04 ppbv	98.1	70.0	130	----
Naphthalene	91-20-3	E621B	0.1	ppbv	1.13 ppbv	75.6	70.0	130	----
Propylene	115-07-1	E621B	0.2	ppbv	1.07 ppbv	93.5	70.0	130	----
Styrene	100-42-5	E621B	0.2	ppbv	1.04 ppbv	90.4	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	1.05 ppbv	89.1	70.0	130	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	1.04 ppbv	97.0	70.0	130	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	0.98 ppbv	104	70.0	130	----
Toluene	108-88-3	E621B	0.1	ppbv	1.05 ppbv	96.4	70.0	130	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	1.02 ppbv	97.3	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	1.08 ppbv	87.6	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	1.04 ppbv	104	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	1.05 ppbv	96.6	70.0	130	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	1.05 ppbv	92.9	70.0	130	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	1.04 ppbv	99.5	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	1.05 ppbv	78.3	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	1.05 ppbv	79.8	70.0	130	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	1.05 ppbv	98.8	70.0	130	----
Vinyl acetate	108-05-4	E621B	0.5	ppbv	1.07 ppbv	92.2	70.0	130	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	1.02 ppbv	91.0	70.0	130	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	1.01 ppbv	101	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike: Target Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 1899960) - continued									
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	2.08 ppbv	94.4	70.0	130	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	1.05 ppbv	92.0	70.0	130	----
Hydrocarbons (QCLot: 1899961)									
F1 (C6-C10)	----	E593A	15	µg/m³	815 µg/m³	83.4	50.0	150	----
Hydrocarbons (QCLot: 1899962)									
Aromatic (C10-C12)	----	E593C	15	µg/m³	60.8 µg/m³	95.2	50.0	150	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	60.1 µg/m³	# 161	50.0	150	LCS-H
Aromatic (C6-C8)	----	E593C	15	µg/m³	60.1 µg/m³	103	50.0	150	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	59.6 µg/m³	102	50.0	150	----
TVOC (C10-C12)	----	E593C	15	µg/m³	121 µg/m³	98.3	50.0	150	----
TVOC (C12-C16)	----	E593C	30	µg/m³	120 µg/m³	127	50.0	150	----
TVOC (C6-C8)	----	E593C	15	µg/m³	120 µg/m³	109	50.0	150	----
TVOC (C8-C10)	----	E593C	15	µg/m³	119 µg/m³	104	50.0	150	----

Qualifiers

Qualifier	Description
LCS-H	*Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Batch Proof Report

Batch Proof ID: 241121.13
Canister ID: 01400-0418
Analysis Date: 3-Dec-24

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	103.58	%

Batch Proof Report

Batch Proof ID: 241202.124
Canister ID: 01400-0138
Analysis Date: 17-Dec-24

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	79.16	%

Batch Proof Report

Batch Proof ID: 241208.232
Canister ID: 01400-0422
Analysis Date: 2-Jan-25

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	99.99	%

Batch Proof Report

Batch Proof ID: 241213.303
Canister ID: 01400-0269
Analysis Date: 30-Jan-25

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	144.02	%

Batch Proof Report

Batch Proof ID: 241215.111
Canister ID: 01400-0056
Analysis Date: 23-Jan-25

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	107.43	%

Batch Proof Report

Batch Proof ID: 250102.129
Canister ID: 01400-0238
Analysis Date: 23-Jan-25

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	98.37	%

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 1

Environmental Division Calgary
Work Order Reference
CG2502146

Telephone : +1 403 407 1800

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Darby Madalena
Phone:	403-723-6867
	Company address below will appear on the final report
Street:	110, 140 Quarry Park Blvd SE
City/Province:	Calgary, AB
Postal Code:	T2C 2X5
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	darby.madalena@tetratech.com
Email 2	jaymes.going@tetratech.com
Email 3	

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	EBA.Accounts.Payable@tetratech.com
Email 2	

Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge m
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge n
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge n
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge ri
☐ Same day [E2] if received by 10am M-S - 200% rush surcl
Additional fees may apply to rush requests on week
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	CG22-EBAE100-0021	AFE/Cost Center:	PO#
Job #:	SWM.SWOP04071-04.007	Major/Minor Code:	Routing Code:
PO / AFE:	SWM.SWOP04071-04.007	Requisitioner:	
LSD:	Monfort Pre-1972 Landfill	Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Wendy Sears	Sampler: William Verduyn

Analysis Request

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	EP692	S621E - Aliphatic and Aromatics	S629B - Methane,CO2,CO,N2,O2	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	VW-05	25-Feb-25	15:26	AIR		R	R	R			
	25XCG-4 (SVP)	↓	14:36	AIR		R	R	R			
	~~XCG-5 (SVP)~~		—	AIR		R	R	R			
	~~XCG-6 (SVP)~~	↓	—	AIR		R	R	R			
	XCG-13 (SVP)	25-Feb-25	12:30	AIR		R	R	R			
	24SVP13H	25-Feb-25	9:22	AIR		R	R	R			
	24SVP31H	↓	9:45	AIR		R	R	R			
	24SVP35H	↓	16:16	AIR		R	R	R			
	VAPOUR DUPLICATE	↓		AIR		R	R	R			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	~~XCG-13 (SVP) had no number on the flow controller, wrote G694 on it in sharpie~~
Are samples for human consumption/ use? ☐ YES ☐ NO	QUOTE CG2022EBAE1000021

SAMPLE RECEIPT DETAILS (ALS use only)					
Cooling Method:	☐ NONE	☐ ICE	☐ ICE PACKS	☐ FROZEN	☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification:	☐ YES	☐ NO			
Cooler Custody Seals Intact:	☐ YES	☐ N/A	Sample Custody Seals Intact:	☐ YES	☐ N/A
INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: William Verduyn	Date: Feb 26, 2025	Time: 4:15	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

20.3 FG 26-02-25 3:15

CERTIFICATE OF ANALYSIS

Work Order	: **CG2505026**		
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 12:10
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 25-Apr-2025
C-O-C number	: ----	Issue Date	: 01-May-2025 08:46
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
- Surrogate Control Limits

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*
Archana Neupane	Lab Assistant	Metals, Calgary, Alberta
George Huang	Supervisor - Inorganic	Metals, Calgary, Alberta
George Huang	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Organics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Metals, Calgary, Alberta

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*
-	no units
%	percent
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre

<: 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

XCG-6 (MW) very limited sample, will not be able to run all analysis.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
					Client sampling date / time	24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
						CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.2	mg/L		351	678	998	594	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		<0.6	<0.6	<0.6	<0.6	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	1.0	mg/L		<0.3	<0.3	<0.3	<0.3	----
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L		288	----	818	487	----
Conductivity	----	E100/CG	1.0	µS/cm		595	----	1800	954	----
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		204	866	994	554	----
pH	----	E108/CG	0.10	pH units		8.22	8.24	7.20	7.89	----
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		363	1110	1110	589	----
Conductivity	----	E100/CG	2.0	µS/cm		----	1550	----	----	----
Alkalinity, total (as CaCO3)	----	E290/CG	2.0	mg/L		----	556	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/CG	0.0050	mg/L		0.0385	----	0.976	0.168	----
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		46.4	16.2	188	27.3	----
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		0.155	<0.100 DLDS	0.166	0.162	----
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		0.109	61.6	<0.100 HTD, DLDS	0.152	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L		0.109	----	<0.112	0.152	----
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		<0.010	<0.050 DLDS	<0.050 HTD, DLDS	<0.050 DLDS	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		3.36	136	19.5	50.8	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0500	mg/L		----	61.6	----	----	----
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		7.15	18.8	22.1	11.6	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
Client sample ID									
Client sampling date / time					24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
					CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
					Result	Result	Result	Result	----
Ion Balance									
Cation sum	----	EC101/CG	0.10	meq/L	6.31	18.2	23.0	11.6	----
Ion balance (APHA)	----	EC101/CG	0.01	%	-6.24	-1.62	2.00	0.0	----
Ion balance (cations/anions)	----	EC101/CG	0.010	%	88.2	96.8	104	100	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L	0.0020	----	0.291	0.0024	----
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L	0.00057	----	<0.00020 DLDS	<0.00010	----
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L	0.00042	----	0.0312	0.00858	----
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L	0.0665	----	1.12	0.490	----
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L	<0.010	----	0.066	0.061	----
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L	0.0000454	----	0.0000419	<0.0000050	----
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L	67.9	234	174	119	----
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L	<0.00050	----	<0.00100 DLDS	<0.00050	----
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L	0.00351	----	0.00165	0.00021	----
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L	<0.010	----	26.9	0.787	----
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L	0.000416	----	0.000580	<0.000050	----
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L	8.39	68.4	136	62.4	----
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L	0.00041	----	1.59	0.219	----
Mercury, dissolved	7439-97-6	E509/CG	0.0000050	mg/L	<0.0000050	----	<0.0000050	<0.0000050	----
Nickel, dissolved	7440-02-0	E421/CG	0.00050	mg/L	0.00250	----	0.0227	0.00099	----
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L	5.51	4.80	4.43	2.92	----
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L	0.000125	----	0.000161	<0.000050	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
Client sample ID									
Client sampling date / time					24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
					CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
					Result	Result	Result	Result	----
Dissolved Metals									
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L	<0.000010	----	<0.000020 DLDS	<0.000010	----
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L	48.1	17.5	42.4	10.1	----
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L	0.00339	----	0.0154	0.0176	----
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L	0.0047	----	0.382	0.0018	----
Dissolved mercury filtration location	----	EP509/CG	-	-	Field	----	Field	Field	----
Dissolved metals filtration location	----	EP421/CG	-	-	Field	Laboratory	Field	Field	----
Volatile Organic Compounds									
Benzene	71-43-2	E611E/CG	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	----
Bromobenzene	108-86-1	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Bromochloromethane	74-97-5	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Bromodichloromethane	75-27-4	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Bromoform	75-25-2	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Bromomethane	74-83-9	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Butylbenzene, n-	104-51-8	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Butylbenzene, sec-	135-98-8	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Butylbenzene, tert-	98-06-6	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Carbon tetrachloride	56-23-5	E611E/CG	0.50	µg/L	<0.50	<0.50	<0.50	<0.50	----
Chlorobenzene	108-90-7	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chloroethane	75-00-3	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chloroform	67-66-3	E611E/CG	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chloromethane	74-87-3	E611E/CG	5.0	µg/L	<5.0	<5.0	<5.0	<5.0	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
					Client sampling date / time	24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
						CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Chlorotoluene, 2-	95-49-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Cymene, p-	99-87-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibromochloromethane	124-48-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibromomethane	74-95-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloroethylene, cis-1,2-	156-59-2	E611E/CG	1.0	µg/L		<1.0	<1.0	11.0	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloromethane	75-09-2	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

					Client sample ID	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
					Client sampling date / time	24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
Analyte	CAS Number	Method/Lab	LOR	Unit		CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Dichloropropylene, cis-1,3-	10061-01-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/CG	1.5	µg/L		<1.5	<1.5	<1.5	<1.5	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Ethylbenzene	100-41-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Hexachlorobutadiene	87-68-3	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Isopropylbenzene	98-82-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Propylbenzene, n-	103-65-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Styrene	100-42-5	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Tetrachloroethylene	127-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Toluene	108-88-3	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichloroethylene	79-01-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichlorofluoromethane	75-69-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-4 (MW)	XCG-6 (MW)	XCG-13 (MW)	XCG-14 (MW)	----
					Client sampling date / time	24-Apr-2025 07:55	24-Apr-2025 08:30	24-Apr-2025 09:00	24-Apr-2025 08:15	----
						CG2505026-001	CG2505026-002	CG2505026-003	CG2505026-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Trimethylbenzene, 1,3,5-	108-67-8	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Vinyl chloride	75-01-4	E611E/CG	1.0	µg/L		<1.0	<1.0	6.6	<1.0	----
Xylene, m+p-	179601-23-1	E611E/CG	0.40	µg/L		<0.40	<0.40	<0.40	<0.40	----
Xylene, o-	95-47-6	E611E/CG	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	----
Xylenes, total	1330-20-7	E611E/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
BTEX, total	----	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611E/CG	1.0	%		79.4	78.1	77.9	78.4	----
Difluorobenzene, 1,4-	540-36-3	E611E/CG	1.0	%		96.0	99.5	95.5	96.5	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2505026**	Page	: 1 of 13
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 12:10
PO	: SWM.SWOP04071-04.007	Issue Date	: 01-May-2025 08:46
C-O-C number	: ----		
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 4		
No. of samples analysed	: 4		

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) XCG-13 (MW)	E298	24-Apr-2025	29-Apr-2025	28 days	5 days	✓	29-Apr-2025	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) XCG-14 (MW)	E298	24-Apr-2025	29-Apr-2025	28 days	5 days	✓	29-Apr-2025	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) XCG-4 (MW)	E298	24-Apr-2025	29-Apr-2025	28 days	5 days	✓	29-Apr-2025	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE XCG-13 (MW)	E235.Cl	24-Apr-2025	25-Apr-2025	28 days	1 days	✓	28-Apr-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE XCG-14 (MW)	E235.Cl	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE XCG-4 (MW)	E235.Cl	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE XCG-6 (MW)	E235.Cl	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 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 XCG-13 (MW)	E235.F	24-Apr-2025	25-Apr-2025	28 days	1 days	✓	28-Apr-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE XCG-14 (MW)	E235.F	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE XCG-4 (MW)	E235.F	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE XCG-6 (MW)	E235.F	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE XCG-13 (MW)	E235.NO3	24-Apr-2025	25-Apr-2025	3 days	1 days	✓	28-Apr-2025	3 days	1 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE XCG-14 (MW)	E235.NO3	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE XCG-4 (MW)	E235.NO3	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE XCG-6 (MW)	E235.NO3	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE XCG-13 (MW)	E235.NO2	24-Apr-2025	25-Apr-2025	3 days	1 days	✓	28-Apr-2025	3 days	1 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
Anions and Nutrients : Nitrite in Water by IC										
HDPE XCG-14 (MW)	E235.NO2	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE XCG-4 (MW)	E235.NO2	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE XCG-6 (MW)	E235.NO2	24-Apr-2025	25-Apr-2025	3 days	2 days	✓	25-Apr-2025	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE XCG-13 (MW)	E235.SO4	24-Apr-2025	25-Apr-2025	28 days	1 days	✓	28-Apr-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE XCG-14 (MW)	E235.SO4	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE XCG-4 (MW)	E235.SO4	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE XCG-6 (MW)	E235.SO4	24-Apr-2025	25-Apr-2025	28 days	2 days	✓	25-Apr-2025	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) XCG-13 (MW)	E509	24-Apr-2025	28-Apr-2025	28 days	4 days	✓	28-Apr-2025	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) XCG-14 (MW)	E509	24-Apr-2025	28-Apr-2025	28 days	4 days	✓	28-Apr-2025	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
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) XCG-4 (MW)	E509	24-Apr-2025	28-Apr-2025	28 days	4 days	✓	28-Apr-2025	28 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) XCG-13 (MW)	E421	24-Apr-2025	29-Apr-2025	180 days	5 days	✓	29-Apr-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) XCG-14 (MW)	E421	24-Apr-2025	29-Apr-2025	180 days	5 days	✓	29-Apr-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) XCG-4 (MW)	E421	24-Apr-2025	29-Apr-2025	180 days	5 days	✓	29-Apr-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) XCG-6 (MW)	E421	24-Apr-2025	29-Apr-2025	180 days	5 days	✓	29-Apr-2025	180 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE XCG-13 (MW)	E290	24-Apr-2025	26-Apr-2025	14 days	2 days	✓	26-Apr-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE XCG-14 (MW)	E290	24-Apr-2025	26-Apr-2025	14 days	2 days	✓	26-Apr-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE XCG-4 (MW)	E290	24-Apr-2025	26-Apr-2025	14 days	2 days	✓	26-Apr-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE XCG-6 (MW)	E290	24-Apr-2025	26-Apr-2025	14 days	2 days	✓	26-Apr-2025	14 days	2 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 XCG-13 (MW)	E100	24-Apr-2025	26-Apr-2025	28 days	2 days	✓	26-Apr-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE XCG-14 (MW)	E100	24-Apr-2025	26-Apr-2025	28 days	2 days	✓	26-Apr-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE XCG-4 (MW)	E100	24-Apr-2025	26-Apr-2025	28 days	2 days	✓	26-Apr-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE XCG-6 (MW)	E100	24-Apr-2025	26-Apr-2025	28 days	2 days	✓	26-Apr-2025	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE XCG-13 (MW)	E108	24-Apr-2025	26-Apr-2025	0.25 hrs	51 hrs	✗ EHTR-FM	26-Apr-2025	0.25 hrs	51 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE XCG-6 (MW)	E108	24-Apr-2025	26-Apr-2025	0.25 hrs	51 hrs	✗ EHTR-FM	26-Apr-2025	0.25 hrs	51 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE XCG-14 (MW)	E108	24-Apr-2025	26-Apr-2025	0.25 hrs	52 hrs	✗ EHTR-FM	26-Apr-2025	0.25 hrs	52 hrs	✗ EHTR-FM
Physical Tests : pH by Meter										
HDPE XCG-4 (MW)	E108	24-Apr-2025	26-Apr-2025	0.25 hrs	52 hrs	✗ EHTR-FM	26-Apr-2025	0.25 hrs	52 hrs	✗ EHTR-FM
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) XCG-13 (MW)	E611E	24-Apr-2025	25-Apr-2025	14 days	1 days	✓	25-Apr-2025	14 days	1 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*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) XCG-14 (MW)	E611E	24-Apr-2025	25-Apr-2025	14 days	1 days	✓	25-Apr-2025	14 days	1 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) XCG-4 (MW)	E611E	24-Apr-2025	25-Apr-2025	14 days	1 days	✓	25-Apr-2025	14 days	1 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) XCG-6 (MW)	E611E	24-Apr-2025	25-Apr-2025	14 days	1 days	✓	25-Apr-2025	14 days	1 days	✓

Legend & Qualifier Definitions

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

EHT: Exceeded ALS recommended hold time prior to analysis.

