2025 Groundwater and Soil Vapour Monitoring Report
Red Deer Motors Site
SE 08-38-27 W4M
Red Deer, Alberta

PRESENTED TO
City of Red Deer

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EXECUTIVE SUMMARY

The City of Red Deer (The City) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2025 groundwater, surface water, and vapour monitoring program at a former landfill known as the Red Deer Motors (RDM) historical waste disposal site (the Site). The Site is located at Plan 0020018, Block 2, Lot 6 MR and Plan 9422275, Block 0, Lot 7 MR within the southeast quarter of Section 08-38-27 W4M.

The objectives of the 2025 monitoring program included:

- Assessing the environmental condition of the Site;
- Evaluating potential impacts on the environment and adjacent receptors related to the Site's former use as a landfill; and
- Providing recommendations for risk management activities.

Tetra Tech's scope of work for the 2025 monitoring and sampling program at the Site included: an annual site walkover; conducting annual soil vapour monitoring at on-site soil vapour monitoring wells; annual sampling at on-site soil vapour monitoring wells for soil vapour; surface water sampling of Waskasoo Creek; updating the hazard quotients; reviewing and updating previous recommendations for the Site; and preparing an annual report.

Surface water samples were collected at three locations along Waskasoo Creek: upstream (SW-02), cross-gradient/downstream (SW-01), and downstream (SW-03) of the Site in October 2025. The current vapour monitoring network consists of three vapour monitoring wells (24VW-01, VW-02, and 25VW-04). Soil vapour samples were collected and analyzed in December 2025. The analytical surface water parameters included pH, electrical conductivity (EC), major ions, total dissolved solids (TDS), nutrients, metals (total for surface water), benzene, toluene, ethylbenzene, and xylenes (BTEX), petroleum hydrocarbon (PHC) fractions F1 and F2, and volatile organic compounds (VOCs). The analytical vapour parameters included the matrix gases oxygen, carbon dioxide, methane, and nitrogen, as well as VOCs, BTEX, and PHCs.

Based upon the results of the groundwater, surface water, and soil vapour monitoring and sampling programs conducted in 2025 and previous years, Tetra Tech has developed the following conclusions:

- In accordance with the scope of work, Tetra Tech did not conduct groundwater monitoring or sampling in 2025. Groundwater monitoring is being completed on a reduced frequency basis, with the next event recommended for 2026. The groundwater flow direction inferred from contoured groundwater elevations during the most recent groundwater monitoring event (September 2024) was to the northwest towards Waskasoo Creek, with an average horizontal hydraulic gradient of approximately 0.04 m/m, consistent with previous findings.
- Landfill gas (LFG) is present within the waste footprint of the Site, similar to previous results:
  - Soil vapour wells 24VW-01 and 25VW-04 were re-installed following integrity issues, in September 2024 and January 2025, respectively. In December 2025, methane concentrations were non-detect at VW-02, 9.3% by volume at 24VW-01 (within the explosive range for methane of 5% for the lower explosive limit [LEL] to 15% for the upper explosive limit [UEL]), and 35.4% by volume at 25VW-04 (above the UEL). Following low methane concentrations measured during the previous monitoring event (0.7% by volume at 25VW-04 and 0.5% by volume at 24VW-01), methane concentrations in December 2025 at the new wells had returned to levels more consistent with what has historically been measured at these locations.

- BTEX and PHC fractions F1 and F2 were detected at concentrations below the soil vapour screening criteria, and no analytical exceedances were identified at VW-02. The Aliphatics (>C_8-C_{10}) concentration at 24VW-01 (74,300 µg/m^3) exceeded the soil vapour screening criteria and increased in December 2025 relative to December 2024. Hexane and methane concentrations at 24VW-01 were also higher in December 2025 than in 2024. As 24VW-01 was re-installed in September 2024, the 2025 results are considered to be more consistent with historical vapour conditions measured at this location. Benzene was not detected at 24VW-01 in December 2025; however, the reporting limit exceeded the screening criteria; therefore, the non-detect analytical result does not rule out the presence of benzene at a concentration above the screening criteria, similar to the exceedance recorded in 2024. Hexane (32,800 µg/m^3) and vinyl chloride (1,390 µg/m^3) exceeded the soil vapour screening criteria at 24VW-01, and dichlorodifluoromethane (8,310 µg/m^3) exceeded the soil vapour screening criteria at 25VW-04. Aromatic PHC sub-fractions were not detected at 25VW-04 in December 2025.

- The soil vapour sample collected from 24VW-01 exceeded the cumulative cancer risk target of 1.0 x 10^{-5} and the cumulative hazard quotient target of 1.0. In 2025, the 24VW-01 cumulative cancer risk was 2.0 x 10^{-4} (primarily driven by vinyl chloride), and the cumulative hazard quotient was 3.9. The cumulative hazard quotient at 25VW-04 was 4.0 (primarily driven by dichlorodifluoromethane and trichloroethene), which also exceeded the target hazard level. Results for VW-02, the closest soil vapour well to the commercial building to the east, were within the target risk and hazard levels.

- Approximately 30 cm of free-phase hydrocarbons (free product) with an odour of motor oil was observed at the bottom of soil vapour well 25VW-04 in December 2025. The well was installed in January 2025 and screened within clay and waste/fill. There was nothing to indicate the presence of hydrocarbons at that time. When 25VW-04 was sampled in February 2025, 1 cm to 2 cm of free product was observed at the bottom of the well The closed landfill was in operation in the late 1960s, at a time when disposing of used motor oil in municipal landfills and within holes dug in the ground on private properties may have been more prevalent. In addition, the screened interval for 25VW-04 is 1.0 mbg to 2.5 mbg, which is relatively shallow, and the oil may have been introduced via the surface in the area, subsequent to the closure of the landfill. Consequently, the source of the oil is not clear, but it has not been identified in other on-site boreholes or wells, including VW-04, which 25VW-04 replaced. The presence and depth of oil in the well will continue to be monitored, as its presence can interfere with soil vapour monitoring and LFG sampling.

Waskasoo Creek is considered a receptor of any groundwater passing through the Site. Surface water analytical results in 2025 along Waskasoo Creek suggest that the surface water quality has not been impacted by groundwater from the Site as most concentrations were higher upstream than downstream.

No exposed waste, odours, or standing water were observed during the 2025 site walkover. Uneven ground was suspected; however, visibility of the ground surface was limited due to long grass and vegetation cover.

The results of the 2025 soil vapour monitoring program, in combination with historical groundwater monitoring results, indicate there are impacts to groundwater and that vapours are being generated from the buried waste remaining in place at RDM. Therefore, ongoing risk management is required, including ongoing monitoring and administrative controls.

The following recommendations are made according to these risk management elements.

Ongoing Monitoring:

- Based on the thin soil cover identified in the earlier work by Tiamat Environmental Consultants Ltd. (Tiamat), continue to conduct an annual basic site walkover when there is no snow cover to document any vegetation die-off and exposed soils, which may lead to potential erosion, cracking, and/or exposed wastes. This information may be used to evaluate whether vegetation cover improvements or potential repairs to the cap are

necessary. During the site walkover, the condition of monitoring wells and soil vapour wells should also be verified.

- Conduct annual surface water sampling of Waskasoo Creek both upstream and downstream of the Site to assess potential impacts from leachate-impacted groundwater entering the creek from the Site. This sampling will be done in conjunction with the Red Deer College monitoring and sampling program and applied to the RDM site. The surface water sample is to be analyzed for pH, EC, routine water chemistry parameters, ammonia, total metals, BTEX, and PHC fractions F1 and F2 and VOCs.
- Water levels at all accessible monitoring wells should continue to be monitored periodically to confirm the groundwater flow pattern. Three of the wells (MW-01, MW-04A, and MW-05) should continue to be sampled on a reduced frequency basis for routine groundwater chemistry parameters, including ammonia, dissolved metals, BTEX, PHC fractions F1 and F2, and VOCs.
- Continue annual monitoring at vapour wells 24VW-01, VW-02, and 25VW-04, including measurement of headspace pressures and LFG concentrations. Consideration may be given to completing monitoring during warmer months (summer or early fall), when LFG generation and vapour migration may be more active, to better assess potential peak conditions.
- Continued annual vapour monitoring is considered warranted to confirm conditions. The suggested monitoring schedule includes measurements of headspace pressures and LFG concentrations in the three site vapour wells 24VW-01, VW-02, and 25VW-04. Headspace vapour monitoring at the groundwater monitoring wells is considered to be of limited value and is not included in the proposed monitoring program.
- Based on the results of the soil vapour sample from 24VW-01 and 25VW-04, there is a potential vapour intrusion risk in the northwest and northeast portions of the Site and continued soil vapour sampling of 24VW-01 and 25VW-04 is recommended.
- During the next monitoring event, the depth to product in 25VW-04 should be measured and documented to confirm the thickness and persistence of the oil present in the standpipe. The product should then be removed, to the extent practicable, using an oil-absorbent sock sized for a monitoring well, appropriate for recovery of the observed product. The well condition should then be re-evaluated after the removal of two socks, allowing the assessment of the presence of oil. It may be necessary to re-site the well.
- Based on the above, the following monitoring program is proposed.

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

Activity	2026	2027	2028	2029	2030
Annual (Summer) Site Walkover	X	X	X	X	X
Annual (Summer) Surface Water Sampling of Waskasoo Creek (Up-gradient and Down-gradient)	X	X	X	X	X
Annual (Summer) Groundwater Monitoring of Water Levels at All Accessible Monitoring Wells and Sampling of Three Monitoring Wells (MW-01, MW-04A, and MW-05)	X			X	
Annual (Winter) Vapour Monitoring at 24VW-01, VW-02, and 25VW-04 and Vapour Sampling at 24VW-01 and 25VW-04	X	X	X	X	X

Notes:
The proposed monitoring program is to be reviewed on an annual basis as new information becomes available.

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. If changes to the land use are identified, recommend measures be taken to protect users.
- Ensure that the Site is clearly identified within The City's utility mapping system. Elevated gas concentrations are present in the subsurface proximate to the corner of 32nd Street and Taylor Drive. Future activities in this vicinity (e.g., utility work, repairs, paving) should consider the potential presence of gas 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.

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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 Appendix A 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 2025 groundwater, surface water, and vapour monitoring program at a former landfill known as the Red Deer Motors (RDM) historical waste disposal site (the Site). The Site is located at Plan 0020018, Block 2, Lot 6 MR and Plan 9422275, Block 0, Lot 7 MR within the southeast quarter of Section 08-38-27 W4M.

The objectives of the monitoring program are:

- To assess the environmental condition of the Site;
- Evaluate potential impacts on the environment and adjacent receptors related to the Site's former use as a landfill; and
- Provide recommendations for risk management activities.

The scope for 2025 presented in Section 1.1 was based on recommendations from Tetra Tech's 2024 groundwater and soil vapour monitoring and sampling program conducted at the Site. Those results were presented and discussed in the 2024 Groundwater and Soil Vapour Monitoring Report – Red Deer Motors Site (Tetra Tech 2025).

The field components of the monitoring program were completed using 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

Based on the 2024 findings and recommendations, the work conducted in 2025 included the following:

- Annual vapour monitoring events, including measuring headspace vapours and groundwater levels within each vapour monitoring well and observing monitoring well integrity.
- Annual vapour monitoring and sampling in December 2025, including measurement of headspace vapours and groundwater levels within each vapour monitoring well and observing vapour well integrity, and collecting vapour samples from 24VW-01, VW-02, and 25VW-04 into Summa canisters for analysis.
- Annual surface water sampling in October 2025 from upstream (SW-02), cross-gradient/downstream (SW-01), and downstream (SW-03) locations on Waskasoo Creek, measuring field parameters at the time of sampling. Sampling was intended to assess potential impacts from the Site on Waskasoo Creek.
- Collection of one duplicate surface water sample for quality assurance/quality control (QA/QC) purposes.
- Monitoring well repairs, as required.
- Completion of a site walkover during each monitoring event to evaluate the cover for potential erosion, cracking, and/or exposed wastes.
- Preparation of an annual report summarizing the field activities, interpreting the groundwater, surface water, and soil vapour analytical results and providing recommendations for future monitoring activities at the Site.

2.0 BACKGROUND INFORMATION

2.1 General Information

The Site is located within SE 08-38-27 W4M, at Plan 0020018, Block 2, Lot 6 MR and Plan 9422275, Block 0, Lot 7 MR. The Site location is shown on Figure 1. The Site is zoned A2 – Environmental Preservation Zone and is across Taylor Drive from Red Deer Polytechnic. The Site is located immediately east of Waskasoo Creek, south of 32nd Street and south and west of commercial buildings. A site plan is shown on Figure 2. The Site is undeveloped and consists of natural areas including grasses, trees, and shrubs with power lines extending north to south on the west side. Additional information on the Site history, historical groundwater monitoring investigations, geology and hydrogeology can be found in Appendix B. Cross-sections prepared by Tiamat Environmental Consultants Ltd. (Tiamat; 2014) using the wells previously installed at the Site in 2013 are included in Appendix C. Borehole logs from 2013, 2021, 2024, and 2025 are included in Appendix F.

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 2022a) and updated in the 2024 Groundwater and Soil Vapour Monitoring Report (Tetra Tech 2025). 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 Protected Areas [AEPA] 2024). 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 (Table 2-1) presents a summary of the relevant receptors and exposure pathways identified in the CSM.

Table 2-1: Summary of Conceptual Site Model

Release Mechanism	COPC	Migration Pathway	Potential Receptor
Leachate infiltration into foundation soils or seepage through cover.	Inorganic parameters and nutrients, metals, petroleum hydrocarbons (PHCs), benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds (VOCs), and other indicator parameters (i.e., biological oxygen demand [BOD] and chemical oxygen demand [COD]).	Direct soil contact.	Human users of the parkland; ecological plants and soil invertebrates.
		Migration to groundwater users via water wells; migration to Waskasoo Creek via groundwater or surface seeps.	Domestic use aquifer (DUA) drinking water; freshwater aquatic life (FAL) in Waskasoo Creek.
		Nutrient and energy cycling.	Microbial functioning of the soil.
Landfill gas (LFG) emissions.	VOCs, methane, BTEX, PHC fractions, and siloxanes.	Vapour inhalation; vapour intrusion to confined spaces.	Human users of the parkland; inhabitants of buildings near the parkland; workers in excavations/trenches.

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 direct soil contact, FAL, 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 included.
- Surface water analytical results were compared to the most conservative values for the protection of FAL as set out in the Alberta Environment and Parks (AEP) document Environmental Quality Guidelines for Alberta Surface Waters (AEP 2018). Surface water quality results for 2021, 2022, 2024, and the 2025 sampling event, are included in Table 3.
- 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 toxicity reference values (TRVs) from Health Canada (2021) and the US EPA (2024).
- Cumulative target risk and hazard levels for the hazard quotient evaluation were determined in accordance with Alberta Tier 2 Soil and Groundwater Remediation Guidelines (Tier 2; AEPA 2024b). For carcinogens, the target risk level is 1×10^{-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 Monitoring Well Network

The groundwater monitoring network at the Site consists of six monitoring wells (MW-01, MW-02, MW-03, MW-04A, MW-04B, and MW-05). Monitoring wells MW-04A, MW-04B, and MW-05 were presumably installed by Alberta Environmental Protection in the 1980s and completion details for these three wells are not known.

The current vapour monitoring network consists of three vapour monitoring wells (24VW-01, VW-02, and 25VW-04). The original vapour monitoring wells (VW-01, VW-02, and VW-03) were installed in 2013 as part of the Phase II ESA. Vapour well VW-03, which was located at the northeast corner of the Site, was likely destroyed during the development of the parking lot on the property directly east of the Site. Vapour well VW-01 was re-installed as

24VW-01 in 2024, and VW-04 was re-installed as 25VW-04 in January 2025 after it was found to have been destroyed as of the 2024 monitoring event.

Surface water locations along Waskasoo Creek were sampled upstream (SW-02), cross-gradient/downstream (SW-01), and downstream (SW-03) of the Site. SW-03 was added for the 2025 monitoring event approximately 100 m downstream of SW-01 to provide additional downstream characterization beyond the Site boundary.

Groundwater and soil vapour monitoring well locations, and surface water sampling locations, are shown on Figure 2. Borehole logs for both groundwater and soil vapour monitoring wells are presented in Appendix F.

3.0 FIELD MONITORING AND SAMPLING METHODOLOGY

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

3.1 Groundwater Monitoring and Sampling

In 2025, Tetra Tech did not conduct groundwater monitoring or sampling, in accordance with the scope of work detailed in Section 1.1. Groundwater monitoring is being completed on a reduced frequency basis, with the next event recommended for 2026.

3.2 Surface Water Sampling

Tetra Tech conducted surface water sampling on October 16, 2025, at Waskasoo Creek.

Surface water samples were collected at three locations along Waskasoo Creek: upstream (SW-02), cross-gradient/downstream (SW-01), and downstream (SW-03) of the Site. Surface water sampling locations are presented on Figure 2.

The methodology for surface water sampling included the following:

- Flow and water level of Waskasoo Creek were observed prior to sampling.
- Surface water samples were collected midstream by submerging the sampling bottle halfway between the water surface and the bottom of the creek bed, with the mouth of the bottle facing upstream.
- Samples were collected into appropriate laboratory-supplied sterile glass and plastic vials and bottles for the required analytical package. Samples were filtered and/or preserved in the field as required.
- Field measurements were taken for pH, electrical conductivity (EC), and temperature at the time of sampling.
- A duplicate sample was collected from SW-01 during the surface water sampling event for QA/QC purposes.
- Samples were submitted in iced coolers to ALS in Calgary, Alberta, for laboratory analysis under chain-of-custody (COC) documentation.

3.2.1 Surface Water Analytical Program

The analytical program for the surface water sampling locations is summarized below:

- Routine water chemistry.

- Ammonia.
- Total metals.
- BTEX and PHC fractions F1 and F2.
- VOCs.

3.3 Vapour Field Program

Tetra Tech conducted soil vapour monitoring and sampling on December 3, 2025, from the soil vapour wells.

Vapour monitoring at the vapour probes consisted of measuring and recording soil gas pressure and composition (methane, carbon dioxide, oxygen, hydrogen sulphide, and balance gas) on a percent volumetric basis. The groundwater level was measured to confirm whether water was present above the screened interval in the wells, which could potentially blind them.

Soil vapour well VW-01, located within the northwest corner of the Site near monitoring well MW-01, was considered to have been compromised, the casing possibly having been damaged by frost heave, allowing the ingress of surface water. On September 4, 2024, Tetra Tech re-installed the well, renamed as 24VW-01, to a depth of 3.5 m with a 0.3 m screen interval.

Soil vapour well VW-03, located at the northeast corner of the Site, was likely destroyed during the parking lot development east of the Site and was replaced by VW-04 in 2021. VW-04 was placed further south, close to MW-02 and MW-03 (Figure 2), to monitor the presence of LFG in the area proximate to the buildings on the commercial properties to the east of the Site. Well VW-04 was re-installed on December 8, 2022, as it was found to have been blinded—that is, the screen was below the shallow water table. On December 3, 2024, during the monitoring event, VW-04 was found to be unserviceable as the cap and protective cover were missing, and the well had been partially filled with soil. On January 15, 2025, Tetra Tech re-installed VW-04, renamed as 25VW-04, to a depth of 2.50 m below grade with a 1.50 m screen interval.

Soil vapour well VW-02 is located in the southeastern portion of the Site and it is the closest soil vapour well to the commercial building to the east. It was installed in this location to monitor LFG that may migrate toward the nearby commercial and residential buildings, as well as due to the presence of a buried stormwater line in the area.

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. The soil vapour probes were purged directly with a CES-Landtec GEM 5000 (GEM) LFG analyzer.

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

A leak detection test was completed to ensure the vapour probe was sealed properly. The test was completed using a helium gas tracer to inspect the testing probe and apparatus for any leaks. If there was a leak beyond the acceptable range of 2% of helium concentration, the connections were tightened, and the leak test was conducted again.

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 of air, 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 vapour samples were transferred to ALS for chemical analyses.

3.3.1 Vapour Well Analytical Program

The analytical program for soil vapour is summarized below:

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

3.3.2 Site Walkover

A site walkover was conducted on October 16, 2025, to review the integrity of the surface material to evaluate for potential erosion, settlement, cracking, and/or exposed wastes.

4.0 RESULTS AND DISCUSSION

This section presents the results of the fieldwork conducted in 2025 at the Site and discussions of these results.

4.1 Groundwater Well Headspace Monitoring

In 2025, Tetra Tech did not conduct groundwater monitoring or sampling, in accordance with the scope of work detailed in Section 1.1. Groundwater monitoring is being completed on a reduced-frequency basis, with the next event recommended for 2026.

Historical methane headspace concentrations measured at the groundwater monitoring wells during previous monitoring events are presented in Table 1.

4.2 Groundwater Elevations

In 2025, Tetra Tech did not conduct groundwater monitoring, in accordance with the scope of work detailed in Section 1.1. Groundwater monitoring is being completed on a reduced-frequency basis, with the next event recommended for 2026.

Historical measured groundwater levels and calculated groundwater elevations from previous monitoring events are presented in Table 1. The groundwater elevations and interpreted contours from the most recent groundwater monitoring event (September 2024) are shown on Figure 4. The inferred groundwater flow direction in September 2024 was to the northwest towards Waskasoo Creek, consistent with historical results, and the average horizontal gradient was approximately 0.04 m/m (Tetra Tech 2025).

4.3 Groundwater Field Parameters

In 2025, Tetra Tech did not conduct groundwater sampling, in accordance with the scope of work detailed in Section 1.1. Groundwater monitoring is being completed on a reduced-frequency basis, with the next event recommended for 2026.

Historical field measurements for temperature, pH, and EC collected at the groundwater monitoring wells during previous monitoring events are presented in Table 2.

4.4 Groundwater Analytical Results

In 2025, Tetra Tech did not conduct groundwater sampling, in accordance with the scope of work detailed in Section 1.1. Groundwater monitoring is being completed on a reduced-frequency basis, with the next event recommended for 2026.

Groundwater analytical results from the most recent groundwater monitoring event (September 2024), along with previous results available for review, are summarized in Table 2 and Table 3. Historical analytical tables, reproduced from the Tiamat Phase II Environmental Site Assessment (2014) are included in Appendix E.

The groundwater analytical data for 2024 is summarized in Table 2. The 2024 laboratory analytical reports are included in Appendix D and historical analytical tables, reproduced from the Tiamat Phase II Environmental Site Assessment (2014) are included in Appendix E.

4.5 Site Walkover

A site walkover was conducted on October 16, 2025, to review the integrity of the surface material and evaluate for potential erosion, cracking, and/or exposed wastes. The Site was observed to have long grass and vegetation cover. Uneven ground is suspected; however, the visibility of the ground surface was limited due to the vegetation. The Site slopes west toward Waskasoo Creek, with a steep slope near the creek. Scattered garbage was observed across the Site. No exposed waste, odours, or standing water were observed.

4.6 Surface Water Field Parameters and Analytical Results

The 2025 surface water field parameters and analytical data are presented in Table 3. The 2025 laboratory analytical reports are included in Appendix E.

Surface water field parameters were as follows:

- Temperatures were 9.47°C (SW-02), 10.43°C (SW-01), and 5.91°C (SW-03).
- The pH values were 7.98 (SW-02), 7.94 (SW-01), and 8.25 (SW-03). Field pH measurements were lower than the laboratory pH at all three monitoring locations.
- EC measurements were 905 µS/cm (SW-01), 928 µS/cm (SW-02), and 807 µS/cm (SW-03). Field EC results were higher than the laboratory measured EC results at all three monitoring locations.

Chloride concentrations at the upstream (SW-02) and cross-gradient/downstream (SW-01) and downstream (SW-03) surface water locations were below the Tier 1 Guideline of 120 mg/L. Marginal exceedances have been observed at SW-02 and SW-01 during previous monitoring events. It is not uncommon to have elevated chloride concentrations in an urban setting due to the use of road salt and other anthropogenic sources.

Low concentrations of nitrate and nitrite were detected at SW-01, SW-02, and SW-03, and concentrations were below the Tier 1 Guideline at all three locations.

Alkalinity exceeded the Tier 1 Guideline of 20 mg/L at SW-01, SW-02, and SW-03 in 2025, consistent with previous sampling events. This is consistent with typically hard water conditions in Alberta.

Total aluminum, iron, and zinc concentrations exceeded their respective Tier 1 Guidelines of 0.05 mg/L, 0.3 mg/L, and 0.03 mg/L. Aluminum exceeded the Tier 1 Guideline at SW-02 and SW-03, iron exceeded the Tier 1 Guideline at SW-01, SW-02, and SW-03, and zinc exceeded the Tier 1 Guideline at SW-02. For aluminum and iron, this is consistent with previous results. Aluminum and iron are naturally present in clay, and the measured concentrations may be related to suspended solids present in the total metals samples. Exceedances were also observed at the upstream location, and the zinc exceedance was limited to the upstream location, suggesting metals concentrations were not originating from the Site.

BTEX, PHC fractions F1 and F2, and VOCs were less than the analytical detection limits at all three surface water sampling locations. This is consistent with previous results.

Surface water analytical results for samples collected in 2025 from upstream and downstream locations along Waskasoo Creek suggest that water quality is similar upstream and downstream of the Site, and the measured concentrations do not indicate impacts from the buried waste onsite.

4.7 Soil Vapour Monitoring Results

The 2025 and historical soil vapour monitoring results are presented in Table 5, and all vapour wells were able to be monitored during the December 2025 monitoring event.

Pressures at all vapour wells were negligible during the December 2025 monitoring events.

Methane concentrations were measured using a GEM LFG analyzer at the soil vapour wells in December 2025, with methane below the instrument detection limit (non-detect) at VW-02. The methane concentration at 24VW-01 was 9.3%, which is within the explosive range for methane (5% lower explosive limit [LEL] to 15% upper explosive limit [UEL]), and at 25VW-04 was 35.4%, which is above the UEL. Carbon dioxide and oxygen were 20% and 0.4% at 24VW-01, 0.7% and 22.3% at VW-02, and 24.6% and 0.7% at 25VW-04. Wells 24VW-01 and 25VW-04 are located within the waste footprint. Overall, methane concentrations in December 2025 were consistent with previous results.

Following low methane concentrations measured during the previous monitoring event (0.7% by volume at 25VW-04 and 0.5% by volume at 24VW-01), methane concentrations in December 2025 returned to levels more consistent with what has historically been measured at these locations.

During the December 2025 monitoring event, oil continued to be observed at the bottom of soil vapour well 25VW-04, with approximately 30 cm of oil and an engine oil odour. The presence of oil may interfere with soil vapour measurements. This occurrence should continue to be monitored, as the presence of free product may interfere with soil vapour measurements.

4.8 Soil Vapour Analytical Results

Table 6 summarizes the soil vapour analytical results collected in December 2025 from 24VW-01, VW-02, and 25VW-04, along with historical analytical results, and compares them to the generic soil vapour screening criteria calculated using information from Tier 1 (AEPA 2024a), Health Canada (2021), US EPA (2024), and CCME (2014). The 2025 laboratory analytical report is included in Appendix D.

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 soil. Petroleum hydrocarbon fractions F1 and F2 were detected at concentrations below the soil vapour screening criteria. BTEX were detected at low concentrations, and no analytical exceedances were identified at VW-02. The Aliphatics (>C_8-C_{10}) concentration at 24VW-01 (74,300 µg/m^3) exceeded the soil vapour screening criteria and increased in December 2025 relative to December 2024. Hexane and methane concentrations at 24VW-01 were also higher in December 2025 than in 2024. As 24VW-01 was re-installed in September 2024, the 2025 results are considered to be more consistent with historical vapour conditions measured at this location. Benzene was not detected at 24VW-01 in December 2025; however, the reporting limit exceeded the screening criteria; therefore, the non-detect analytical result does not rule out the presence of benzene at a concentration above the screening criteria, similar to the exceedance recorded in 2024.

Naphthalene was not detected in the December 2025 soil vapour samples, and the reporting limits were below the screening criteria.

VOCs (parameters with a TRV for inhalation) were compared against the screening criteria for residential land use, coarse-grained soil. Several VOC parameters were detected in the soil vapour samples, with measured concentrations generally below the screening criteria. At 24VW-01, the December 2025 hexane concentration (32,800 µg/m^3) exceeded the screening criteria (18,839 µg/m^3) and had increased relative to the December 2024 concentration (3,770 µg/m^3). The December 2025 vinyl chloride concentration (1,390 µg/m^3) exceeded the

screening criteria (70 µg/m^3) and increased in comparison to the December 2024 (242 µg/m^3) concentration. At 25VW-04, the concentration of dichlorodifluoromethane (8,310 µg/m^3) exceeded the screening criteria (3,584 µg/m^3). As 25VW-04 was a new well, there was not a directly comparable 2024 concentration, but this is comparable to the December 2022 concentration of 3,920 µg/m^3 at VW-04.

Based on the laboratory analytical results for the soil vapour samples, methane concentrations were 0.169% by volume at VW-02, 7.41% by volume at 24VW-01 (within the explosive range for methane of 5% LEL to 15% UEL), and 31.6% by volume at 25VW-04 (above the UEL).

4.9 Quality Assurance/Quality Control

4.9.1 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;
- Collecting a duplicate surface water sample during the sampling program;
- Conducting leak testing at vapour wells prior to the collection of vapour samples; and
- Documenting field procedures and sampling activities.

4.9.2 Results

The surface water QA/QC results are included in Table 4. The duplicate sample for surface water was taken at SW-01. The duplicate samples were submitted for analysis of the same parameters as the primary sample.

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

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

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% for surface water, 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 surface water duplicate sample at SW-01 in October 2025, RPDs were less than 20% for the reported concentrations.

Based on the QA/QC results, the sample methods and results are considered reliable overall.

Soil vapour QA/QC, including duplicate sample results collected in December 2024, was addressed in the previous summary report (Tetra Tech 2025); no soil vapour duplicates were collected during the December 2025 monitoring event.

5.0 HAZARD QUOTIENT RESULTS

Soil vapour well 25VW-04 is located on the northeastern portion of the Site, approximately 240 m from the nearest residential building and approximately 60 m from the nearest commercial building. The vapour well replaces former VW-03 and the rationale for siting the well here was the relative proximity of commercial buildings east of the vapour well.

Soil vapour well 24VW-01 is located in the northwest corner of the Site and is bounded by roads on the north and west. It is approximately 315 m from the nearest residential building and approximately 80 m from the nearest commercial building. The rationale for siting the well here was that utility corridors are present along the road rights-of-way, which could be a preferential pathway for the soil vapour.Soil vapour well VW-02 is located in the southeastern portion of the Site approximately 100 m from the nearest commercial building to the east and approximately 150 m from the nearest residential buildings to the south and east. This well was positioned at this location to monitor LFG that has the potential to migrate towards these nearby receptors, and due to the location of a buried stormwater line in the area.

Using the soil vapour screening levels and calculations described in the 2024 Groundwater and Soil Vapour Monitoring Report (Tetra Tech 2025), the soil vapour sampling results, estimated cancer risks (for carcinogens), and estimated hazard quotients (for non-carcinogens) were calculated for the Site.

Table 7 summarizes the properties of the compounds being assessed. The table has been updated using current toxicity reference values and screening criteria sources, including Health Canada (2021) and US EPA (2024) which has been updated with 2021 toxicological data and 2024 screening levels. Table 8 summarizes the soil properties used for 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 risk and hazard for the volatile compounds that were detected in soil vapour.

Cumulative target risk and hazard levels were determined in accordance with the Tier 2 Guidelines. For carcinogens, the target risk level is 1×10^{-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 compound 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.

As shown in Table 11, the cumulative risk indices for carcinogens in soil vapour samples from 24VW-01, VW-02, and 25VW-04 were 2.0×10^{-4}, 2.4×10^{-6}, and 8.3×10^{-6}, respectively. The 24VW-01 cumulative risk level exceeds the target risk level of 1.0×10^{-5}, primarily due to vinyl chloride, which had an individual risk of 2.0×10^{-4} at this

location. The December 2025 cumulative risk at 24VW-01 was an increase compared to December 2024 (6.5×10^{-5}).

The cumulative hazard index for non-carcinogens at 24VW-01 was 3.9, exceeding the target hazard level of 1.0. The cumulative hazard indices for VW-02 and 25VW-04 were 0.4 and 4.0, respectively, with VW-02 below the target hazard level and 25VW-04 exceeding the target hazard level. The elevated hazard at 24VW-01 was primarily related to hexane (individual hazard quotient of 1.7). The elevated hazard at 25VW-04 was primarily related to dichlorodifluoromethane (individual hazard quotient of 2.3) and trichloroethene (individual hazard quotient of 1.7).

The estimated risks and hazards associated with 24VW-01 and 25VW-04 indicate a potential risk from vapour intrusion to indoor air; however, both wells are located within the waste footprint of the Site and vapour concentrations would be expected to decrease away from the waste area. Vapour concentrations at these locations should continue to be monitored for potential trends and to evaluate risks and hazards.

6.0 EVALUATION OF SITE CONDITIONS

6.1 Summary of Site Conditions

The Site contains buried landfill waste in proximity to a surface water receptor, namely Waskasoo Creek. Based on the 2025 and historical monitoring results, environmental concerns remain related to the former landfill; however, current surface water data do not indicate impacts to the creek from the Site.

Historically, groundwater quality at the hydraulically down-gradient monitoring wells near Waskasoo Creek, including MW-01, MW-04, and MW-05, appears to be affected by leachate. Parameters that are typical of municipal solid waste (MSW) leachate, including chloride and VOCs, have been reported at higher concentrations at these wells than those measured at the up-gradient and cross-gradient wells. Previous groundwater analytical results collected for background monitoring well MW-02, located to the east and hydraulically up-gradient, do not suggest MSW leachate impacts at that location.

Waste was placed at the Site between approximately 1968 and 1970 (approximately 3 years). The landfilling timeframe would indicate that the estimated age of the waste material would be approximately 55 years old. Consequently, consistent groundwater quality results are to be expected, supporting a monitoring and sampling frequency requirement of less than once per year.

The December 2025 LFG field monitoring results at 24VW-01, VW-02, and 25VW-04 indicate methane was 9.3% at 24VW-01, non-detect at VW-02, and 35.4% at 25VW-04. Carbon dioxide was elevated and oxygen was less than ambient air at 24VW-01 (20% carbon dioxide and 0.4% oxygen) and 25VW-04 (24.6% carbon dioxide and 0.7% oxygen). As 24VW-01 and 25VW-04 are located within the waste footprint, low oxygen and elevated carbon dioxide levels, in addition to elevated methane, are to be expected as the waste breaks down.

The LFG results indicate LFG is present within the waste footprint at 24VW-01 and 25VW-04. Methane was non-detect at VW-02, indicating LFG is not migrating to the south portion of the Site.

With respect to 24VW-01 and 25VW-04, it is important to note that following low methane concentrations measured during the previous monitoring event (0.7% by volume at 25VW-04 in February 2025, and 0.5% by volume at 24VW-01 in December 2024), methane concentrations in December 2025 returned to levels more consistent with what has historically been measured at these locations. Methane at 24VW-01 (9.3%) is within the explosive range for methane (5% LEL to 15% UEL) and is above the UEL at 25VW-04 (35.4%).

Benzene was not detected at 24VW-01 in December 2025; however, the reporting limit exceeded the screening criteria. BTEX and PHC fractions F1 and F2 were detected at concentrations below the soil vapour screening criteria, and no analytical exceedances were identified at VW-02.

The most recent results should be confirmed and warrant ongoing annual LFG monitoring.

No exposed waste, odours, or standing water were observed during the October 16, 2025 site walkover. Uneven ground was suspected; however, visibility of the ground surface was limited due to long grass and vegetation cover.

The results of the 2025 soil vapour monitoring program, in combination with historical groundwater monitoring results, indicate there are impacts to groundwater and that vapours are being generated from the buried waste remaining in place at RDM. Although impacts to surface water have not been identified, the Site is adjacent to Waskasoo Creek. Therefore, ongoing risk management is required, including ongoing monitoring and administrative controls.

6.2 Summary of Hazard Quotient Results

A summary of the 2014 hazard quotients from the 2014 risk management plan (RMP) by Tiamat are outlined below as well as mitigative measures outlined by XCG Consulting Limited (XCG; 2018).

For consistency with the approach presented by XCG, Tetra Tech compared individual hazard quotients with the individual target hazard level (0.2). Based on the 2025 program, the greatest individual hazard quotient calculated for the Site was 2.32 for dichlorodifluoromethane at 25VW-04 (vs. target hazard level of 0.2) and the greatest cumulative hazard quotient was 4.0 (vs. target hazard level of 1.0) at 25VW-04. The greatest estimated individual cancer risk was 2.0×10^{-4} for vinyl chloride at 24VW-01, and the greatest estimated cumulative cancer risk was 2.0×10^{-4} (vs. target risk of 1.0×10^{-5}) at 24VW-01. XCG identified the following generic mitigative measures for developments within a 300 m setback of these landfills (based on Tiamat 2014).

Passive Measures

1. Passive Measures – Level A: for Cancer Risk of > 1E-5 and < 5E-5 and/or Hazard Quotient >0.2 and <1. Compacted clay liner with a minimum thickness of 1 m and confirmed maximum hydraulic conductivity of 10^{8} m/sec.

2. Passive Measures – Level B: for Cancer Risk of > $5E^{-5}$ and < $5E^{-4}$ and/or Hazard Quotient >1 and <5. Synthetic liner with type of material, thickness, and installation details dependent on the design professional.

4. Passive Measures – Level C: for Cancer Risk of > $5E^{-4}$ and < $1E^{-3}$ and/or Hazard Quotient >5 and <50. Passive sub-slab depressurization (SSD) system with a minimum depressurization of 4 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

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 Hazard Quotient 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 Hazard Quotient values >100. Installation of geomembrane and active soil vapour extraction with system fault notification alarm.

Based on the 2025 cumulative cancer risk and hazard quotient results, the site conditions correspond to Passive Measures – Level B for the purposes of the generic mitigative measure framework applicable to sensitive development within the 300 m setback.

Based on discussions with The City, a relatively new commercial building is present approximately 60 m east of 25VW-04. The building is associated with a car dealership and thought to be used for motor vehicle repair and includes a paint spray booth. The commercial use of the building suggests that ventilation and air quality control systems will be in place, and therefore, it is unlikely that it would be a sensitive receptor for potential LFG migration.

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

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of the groundwater, surface water, and soil vapour monitoring and sampling programs conducted in 2025 and previous years, Tetra Tech has developed the following conclusions:

- In 2025, Tetra Tech did not conduct groundwater monitoring or sampling, in accordance with the scope of work. Groundwater monitoring is being completed on a reduced frequency basis, with the next event recommended for 2026. The groundwater flow direction inferred from contoured groundwater elevations during the most recent groundwater monitoring event (September 2024) was to the northwest towards Waskasoo Creek, with an average horizontal hydraulic gradient of approximately 0.04 m/m, consistent with previous findings.
- LFG is present within the waste footprint of the Site, similar to previous results:
  - Soil vapour wells 24VW-01 and 25VW-04 were re-installed following integrity issues, in September 2024 and January 2025, respectively. In December 2025, methane concentrations were non-detect at VW-02, 9.3% by volume at 24VW-01 (within the explosive range for methane of 5% LEL to 15% UEL), and 35.4% by volume at 25VW-04 (above the UEL). Following low methane concentrations measured during the previous monitoring event (0.7% by volume at 25VW-04 and 0.5% by volume at 24VW-01), methane concentrations in December 2025 at the new wells had returned to levels more consistent with what has historically been measured at these locations.
  - BTEX and PHC fractions F1 and F2 were detected at concentrations below the soil vapour screening criteria, and no analytical exceedances were identified at VW-02. The Aliphatics (>C_8-C_{10}) concentration at 24VW-01 (74,300 µg/m^3) exceeded the soil vapour screening criteria and increased in December 2025 relative to December 2024. Hexane and methane concentrations at 24VW-01 were also higher in December 2025 than in 2024. As 24VW-01 was re-installed in September 2024, the 2025 results are considered to be more consistent with historical vapour conditions measured at this location. Benzene was not detected at 24VW-01 in December 2025; however, the reporting limit exceeded the screening criteria; therefore, the non-detect analytical result does not rule out the presence of benzene at a concentration above the screening criteria, similar to the exceedance recorded in 2024. Hexane (32,800 µg/m^3) and vinyl chloride (1,390 µg/m^3) exceeded the soil vapour screening criteria at 24VW-01, and dichlorodifluoromethane (8,310 µg/m^3) exceeded the soil vapour screening criteria at 25VW-04. Aromatic PHC sub-fractions were not detected at 25VW-04 in December 2025.

- The soil vapour sample collected from 24VW-01 exceeded the cumulative cancer risk target of 1.0×10^{-5} and the cumulative hazard quotient target of 1.0. In 2025, the 24VW-01 cumulative cancer risk was 2.0×10^{-4} (primarily driven by vinyl chloride), and the cumulative hazard quotient was 3.9. The cumulative hazard quotient at 25VW-04 was 4.0 (primarily driven by dichlorodifluoromethane and trichloroethene), which also exceeded the target hazard level. Results for VW-02, the closest soil vapour well to the commercial building to the east, were within the target risk and hazard levels.

- Approximately 30 cm of free-phase hydrocarbons (free product) with an odour of motor oil was observed at the bottom of soil vapour well 25VW-04 in December 2025. The well was installed in January 2025 and screened within clay and waste/fill. There was nothing to indicate the presence of hydrocarbons at that time. When 25VW-04 was sampled in February 2025, 1 cm to 2 cm of free product was observed at the bottom of the well The closed landfill was in operation in the late 1960s, at a time when disposing of used motor oil in municipal landfills and within holes dug in the ground on private properties may have been more prevalent. In addition, the screened interval for 25VW-04 is 1.0 mbg to 2.5 mbg, which is relatively shallow, and the oil may have been introduced via the surface in the area, subsequent to the closure of the landfill. Consequently, the source of the oil is not clear, but it has not been identified in other on-site boreholes or wells, including VW-04, which 25VW-04 replaced. The presence and depth of oil in the well will continue to be monitored, as its presence can interfere with soil vapour monitoring and LFG sampling.

Waskasoo Creek is considered a receptor of any groundwater passing through the Site. Surface water analytical results in 2025 along Waskasoo Creek suggest that the surface water quality has not been impacted by groundwater from the Site as most concentrations were higher upstream than downstream.

No exposed waste, odours, or standing water were observed during the 2025 site walkover. Uneven ground was suspected; however, visibility of the ground surface was limited due to long grass and vegetation cover.

The results of the 2025 soil vapour monitoring program, in combination with historical groundwater monitoring results, indicate there are impacts to groundwater and that vapours are being generated from the buried waste remaining in place at RDM. Therefore, ongoing risk management is required, including ongoing monitoring and administrative controls.

The following recommendations are made according to these risk management elements.

Ongoing Monitoring:

- Based on the thin soil cover identified in the earlier work by Tiamat, continue to conduct an annual basic site walkover when there is no snow cover to document any vegetation die-off and exposed soils, which may lead to potential erosion, cracking, and/or exposed wastes. This information may be used to evaluate whether vegetation cover improvements or potential repairs to the cap are necessary. During the site walkover, the condition of monitoring wells and soil vapour wells should also be verified.

- Conduct annual surface water sampling of Waskasoo Creek both upstream and downstream of the Site to assess potential impacts from leachate-impacted groundwater entering the creek from the Site. This sampling will be done in conjunction with the Red Deer College monitoring and sampling program and applied to the RDM site. The surface water sample should be analyzed for pH, EC, routine water chemistry parameters, ammonia, total metals, BTEX, and PHC fractions F1 and F2 and VOCs.

- Water levels at all accessible monitoring wells should continue to be monitored periodically to confirm the groundwater flow pattern. Three of the wells (MW-01, MW-04A, and MW-05) should continue to be sampled on a reduced frequency basis for routine groundwater chemistry parameters, including ammonia, dissolved metals, BTEX, PHC fractions F1 and F2, and VOCs.

- Continue annual monitoring at vapour wells 24VW-01, VW-02, and 25VW-04, including measurement of headspace pressures and LFG concentrations. Consideration may be given to completing monitoring during warmer months (summer or early fall), when LFG generation and vapour migration may be more active, to better assess potential peak conditions.

- Continued annual vapour monitoring is considered warranted to confirm conditions. The suggested monitoring schedule includes measurements of headspace pressures and LFG concentrations in the three site vapour wells 24VW-01, VW-02, and 25VW-04. Headspace vapour monitoring at the groundwater monitoring wells is considered to be of limited value and is not included in the proposed monitoring program.

- Based on the results of the soil vapour sample from 24VW-01 and 25VW-04, there is a potential vapour intrusion risk in the northwest and northeast portions of the Site and continued soil vapour sampling of 24VW-01 and 25VW-04 is recommended.

- During the next monitoring event, the depth to product in 25VW-04 should be measured and documented to confirm the thickness and persistence of the oil present in the standpipe. The product should then be removed, to the extent practicable, using an oil-absorbent sock sized for a monitoring well, appropriate for recovery of the observed product. The well condition should then be re-evaluated after the removal of two socks, allowing the assessment of the presence of oil. It may be necessary to re-site the well.

- Based on the above, the following monitoring program is proposed.

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

Activity	2026	2027	2028	2029	2030
Annual (Summer) Site Walkover	X	X	X	X	X
Annual (Summer) Surface Water Sampling of Waskasoo Creek (Up-gradient and Down-gradient)	X	X	X	X	X
Annual (Summer) Groundwater Monitoring of All Accessible Monitoring Wells and Sampling of Three Monitoring Wells (MW-01, MW-04A, and MW-05)	X			X	
Annual (Winter) Vapour Monitoring at 24VW-01, VW-02 and 25VW-04 and Vapour Sampling at 24VW-01 and 25VW-04.	X	X	X	X	X

Notes:
The proposed monitoring program is to be reviewed on an annual basis as new information becomes available.

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 and appropriate administrative requirements are met for the Site in accordance with City policies and Provincial Regulations. If changes to the land use are identified, recommend measures be taken to protect users.

- Ensure that the Site is clearly identified within The City's utility mapping system. Elevated gas concentrations are present in the subsurface proximate to the corner of 32nd Street and Taylor Drive. Future activities in this vicinity (e.g., utility work, repairs, paving) should consider the potential presence of gas 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.

8.0 CLOSURE

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

Respectfully submitted,
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REFERENCES

Alberta Environment and Parks. 2018. Environmental Quality Guidelines for Alberta Surface Waters. Water Policy Branch, Alberta Environment and Parks, Edmonton, Alberta. ISBN 978-1-4601-3873-1.

Alberta Environment and Parks. 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division, Edmonton, AB. ISBN 978-1-4601-5501-1.

Alberta Environment and Protected Areas. 2024a. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Lands Policy and Programs Branch, Lands Division, Edmonton, AB. ISBN 978-1-4601-6067-1.

Alberta Environment and Protected Areas. 2024b. Alberta Tier 2 Soil and Groundwater Remediation Guidelines. Lands Policy and Programs Branch, Lands Division, Edmonton, AB. ISBN 978-1-4601-6066-4.

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.

Canadian Council of Ministers of the Environment. 2016a. Guidance Manual. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 1. Canadian Council of Ministers of the Environment, Winnipeg, MB. ISBN 978-1-77202-026-7.

Canadian Council of Ministers of the Environment. 2016b. Suggested Operating Procedures. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 3. Canadian Council of Ministers of the Environment, Winnipeg, MB. ISBN 978-1-77202-030-4.

City of Red Deer. 2024. Zoning Bylaw 3357/2024. Adopted May 13, 2024, Amended September 3, 2025. https://www.reddeer.ca/media/reddeerca/city-government/bylaws/land-use-bylaws/amendments/Red-Deer-Zoning-Bylaw-3357-2024---Amended-September-03,-2025.pdf

Health Canada. 2021. Federal Contaminated Site Risk Assessment in Canada: Toxicological Reference Values (TRVs), version 3.0.

Hem, J.D. 1992. Study and Interpretation of the Chemical Characteristics of Natural Water U.S. Geological Survey, Water Supply Paper 2254.

Project Number: 704-SWM.SWOP04071-03.004.

Tetra Tech Canada Inc. 2020. 2019 Groundwater and Soil Vapour Monitoring Report – Red Deer Motors. Prepared for The City of Red Deer. October 2020. Project Number: 704-SWM.SWOP04071-01.006.

Tetra Tech Canada Inc. 2022. 2021 Groundwater and Soil Vapour Monitoring Report – Red Deer Motors. Prepared for The City of Red Deer. June 2022. Project Number: 704-SWM.SWOP04071-02.005.

Tetra Tech Canada Inc. 2024. 2022 and 2023 Groundwater and Soil Vapour Monitoring Report. Red Deer Motors Site, SE 08-38-27 W4M. Prepared for the City of Red Deer. July 17, 2024.

Tetra Tech Canada Inc. 2025. 2024 Groundwater and Soil Vapour Monitoring Report. Red Deer Motors Site, SE 08-38-27 W4M. Prepared for the City of Red Deer. September 18, 2025.

Tiamat Environmental Consultants Ltd. 2014. Phase II Environmental Site Assessment, Historic Waste Disposal Site, Red Deer Motors, The City of Red Deer. February 26, 2014.

United States Environmental Protection Agency. 2024. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

XCG Consulting Limited. 2018. Vapour Intrusion Assessment and Environmental Monitoring Report, prepared for the City of Red Deer's Montfort Landfill.

TABLES

Table 1: Groundwater Monitoring Results

Monitoring Well		MW-01	MW-02	MW-03	MW-04A	MW-04B	MW-05
Total Drilled Depth (m)		6.1	6.6	5.1	4.6	6.0	4.6
Top of Screened Interval (mbg)		872.5	-	-	-	-	-
Bottom of Screened Interval (mbg)		867.9	-	-	-	-	-
Stick up (m)		1.09	0.79	0.01	0.20	0.78	0.52
Ground Elevation (m)		874.01	877.30	877.30	871.28	871.28	872.75
TPC Elevation (m)		875.10	878.10	877.31	871.48	872.20	873.50
Depth to Groundwater (mBTPC)	Aug-13	4.17	3.03	-	-	-	-
	Jun-19	5.04	CNL	CNL	-	-	-
	Dec-19	5.37	CNL	CNL	2.97	1.80	3.18
	Jul-21	5.20	3.72	-	2.03	1.77	3.42
	Nov-21	5.44	4.61	3.51	3.09	1.77	3.38
	Dec-22	5.41	4.10	3.53	2.96	1.68	3.21
	Sep-24	5.39	4.04	3.47	3.04	1.74	3.44
Groundwater Elevation (m)	Aug-13	869.84	874.28	-	-	-	-
	Jun-19	870.06	-	-	-	-	-
	Dec-19	869.73	-	-	868.52	870.39	870.32
	Jul-21	869.90	874.38	-	869.45	870.43	870.08
	Nov-21	869.66	873.49	873.79	868.39	870.43	870.12
	Dec-22	869.19	873.99	873.77	868.53	870.52	870.28
	Sep-24	869.71	874.05	873.83	868.44	870.45	870.05
Volatile Organic Compounds* (VOCs) (ppm)	Jun-19	12	CNL	CNL	-	-	-
	Dec-19	1	CNL	CNL	ND	ND	ND
Combustible Vapour Concentrations** (CVCs) (ppm)	Jun-19	190	CNL	CNL	-	-	-
	Dec-19	10	CNL	CNL	ND	ND	ND
Methane Concentrations** (ppm)	Jul-21	ND	ND	-	25	ND	5
	Nov-21	35	420	90	60	15	ND
	Dec-22	35	25	55	ND	25	15
	Sep-24	ND	ND	ND	ND	ND	ND

Notes:
CNL - Could not locate.
mbg - Metres below grade.
mBTPC - Metres below top of plastic pipe casing.
ND - Non-detect.
ppm - Parts per million.
- Not monitored/information unavailable.
*- Measured using an RKI Eagle II calibrated to hexane and isobutylene operated in methane elimination mode.
**- Measured using an RKI Eagle II calibrated to methane.

Table 2: Groundwater Analytical Results

Parameter	Units	Tier 1 Guideline [1,2]	MW-01	MW-01	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-04A	MW-04A	MW-04A	MW-04A	MW-04B	MW-05	MW-05	MW-05	MW-05
			MW-01	MW-01	MW-01	DUPLICATE	MW-01	DUPLICATE	MW-02	MW-02	MW-04A	MW-04A	MW-04A	MW-04A	MW-04B	MW-05	MW-05	MW-05	MW-05
			6-Dec-2019	23-Nov-2021	09-Dec-2022	09-Dec-2022	06-Sep-2024	06-Sep-2024	23-Nov-2021	23-Nov-2021	6-Dec-2019	23-Nov-2021	09-Dec-2022	06-Sep-2024	6-Dec-2019	6-Dec-2019	23-Nov-2021	09-Dec-2022	06-Sep-2024
Field Testing																			
Field Temperature	°C	-	6.6	5.7	4.2	-	8.7	8.7	4.4	-	5.5	4.1	4.79	-	4.6	2.2	6.0	4.4	9.1
Field Electric Conductivity	µS/cm	-	2,213	1821	1,505	-	2,680	2,680	965	-	1,754	2,061	1,717	-	1,282	1,918	1,131	1,296	2,530
Field pH	pH Units	6.5 to 8.5	8.32	7.28	6.77	-	6.62	6.62	7.38	-	7.90	7.47	7.23	-	8.40	7.81	6.28	6.88	6.65
Routine																			
pH	pH Units	6.5 to 8.5	7.71	7.32	7.17	7.19	7.27	7.18	7.56	7.58	8.10	7.75	7.78	7.81	7.80	7.76	7.40	7.76	7.08
Electrical Conductivity (EC)	µS/cm	-	2,220	2220	2,470	2,470	2,530	2,530	1040	1040	1,250	2670	2,740	2,650	1,260	1,930	2270	2,060	2,460
Total Dissolved Solids (TDS)	mg/L	500	**1,300**	**1350**	**1,560**	**1,560**	**1,470**	**1,460**	**645**	**645**	**1,840**	**1780**	**1,840**	**1,740**	**1,040**	**1,060**	**1460**	**1,340**	**1,520**
Hardness as $CaCO_3$	mg/L	-	811	815	877	865	788	801	544	557	1,140	953	1,010	929	201	812	904	908	973
Alkalinity (total as $CaCO_3$)	mg/L	-	564	537	772	770	697	652	517	510	559	710	737	761	881	581	1110	970	1,030
Bicarbonate	mg/L	-	688	655	941	940	850	795	631	623	682	866	899	928	1,070	709	1350	1,180	1,260
Carbonate	mg/L	-	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0
Hydroxide	mg/L	-	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0
Calcium	mg/L	-	161	162	170	170	153	158	133	137	249	210	206	199	49.8	161	174	169	182
Magnesium	mg/L	-	99.4	99.8	110	107	98.5	98.8	51.6	52.1	126	104	120	105	18.6	99.6	114	118	126
Potassium	mg/L	-	9.55	7.41	8.61	8.43	7.71	7.82	7.48	7.51	5.29	5.21	4.62	5.94	3.37	9.91	9.21	8.52	10.4
Sodium	mg/L	200	189	173	**238**	**232**	**214**	**217**	16.7	17.0	**284**	**262**	**289**	**269**	**256**	177	183	177	183
Chloride	mg/L	120	**423**	**450**	**381**	**393**	**460**	**463**	54.1	52.6	**450**	**363**	**349**	**315**	6.8	**167**	**187**	**179**	**207**
Fluoride	mg/L	1.5	0.12	0.240	0.253	0.231	0.176	0.181	0.193	0.196	0.14	0.259	0.266	0.239	0.35	<0.10	0.163	0.235	0.120
Phosphorus - Total	mg/L	-	1.72	-	-	-	-	-	-	-	0.761	-	-	-	0.085	2.29	-	-	-
Sulphate	mg/L	429 [3]	79.1	70.0	118	120	52.2	53.4	43.5	43.4	394	393	416	372	174	94.9	79.6	68.9	153
Ionic Balance	N/A	-	101	100	102	99.0	93.6	97.8	101	101	110	102	99.1	95.3	71.4	135	102	103	94.6
Nutrients																			
Ammonia as N	mg/L	2.8 [6]	**7.2**	2.12	2.82	2.80	-	-	0.111	0.130	0.450	0.372	0.103	-	0.306	**7.1**	6.43	5.59	-
Nitrate (as NO_3-N)	mg/L	3	<0.10	<0.10	<0.100	<0.100	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.100	0.202	<0.10	<0.10	<0.10	<0.100	<0.100
Nitrite (as NO_2-N)	mg/L	0.20 [4]	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Nitrate and Nitrite (as N)	mg/L	-	<0.11	-	<0.112	<0.112	<0.112	<0.112	-	-	<0.11	-	<0.112	0.202	<0.11	<0.11	-	<0.112	<0.112
Total Kjeldahl Nitrogen (TKN)	mg/L	-	9.9	-	-	-	-	-	-	-	10.9	-	-	-	0.51	8.9	-	-	-
Carbon																			
Dissolved Organic Carbon (DOC)	mg/L	-	10.6	-	-	-	-	-	-	-	23.0	-	-	-	7.4	18.3	-	-	-
Dissolved Metals																			
Aluminum	mg/L	0.050 [5]	0.0016	0.0061	0.0064	0.0081	<0.0020	<0.0020	0.0028	0.0024	0.0027	<0.0050	0.0084	0.0037	0.0027	0.0028	<0.0050	<0.0050	**0.0641**
Antimony	mg/L	0.006	<0.00010	0.00053	<0.00050	<0.00050	<0.00020	<0.00020	<0.00010	<0.00010	0.00147	0.00502	0.00183	**0.00952**	<0.00010	0.00021	<0.00050	<0.00050	0.00023
Arsenic	mg/L	0.005	**0.0225**	**0.0210**	**0.0202**	**0.0195**	**0.0228**	**0.0232**	0.000160	0.00018	**0.0146**	**0.0125**	0.00356	0.00425	**0.00711**	**0.0134**	**0.0139**	**0.00591**	**0.00864**
Barium	mg/L	1	0.604	0.531	0.540	0.534	0.616	0.600	0.139	0.140	0.0479	0.0429	0.0452	0.0531	0.0228	0.794	0.708	0.665	0.796
Beryllium	mg/L	-	-	<0.00010	-	-	-	-	<0.000020	<0.000020	-	<0.00010	-	-	-	-	<0.00010	-	-
Bismuth	mg/L	-	-	<0.000205	-	-	-	-	<0.000050	<0.000050	-	<0.000205	-	-	-	-	<0.000205	-	-
Boron	mg/L	1.5	0.079	0.068	0.075	0.074	0.073	0.075	0.064	0.066	0.142	0.138	0.156	0.139	0.214	0.169	0.215	0.210	0.175
Cadmium	mg/L	0.00037 [3]	0.0000142	<0.0000250	<0.0000250	<0.0000250	<0.0000100	<0.0000100	0.0000574	0.0000579	0.0000150	0.0000420	<0.0000250	**0.00194**	0.0000275	0.0000461	0.0000301	0.0000365	0.0000706
Chromium	mg/L	0.05	0.00013	<0.0025	<0.00050	<0.00050	<0.00100	<0.00100	<0.00050	<0.00050	0.00023	<0.0025	<0.00050	<0.00100	<0.00010	0.00029	<0.0025	<0.00050	<0.00100
Cobalt	mg/L	-	-	0.00302	-	-	-	-	0.00166	0.00171	-	0.0031	-	-	-	-	0.0151	-	-
Copper	mg/L	0.007	0.00033	<0.0010	<0.00100	<0.00100	<0.00040	<0.00040	0.00056	0.00060	0.00358	0.00149	0.00231	**0.154**	0.00037	**0.00753**	<0.0010	<0.00100	0.00250
Iron	mg/L	0.30	**24.4**	**24.1**	**24.8**	**24.1**	**25.3**	**25.4**	<0.010	<0.010	**1.23**	**0.425**	**0.315**	<0.020	0.025	**7.43**	**10.4**	**6.58**	**6.93**
Lead	mg/L	0.007 [3]	<0.000050	<0.000250	<0.000250	<0.000250	<0.000100	<0.000100	<0.000050	<0.000050	0.000225	0.000302	<0.000250	0.000540	<0.000050	0.000246	<0.000250	<0.000250	0.000348
Lithium	mg/L	-	-	0.0455	-	-	-	-	0.0489	0.0508	-	0.115	-	-	-	-	0.0787	-	-
Manganese	mg/L	0.020	**1.91**	**1.95**	**2.11**	**2.08**	**1.86**	**1.94**	**1.48**	**1.49**	**0.732**	**0.578**	**0.399**	**0.481**	**0.178**	**1.28**	**1.62**	**1.51**	**1.91**
Mercury	mg/L	0.000005	<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	-	-	0.00243	-	-	-	-	0.000335	0.000316	-	0.0133	-	-	-	-	0.00281	-	-
Nickel	mg/L	0.17 [3]	0.0135	0.00921	0.0103	0.0103	0.0137	0.0138	0.00246	0.00236	0.0346	0.0329	0.0212	0.0508	<0.00050	0.0262	0.0275	0.0260	0.0268
Phosphorus	mg/L	-	-	<0.25	-	-	-	-	<0.050	<0.050	-	<0.25	-	-	-	-	<0.25	-	-
Selenium	mg/L	0.002	0.000074	<0.00025	<0.000250	<0.000250	0.000116	0.000106	<0.000050	<0.000050	0.000172	0.000255	0.000324	**0.00298**	<0.000050	0.000245	<0.00025	<0.000250	0.000193
Silicon	mg/L	-	-	14.6	-	-	-	-	9.89	10.1	-	5.55	-	-	-	-	10.4	-	-
Silver	mg/L	0.0001	<0.000010	<0.000050	<0.000050	<0.000050	<0.000020	<0.000020	<0.000010	<0.000010	<0.000010	<0.000050	<0.000050	<0.000020	<0.000010	<0.000010	<0.000050	<0.000050	<0.000020
Strontium	mg/L	-	-	1.52	-	-	-	-	0.988	1.02	-	1.62	-	-	-	-	1.79	-	-
Sulphur	mg/L	-	-	25.2	-	-	-	-	15.5	15.8	-	136	-	-	-	-	26.8	-	-
Thallium	mg/L	-	-	<0.000050	-	-	-	-	0.000036	0.000034	-	<0.000050	-	-	-	-	<0.000050	-	-
Tin	mg/L	-	-	<0.00050	-	-	-	-	<0.00010	<0.00010	-	<0.00050	-	-	-	-	<0.00050	-	-
Titanium	mg/L	-	-	<0.00150	-	-	-	-	<0.00030	<0.00030	-	<0.00150	-	-	-	-	<0.00150	-	-
Uranium	mg/L	0.015	0.00196	0.00151	0.00384	0.00399	0.00287	0.00279	0.00910	0.00938	**0.0391**	**0.0993**	**0.0919**	**0.0918**	0.00217	0.00927	0.0131	0.0122	0.0122
Vanadium	mg/L	-	-	<0.0025	-	-	-	-	<0.00050	<0.00050	-	<0.0025	-	-	-	-	<0.0025	-	-
Zinc	mg/L	0.03	0.0015	<0.0050	<0.0050	<0.0050	<0.0020	0.0027	0.0034	0.0032	0.0034	<0.0050	<0.0050	**0.0386**	<0.0010	0.0060	0.0055	<0.0050	0.0056
Zirconium	mg/L	-	-	<0.0010	-	-	-	-	<0.00020	<0.00020	-	<0.0010	-	-	-	-	0.00204	-	-
Organics																			
AOX	mg/L	-	ND	-	-	-			-	-	ND	-	-	-	ND	ND	-	-	-
Hydrocarbons																			
Benzene	mg/L	0.005	0.00060	<0.00050	0.00116	0.00110	0.00242	0.00221	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00189	0.00143	0.00132	0.00184
Toluene	mg/L	0.021	<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
Ethylbenzene	mg/L	0.0016	<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
Xylenes (m & p)	mg/L	-	<0.00050	<0.00040	<0.00040	<0.00040	<0.00030	<0.00030	<0.00040	<0.00040	<0.00050	<0.00040	<0.00040	<0.00030	<0.00050	<0.00050	<0.00040	<0.00040	<0.00030
Xylene (o)	mg/L	-	<0.00050	<0.00030	<0.00030	<0.00030	<0.00040	<0.00040	<0.00030	<0.00030	<0.00050	<0.00030	<0.00030	<0.00040	<0.00050	<0.00050	<0.00030	<0.00030	<0.00040
Xylenes Total	mg/L	0.020	<0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00071	<0.00050	<0.00050	<0.00050	<0.00071	<0.00071	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.072	<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	<0.100	<0.100	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.100	<0.1	<0.10	<0.10	<0.10	<0.100	<0.1
F1 (C_6-C_{10}) - BTEX	mg/L	0.81	<0.10	<0.10	<0.100	<0.100	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.100	<0.1	<0.10	<0.10	<0.10	<0.100	<0.1
F2 (C_{10}-C_{16})	mg/L	1.1	<0.10	<0.10	<0.100	<0.100	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.100	<0.1	<0.10	<0.10	<0.10	<0.100	<0.1
Total BTEX	mg/L	-	-	<0.0010	-	-	0.0024	0.0022	<0.0010	<0.0010	-	<0.0010	-	<0.0010	-	-	0.0014	-	0.0018