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)							
Conductivity in Water	E100	1967968	1	12	8.3	5.0	✓
pH by Meter	E108	1967967	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1967317	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1967316	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967315	1	14	7.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967313	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1967314	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	1967966	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1970997	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1969123	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1967202	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1966926	1	9	11.1	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	1967968	1	12	8.3	5.0	✓
pH by Meter	E108	1967967	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1967317	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1967316	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967315	1	14	7.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967313	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1967314	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	1967966	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1970997	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1969123	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1967202	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1966926	1	9	11.1	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	1967968	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1967317	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1967316	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967315	1	14	7.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967313	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1967314	1	20	5.0	5.0	✓
Alkalinity Species by Titration	E290	1967966	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1970997	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1969123	1	20	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*
Method Blanks (MB) - Continued							
Dissolved Mercury in Water by CVAAS	E509	1967202	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1966926	1	9	11.1	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	1967317	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1967316	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1967315	1	14	7.1	5.0	✓
Nitrate in Water by IC	E235.NO3	1967313	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1967314	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1970997	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1969123	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1967202	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1966926	1	9	11.1	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 - Calgary	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 - Calgary	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.
Chloride in Water by IC	E235.Cl ALS Environmental - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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.
Ammonia by Fluorescence	E298 ALS Environmental - Calgary	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)

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Calgary	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.
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Calgary	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.
VOCs (Prairies List) by Headspace GC-MS	E611E ALS Environmental - Calgary	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Calgary	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved 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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Calgary	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).
TDS in Water (Calculation)	EC103 ALS Environmental - Calgary	Water	APHA 1030E (mod)	Total Dissolved Solids is 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.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Calgary	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

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

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Calgary	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

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QUALITY CONTROL REPORT

Work Order	: **CG2505026**	Page	: 1 of 15
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 12:10
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 25-Apr-2025
C-O-C number	: ----	Issue Date	: 01-May-2025 08:46
Sampler	: Willem Verduyn		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Archana Neupane	Lab Assistant	Calgary Metals, Calgary, Alberta
George Huang	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
George Huang	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Katarzyna Glinka	Analyst	Calgary Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta

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: 1967966)											
CG2504908-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	71.0	68.3	3.88%	20%	----
Physical Tests (QC Lot: 1967967)											
CG2505024-001	Anonymous	pH	----	E108	0.10	pH units	8.38	8.54	1.89%	4%	----
Physical Tests (QC Lot: 1967968)											
CG2505026-001	XCG-4 (MW)	Conductivity	----	E100	1.0	µS/cm	595	589	1.01%	10%	----
Anions and Nutrients (QC Lot: 1967313)											
CG2504908-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	4.00	mg/L	<4.00	<4.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967314)											
CG2504908-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	60.0	mg/L	171	175	4.17	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967315)											
CG2504908-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	2.00	mg/L	<2.00	<2.00	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967316)											
CG2505026-001	XCG-4 (MW)	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.155	0.152	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1967317)											
CG2505026-001	XCG-4 (MW)	Chloride	16887-00-6	E235.Cl	0.50	mg/L	46.4	46.3	0.318%	20%	----
Anions and Nutrients (QC Lot: 1970997)											
CG2505026-001	XCG-4 (MW)	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0385	0.0287	0.0098	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1967202)											
CG2504999-005	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1969123)											
CG2504999-005	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0041	0.0033	0.0008	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00219	0.00219	0.104%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.662	0.664	0.372%	20%	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.014	0.013	0.0005	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	75.5	73.3	2.88%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	3.09	3.16	2.29%	20%	----

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: 1969123) - continued											
CG2504999-005	Anonymous	Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	17.6	17.2	2.72%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.288	0.289	0.257%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.54	1.52	1.38%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	6.91	6.83	1.16%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000539	0.000551	2.15%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1966926)											
CG2505003-001	Anonymous	Benzene	71-43-2	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromobenzene	108-86-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromochloromethane	74-97-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, n-	104-51-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, sec-	135-98-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Butylbenzene, tert-	98-06-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611E	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Chlorotoluene, 2-	95-49-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Chlorotoluene, 4-	106-43-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Cymene, p-	99-87-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dibromomethane	74-95-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	1.0	µg/L	<1.0	<1.0	0	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*
Volatile Organic Compounds (QC Lot: 1966926) - continued											
CG2505003-001	Anonymous	Dichlorobenzene, 1,4-	106-46-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,1-	75-34-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,3-	142-28-9	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 2,2-	594-20-7	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, 1,1-	563-58-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Propylbenzene, n-	103-65-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Styrene	100-42-5	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Toluene	108-88-3	E611E	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611E	1.0	µg/L	<1.0	<1.0	0	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*
Volatile Organic Compounds (QC Lot: 1966926) - continued											
CG2505003-001	Anonymous	Xylene, m+p-	179601-23-1	E611E	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611E	0.30	µg/L	<0.30	<0.30	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: 1967966)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1967968)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Anions and Nutrients (QCLot: 1967313)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1967314)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1967315)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1967316)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1967317)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1970997)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Dissolved Metals (QCLot: 1967202)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1969123)						
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	----
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	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
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	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1969123) - continued						
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1966926)						
Benzene	71-43-2	E611E	0.5	µg/L	<0.50	----
Bromobenzene	108-86-1	E611E	1	µg/L	<1.0	----
Bromochloromethane	74-97-5	E611E	1	µg/L	<1.0	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	<1.0	----
Bromoform	75-25-2	E611E	1	µg/L	<1.0	----
Bromomethane	74-83-9	E611E	1	µg/L	<1.0	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	<1.0	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	<1.0	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	<1.0	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	<0.50	----
Chlorobenzene	108-90-7	E611E	1	µg/L	<1.0	----
Chloroethane	75-00-3	E611E	1	µg/L	<1.0	----
Chloroform	67-66-3	E611E	1	µg/L	<1.0	----
Chloromethane	74-87-3	E611E	5	µg/L	<5.0	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	<1.0	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	<1.0	----
Cymene, p-	99-87-6	E611E	1	µg/L	<1.0	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	<1.0	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	<1.0	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	<1.0	----
Dibromomethane	74-95-3	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	<1.0	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	<1.0	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	<1.0	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1966926) - continued						
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	<1.0	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	<1.0	----
Dichloromethane	75-09-2	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	<1.0	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	<1.0	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	<1.0	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	<1.0	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	<0.50	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	<1.0	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	<1.0	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	<0.50	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	<1.0	----
Styrene	100-42-5	E611E	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	<1.0	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	<1.0	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	<1.0	----
Toluene	108-88-3	E611E	0.5	µg/L	<0.50	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	<1.0	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	<1.0	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	<1.0	----
Trichloroethylene	79-01-6	E611E	1	µg/L	<1.0	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	<1.0	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	<1.0	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	<0.30	----

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: 1967966)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 1967967)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1967968)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	102	90.0	110	----
Anions and Nutrients (QCLot: 1967313)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1967314)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1967315)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 1967316)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 1967317)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1970997)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 1969123)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	98.6	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.7	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	99.2	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	95.9	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.8	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.6	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.2	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	95.8	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	100.0	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: 1969123) - continued									
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.7	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	94.5	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	96.0	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.5	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	91.3	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.7	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	96.6	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.4	80.0	120	----
Volatile Organic Compounds (QCLot: 1966926)									
Benzene	71-43-2	E611E	0.5	µg/L	100 µg/L	98.3	70.0	130	----
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	82.6	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	90.6	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	83.4	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	84.2	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	94.4	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	95.4	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	94.0	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	87.0	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	92.3	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	87.6	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	98.2	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	80.1	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	83.3	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	81.5	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	89.7	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	84.9	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	83.2	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	89.0	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	90.7	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	94.5	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	82.5	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	84.2	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	83.0	60.0	140	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1966926) - continued									
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	90.4	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	94.4	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	82.2	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	93.6	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	83.0	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	88.4	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	90.4	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	89.1	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	98.2	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	99.3	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	91.9	70.0	130	----
Ethylbenzene	100-41-4	E611E	0.5	µg/L	100 µg/L	80.6	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	89.9	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	85.8	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	95.5	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	96.4	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	81.4	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	87.8	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	84.5	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Toluene	108-88-3	E611E	0.5	µg/L	100 µg/L	88.2	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	85.7	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	88.1	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	90.4	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	97.8	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	92.2	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	80.6	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	88.6	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	88.2	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	84.7	60.0	140	----
Xylene, m+p-	179601-23-1	E611E	0.4	µg/L	200 µg/L	96.7	70.0	130	----
Xylene, o-	95-47-6	E611E	0.3	µg/L	100 µg/L	82.4	70.0	130	----

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: 1967313)										
CG2504908-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.90 mg/L	2.5 mg/L	116	75.0	125	----
Anions and Nutrients (QCLot: 1967314)										
CG2504908-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 1967315)										
CG2504908-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.545 mg/L	0.5 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 1967316)										
CG2505026-002	XCG-6 (MW)	Fluoride	16984-48-8	E235.F	0.980 mg/L	1 mg/L	98.0	75.0	125	----
Anions and Nutrients (QCLot: 1967317)										
CG2505026-002	XCG-6 (MW)	Chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1970997)										
CG2505026-003	XCG-13 (MW)	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	----	ND	75.0	125	----
Dissolved Metals (QCLot: 1967202)										
CG2504999-006	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000114 mg/L	0 mg/L	114	70.0	130	----
Dissolved Metals (QCLot: 1969123)										
CG2504999-006	Anonymous	Aluminum, dissolved	7429-90-5	E421	1.85 mg/L	2 mg/L	92.7	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.193 mg/L	0.2 mg/L	96.5	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.197 mg/L	0.2 mg/L	98.4	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Boron, dissolved	7440-42-8	E421	1.03 mg/L	1 mg/L	103	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	37.9 mg/L	40 mg/L	94.8	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.390 mg/L	0.4 mg/L	97.4	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.190 mg/L	0.2 mg/L	94.9	70.0	130	----
		Iron, dissolved	7439-89-6	E421	19.0 mg/L	20 mg/L	94.9	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.190 mg/L	0.2 mg/L	94.9	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	8.82 mg/L	10 mg/L	88.2	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.193 mg/L	0.2 mg/L	96.5	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.379 mg/L	0.4 mg/L	94.7	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	38.0 mg/L	40 mg/L	94.9	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.390 mg/L	0.4 mg/L	97.5	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0390 mg/L	0.04 mg/L	97.4	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0367 mg/L	0.04 mg/L	91.9	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	3.89 mg/L	4 mg/L	97.2	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
Volatile Organic Compounds (QCLot: 1966926)										
CG2505003-001	Anonymous	Benzene	71-43-2	E611E	91.8 µg/L	100 µg/L	91.8	70.0	130	----
		Bromobenzene	108-86-1	E611E	84.4 µg/L	100 µg/L	84.4	70.0	130	----
		Bromochloromethane	74-97-5	E611E	83.6 µg/L	100 µg/L	83.6	70.0	130	----
		Bromodichloromethane	75-27-4	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Bromoform	75-25-2	E611E	84.2 µg/L	100 µg/L	84.2	70.0	130	----
		Bromomethane	74-83-9	E611E	79.3 µg/L	100 µg/L	79.3	60.0	140	----
		Butylbenzene, n-	104-51-8	E611E	95.0 µg/L	100 µg/L	95.0	70.0	130	----
		Butylbenzene, sec-	135-98-8	E611E	97.9 µg/L	100 µg/L	97.9	70.0	130	----
		Butylbenzene, tert-	98-06-6	E611E	95.7 µg/L	100 µg/L	95.7	70.0	130	----
		Carbon tetrachloride	56-23-5	E611E	80.0 µg/L	100 µg/L	80.0	70.0	130	----
		Chlorobenzene	108-90-7	E611E	86.1 µg/L	100 µg/L	86.1	70.0	130	----
		Chloroethane	75-00-3	E611E	81.4 µg/L	100 µg/L	81.4	60.0	140	----
		Chloroform	67-66-3	E611E	90.8 µg/L	100 µg/L	90.8	70.0	130	----
		Chloromethane	74-87-3	E611E	73.2 µg/L	100 µg/L	73.2	60.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	85.1 µg/L	100 µg/L	85.1	70.0	130	----
		Chlorotoluene, 4-	106-43-4	E611E	83.3 µg/L	100 µg/L	83.3	70.0	130	----
		Cymene, p-	99-87-6	E611E	91.2 µg/L	100 µg/L	91.2	70.0	130	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	79.7 µg/L	100 µg/L	79.7	70.0	130	----
		Dibromochloromethane	124-48-1	E611E	89.9 µg/L	100 µg/L	89.9	70.0	130	----
		Dibromoethane, 1,2-	106-93-4	E611E	74.8 µg/L	100 µg/L	74.8	70.0	130	----
		Dibromomethane	74-95-3	E611E	83.2 µg/L	100 µg/L	83.2	70.0	130	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	82.4 µg/L	100 µg/L	82.4	70.0	130	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	84.8 µg/L	100 µg/L	84.8	70.0	130	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	86.3 µg/L	100 µg/L	86.3	70.0	130	----
		Dichlorodifluoromethane	75-71-8	E611E	77.3 µg/L	100 µg/L	77.3	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	83.1 µg/L	100 µg/L	83.1	70.0	130	----
		Dichloroethane, 1,2-	107-06-2	E611E	87.8 µg/L	100 µg/L	87.8	70.0	130	----
		Dichloroethylene, 1,1-	75-35-4	E611E	75.2 µg/L	100 µg/L	75.2	70.0	130	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	86.3 µg/L	100 µg/L	86.3	70.0	130	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	79.1 µg/L	100 µg/L	79.1	70.0	130	----
		Dichloromethane	75-09-2	E611E	81.5 µg/L	100 µg/L	81.5	70.0	130	----
		Dichloropropane, 1,2-	78-87-5	E611E	99.0 µg/L	100 µg/L	99.0	70.0	130	----
		Dichloropropane, 1,3-	142-28-9	E611E	78.4 µg/L	100 µg/L	78.4	70.0	130	----
		Dichloropropane, 2,2-	594-20-7	E611E	73.6 µg/L	100 µg/L	73.6	70.0	130	----
		Dichloropropylene, 1,1-	563-58-6	E611E	90.5 µg/L	100 µg/L	90.5	70.0	130	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	91.5 µg/L	100 µg/L	91.5	70.0	130	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	82.5 µg/L	100 µg/L	82.5	70.0	130	----
		Ethylbenzene	100-41-4	E611E	85.7 µg/L	100 µg/L	85.7	70.0	130	----
		Hexachlorobutadiene	87-68-3	E611E	80.2 µg/L	100 µg/L	80.2	70.0	130	----
		Isopropylbenzene	98-82-8	E611E	92.4 µg/L	100 µg/L	92.4	70.0	130	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	80.3 µg/L	100 µg/L	80.3	70.0	130	----
		Propylbenzene, n-	103-65-1	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Styrene	100-42-5	E611E	87.2 µg/L	100 µg/L	87.2	70.0	130	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	96.0 µg/L	100 µg/L	96.0	70.0	130	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	82.3 µg/L	100 µg/L	82.3	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
Volatile Organic Compounds (QCLot: 1966926) - continued										
CG2505003-001	Anonymous	Tetrachloroethylene	127-18-4	E611E	91.1 µg/L	100 µg/L	91.1	70.0	130	----
		Toluene	108-88-3	E611E	81.1 µg/L	100 µg/L	81.1	70.0	130	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	85.2 µg/L	100 µg/L	85.2	70.0	130	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	78.5 µg/L	100 µg/L	78.5	70.0	130	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	97.8 µg/L	100 µg/L	97.8	70.0	130	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	83.4 µg/L	100 µg/L	83.4	70.0	130	----
		Trichloroethylene	79-01-6	E611E	95.0 µg/L	100 µg/L	95.0	70.0	130	----
		Trichlorofluoromethane	75-69-4	E611E	93.7 µg/L	100 µg/L	93.7	60.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	82.0 µg/L	100 µg/L	82.0	70.0	130	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	89.4 µg/L	100 µg/L	89.4	70.0	130	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	88.8 µg/L	100 µg/L	88.8	70.0	130	----
		Vinyl chloride	75-01-4	E611E	78.1 µg/L	100 µg/L	78.1	60.0	140	----
		Xylene, m+p-	179601-23-1	E611E	170 µg/L	200 µg/L	85.2	70.0	130	----
		Xylene, o-	95-47-6	E611E	89.0 µg/L	100 µg/L	89.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Darby Madalena
Phone:	403-723-6867
	Company address below will appear on the final report
Street:	110, 140 Quarry Park Blvd SE
City/Province:	Calgary, AB
Postal Code:	T2C 2X5
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	darby.madalena@tetratech.com
Email 2	jaymes.going@tetratech.com
Email 3	wendy.cadelago@tetratech.com
Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	EBA.Accounts.Payable@tetratech.com
Email 2	

Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	CG22-EBAE100-0021	AFE/Cost Center:	PO#:
Job #:	SWM.SWOP04071-04.007	Major/Minor Code:	Routing Code:
PO / AFE:	SWM.SWOP04071-04.007	Requisitioner:	
LSD:	Monfort Pre-1972 Landfill	Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Wendy Sears	Sampler: Willem Verduyn

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	S5421B - Routine + Diss Metals	EP509 - Dissolved Hg	E611E - VOC	E298 - Ammonia	ON HOLD	STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	XCG-4 (MW)	24-Apr-25	7:55	GW	6	R	R	R	R			
	XCG-6 (MW)	↓	8:30	↓	3	R	R	R	R			
	XCG-13 (MW)		9:00		6	R	R	R	R			
	XCG-14 (MW)		8:15		6	R	R	R	R			

Environmental Division Calgary
Work Order Reference
CG2505026

Telephone : +1 403 407 1800

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	Limited water in routine for XCG-6(MW) Please prioritize chloride analysis and perform as many as possible for routine
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
6.4							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				4/12/25	1210			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FER 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **CG2504980**		
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 13:23
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 02-May-2025
C-O-C number	: ----	Issue Date	: 08-May-2025 17:17
Sampler	: WILLIAM VERDUYN		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 1		
No. of samples analysed	: 1		

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
- Surrogate Control Limits

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*
David Tremblett	VOC Section Supervisor	Air Quality, 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*
-	no units
%	percent
inches Hg	inches of mercury
ppbv	parts per billion (volume/volume)
µg/m³	micrograms per cubic metre

<: 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.

Qualifiers

Qualifier	Description
AI	Analytical interferences may be present. Result may be biased high.
SFPR	Suspected False Positive Result, based on detection in Lab Blanks and/or Field Blanks, or other known issues.

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	XCG-6 (SVP)	----	----	----	----
Client sample ID					XCG-6 (SVP)	----	----	----	----
Client sampling date / time					23-Apr-2025 16:26	----	----	----	----
					CG2504980-001	----	----	----	----
					Result	----	----	----	----
Field Tests									
ID, batch proof	----	EF001/WT	-	-	241210.211	----	----	----	----
ID, canister	----	EF001/WT	-	-	01400-0537	----	----	----	----
ID, regulator	----	EF001/WT	-	-	G105	----	----	----	----
Pressure on receipt	----	EF001/WT	0.10	inches Hg	-9.80	----	----	----	----
Permanent Gases									
Carbon dioxide	124-38-9	E629B-H/WT	0.050	%	4.40	----	----	----	----
Carbon monoxide	630-08-0	E629B-H/WT	0.050	%	<0.050	----	----	----	----
Methane	74-82-8	E629B-H/WT	0.050	%	<0.050	----	----	----	----
Nitrogen	7727-37-9	E629B-H/WT	1.0	%	75.0	----	----	----	----
Oxygen	7782-44-7	E629B-H/WT	0.10	%	12.4	----	----	----	----
Volatile Organic Compounds									
Acetone	67-64-1	E621B/WT	1.0	ppbv	15.6 AI	----	----	----	----
Acetone	67-64-1	EC621B/WT	2.4	µg/m³	37.0	----	----	----	----
Allyl chloride	107-05-1	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Allyl chloride	107-05-1	EC621B/WT	0.63	µg/m³	<0.63	----	----	----	----
Benzene	71-43-2	E621B/WT	0.10	ppbv	0.20	----	----	----	----
Benzene	71-43-2	EC621B/WT	0.32	µg/m³	0.64	----	----	----	----
Benzyl chloride	100-44-7	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Benzyl chloride	100-44-7	EC621B/WT	1.0	µg/m³	<1.0	----	----	----	----
Bromodichloromethane	75-27-4	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Bromodichloromethane	75-27-4	EC621B/WT	1.3	µg/m³	<1.3	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
						CG2504980-001	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Bromoform	75-25-2	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Bromoform	75-25-2	EC621B/WT	2.1	µg/m³		<2.1	----	----	----	----
Bromomethane	74-83-9	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Bromomethane	74-83-9	EC621B/WT	0.78	µg/m³		<0.78	----	----	----	----
Butadiene, 1,3-	106-99-0	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Butadiene, 1,3-	106-99-0	EC621B/WT	0.44	µg/m³		<0.44	----	----	----	----
Carbon disulfide	75-15-0	E621B/WT	0.50	ppbv		<0.50	----	----	----	----
Carbon disulfide	75-15-0	EC621B/WT	1.6	µg/m³		<1.6	----	----	----	----
Carbon tetrachloride	56-23-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Carbon tetrachloride	56-23-5	EC621B/WT	1.30	µg/m³		<1.26	----	----	----	----
Chlorobenzene	108-90-7	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Chlorobenzene	108-90-7	EC621B/WT	0.92	µg/m³		<0.92	----	----	----	----
Chloroethane	75-00-3	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Chloroethane	75-00-3	EC621B/WT	0.53	µg/m³		<0.53	----	----	----	----
Chloroform	67-66-3	E621B/WT	0.20	ppbv		0.51	----	----	----	----
Chloroform	67-66-3	EC621B/WT	0.98	µg/m³		2.49	----	----	----	----
Chloromethane	74-87-3	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Chloromethane	74-87-3	EC621B/WT	0.41	µg/m³		<0.41	----	----	----	----
Cyclohexane	110-82-7	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Cyclohexane	110-82-7	EC621B/WT	0.69	µg/m³		<0.69	----	----	----	----
Dibromochloromethane	124-48-1	E621B/WT	0.20	ppbv		<0.20	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
						CG2504980-001	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	EC621B/WT	1.7	µg/m³		<1.7	----	----	----	----
Dibromoethane, 1,2-	106-93-4	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dibromoethane, 1,2-	106-93-4	EC621B/WT	1.5	µg/m³		<1.5	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	EC621B/WT	1.2	µg/m³		<1.2	----	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichlorobenzene, 1,3-	541-73-1	EC621B/WT	1.2	µg/m³		<1.2	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	EC621B/WT	1.2	µg/m³		<1.2	----	----	----	----
Dichlorodifluoromethane	75-71-8	E621B/WT	0.20	ppbv		40.9	----	----	----	----
Dichlorodifluoromethane	75-71-8	EC621B/WT	1.0	µg/m³		202	----	----	----	----
Dichloroethane, 1,1-	75-34-3	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloroethane, 1,1-	75-34-3	EC621B/WT	0.81	µg/m³		<0.81	----	----	----	----
Dichloroethane, 1,2-	107-06-2	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloroethane, 1,2-	107-06-2	EC621B/WT	0.81	µg/m³		<0.81	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	EC621B/WT	0.79	µg/m³		<0.79	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	EC621B/WT	0.79	µg/m³		<0.79	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	EC621B/WT	0.79	µg/m³		<0.79	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
						CG2504980-001	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Dichloromethane	75-09-2	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloromethane	75-09-2	EC621B/WT	0.69	µg/m³		<0.69	----	----	----	----
Dichloropropane, 1,2-	78-87-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloropropane, 1,2-	78-87-5	EC621B/WT	0.9	µg/m³		<0.9	----	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	EC621B/WT	0.9	µg/m³		<0.9	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E621B/WT	0.30	ppbv		<0.30	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	EC621B/WT	1.3	µg/m³		<1.8	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	EC621B/WT	0.9	µg/m³		<0.9	----	----	----	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B/WT	0.20	ppbv		16.9 AI	----	----	----	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	EC621B/WT	1.4	µg/m³		118	----	----	----	----
Dioxane, 1,4-	123-91-1	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Dioxane, 1,4-	123-91-1	EC621B/WT	0.72	µg/m³		<0.72	----	----	----	----
Ethyl acetate	141-78-6	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Ethyl acetate	141-78-6	EC621B/WT	0.72	µg/m³		<0.72	----	----	----	----
Ethylbenzene	100-41-4	E621B/WT	0.10	ppbv		0.32	----	----	----	----
Ethylbenzene	100-41-4	EC621B/WT	0.43	µg/m³		1.39	----	----	----	----
Ethyltoluene, 4-	622-96-8	E621B/WT	0.20	ppbv		0.23	----	----	----	----
Ethyltoluene, 4-	622-96-8	EC621B/WT	1.0	µg/m³		1.1	----	----	----	----
Heptane, n-	142-82-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
						CG2504980-001	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Heptane, n-	142-82-5	EC621B/WT	0.82	µg/m³		<0.82	----	----	----	----
Hexachlorobutadiene	87-68-3	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Hexachlorobutadiene	87-68-3	EC621B/WT	2.1	µg/m³		<2.1	----	----	----	----
Hexane, n-	110-54-3	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Hexane, n-	110-54-3	EC621B/WT	0.70	µg/m³		<0.70	----	----	----	----
Hexanone, 2-	591-78-6	E621B/WT	1.0	ppbv		<1.0	----	----	----	----
Hexanone, 2-	591-78-6	EC621B/WT	4.10	µg/m³		<4.10	----	----	----	----
Isopropylbenzene	98-82-8	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Isopropylbenzene	98-82-8	EC621B/WT	1.0	µg/m³		<1.0	----	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	E621B/WT	0.20	ppbv		1.16	----	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	EC621B/WT	0.59	µg/m³		3.42	----	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	EC621B/WT	0.82	µg/m³		<0.82	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	EC621B/WT	0.72	µg/m³		<0.72	----	----	----	----
Naphthalene	91-20-3	E621B/WT	0.10	ppbv		0.34	----	----	----	----
Naphthalene	91-20-3	EC621B/WT	0.52	µg/m³		1.78	----	----	----	----
Propylene	115-07-1	E621B/WT	0.20	ppbv		6.85 AI	----	----	----	----
Propylene	115-07-1	EC621B/WT	0.34	µg/m³		11.8	----	----	----	----
Styrene	100-42-5	E621B/WT	0.20	ppbv		<0.20	----	----	----	----
Styrene	100-42-5	EC621B/WT	0.85	µg/m³		<0.85	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
					CG2504980-001	----	----	----	----	----
					Result	----	----	----	----	----
Volatile Organic Compounds										
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	EC621B/WT	1.4	µg/m³	<1.4	----	----	----	----
Tetrachloroethylene	127-18-4	E621B/WT	0.20	ppbv	0.28	----	----	----	----
Tetrachloroethylene	127-18-4	EC621B/WT	1.4	µg/m³	1.9	----	----	----	----
Tetrahydrofuran	109-99-9	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Tetrahydrofuran	109-99-9	EC621B/WT	0.59	µg/m³	<0.59	----	----	----	----
Toluene	108-88-3	E621B/WT	0.10	ppbv	0.96	----	----	----	----
Toluene	108-88-3	EC621B/WT	0.38	µg/m³	3.62	----	----	----	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	EC621B/WT	1.5	µg/m³	<1.5	----	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trichlorobenzene, 1,2,4-	120-82-1	EC621B/WT	1.5	µg/m³	<1.5	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	EC621B/WT	1.1	µg/m³	<1.1	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	EC621B/WT	1.1	µg/m³	<1.1	----	----	----	----
Trichloroethylene	79-01-6	E621B/WT	0.20	ppbv	4.52	----	----	----	----
Trichloroethylene	79-01-6	EC621B/WT	1.1	µg/m³	24.3	----	----	----	----
Trichlorofluoromethane	75-69-4	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trichlorofluoromethane	75-69-4	EC621B/WT	1.1	µg/m³	<1.1	----	----	----	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B/WT	0.20	ppbv	1.08	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	XCG-6 (SVP)	----	----	----	----
					Client sampling date / time	23-Apr-2025 16:26	----	----	----	----
					CG2504980-001	----	----	----	----	----
					Result	----	----	----	----	----
Volatile Organic Compounds										
Trimethylbenzene, 1,2,4-	95-63-6	EC621B/WT	1.0	µg/m³	5.3	----	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Trimethylbenzene, 1,3,5-	108-67-8	EC621B/WT	1.0	µg/m³	<1.0	----	----	----	----
Trimethylpentane, 2,2,4-	540-84-1	E621B/WT	0.20	ppbv	0.44	----	----	----	----
Trimethylpentane, 2,2,4-	540-84-1	EC621B/WT	0.9	µg/m³	2.0	----	----	----	----
Vinyl acetate	108-05-4	E621B/WT	0.50	ppbv	<0.50	----	----	----	----
Vinyl acetate	108-05-4	EC621B/WT	1.8	µg/m³	<1.8	----	----	----	----
Vinyl bromide	593-60-2	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Vinyl bromide	593-60-2	EC621B/WT	0.9	µg/m³	<0.9	----	----	----	----
Vinyl chloride	75-01-4	E621B/WT	0.20	ppbv	<0.20	----	----	----	----
Vinyl chloride	75-01-4	EC621B/WT	0.51	µg/m³	<0.51	----	----	----	----
Xylene, m+p-	179601-23-1	E621B/WT	0.20	ppbv	1.23	----	----	----	----
Xylene, m+p-	179601-23-1	EC621B/WT	0.87	µg/m³	5.34	----	----	----	----
Xylene, o-	95-47-6	E621B/WT	0.10	ppbv	0.58	----	----	----	----
Xylene, o-	95-47-6	EC621B/WT	0.43	µg/m³	2.52	----	----	----	----
Xylenes, total	1330-20-7	E621B/WT	0.30	ppbv	1.81	----	----	----	----
Xylenes, total	1330-20-7	EC621B/WT	1.3	µg/m³	7.8	----	----	----	----
BTEX, total	----	E621B/WT	0.30	ppbv	3.29	----	----	----	----
BTEX, total	----	EC621B/WT	1.2	µg/m³	13.5	----	----	----	----
Hydrocarbons										
Aliphatic (C10-C12)	----	E593C/WT	15	µg/m³	<23	----	----	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: XCG-6 (SVP)	----	----	----	----
					Client sampling date / time: 23-Apr-2025 16:26	----	----	----	----
					CG2504980-001	----	----	----	----
					Result	----	----	----	----
Hydrocarbons									
Aliphatic (C12-C16)	----	E593C/WT	30	µg/m³	<30	----	----	----	----
Aliphatic (C6-C8)	----	E593C/WT	15	µg/m³	<15	----	----	----	----
Aliphatic (C8-C10)	----	E593C/WT	15	µg/m³	35	----	----	----	----
Aromatic (C10-C12)	----	E593C/WT	15	µg/m³	<71 SFPR	----	----	----	----
Aromatic (C12-C16)	----	E593C/WT	30	µg/m³	<30	----	----	----	----
Aromatic (C6-C8)	----	E593C/WT	15	µg/m³	<15	----	----	----	----
Aromatic (C8-C10)	----	E593C/WT	15	µg/m³	<15	----	----	----	----
F1 (C6-C10)	----	E593A/WT	15	µg/m³	<15	----	----	----	----
F1-BTEX	----	EC592A/WT	15	µg/m³	<15	----	----	----	----
F2 (C10-C16)	----	E593A/WT	15	µg/m³	<80 SFPR	----	----	----	----
F2-Naphthalene	----	EC593D/WT	15	µg/m³	<80	----	----	----	----
TVOC (C10-C12)	----	E593C/WT	15	µg/m³	<77 SFPR	----	----	----	----
TVOC (C12-C16)	----	E593C/WT	30	µg/m³	<30	----	----	----	----
TVOC (C6-C8)	----	E593C/WT	15	µg/m³	<15	----	----	----	----
TVOC (C8-C10)	----	E593C/WT	15	µg/m³	35	----	----	----	----
Hydrocarbons Surrogates									
Bromofluorobenzene, 4-	460-00-4	E593C/WT	1	%	101	----	----	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E621B/WT	0.20	%	89.6	----	----	----	----