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Table 2: Groundwater Analytical Results

Parameter	Units	Tier 1 Guideline [1,2]	MW-01	MW-01	MW-01	MW-01	MW-01	MW-01	MW-02	MW-02	MW-04A	MW-04A	MW-04A	MW-04A	MW-04B	MW-05	MW-05	MW-05	MW-05
			MW-01	MW-01	MW-01	DUPLICATE	MW-01	DUPLICATE	MW-02	MW-02	MW-04A	MW-04A	MW-04A	MW-04A	MW-04B	MW-05	MW-05	MW-05	MW-05
			6-Dec-2019	23-Nov-2021	09-Dec-2022	09-Dec-2022	06-Sep-2024	06-Sep-2024	23-Nov-2021	23-Nov-2021	6-Dec-2019	23-Nov-2021	09-Dec-2022	06-Sep-2024	6-Dec-2019	6-Dec-2019	23-Nov-2021	09-Dec-2022	06-Sep-2024
Volatile Fatty/Carboxylic Acids																			
Acetic Acid	mg/L	-	<10	-	-	-	-	-	-	-	<10	-	-	-	<10	<10	-	-	-
Butyric Acid	mg/L	-	<1.0	-	-	-	-	-	-	-	<1.0	-	-	-	<1.0	<1.0	-	-	-
Formic Acid	mg/L	-	<50	-	-	-	-	-	-	-	<50	-	-	-	<50	<50	-	-	-
Hexanoic Acid	mg/L	-	<1.0	-	-	-	-	-	-	-	<1.0	-	-	-	<1.0	<1.0	-	-	-
iso-Butyric Acid	mg/L	-	<1.0	-	-	-	-	-	-	-	<1.0	-	-	-	<1.0	<1.0	-	-	-
Isovaleric acid	mg/L	-	<1.0	-	-	-	-	-	-	-	<1.0	-	-	-	<1.0	<1.0	-	-	-
Propionic Acid	mg/L	-	<5.0	-	-	-	-	-	-	-	<5.0	-	-	-	<5.0	<5.0	-	-	-
Valeric Acid	mg/L	-	<1.0	-	-	-	-	-	-	-	<1.0	-	-	-	<1.0	<1.0	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	mg/L	0.001	-	<0.0010	-	-	-	-	<0.0010	<0.0010	-	<0.0010	-	-	-	-	<0.0010	-	-
Volatile Organic Compounds (VOCs)																			
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
1,1,1-Trichloroethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	0.014	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<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
1,2,3-Trichlorobenzene	mg/L	0.008	<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
1,2,3-Trichloropropane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<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
1,2,4-Trimethylbenzene	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
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
1,2-Dibromoethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.0007	<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
1,2-Dichloroethane	mg/L	0.005	<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-Dichloroethene (cis)	mg/L	-	0.0096	0.0032	0.0147	0.0140	0.0174	0.0154	<0.0010	<0.0010	0.0019	0.0018	0.0013	0.0015	<0.0010	0.222	0.189	0.184	0.235
1,2-Dichloroethene (trans)	mg/L	-	0.00187	<0.0010	0.0023	0.0022	0.0037	0.0033	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	0.018	0.0127	0.0134	0.0177
1,2-Dichloropropane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	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
1,3-Dichlorobenzene	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<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
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
1,3-Dichloropropene [cis]	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
1,3-Dichloropropene [trans]	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
1,4-Dichlorobenzene	mg/L	0.001	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<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
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
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
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
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
Bromodichloromethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Bromomethane	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
Carbon tetrachloride	mg/L	0.0015	<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	0.0013	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<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	<0.0010
Chloroform	mg/L	0.018	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	-	<0.0010	<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0050	<0.0050	<0.0050
Dibromochloromethane	mg/L	0.19	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Dibromomethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	-	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.0013	<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
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
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
Methylene Chloride	mg/L	0.05	<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-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
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
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
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
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
Tetrachloroethene	mg/L	0.01	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/L	0.00032	*<0.00050*	*<0.0010*	*<0.0010*	*<0.0010*	<0.0010	<0.0010	*<0.0010*	*<0.0010*	<0.00050	*<0.0010*	*<0.0010*	*<0.0010*	*<0.00050*	<0.00050	*<0.0010*	*<0.0010*	*<0.0010*
Trichlorofluoromethane	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
Trihalomethanes	mg/L	0.1	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.0020	-	-	<0.0020	<0.0020	<0.0020
Vinyl chloride	mg/L	0.0011	**0.0124**	**0.0039**	**0.0087**	**0.0082**	**0.0061**	**0.0043**	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	**0.0132**	**0.0090**	**0.0074**	**0.0098**

Notes:

[1] Alberta Environment and Protected Areas (AEPA). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Referenced guidelines are for coarse-textured soils under Residential/Parkland land use.

[2] Alberta Environment and Parks (AEP). Environmental Quality Guidelines for Alberta Surface Waters. March 2018. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (FAL). Most conservative values applied (chronic or acute).

[3] Guideline varies with hardness. Values shown based on site hardness range of 201 mg/L to 1140 mg/L.

[4] Guideline varies with chloride. Values shown based on site chloride range of 6.8 mg/L to 450 mg/L.

[5] Guideline varies with pH. Values shown based on site pH range of 6.28 to 8.40.

[6] Guideline varies with pH and temperature. Values shown based on pH range of 6.28 to 8.40 and temperature range of 2.18°C to 6.55°C.

"-" No applicable guideline.

"ND" Non-detected.

BOLD - Greater than Tier 1 Guideline.

Italic - Detection limit greater than Tier 1 guideline.

N/A - Not applicable.

TETRA TECH

Table 3: Historical Surface Water Analytical Results

Parameter	Unit	Guideline[1]	SW-01 DOWNSTREAM	SW-01 DOWNSTREAM	SW-01 DOWNSTREAM	SW-01	SW-01 DOWNSTREAM		SW-02 UPSTREAM	SW-02 UPSTREAM	SW-02 UPSTREAM	SW-02	SW-02 UPSTREAM	SW-03 DOWNSTREAM
			13 Jul 2021	09 Sep 2021	10 Nov 2022	07 Sep 2024	16-Oct-25	16/Oct/25 DUP	13 Jul 2021	09 Sep 2021	10 Nov 2022	07 Sep 2024	16-Oct-25	16-Oct-25
Field Parameters														
Field pH	pH Units	6.5-9	-	-	8.35	8.14	7.94	-	-	-	8.83	7.84	7.98	8.25
Field Temperature	°C	-	-	-	-0.3	20.5	10.43	-	-	-	-0.1	18.7	9.47	5.91
Field Electric Conductivity	µS/cm	-	-	-	1,734	1038	905	-	-	-	2,350	1318	928	807
Routine														
pH	pH Units	6.5-9	8.28	8.47	8.15	8.49	8.49	8.46	8.41	8.41	8.17	8.28	8.51	8.46
Electrical Conductivity (EC)	µS/cm	-	1,130	1,140	1,210	950	876	872	1,110	1,260	1,200	1,240	912	797
Total Dissolved Solids (TDS)	mg/L	-	680	664	793	568	500	499	672	763	786	761	520	454
Hardness as CaCO3	mg/L	-	457	469	552	414	390	385	440	573	550	565	400	336
Alkalinity (total as CaCO3)	mg/L	20	**390**	**325**	**460**	**317**	**298**	**300**	**386**	**413**	**462**	**445**	**315**	**276**
Bicarbonate	mg/L	-	475	364	561	368	334	337	442	474	563	537	351	310
Carbonate	mg/L	-	<5.0	15.7	<1	8.9	14.3	14.3	14.3	14.9	<1	2.8	16.4	13.6
Hydroxide	mg/L	-	<5.0	<5.0	<1	<1.0	<0.3	<0.3	<5.0	<5.0	<1	<1.0	<0.3	<0.3
Calcium	mg/L	-	93.5	77.4	120	74.2	80.9	79.8	89.6	119	119	117	82.2	70.9
Magnesium	mg/L	-	54.4	67	61.2	57.3	45.7	45.2	52.5	67	61.4	72	47.4	38.7
Potassium	mg/L	-	6.56	7.18	8.83	5.58	5.18	5.11	6.49	7.06	8.84	6.66	5.41	4.5
Sodium	mg/L	-	78.1	76.2	86.7	60	47.3	46.7	78.1	74.5	86.5	72.2	47.3	44.1
Chloride	mg/L	120	120	**146**	**139**	115	90	90	119	**146**	**136**	**141**	90.6	80.2
Fluoride	mg/L	-	0.2	0.14	0.201	0.228	0.168	0.158	0.2	0.16	0.197	0.187	0.155	0.17
Sulphate	mg/L	429[#1]	87.2	90.5	75	60.2	36.6	36.6	90.1	92.8	70.9	63.3	38.3	36.2
Anions Total	meq/L	-	-	-	-	-	9.31	9.35	-	-	-	-	9.71	8.59
Cations Total	meq/L	-	-	-	-	-	9.99	9.87	-	-	-	-	10.2	8.76
Cation - Anion Balance	%	-	-	-	-	-	3.52	2.71	-	-	-	-	2.46	0.98
Ionic Balance	%	-	97.1	102	101	101	107	106	94.8	103	103	102	105	102
Nutrients														
Ammonia as N	mg/L	0.29-0.95[#2]	-	<0.050	0.0874	-	-	-	-	0.058	0.0792	-	-	-
Nitrate (as NO3-N)	mg/L	3	1.34	1.01	1.41	0.642	0.612	0.611	0.9	1.96	1.36	1.64	0.716	0.655
Nitrite (as NO2-N)	mg/L	0.2[#3]	<0.050	<0.050	<0.05	<0.050	0.024	0.023	<0.050	<0.050	<0.05	<0.050	0.064	0.025
Nitrate and Nitrite (as N) (mg/L)	mg/L	-	1.34	1.01	1.41	0.642	0.636	0.634	0.9	1.96	1.36	1.64	0.78	0.68
Dissolved Metals														
Iron	mg/L	0.3	-	-	-	-	0.035	0.034	-	-	-	-	0.143	0.052
Manganese	mg/L	-	-	-	-	-	0.0732	0.0724	-	-	-	-	0.373	0.0918
Total Metals														
Aluminum	mg/L	0.05[#4]	0.039	0.009	0.0284	0.0468	0.0419	0.0438	0.0193	**0.055**	**0.059**	**0.448**	**0.0587**	**0.0606**
Antimony	mg/L	-	0.00023	0.00034	0.00023	0.00035	0.00046	0.00044	0.00023	0.00047	0.00021	0.00035	0.00041	0.00049
Arsenic	mg/L	0.005	0.00327	0.00163	0.00121	0.00121	0.00096	0.00099	0.00241	0.00216	0.00176	0.00217	0.00161	0.00106
Barium	mg/L	-	0.2	0.222	0.196	0.166	0.17	0.169	0.167	0.307	0.2	0.277	0.192	0.157
Boron	mg/L	1.5	0.063	0.084	0.078	0.088	0.065	0.065	0.061	0.085	0.082	0.107	0.075	0.059
Cadmium	mg/L	0.00037[#1]	0.0000169	<0.0000050	<0.000005	0.0000057	0.0000072	0.0000076	0.000069	0.0000118	0.000013	0.0000195	0.0000089	0.0000069
Calcium	mg/L	-	-	-	-	-	81	79.7	-	-	-	-	83.3	72.7
Chromium	mg/L	0.001	0.00015	0.00014	<0.0005	<0.00050	<0.00050	<0.00050	0.00013	0.00022	<0.0005	0.00076	<0.00050	<0.00050
Chromium, Trivalent (Cr^{3+})	mg/L	0.0089	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	0.0524-0.0883[#1]	0.00107	0.00135	0.00122	0.00148	0.00169	0.0017	0.00123	0.00194	0.00119	0.00174	0.00172	0.00189
Iron	mg/L	0.3	**0.349**	0.231	**0.362**	0.164	**0.334**	**0.346**	0.181	**0.526**	**0.551**	**0.95**	**0.566**	**0.381**
Lead	mg/L	0.007[#1]	0.000133	<0.000050	0.000054	0.000074	0.000077	0.000081	0.000089	0.0001	0.00009	0.000749	0.000101	0.000171
Manganese	mg/L	-	-	-	-	-	43.9	43.9	-	-	-	-	45	38
Manganese	mg/L	-	0.0888	0.0194	0.0428	0.0115	0.0792	0.0792	0.0167	0.103	0.0897	0.152	0.383	0.0998
Mercury	mg/L	0.000005	<0.0000050	-	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	<0.000005	<0.0000050	<0.0000050	<0.0000050
Nickel	mg/L	0.15-0.23[#1]	0.00255	0.00261	0.00306	0.00232	0.00318	0.00323	0.00242	0.00294	0.00309	0.0039	0.00379	0.00301
Potassium	mg/L	-	-	-	-	-	5.02	5.02	-	-	-	-	5.27	4.46
Selenium	mg/L	0.002	0.0005	0.000813	0.000326	0.000385	0.000166	0.000194	0.000404	0.000853	0.000382	0.000527	0.000212	0.000167
Silver	mg/L	0.00025	<0.000010	<0.000010	<0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.000010	<0.000010	<0.000010
Sodium	mg/L	-	-	-	-	-	46.1	45.9	-	-	-	-	46	42.5
Uranium	mg/L	0.015	0.00547	0.00821	0.00593	0.00637	0.00433	0.00444	0.00502	0.00818	0.00587	0.00812	0.00453	0.00376
Zinc	mg/L	0.03	0.0112	0.003	0.0082	0.0062	0.0257	0.0255	0.0059	0.0139	0.0111	**0.132**	**0.122**	0.03
Hydrocarbons														
Benzene	mg/L	0.04	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0005	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	0.09	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Xylene (o)	mg/L	-	<0.00050	<0.00050	<0.0003	<0.00030	<0.00030	<0.00030	<0.00050	<0.00050	<0.0003	<0.00030	<0.00030	<0.00030
Xylenes (m & p)	mg/L	-	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040
Xylenes Total	mg/L	0.03	-	<0.00071	<0.0005	<0.00050	<0.00050	<0.00050	-	<0.00071	<0.0005	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.072	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
F1 (C6-C10) - BTEX	mg/L	-	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
F2 (C10-C16 Hydrocarbons)	mg/L	0.11	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Total BTEX	mg/L	-	-	-	<0.001	<0.0010	-	-	-	-	<0.001	<0.0010	-	-

Notes:
SW-01 is downstream and SW-02 is upstream.
[1] Government of Alberta. 2018. Environmental Quality Guidelines for Alberta Surface Waters. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[#1] Guideline varies with hardness. Values shown based on hardness range of 336 mg/L to 573 mg/L.
[#2] Guideline varies with pH and temperature. Values shown based on pH range of 7.84 to 8.83 and temperature range of -0.3°C 20.5°C.
[#3] Guideline varies with chloride. Values shown based on chloride range of 80.2 mg/L to 146 mg/L.
[#4] Guideline varies with pH. Values shown
"-" No applicable guideline.
"ND" Non-detected.
BOLD - Greater than Tier 1 Guideline.
N/A - Not applicable.

Table 3: Historical Surface Water Analytical Results

Parameter	Unit	Guideline[1]	SW-01 DOWNSTREAM	SW-01 DOWNSTREAM	SW-01 DOWNSTREAM	SW-01	SW-01 DOWNSTREAM		SW-02 UPSTREAM	SW-02 UPSTREAM	SW-02 UPSTREAM	SW-02	SW-02 UPSTREAM	SW-03 DOWNSTREAM
			13 Jul 2021	09 Sep 2021	10 Nov 2022	07 Sep 2024	16-Oct-25	16/Oct/25 DUP	13 Jul 2021	09 Sep 2021	10 Nov 2022	07 Sep 2024	16-Oct-25	16-Oct-25
Volatile Organic Compounds (VOCs)														
Bromobenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Bromochloromethane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Bromodichloromethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
sec-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
tert-Butylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Carbon tetrachloride	mg/L	0.0133	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0013	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.0018	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	-	<0.0010	<0.0010	<0.005	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.005	<0.0050	<0.0050	<0.0050
2-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
4-Chlorotoluene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dibromoethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Dibromomethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.0007	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	0.15	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.026	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.1	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (cis)	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dichloroethene (trans)	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<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
1,3-Dichloropropene [cis]	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,3-Dichloropropene [trans]	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	0.0013	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Methyl t-Butyl Ether (MTBE)	mg/L	10	-	-	<0.0005	<0.00050	<0.00050	<0.00050	-	-	<0.0005	<0.00050	<0.00050	<0.00050
Methylene Chloride	mg/L	0.0981	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
iso-Propylbenzene (cumene)	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
n-Propylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Tetrachloroethene	mg/L	0.11	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	0.008	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,2,4-Trichlorobenzene	mg/L	0.024	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/L	0.021	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Trihalomethanes	mg/L	-	-	-	<0.002	<0.0020	<0.0020	<0.0020	-	-	<0.002	<0.0020	<0.0020	<0.0020
1,2,3-Trichloropropane	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	-	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/L	-	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.001	<0.0010	<0.0010	<0.0010

Notes:
SW-01 is downstream and SW-02 is upstream.
[1] Government of Alberta. 2018. Environmental Quality Guidelines for Alberta Surface Waters. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta. Table 1 Surface water quality guidelines for the protection of freshwater aquatic life (PAL). Most conservative values applied (chronic or acute).
[#1] Guideline varies with hardness. Values shown based on hardness range of 336 mg/L to 573 mg/L.
[#2] Guideline varies with pH and temperature. Values shown based on pH range of 7.84 to 8.83 and temperature range of -0.3°C 20.5°C.
[#3] Guideline varies with chloride. Values shown based on chloride range of 80.2 mg/L to 146 mg/L.
[#4] Guideline varies with pH. Values shown
"-" No applicable guideline.
"ND" Non-detected.
BOLD - Greater than Tier 1 Guideline.
N/A - Not applicable.

Table 4: Surface Water Quality Assurance/Quality Control Analytical Results

Parameters	Unit	SW-01	DUPLICATE	RPD (%)
		16-Oct-25	16-Oct-25	
Routine				
pH	pH Units	8.49	8.46	0.4
Electrical Conductivity (EC)	µS/cm	876	872	0.5
Total Dissolved Solids (TDS)	mg/L	500	499	0.2
Dissolved Hardness as $CaCO_3$	mg/L	390	385	1
Alkalinity (total as $CaCO_3$)	mg/L	298	300	1
Alkalinity (Bicarbonate)	mg/L	334	337	1
Alkalinity (Carbonate)	mg/L	14.3	14.3	0
Hydroxide	mg/L	<0.3	<0.3	-
Calcium	mg/L	80.9	79.8	1
Magnesium	mg/L	45.7	45.2	1
Potassium	mg/L	5.18	5.11	1
Sodium	mg/L	47.3	46.7	1.3
Chloride	mg/L	90	90	0
Fluoride	mg/L	0.168	0.158	-
Sulphate	mg/L	36.6	36.6	0
Anions Total	meq/L	9.31	9.35	0.4
Cations Total	meq/L	9.99	9.87	1
Nutrients				
Nitrate (as NO_3-N)	mg/L	0.612	0.611	0.2
Nitrite (as NO_2-N)	mg/L	0.024	0.023	-
Nitrate and Nitrite (as N)	mg/L	0.636	0.634	0.3

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 4: Surface Water Quality Assurance/Quality Control Analytical Results

Parameters	Unit	SW-01	DUPLICATE	RPD (%)
		16-Oct-25	16-Oct-25	
Dissolved Metals				
Iron	mg/L	0.035	0.034	-
Manganese	mg/L	0.0732	0.0724	1
Total Metals				
Aluminum	mg/L	0.0419	0.0438	4
Antimony	mg/L	0.00046	0.00044	-
Arsenic	mg/L	0.00096	0.00099	3
Barium	mg/L	0.17	0.169	1
Boron	mg/L	0.065	0.065	0
Cadmium	mg/L	0.0000072	0.0000076	-
Calcium	mg/L	81	79.7	2
Chromium	mg/L	<0.00050	<0.00050	-
Copper	mg/L	0.00169	0.0017	-
Iron	mg/L	0.334	0.346	4
Lead	mg/L	0.000077	0.000081	-
Magnesium	mg/L	43.9	43.9	0
Manganese	mg/L	0.0792	0.0792	0
Mercury	mg/L	<0.0000050	<0.0000050	-
Nickel	mg/L	0.00318	0.00323	2
Potassium	mg/L	5.02	5.02	0
Selenium	mg/L	0.000166	0.000194	-
Silver	mg/L	<0.000010	<0.000010	-
Sodium	mg/L	46.1	45.9	0.4
Uranium	mg/L	0.00433	0.00444	3
Zinc	mg/L	0.0257	0.0255	1
Hydrocarbons				
Benzene	mg/L	<0.00050	<0.00050	-
Toluene	mg/L	<0.00050	<0.00050	-
Ethylbenzene	mg/L	<0.00050	<0.00050	-
Xylene (o)	mg/L	<0.00030	<0.00030	-
Xylenes (m & p)	mg/L	<0.00040	<0.00040	-
Xylenes Total	mg/L	<0.00050	<0.00050	-
Styrene	mg/L	<0.00050	<0.00050	-
F1 (C_6-C_{10})	mg/L	<0.1	<0.1	-
F1 (C_6-C_{10}) - BTEX	mg/L	<0.1	<0.1	-
F2 (C_{10}-C_{16})	mg/L	<0.1	<0.1	-

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 4: Surface Water Quality Assurance/Quality Control Analytical Results

Parameters	Unit	SW-01	DUPLICATE	RPD (%)
		16-Oct-25	16-Oct-25	
Volatile Organic Compounds (VOCs)				
Bromobenzene	mg/L	<0.0010	<0.0010	-
Bromochloromethane	mg/L	<0.0010	<0.0010	-
Bromodichloromethane	mg/L	<0.0010	<0.0010	-
Bromoform	mg/L	<0.0010	<0.0010	-
Bromomethane	mg/L	<0.0010	<0.0010	-
n-Butylbenzene	mg/L	<0.0010	<0.0010	-
sec-Butylbenzene	mg/L	<0.0010	<0.0010	-
tert-Butylbenzene	mg/L	<0.0010	<0.0010	-
Carbon tetrachloride	mg/L	<0.00050	<0.00050	-
Chlorobenzene	mg/L	<0.0010	<0.0010	-
Chloroethane	mg/L	<0.0010	<0.0010	-
Chloroform	mg/L	<0.0010	<0.0010	-
Chloromethane	mg/L	<0.0050	<0.0050	-
2-Chlorotoluene	mg/L	<0.0010	<0.0010	-
4-Chlorotoluene	mg/L	<0.0010	<0.0010	-
Dibromochloromethane	mg/L	<0.0010	<0.0010	-
1,2-Dibromo-3-chloropropane	mg/L	<0.0010	<0.0010	-
1,2-Dibromoethane	mg/L	<0.0010	<0.0010	-
Dibromomethane	mg/L	<0.0010	<0.0010	-
1,2-Dichlorobenzene	mg/L	<0.00050	<0.00050	-
1,3-Dichlorobenzene	mg/L	<0.0010	<0.0010	-
1,4-Dichlorobenzene	mg/L	<0.0010	<0.0010	-
1,1-Dichloroethane	mg/L	<0.0010	<0.0010	-
1,2-Dichloroethane	mg/L	<0.0010	<0.0010	-
1,1-Dichloroethene	mg/L	<0.0010	<0.0010	-
1,2-Dichloroethene (cis)	mg/L	<0.0010	<0.0010	-
1,2-Dichloroethene (trans)	mg/L	<0.0010	<0.0010	-
Dichlorodifluoromethane	mg/L	<0.0010	<0.0010	-
1,2-Dichloropropane	mg/L	<0.0010	<0.0010	-
1,3-Dichloropropane	mg/L	<0.0010	<0.0010	-
2,2-Dichloropropane	mg/L	<0.0010	<0.0010	-
1,1-Dichloropropene	mg/L	<0.0010	<0.0010	-
1,3-Dichloropropene	mg/L	<0.0015	<0.0015	-
1,3-Dichloropropene [cis]	mg/L	<0.0010	<0.0010	-
1,3-Dichloropropene [trans]	mg/L	<0.0010	<0.0010	-
Hexachlorobutadiene	mg/L	<0.0010	<0.0010	-
p-Isopropyltoluene	mg/L	<0.0010	<0.0010	-
Methyl t-Butyl Ether (MTBE)	mg/L	<0.00050	<0.00050	-
Methylene Chloride	mg/L	<0.0010	<0.0010	-
iso-Propylbenzene (cumene)	mg/L	<0.0010	<0.0010	-
n-Propylbenzene	mg/L	<0.0010	<0.0010	-
1,1,1,2-Tetrachloroethane	mg/L	<0.0010	<0.0010	-
1,1,2,2-Tetrachloroethane	mg/L	<0.0010	<0.0010	-
Tetrachloroethene	mg/L	<0.0010	<0.0010	-
1,2,3-Trichlorobenzene	mg/L	<0.0010	<0.0010	-
1,2,4-Trichlorobenzene	mg/L	<0.0010	<0.0010	-
1,1,1-Trichloroethane	mg/L	<0.0010	<0.0010	-
1,1,2-Trichloroethane	mg/L	<0.0010	<0.0010	-
Trichloroethene	mg/L	<0.0010	<0.0010	-
Trichlorofluoromethane	mg/L	<0.0010	<0.0010	-
Trihalomethanes	mg/L	<0.0020	<0.0020	-
1,2,3-Trichloropropane	mg/L	<0.0010	<0.0010	-
1,2,4-Trimethylbenzene	mg/L	<0.0010	<0.0010	-
1,3,5-Trimethylbenzene	mg/L	<0.0010	<0.0010	-
Vinyl chloride	mg/L	<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 5: Soil Vapour Monitoring Results

Parameter	Gas Well																												
	VW-01							24VW-01		VW-02								VW-03		VW-04[4]					25VW-04	
	Aug-13	Jun-19	Dec-19	Jul-21	Nov-21	Dec-22	Jun-23	Dec-24	Dec-25	Aug-13	Jun-19	Dec-19	Jul-21	Nov-21	Dec-22	Dec-24	Dec-25	Aug-13	Jun-19	Jul-21	Nov-21	Dec-22	Jun-23	Dec-24	Feb-25	Dec-25
Total Drilled Depth (m)	3.5							3.5		6.1								7.6		4.0					2.5	
Top of Screen Interval (mbg)	3.2							3.2		5.80								7.3		2.5					1	
Bottom of Screened Interval (mbg)	3.5							3.5		6.10								7.6		4.0					2.5	
Stick up (m)	0.84							0.83		0.92								0.00		-0.02					0.98	
Pressure (kPa)[1]		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0
CH_4 (%)	26.0	11.7	0.0	5.1	3.9	0.0		0.5	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		4.1	2.0	30.3	9.7		0.7	35.4
CO (ppm)[2]	0.0	8.0	0.0	0.0	0.0	0.0		0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		2.0	0.0	11.0	2.0		1.0	11.0
CO_2 (%)	13.1	13.7	0.2	17.7	17.7	0.8	Blinded	1.2	20.0	4.6	0.1	0.2	0.1	0.1	0.2	0.7	0.7	1.9	Destroyed	9.7	5.1	20.3	18.9	Destroyed	7.0	24.6
O_2 (%)	8.4	3.3	20.9	0.2	5.0	22.1		20.1	0.4	17.2	19.9	21.3	20.6	22.7	22.5	20.4	22.3	19.8		12.4	16.8	1.6	2.8		12.7	0.7
Balance (% v/v)	52.5	71.3	78.8	77.1	73.5	77.1		78.2	70.3	77.8	80.1	78.4	79.3	77.2	77.3	79.0	76.9	78.3		73.8	76.1	47.7	69.0		79.6	39.3
Static Water Level (mbtoc)[3]	-	Dry	Dry	Dry	Dry	CNM	3.65	Dry	Dry	-	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		1.30	1.84	1.71	1.65		Dry[5]	Dry[5]

Notes:

[1] Kpa - Kilopascal.
[2] ppm - Parts per million.
[3] mbtoc - Metres below top of casing.
[4] Well blinded during July and November 2021 - results may not be valid.
[5] Oil recorded at bottom of well.
CNM - Could not measure.

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Table 6: Soil Vapour Analytical Results

Location Code		Generic Soil Vapour Criteria - Residential Coarse-Grained[1]	VW-01							VW-02			VW-03	VW-04				
Field ID			VW-01	VW-01	19DUP01	VW-01	24VW-01	DUPLICATE	24VW-01	VW-02	VW-02	VW-02	VW-03	VW-04	DUPLICATE	VW-04	25VW-04	25VW-04
Sample Date			2-Aug-2013	5-Dec-2019	5-Dec-2019	23-Nov-2021	03 Dec 2024	03 Dec 2024	03 Dec 2025	3-Aug-2013	5-Dec-2019	03 Dec 2025	2-Aug-2013	23-Nov-2021	23-Nov-2021	09-Dec-2022	26 Feb 2025	03 Dec 2025
Lab Report Number			B3C8546	L2393599	L2393599	L2671038	CG2417906	CG2417906	CG2517661	B3C8605	L2393599	CG2517661	B3C8546	L2671038	L2671038	CG2217083	CG2502145	CG2517661
Laboratory ID			SN8304 / SN8076-01	L2393599-1 / L2393599-4	L2393599-3	L2671038-1	CG2417906-001	CG2417906-002	CG2517661-001	SN8568 / SN8077-01	L2393599-2 / L2393599-5	CG2517661-002	SN8305 / SN8148-01	L2671038-2	L2671038-3	CG2217083-1	CG2502145-001	CG2517661-003
Parameter	**Units**	**µg/m³**																
Field Testing																		
Air Volume	L	NG	-	0.06	-	-	-	-	-	-	0.06	-	-	-	-	-	-	-
Initial Pressure / Pressure on Receipt	in Hg	NG	-2.85	-11.4	-9.6	15	-8.99	-11.6	-8.58	-7.33	-4.9	-8.78	-6.92	-11	-4	-10.2	-11.2	-10.2
Aliphatic/Aromatic PHC Sub-Fractionation																		
Aliphatics (C_6-C_8)	µg/m³	740,737	88,300	56,400	56,200	-	24,600	25,800	298,000	2,990	1,300	280	34	-	-	447,000	24,800	297
Aliphatics (>C_8-C_{10})	µg/m³	40,257	<480	21,500	21,100	-	13,700	14,300	**74,300**	577	728	158	73.1	-	-	931	24,200	107
Aliphatics (>C_{10}-C_{12})	µg/m³	40,257	664	9,920	9,690	-	10,500	10,700	13,900	345	179	<15	202	-	-	135	7,030	<15
Aliphatics (>C_{12}-C_{16})	µg/m³	40,257	<480	880	840	-	<710	<659	<5,430	106	<30	<30	105	-	-	<30	202	<30
Aromatics (C_6-C_8)	µg/m³	740,737	-	-	-	-	<721	<670	<5,520	-	-	<15	-	-	-	2,340	137	<15
Aromatics (>C_8-C_{10})	µg/m³	805	<480	<390	<360	-	<721	<670	<5,520	44.8	<15	<15	30.9	-	-	189	1,760	<15
Aromatics (>C_{10}-C_{12})	µg/m³	8,051	<480	490	470	-	1,030	1,080	<5,520	78.4	<15	<15	58.1	-	-	41	1,090	<15
Aromatics (>C_{12}-C_{16})	µg/m³	8,051	<480	<770	<730	-	<1,440	<1,340	<11,000	<5.0	<30	<30	<5.00	-	-	<30	<149	<30
CWS TVOC																		
CWS TVOC (C_6-C_8)	µg/m³	NG	-	-	-	-	24,600	25,800	298,000	-	-	280	-	-	-	449,000	24,900	297
CWS TVOC (>C_8-C_{10})	µg/m³	NG	-	-	-	-	13,700	14,300	74,300	-	-	158	-	-	-	1120	26,000	107
CWS TVOC (>C_{10}-C_{12})	µg/m³	NG	-	-	-	-	11,500	11,800	13,900	-	-	<15	-	-	-	176	8120	<15
CWS TVOC (>C_{12}-C_{16})	µg/m³	NG	-	-	-	-	<1,440	<1,340	<11,000	-	-	<30	-	-	-	<30	202	<30
Linear & Cyclic Methyl Siloxanes																		
Hexamethylcyclotrisiloxane, D3(CVMS)	µg/m³	NG	192.7	<170	-	-	-	-	-	84.4	<170	-	14.6	-	-	-	-	-
Octamethylcyclotetrasiloxane, D4(CVMS)	µg/m³	NG	73.9	<170	-	-	-	-	-	29.9	<170	-	23.4	-	-	-	-	-
Decamethylcyclopentasiloxane, D5(CVMS)	µg/m³	NG	34.9	<170	-	-	-	-	-	32.1	<170	-	42.0	-	-	-	-	-
Dodecamethylcyclohexasiloxane, D6(CVMS)	µg/m³	NG	<53.1	<170	-	-	-	-	-	145.4	<170	-	151.3	-	-	-	-	-
Hexamethyldisiloxane, MM(LVMS)	µg/m³	NG	<2.10	<170	-	-	-	-	-	<1.00	<170	-	<0.10	-	-	-	-	-
Octamethyltrisiloxane, MDM(LVMS)	µg/m³	NG	<4.10	<170	-	-	-	-	-	<1.90	<170	-	<0.20	-	-	-	-	-
Decamethyltetrasiloxane, MD2M(LVMS)	µg/m³	NG	<5.30	<170	-	-	-	-	-	<2.50	<170	-	<0.30	-	-	-	-	-
Dodecamethylpentasiloxane, MD3M(LVMS)	µg/m³	NG	<52.8	<170	-	-	-	-	-	<24.9	<170	-	<3.00	-	-	-	-	-
Hydrocarbons																		
Benzene	µg/m³	41	<54.6*	<16	<15	<15	18.8	**96.8**	<119*	16.5	1.4	2.17	2.51	20	<15	<65.5*	28.8	4.19
Toluene	µg/m³	75,190	<304	<19	<17	<36	13.4	66.3	<140	18.1	1.31	7.09	14.8	<36	<36	<21.9	4.07	14.9
Ethylbenzene	µg/m³	68,650	<119	<22	<20	<42	2.47	4.69	<162	3.24	<0.87	1.69	3.98	<42	<42	<21.0	50.4	2.47
Xylenes (m & p)	µg/m³	NG	<428	<43	<39	<84	6.9	11.3	<323	8.23	<1.7	6.95	15.8	<84	<84	92.0	265	9.94
Xylene (o)	µg/m³	NG	<82.5	<22	<20	<42	5.17	6.6	<162	5.29	<0.87	2.3	7.23	<42	<42	21.0	228	3.08
Xylenes Total	µg/m³	3,520	<429	<48	<43	<96	12.1	17.9	<484	13.5	<2.0	9.2	23.1	<96	<96	113	493	13
Styrene	µg/m³	3,220	181	<21	<19	<41	<0.85	1.7	<317	<0.852	<0.85	<0.85	1.57	<41	<41	<41.2	<4.60	<0.89
Total BTEX	µg/m³	NG	-	-	-	-	46.8	186	<0.905	-	-	0.0202	-	-	-	<171	576	0.0346
F1 (C_6-C_{10})	µg/m³	867,383	142,020	62,900	62,500	63,900	35,600	37,200	354,000	3,946	1,720	454	148	4980	3540	404,000	44,600	417
F1 (C_6-C_{10}) less BTEX	ug/m3	867,383	-	-	-	-	-	-	354,000	-	-	434	-	-	-	-	-	382
F2 (C_{10}-C_{16})	µg/m³	52,495	1,384	19,300	18,900	**67,500**	14,900	15,500	18,700	531.9	380	26	367.6	<720	<720	303	10,700	22
F2-NAPHTHALENE	µg/m3	52,495	-	-	-	-	-	-	18,700	-	-	26	-	-	-	-	-	22
Alcohols																		
Isopropanol	µg/m³	6,219	<701	<61	<56	-	-	-	-	8.94	<2.5	-	12.4	-	-	-	-	-
High Level Fixed Gases																		
Nitrogen	%	NG	52.5	66.3	69.8	-	73.1	69.7	7.41	77.8	74.9	0.169	78.3	75.7	76.6	-	79.4	31.6
Oxygen	%	NG	8.4	7.04	7.49	-	14.9	13.4	-	17.2	20.3	-	19.8	18.0	19.6	3.63	14.0	-
Carbon Dioxide	%	NG	13.1	11.1	11.5	12.9	4.94	5.81	-	4.6	0.391	-	1.9	4.06	2.77	16.6	5.56	-
Carbon Monoxide	%	NG	<0.20	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.30	<0.050	-	<0.30	<0.050	<0.050	0.072	<0.050	-
Methane	%	NG	26	5.26	5.46	2.03	1.45	1.78	70.9	<0.30	<0.050	76.9	<0.30	2.21	1.47	33.8	0.648	43.9
Hydrocarbon Gases (C_1-C_5)																		
Methane	%	NG	-	-	-	-	-	-	-	0.0067	0.00333	-	<0.00068	-	-	-	-	-
Ethane	%	NG	0.00011	<0.00020	<0.00020	<0.00020	-	-	-	<0.000028	<0.00020	-	<0.000034	0.00067	0.00044	-	-	-
Ethene	%	NG	0.000067	0.00026	0.00025	<0.00020	-	-	-	<0.000028	<0.00020	-	<0.000034	<0.00020	<0.00020	-	-	-
Propane	%	NG	0.000034	<0.00020	<0.00020	<0.00020	-	-	-	<0.000028	<0.00020	-	<0.000034	<0.00020	<0.00020	-	-	-
Propene	%	NG	0.000022	<0.00020	<0.00020	<0.00020	-	-	-	<0.000028	<0.00020	-	<0.000034	<0.00020	<0.00020	-	-	-
Butane	%	NG	0.00024	<0.00020	<0.00020	<0.00020	-	-	-	<0.000056	<0.00020	-	<0.000068	<0.00020	<0.00020	-	-	-
Pentane	%	NG	0.0014	0.00021	0.0002	<0.00020	-	-	-	<0.000028	<0.00020	-	<0.000034	<0.00020	<0.00020	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																		
Naphthalene	µg/m³	380	-	<66	<60	<50	4.14	4.46	<195	-	<2.6	<0.52	-	<50	<50	<25.3	6.24	<0.52

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Table 6: Soil Vapour Analytical Results

Location Code		Generic Soil Vapour Criteria - Residential Coarse-Grained[1]	VW-01							VW-02			VW-03	VW-04				
Field ID			VW-01	VW-01	19DUP01	VW-01	24VW-01	DUPLICATE	24VW-01	VW-02	VW-02	VW-02	VW-03	VW-04	DUPLICATE	VW-04	25VW-04	25VW-04
Sample Date			2-Aug-2013	5-Dec-2019	5-Dec-2019	23-Nov-2021	03 Dec 2024	03 Dec 2024	03 Dec 2025	3-Aug-2013	5-Dec-2019	03 Dec 2025	2-Aug-2013	23-Nov-2021	23-Nov-2021	09-Dec-2022	26 Feb 2025	03 Dec 2025
Lab Report Number			B3C8546	L2393599	L2393599	L2671038	CG2417906	CG2417906	CG2517661	B3C8605	L2393599	CG2517661	B3C8546	L2671038	L2671038	CG2217083	CG2502145	CG2517661
Laboratory ID			SN8304 / SN8076-01	L2393599-1 / L2393599-4	L2393599-3	L2671038-1	CG2417906-001	CG2417906-002	CG2517661-001	SN8568 / SN8077-01	L2393599-2 / L2393599-5	CG2517661-002	SN8305 / SN8148-01	L2671038-2	L2671038-3	CG2217083-1	CG2502145-001	CG2517661-003
Parameter	**Units**	**µg/m³**																
Volatile Organic Compounds (VOCs)																		
1,1,1-Trichloroethane	µg/m³	1,693,510	<155	<27	<25	<52	<1.1	<1.2	<405	18.8	<1.1	<1.1	<1.64	<52	<52	<52.7	<5.9	<1.1
1,1,2,2-Tetrachloroethane	µg/m³	11	<130*	<34*	<31*	<66*	<1.6	<1.8	<510	<1.37	<1.4	<1.4	<1.37	<66*	<66*	<66.3*	<7.4	<1.4
1,1,2-Trichloroethane	µg/m³	7	<77.7*	<27*	<25*	<52*	<1.1	<1.2	<405*	<0.818	<1.1	<1.1	<0.818	<52*	<52*	<52.7*	<5.9	<1.1
1,1-Dichloroethane	µg/m³	430	<76.9	<20	<18	<39	<0.81	<0.93	<301	<11.1	<0.81	<0.81	<0.809	<39	<39	<39.1	<4.37	<0.85
1,1-Dichloroethene	µg/m³	6,470	<94.2	<20	<18	<38	<0.79	<0.91	<295	5.6	<0.79	<0.79	<0.991	<38	<38	<38.3	<4.28	<0.83
1,2,4-Trichlorobenzene	µg/m³	365	<1,410*	<37	<34	<71	<1.5	<1.7	<551*	<14.8	<1.5	<1.5	<14.8	<71	<71	<71.7	<8.0	<1.6
1,2,4-Trimethylbenzene	µg/m³	2,235	<233	<25	<22	<47	4	4	<365	11.3	<0.98	2.3	13.5	<47	<47	<47.5	102	2.5
1,2-Dibromoethane	µg/m³	2.2	<124*	<38*	<35*	<74*	<1.5	<1.8	<571*	<1.31	<1.5	<1.5	<1.31	<74*	<74*	<74.2*	<8.3	<1.6
1,2-Dichlorobenzene	µg/m³	7,072	<228	<30	<27	<58	<1.2	<1.4	<447	<2.40	<1.2	<1.2	<2.40	<58	<58	<58.1	<6.5	<1.3
1,2-Dichloroethane	µg/m³	24	<76.9*	**45.0**	**33.0**	<39*	10	11.4	<301*	<0.809	<0.81	<0.81	<0.809	<39*	<39*	<39.1*	6.48	<0.85
1,2-Dichloroethene (cis)	µg/m³	242	**486**	34	22.0	<38	7.73	9.32	<295*	52.3	<0.79	<0.79	1.68	<38	<38	50.0	<4.28	<0.83
1,2-Dichloroethene (trans)	µg/m³	1,400	118	24	<18	<38	2.5	2.78	<295	<0.793	<0.79	<0.79	<0.793	<38	<38	50.0	4.76	<0.83
1,2-Dichloropropane	µg/m³	135	<176*	<23	<21	<44	<0.9	<1.1	<343*	<1.85	<0.92	<0.9	<1.85	<44	<44	<44.6	<5.0	<1.0
1,2-Dichlorotetrafluoroethane	µg/m³	566,335	<113	65	47	<67	1.9	2	<519	240	7.6	<1.4	4.07	230	181	669	58	<5,240
1,3,5-Trimethylbenzene	µg/m³	2,235	<233	172	126	129	135	146	<365	19.9	<0.98	<1.0	<9.29	<47	<47	<47.5	436	<1.0
1,3-Butadiene	µg/m³	17	<105*	<11	<10	<21*	<4.64	<5.75	<164*	<1.11	<0.44	<0.44	<1.11	<21*	<21*	<23.7*	<2.39	<50.0
1,3-Dichlorobenzene	µg/m³	64	<228*	<30	<27	<58	<1.2	<1.4	<447*	<2.40	<1.2	<1.2	<2.40	<58	<58	<58.1	<6.5	<1.3
1,3-Dichloropropene	µg/m³	NG	-	-	-	-	<1.8	<2.1	<674	-	-	<1.8	-	-	-	<87.7	<9.8	<1.9
1,3-Dichloropropene [cis]	µg/m³	163	<77.6	<23	<21	<44	<0.9	<1.0	<337*	<0.817	<0.91	<0.9	<0.817	<44	<44	<43.8	<4.9	<1.0
1,3-Dichloropropene [trans]	µg/m³	149	<73.3	<23	<21	<44	<0.9	<1.0	<337*	<0.772	<0.91	<0.9	<0.772	<44	<44	<43.8	<4.9	<1.0
1,4-Dichlorobenzene	µg/m³	64	<228*	<30	<27	<58	<1.2	<1.4	<447*	<2.40	<1.2	<1.2	<2.40	<58	<58	<58.1	12.6	<1.3
1,4-Dioxane	µg/m³	105	<685*	<18	<16	<35	<0.72	<0.83	<268*	<7.21	<0.72	<0.72	<7.21	<35	<35	<34.8	<3.89	<0.76
1-Methyl-4 ethyl benzene	µg/m³	14,461	<1,030	<25	<22	<47	2.9	3.1	<365	<10.8	<0.98	<1.0	<10.8	<47	<47	<47.5	61.9	<1.0
2-Butanone (MEK)	µg/m³	167,364	<841	<15	<13	<28	<7.37	<10.3	<219	<8.85	0.74	0.62	17.2	<28	<28	245	<3.18	<0.62
2-Hexanone (MBK)	µg/m³	1,053	<778	<100	<93	<200	<148	<186	<4,750*	<8.19	<4.1	<5.33	<8.19	<200	<200	<198	<311	<4.10
4-Methyl-2-pentanone (MIBK)	µg/m³	102,977	<1,250	<20	<19	<39	<0.82	<0.94	<304	<13.1	<0.82	<0.82	<13.1	<39	<39	<39.6	<4.42	<0.86
Acetone	µg/m³	918,788	<181	<460	<320	<57	18.8	21.1	<884	86.7	9.0	6.9	42.9	<57	<57	323	<12.8	<11.2
Allyl chloride	µg/m³	32	-	<16	<14	<30	<0.63	<0.72	<233*	-	<0.63	<0.63	-	<30	<30	<30.2	<3.38	<0.66
Benzyl chloride	µg/m³	34	<492*	<26	<24	<50*	<1.0	<1.2	<385*	<5.18	<1.0	<1.0	<5.18	<50*	<50*	<50.0*	<5.6	<1.1
Bromodichloromethane	µg/m³	28	<127*	<34*	<30*	<64*	3.8	4	<498*	<1.34	<1.3	<1.3	<1.34	<64*	<64*	<64.7*	<7.2	<1.4
Bromoform	µg/m³	1,494	<196	<52	<47	<99	<2.1	<2.4	<768	<2.07	<2.1	<2.1	<2.07	<99	<99	<99.8	<11.2	<2.2
Bromomethane	µg/m³	173	<66.4	<19	<18	<37	<0.78	<0.89	<289*	<0.699	<0.78	<0.78	<0.699	<37	<37	<37.5	<4.19	<0.82
Volatile Organic Compounds (VOCs)																		
Carbon disulfide	µg/m³	21,713	<148	<16	<14	<30	<1.6	<1.8	<579	126	2.75	<1.6	9.99	<30	<30	<75.4	<8.4	<1.6
Carbon tetrachloride	µg/m³	113	<179*	<31	<29	<61	<1.26	<1.45	<467*	<1.89	<1.3	<1.26	<1.89	<61	<61	<60.8	<6.79	<1.32
Chlorobenzene	µg/m³	347	<87.5	<23	<21	<44	<0.92	<1.06	<342	<0.921	<0.92	<0.92	<0.921	<44	<44	<44.5	<4.97	<0.97
Chloroethane	µg/m³	124,080	<75.2	<13	<12	<25	0.55	<0.61	<196	<0.792	<0.53	<0.53	<0.792	<25	<25	<25.5	<2.85	<11.5
Chloroform	µg/m³	27	<69.6*	<24	<22	<47*	<0.98	<1.12	<363*	**88.8**	<0.98	<0.98	2.55	<47*	<47*	<47.2*	<5.27	<1.03
Chloromethane	µg/m³	2,657	<58.9	<10	<9.4	<20	1.92	1.98	<153	<0.620	1.1	<0.89	2.12	<20	<20	<19.9	<2.23	<25.6
Cyclohexane	µg/m³	201,510	16,900	6,700	6,450	2890	1,680	1,750	23,700	753	45	17.9	1.19	1180	800	699	2,510	1.48
Dibromochloromethane	µg/m³	6,070	<162	<43	<39	<82	<1.7	<2.0	<633	<1.70	<1.7	<1.7	<1.70	<82	<82	<82.3	<9.2	<1.8
Dichlorodifluoromethane	µg/m³	3,584	<285	31	<22	<48	4.4	4.4	<367	1,720	47.8	7.1	7.92	555	397	**3,920**	142	**8,310**
Ethyl acetate	µg/m³	2,509	<753	<18	<16	<35	<1.51	<2.16	<1,690	<7.93	<0.72	<0.72	<7.93	<35	<35	<34.8	<3.89	<0.76
Freon 113	µg/m³	230,627	<109	<38	<35	<74	<1.5	<1.8	<569	<1.15	<1.5	<1.5	<1.15	<74	<74	<74	<8.3	<1.6
Heptane	µg/m³	14,461	8,060	4,210	2,880	691	898	939	10,400	740	16.5	15.3	2.39	<39	<39	672	1,460	2.25
Hexachlorobutadiene	µg/m³	51	<3,040*	<53*	<48	<100*	<2.1	<2.4	<792*	<32.0	<2.1	<2.1	<32.0	<100*	<100*	<103*	<11.5	<2.2
Hexane	µg/m³	18,839	**62,700**	11,700	11,600	3000	3,770	3,980	**32,800**	501	79.8	29.1	<4.65	562	391	3,980	1,190	79.7
Isooctane	µg/m³	14,917	<88.8	1,050	720	382	132	155	1,890	<0.934	4.45	2.5	2.99	115	80	58.9	282	5.6
iso-Propylbenzene (cumene)	µg/m³	14,461	-	<25	<22	<47	2.1	2.3	<365	-	<0.98	<1.0	-	<47	<47	<47.5	10.8	<1.0
Methyl t-Butyl Ether (MTBE)	µg/m³	1,153	<68.5	<18	<16	<35	<0.72	<0.83	<268	<0.721	<0.72	<0.72	<0.721	<35	<35	<34.8	<3.89	<0.76
Methylene Chloride	µg/m³	18,764	<433	<17	<16	<33	<0.69	<0.80	<258	5.1	<0.69	<0.69	3.67	<33	<33	<33.6	<3.75	<0.73
Propene	µg/m³	91,723	639	676	474	146	57.3	63.5	<232	<14.9	<0.34	<2.72	<6.69	81	58	1,010	<23.1	<978
Tetrachloroethene	µg/m³	1,390	<129	<34	<31	<65	<1.4	<1.6	<504	**1,500**	252	26.6	<1.36	<65	<65	<65.5	<7.3	2.3
Tetrahydrofuran	µg/m³	62,828	<112	<15	<13	<28	1.18	0.91	<219	<1.18	<0.59	<0.59	15.2	<28	<28	1,800	<3.18	<0.62
Trichloroethene	µg/m³	70	<153*	<27	<24	<52	1.4	1.8	<399*	**440**	7.6	27.1	7.08	<52	<52	<51.9	<5.8	111
Trichlorofluoromethane	µg/m³	34,325	<107	<28	<26	<54	<1.1	<1.3	<417	284	60.2	8.6	2.35	<54	<54	<54.3	<6.1	<3.5
Vinyl acetate	µg/m³	6,586	<66.9	<44	<40	260	<422	<394	<1,960	<0.704	<1.8	<1.8	<0.704	<85	<85	<268	<79.2	<104
Vinyl bromide (bromoethene)	µg/m³	40	<83.1*	<22	<20	<42*	<0.9	<1.0	<325*	<0.875	<0.87	<0.9	<0.875	<42*	<42*	<42.2*	<4.7	<0.9
Vinyl chloride	µg/m³	70	**1330**	**926**	**664**	62	**242**	**256**	**1,390**	1.29	3.98	<0.51	<0.460	<25	<25	**1,130**	<2.76	<93.5*

Notes:

[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.

NG	No applicable criteria.
BOLD	Greater than criteria.
*	Detection limit raised above criteria.

TETRA TECH

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		--	0.003	0.225	0.088	1.00E-05	10	--	--	--
Toluene		3.8	--	0.274	0.087	9.20E-06	10	--	--	--
Ethylbenzene		1	--	0.358	0.075	8.50E-06	10	--	--	--
Xylenes		0.18	--	0.252	0.078	9.90E-06	10	--	--	--
Naphthalene		0.003	--	0.017	0.059	7.50E-06	10	--	--	--
F1	Aliphatic C>6-C8	18.4	--	50	0.05	0.00001	10	0.55	0.854	0.842
	Aliphatic C>8-C10	1	--	80	0.05	0.00001	10	0.36	0.141	0.153
	Aromatic C>8-C10	0.2	--	0.48	0.05	0.00001	10	0.09	0.005	0.005
F2	Aliphatic C>10-C12	1	--	120	0.05	0.00001	10	0.36	0.767	0.766
	Aliphatic C>12-C16	1	--	520	0.05	0.00001	10	0.44	0.205	0.206
	Aromatic C>10-C12	0.2	--	0.14	0.05	0.00001	10	0.09	0.023	0.023
	Aromatic C>12-C16	0.2	--	0.053	0.05	0.00001	10	0.11	0.005	0.005
1,1,1-Trichloroethane		5	--	0.688	0.078	0.000009	10	--	--	--
1,1,2,2-Tetrachloroethane		--	0.000172	0.019	0.071	0.000008	10	--	--	--
1,1,2-Trichloroethane		0.0002	0.000625	0.038	0.078	0.000009	10	--	--	--
1,1-Dichloroethane		--	0.006250	0.240	0.074	0.000011	10	--	--	--
1,1-Dichloroethene		0.2	--	0.942	0.090	0.000010	10	--	--	--
1,2,4-Trichlorobenzene		0.007	--	0.112	0.030	0.000008	10	--	--	--
1,2,4-Trimethylbenzene		0.06	--	0.230	0.061	0.000008	10	--	--	--
1,2-Dibromoethane		0.0093	0.016700	0.027	0.022	0.000012	10	--	--	--
1,2-Dichlorobenzene		0.2	--	0.072	0.069	0.000008	10	--	--	--
1,2-Dichloroethane		0.007	0.000385	0.049	0.104	0.000010	10	--	--	--
1,2-Dichloropropane		0.004	0.002703	0.110	0.078	0.000009	10	--	--	--
1,3,5-Trimethylbenzene		0.06	--	0.359	0.060	0.000008	10	--	--	--
1,3-Butadiene		0.002	0.000333	3.009	0.249	0.000011	10	--	--	--
1,3-Dichlorobenzene		0.095	0.000909	0.128	0.069	0.000008	10	--	--	--
1,4-Dichlorobenzene		0.095	0.000909	0.098	0.069	0.000008	10	--	--	--
1,4-Dioxane		0.03	0.002000	0.000	0.229	0.000010	10	--	--	--
2-Hexanone		0.03	--	0.004	0.070	0.000008	10	--	--	--
Acetone		31	--	0.002	0.124	0.000011	10	--	--	--
Allyl chloride		0.001	--	0.450	0.094	0.000011	10	--	--	--
Benzyl chloride		0.001	--	0.017	0.075	0.000008	10	--	--	--
Bromodichloromethane		--	0.000270	0.098	0.030	0.000011	10	--	--	--
Bromoform		--	0.009091	0.024	0.015	0.000010	10	--	--	--
Bromomethane		0.005	--	0.255	0.073	0.000012	10	--	--	--
Carbon Disulfide		0.7	--	0.705	0.104	0.000010	10	--	--	--
Carbon Tetrachloride		0.1	0.001667	1.183	0.078	0.000009	10	--	--	--
Chlorobenzene		0.01	--	0.148	0.073	0.000009	10	--	--	--
Chloroethane		1	--	0.073	0.271	0.000012	10	--	--	--
Chloroform		0.098	0.000435	0.154	0.104	0.000010	10	--	--	--
Chloromethane		0.09	--	0.388	0.126	0.000007	10	--	--	--
cis-1,2-Dichloroethene		0.007	--	0.302	0.074	0.000011	10	--	--	--
cis-1,3-Dichloropropene		0.02	0.002500	0.053	0.087	0.000010	10	--	--	--
Cyclohexane		6	--	7.618	0.080	0.000009	10	--	--	--
Dibromochloromethane		0.07	--	0.040	0.020	0.000011	10	--	--	--
Dichlorodifluoromethane		0.1	--	16.475	0.067	0.000010	10	--	--	--
4-Ethyltoluene		0.40	--	0.205	0.065	0.000007	10	--	--	--
Ethyl acetate		0.07	--	0.006	0.067	0.000010	10	--	--	--
Freon 113		5	--	21.500	0.038	0.000009	10	--	--	--
Freon 114		17	--	115.000	0.082	0.000009	10	--	--	--
Heptane		0.4	--	83.709	0.065	0.000007	10	--	--	--
Hexachlorobutadiene		--	0.000455	0.421	0.027	0.000007	10	--	--	--
Isooctane		0.4	--	30.500	0.060	0.000007	10	--	--	--
Isopropyl alcohol		0.2	--	0.000331	0.103	0.000011	10	--	--	--
Isopropylbenzene		0.4	--	0.591	0.065	0.000007	10	--	--	--
Methyl ethyl ketone		5	--	0.001	0.081	0.000010	10	--	--	--
Methyl isobutyl ketone		0.003	--	0.006	0.075	0.000008	10	--	--	--
Methylene chloride		0.6	1	0.151	0.101	0.000012	10	--	--	--
MTBE		0.037	--	0.028	0.102	0.000011	10	--	--	--
n-Hexane		0.7	--	73.916	0.200	0.000008	10	--	--	--
Propylene		3	--	8.013	0.110	0.000011	10	--	--	--
Styrene		0.092	--	0.130	0.071	0.000008	10	--	--	--
Tetrachloroethylene		0.36	0.038462	1.077	0.072	0.000008	10	--	--	--
Tetrahydrofuran		2	--	0.003	0.099	0.000011	10	--	--	--
trans-1,2-Dichloroethene		--	--	0.277	0.071	0.000012	10	--	--	--
trans-1,3-Dichloropropene		0.02	0.002500	0.053	0.087	0.000010	10	--	--	--
Trichloroethylene		0.04	0.002439	0.477	0.079	0.000009	10	--	--	--
Trichlorofluoromethane		1.05	--	5.200	0.087	0.000010	10	--	--	--
Vinyl acetate		0.2	--	0.024	0.085	0.000009	10	--	--	--
Vinyl bromide		0.003	--	0.260	0.100	0.000012	10	--	--	--
Vinyl chloride		0.1	0.002273	3.236	0.106	0.000012	10	--	--	--
Hydrogen Sulfide		0.002	--	0.350	0.188	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). 2024. Alberta Tier 1 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). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines.

Table 9: Building Properties for Evaluation of Vapour Transport

Parameter		Units	Residential/Parkland Land Use
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	2.70E+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). 2024. Alberta Tier 1 Soil and Groundwater Remediation Guidelines.