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

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2504980**	Page	: 1 of 6
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 13:23
PO	: SWM.SWOP04071-04.007	Issue Date	: 08-May-2025 17:18
C-O-C number	: ----		
Sampler	: WILLIAM VERDUYN		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 1		
No. of samples analysed	: 1		

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.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- 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)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Air**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Hydrocarbons	QC-1982370-002	----	Aromatic (C12-C16)	----	E593C	160 % LCS-ND	50.0-150%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	*Description*
LCS-ND	*Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.*

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: **Air**

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
Field Tests : Air Canister Information										
Air Canister XCG-6 (SVP)	EF001	23-Apr-2025	----	----	----		06-May-2025	----	----	
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)										
Air Canister XCG-6 (SVP)	E593C	23-Apr-2025	----	----	----		06-May-2025	30 days	13 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)										
Air Canister XCG-6 (SVP)	E593A	23-Apr-2025	----	----	----		06-May-2025	30 days	13 days	✓
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Air Canister XCG-6 (SVP)	E629B-H	23-Apr-2025	----	----	----		02-May-2025	30 days	9 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)										
Air Canister XCG-6 (SVP)	E621B	23-Apr-2025	----	----	----		06-May-2025	30 days	13 days	✓

Legend & Qualifier Definitions

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: **Air**

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)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1982369	1	1	100.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1982370	1	1	100.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1982371	1	1	100.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1977213	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1982369	1	1	100.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1982370	1	1	100.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1982371	1	1	100.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1977213	1	3	33.3	5.0	✓
Method Blanks (MB)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	1982369	1	1	100.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	1982370	1	1	100.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	1982371	1	1	100.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1977213	1	3	33.3	5.0	✓
Air Canister Information	EF001	1981833	1	9	11.1	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
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Total Volatile Organic Compounds (TVOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B ALS Environmental - Waterloo	Air	EPA TO-15 (mod)	Volatile Organic Compounds (VOC) in canisters (or bags) are transferred to a preconcentrator system and then thermally desorbed prior to injection into a GC-MS system for analysis.
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
F1-BTEX in Canisters or Bags GC-MS (µg/m3)	EC592A ALS Environmental - Waterloo	Air	unit conversion	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
F2-Naphthalene in Canisters by GC-MS (ug/m3)	EC593D ALS Environmental - Waterloo	Air	CCME PHC	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ug/m3)	EC621B ALS Environmental - Waterloo	Air	unit conversion	Convert ppbV to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **CG2504980**	Page	: 1 of 11
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Darby Madalena	Account Manager	: Patryk Wojciak
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary, Alberta Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.007	Date Samples Received	: 24-Apr-2025 13:23
PO	: SWM.SWOP04071-04.007	Date Analysis Commenced	: 02-May-2025
C-O-C number	: ----	Issue Date	: 08-May-2025 17:17
Sampler	: WILLIAM VERDUYN		
Site	: Monfort Pre-1972 Landfill		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 1		
No. of samples analysed	: 1		

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
- 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*
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, 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: **Air**

					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*
Permanent Gases (QC Lot: 1977213)											
CG2504980-001	XCG-6 (SVP)	Carbon dioxide	124-38-9	E629B-H	0.050	%	4.40	4.39	0.319%	20%	----
		Carbon monoxide	630-08-0	E629B-H	0.050	%	<0.050	<0.050	0	Diff <2x LOR	----
		Methane	74-82-8	E629B-H	0.050	%	<0.050	<0.050	0	Diff <2x LOR	----
		Nitrogen	7727-37-9	E629B-H	1.0	%	75.0	74.8	0.243%	20%	----
		Oxygen	7782-44-7	E629B-H	0.10	%	12.4	12.1	3.01%	20%	----
Volatile Organic Compounds (QC Lot: 1982371)											
CG2504980-001	XCG-6 (SVP)	Acetone	67-64-1	E621B	5.0	ppbv	15.6	19.2	3.6	Diff <2x LOR	----
		Allyl chloride	107-05-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Benzene	71-43-2	E621B	0.10	ppbv	0.20	0.23	0.03	Diff <2x LOR	----
		Benzyl chloride	100-44-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromoform	75-25-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Bromomethane	74-83-9	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Butadiene, 1,3-	106-99-0	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Carbon disulfide	75-15-0	E621B	0.50	ppbv	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Chloroform	67-66-3	E621B	0.20	ppbv	0.51	0.51	0.004	Diff <2x LOR	----
		Chloromethane	74-87-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Cyclohexane	110-82-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dibromoethane, 1,2-	106-93-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorodifluoromethane	75-71-8	E621B	1.00	ppbv	40.9	41.8	2.29%	30%	----
		Dichloroethane, 1,1-	75-34-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1982371) - continued											
CG2504980-001	XCG-6 (SVP)	Dichloroethylene, cis-1,2-	156-59-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropylene, cis+trans-1,3-	542-75-6	E621B	0.3	ppbv	<0.30	<0.30	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	1.00	ppbv	16.9	17.4	3.03%	30%	----
		Dioxane, 1,4-	123-91-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Ethyl acetate	141-78-6	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E621B	0.10	ppbv	0.32	0.34	0.02	Diff <2x LOR	----
		Ethyltoluene, 4-	622-96-8	E621B	0.20	ppbv	0.23	0.28	0.05	Diff <2x LOR	----
		Heptane, n-	142-82-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Hexachlorobutadiene	87-68-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Hexane, n-	110-54-3	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Hexanone, 2-	591-78-6	E621B	1.0	ppbv	<1.0	<1.0	0	Diff <2x LOR	----
		Isopropylbenzene	98-82-8	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E621B	0.20	ppbv	1.16	1.26	0.10	Diff <2x LOR	----
		Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E621B	0.10	ppbv	0.34	0.35	0.02	Diff <2x LOR	----
		Propylene	115-07-1	E621B	1.00	ppbv	6.85	7.19	4.92%	30%	----
		Styrene	100-42-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E621B	0.20	ppbv	0.28	0.28	0.005	Diff <2x LOR	----
		Tetrahydrofuran	109-99-9	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Toluene	108-88-3	E621B	0.10	ppbv	0.96	1.02	5.39%	30%	----
		Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E621B	1.00	ppbv	4.52	4.77	0.25	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----

Sub-Matrix: **Air**

					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*
Volatile Organic Compounds (QC Lot: 1982371) - continued											
CG2504980-001	XCG-6 (SVP)	Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.20	ppbv	1.08	1.12	0.04	Diff <2x LOR	----
		Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.20	ppbv	<0.20	0.20	0.003	Diff <2x LOR	----
		Trimethylpentane, 2,2,4-	540-84-1	E621B	0.20	ppbv	0.44	0.44	0.0006	Diff <2x LOR	----
		Vinyl acetate	108-05-4	E621B	0.50	ppbv	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl bromide	593-60-2	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E621B	0.20	ppbv	1.23	1.33	0.10	Diff <2x LOR	----
		Xylene, o-	95-47-6	E621B	0.10	ppbv	0.58	0.62	0.04	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1982369)											
CG2504980-001	XCG-6 (SVP)	F1 (C6-C10)	----	E593A	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		F2 (C10-C16)	----	E593A	15	µg/m³	<80	<15	15	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1982370)											
CG2504980-001	XCG-6 (SVP)	Aromatic (C10-C12)	----	E593C	16	µg/m³	<71	<16	71	Diff <2x LOR	----
		Aromatic (C12-C16)	----	E593C	30	µg/m³	<30	<30	0	Diff <2x LOR	----
		Aromatic (C6-C8)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		Aromatic (C8-C10)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		TVOC (C10-C12)	----	E593C	15	µg/m³	<77	<15	62	Diff <2x LOR	----
		TVOC (C12-C16)	----	E593C	30	µg/m³	<30	<30	0	Diff <2x LOR	----
		TVOC (C6-C8)	----	E593C	15	µg/m³	<15	<15	0	Diff <2x LOR	----
		TVOC (C8-C10)	----	E593C	15	µg/m³	35	34	1.0	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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1981833)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Permanent Gases (QCLot: 1977213)						
Carbon dioxide	124-38-9	E629B-H	0.05	%	<0.050	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	<0.050	----
Methane	74-82-8	E629B-H	0.05	%	<0.050	----
Nitrogen	7727-37-9	E629B-H	1	%	<1.0	----
Oxygen	7782-44-7	E629B-H	0.1	%	<0.10	----
Volatile Organic Compounds (QCLot: 1982371)						
Acetone	67-64-1	E621B	1	ppbv	<1.0	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	<0.20	----
Benzene	71-43-2	E621B	0.1	ppbv	<0.10	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	<0.20	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	<0.20	----
Bromoform	75-25-2	E621B	0.2	ppbv	<0.20	----
Bromomethane	74-83-9	E621B	0.2	ppbv	<0.20	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	<0.20	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	<0.50	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	<0.20	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	<0.20	----
Chloroethane	75-00-3	E621B	0.2	ppbv	<0.20	----
Chloroform	67-66-3	E621B	0.2	ppbv	<0.20	----
Chloromethane	74-87-3	E621B	0.2	ppbv	<0.20	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	<0.20	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	<0.20	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	<0.20	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	<0.20	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	<0.20	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1982371) - continued						
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	<0.20	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	<0.20	----
Dichloromethane	75-09-2	E621B	0.2	ppbv	<0.20	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	<0.20	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	<0.20	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	<0.20	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	<0.20	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	<0.20	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	<0.10	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	<0.20	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	<0.20	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	<0.20	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	<0.20	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	<1.0	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	<0.20	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	<0.20	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	<0.20	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	<0.20	----
Naphthalene	91-20-3	E621B	0.1	ppbv	<0.10	----
Propylene	115-07-1	E621B	0.2	ppbv	<0.20	----
Styrene	100-42-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	<0.20	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	<0.20	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	<0.20	----
Toluene	108-88-3	E621B	0.1	ppbv	<0.10	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	<0.20	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	<0.20	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	<0.20	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	<0.20	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	<0.20	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	<0.20	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	<0.20	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1982371) - continued						
Vinyl acetate	108-05-4	E621B	0.5	ppbv	<0.50	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	<0.20	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	<0.20	----
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	<0.20	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	<0.10	----
Hydrocarbons (QCLot: 1982369)						
F1 (C6-C10)	----	E593A	15	µg/m³	<15	----
F2 (C10-C16)	----	E593A	15	µg/m³	<15	----
Hydrocarbons (QCLot: 1982370)						
Aromatic (C10-C12)	----	E593C	15	µg/m³	<15	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	<30	----
Aromatic (C6-C8)	----	E593C	15	µg/m³	<15	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	<15	----
TVOC (C10-C12)	----	E593C	15	µg/m³	<15	----
TVOC (C12-C16)	----	E593C	30	µg/m³	<30	----
TVOC (C6-C8)	----	E593C	15	µg/m³	<15	----
TVOC (C8-C10)	----	E593C	15	µg/m³	<15	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Permanent Gases (QCLot: 1977213)									
Carbon dioxide	124-38-9	E629B-H	0.05	%	4.98 %	100	70.0	130	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	0.747 %	106	70.0	130	----
Methane	74-82-8	E629B-H	0.05	%	15 %	101	70.0	130	----
Nitrogen	7727-37-9	E629B-H	1	%	50.4 %	101	70.0	130	----
Oxygen	7782-44-7	E629B-H	0.1	%	7.41 %	104	70.0	130	----
Volatile Organic Compounds (QCLot: 1982371)									
Acetone	67-64-1	E621B	1	ppbv	1.03 ppbv	95.4	70.0	130	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	1.04 ppbv	96.9	70.0	130	----
Benzene	71-43-2	E621B	0.1	ppbv	1.04 ppbv	99.1	70.0	130	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	0.99 ppbv	97.3	70.0	130	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	1.07 ppbv	109	70.0	130	----
Bromoform	75-25-2	E621B	0.2	ppbv	1.03 ppbv	110	70.0	130	----
Bromomethane	74-83-9	E621B	0.2	ppbv	1.01 ppbv	108	70.0	130	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	1.05 ppbv	108	70.0	130	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	0.99 ppbv	105	70.0	130	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	1.05 ppbv	108	70.0	130	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	1.03 ppbv	107	70.0	130	----
Chloroethane	75-00-3	E621B	0.2	ppbv	1.04 ppbv	105	70.0	130	----
Chloroform	67-66-3	E621B	0.2	ppbv	1.04 ppbv	112	70.0	130	----
Chloromethane	74-87-3	E621B	0.2	ppbv	1.03 ppbv	111	70.0	130	----
Cyclohexane	110-82-7	E621B	0.2	ppbv	1.06 ppbv	109	70.0	130	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	1.05 ppbv	110	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	1.04 ppbv	107	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	0.97 ppbv	110	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	0.99 ppbv	107	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	0.98 ppbv	104	70.0	130	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	1.05 ppbv	117	70.0	130	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	1.01 ppbv	113	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E621B	0.2	ppbv	1.04 ppbv	106	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E621B	0.2	ppbv	1.01 ppbv	94.7	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	1.04 ppbv	101	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	1.06 ppbv	98.0	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1982371) - continued									
Dichloromethane	75-09-2	E621B	0.2	ppbv	1.02 ppbv	109	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	1.05 ppbv	112	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	1.04 ppbv	99.2	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	1.05 ppbv	94.0	70.0	130	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	0.96 ppbv	108	70.0	130	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	1.05 ppbv	95.0	70.0	130	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	1.04 ppbv	125	70.0	130	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	1.04 ppbv	97.7	70.0	130	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	1.01 ppbv	102	70.0	130	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	1.06 ppbv	101	70.0	130	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	1.02 ppbv	112	70.0	130	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	1.06 ppbv	105	70.0	130	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	1.04 ppbv	98.1	70.0	130	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	1 ppbv	103	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	1.05 ppbv	100	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	0.99 ppbv	103	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	1.06 ppbv	94.4	70.0	130	----
Naphthalene	91-20-3	E621B	0.1	ppbv	0.98 ppbv	81.3	70.0	130	----
Propylene	115-07-1	E621B	0.2	ppbv	1.02 ppbv	90.4	70.0	130	----
Styrene	100-42-5	E621B	0.2	ppbv	1.04 ppbv	95.2	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	0.99 ppbv	115	70.0	130	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	1.04 ppbv	111	70.0	130	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	1.04 ppbv	96.8	70.0	130	----
Toluene	108-88-3	E621B	0.1	ppbv	1.04 ppbv	99.2	70.0	130	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	1.05 ppbv	106	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	0.99 ppbv	87.5	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	1.05 ppbv	107	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	1.03 ppbv	113	70.0	130	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	1.01 ppbv	97.6	70.0	130	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	1.04 ppbv	106	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	1.05 ppbv	92.9	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	1 ppbv	104	70.0	130	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	1.04 ppbv	109	70.0	130	----
Vinyl acetate	108-05-4	E621B	0.5	ppbv	1.05 ppbv	108	70.0	130	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	0.99 ppbv	109	70.0	130	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	1.04 ppbv	112	70.0	130	----

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike: Target Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 1982371) - continued									
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	2.06 ppbv	104	70.0	130	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	1.03 ppbv	103	70.0	130	----
Hydrocarbons (QCLot: 1982369)									
F1 (C6-C10)	----	E593A	15	µg/m³	815 µg/m³	72.3	50.0	150	----
Hydrocarbons (QCLot: 1982370)									
Aromatic (C10-C12)	----	E593C	15	µg/m³	60.8 µg/m³	78.0	50.0	150	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	60.1 µg/m³	# 160	50.0	150	LCS-ND
Aromatic (C6-C8)	----	E593C	15	µg/m³	60.1 µg/m³	88.7	50.0	150	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	59.6 µg/m³	89.1	50.0	150	----
TVOC (C10-C12)	----	E593C	15	µg/m³	121 µg/m³	83.9	50.0	150	----
TVOC (C12-C16)	----	E593C	30	µg/m³	120 µg/m³	118	50.0	150	----
TVOC (C6-C8)	----	E593C	15	µg/m³	120 µg/m³	94.9	50.0	150	----
TVOC (C8-C10)	----	E593C	15	µg/m³	119 µg/m³	98.5	50.0	150	----

Qualifiers

Qualifier	Description
LCS-ND	*Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.*

Batch Proof Report

Batch Proof ID: 241210.229
Canister ID: 01400-0016
Analysis Date: 2-Jan-25

right solutions.
right partner.