Table 10: Generic Soil Vapour Criteria

Parameter	Residential/Parkland			
	Units	Coarse-Grained	Units	Coarse-Grained
Benzene	mg/m^3	0.041	µg/m^3	41.0
Toluene		75.2		75,190
Ethylbenzene		68.7		68,650
Xylenes		3.52		3,520
PHC F1		867		867,380
PHC F2		52.5		52,500
Naphthalene		0.38		1,694,000
1,1,1-Trichloroethane		1,694		1,693,510
1,1,2,2-Tetrachloroethane		0.011		11.2
1,1,2-Trichloroethane		0.0070		7.00
1,1-Dichloroethane		0.43		430
1,1-Dichloroethene		6.47		6,470
1,2,4-Trichlorobenzene		0.36		365
1,2,4-Trimethylbenzene		2.23		2,235
1,2-Dibromoethane		0.0022		2.16
1,2-Dichlorobenzene		7.07		7,072
1,2-Dichloroethane		0.020		23.9
1,2-Dichloroethene (cis)		0.24		242
1,2-Dichloroethene (trans)		1.40		1,400
1,2-Dichloropropane		0.14		135
1,3,5-Trimethylbenzene		2.23		2,235
1,3-Butadiene		0.020		17.3
1,3-Dichlorobenzene		0.060		64.3
1,3-Dichloropropene [cis]		0.16		163
1,3-Dichloropropene [trans]		0.15		149
1,4-Dichlorobenzene		0.064		64.0
1,4-Dioxane		0.11		105
1-Methyl-4 ethyl benzene		14.5		14,461
2-Butanone (MEK)		167		167,364
2-Hexanone (MBK)		1.05		1,053
4-Methyl-2-pentanone (MIBK)		103		102,977
Acetone		919		918,788
Allyl chloride		0.030		32.0
Benzyl chloride		0.030		34.3
Bromodichloromethane		0.030		28.3
Bromoform		1.49		1,494
Bromomethane		0.17		173
Carbon disulfide		21.7		21,713
Carbon tetrachloride		0.11		113
Chlorobenzene		0.35		347
Chloroethane		124		124,080
Chloroform		0.030		27.0
Chloromethane		2.66		2,657
Cyclohexane		202		201,510
Dibromochloromethane		6.07		6,070
Dichlorodifluoromethane		3.58		3,584
Ethyl acetate		2.51		2,509
Freon 113		231		230,627
Freon 114		566		566,335
Heptane		14.5		14,461
Hexachlorobutadiene		0.050		50.7
Hexane		18.8		18,839
Isooctane		14.9		14,917
iso-Propylbenzene (cumene)		14.5		14,461
Isopropanol		6.22		6,219
Methyl t-Butyl Ether (MTBE)		1.15		1,153
Methylene Chloride		18.8		18,764
Propylene		91.7		91,723
Styrene		3.22		3,220
Tetrachloroethene		1.39		1,390
Tetrahydrofuran		62.8		62,828
Trichloroethene		0.070		70.0
Trichlorofluoromethane		34.3		34,325
Vinyl acetate		6.59		6,586
Vinyl bromide (bromoethene)		0.040		40.0
Vinyl chloride		0.070		70.0

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). 2024. 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). 2024. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 11: Soil Vapour Risk Evaluation

Parameter	Unit	Soil Vapour Screening Criteria [a]	Soil Vapour Results (µg/m³)													Comparisons of Soil Vapour Measurements to Soil Vapour Criteria											
																Estimated Cancer Risk [b]											
			VW-01	VW-01	VW-01	24VW-01	24VW-01	VW-02	VW-02	VW-02	VW-03	VW-04	VW-04	25VW-04	25VW-04	VW-01	VW-01	VW-01	24VW-01	24VW-01	VW-02	VW-02	VW-02	VW-03	VW-04	VW-04	25VW-04	25VW-04
			2-Aug-13	5-Dec-19	23-Nov-21	3-Dec-24	3-Dec-25	3-Aug-13	5-Dec-19	3-Dec-25	2-Aug-13	23-Nov-21	9-Dec-22	26-Feb-25	3-Dec-25	2-Aug-13	5-Dec-19	23-Nov-21	3-Dec-24	3-Dec-25	3-Aug-13	5-Dec-19	3-Dec-25	2-Aug-13	23-Nov-21	9-Dec-22	26-Feb-25	3-Dec-25
Benzene	µg/m³	41	<54.6*	<16	<15	96.8	<119	16.5	1.4	2.17	2.51	20	<65.5	28.8	4.19	ND	ND	ND	**2.4E-05**	ND	4.0E-06	3.4E-07	5.3E-07	6.1E-07	4.9E-06	ND	7.0E-06	1.0E-06
Toluene	µg/m³	75,190	<304	<19	<36	66.3	<140	18.1	1.31	7.09	14.8	<36	<21.9	4.07	14.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/m³	68,650	<119	<22	<42	4.69	<162	3.24	<0.87	1.69	3.98	<42	<21	50.4	2.47	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes	µg/m³	3520	<429	<48	<96	17.9	<484	13.5	<2.0	9.2	23.1	<96	113	493	13	-	-	-	-	-	-	-	-	-	-	-	-	-
F1 (C_6-C_{10})	µg/m³	867,383	142,020	62,900	63,900	37,200	354,000	3,946	1,720	454	147.7	4,980	404,000	44,600	417	-	-	-	-	-	-	-	-	-	-	-	-	-
F2 (C_{10}-C_{16})	µg/m³	52,495	1,384	19,300	67,500	15,500	18,700	531.9	380	26	367.6	<720	303	10,700	22	-	-	-	-	-	-	-	-	-	-	-	-	-
Aliphatics (C_6-C_8)	µg/m³	740,737	88,300	56,400	-	25,800	298,000	2,990	1,300	280	34.4	-	447,000	24,800	297	-	-	-	-	-	-	-	-	-	-	-	-	-
Aliphatics (>C_8-C_{10})	µg/m³	40,257	<480	21,500	-	14,300	74,300	577	728	158	73.1	-	931	24200	107	-	-	-	-	-	-	-	-	-	-	-	-	-
Aliphatics (>C_{10}-C_{12})	µg/m³	40,257	664	9,920	-	10,700	13,900	345	179	<15	202	-	135	7,030	<15	-	-	-	-	-	-	-	-	-	-	-	-	-
Aliphatics (>C_{12}-C_{16})	µg/m³	40,257	<480	880	-	<710	<5,430	106	<30	<30	105	-	<30	202	<30	-	-	-	-	-	-	-	-	-	-	-	-	-
Aromatics (C_6-C_8)	µg/m³	740,737	-	-	-	<721	<5,520	-	-	<15	-	-	2,340	137	<15	-	-	-	-	-	-	-	-	-	-	-	-	-
Aromatics (>C_8-C_{10})	µg/m³	805	<480	<390	-	<721	<5,520	44.8	<15	<15	30.9	-	189	1,760	<15	-	-	-	-	-	-	-	-	-	-	-	-	-
Aromatics (>C_{10}-C_{12})	µg/m³	8,051	<480	490	-	1,080	<5,520	78.4	<15	<15	58.1	-	41	1,090	<15	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/m³	3,220	181	<21	<41	1.7	<317	<0.852	<0.85	<0.85	1.57	<41	<41.2	<4.60	<0.89	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/m³	380	-	<66	<50	4.46	<195	-	<2.6	<0.52	-	<50	<25.3	6.24	<0.52	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/m³	2,235	<233	<25	<47	4.00	<365	11.3	<0.98	2.3	13.5	<47	<47.5	102	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/m³	217 / 24[e]	<76.9*	45	<39*	11.4	<301	<0.809	<0.81	<0.81	<0.809	<39*	<39.1	6.48	<0.85	ND	**1.9E-05**	ND	4.8E-06	ND	ND	ND	ND	ND	ND	ND	2.7E-06	ND
1,2-Dichloroethene (cis)	µg/m³	242	486	34	<38	9.32	<295	52.3	<0.79	<0.79	1.68	<38	50	<4.28	<0.83	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (trans)	µg/m³	1,400	118	24	<38	2.78	<295	<0.793	<0.79	<0.79	<0.793	<38	50	4.76	<0.83	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorotetrafluoroethane	µg/m³	566,335	<113	65	<67	2.00	<519	240	7.60	<1.4	4.07	230	669	58.0	<5,240	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/m³	2,235	<233	172	129	146	<365	19.9	<0.98	<1.0	<9.29	<47	<47.5	436	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/m³	3,359 / 64[e]	<228*	<30	<58	<1.4	<447	<2.40	<1.2	<1.2	<2.40	<58	<58.1	12.6	<1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.0E-06	ND
1-Methyl-4 ethyl benzene	µg/m³	14,461	<1,030	<25	<47	3.10	<365	<10.8	<0.98	<1.0	<10.8	<47	<47.5	61.9	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (MEK)	µg/m³	167,364	<841	<15	<28	<10.3	<219	<8.85	0.74	0.62	17.2	<28	245	<3.18	<0.62	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/m³	918,788	<181	<460	<57	21.1	<884	86.7	9.0	6.9	42.9	<57	323	<12.8	<11.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/m³	28	<127*	<34*	<64*	4.00	<498	<1.34	<1.3	<1.3	<1.34	<64*	<64.7*	<7.2	<1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/m³	21,713	<148	<16	<30	<1.8	<579	126	2.75	<1.6	9.99	<30	<75.4	<8.4	<1.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/m³	124,080	<75.2	<13	<25	<0.61	<196	<0.792	<0.53	<0.53	<0.792	<25	<25.5	<2.85	<11.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	µg/m³	2,657	<58.9	<10	<20	1.98	<153	<0.620	1.1	<0.89	2.12	<20	<19.9	<2.23	<25.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/m³	201,510	16,900	6,700	2,890	1,750	23,700	753	45	17.9	1.19	1,180	699	2,510	1.48	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/m³	3,584	<285	31	<48	4.40	<367	1,720	47.8	7.1	7.92	555	3,920	142	8,310	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptane	µg/m³	14,461	8,060	4,210	691	939	10,400	740	16.5	15.3	2.39	<39	672	1,460	2.25	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexane	µg/m³	18,839	62,700	11,700	3,000	3,980	32,800	501	79.8	29.1	<4.65	562	3,980	1,190	79.7	-	-	-	-	-	-	-	-	-	-	-	-	-
Isooctane	µg/m³	14,917	<88.8	1,050	382	155	1,890	<0.934	4.45	2.5	2.99	115	58.9	282	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-
iso-Propylbenzene (cumene)	µg/m³	14,461	-	<25	<47	2.30	<365	-	<0.98	<1.0	-	<47	<47.5	10.8	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Propene	µg/m³	91,723	639	676	146	63.5	<232	<14.9	<0.34	<2.72	<6.69	81	1,010	<23.1	<978	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/m³	1,392 / 2,679[e]	<129	<34	<65	<1.6	<504	1,500	252	26.6	<1.36	<65	<65.5	<7.3	2.3	ND	ND	ND	ND	ND	5.6E-06	9.4E-07	9.9E-08	ND	ND	ND	ND	8.6E-09
Tetrahydrofuran	µg/m³	62,828	<112	<15	<28	1.18	<219	<1.18	<0.59	<0.59	15.2	<28	1,800	<3.18	<0.62	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/m³	67 / 153[e]	<153*	<27	<52	1.80	<399	440	7.6	27.1	7.08	<52	<51.9	<5.8	111	ND	ND	ND	1.2E-07	ND	**2.9E-05**	5.0E-07	1.8E-06	4.6E-07	ND	ND	ND	7.3E-06
Trichlorofluoromethane	µg/m³	34,325	<107	<28	<54	<1.3	<417	284	60.2	8.6	2.35	<54	<54.3	<6.1	<3.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	µg/m³	6,586	<66.9	<44	260	<422	<1,960	<0.704	<1.8	<1.8	<0.704	<85	<268	<79.2	<104	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/m³	3,086 / 70[e]	1,330	926	62	256	1,390	1.29	3.98	<0.51	<0.460	<25	1,130	<2.76	<93.5	**1.9E-04**	**1.3E-04**	8.9E-06	**3.7E-05**	**2.0E-04**	1.8E-07	5.7E-07	ND	ND	ND	**1.6E-04**	ND	ND
Cumulative Risk and Hazard Index [d]																**1.9E-04**	**1.5E-04**	8.9E-06	**6.5E-05**	**2.0E-04**	**3.9E-05**	2.3E-06	2.4E-06	1.1E-06	4.9E-06	**1.6E-04**	**1.2E-05**	8.3E-06
Target Risk and Hazard Levels																**1.0 x 10^{-5}**											

Notes:

< – not detected. Listed value is the corresponding detection limit.
- = screening criteria not calculated as appropriate toxicity data not available.
Bold = identifies estimated risks and hazards that exceed the target risk level of 1 x 10^{-5}, individual hazards of 0.2, and/or target hazard level of 1.

[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]												
			VW-01	VW-01	VW-01	24VW-01	24VW-01	VW-02	VW-02	VW-02	VW-03	VW-04	VW-04	25VW-04	25VW-04
			2-Aug-13	5-Dec-19	23-Nov-21	3-Dec-24	3-Dec-25	3-Aug-13	5-Dec-19	3-Dec-25	2-Aug-13	23-Nov-21	9-Dec-22	26-Feb-25	3-Dec-25
Benzene	µg/m^3	41	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/m^3	75,190	ND	ND	ND	8.8E-04	ND	2.4E-04	1.7E-05	9.4E-05	2.0E-04	ND	ND	5.4E-05	2.0E-04
Ethylbenzene	µg/m^3	68,650	ND	ND	ND	6.8E-05	ND	4.7E-05	ND	2.5E-05	5.8E-05	ND	ND	7.3E-04	3.6E-05
Xylenes	µg/m^3	3520	ND	ND	ND	0.01	ND	3.8E-03	ND	2.6E-03	6.6E-03	ND	0.03	0.14	3.7E-03
F1 (C_6-C_{10})	µg/m^3	867,383	0.164	0.073	0.074	0.043	**0.41**	4.5E-03	2.0E-03	5.2E-04	1.7E-04	5.7E-03	**0.47**	0.051	4.8E-04
F2 (C_{10}-C_{16})	µg/m^3	52,495	0.026	**0.37**	**1.3**	ND	**0.36**	0.010	7.2E-03	5.0E-04	7.0E-03	ND	0.01	0.20	4.2E-04
Aliphatics (C_6-C_8)	µg/m^3	740,737	0.12	0.076	ND	0.035	**0.40**	4.0E-03	1.8E-03	3.8E-04	4.6E-05	ND	**0.60**	0.033	4.0E-04
Aliphatics (>C_8-C_{10})	µg/m^3	40,257	ND	**0.53**	ND	**0.36**	**1.85**	0.014	0.018	3.9E-03	1.8E-03	ND	0.02	**0.60**	2.7E-03
Aliphatics (>C_{10}-C_{12})	µg/m^3	40,257	0.016	**0.25**	ND	**0.27**	**0.35**	8.6E-03	4.4E-03	ND	5.0E-03	ND	0.003	0.17	ND
Aliphatics (>C_{12}-C_{16})	µg/m^3	40,257	ND	0.022	ND	ND	ND	2.6E-03	ND	ND	2.6E-03	ND	ND	5.0E-03	ND
Aromatics (C_6-C_8)	µg/m^3	740,737	-	ND	ND	ND	ND	-	ND	ND	-	ND	3.2E-03	1.8E-04	ND
Aromatics (>C_8-C_{10})	µg/m^3	805	ND	ND	ND	ND	ND	0.056	ND	ND	0.038	ND	**0.23**	**2.2**	ND
Aromatics (>C_{10}-C_{12})	µg/m^3	8,051	ND	0.061	ND	0.13	ND	9.7E-03	ND	ND	7.2E-03	ND	5.1E-03	0.14	ND
Styrene	µg/m^3	3,220	0.056	ND	ND	ND	ND	ND	ND	ND	4.9E-04	ND	ND	ND	ND
Naphthalene	µg/m^3	380	ND	ND	ND	0.012	ND	-	ND	ND	-	ND	ND	0.016	ND
1,2,4-Trimethylbenzene	µg/m^3	2,235	ND	ND	ND	1.8E-03	ND	5.1E-03	ND	1.0E-03	6.0E-03	ND	ND	0.046	1.1E-03
1,2-Dichloroethane	µg/m^3	217 / 24[e]	ND	**0.21**	ND	0.053	ND	ND	ND	ND	ND	ND	ND	0.030	ND
1,2-Dichloroethene (cis)	µg/m^3	242	**2.0**	0.14	ND	0.039	ND	**0.22**	ND	ND	6.9E-03	ND	**0.21**	ND	ND
1,2-Dichloroethene (trans)	µg/m^3	1,400	0.084	0.017	ND	2.0E-03	ND	ND	ND	ND	ND	ND	0.036	3.4E-03	ND
1,2-Dichlorotetrafluoroethane	µg/m^3	566,335	ND	1.1E-04	ND	3.5E-06	ND	4.2E-04	1.3E-05	ND	7.2E-06	4.1E-04	1.2E-03	1.0E-04	ND
1,3,5-Trimethylbenzene	µg/m^3	2,235	ND	0.077	0.058	0.065	ND	8.9E-03	ND	ND	ND	ND	ND	0.20	ND
1,4-Dichlorobenzene	µg/m^3	3,359 / 64[e]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methyl-4 ethyl benzene	µg/m^3	14,461	ND	ND	ND	2.1E-04	ND	ND	ND	ND	ND	ND	ND	4.3E-03	ND
2-Butanone (MEK)	µg/m^3	167,364	ND	ND	ND	ND	ND	ND	4.4E-06	3.7E-06	1.0E-04	ND	1.5E-03	ND	ND
Acetone	µg/m^3	918,788	ND	ND	ND	2.3E-05	ND	9.4E-05	9.8E-06	7.5E-06	4.7E-05	ND	3.5E-04	ND	ND
Bromodichloromethane	µg/m^3	28	ND	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	µg/m^3	21,713	ND	ND	ND	ND	ND	5.8E-03	1.3E-04	ND	4.6E-04	ND	ND	ND	ND
Chloroethane	µg/m^3	124,080	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	µg/m^3	2,657	ND	ND	ND	7.5E-04	ND	ND	4.1E-04	ND	8.0E-04	ND	ND	ND	ND
Cyclohexane	µg/m^3	201,510	0.084	0.033	1.4E-02	8.7E-03	**0.12**	3.7E-03	2.2E-04	8.9E-05	5.9E-06	5.9E-03	3.5E-03	0.012	7.3E-06
Dichlorodifluoromethane	µg/m^3	3,584	ND	8.6E-03	ND	1.2E-03	ND	**0.48**	0.013	2.0E-03	2.2E-03	0.15	**1.1**	0.040	**2.32**
Heptane	µg/m^3	14,461	**0.56**	**0.29**	4.8E-02	0.065	**0.72**	0.051	1.1E-03	1.1E-03	1.7E-04	ND	0.05	0.10	1.6E-04
Hexane	µg/m^3	18,839	**3.3**	**0.62**	0.16	**0.21**	**1.74**	0.027	4.2E-03	1.5E-03	ND	3.0E-02	**0.21**	0.063	4.2E-03
Isooctane	µg/m^3	14,917	ND	0.070	0.026	0.010	**0.13**	ND	3.0E-04	1.7E-04	2.0E-04	7.7E-03	3.9E-03	0.019	3.8E-04
iso-Propylbenzene (cumene)	µg/m^3	14,461	-	ND	ND	1.6E-04	ND	-	ND	ND	-	ND	ND	7.5E-04	ND
Propene	µg/m^3	91,723	0.007	7.4E-03	1.6E-03	6.9E-04	ND	ND	ND	ND	ND	8.8E-04	0.01	ND	ND
Tetrachloroethene	µg/m^3	1,392 / 2,679[e]	ND	ND	ND	ND	ND	**1.1**	0.18	0.02	ND	ND	ND	ND	0.002
Tetrahydrofuran	µg/m^3	62,828	ND	ND	ND	1.9E-05	ND	ND	ND	ND	2.4E-04	ND	0.03	ND	ND
Trichloroethene	µg/m^3	67 / 153[e]	ND	ND	ND	0.03	ND	**6.6**	0.11	**0.40**	0.11	ND	ND	ND	**1.66**
Trichlorofluoromethane	µg/m^3	34,325	ND	ND	ND	ND	ND	8.3E-03	1.8E-03	2.5E-04	6.8E-05	ND	ND	ND	ND
Vinyl acetate	µg/m^3	6,586	ND	ND	0.039	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µg/m^3	3,086 / 70[e]	**0.43**	**0.30**	0.020	8.3E-02	4.5E-01	4.2E-04	1.3E-03	ND	ND	ND	**0.37**	ND	ND
			6.7	**2.2**	**1.7**	**0.8**	**3.9**	**8.5**	**0.3**	**0.4**	**0.1**	**0.2**	**2.5**	**0.9**	**4.0**
									1.00						

Notes:

< – not detected. Listed value is the corresponding detection limit.
- = screening criteria not calculated as appropriate toxicity data not available.
Bold = identifies estimated risks and hazards that exceed the target risk level of 1 x 10^{-5}, individual hazards of 0.2, and/or target hazard level of 1.

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

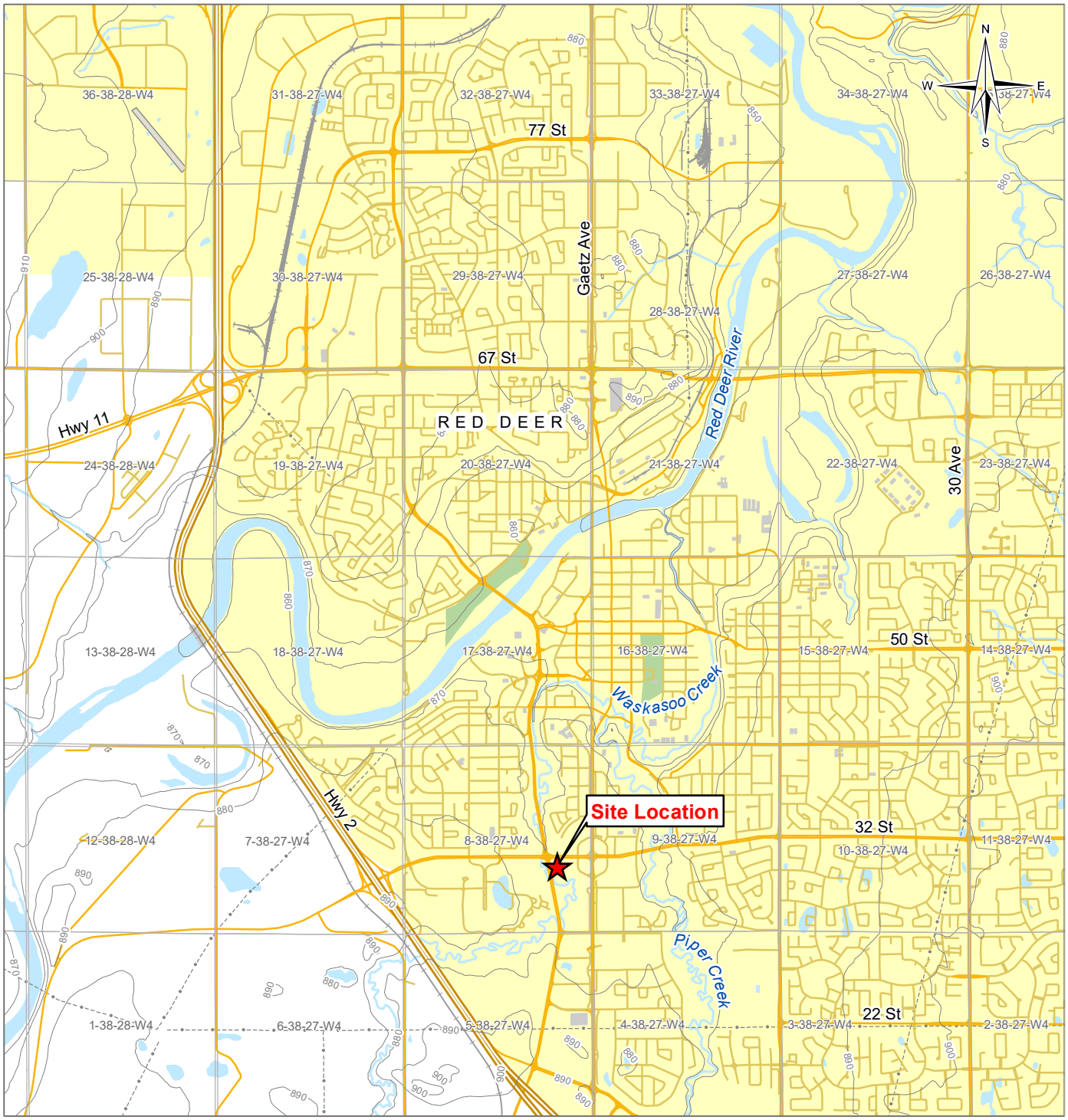
[b] Estimated cancer risk = (soil vapour concentration/ cancer soil vapour screening level) x 10^{-5}.

[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
- Residential Area
- Contour (10 m)
- Watercourse
- Waterbody
- Urban Area

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

2025 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT RED DEER MOTORS

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_Fig01_SiteLocation.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-EDM	DS	SL	CW	0

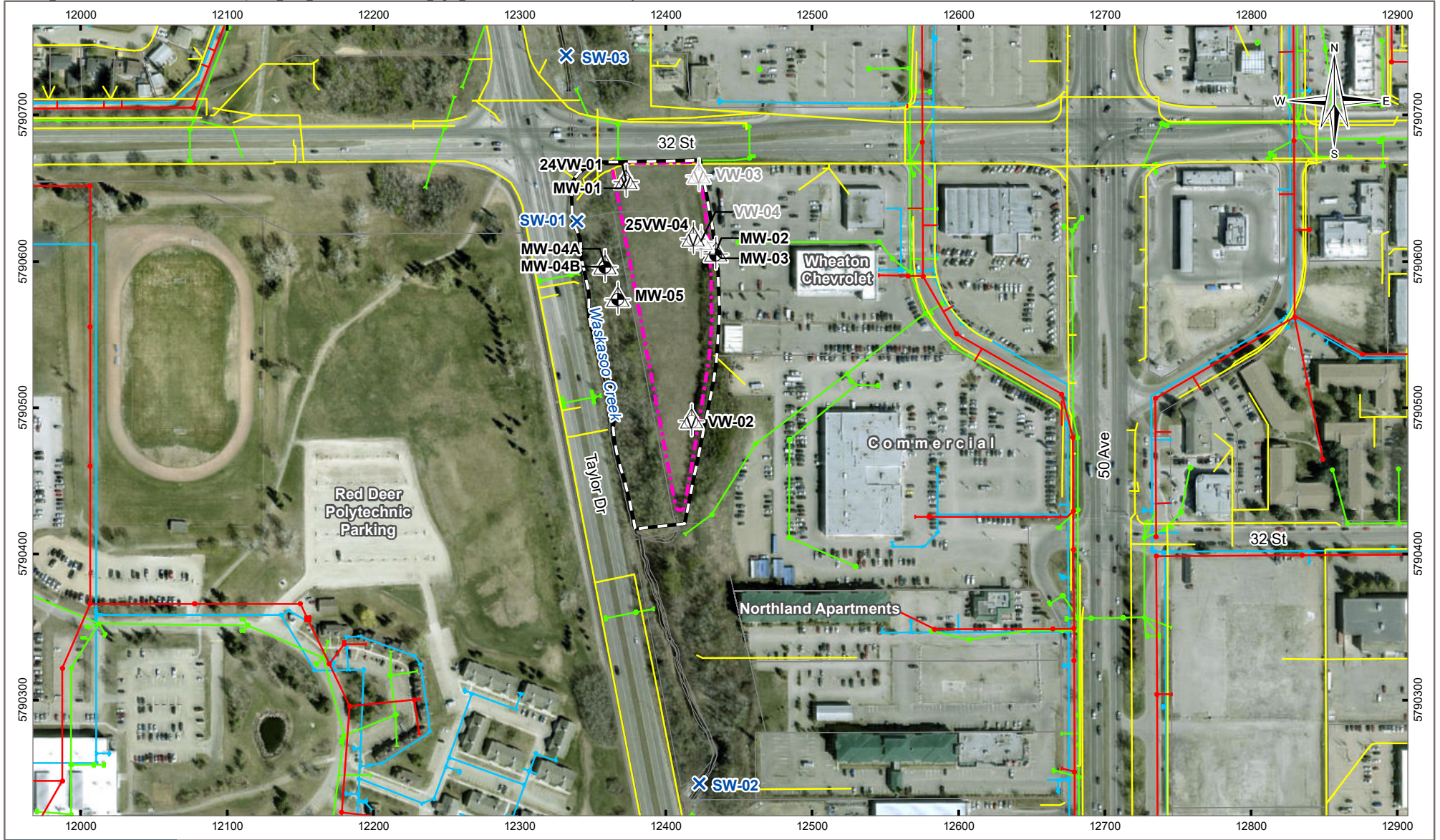
DATE January 13, 2026
PROJECT NO. SWM.SWOP04071-05.004

TETRA TECH

Figure 1

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\004_RDM_SoilGW\SWOP04071-05_Fig01_SiteLocation.mxd modified 1/13/2026 by DARREN.SCHOULS

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\004_RDM_SoilGW\SWOP04071-05_Fig02_LandUse.mxd modified 1/13/2026 by DARREN.SCHOULS



LEGEND

- Monitoring Well
- Vapour Well - Faded symbol indicates a destroyed well
- Surface Water
- 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)
Roads from City of Red Deer Open Data, 2018
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.
VW-03 was not located.

Scale: 1:3,700

50 25 0 50

Metres

PROJECTION	DATUM
3TM 114	NAD83

FILE NO. SWOP04071-05_Fig02_LandUse.mxd

CLIENT: The City of Red Deer

TETRA TECH

2025 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT RED DEER MOTORS

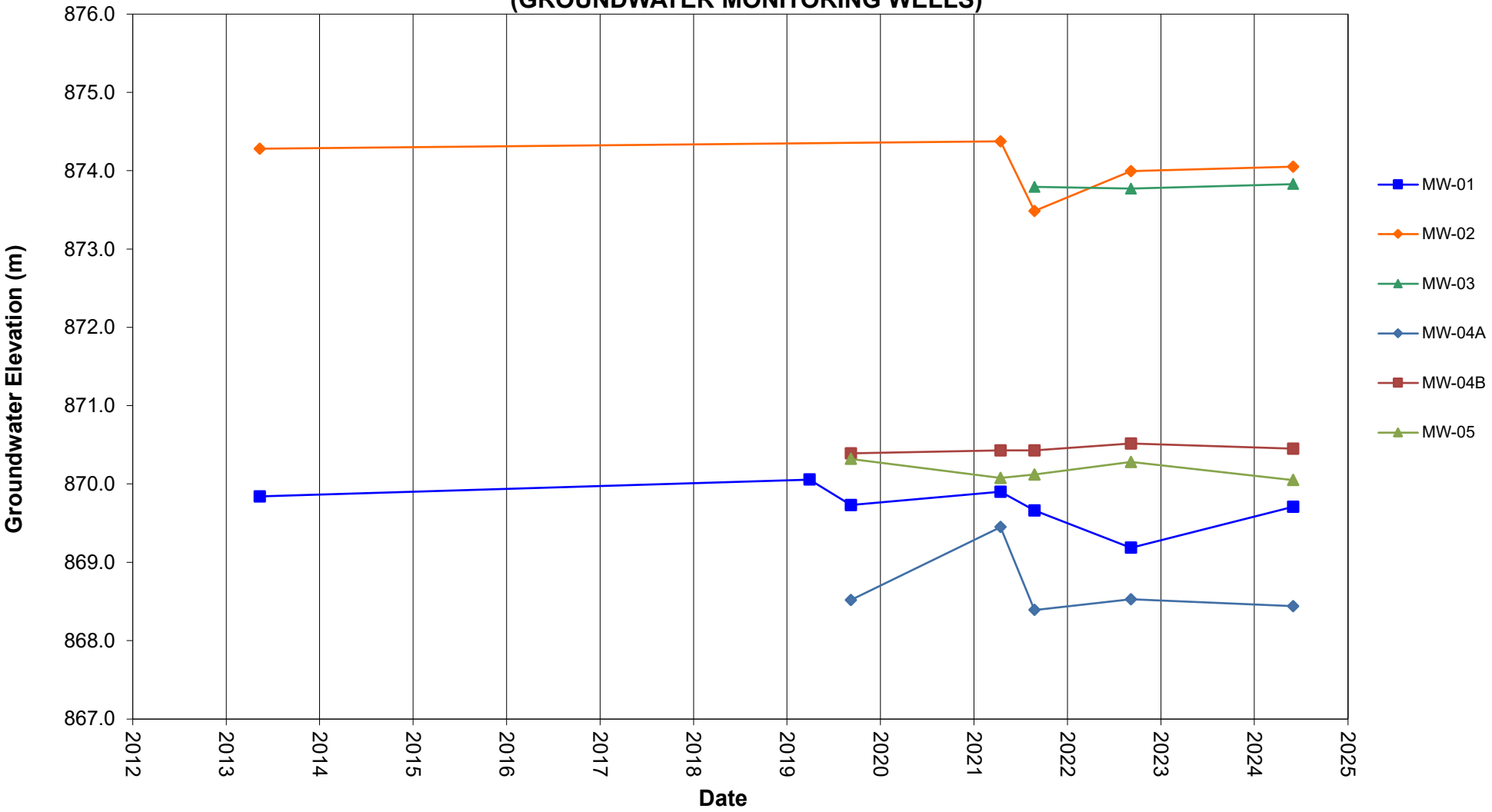
Site Plan and Surrounding Land Use

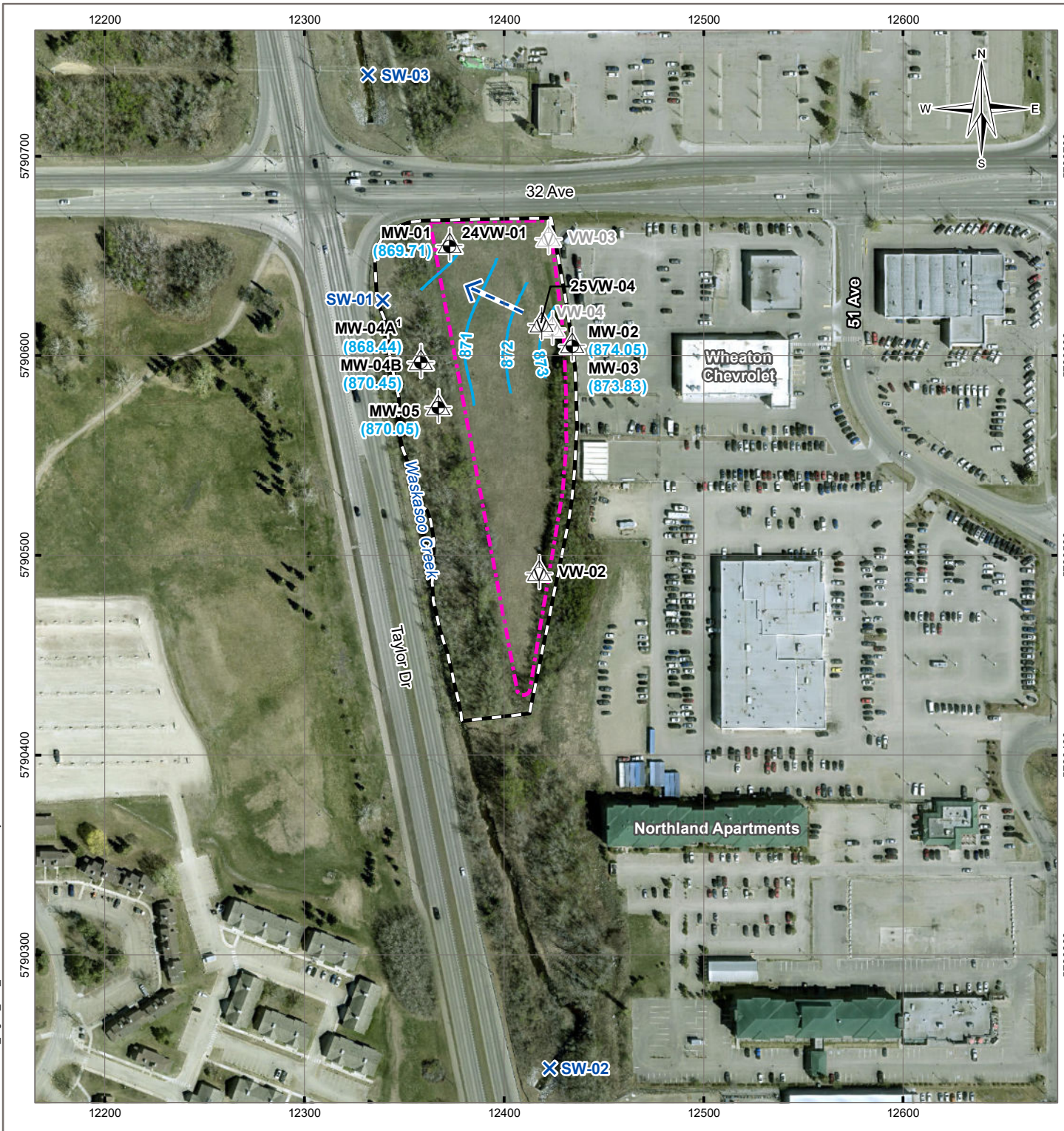
OFFICE	DWN	CKD	APVD	REV
Tt-EDM	DS	SL	CW	0

DATE	PROJECT NO.
January 13, 2026	SWM.SWOP04071-05.004

Figure 2

FIGURE 3
HISTORICAL GROUNDWATER ELEVATIONS
(GROUNDWATER MONITORING WELLS)





LEGEND

- Monitoring Well
- Vapour Well - Faded symbol indicates a destroyed well
- Surface Water
- (8XX.XX) Groundwater Elevation (masl)
- Groundwater Elevation Contour (1 masl)
- Inferred Groundwater Flow Direction
- Site Boundary
- Historic Waste Disposal (Provided by Tiamat, 2014)

NOTES

Base data source: Imagery provided by ESRI; Red Deer County (2024)
Roads from City of Red Deer Open Data, 2018
VW-03 was not located
masl - metres above sea level
[1] Well excluded from groundwater contouring

2025 GROUNDWATER AND SOIL VAPOUR MONITORING REPORT RED DEER MOTORS

Groundwater Elevations September 2024

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

Scale: 1:2,800
50 25 0 50
Metres

TETRA TECH

FILE NO.				
SWOP04071-05_Fig04_GW_2024.mxd				
OFFICE	**DWN**	**CKD**	**APVD**	**REV**
Tt-EDM	DS	SL	CW	0
DATE	**PROJECT NO.**			
January 13, 2026	SWM.SWOP04071-05.004			

Figure 4

G:\SOLID_WASTE\SWOP\SWOP04071-05\GIS\Maps\004_RDM_SoilGW\SWOP04071-05_Fig04_GW_2024.mxd modified 1/13/2026 by DARREN.SCHOULS

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").

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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

SITE HISTORY, HISTORICAL INFORMATION, SITE SETTING, CONCEPTUAL SITE MODEL, AND REVIEW OF 2014 RISK MANAGEMENT PLAN

1.0 SITE HISTORY

The following section summarizes the history of the site and was developed for the 2019 groundwater and soil vapour monitoring report[1].

Municipal records indicate that waste disposal at the site occurred between approximately 1967 and 1968. This indicates that the estimated age of the waste material would be approximately 55 years old. Records indicate the waste as being municipal solid waste (MSW) consisting of plastics, cans, paper, metal, wire, glass, and rubber. Some construction debris was also identified in areas consisting of bricks, wood, and concrete. The former landfill is listed as inactive and closed.

Historical waste disposal was identified during the Phase II environmental site assessment[2] (ESA) throughout the entire site up to 32 Street at the north end. Estimated waste areas are identified on Figure 2. The Phase II ESA estimated the total area of buried waste at approximately 9,600 m^2 on-site and approximately 1,580 m^2 off-site (south of the 32 Street roadway).

Results of the Phase II ESA conducted by Tiamat Environmental Consultants Ltd. (Tiamat) indicated a thin surficial layer of sod, sand, and loam was overlying a sand and clay fill. The fill ranged from 3.0 m to 4.6 m deep in the areas of the site without MSW. Within the waste footprint, MSW was observed beneath the sod and loam layer to a depth of up to 4.6 m. The testholes along the east boundary of site had large amounts of MSW waste up to 3 m deep. MSW was overlying native clay. The investigation was conducted to depths of up to 7.6 m and bedrock was not encountered at any locations[2].

The Red Deer College historical landfill is situated west of the site, immediately west of Taylor Drive.

2.0 HISTORICAL GROUNDWATER MONITORING AND INVESTIGATION SUMMARY

The following section provides the historical environmental monitoring results for the site.

Previous reports prepared by Tiamat for the site include:

- Phase I Environmental Site Assessment, Historic Waste Disposal Site, Red Deer Motors, The City of Red Deer. September 24, 2013[3].
- Phase II Environmental Site Assessment, Historic Waste Disposal Site, Red Deer Motors, The City of Red Deer. February 26, 2014[2].
- Environmental Risk Management Plan, Historic Waste Disposal Sites, Red Deer College & Red Deer Motors, The City of Red Deer. November 27, 2014[4].

[1] Tetra Tech Canada Inc. 2019 Groundwater and Soil Vapour Monitoring Report – Red Deer Motors. Prepared for The City of Red Deer. October 2020. Project Number: 704-SWM.SWOP04071-01.006.

[2] Tiamat Environmental Consultants Ltd. 2014a. Phase II Environmental Site Assessment, Historic Waste Disposal Site, Red Deer Motors, The City of Red Deer. February 26, 2014.

[3] Tiamat Environmental Consultants Ltd. 2013. Phase I Environmental Site Assessment, Historic Waste Disposal Site, Red Deer Motors, The City of Red Deer. September 24, 2013.

[4] Tiamat Environmental Consultants Ltd. 2014b. Environmental Risk Management Plan, Historic Waste Disposal Sites, Red Deer College & Red Deer Motors, The City of Red Deer. November 27, 2014.

The Phase I ESA[3] indicated that a sanitary waste permit existed for the site and environmental concerns could include the following listed below. The status of the permit is unknown and it was not reviewed.

- Generation of leachate from infiltration and percolation of precipitation into the first water-bearing zone.
- Generation of landfill gas (LFG), which may contain methane and other volatile organic compounds (VOCs) with the decomposition of the biomass materials and petroleum derived products.
- Differential ground settlement as waste material decomposes and consolidates.

Six testholes (TH-03, TH-05, TH-06, TH-07, TH-08, and TH-09) were advanced in 2013 as part of the Phase II ESA, and three vapour wells (VW-01 to VW-03) and three monitoring wells (MW-01 to MW-03) were installed. Tiamat noted that three previously installed by Alberta Environmental Protection[5] monitoring wells were on the west boundary of the site prior to conducting the Phase II ESA. No information regarding the Alberta Environmental Protection wells was included in the Phase I ESA or Phase II ESA for the site, and borehole logs were not available for review. These wells are identified as MW-04A, MW-04B, and MW-05.

The results of the Phase II ESA[2] indicated the following:

- Waste material on site is located on native sand or clay till.
- In 2013, the average groundwater depth was 4.2 m, which is situated within the waste material. The estimated horizontal hydraulic gradient was 2% to the northwest. Tiamat presented an estimated horizontal groundwater flow velocity of 4.7 m/year; however, it is unclear whether these calculations were for the adjacent Red Deer College site or for the subject site.
- VOCs and other petroleum hydrocarbons (PHCs) had detectable concentrations in 2013 at the monitoring wells at the down-gradient end of the site. These parameters were indicative of leachate. The leachate was characterized showing negative redox potentials and near anoxic conditions for dissolved oxygen.
- Several commercial businesses and residential developments are nearby the Red Deer Motors site.
- Differential settlement of cap material had occurred at the site. No activities located on adjacent lands were interpreted to be contributing environmental concerns.
- Light petroleum gases were detected at vapour wells on site and PHCs were detected at the northwest portion of site.
- The vapour wells detected volatile PHCs to carbon chain 12 and semi-volatile, oxygenated, and halogenated volatile hydrocarbons and ketones were detected in the soil vapour samples.

The recommendations of the program were as follows:

- Monitor groundwater elevations and soil vapour data bi-annually for one hydrogeological cycle.
- Determine if surface water sampling should be included with groundwater sampling to determine exposure from leachate contaminants in Waskasoo Creek.
- 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.

[5] Currently Alberta Environment and Protected Areas (AEPA).

- Develop a risk management plan (RMP) to consider future land uses and address environmental concerns.
- Review all data to update the RMP with new information.

The RMP conducted by Tiamat in 2014 stated:

"the outcome of the RMP confirm the identified chemicals of concern and relevant risk are manageable to facilitate future developments which may lie within the regulated setback distance to the historic waste disposal site"[4].

The following recommendations were made:

- Information in the preliminary quantitative risk assessment (PQRA) should be updated as new site information is obtained.
- A review of the RMP should be completed when the PQRA information is updated, if there are changes to the chemicals of potential concern (COPCs).
- The RMP should be reviewed and updated at five-year intervals.

2.1 2021 Vapour Well Installation

On May 4, 2021, a new vapour well (VW-04) was installed using a tracked drill rig and solid stem augers along the east site boundary near monitoring wells MW-02 and MW-03 to monitor LFG vapour along the east site boundary. While drilling the vapour well, waste was encountered 1 m below ground (mbg). The vapour well was installed with 19 mm diameter polyvinyl chloride (PVC) pipe to a depth of 4.0 mbg and screened with 19 mm slotted PVC pipe from 2.5 mbg to 4.0 mbg. Free water was not observed in the borehole during the installation of the vapour well; materials were noted as dry to a depth of 3.0 mbg and damp between 3.0 mbg and 4.0 mbg. This well was reinstalled in 2022 as described in the main report.

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 City of Red Deer (The City) and the site are located within the Red Deer River drainage basin with principal drainage via the Red Deer River located northwest of the site. The river has incised the uplands with gentle slopes to the east and west of the river, south of the site, aligned with Waskasoo Creek. The geology in the river valley is characterized by fluvial surficial sediments deposited by the Red Deer River, overlying shale and sandstone bedrock of the Paskapoo Formation. Key elements of the geological setting are presented below from Tiamat's 2013 Phase I ESA report[3]:

"The fertile black soil in the region (Penhold Loam) is of alluvial lacustrine origin. The Penhold Loam is a well-drained fine sandy loam classified as Chernozemic. It is generally stone free and in natural areas, is typically 1.5 m thick, more or less.

The Quaternary deposits consist of drift deposits of clay, silt, gravel and sand.

The Tertiary bedrock consists of sequences of alternating shales and sandstones of the Paskapoo Formation. This non-marine bedrock is composed of mudstone, siltstone and sandstone."

3.1.2 Local Geology

Based on borehole logs from the Phase II ESA conducted by Tiamat, the site is underlain by sand, loam and clay fill, underlain by clay till and/or native sands. Within the waste footprint, waste was encountered immediately below surface and was mixed with sand fill material. Fill material extended to maximum depths of approximately 7.6 m below grade and waste was identified to a maximum depth of approximately 4.3 m below grade. Bedrock was not encountered during the Phase II ESA.

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 buried channel 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[3]:

"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."

There are two significant buried valleys and aquifer resources beneath the city, Mapping by the Alberta Geological Survey[6] indicates that a north-northeast trending valley is situated east of the site, and a northeast trending valley (which connects to the first) is situated south of the site. The valleys could influence the geology and hydrogeology beneath the site, however the width of the valleys are not defined.

Waskasoo Creek is the primary surface water feature near the site. The creek historically meandered in the area of the site, but since the construction of Taylor Drive, circa late 1980s, follows a constructed drainage channel in a northerly direction. The regional groundwater flow is expected to follow the bedrock topography and may be influenced by the buried channels in the area that are trending in a northeasterly direction."

[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

Waskasoo Creek is located on the west side of the site and extends to the north beneath 32 Street. It flows along the east side of Taylor Drive past the site, and discharges into the Red Deer River. Waskasoo Creek is located adjacent to the west of the site, and the Red Deer River is located approximately 1.8 km north of the site. The site is within a groundwater recharge zone and has a downward flow component. Shallow groundwater flow is assumed to flow towards the creek.

3.3 Groundwater Resource Usage

A search of the Alberta Water Well Database conducted in February 2026 for groundwater users within a 1 km radius of the Red Deer Motors site identified 13 groundwater wells; six of the wells are listed as domestic use, two are listed as domestic and stock use, two are listed as industrial use, two as “other” use, and one as observation use[7].

The nearest water well to site is located approximately 650 m east of the site. The proposed well use is domestic and stock. The water wells within a 1 km radius of the site range from 5.8 m to 120 m depths. The status and use of the surrounding groundwater wells were not confirmed and they were not field verified.

4.0 REVIEW OF THE 2014 HAZARD QUOTIENTS FROM THE RISK MANAGEMENT PLAN AND MITIGATIVE MEASURES FOR THE SITE

The following section is a review of the 2014 RMP for the site that was completed by Tiamat. The review of the 2014 RMP was completed for the 2019 groundwater and soil vapour monitoring report[1].

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 (HQ) 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 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 HQs to address uncertainties. HQs from the RMP ranged up to 588,280 (including the 10x factor of safety). Based on these, the RMP then provided recommended generic mitigative measures based on the calculated HQs, ranging from passive to active measures, recognizing that the ultimate approach would require a design professional for the proposed development.

Following the 2014 RMP, 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”[8], 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 6. HQs were calculated using estimated dose (based on concentrations measured at the site) and divided by screening criteria. Soil vapour concentrations from the

[7] Government of Alberta, Alberta Water Well Information Database (or Baseline Water Well Test Database). Retrieved [February 10, 2026], from http://groundwater.alberta.ca/WaterWells/d/

[8] 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.

Phase II ESA conducted in 2013 were not compared to soil vapour quality guidelines; however, spot checks of five target compounds with the highest HQs in the 2013 work (benzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, cis-1,2-dichloroethene, and trans-1,2-dichloroethene) identified that the 2013 concentrations for soil vapour wells VW-02 and VW-03 would not have unacceptable HQs using the updated CCME methodology. Soil vapour well VW-01 would have unacceptable HQs using the updated CCME methodology for cis-1,2-dichloroethene, hexane, and vinyl chloride.

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 HQs. Subsequent to the 2014 RMP and to the release of the CCME Protocol document, The City undertook additional assessment at another former City landfill (Montfort); as part of that work, their consultant XCG Consulting Limited (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 HQ and Cancer Risks calculated by XCG[9]. 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

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.

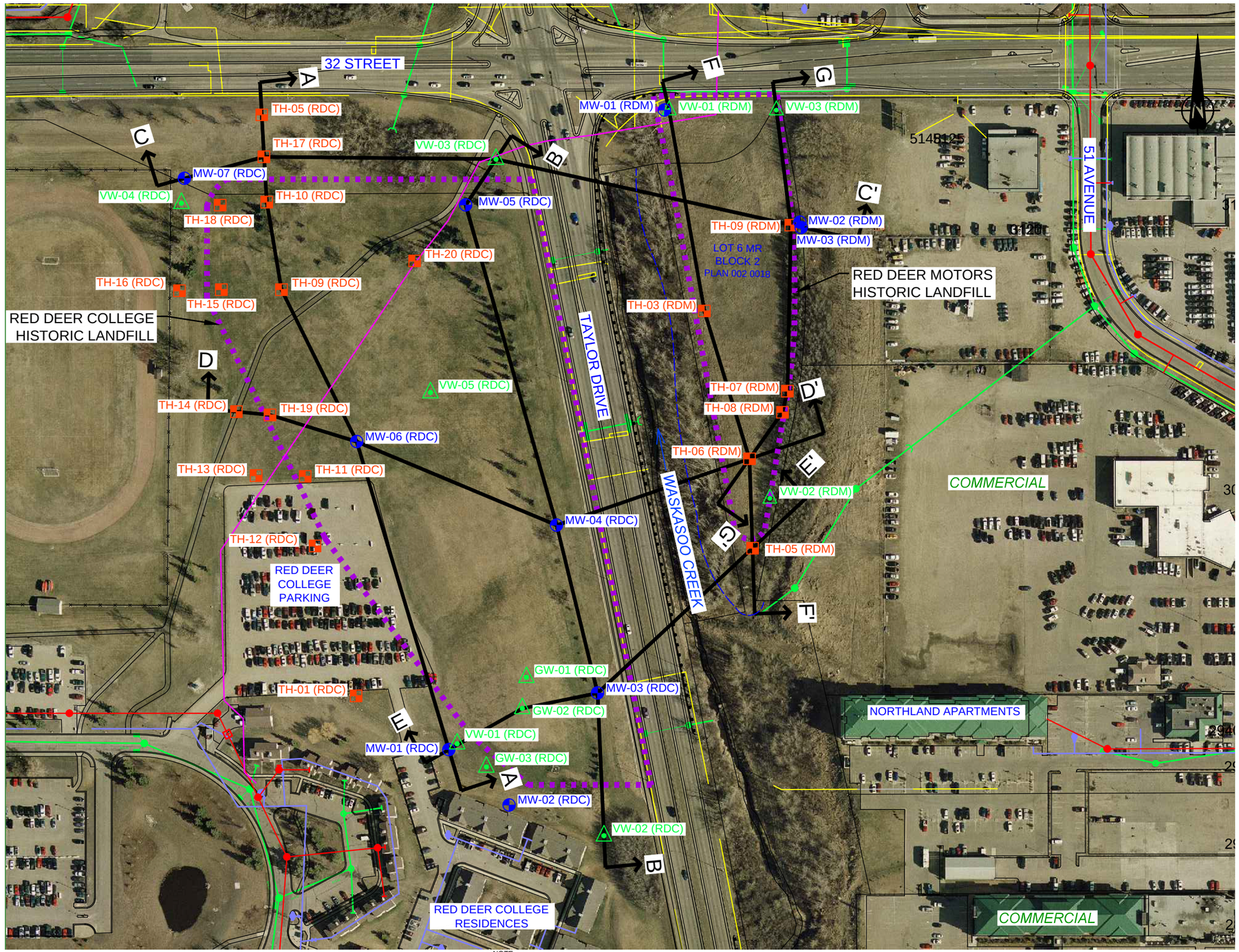
2. Active Measures – Level E: for Cancer Risk of >$2E^{-3}$ and/or HQ values >100.

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

[9] XCG Consulting Limited. 2018. Vapour Intrusion Assessment and Environmental Monitoring Report, prepared for the City of Red Deer's Montfort Landfill.

APPENDIX C

CROSS-SECTIONS (TIAMAT 2014)



SOURCE
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0 20 50 100m
Scale 1:2000

PHASE II TEST LOCATIONS
MW-## GROUNDWATER MONITORING WELL INSTALLED BY TIAMAT
TH-## TESTHOLE
VW-## SOIL VAPOUR MONITORING WELL
MW-## GROUNDWATER MONITORING WELL INSTALLED BY OTHERS
REFER TO TABLE 1 FOR TESTHOLE INFORMATION

LEGEND
HISTORIC WASTE DISPOSAL
LOT BOUNDARY
100 YEAR FLOOD LINE
CROSS SECTION LOCATION
ELECTRICAL
SANITARY
STORM
WATER
PRIVATE COMMUNICATIONS CABLE INSTALLED JULY 2011

NOTE:
LOCATION OF BURIED UTILITIES ARE APPROXIMATE, ACTUAL LOCATIONS OF THE SHALLOW UTILITIES AND ANY OTHER UTILITIES SHOULD BE VERIFIED PRIOR TO ANY GROUND DISTURBANCE ACTIVITY.

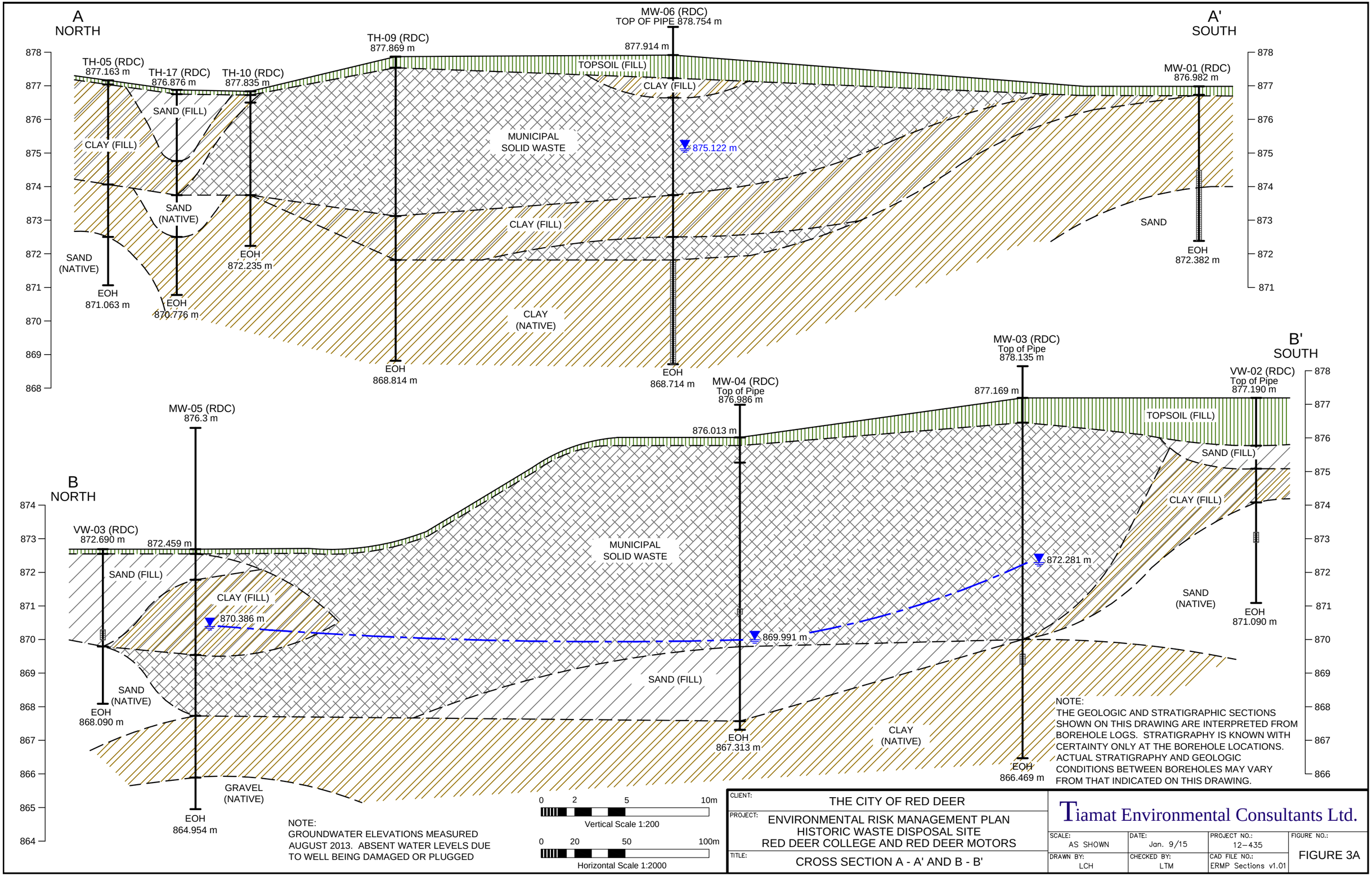
CLIENT: THE CITY OF RED DEER

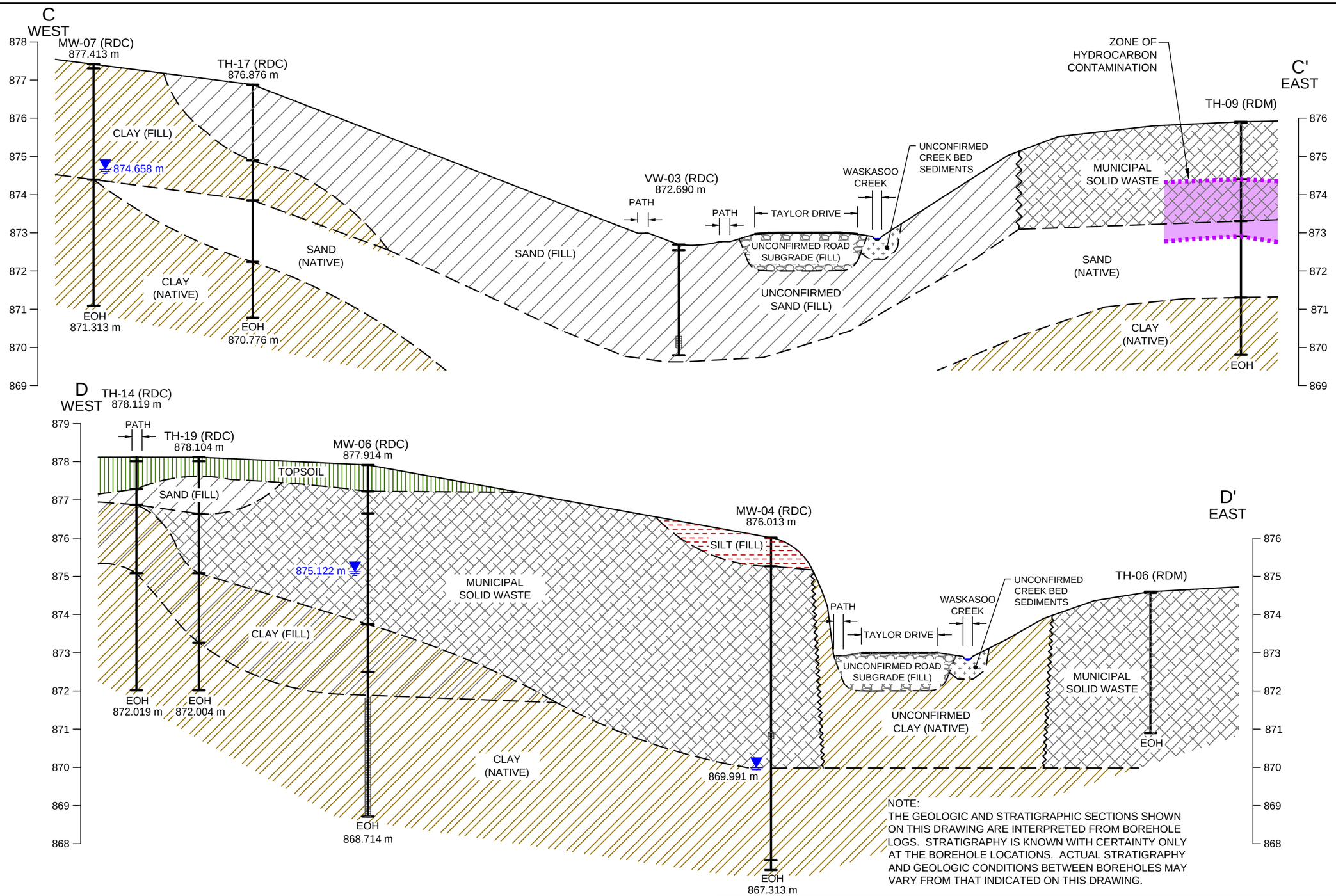
PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
RED DEER COLLEGE AND RED DEER MOTORS

TITLE: INTERPRETED EXTENT OF WASTE

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
1 : 2000	JAN. 18/15	12-435	FIGURE 2
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: ERMP v1.03	


A
NORTH
A'
SOUTH
TH-05 (RDC)
877.163 m
TH-17 (RDC)
876.876 m
TH-10 (RDC)
877.835 m
TH-09 (RDC)
877.869 m
MW-06 (RDC)
TOP OF PIPE 878.754 m
877.914 m
MW-01 (RDC)
876.982 m
TOPSOIL (FILL)
CLAY (FILL)
SAND (FILL)
CLAY (FILL)
MUNICIPAL
SOLID WASTE
875.122 m
SAND
(NATIVE)
CLAY (FILL)
SAND
SAND
(NATIVE)
EOH
872.235 m
EOH
872.382 m
EOH
871.063 m
EOH
870.776 m
CLAY
(NATIVE)
EOH
868.814 m
EOH
868.714 m
878
877
876
875
874
873
872
871
870
869
868
B
NORTH
B'
SOUTH
MW-05 (RDC)
876.3 m
MW-04 (RDC)
Top of Pipe
876.986 m
MW-03 (RDC)
Top of Pipe
878.135 m
VW-02 (RDC)
Top of Pipe
877.190 m
877.169 m
876.013 m
TOPSOIL (FILL)
SAND (FILL)
CLAY (FILL)
VW-03 (RDC)
872.690 m
872.459 m
MUNICIPAL
SOLID WASTE
872.281 m
SAND
(NATIVE)
EOH
871.090 m
SAND (FILL)
CLAY (FILL)
870.386 m
869.991 m
SAND
(NATIVE)
SAND (FILL)
EOH
868.090 m
CLAY
(NATIVE)
EOH
867.313 m
EOH
866.469 m
GRAVEL
(NATIVE)
EOH
864.954 m
878
877
876
875
874
873
872
871
870
869
868
867
866
874
873
872
871
870
869
868
867
866
865
864
NOTE:
THE GEOLOGIC AND STRATIGRAPHIC SECTIONS SHOWN ON THIS DRAWING ARE INTERPRETED FROM BOREHOLE LOGS. STRATIGRAPHY IS KNOWN WITH CERTAINTY ONLY AT THE BOREHOLE LOCATIONS. ACTUAL STRATIGRAPHY AND GEOLOGIC CONDITIONS BETWEEN BOREHOLES MAY VARY FROM THAT INDICATED ON THIS DRAWING.
NOTE:
GROUNDWATER ELEVATIONS MEASURED AUGUST 2013. ABSENT WATER LEVELS DUE TO WELL BEING DAMAGED OR PLUGGED
0 2 5 10m
Vertical Scale 1:200
0 20 50 100m
Horizontal Scale 1:2000
CLIENT: THE CITY OF RED DEER
PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
RED DEER COLLEGE AND RED DEER MOTORS
TITLE: CROSS SECTION A - A' AND B - B'
Tiamat Environmental Consultants Ltd.
SCALE: AS SHOWN
DATE: Jan. 9/15
PROJECT NO.: 12-435
FIGURE NO.: FIGURE 3A
DRAWN BY: LCH
CHECKED BY: LTM
CAD FILE NO.: ERMP Sections v1.01



NOTE:
THE GEOLOGIC AND STRATIGRAPHIC SECTIONS SHOWN ON THIS DRAWING ARE INTERPRETED FROM BOREHOLE LOGS. STRATIGRAPHY IS KNOWN WITH CERTAINTY ONLY AT THE BOREHOLE LOCATIONS. ACTUAL STRATIGRAPHY AND GEOLOGIC CONDITIONS BETWEEN BOREHOLES MAY VARY FROM THAT INDICATED ON THIS DRAWING.