1,1,1-Trichloroethane	<0.02	ppb(V)	cis-1,3-Dichloropropene	<0.02	ppb(V)
1,1,1,2-Tetrachloroethane	<0.02	ppb(V)	Cyclohexane	<0.20	ppb(V)
1,1,2,2-Tetrachloroethane	<0.02	ppb(V)	Dibromochloromethane	<0.20	ppb(V)
1,1,2-Trichloroethane	<0.02	ppb(V)	Dichlorodifluoromethane	<0.20	ppb(V)
1,1-Dichloroethane	<0.02	ppb(V)	Ethyl Acetate	<0.20	ppb(V)
1,1-Dichloroethene	<0.02	ppb(V)	Ethyl Benzene	<0.02	ppb(V)
1,2,4-Trichlorobenzene	<0.20	ppb(V)	Freon 113	<0.20	ppb(V)
1,2,4-Trimethylbenzene	<0.20	ppb(V)	Freon 114	<0.20	ppb(V)
1,2-Dibromoethane	<0.01	ppb(V)	Hexachlorobutadiene	<0.02	ppb(V)
1,2-Dichlorobenzene	<0.02	ppb(V)	Isooctane	<0.20	ppb(V)
1,2-Dichloroethane	<0.01	ppb(V)	Isopropyl Alcohol	<0.20	ppb(V)
1,2-Dichloropropane	<0.02	ppb(V)	Isopropylbenzene	<0.20	ppb(V)
1,3,5-Trimethylbenzene	<0.20	ppb(V)	m&p-Xylene	<0.04	ppb(V)
1,3-Butadiene	<0.20	ppb(V)	Methyl Ethyl Ketone	<0.20	ppb(V)
1,3-Dichlorobenzene	<0.02	ppb(V)	Methylcyclohexane	<0.20	ppb(V)
1,4-Dichlorobenzene	<0.02	ppb(V)	Methyl Isobutyl Ketone	<0.20	ppb(V)
1,4-Dioxane	<0.20	ppb(V)	Methylene Chloride	<0.02	ppb(V)
2-Chlorophenol	<0.20	ppb(V)	MTBE	<0.20	ppb(V)
2-Hexanone	<1.0	ppb(V)	Naphthalene	<0.05	ppb(V)
4-Ethyltoluene	<0.20	ppb(V)	n-Decane	<0.20	ppb(V)
Acetone	<1.0	ppb(V)	n-Heptane	<0.20	ppb(V)
Acrolein	<0.10	ppb(V)	n-Hexane	<0.02	ppb(V)
Allyl Chloride	<0.20	ppb(V)	o-Xylene	<0.02	ppb(V)
Benzene	<0.02	ppb(V)	Propylene	<0.20	ppb(V)
Benzyl Chloride	<0.20	ppb(V)	Styrene	<0.02	ppb(V)
Bromodichloromethane	<0.20	ppb(V)	Tetrachloroethylene	<0.02	ppb(V)
Bromobenzene	<0.20	ppb(V)	Tetrahydrofuran	<0.20	ppb(V)
Bromoform	<0.02	ppb(V)	Toluene	<0.02	ppb(V)
Bromomethane	<0.20	ppb(V)	trans-1,2-Dichloroethene	<0.02	ppb(V)
Carbon Disulfide	<0.50	ppb(V)	trans-1,3-Dichloropropene	<0.02	ppb(V)
Carbon Tetrachloride	<0.02	ppb(V)	Trichloroethylene	<0.02	ppb(V)
Chlorobenzene	<0.20	ppb(V)	Trichlorofluoromethane	<0.20	ppb(V)
Chloroethane	<0.02	ppb(V)	Vinyl Acetate	<0.50	ppb(V)
Chloroform	<0.02	ppb(V)	Vinyl Bromide	<0.20	ppb(V)
Chloromethane	<0.20	ppb(V)	Vinyl Chloride	<0.02	ppb(V)
cis-1,2-Dichloroethene	<0.02	ppb(V)	4-Bromofluorobenzene	86.46	%

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Darby Madalena
Phone:	403-723-6867
	Company address below will appear on the final report
Street:	110, 140 Quarry Park Blvd SE
City/Province:	Calgary, AB
Postal Code:	T2C 2X5
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☐ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: darby.madalena@tetratech.com

Email 2: jaymes.going@tetratech.com

Email 3: wendy.cadelago@tetratech.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: EBA.Accounts.Payable@tetratech.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	CG22-EBAE100-0021
Job #:	SWM.SWOP04071-04.007
PO / AFE:	SWM.SWOP04071-04.007
LSD:	Monfort Pre-1972 Landfill

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Wendy Sears

Sampler: Willem Veldyon

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	EP592	S621E - Aliphatic and Aromatics	S629B - Methane,CO2,CO,N2,O2	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	XCG-6 (SVP)	23-Apr-25	16:26	AIR		R	R	R			

Environmental Division Calgary

Work Order Reference

CG2504980

Telephone : +1 403 407 1800

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

QUOTE CG2022EBAE1000021

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
16.5					

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Willem Veldyon	Apr 24/25	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	4/25/25	1210

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX G

HISTORICAL ANALYTICAL DATA

Table 5 Summary of Field Parameters in Groundwater

Location	Date	Temperature (°C)	pH	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)
2016 Alberta Tier 1 Guidelines[1] (COARSE)		--	6.5-8.5	--	--	--
March Sampling Event						
MW-01	12-Mar-17	7.45	6.56	828	9.05	184.2
MW-02	13-Mar-17	4.16	7.32	1247	2.95	-31.0
MW-03	13-Mar-17	4.31	6.90	1766	0.86	-23.6
MW-06	14-Mar-17	5.05	**6.06**	2847	4.54	16.3
MW-07	14-Mar-17	6.33	**6.11**	2370	0.99	-15.6
XCG-1 (MW)	11-Mar-17	6.80	7.17	676	6.82	72.2
XCG-2 (MW)	11-Mar-17	6.04	7.25	822	5.10	118.6
XCG-4 (MW)	13-Mar-17	1.59	8.38	1110	3.21	-137.2
XCG-5 (MW)	13-Mar-17	4.59	**10.29**	747	8.36	-186.6
XCG-6 (MW)	13-Mar-17	4.36	**6.20**	1842	3.76	210.7
XCG-12 (MW)	14-Mar-17	3.25	**6.47**	1017	4.54	16.3
XCG-13 (MW)	14-Mar-17	3.82	**6.19**	2025	1.13	11.3
XCG-14 (MW)	11-Mar-17	6.16	7.26	1022	4.53	58.8

Notes:

1. Alberta Tier 1 groundwater remediation guidelines for residential/parkland land use, coarse grained soil (February 2016).

-- No Value

Bold Exceeds the Alberta Tier 1 Guidelines

Table 6 Summary of Analytical Results for VOCs in Groundwater

Sample ID		2016 Alberta Tier 1 Guidelines[1] (COARSE)	MW-01	MW-02	MW-03	MW-06	MW-07	XCG-1 (MW)	XCG-2 (MW)		XCG-4 (MW)	XCG 5 (MW)	XCG 6 (MW)	XCG-12 (MW)	XCG-13 (MW)	XCG-14 (MW)	Field Blank
Laboratory ID	**RDL**	**Groundwater**	QR8541	QS0279	QS0278	QS2251	QS2250	QR7384	QR8538	QR8539	QS2248	QS0277	QS0276	QR8542	QS2249	QR8540	QR8543
Units	**µg/L**	**µg/L**	**12-Mar-17**	**13-Mar-17**	**13-Mar-17**	**14-Mar-17**	**14-Mar-17**	**10-Mar-17**	**11-Mar-17**	**11-Mar-17**	**14-Mar-17**	**13-Mar-17**	**13-Mar-17**	**12-Mar-17**	**14-Mar-17**	**11-Mar-17**	**12-Mar-17**
Total Trihalomethanes	1	100	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3
Bromodichloromethane	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	2.0	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	0.50	0.57	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	0.50	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane	1.00	190	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	1.00	--	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	0.50	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	2.00	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dibromoethane	0.20	--	<0.20	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-dichlorobenzene	0.50	0.7	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	0.5	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	0.50	1	<0.50	<0.50	<0.50	**1.2**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	0.50	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene	0.50	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene	0.50	--	<0.50	<0.50	20	18	120	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	130	<0.50	<0.50
trans-1,2-dichloroethene	0.50	--	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	<0.50	<0.50
Dichloromethane	2.00	50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dichloropropane	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-dichloropropene	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl methacrylate	0.5	470	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl-tert-butylether (MTBE)	0.5	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	1	72	<0.50	<0.50	<0.50	0.75	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-tetrachloroethane	1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	2.00	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	0.50	10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-trichlorobenzene	1.00	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	1.00	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trichlorobenzene	0.50	14	<0.50	<0.50	<0.50	0.73	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-trichloroethane	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-trichloroethane	0.50	--	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	0.50	5	<0.50	<0.50	<0.50	<0.50	**7.4**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	<0.50	<0.50
Trichlorofluoromethane	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-trimethylbenzene	0.50	--	<0.50	<0.50	<0.50	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-trimethylbenzene	0.50	--	<0.50	<0.50	<0.50	3.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	0.50	1.1	<0.50	<0.50	**16**	**8.4**	**39**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**21**	<0.50	<0.50

Notes:

RDL	Laboratory Reportable Detection Limit
1. Alberta Tier 1 groundwater remediation	guidelines for residential/parkland land use, coarse grained soil (February 2016).
--	no value
<	Less than the RDL
Bold	Exceeds the Alberta Tier 1 Guidelines

Table 7 Summary of Analytical Results for Routine Parameters and Nutrients in Groundwater

Sample ID			2016 Alberta Tier 1 Guidelines[1] (COARSE)	MW-01	MW-02	MW-03	MW-06	MW-07	XCG-1 (MW)	XCG-2 (MW)		XCG-4 (MW)	XCG-5 (MW)	XCG-6 (MW)	XCG-12 (MW)	XCG-13 (MW)	XCG-14 (MW)	Field Blank
Laboratory ID		**RDL**	**Groundwater**	QR8541	QS0279	QS0278	QS2251	QS2250	QR7384	QR8538	QR8539	QS2248	QS0277	QS0276	QR8542	QS2249	QR8540	QR8543
	Units			**12-Mar-17**	**13-Mar-17**	**13-Mar-17**	**14-Mar-17**	**14-Mar-17**	**10-Mar-17**	**11-Mar-17**	**11-Mar-17**	**14-Mar-17**	**13-Mar-17**	**13-Mar-17**	**12-Mar-17**	**14-Mar-17**	**11-Mar-17**	**12-Mar-17**
Calculated Parameters																		
Anion Sum	meq/L	N/A	--	9.3	13	20	32	25	7.1	8.8	8.8	12	8.1	18	12	24	12	0.0000
Cation Sum	meq/L	N/A	--	8.9	13	20	30	26	7.1	8.8	8.9	12	8.0	18	12	23	12	0.0030
Hardness (CaCO3)	mg/L	0.50	--	420	520	920	970	1100	340	320	320	480	390	870	550	1000	560	<0.50
Ion Balance (% Difference)	N/A	0.010	--	2.0	1.3	0.29	3.5	0.66	0.43	0.13	0.50	0.87	0.31	0.89	1.5	2.3	0.77	NC
Dissolved Nitrate (NO3)	mg/L	0.044	--	0.21	6.2	1.7	0.14	0.20	0.10	0.063	0.077	<0.044	2.7	250	0.17	<0.044	0.056	<0.044
Nitrate plus Nitrite (N)	mg/L	0.010	--	0.047	1.4	0.38	0.031	0.044	0.024	0.014	0.017	<0.010	0.61	56	0.037	<0.010	0.013	<0.010
Dissolved Nitrite (NO2)	mg/L	0.033	--	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.20	<0.033	<0.033	<0.033	<0.033
Calculated Total Dissolved Solids	mg/L	10	500	450	**660**	**990**	**1500**	**1300**	350	460	460	**580**	380	**1000**	**580**	**1100**	**570**	<10
Miscellaneous Inorganics																		
Conductivity	uS/cm	1.0	--	830	1200	1800	2800	2400	660	820	830	1000	700	1700	1000	2100	1000	1.1
pH	pH	N/A	6.5-8.5	7.37	7.57	7.31	7.10	7.12	7.73	7.30	7.29	7.74	7.76	7.32	7.59	7.15	7.34	**5.57**
Anions																		
Alkalinity (PP as CaCO3)	mg/L	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity (Total as CaCO3)	mg/L	0.50	--	410	360	960	1500	890	310	340	340	550	390	600	530	920	490	<0.50
Bicarbonate (HCO3)	mg/L	0.50	--	500	430	1200	1800	1100	380	420	420	670	470	730	640	1100	590	<0.50
Carbonate (CO3)	mg/L	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide (OH)	mg/L	0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dissolved Sulphate (SO4)	mg/L	1.0	500 or 128 to 429 (a)	37	53	36	<1.0	7.2	29	57	58	9.3	10	82	42	6.8	56	<1.0
Dissolved Chloride (Cl)	mg/L	1.0	120	12	**160**	13	83	**260**	10	27	27	17	2.0	11	22	**200**	21	<1.0
Nutrients																		
Dissolved Nitrite (N)	mg/L	0.010-0.033	1.0 or 0.06 to 0.6 (b)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.060	<0.033	<0.010	<0.010	<0.010
Dissolved Nitrate (N)	mg/L	0.010	3	0.047	1.4	0.38	0.031	0.044	0.024	0.014	0.017	<0.010	0.61	**56**	0.58	<0.010	0.013	<0.010
Total Ammonia (N)	mg/L	0.050	0.018 to 190 (c)	0.19	<0.050	0.13	**69**	0.87	0.38	0.23	0.23	0.17	<0.050	0.093	0.54	0.18	0.30	<0.050
Total Nitrogen (N)	mg/L	0.055	--	1.3	1.8	1.0	96	1.9	2.5	0.45	0.55	0.64	0.82	57	3.6	0.93	1.4	<0.055
Total Phosphorus (P)	mg/L	0.015-0.0030	--	0.70	0.0061	0.0097	1.1	0.030	2.5	0.19	0.10	0.11	0.0085	0.0046	1.2	0.020	2.6	<0.0030
Total Kjeldahl Nitrogen	mg/L	0.050-0.25	--	1.2	0.34	0.63	96	1.9	2.5	0.44	0.53	0.64	0.21	1.0	3.4	0.93	1.4	<0.050
Demand Parameters																		
Biochemical Oxygen Demand	mg/L	2-10	--	<2.0	<2.0	6.9	22	7.8	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	8.3	3.1	<2.0	<2.0
Total Chemical Oxygen Demand	mg/L	5	--	<5.0	15	65	330	64	71	37	36	41	<5.0	20	110	41	85	<5.0
Misc. Inorganics																		
Total Organic Carbon (C)	mg/L	0.5-5.0	--	4.3	8.8	8.1	72.0	19	<2.5	3.3	4.2	4.3	3.7	12.0	16	15	<5.0	<0.50
Organic Acids																		
Formic Acid	mg/L	<0.5	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acetic Acid	mg/L	<0.5	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Propionic Acid	mg/L	<0.5	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butyric Acid	mg/L	<10	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Misc. Organics																		
Adsorbable Organic Halogen	mg/L	0.01	--	0.02	0.07	<0.01	0.14	0.06	0.02	0.03	0.02	0.03	0.01	0.03	0.02	0.6	0.02	0.02

Notes:

RDL Laboratory Reportable Detection Limit

1. Alberta Tier 1 groundwater remediation guidelines for residential/parkland land use, coarse grained soil (February 2016).