0 2 5 10m
Vertical Scale 1:200

0 20 50 100m
Horizontal Scale 1:2000

NOTE:
GROUNDWATER ELEVATIONS MEASURED AUGUST 2013. ABSENT WATER LEVELS DUE TO WELL BEING DAMAGED OR PLUGGED

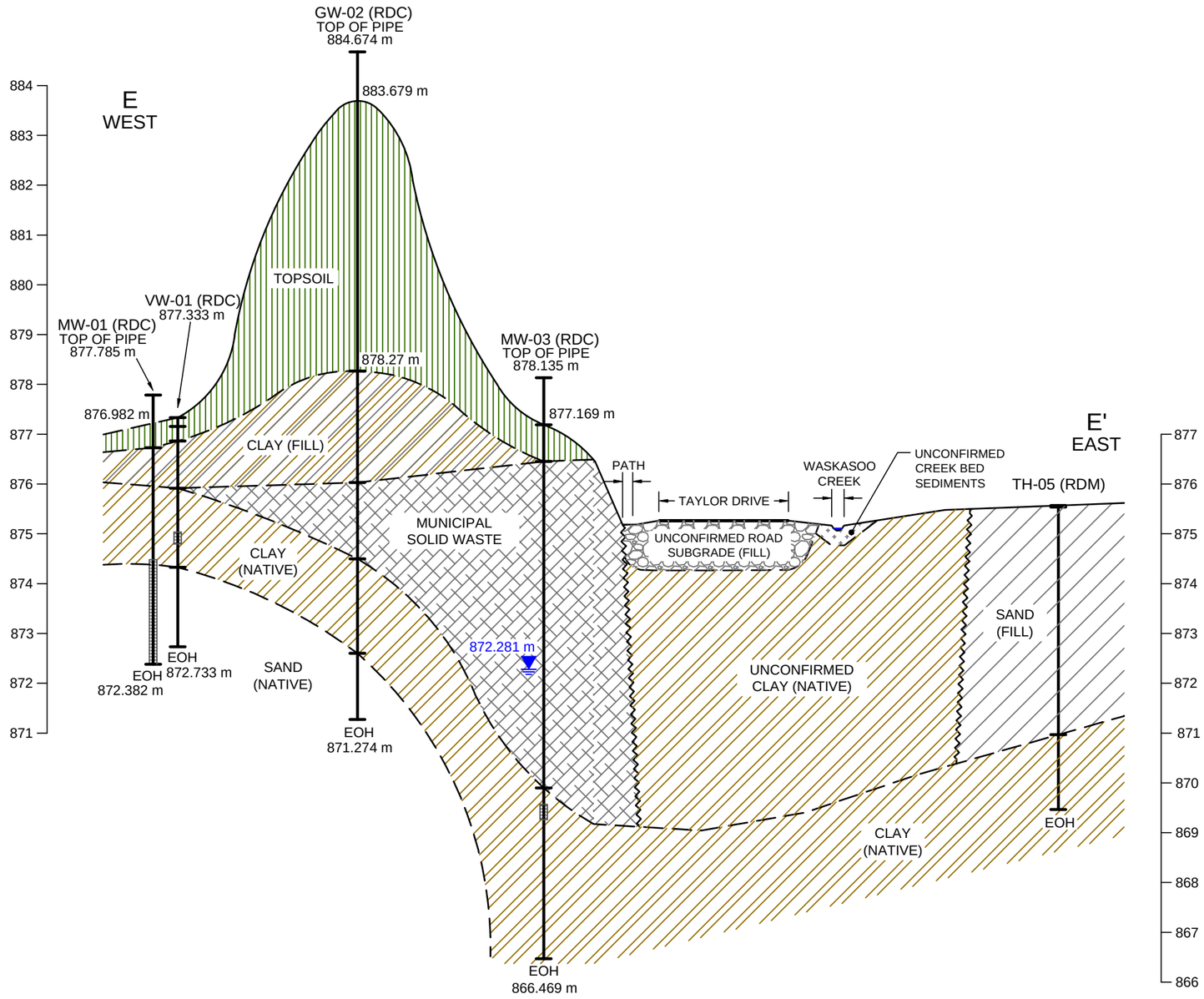
CLIENT: THE CITY OF RED DEER

PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
RED DEER COLLEGE AND RED DEER MOTORS

TITLE: CROSS SECTION C - C' AND D - D'

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
AS SHOWN	June 27/14	12-435	FIGURE 3B
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: ERMP Sections v1.00	



NOTE:
THE GEOLOGIC AND STRATIGRAPHIC SECTIONS SHOWN ON THIS DRAWING ARE INTERPRETED FROM BOREHOLE LOGS. STRATIGRAPHY IS KNOWN WITH CERTAINTY ONLY AT THE BOREHOLE LOCATIONS. ACTUAL STRATIGRAPHY AND GEOLOGIC CONDITIONS BETWEEN BOREHOLES MAY VARY FROM THAT INDICATED ON THIS DRAWING.

0 2 5 10m
Vertical Scale 1:200

0 20 50 100m
Horizontal Scale 1:2000

NOTE:
GROUNDWATER ELEVATIONS MEASURED AUGUST 2013. ABSENT WATER LEVELS DUE TO WELL BEING DAMAGED OR PLUGGED

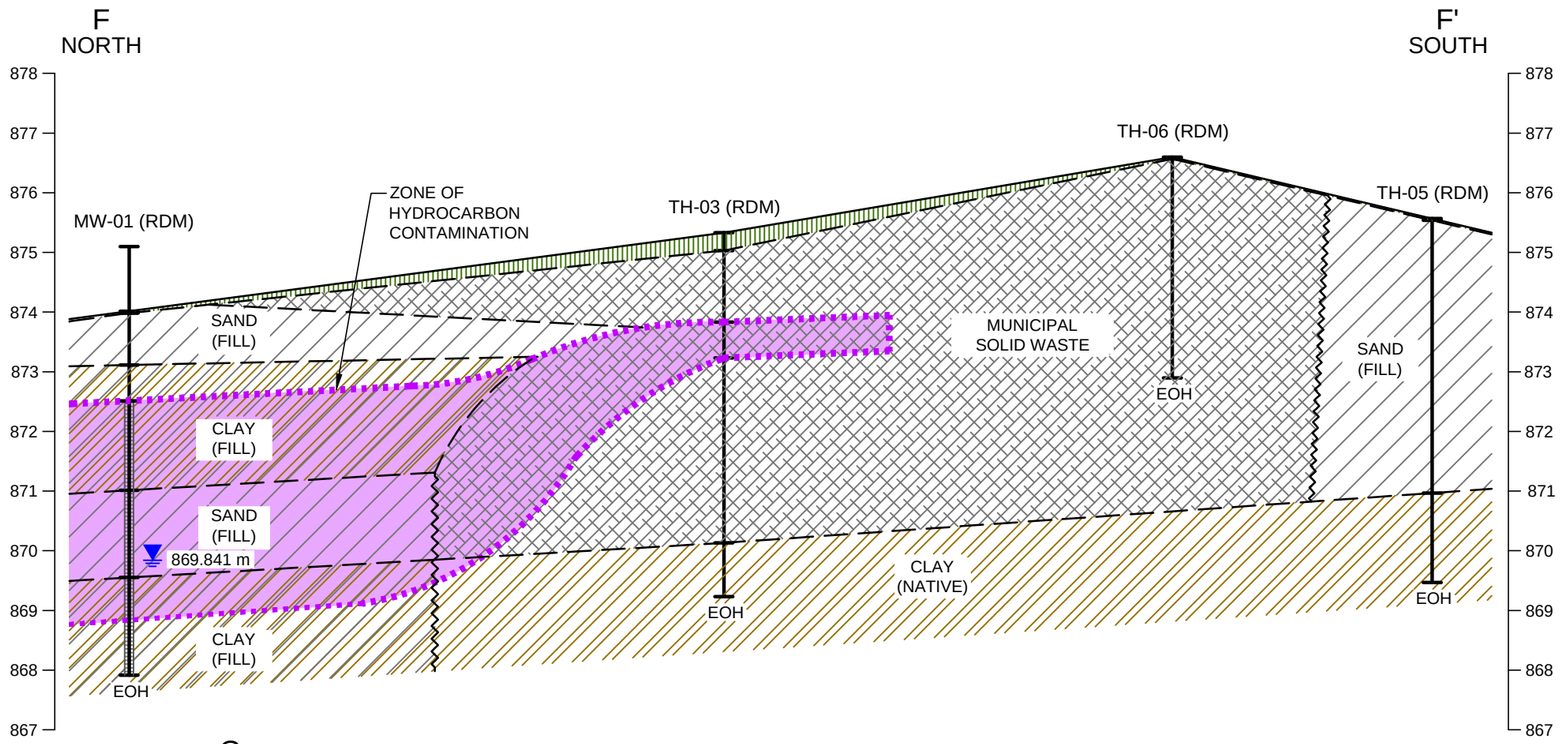
CLIENT: THE CITY OF RED DEER

PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
RED DEER COLLEGE AND RED DEER MOTORS

TITLE: CROSS SECTION E - E'

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
AS SHOWN	June 27/14	12-435	FIGURE 3C
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: ERMP Sections v1.00	



NOTE:
THE GEOLOGIC AND STRATIGRAPHIC SECTIONS SHOWN ON THIS DRAWING ARE INTERPRETED FROM BOREHOLE LOGS. STRATIGRAPHY IS KNOWN WITH CERTAINTY ONLY AT THE BOREHOLE LOCATIONS. ACTUAL STRATIGRAPHY AND GEOLOGIC CONDITIONS BETWEEN BOREHOLES MAY VARY FROM THAT INDICATED ON THIS DRAWING.

0 2 5 10m
Vertical Scale 1:200

0 20 50 100m
Horizontal Scale 1:2000

NOTE:
GROUNDWATER ELEVATIONS MEASURED AUGUST 2013. ABSENT WATER LEVELS DUE TO WELL BEING DAMAGED OR PLUGGED

CLIENT: THE CITY OF RED DEER

PROJECT: ENVIRONMENTAL RISK MANAGEMENT PLAN
HISTORIC WASTE DISPOSAL SITE
RED DEER COLLEGE AND RED DEER MOTORS

TITLE: CROSS SECTION F - F' AND G - G'

Tiamat Environmental Consultants Ltd.

SCALE:	DATE:	PROJECT NO.:	FIGURE NO.:
AS SHOWN	June 27/14	12-435	FIGURE 3D
DRAWN BY: LCH	CHECKED BY: LTM	CAD FILE NO.: ERMP Sections v1.00	

APPENDIX D

LABORATORY ANALYTICAL REPORTS

CERTIFICATE OF ANALYSIS

Work Order	: **CG2412792**	Page	: 1 of 8
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 AB Canada T1Y 7B5
Telephone	: 403 203 3355	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-04.004	Date Samples Received	: 06-Sep-2024 15:00
PO	: SWM.SWOP04071-04.004	Date Analysis Commenced	: 07-Sep-2024
C-O-C number	: CORD RED DEER MOTORS	Issue Date	: 12-Sep-2024 10:05
Sampler	: WILLEM VERDUYN		
Site	:		
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*
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Gurvinder Kour	Lab Assistant	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Nguyen Tran	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
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: 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

CG2412792-002 dissolved mercury vial received empty - parameter could not be run.

Sample Comments

Sample	Client Id	*Comment*
CG2412792-002	MW-04A	Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

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-01	MW-04A	MW-05	DUPLICATE	----
					Client sampling date / time	06-Sep-2024 07:15	06-Sep-2024 07:45	06-Sep-2024 08:00	06-Sep-2024 00:00	----
						CG2412792-001	CG2412792-002	CG2412792-003	CG2412792-004	--------
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.0	mg/L		850	928	1260	795	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		<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	----
Alkalinity, total (as CaCO3)	----	E290/CG	1.0	mg/L		697	761	1030	652	----
Conductivity	----	E100/CG	1.0	µS/cm		2530	2650	2460	2530	----
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		788	929	973	801	----
pH	----	E108/CG	0.10	pH units		7.27	7.81	7.08	7.18	----
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		1470	1740	1520	1460	----
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		460	315	207	463	----
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		0.176	0.239	0.120	0.181	----
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		<0.100 DLDS	0.202	<0.100 DLDS	<0.100 DLDS	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0032	mg/L		<0.112	0.202	<0.112	<0.112	----
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		<0.050 DLDS	<0.050 DLDS	<0.050 DLDS	<0.050 DLDS	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		52.2	372	153	53.4	----
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		28.0	31.9	29.6	27.2	----
Cation sum	----	EC101/CG	0.10	meq/L		26.2	30.4	28.0	26.6	----
Ion balance (APHA)	----	EC101/CG	0.01	%		-3.32	-2.41	-2.78	-1.12	----
Ion balance (cations/anions)	----	EC101/CG	0.010	%		93.6	95.3	94.6	97.8	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/CG	0.0010	mg/L		<0.0020 DLDS	0.0037	0.0641	<0.0020 DLDS	----
Antimony, dissolved	7440-36-0	E421/CG	0.00010	mg/L		<0.00020 DLDS	0.00952	0.00023	<0.00020 DLDS	----
Arsenic, dissolved	7440-38-2	E421/CG	0.00010	mg/L		0.0228	0.00425	0.00864	0.0232	----
Barium, dissolved	7440-39-3	E421/CG	0.00010	mg/L		0.616	0.0531	0.796	0.600	----
Boron, dissolved	7440-42-8	E421/CG	0.010	mg/L		0.073	0.139	0.175	0.075	----
Cadmium, dissolved	7440-43-9	E421/CG	0.0000050	mg/L		<0.0000100 DLDS	0.00194	0.0000706	<0.0000100 DLDS	----
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L		153	199	182	158	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-01	MW-04A	MW-05	DUPLICATE	----
					Client sampling date / time	06-Sep-2024 07:15	06-Sep-2024 07:45	06-Sep-2024 08:00	06-Sep-2024 00:00	----
						CG2412792-001	CG2412792-002	CG2412792-003	CG2412792-004	--------
						Result	Result	Result	Result	----
Dissolved Metals										
Chromium, dissolved	7440-47-3	E421/CG	0.00050	mg/L		<0.00100 DLDS	<0.00100 DLDS	<0.00100 DLDS	<0.00100 DLDS	----
Copper, dissolved	7440-50-8	E421/CG	0.00020	mg/L		<0.00040 DLDS	0.154	0.00250	<0.00040 DLDS	----
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L		25.3	<0.020 DLDS	6.93	25.4	----
Lead, dissolved	7439-92-1	E421/CG	0.000050	mg/L		<0.000100 DLDS	0.000540	0.000348	<0.000100 DLDS	----
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L		98.5	105	126	98.8	----
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L		1.86	0.481	1.91	1.94	----
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		0.0137	0.0508	0.0268	0.0138	----
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L		7.71	5.94	10.4	7.82	----
Selenium, dissolved	7782-49-2	E421/CG	0.000050	mg/L		0.000116	0.00298	0.000193	0.000106	----
Silver, dissolved	7440-22-4	E421/CG	0.000010	mg/L		<0.000020 DLDS	<0.000020 DLDS	<0.000020 DLDS	<0.000020 DLDS	----
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L		214	269	183	217	----
Uranium, dissolved	7440-61-1	E421/CG	0.000010	mg/L		0.00287	0.0918	0.0122	0.00279	----
Zinc, dissolved	7440-66-6	E421/CG	0.0010	mg/L		<0.0020 DLDS	0.0386	0.0056	0.0027	----
Dissolved mercury filtration location	----	EP509/CG	-	-		Field	Laboratory	Field	Field	----
Dissolved metals filtration location	----	EP421/CG	-	-		Field	Laboratory	Field	Field	----
Volatile Organic Compounds										
Benzene	71-43-2	E611A/CG	0.50	µg/L		2.42	<0.50	1.84	2.21	----
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	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-01	MW-04A	MW-05	DUPLICATE	----
					Client sampling date / time	06-Sep-2024 07:15	06-Sep-2024 07:45	06-Sep-2024 08:00	06-Sep-2024 00:00	----
						CG2412792-001	CG2412792-002	CG2412792-003	CG2412792-004	--------
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Chloromethane	74-87-3	E611E/CG	5.0	µg/L		<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	----
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		17.4	1.5	235	15.4	----
Dichloroethylene, trans-1,2-	156-60-5	E611E/CG	1.0	µg/L		3.7	<1.0	17.7	3.3	----
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	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611E/CG	1.5	µg/L		<1.5	<1.5	<1.5	<1.5	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
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	E611A/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	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	MW-01	MW-04A	MW-05	DUPLICATE	----
					Client sampling date / time	06-Sep-2024 07:15	06-Sep-2024 07:45	06-Sep-2024 08:00	06-Sep-2024 00:00	----
						CG2412792-001	CG2412792-002	CG2412792-003	CG2412792-004	--------
						Result	Result	Result	Result	----
Volatile Organic Compounds										
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	E611A/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	----
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		6.1	<1.0	9.8	4.3	----
Xylene, m+p-	179601-23-1	E611A/CG	0.40	µg/L		<0.40	<0.40	<0.40	<0.40	----
Xylene, o-	95-47-6	E611A/CG	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	----
Xylenes, total	1330-20-7	E611A/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
BTEX, total	----	E611E/CG	1.0	µg/L		2.4	<1.0	1.8	2.2	----
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/CG	100	µg/L		<100	<100	<100	<100	----
F1-BTEX	----	EC580/CG	25	µg/L		<100	<100	<100	<100	----
F2 (C10-C16)	----	E601/CG	100	µg/L		<100	<100	<100	<100	----
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/CG	1.0	%		103	96.3	95.9	103	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/CG	1.0	%		110	112	110	111	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/CG	1.0	%		76.3	75.8	72.6	72.4	----
Difluorobenzene, 1,4-	540-36-3	E611A/CG	1.0	%		102	104	102	102	----

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

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2412792**	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.SWOP04071-04.004	Date Samples Received	: 06-Sep-2024 15:00
PO	: SWM.SWOP04071-04.004	Issue Date	: 12-Sep-2024 10:06
C-O-C number	: CORD RED DEER MOTORS		
Sampler	: WILLEM VERDUYN		
Site	:		
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 : Chloride in Water by IC										
HDPE DUPLICATE	E235.Cl	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-01	E235.Cl	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-04A	E235.Cl	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW-05	E235.Cl	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE DUPLICATE	E235.F	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-01	E235.F	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW-04A	E235.F	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-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 : Fluoride in Water by IC										
HDPE MW-05	E235.F	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUPLICATE	E235.NO3	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-01	E235.NO3	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-04A	E235.NO3	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW-05	E235.NO3	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUPLICATE	E235.NO2	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-01	E235.NO2	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-04A	E235.NO2	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW-05	E235.NO2	06-Sep-2024	07-Sep-2024	3 days	1 days	✓	07-Sep-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 DUPLICATE	E235.SO4	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-01	E235.SO4	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-04A	E235.SO4	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW-05	E235.SO4	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) DUPLICATE	E509	06-Sep-2024	10-Sep-2024	28 days	4 days	✓	10-Sep-2024	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW-01	E509	06-Sep-2024	10-Sep-2024	28 days	4 days	✓	10-Sep-2024	28 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW-05	E509	06-Sep-2024	10-Sep-2024	28 days	4 days	✓	10-Sep-2024	28 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) DUPLICATE	E421	06-Sep-2024	10-Sep-2024	180 days	4 days	✓	11-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW-01	E421	06-Sep-2024	10-Sep-2024	180 days	4 days	✓	11-Sep-2024	180 days	5 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-04A	E421	06-Sep-2024	10-Sep-2024	180 days	4 days	✓	11-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW-05	E421	06-Sep-2024	10-Sep-2024	180 days	4 days	✓	11-Sep-2024	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
DUPLICATE	E581.F1	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-01	E581.F1	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-04A	E581.F1	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
MW-05	E581.F1	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
DUPLICATE	E601	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-01	E601	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-04A	E601	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	40 days	0 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
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate)										
MW-05	E601	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	40 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
DUPLICATE	E290	06-Sep-2024	07-Sep-2024	14 days	1 days	✓	07-Sep-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-01	E290	06-Sep-2024	07-Sep-2024	14 days	1 days	✓	07-Sep-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-04A	E290	06-Sep-2024	07-Sep-2024	14 days	1 days	✓	07-Sep-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW-05	E290	06-Sep-2024	07-Sep-2024	14 days	1 days	✓	07-Sep-2024	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
DUPLICATE	E100	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-01	E100	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-04A	E100	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-2024	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MW-05	E100	06-Sep-2024	07-Sep-2024	28 days	1 days	✓	07-Sep-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
Physical Tests : pH by Meter										
HDPE DUPLICATE	E108	06-Sep-2024	07-Sep-2024	0.25 hrs	25 hrs	× EHTL	07-Sep-2024	0.25 hrs	25 hrs	× EHTL
Physical Tests : pH by Meter										
HDPE MW-04A	E108	06-Sep-2024	07-Sep-2024	0.25 hrs	32 hrs	× EHTR-FM	07-Sep-2024	0.25 hrs	32 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-05	E108	06-Sep-2024	07-Sep-2024	0.25 hrs	32 hrs	× EHTR-FM	07-Sep-2024	0.25 hrs	32 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW-01	E108	06-Sep-2024	07-Sep-2024	0.25 hrs	33 hrs	× EHTR-FM	07-Sep-2024	0.25 hrs	33 hrs	× EHTR-FM
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPLICATE	E611A	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-01	E611A	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-04A	E611A	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW-05	E611A	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPLICATE	E611E	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-01	E611E	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-04A	E611E	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW-05	E611E	06-Sep-2024	09-Sep-2024	14 days	3 days	✓	09-Sep-2024	14 days	3 days	✓

Legend & Qualifier Definitions

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

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

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1639034	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1640140	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1640139	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1638965	1	4	25.0	5.0	✓
Conductivity in Water	E100	1639032	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1642121	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1643007	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1638957	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1638963	1	4	25.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1638964	1	4	25.0	5.0	✓
pH by Meter	E108	1639033	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1638962	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1640141	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1639034	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1640140	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1640139	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	1639978	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	1638965	1	4	25.0	5.0	✓
Conductivity in Water	E100	1639032	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1642121	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1643007	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1638957	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1638963	1	4	25.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1638964	1	4	25.0	5.0	✓
pH by Meter	E108	1639033	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1638962	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1640141	1	4	25.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1639034	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1640140	1	4	25.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1640139	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	1639978	1	11	9.0	5.0	✓
Chloride in Water by IC	E235.Cl	1638965	1	4	25.0	5.0	✓
Conductivity in Water	E100	1639032	1	17	5.8	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	1642121	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1643007	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1638957	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1638963	1	4	25.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1638964	1	4	25.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1638962	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1640141	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1640140	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1638965	1	4	25.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1642121	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1643007	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1638957	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1638963	1	4	25.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1638964	1	4	25.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1638962	1	20	5.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	1640141	1	4	25.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - 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.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. 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. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID	E601 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A 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.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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).
F1-BTEX	EC580 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
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.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Calgary	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **CG2412792**	Page	: 1 of 17
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.SWOP04071-04.004	Date Samples Received	: 06-Sep-2024 15:00
PO	: SWM.SWOP04071-04.004	Date Analysis Commenced	: 07-Sep-2024
C-O-C number	: CORD RED DEER MOTORS	Issue Date	: 12-Sep-2024 10:05
Sampler	: WILLEM VERDUYN		
Site	:		
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*
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Gurvinder Kour	Lab Assistant	Calgary Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Katarzyna Glinka	Analyst	Calgary Inorganics, Calgary, Alberta
Nguyen Tran	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: 1639032)											
CG2412760-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	1940	1940	0.154%	10%	----
Physical Tests (QC Lot: 1639033)											
CG2412760-001	Anonymous	pH	----	E108	0.10	pH units	8.09	7.84	3.14%	4%	----
Physical Tests (QC Lot: 1639034)											
CG2412760-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	408	402	1.46%	20%	----
Anions and Nutrients (QC Lot: 1638957)											
CG2412779-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.248	0.247	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1638962)											
CG2412779-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	846	837	0.977%	20%	----
Anions and Nutrients (QC Lot: 1638963)											
CG2412792-001	MW-01	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: 1638964)											
CG2412792-001	MW-01	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: 1638965)											
CG2412792-001	MW-01	Chloride	16887-00-6	E235.Cl	2.50	mg/L	460	456	0.789%	20%	----
Dissolved Metals (QC Lot: 1642121)											
CG2412769-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1643007)											
CG2412792-001	MW-01	Aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.0228	0.0232	1.76%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.616	0.633	2.78%	20%	----
		Boron, dissolved	7440-42-8	E421	0.020	mg/L	0.073	0.074	0.0005	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.100	mg/L	153	158	3.15%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	25.3	24.9	1.79%	20%	----
		Lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	98.5	97.8	0.713%	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: 1643007) - continued											
CG2412792-001	MW-01	Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	1.86	1.92	3.34%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.0137	0.0136	0.549%	20%	----
		Potassium, dissolved	7440-09-7	E421	0.100	mg/L	7.71	7.74	0.458%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.000116	0.000104	0.000012	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	214	218	1.84%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00287	0.00275	4.32%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1640140)											
CG2412792-001	MW-01	Benzene	71-43-2	E611A	0.50	µg/L	2.42	2.63	0.21	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1640141)											
CG2412792-001	MW-01	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	----

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: 1640141) - continued											
CG2412792-001	MW-01	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	----
		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	17.4	18.9	8.14%	30%	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	1.0	µg/L	3.7	4.1	0.4	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	----
		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	----
		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	----

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: 1640141) - continued											
CG2412792-001	MW-01	Vinyl chloride	75-01-4	E611E	1.0	µg/L	6.1	5.6	8.59%	50%	----
Hydrocarbons (QC Lot: 1640139)											
CG2412792-001	MW-01	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	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: 1639032)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1639034)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 1638957)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1638962)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1638963)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1638964)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1638965)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 1642121)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1643007)						
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: 1643007) - 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	----
Volatile Organic Compounds (QCLot: 1640140)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 1640141)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1640141) - continued						
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	----
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	----
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	----
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	----
Hydrocarbons (QCLot: 1639978)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 1640139)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

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: 1639032)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 1639033)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1639034)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 1638957)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 1638962)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 1638963)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 1638964)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.3	90.0	110	----
Anions and Nutrients (QCLot: 1638965)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.2	90.0	110	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	111	80.0	120	----
Dissolved Metals (QCLot: 1643007)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.1	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	91.8	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	96.9	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	91.7	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.6	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	96.8	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.8	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1643007) - continued									
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.0	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.8	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	89.6	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	90.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.6	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	100	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.1	80.0	120	----
Volatile Organic Compounds (QCLot: 1640140)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	98.8	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	78.6	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	87.1	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	93.4	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	84.1	70.0	130	----
Volatile Organic Compounds (QCLot: 1640141)									
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	93.8	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	94.0	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	82.8	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	127	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	70.9	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	76.8	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	77.4	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	78.0	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	114	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	103	70.0	130	----
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	111	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	94.6	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	94.6	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	82.9	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	95.7	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	94.6	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	91.2	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	95.2	70.0	130	----

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: 1640141) - continued									
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	92.3	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	94.9	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	129	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	122	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	96.7	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	106	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	124	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	80.4	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	88.7	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	97.0	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	97.7	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	81.7	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	90.6	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	104	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	81.9	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	92.1	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	91.3	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	126	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	72.4	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	74.9	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	72.7	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	79.5	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	130	70.0	130	----
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	76.5	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	86.5	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	125	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	77.0	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	77.7	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	107	60.0	140	----
Hydrocarbons (QCLot: 1639978)									
F2 (C10-C16)	----	E601	100	µg/L	3830 µg/L	84.9	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 1640139)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2480 µg/L	105	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: 1638957)										
CG2412779-009	Anonymous	Fluoride	16984-48-8	E235.F	0.987 mg/L	1 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 1638962)										
CG2412779-009	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	98.9 mg/L	100 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 1638963)										
CG2412792-002	MW-04A	Nitrate (as N)	14797-55-8	E235.NO3	2.50 mg/L	2.5 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 1638964)										
CG2412792-002	MW-04A	Nitrite (as N)	14797-65-0	E235.NO2	0.504 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1638965)										
CG2412792-002	MW-04A	Chloride	16887-00-6	E235.Cl	ND mg/L	----	ND	75.0	125	----
Dissolved Metals (QCLot: 1642121)										
CG2412769-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000125 mg/L	0 mg/L	125	70.0	130	----
Dissolved Metals (QCLot: 1643007)										
CG2412792-002	MW-04A	Aluminum, dissolved	7429-90-5	E421	2.01 mg/L	2 mg/L	101	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.192 mg/L	0.2 mg/L	96.1	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.191 mg/L	0.2 mg/L	95.5	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.192 mg/L	0.2 mg/L	96.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.882 mg/L	1 mg/L	88.2	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0375 mg/L	0.04 mg/L	93.7	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.379 mg/L	0.4 mg/L	94.8	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.189 mg/L	0.2 mg/L	94.6	70.0	130	----
		Iron, dissolved	7439-89-6	E421	18.8 mg/L	20 mg/L	93.9	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.187 mg/L	0.2 mg/L	93.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.373 mg/L	0.4 mg/L	93.2	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	39.0 mg/L	40 mg/L	97.4	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.358 mg/L	0.4 mg/L	89.6	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0360 mg/L	0.04 mg/L	90.0	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	----	ND	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	3.67 mg/L	4 mg/L	91.7	70.0	130	----
Volatile Organic Compounds (QCLot: 1640140)										
CG2412792-001	MW-01	Benzene	71-43-2	E611A	112 µg/L	100 µg/L	112	70.0	130	----
		Ethylbenzene	100-41-4	E611A	79.4 µg/L	100 µg/L	79.4	70.0	130	----