-- no value

< Less than the RDL

(a) Varies with hardness. See table 1.7 of the Environmental Quality Guidelines for Alberta Surface Waters (2014) if hardness is less than 250 mg/L.

(b) Varies with chloride. See table 1.4 of the Environmental Quality Guidelines for Alberta Surface Waters (2014) if chloride is less than 10 mg/L.

(c) Temperature and pH dependent. See table 1.2 of the Environmental Quality Guidelines for Alberta Surface Waters (2014).

Bold Exceeds the Alberta Tier 1 Guidelines

Table 8 Summary of Analytical Results for Dissolved Metals in Groundwater

Sample ID			2016 Alberta Tier 1 Guidelines[1] (COARSE)	MW-01	MW-02	MW-03	MW-06	MW-07	XCG-1 (MW)	XCG-2 (MW)		XCG-4 (MW)	XCG-5 (MW)	XCG-6 (MW)	XCG-12 (MW)	XCG-13 (MW)	XCG-14 (MW)	Field Blank
Laboratory ID		RDL	Groundwater	QR8541	QS0279	QS0278	QS2251	QS2250	QR7384	QR8538	QR8539	QS2248	QS0277	QS0276	QR8542	QS2249	QR8540	QR8543
	Units			12-Mar-17	13-Mar-17	13-Mar-17	14-Mar-17	14-Mar-17	10-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	13-Mar-17	13-Mar-17	12-Mar-17	14-Mar-17	11-Mar-17	12-Mar-17
Dissolved Cadmium (Cd)	ug/L	0.02	5 or 0.11 to 7.7 (a)	0.29	0.044	0.044	<0.020	0.022	0.053	0.15	0.13	0.29	0.042	0.060	0.023	0.088	0.064	<0.020
Dissolved Aluminum (Al)	mg/L	0.003	0.1 or 0.023 to 0.074 (b)	0.0039	<0.0030	<0.0030	0.0057	<0.0030	0.0056	0.0031	0.0038	0.0044	<0.0030	<0.0030	0.0054	0.0042	0.0031	<0.0030
Dissolved Antimony (Sb)	mg/L	0.0006	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00065	<0.00060	<0.00060	0.00075	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Dissolved Arsenic (As)	mg/L	0.0002	0.005	0.00029	<0.00020	0.00041	0.0092	0.0073	0.0011	0.0013	0.0013	0.00044	0.00033	0.00046	**0.019**	0.0014	0.0011	<0.00020
Dissolved Barium (Ba)	mg/L	0.01	1	0.71	0.64	0.89	0.99	**1.1**	0.51	0.090	0.093	0.22	0.22	0.46	**1.2**	0.94	0.52	<0.010
Dissolved Beryllium (Be)	mg/L	0.001	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Boron (B)	mg/L	0.02	1.5	0.042	0.025	0.17	0.23	0.066	0.038	0.090	0.090	0.038	0.024	0.049	0.054	0.050	0.046	<0.020
Dissolved Calcium (Ca)	mg/L	0.3	--	110	130	220	230	230	77	84	83	130	86	250	130	190	120	<0.30
Dissolved Chromium (Cr)	mg/L	0.001	--	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Cobalt (Co)	mg/L	0.0003	--	<0.00030	0.0011	0.0016	0.014	0.012	0.00097	0.0024	0.0023	0.00099	<0.00030	0.00050	0.00080	0.0068	0.00043	<0.00030
Dissolved Copper (Cu)	mg/L	0.0002	0.007	0.00085	0.0010	0.0013	<0.00020	<0.00020	0.0032	0.0011	0.0010	0.0019	0.00071	0.0022	0.00047	0.00089	0.00071	<0.00020
Dissolved Iron (Fe)	mg/L	0.06	0.3	<0.060	0.065	0.13	**29**	**12**	<0.060	<0.060	<0.060	<0.060	<0.060	0.086	<0.060	0.066	<0.060	<0.060
Dissolved Lead (Pb)	mg/L	0.0002	0.001 to 0.007 (a)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Lithium (Li)	mg/L	0.02	--	0.027	0.022	0.064	<0.020	0.038	0.020	0.037	0.038	<0.020	<0.020	<0.020	0.031	0.051	0.047	<0.020
Dissolved Magnesium (Mg)	mg/L	0.2	--	37	51	88	97	130	35	28	27	38	42	62	56	140	61	<0.20
Dissolved Manganese (Mn)	mg/L	0.004	0.05	**0.089**	<0.0040	**0.49**	**0.49**	**1.8**	**0.28**	**0.50**	**0.49**	**0.29**	<0.0040	**0.15**	**0.61**	**0.71**	**0.26**	<0.0040
Dissolved Molybdenum (Mo)	mg/L	0.0002	--	0.0027	0.00040	0.00069	0.00074	0.0024	0.0040	0.0043	0.0046	0.00081	0.00088	0.00044	0.0034	0.00055	0.0020	<0.00020
Dissolved Nickel (Ni)	mg/L	0.0005	0.037 to 1.52 (a)	0.00092	0.0029	0.0072	0.012	0.016	0.0032	0.0073	0.0069	0.0081	0.0012	0.0049	0.0021	0.015	0.0013	<0.00050
Dissolved Phosphorus (P)	mg/L	0.1	--	0.11	<0.10	<0.10	<0.10	<0.10	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Potassium (K)	mg/L	0.3	--	3.9	2.5	6.3	33	3.7	3.3	3.7	3.7	25	2.0	6.5	7.7	3.2	2.5	<0.30
Dissolved Selenium (Se)	mg/L	0.0002	0.001	0.00023	<0.00020	<0.00020	0.00050	0.00026	0.00030	0.00061	0.00058	<0.00020	0.00021	0.00034	<0.00020	0.00027	<0.00020	<0.00020
Dissolved Silicon (Si)	mg/L	0.1	--	6.1	7.7	7.8	15	11	6.2	6.5	6.6	7.6	11	8.1	7.6	9.4	6.8	<0.10
Dissolved Silver (Ag)	mg/L	0.0001	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Sodium (Na)	mg/L	0.5	200	9.8	48	39	88	73	6.8	51	54	29	4.8	17	11	54	10	<0.50
Dissolved Strontium (Sr)	mg/L	0.02	--	0.71	0.41	1.3	1.2	1.7	0.55	0.81	0.82	0.38	0.28	0.65	0.72	1.9	1.1	<0.020
Dissolved Sulphur (S)	mg/L	0.2	--	10	15	9.0	2.3	3.4	8.3	16	17	3.1	2.8	21	12	2.7	15	<0.20
Dissolved Thallium (Tl)	mg/L	0.0002	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Tin (Sn)	mg/L	0.001	--	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Dissolved Titanium (Ti)	mg/L	0.001	--	<0.0010	<0.0010	<0.0010	0.0022	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Uranium (U)	mg/L	0.0001	0.015	0.0098	0.0026	0.0095	0.00060	0.010	0.0037	0.013	0.014	0.0028	0.0016	0.0025	0.0013	0.011	0.015	<0.00010
Dissolved Vanadium (V)	mg/L	0.001	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Zinc (Zn)	mg/L	0.003	0.03	0.0036	<0.0030	<0.0030	0.013	<0.0030	0.0032	<0.0030	<0.0030	0.0073	<0.0030	<0.0030	<0.0030	0.0034	<0.0030	<0.0030

Notes:

RDL Laboratory Reportable Detection Limit

1. Alberta Tier 1 groundwater remediation guidelines for residential/parkland land use, coarse grained soil (February 2016).

-- no value

< Less than the RDL

Bold Exceeds the Alberta Tier 1 Guidelines

(a) Varies with hardness. See table 1.3 of the Environmental Quality Guidelines for Alberta Surface Waters (2014).

(b) Varies with pH, see table 1.1 of the Environmental Quality Guidelines for Alberta Surface Waters (2014).

Table 9 Summary of Analytical Results for Total Metals in Groundwater

Sample ID			2016 Alberta Tier 1 Guidelines[1] (COARSE)	MW-01	MW-02	MW-03	MW-06	MW-07	XCG-1 (MW)	XCG-2 (MW)		XCG-4 (MW)	XCG-5 (MW)	XCG-6 (MW)	XCG-12 (MW)	XCG-13 (MW)	XCG-14 (MW)	Field Blank
Laboratory ID		RDL	Groundwater	QR8541	QS0279	QS0278	QS2251	QS2250	QR7384	QR8538	QR8539	QS2248	QS0277	QS0276	QR8542	QS2249	QR8540	QR8543
	Units			12-Mar-17	13-Mar-17	13-Mar-17	14-Mar-17	14-Mar-17	10-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	13-Mar-17	13-Mar-17	12-Mar-17	14-Mar-17	11-Mar-17	12-Mar-17
Total Cadmium (Cd)	ug/L	0.020	--	1.9	0.34	0.089	0.77	0.25	4.2	1.1	0.76	12	0.12	0.19	1.8	0.17	1.7	<0.020
Total Aluminum (Al)	mg/L	0.0030	--	6.6	0.18	0.53	11	0.39	27	2.8	2.5	3.3	0.087	0.067	12	0.18	16	<0.0030
Total Antimony (Sb)	mg/L	0.00060	--	0.00063	<0.00060	<0.00060	0.00096	<0.00060	0.00090	0.00093	0.00075	<0.00060	0.00082	<0.00060	0.00077	<0.00060	0.00085	<0.00060
Total Arsenic (As)	mg/L	0.00020	--	0.0086	0.00036	0.00094	0.023	0.015	0.056	0.0043	0.0037	0.0030	0.00057	0.00047	0.062	0.0018	0.021	<0.00020
Total Barium (Ba)	mg/L	0.010	--	0.85	0.68 (1)	0.91	1.5	1.2	1.5	0.14	0.13	0.27	0.23	0.47	1.4	0.91	1.2	<0.010
Total Beryllium (Be)	mg/L	0.0010	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0016	<0.0010
Total Boron (B)	mg/L	0.020	--	0.042	0.030	0.20	0.25	0.064	0.047	0.11	0.098	0.039	0.029	0.057	0.055	0.050	0.065	<0.020
Total Calcium (Ca)	mg/L	0.30	--	130	130	240	280	240	250	93	83	140	88	260	170	190	240	<0.30
Total Chromium (Cr)	mg/L	0.0010	--	0.011	<0.0010	0.0018	0.019	<0.0010	0.048	0.0036	0.0026	0.0060	<0.0010	<0.0010	0.021	<0.0010	0.029	<0.0010
Total Cobalt (Co)	mg/L	0.00030	--	0.0081	0.0015	0.0019	0.024	0.014	0.035	0.0047	0.0044	0.0035	<0.00030	0.00060	0.015	0.0070	0.022	<0.00030
Total Copper (Cu)	mg/L	0.00020	--	0.019	0.0018	0.0025	0.032	0.0017	0.091	0.0063	0.0057	0.0095	0.0012	0.0023	0.034	0.0012	0.056	<0.00020
Total Iron (Fe)	mg/L	0.060	--	14	0.46 (1)	1.2	69	19	75	4.6	3.7	5.6	0.30	0.26	28	0.52	41	<0.060
Total Lead (Pb)	mg/L	0.00020	--	0.0084	0.00023	0.00082	0.021	0.00084	0.036	0.0045	0.0038	0.010	<0.00020	<0.00020	0.016	0.00024	0.024	<0.00020
Total Lithium (Li)	mg/L	0.020	--	0.032	0.025	0.072	0.026	0.036	0.061	0.041	0.037	<0.020	<0.020	<0.020	0.038	0.047	0.068	<0.020
Total Magnesium (Mg)	mg/L	0.20	--	46	54	97	120	130	83	31	27	41	43	66	60	140	92	<0.20
Total Manganese (Mn)	mg/L	0.0040	--	0.87	0.0061	0.55	0.79	1.8	1.6	0.60	0.54	0.37	0.0054	0.19	0.97	0.71	1.0	<0.0040
Total Molybdenum (Mo)	mg/L	0.00020	--	0.0036	0.00049	0.00087	0.0018	0.0025	0.0058	0.0049	0.0046	0.0014	0.00088	0.00053	0.0041	0.00061	0.0031	<0.00020
Total Nickel (Ni)	mg/L	0.00050	--	0.022	0.0046	0.0088	0.039	0.018	0.089	0.014	0.013	0.019	0.0015	0.0054	0.044	0.015	0.059	<0.00050
Total Phosphorus (P)	mg/L	0.10	--	0.48	<0.10 (1)	<0.10	1.1	<0.10	2.1	0.19	0.15	0.10	<0.10	<0.10	0.75	<0.10	1.2	<0.10
Total Potassium (K)	mg/L	0.30	--	5.1	2.7 (1)	7.3	38	3.7	8.0	4.5	4.0	26	2.1	7.1	8.3	3.3	6.0	<0.30
Total Selenium (Se)	mg/L	0.00020	--	0.00060	<0.00020	0.00021	0.00076	0.00021	0.0024	0.00089	0.00081	0.00029	0.00023	0.00037	0.00064	0.00025	0.0029	<0.00020
Total Silicon (Si)	mg/L	0.10	--	20	8.8 (1)	11	36	12	50	16	14	17	12	9.2	30	10	43	<0.10
Total Silver (Ag)	mg/L	0.00010	--	0.00013	<0.00010	<0.00010	0.00023	<0.00010	0.00064	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	0.00033	<0.00010	0.00029	<0.00010
Total Sodium (Na)	mg/L	0.50	--	8.0	51	42	95	76	7.3	56	51	35	4.6	19	9.7	56	10	<0.50
Total Strontium (Sr)	mg/L	0.020	--	0.66	0.44 (1)	1.3	1.3	1.6	0.80	0.86	0.77	0.38	0.28	0.65	0.67	1.7	1.2	<0.020
Total Sulphur (S)	mg/L	0.20	--	9.3	17	11	3.0	3.8	9.1	17	16	4.5	3.0	27	11	2.8	17	<0.20
Total Thallium (Tl)	mg/L	0.00020	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00072	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00031	<0.00020	0.00040	<0.00020
Total Tin (Sn)	mg/L	0.0010	--	0.0017	<0.0010	<0.0010	0.0065	<0.0010	0.0084	0.0045	0.0037	0.0020	0.0010	<0.0010	0.0095	<0.0010	0.0019	<0.0010
Total Titanium (Ti)	mg/L	0.0010	--	0.11	0.0069	0.016	0.19	0.014	0.26	0.037	0.032	0.13	0.0022	0.0046	0.17	0.0050	0.21	<0.0010
Total Uranium (U)	mg/L	0.00010	--	0.010	0.0031	0.0091	0.0016	0.0099	0.0066	0.015	0.014	0.0035	0.0016	0.0025	0.0023	0.011	0.015	<0.00010
Total Vanadium (V)	mg/L	0.0010	--	0.019	<0.0010	0.0022	0.031	0.0017	0.075	0.0058	0.0053	0.010	<0.0010	<0.0010	0.036	<0.0010	0.050	<0.0010
Total Zinc (Zn)	mg/L	0.0030	--	0.090	0.011	0.0074	0.099	0.0071	0.27	0.032	0.030	0.044	0.0053	<0.0030	0.15	0.0053	0.19	<0.0030

Notes:

RDL — Laboratory Reportable Detection Limit

1. Alberta Tier 1 groundwater remediation guidelines for residential/parkland land use, coarse grained soil (February 2016).

-- — no value

< — Less than the RDL

Bold — Exceeds the Alberta Tier 1 Guidelines

Table 10 Summary of Analytical Results for PHCs in Groundwater

Sample ID			2016 Alberta Tier 1 Guidelines[1] (COARSE)	MW-01	MW-02	MW-03	MW-06	MW-07	XCG-1 (MW)	XCG-2 (MW)	XCG-4 (MW)	XCG 5 (MW)	XCG 6 (MW)	XCG-12 (MW)	XCG-13 (MW)	XCG-14 (MW)	Field Blank
Laboratory ID		RDL	Groundwater	QR8541	QS0279	QS0278	QS2251	QS2250	QR7384	QR8538	QS2248	QS0277	QS0276	QR8542	QS2249	QR8540	QR8543
	Units			12-Mar-17	13-Mar-17	13-Mar-17	14-Mar-17	14-Mar-17	10-Mar-17	11-Mar-17	14-Mar-17	13-Mar-17	13-Mar-17	12-Mar-17	14-Mar-17	11-Mar-17	12-Mar-17
Benzene	µg/L	0.40	5	<0.40	<0.40	<0.40	**4.8**	1.7	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.86	<0.40	<0.40
Toluene	µg/L	0.40	21	<0.40	<0.40	<0.40	3.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	µg/L	0.40	1.6	<0.40	<0.40	<0.40	**58**	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
m & p-Xylene	µg/L	0.80	--	<0.80	<0.80	<0.80	30	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
o-Xylene	µg/L	0.40	--	<0.40	<0.40	<0.40	15	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	µg/L	0.80	20	<0.80	<0.80	<0.80	**45**	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
F1 (C6-C10) - BTEX	µg/L	100	810	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F1 (C6-C10)	µg/L	100	810	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F2 (C10-C16 Hydrocarbons)	mg/L	0.10	1100	<0.10	<0.10	<0.10	0.52	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Notes:

RDL Laboratory Reportable Detection Limit

1. Alberta Tier 1 groundwater remediation guidelines for residential/parkland land use, coarse grained soil (February 2016).

-- no value

< Less than the RDL

Bold Exceeds the Alberta Tier 1 Guidelines

Table 11 Summary of Analytical Results for Fixed Gases and Petroleum Hydrocarbons in Soil Vapour

Sample ID	Units	Reportable Detection Limit	Deminimus Screening - Soil Vapour Screening Criteria	Soil Vapour Probes													
				VW-01	VW-03	VW-05		XCG-1(SVP)	XCG-2(SVP)	XCG-4(SVP)		XCG-5(SVP)	XCG-6(SVP)	XCG-9(SVP)	XCG-10(SVP)	XCG-12(SVP)	XCG-13(SVP)	Trip Blank
Laboratory				Maxxam	Maxxam	Maxxam		Maxxam	Maxxam	Maxxam		Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Canister number				332	1280	1800	3017	1470	243	1281	212	1380	238	333	354	262	354	215
Laboratory ID				EBG095	EBG097	EBG090	EBG091	EBG092	EBG089	EBG086	EMV462	EBG085	EBG088	EBG096	EBG094	EBG087	EBG093	EBG098
Date Sampled				12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	1-Jun-17	14-Mar-17	13-Mar-17	11-Mar-17	12-Mar-17	14-Mar-17	12-Mar-17	N/A
Summa Canister Pressure on Receipt (psig)	(psig)	NV		(-2.9)	(-3.1)	(-1.9)	(-2.0)	(-1.7)	(-3.6)	(-3.4)	(-2.5)	(-3.4)	(-3.0)	(-2.7)	(-1.1)	(-3.0)	(-1.7)	(-14.3)
Oxygen	(% v/v)	0.2-0.3	NV	23.0	12.5	8.6	9.6	20.4	20.3	2.0	5.5	20.3	1.9	21.3	15.8	18.7	4.3	--
Nitrogen	(% v/v)	0.2-0.3	NV	77.0	80.7	79.0	78.9	78.1	78.4	82.8	--	77.4	81.5	78.2	81.7	79.0	84.8	--
Carbon Monoxide	(% v/v)	0.2-0.3	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.3	<0.2	--	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	--
Methane	(% v/v)	0.2-0.3	0.1 to 0.5 % v/v	<0.2	<0.2	**0.3**	**0.3**	<0.2	<0.3	**5.7**	< 0.2	<0.3	**1.2**	<0.2	<0.2	<0.2	**1.1**	--
Methane	ppm	3.4-5.4	1000 ppm to 5000 ppm	<4.3	<3.8	NR	NR	<3.9	5.9	NR	--	<5.2	NR	<4.2	<3.4	32	NR	--
Carbon Dioxide	(% v/v)	0.2-0.3	NV	<0.2	6.8	12.1	11.3	1.5	1.3	9.5	9.6	2.3	15.4	0.6	2.5	2.3	9.8	--
Ethane	ppm	0.17-0.27	1,000	<0.21	<0.19	2.3	2.1	<0.2	<0.27	0.24	--	<0.26	<0.22	<0.21	<0.17	<0.23	<0.19	--
Ethylene	ppm	0.17-0.27	200	<0.21	<0.19	6.8	6.3	<0.2	<0.27	6.2	--	<0.26	0.57	<0.21	<0.17	<0.23	0.25	--
Propane	ppm	0.17-0.27	1,000	<0.21	<0.19	<0.21	<0.2	<0.2	<0.27	<0.23	--	<0.26	<0.22	<0.21	<0.17	<0.23	<0.19	--
Propene	ppm	0.17-0.27	35	<0.21	<0.19	<0.21	<0.2	<0.2	<0.27	<0.23	--	<0.26	<0.22	<0.21	<0.17	<0.23	<0.19	--
F1-BTEX, C6-C10 (as Toluene)	µg/m3	5.0	59,532	7.9	31.8	486	530	36.1	<5.0	39.7	--	18.4	668	6.0	43.0	8.8	5830	<5.0
F2, C10-C16 (as Decane)	µg/m3	5.0	27,778	12.7	<5.0	62.8	68.9	<5.0	<5.0	<5.0	--	6.2	<5.0	<5.0	<5.0	<5.0	972	<5.0

Notes:

Bold Shaded	Concentration exceeds calculated soil vapour screening criteria
-	Criteria not derived (concentration below detection limits)
NR	Lab did not report ppm units (based on elevated %v/v detection)
--	No Data
<	Below Laboratory MDL

Table 12 Summary of Analytical Results for VOCs in Soil Vapour

Sample ID	Units	Reportable Detection Limit	Deminimus Screening -Soil Vapour Screening Criteria	Soil Vapour Probes														
				VW-01	VW-03	VW-05		XCG-1(SVP)	XCG-2(SVP)	XCG-4(SVP)		XCG-5(SVP)	XCG-6(SVP)	XCG-9(SVP)	XCG-10(SVP)	XCG-12(SVP)	XCG-13(SVP)	Trip Blank
Laboratory				Maxxam	Maxxam	Maxxam		Maxxam	Maxxam	Maxxam		Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Canister number				332	1280	1800	3017	1470	243	1281	212	1380	238	333	354	262	354	215
Laboratory ID				EBG095	EBG097	EBG090	EBG091	EBG092	EBG089	EBG086	EMV462	EBG085	EBG088	EBG096	EBG094	EBG087	EBG093	EBG098
Date Sampled				12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	1-Jun-17	14-Mar-17	13-Mar-17	11-Mar-17	12-Mar-17	14-Mar-17	12-Mar-17	N/A
Dichlorodifluoromethane (FREON 12)	µg/m³	0.989 - 9.89	17,800	2.50	571	867	855	8.46	2.68	41.3	--	280	88.9	2.46	3.67	89.5	2950	<0.989
1,2-Dichlorotetrafluoroethane	µg/m³	1.19 - 4.75	7,000,000	<1.19	1790	516	512	<1.19	<1.19	44.4	--	<1.19	341	<1.19	4.91	<1.19	565	<1.19
Chloromethane	µg/m³	0.62	1,800	4.39	<0.620	<0.620	<0.620	<0.620	<0.620	<0.620	--	<0.620	<0.620	<0.620	<0.30	<0.620	<0.620	<0.620
Vinyl Chloride	µg/m³	0.256 - 1.28	114.00	<0.256	<0.256	**1180**	**1250**	<0.256	<0.256	21.8	--	<0.256	**154**	<0.256	<0.10	<0.256	**114**	<0.256
Chloroethane	µg/m³	0.792	200,000.0	<0.792	<0.792	23.2	23.1	<0.792	<0.792	<0.792	--	<0.792	0.978	<0.792	<0.30	<0.792	4.36	<0.792
1,3-Butadiene	µg/m³	1.11	-	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	--	<1.11	<1.11	<1.11	<0.50	<1.11	<1.11	<1.11
Trichlorofluoromethane (FREON 11)	µg/m³	0.12	20,000	1.21	<1.12	5.92	5.85	<1.12	<1.12	<1.12	--	1.31	<1.12	<1.12	<0.20	<1.12	<1.12	<1.12
Ethanol (ethyl alcohol)	µg/m³	1.88	1,900,000	21.1	<1.88	81.9	81.7	<1.88	<1.88	180	--	2.74	<1.88	<1.88	<1.0	<1.88	<1.88	<1.88
Trichlorotrifluoroethane	µg/m³	1.15	-	<1.15	<1.15	<1.15	<1.15	<1.15	<1.15	<1.15	--	<1.15	<1.15	<1.15	<0.15	<1.15	<1.15	<1.15
2-propanol	µg/m³	2.46	491,000	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	--	<2.46	<2.46	<2.46	<1.0	<2.46	<2.46	<2.46
2-Propanone	µg/m³	1.90 - 47.5	618,000	11.1	<1.90	4.33	4.45	<1.90	<1.90	<21.1	--	3.29	5.48	<1.90	<0.80	<1.90	<47.5	<1.90
Methyl Ethyl Ketone (2-Butanone)	µg/m³	2.95 - 6.19	100,000	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	--	<2.95	<6.19	<2.95	<1.0	<2.95	<3.24	<2.95
Methyl Isobutyl Ketone	µg/m³	4.1	-	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	--	<4.10	<4.10	<4.10	<1.0	<4.10	<4.10	<4.10
Methyl Butyl Ketone (2-Hexanone)	µg/m³	4.1	-	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	--	<4.10	<4.10	<4.10	<1.0	<4.10	<4.10	<4.10
Methyl t-butyl ether (MTBE)	µg/m³	0.721	-	<0.721	<0.721	<0.721	<0.721	<0.721	<0.721	<0.721	--	<0.721	<0.721	<0.721	<0.20	<0.721	<0.721	<0.721
Ethyl Acetate	µg/m³	3.6	-	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	--	<3.60	<3.60	<3.60	<1.0	<3.60	<3.60	<3.60
1,1-Dichloroethylene	µg/m³	0.396	4,000	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	--	<0.396	<0.396	<0.396	<0.10	<0.396	5.72	<0.396
cis-1,2-Dichloroethylene	µg/m³	0.396	179	<0.396	1.39	91.0	90.6	<0.396	<0.396	<0.396	--	<0.396	6.99	<0.396	0.59	<0.396	**223**	<0.396
trans-1,2-Dichloroethylene	µg/m³	0.396	179	<0.396	<0.396	5.07	5.05	<0.396	<0.396	<0.396	--	<0.396	1.60	<0.396	<0.10	<0.396	5.49	<0.396
Methylene Chloride(Dichloromethane)	µg/m³	2.78	-	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	--	<2.78	<2.78	<2.78	<0.80	<2.78	<2.78	<2.78
Chloroform	µg/m³	0.488	560	1.40	21.2	<0.488	<0.488	0.734	3.24	0.523	--	<0.488	<0.488	10.5	3.03	0.793	1.32	<0.488
Carbon Tetrachloride	µg/m³	0.629	-	<0.629	<0.629	<0.629	<0.629	<0.629	<0.629	<0.629	--	<0.629	<0.629	<0.629	<0.10	<0.629	<0.629	<0.629
1,1-Dichloroethane	µg/m³	0.405 - 1.21	3,300	<0.405	0.522	<1.21	<1.21	<0.405	<0.405	<0.405	--	<0.405	<0.405	<0.405	<0.10	<0.405	1.74	<0.405
1,2-Dichloroethane	µg/m³	0.405	-	<0.405	<0.405	<0.405	<0.405	<0.405	<0.405	<0.405	--	<0.405	<0.405	<0.405	<0.10	<0.405	<0.405	<0.405
Ethylene Dibromide	µg/m³	0.768	-	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	--	<0.768	<0.768	<0.768	<0.10	<0.768	<0.768	<0.768
1,1,1-Trichloroethane	µg/m³	0.546	20,000	<0.546	<0.546	0.930	0.937	<0.546	<0.546	<0.546	--	<0.546	<0.546	<0.546	<0.10	<0.546	<0.546	<0.546
1,1,2-Trichloroethane	µg/m³	0.546	-	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	--	<0.546	<0.546	<0.546	<0.10	<0.546	<0.546	<0.546
1,1,2,2-Tetrachloroethane	µg/m³	0.687	-	<0.687	<0.687	<0.687	<0.687	<0.687	<0.687	<0.687	--	<0.687	<0.687	<0.687	<0.10	<0.687	<0.687	<0.687
cis-1,3-Dichloropropene	µg/m³	0.454	-	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	--	<0.454	<0.454	<0.454	<0.10	<0.454	<0.454	<0.454
trans-1,3-Dichloropropene	µg/m³	0.454	-	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	--	<0.454	<0.454	<0.454	<0.10	<0.454	<0.454	<0.454
1,2-Dichloropropane	µg/m³	0.462	-	<0.462	<0.462	<0.462	<0.462	<0.462	<0.462	<0.462	--	<0.462	<0.462	<0.462	<0.10	<0.462	<0.462	<0.462
Bromomethane	µg/m³	0.388	-	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	--	<0.388	<0.388	<0.388	<0.10	<0.388	<0.388	<0.388
Bromoform	µg/m³	2.07	-	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	--	<2.07	<2.07	<2.07	<0.20	<2.07	<2.07	<2.07
Bromodichloromethane	µg/m³	1.34	-	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	--	<1.34	<1.34	<1.34	<0.20	<1.34	<1.34	<1.34
Dibromochloromethane	µg/m³	1.7	-	<1.70	<1.70	<1.70	<1.70	<1.70	<1.70	<1.70	--	<1.70	<1.70	<1.70	<0.20	<1.70	<1.70	<1.70
Trichloroethylene	µg/m³	0.537	800	<0.537	1.02	1.24	1.59	<0.537	<0.537	<0.537	--	<0.537	0.566	<0.537	1.01	<0.537	11.7	<0.537
Tetrachloroethylene	µg/m³	0.678	800	<0.678	3.55	4.49	4.43	1.84	2.08	8.87	--	<0.678	0.991	0.792	1.86	<0.678	1.40	<0.678
Benzene	µg/m³	0.319	303	0.529	0.366	1.35	1.31	<0.319	<0.319	<0.319	--	<0.319	0.950	<0.319	<0.10	<0.319	0.923	<0.319
Toluene	µg/m³	0.376	190,000	1.62	0.529	6.61	2.46	1.07	0.879	1.10	--	1.43	1.85	0.943	0.20	1.08	2.18	<0.376
Ethylbenzene	µg/m³	0.434	50,000	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	--	<0.434	<0.434	<0.434	<0.10	<0.434	<0.434	<0.434
p+m-Xylene	µg/m³	0.868 - 1.30	9,000	<0.868	<0.868	1.11	1.08	<0.868	<0.868	<0.868	--	<0.868	<0.868	<0.868	<0.20	<0.868	<1.30	<0.868
o-Xylene	µg/m³	0.434	9,000	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	--	<0.434	<0.434	<0.434	<0.10	<0.434	0.608	<0.434
Styrene	µg/m³	0.426	4,600	<0.426	<0.426	<0.426	<0.426	<0.426	<0.426	2.41	--	<0.426	<0.426	<0.426	<0.10	<0.426	<0.426	<0.426
4-ethyltoluene	µg/m³	2.46	-	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	--	<2.46	<2.46	<2.46	<0.50	<2.46	<2.46	<2.46
1,3,5-Trimethylbenzene	µg/m³	2.46	400	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	--	<2.46	<2.46	<2.46	<0.50	<2.46	<2.46	<2.46
1,2,4-Trimethylbenzene	µg/m³	2.46	400	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	--	<2.46	<2.46	<2.46	<0.50	<2.46	<2.46	<2.46
Chlorobenzene	µg/m³	0.46	-	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	--	<0.460	<0.460	<0.460	<0.10	<0.460	<0.460	<0.460
Benzyl chloride	µg/m³	2.59	-	<2.59	<2.59	<2.59	<2.59	<2.59	<2.59	<2.59	--	<2.59	<2.59	<2.59	<0.50	<2.59	<2.59	<2.59
1,3-Dichlorobenzene	µg/m³	2.4	-	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	--	<2.40	<2.40	<2.40	<0.40	<2.40	<2.40	<2.40
1,4-Dichlorobenzene	µg/m³	0.601	1,900	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	--	<0.601	<0.601	<0.601	<0.10	<0.601	<0.601	<0.601
1,2-Dichlorobenzene	µg/m³	0.601	-	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	--	<0.601	<0.601	<0.601	<0.10	<0.601	<0.601	<0.601
1,2,4-Trichlorobenzene	µg/m³	3.71	-	<3.71	<3.71	<3.71	<3.71	<3.71	<3.71	<3.71	--	<3.71	<3.71	<3.71	<0.50	<3.71	<3.71	<3.71
Hexachlorobutadiene	µg/m³	5.33	-	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	--	<5.33	<5.33	<5.33	<0.50	<5.33	<5.33	<5.33
Hexane	µg/m³	1.06	14,000	<1.06	<1.06	3.33	3.17	2.93	<1.06	1.71	--	<1.06	7.14	<1.06	<0.30	<1.06	6.03	<1.06
Heptane	µg/m³	1.23	8,000	<1.23	<1.23	1.89	1.34	1.48	1.50	1.33	--	<1.23	1.92	<1.23	<0.30	<1.23	<1.23	<1.23
Cyclohexane	µg/m³	0.688	120,000	<0.688	<0.688	31.5	30.9	<0.688	<0.688	<0.688	--	<0.688	27.4	<0.688	<0.20	<0.688	92.6	<0.688
Tetrahydrofuran	µg/m³	1.18	40,000	<1.18	<1.18	<1.18	<1.18	<1.18	<1.18	<1.18	--	<1.18	<1.18	<1.18	<0.40	<1.18	<1.18	<1.18
1,4-Dioxane	µg/m³	3.6	-	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	--	<3.60	<3.60	<3.60	<1.0	<3.60	<3.60	<3.60
Naphthalene	µg/m³	2.62	-	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	--	<2.62	<2.62	<2.62	<0.50	<2.62	<2.62	<2.62
Total Xylenes	µg/m³	1.3 - 1.74	9,000	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	--	<1.30	<1.30	<1.30	<0.30	<1.30	<1.74	<1.30
1,1,1,2-Tetrachloroethane	µg/m³	0.687	-	<0.687	<0.687	<0.687	<0.687	<0.687	<0.687	<0.687	--	<0.687	<0.687	<0.687	<0.10	<0.687	<0.687	<0.687
Vinyl Bromide	µg/m³	0.875	-	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	--	<0.875	<0.875	<0.875	<0.20	<0.875	<0.875	<0.875
Propene	µg/m³	0.861- 31.0	60,000	<3.10	<1.72	73.2	72.7	<2.93	<0.861	89.2	--	<0.861	38.9	<3.10	<1.0	<1.55	<31.0	<0.861
2,2,4-Trimethylpentane	µg/m³	0.934	64,173	<0.934	<0.934	3.03	2.95	<0.934	<0.934	<0.934	--	<0.934	4.56	<0.934	<0.20	<0.934	8.17	<0.934
Carbon Disulfide	µg/m³	1.56	2,000	<1.56	<1.56	<1.56	<1.56	6.11	3.69	<1.56	--	3.48	<1.56	7.53	4.11	25.7	<1.56	<1.56
Vinyl Acetate	µg/m³	0.704 - 4.23	-	<0.704	<0.704	<2.82	<2.46	<0.704	<0.704	<0.704	--	<0.704	<2.11	<0.704	<0.20	<0.704	<4.23	<0.704

Notes:

BOLD Shaded	**Concentration exceeds calculated soil vapour screening criteria**
-	Criteria not derived (concentration below detection limits)
--	No Data
<	Below Laboratory MDL

Table 13 Summary of Analytical Results for Siloxanes in Soil Vapour

Sample ID	Units	Reportable Detection Limit	Deminimus Screening -Soil Vapour Screening Criteria	Soil Vapour Probes									
				VW-01	VW-03	VW-05		XCG-1(SVP)	XCG-2(SVP)	XCG-4(SVP)	XCG-6(SVP)	XCG-10(SVP)	XCG-13(SVP)
Laboratory				ALS	ALS	ALS		ALS	ALS	ALS	ALS	ALS	ALS
Tube ID				G0150695SVI	G0150687SVI	G0150642SVI	G0150640SVI	G0150699SVI	G0150637SVI	G0150637SVI	G0150069SVI	G0150698SVI	G0150688SVI
Laboratory ID				L1901643-2	L1901643-1	L1901643-3	L1901643-4	L1901643-5	L1901643-8	L1901643-8	L1901643-7	L1901643-9	L1901643-6
Date Sampled				12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	13-Mar-17	12-Mar-17	12-Mar-17
hexamethyl cyclotrisolxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
octamethyl cyclotetrasiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
decamethyl cyclopentasiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
dodecamethyl cyclohexasiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
hexamethyldisiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
octamethyltrisiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
decamethyltetrasiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170
dodecamethylpentasiloxane	µg/m³	170	-	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170

Notes:

- **Criteria not derived (concentration below detection limits)**

< Below Laboratory RDL

Table 14 Summary of Deminimus Screening Results for Indoor Air Parameters
Derive Acceptable Soil Vapour Concentrations (Soil Vapour Screening Levels)

$$Csv = \frac{Cair}{alpha}$$

where
Csv = Allowable Concentration of Soil Vapour
Cair = Concentration in indoor air (or trench air)
alpha = vapour attenuation factor Alpha Coarse Graine Alpha Fine Grained = 2. Demininus Alpha = 0.01 Deminimus Alpha = 0.01

Assumptions in selection of vapour attenuation factors
1. Assume 0.3 metre depth from vapour sample to building foundation
2. Assume residential building with basement (this is considered protective of slab on grade)
3. Alpha values calculated in accordance with CCME, 2014 "A Protocol for the Derivation of Soil Vapour Guidelines for Protection of Human Exposures Via Inhalation"
concern. The physical-chemical properties for benzene have been applied to all

Chemical	Assume Coarse Grained Residential Basement Setting	Assume Fine Grained Residential Basement Setting	Deminimus Screening				
	(Coarse Grained) Soil Vapour Screening (µg/m^3)	(Fine Grained) Soil Vapour Screening (µg/m^3)	*Soil Vapour Screening (µg/m^3)*	*Soil Vapour Screening (µg/m^3)*	Worst case concentration in soil vapour probes (including probes within the limit of waste)	Location	Include in Indoor Air Testing? (Y/N)
trans-1,2-dichloroethylene	9.13E+02	8.22E+03	**1.79E+02**	**179**	5.49	XCG-13(SVP)	N
1,2-dibromoethane	9.18E+02	8.27E+03	**1.80E+02**	**180**	0.768	RDL in all	N
1,2-dichlorobenzene	1.96E+05	1.77E+06	**3.85E+04**	**38482**	0.601	RDL in all	N
styrene	2.35E+04	2.11E+05	**4.60E+03**	**4600**	2.41	XCG-4(SVP)	N
1,3,5-trichlorobenzene	3.67E+02	3.31E+03	**7.20E+01**	**72**	*not measured in SV. See note below.		N
1,1,2-trichloroethane	1.83E+03	1.64E+04	**3.58E+02**	**358**	0.546	RDL in all	N
Ethane	8.13E+05	8.13E+05	**8.13E+05**	**813000**	318	XCG-4(SVP)	N
Ethylene	1.74E+05	1.74E+05	**1.74E+05**	**174000**	8400	VW-05	N
Methane	methane concentration ppmv 1,000 to <5000 and soil gas pressure 0.69 to <3.5 kPa	methane concentration ppmv 1,000 to <5000 and soil gas pressure 0.69 to <3.5 kPa	**1.5E+6 to <7.6E+6 ug/m3**	**1,500,000 to <7,600,000 ug/m3**	37,393,865.03 (5.7%)	XCG-4(SVP)	**Y**
Propane	1.80E+06	1.80E+06	**1.80E+06**	**1800000**	524	Non-detect in all, XCG-2 (SVP) was potential highest	N
Dichlorodifluoromethane (Freon 12)	9.08E+04	8.17E+05	**1.78E+04**	**17800**	2950	XCG-13(SVP)	N
1,2-dichlorotetrafluorethane (R114)	7.00E+06	7.00E+06	**7.00E+06**	**7000000**	1790	VW-03	N
Chloromethane	9.18E+03	8.27E+04	**1.80E+08**	**1800**	4.39	VW-01	N
Vinyl Chloride	5.80E+02	5.22E+03	**1.14E+02**	**114**	1250	VW-05 (duplicate)	**Y**
Chloroethane	1.02E+06	9.18E+06	**2.00E+05**	**200000**	23.2	VW-05	N
Trichlorofluormethane (Freon 11)	1.02E+05	9.18E+05	**2.00E+04**	**20000**	5.92	VW-05	N
Ethanol (Ethyl Alcohol)	1.90E+06	1.90E+06	**1.90E+06**	**618000**	180	XCG-4(SVP)	N
2-Propanol (isopropyl alcohol)	4.91E+05	4.91E+05	**4.91E+05**	**491000**	2.46	RDL in all	N
2-Propanone (acetone)	3.15E+06	2.84E+07	**6.18E+05**	**618000**	47.5	XCG-13(SVP)- elevated RDL bc of matrix interference	N
Methyl Ethyl Ketone (2-Butanone)	5.10E+05	4.59E+06	**1.00E+05**	**100000**	6.19	XCG-6(SVP)- elevated RDL bc of matrix interference	N
1,4-dichlorobenzene	9.69E+03	8.73E+04	**1.90E+03**	**1900**	0.601	RDL in all	N
1,1,-dichlorethylene	2.04E+04	1.84E+05	**4.00E+03**	**4000**	5.72	XCG-13(SVP)	N
cis-1,2-dichloroethylene	9.13E+02	8.22E+03	**1.79E+02**	**179**	223	XCG-13(SVP)	**Y**
methylene chloride (dichloromethane)	2.22E+05	2.00E+06	**4.35E+04**	**43478**	2.78	RDL in all	N
chloroform	2.86E+03	2.57E+04	**5.60E+02**	**560**	21.2	VW-03	N
1,1,1-trichloroethane	1.02E+05	9.18E+05	**2.00E+04**	**20000**	0.937	VW-05 (duplicate)	N
trichloroethylene (updated)	4.08E+03	3.67E+04	**8.00E+02**	**800**	11.7	XCG-13 (SVP)	N
tetrachloroethylene	4.08E+03	3.67E+04	**8.00E+02**	**800**	12.6	XCG-10(SVP)	N
benzene	1.55E+03	1.39E+04	**3.03E+02**	**303**	1.35	VW-05	N
toluene	9.69E+05	8.73E+06	**1.90E+05**	**190000**	6.61	VW-05	N
PHC F1	3.04E+05	2.73E+06	**5.95E+04**	**59532**	5830	XCG-13(SVP)	N
PHC F2	1.42E+05	1.28E+06	**2.78E+04**	**27778**	972	XCG-13(SVP)	N
ethylbenzene	2.55E+05	2.30E+06	**5.00E+04**	**50000**	0.434	RDL in all	N
total xylenes	4.59E+04	4.13E+05	**9.00E+03**	**9000**	1.74	XCG-13(SVP)- elevated RDL bc of matrix interference	N
1,3,5-trimethylbenzene	2.04E+03	1.84E+04	**4.00E+02**	**400**	2.46	RDL in all	N
1,2,4-trimethylbenzene	2.04E+03	1.84E+04	**4.00E+02**	**400**	2.46	RDL in all	N
hexane	7.14E+04	6.43E+05	**1.40E+04**	**14000**	7.14	XCG-6(SVP)	N
heptane	4.08E+04	3.67E+05	**8.00E+03**	**8000**	1.92	XCG-6(SVP)	N
cyclohexane	6.12E+05	5.51E+06	**1.20E+05**	**120000**	92.6	XCG-13(SVP)	N
tetrahydrofuran	2.04E+05	1.84E+06	**4.00E+04**	**40000**	1.18	RDL in all	N
propene	3.06E+05	2.76E+06	**6.00E+04**	**60000**	89.2	XCG-4(SVP)	N
2,2,4-trimethylpentane	6.42E+04	6.42E+04	**6.42E+04**	**64173**	8.17	XCG-13(SVP)	N
carbon disulfide	1.02E+04	9.18E+04	**2.00E+03**	**2000**	25.7	XCG-12(SVP)	N

Notes

1. Methane screening will be completed in accordance with Table 6, Draft Soil and Building Methane Gas Management Guide, Oct 2013, (Alberta Health Services)

*1,3,5-trichlorobenzene was detected in MW-06 but not measured in soil vapour because of the following:
(note that MW-06 is assumed to be within the limit of waste, and therefore 1,3,5-trichlorobenzene was not under consideration for indoor air testing)

Henry's Law Constant (HCL)	1.9x 10-3 atm m^3/mol	
Convert to HLC (unitless)	0.077661031	
Concentration of 1,3,5-trichlorobenzene detected in Groundwater	0.73	µg/L
Using Henry's Law to convert to soil vapour concentration =	Csv = Cgw (µg/L) X HCL(unitless) x 1000 L/m^3	
Concentration in Soil Vapour = Csv = 0.73 µg/L * 0.077661 * 1000 L/m^3 =	56.69	µg/m^3

This concentration is less than the soil vapour screening value of 72 µg/m^3. Therefore, even with very conservative assumptions, groundwater at concentrations detected would not cause a soil vapour concentration to exceed the demininums screening concentrations.

Table 15 Summary of Analytical Results for VOCs in Indoor Air

Sample ID	UNITS	Reportable Detection Limit	Health Based Indoor Air Criteria	Indoor Air Samples											Ambient
				19-HILL CRESCENT/2758	39-HERMARY ST/T21636	35-HERMARY ST/14258		21-HERMARY ST/18232	13-HERMARY ST/129	14-5125 62 ST/14918	16-5125 62 ST/14531	17-5125 62 ST/18260	6210-53 AVE/14530	6214-53 AVE/2813	OAQ/2595
Laboratory				Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Laboratory ID				EBG197	EBG194	EBG196	EBG205	EBG201	EBG200	EBG199	EBG198	EBG195	EBG202	EBG203	EBG204
Date Sampled				3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017
Summa Canister Pressure on Receipt	**psig**	NV	NV	(-3.9)	(-5.0)	(-4.5)	(-4.5)	(-4.6)	(-4.5)	(-4.0)	(-4.0)	(-3.6)	(-4.5)	(-4.3)	(-2.2)
Vinyl Chloride	**µg/m^3**	0.0511	1.136	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
cis-1,2-Dichloroethylene	**µg/m^3**	0.200	1.790	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methane	**% v/v**	0.1-0.2	0.25-0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

Note 1 Health Based Indoor Air Criteria is derived from Risk Assessment modelling, which takes a number of conservative assumptions into consideration. The Criteria are not regulated, rather are indicators of possible sources

Bold and underline Parameter concentration exceeds Health Based Indoor Air Criteria for Commercial Use

NA Not Analyzed

< Below Laboratory RDL