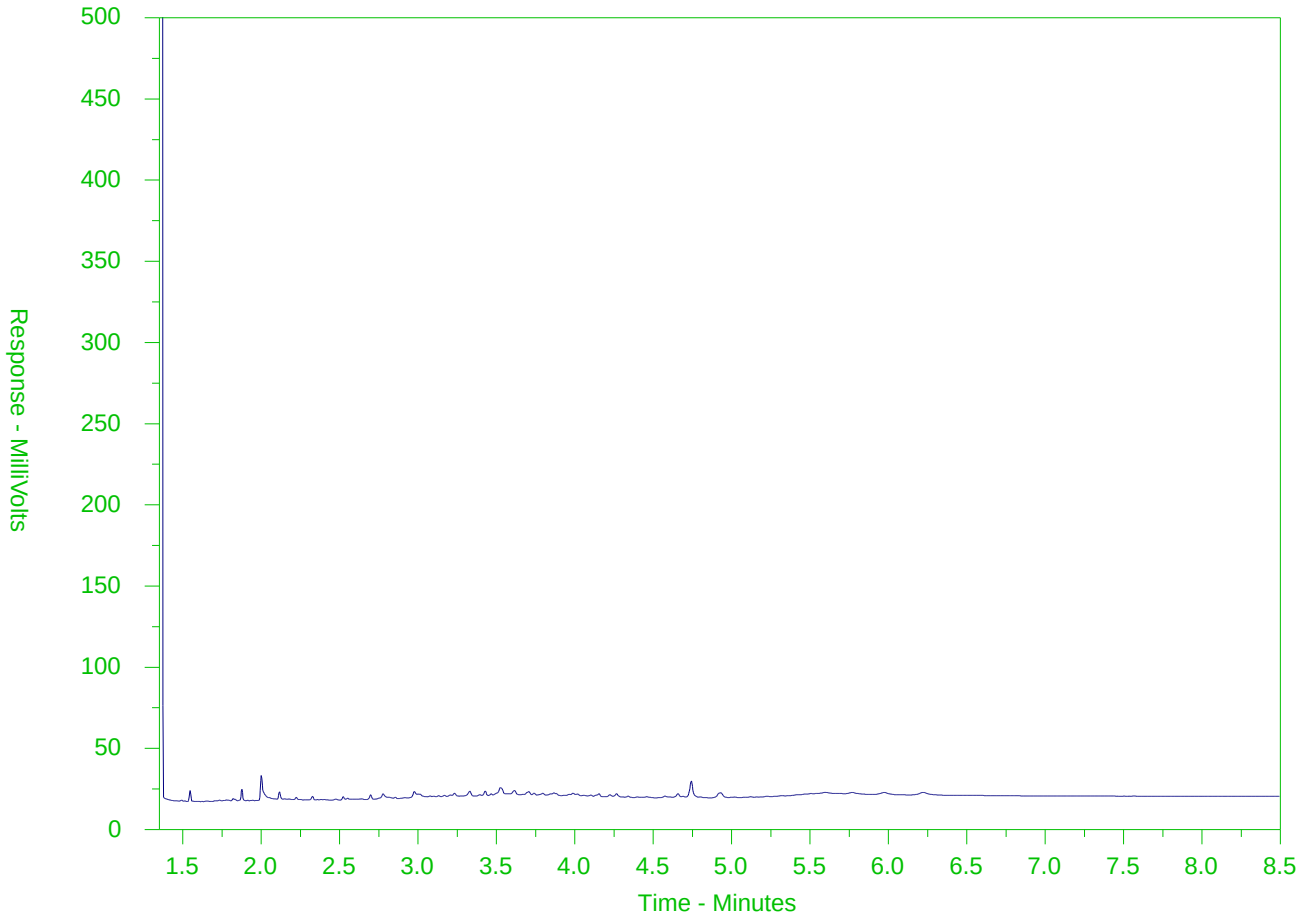
Sub-Matrix: **Water**

					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: 1640140) - continued										
CG2412792-001	MW-01	Toluene	108-88-3	E611A	88.3 µg/L	100 µg/L	88.3	70.0	130	----
		Xylene, m+p-	179601-23-1	E611A	196 µg/L	200 µg/L	98.0	70.0	130	----
		Xylene, o-	95-47-6	E611A	88.0 µg/L	100 µg/L	88.0	70.0	130	----
Volatile Organic Compounds (QCLot: 1640141)										
CG2412792-001	MW-01	Bromobenzene	108-86-1	E611E	89.4 µg/L	100 µg/L	89.4	70.0	130	----
		Bromochloromethane	74-97-5	E611E	111 µg/L	100 µg/L	111	70.0	130	----
		Bromodichloromethane	75-27-4	E611E	122 µg/L	100 µg/L	122	70.0	130	----
		Bromoform	75-25-2	E611E	79.2 µg/L	100 µg/L	79.2	70.0	130	----
		Bromomethane	74-83-9	E611E	125 µg/L	100 µg/L	125	60.0	140	----
		Butylbenzene, n-	104-51-8	E611E	72.8 µg/L	100 µg/L	72.8	70.0	130	----
		Butylbenzene, sec-	135-98-8	E611E	71.5 µg/L	100 µg/L	71.5	70.0	130	----
		Butylbenzene, tert-	98-06-6	E611E	70.8 µg/L	100 µg/L	70.8	70.0	130	----
		Carbon tetrachloride	56-23-5	E611E	76.5 µg/L	100 µg/L	76.5	70.0	130	----
		Chlorobenzene	108-90-7	E611E	129 µg/L	100 µg/L	129	70.0	130	----
		Chloroethane	75-00-3	E611E	104 µg/L	100 µg/L	104	60.0	140	----
		Chloroform	67-66-3	E611E	118 µg/L	100 µg/L	118	70.0	130	----
		Chloromethane	74-87-3	E611E	123 µg/L	100 µg/L	123	60.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	86.5 µg/L	100 µg/L	86.5	70.0	130	----
		Chlorotoluene, 4-	106-43-4	E611E	91.0 µg/L	100 µg/L	91.0	70.0	130	----
		Cymene, p-	99-87-6	E611E	72.8 µg/L	100 µg/L	72.8	70.0	130	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	95.5 µg/L	100 µg/L	95.5	70.0	130	----
		Dibromochloromethane	124-48-1	E611E	111 µg/L	100 µg/L	111	70.0	130	----
		Dibromoethane, 1,2-	106-93-4	E611E	122 µg/L	100 µg/L	122	70.0	130	----
		Dibromomethane	74-95-3	E611E	108 µg/L	100 µg/L	108	70.0	130	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	95.5 µg/L	100 µg/L	95.5	70.0	130	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	92.2 µg/L	100 µg/L	92.2	70.0	130	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	94.3 µg/L	100 µg/L	94.3	70.0	130	----
		Dichlorodifluoromethane	75-71-8	E611E	123 µg/L	100 µg/L	123	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dichloroethane, 1,2-	107-06-2	E611E	124 µg/L	100 µg/L	124	70.0	130	----
		Dichloroethylene, 1,1-	75-35-4	E611E	108 µg/L	100 µg/L	108	70.0	130	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	121 µg/L	100 µg/L	121	70.0	130	----
		Dichloromethane	75-09-2	E611E	130 µg/L	100 µg/L	130	70.0	130	----
		Dichloropropane, 1,2-	78-87-5	E611E	130 µg/L	100 µg/L	130	70.0	130	----
		Dichloropropane, 1,3-	142-28-9	E611E	118 µg/L	100 µg/L	118	70.0	130	----
		Dichloropropane, 2,2-	594-20-7	E611E	91.4 µg/L	100 µg/L	91.4	70.0	130	----
		Dichloropropylene, 1,1-	563-58-6	E611E	98.4 µg/L	100 µg/L	98.4	70.0	130	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Hexachlorobutadiene	87-68-3	E611E	81.5 µg/L	100 µg/L	81.5	70.0	130	----
		Isopropylbenzene	98-82-8	E611E	96.5 µg/L	100 µg/L	96.5	70.0	130	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Propylbenzene, n-	103-65-1	E611E	83.1 µg/L	100 µg/L	83.1	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: 1640141) - continued										
CG2412792-001	MW-01	Styrene	100-42-5	E611E	93.5 µg/L	100 µg/L	93.5	70.0	130	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	126 µg/L	100 µg/L	126	70.0	130	----
		Tetrachloroethylene	127-18-4	E611E	84.5 µg/L	100 µg/L	84.5	70.0	130	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	80.7 µg/L	100 µg/L	80.7	70.0	130	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	80.1 µg/L	100 µg/L	80.1	70.0	130	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	90.3 µg/L	100 µg/L	90.3	70.0	130	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	122 µg/L	100 µg/L	122	70.0	130	----
		Trichloroethylene	79-01-6	E611E	86.9 µg/L	100 µg/L	86.9	70.0	130	----
		Trichlorofluoromethane	75-69-4	E611E	90.1 µg/L	100 µg/L	90.1	60.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	127 µg/L	100 µg/L	127	70.0	130	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	77.9 µg/L	100 µg/L	77.9	70.0	130	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	79.8 µg/L	100 µg/L	79.8	70.0	130	----
		Vinyl chloride	75-01-4	E611E	113 µg/L	100 µg/L	113	60.0	140	----

ALS Sample ID: CG2412792-001-E601
Client Sample ID: MW-01



F2		F3	F4
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

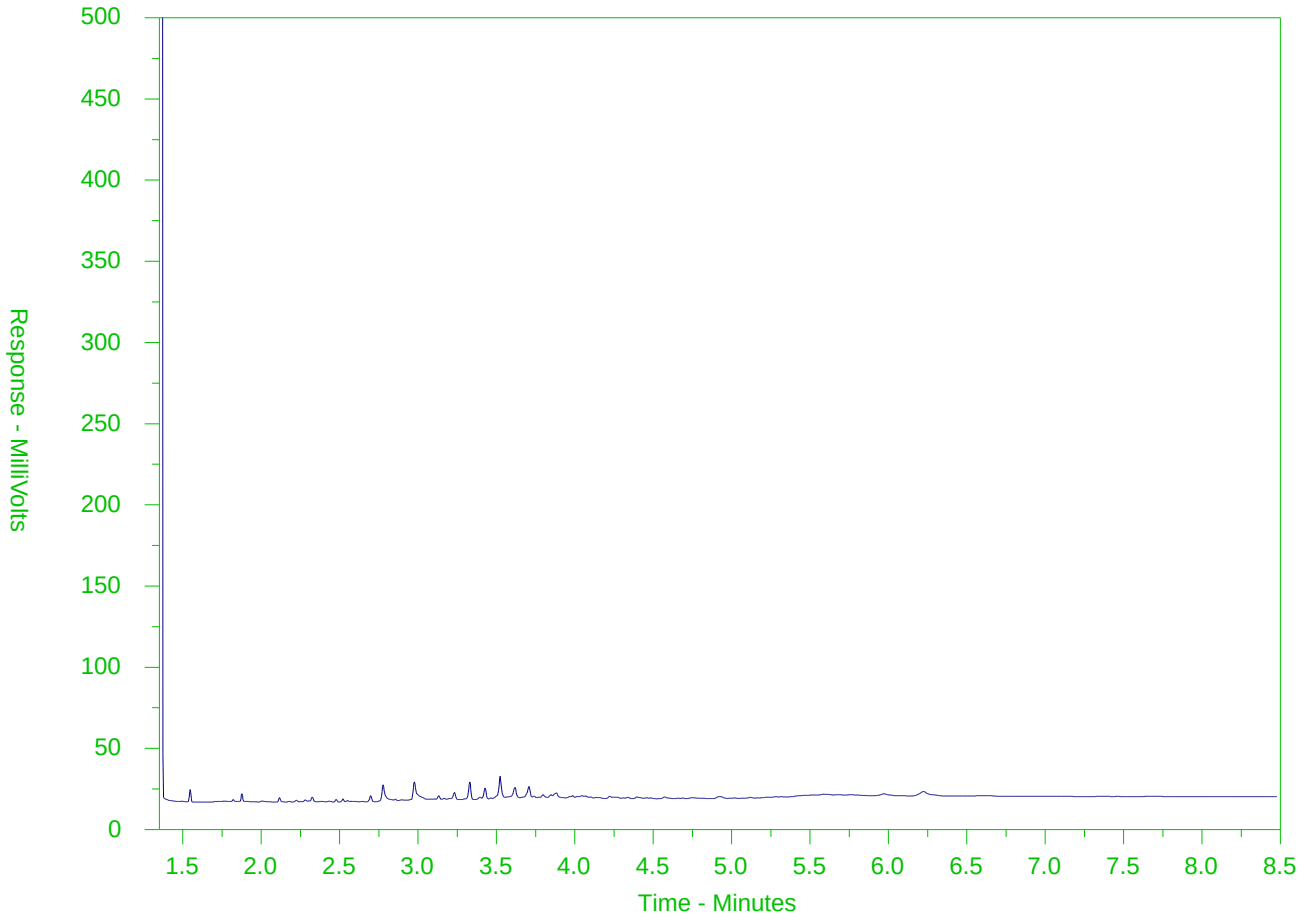
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2412792-002-E601
Client Sample ID: MW-04A



← F2 →	← F3 →	← F4 →	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

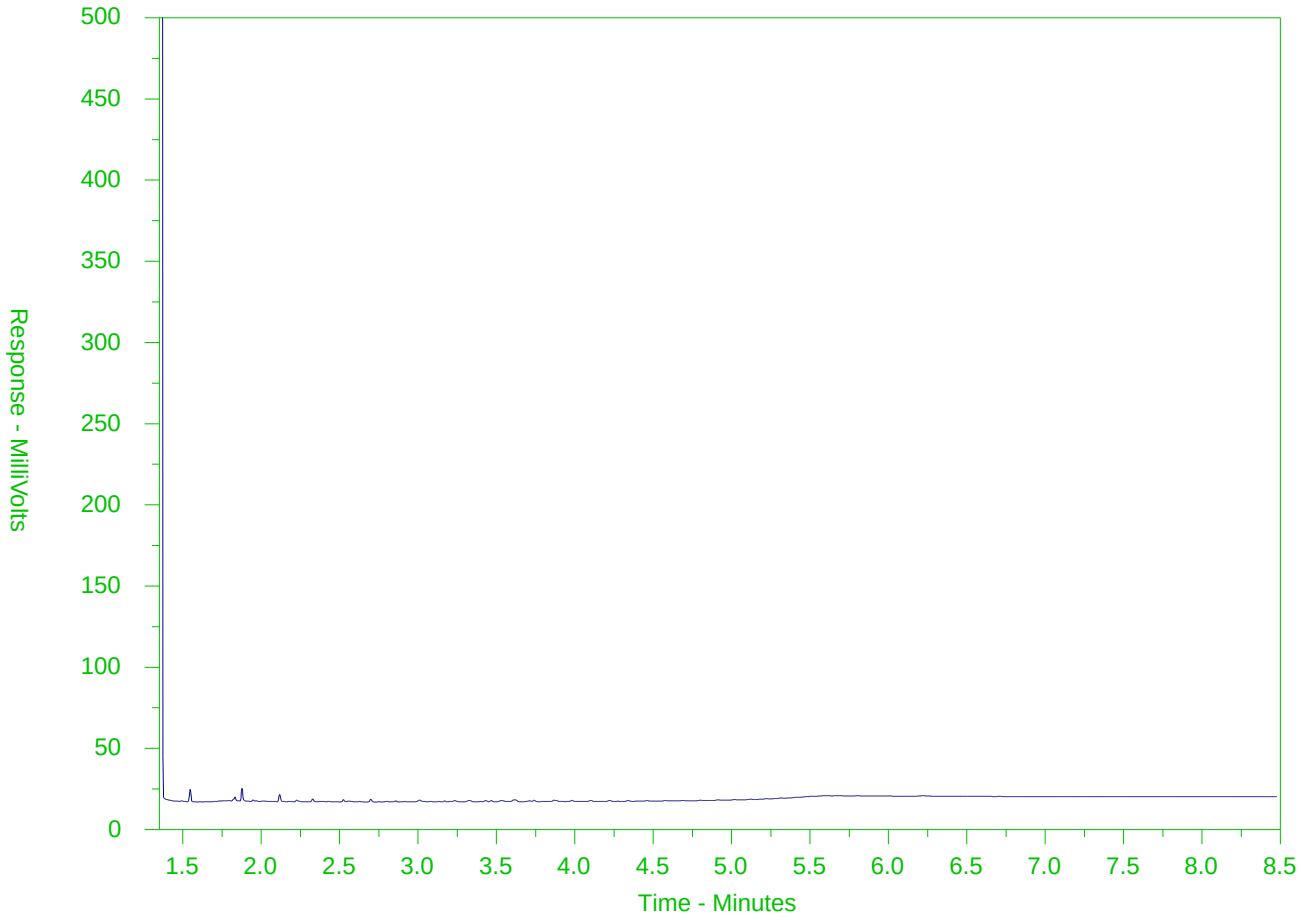
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2412792-003-E601
Client Sample ID: MW-05



← F2 →	← F3 →	← F4 →	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

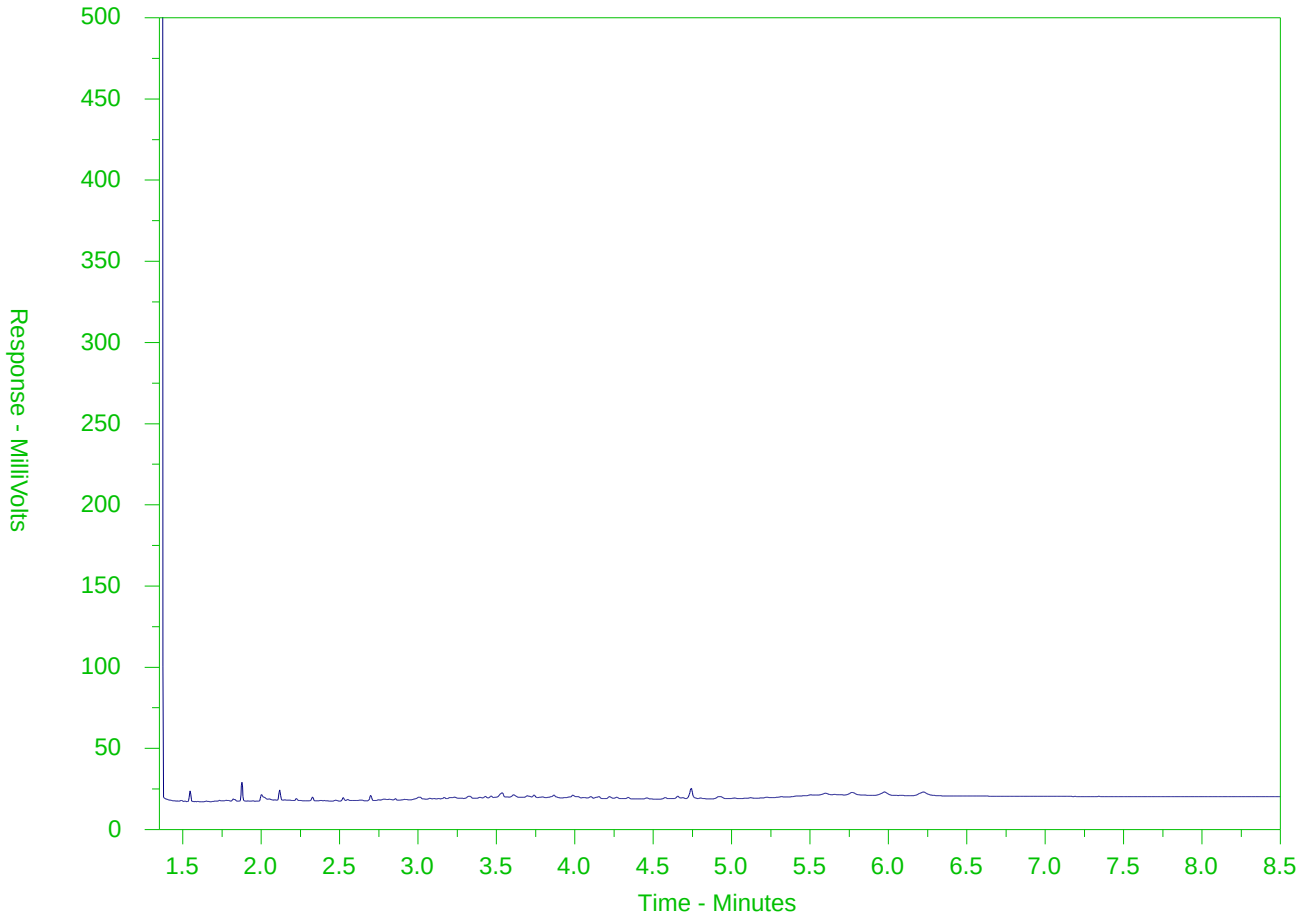
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2412792-004-E601
Client Sample ID: DUPLICATE



← F2 →	← F3 →	← F4 →	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

~~RDA~~ RDM

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # CORD Red Deer Motors

Page 1 of 1

Report to:		**Report Format / Distribution**		**Service Requested:**
Company:	Tetra Tech Canada Inc.	☐ Standard ☐ Other		☑ Regular Service (Default)
Contact:	Darby Madalena	☑ PDF ☑ Excel ☐ Fax		☐ Rush Service (2-3 Days)
Address:	110, 140 Quarry Park Blvd SE, Calgary, AB T2C 3G3	Email 1:	darby.madalena@tetratech.com	☐ Priority Service (1 Day or ASAP)
		Email 2:		☐ Emergency Service (<1 Day / Wkend) - Contact ALS
Phone:	403-723-6867 Fax: 403-203-3301	ALS Digital Crosstab results		**Analysis Request**
Invoice To:	☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →→		
Company:	SAME AS REPORT	**Client / Project Information:**		
Contact:		Job #:	SWM.SWOP04071-04.004	
Address:		PO/AFE:	SWM.SWOP04071-04.004	
Sample		Legal Site Description:		
Phone:	Fax:	Quote #:	CG22-EBAE100-0021	
Lab Work Order # (lab use only)		**ALS Contact:**	Patryk Wojciak	**Sampler (Initials):** Willem Verduyn

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	S5421B - Routine + Metals	S665A.F - BTEX/F1-F2	E611E - VOC	Hazardous?	Highly Contaminated?	Number of Containers
	MW-01		7:15	Water	X	X	X			9
	MW-04A		7:45	Water	X	X	X			5
	MW-05		8:00	Water	X	X	X			9
	Duplicate			Water	X	X	X			9

Guidelines / Regulations	**Special Instructions / Hazardous Details**

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 adjacent worksheet.

								Sample Condition (lab use)	
Relinquished By:	Willem	Date & Time:		Received By:		Date & Time:	9/06/24 15:00	Temperature	Samples Received in Good Condition? Y / N (if not provided details)
Relinquished By:	Verduyn	Date & Time:		Received By:		Date & Time:		5.0	

RDM project

Environmental Division
Calgary
Work Order Reference
CG2412792

Telephone : +1 403 407 1800

CERTIFICATE OF ANALYSIS

Work Order	:	**CG2515185**		
Client	:	**Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	:	Kara Heckert	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	:	204 954 6832	E-mail	: patryk.wojciak@alsglobal.com
Project	:	SWM.SWOP04071-05.004	Telephone	: +1 403 407 1800
PO	:	SWM.SWOP04071-05.004	Date Samples Received	: 17-Oct-2025 13:40
C-O-C number	:	CORD RDM SWS	Date Analysis Commenced	: 17-Oct-2025
Sampler	:	WV	Issue Date	: 25-Oct-2025 09:49
Site	:	----		
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*
Forest Crocker		Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Joshua Stessun	Laboratory Analyst	Organics, Calgary, Alberta
Jyotsnarani Devi	Laboratory Analyst	Organics, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, 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.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L		390	400	336	385	----
Conductivity	----	E100/CG	2.0	µS/cm		876	912	797	872	----
pH	----	E108/CG	0.10	pH units		8.49	8.51	8.46	8.46	----
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	1.2	mg/L		334	351	310	337	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	1.0	mg/L		14.3	16.4	13.6	14.3	----
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	2.0	mg/L		298	315	276	300	----
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L		500	520	454	499	----
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/CG	0.50	mg/L		90.0	90.6	80.2	90.0	----
Fluoride	16984-48-8	E235.F/CG	0.020	mg/L		0.168	0.155	0.170	0.158	----
Nitrate (as N)	14797-55-8	E235.NO3/CG	0.020	mg/L		0.612	0.716	0.655	0.611	----
Nitrite (as N)	14797-65-0	E235.NO2/CG	0.010	mg/L		0.024	0.064	0.025	0.023	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	0.30	mg/L		36.6	38.3	36.2	36.6	----
Nitrate + Nitrite (as N)	----	EC235.N+N/CG	0.0500	mg/L		0.636	0.780	0.680	0.634	----
Ion Balance										
Anion sum	----	EC101/CG	0.10	meq/L		9.31	9.71	8.59	9.35	----
Cation sum	----	EC101/CG	0.10	meq/L		9.99	10.2	8.76	9.87	----
Ion balance (APHA)	----	EC101/CG	0.01	%		3.52	2.46	0.98	2.71	----
Ion balance (cations/anions)	----	EC101/CG	0.010	%		107	105	102	106	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Total Metals										
Aluminum, total	7429-90-5	E420/CG	0.0030	mg/L		0.0419	0.0587	0.0606	0.0438	----
Antimony, total	7440-36-0	E420/CG	0.00010	mg/L		0.00046	0.00041	0.00049	0.00044	----
Arsenic, total	7440-38-2	E420/CG	0.00010	mg/L		0.00096	0.00161	0.00106	0.00099	----
Barium, total	7440-39-3	E420/CG	0.00010	mg/L		0.170	0.192	0.157	0.169	----
Boron, total	7440-42-8	E420/CG	0.010	mg/L		0.065	0.075	0.059	0.065	----
Cadmium, total	7440-43-9	E420/CG	0.0000050	mg/L		0.0000072	0.0000089	0.0000069	0.0000076	----
Calcium, total	7440-70-2	E420/CG	0.050	mg/L		81.0	83.3	72.7	79.7	----
Chromium, total	7440-47-3	E420/CG	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Copper, total	7440-50-8	E420/CG	0.00050	mg/L		0.00169	0.00172	0.00189	0.00170	----
Iron, total	7439-89-6	E420/CG	0.010	mg/L		0.334	0.566	0.381	0.346	----
Lead, total	7439-92-1	E420/CG	0.000050	mg/L		0.000077	0.000101	0.000171	0.000081	----
Magnesium, total	7439-95-4	E420/CG	0.0050	mg/L		43.9	45.0	38.0	43.9	----
Manganese, total	7439-96-5	E420/CG	0.00010	mg/L		0.0792	0.383	0.0998	0.0792	----
Mercury, total	7439-97-6	E508/CG	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
Nickel, total	7440-02-0	E420/CG	0.00050	mg/L		0.00318	0.00379	0.00301	0.00323	----
Potassium, total	7440-09-7	E420/CG	0.050	mg/L		5.02	5.27	4.46	5.02	----
Selenium, total	7782-49-2	E420/CG	0.000050	mg/L		0.000166	0.000212	0.000167	0.000194	----
Silver, total	7440-22-4	E420/CG	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, total	7440-23-5	E420/CG	0.050	mg/L		46.1	46.0	42.5	45.9	----
Uranium, total	7440-61-1	E420/CG	0.000010	mg/L		0.00433	0.00453	0.00376	0.00444	----
Zinc, total	7440-66-6	E420/CG	0.0030	mg/L		0.0257	0.122	0.0300	0.0255	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/CG	0.050	mg/L		80.9	82.2	70.9	79.8	----
Iron, dissolved	7439-89-6	E421/CG	0.010	mg/L		0.035	0.143	0.052	0.034	----
Magnesium, dissolved	7439-95-4	E421/CG	0.0050	mg/L		45.7	47.4	38.7	45.2	----
Manganese, dissolved	7439-96-5	E421/CG	0.00010	mg/L		0.0732	0.373	0.0918	0.0724	----
Potassium, dissolved	7440-09-7	E421/CG	0.050	mg/L		5.18	5.41	4.50	5.11	----
Sodium, dissolved	7440-23-5	E421/CG	0.050	mg/L		47.3	47.3	44.1	46.7	----
Dissolved metals filtration location	----	EP421/CG	-	-		Field	Field	Field	Field	----
Volatile Organic Compounds										
Benzene	71-43-2	E611A/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	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Chloromethane	74-87-3	E611E/CG	5.0	µg/L		<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	----
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	<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	----
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	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Dichloropropylene, 1,1-	563-58-6	E611E/CG	1.0	µg/L		<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	----
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	E611A/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	E611A/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	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW-01 ----	SW-02 ----	SW-03 ----	DUPLICATE ----	----
					Client sampling date / time	16-Oct-2025 15:00	16-Oct-2025 16:10	16-Oct-2025 15:45	16-Oct-2025 00:00	----
						CG2515185-001	CG2515185-002	CG2515185-003	CG2515185-004	----
						Result	Result	Result	Result	----
Volatile Organic Compounds										
Trimethylbenzene, 1,2,4-	95-63-6	E611E/CG	1.0	µg/L		<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	----
Vinyl chloride	75-01-4	E611E/CG	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Xylene, m+p-	179601-23-1	E611A/CG	0.40	µg/L		<0.40	<0.40	<0.40	<0.40	----
Xylene, o-	95-47-6	E611A/CG	0.30	µg/L		<0.30	<0.30	<0.30	<0.30	----
Xylenes, total	1330-20-7	E611A/CG	0.50	µg/L		<0.50	<0.50	<0.50	<0.50	----
Trihalomethanes [THMs], total	----	E611E/CG	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/CG	100	µg/L		<100	<100	<100	<100	----
F1-BTEX	----	EC580/CG	25	µg/L		<100	<100	<100	<100	----
F2 (C10-C16)	----	E601/CG	100	µg/L		<100	<100	<100	<100	----
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/CG	1.0	%		83.2	83.7	86.1	87.8	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/CG	1.0	%		86.0	75.5	84.5	81.3	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611E/CG	1.0	%		92.4	93.1	87.4	88.8	----
Bromofluorobenzene, 4-	460-00-4	E611A/CG	1.0	%		92.4	93.1	87.4	88.8	----
Difluorobenzene, 1,4-	540-36-3	E611E/CG	1.0	%		101	98.3	96.8	99.3	----
Difluorobenzene, 1,4-	540-36-3	E611A/CG	1.0	%		101	98.3	96.8	99.3	----

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

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **CG2515185**	Page	: 1 of 14
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	: Kara Heckert	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	: 204 954 6832	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-05.004	Date Samples Received	: 17-Oct-2025 13:40
PO	: SWM.SWOP04071-05.004	Issue Date	: 25-Oct-2025 09:48
C-O-C number	: CORD RDM SWS		
Sampler	: WV		
Site	: ----		
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 : Chloride in Water by IC										
HDPE DUPLICATE	E235.Cl	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-01	E235.Cl	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-02	E235.Cl	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW-03	E235.Cl	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE DUPLICATE	E235.F	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-01	E235.F	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW-02	E235.F	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	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 : Fluoride in Water by IC										
HDPE SW-03	E235.F	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE DUPLICATE	E235.NO3	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW-01	E235.NO3	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW-02	E235.NO3	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW-03	E235.NO3	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE DUPLICATE	E235.NO2	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW-01	E235.NO2	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW-02	E235.NO2	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW-03	E235.NO2	16-Oct-2025	17-Oct-2025	3 days	1 days	✓	17-Oct-2025	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 DUPLICATE	E235.SO4	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW-01	E235.SO4	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW-02	E235.SO4	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW-03	E235.SO4	16-Oct-2025	17-Oct-2025	28 days	1 days	✓	17-Oct-2025	28 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) DUPLICATE	E421	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW-01	E421	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW-02	E421	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) SW-03	E421	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUPLICATE	E581.F1	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-01	E581.F1	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-02	E581.F1	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) SW-03	E581.F1	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DUPLICATE	E601	16-Oct-2025	21-Oct-2025	14 days	5 days	✓	22-Oct-2025	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-01	E601	16-Oct-2025	21-Oct-2025	14 days	5 days	✓	22-Oct-2025	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-02	E601	16-Oct-2025	21-Oct-2025	14 days	5 days	✓	22-Oct-2025	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) SW-03	E601	16-Oct-2025	21-Oct-2025	14 days	5 days	✓	22-Oct-2025	40 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUPLICATE	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW-01	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-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 : Alkalinity Species by Titration										
HDPE SW-02	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW-03	E290	16-Oct-2025	18-Oct-2025	14 days	2 days	✓	18-Oct-2025	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE DUPLICATE	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-01	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-02	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE SW-03	E100	16-Oct-2025	18-Oct-2025	28 days	2 days	✓	18-Oct-2025	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE SW-02	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	42 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	42 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE DUPLICATE	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	43 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	43 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW-01	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	43 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	43 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 SW-03	E108	16-Oct-2025	18-Oct-2025	0.25 hrs	43 hrs	× EHTR-FM	18-Oct-2025	0.25 hrs	43 hrs	× EHTR-FM
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) DUPLICATE	E508	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW-01	E508	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW-02	E508	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW-03	E508	16-Oct-2025	21-Oct-2025	28 days	5 days	✓	21-Oct-2025	28 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) DUPLICATE	E420	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW-01	E420	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW-02	E420	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW-03	E420	16-Oct-2025	21-Oct-2025	180 days	5 days	✓	21-Oct-2025	180 days	5 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPLICATE	E611A	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-01	E611A	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-02	E611A	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-03	E611A	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) DUPLICATE	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-01	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-02	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 days	✓
Volatile Organic Compounds : VOCs (Prairies List) by Headspace GC-MS										
Glass vial (sodium bisulfate) SW-03	E611E	16-Oct-2025	25-Oct-2025	14 days	9 days	✓	25-Oct-2025	14 days	9 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)							
Conductivity in Water	E100	2284223	1	20	5.0	5.0	✓
pH by Meter	E108	2284222	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	2283644	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	2283643	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	2283645	1	13	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	2283641	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2283642	1	14	7.1	5.0	✓
Alkalinity Species by Titration	E290	2284224	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2288302	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2288305	1	6	16.6	5.0	✓
Total Mercury in Water by CVAAS	E508	2289237	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2298661	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	2298660	1	10	10.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2284223	1	20	5.0	5.0	✓
pH by Meter	E108	2284222	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	2283644	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	2283643	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	2283645	1	13	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	2283641	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2283642	1	14	7.1	5.0	✓
Alkalinity Species by Titration	E290	2284224	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2288302	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2288305	1	6	16.6	5.0	✓
Total Mercury in Water by CVAAS	E508	2289237	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2298661	1	9	11.1	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	2287313	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2298660	1	10	10.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	2284223	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	2283644	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	2283643	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	2283645	1	13	7.6	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							
Nitrate in Water by IC	E235.NO3	2283641	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2283642	1	14	7.1	5.0	✓
Alkalinity Species by Titration	E290	2284224	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2288302	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2288305	1	6	16.6	5.0	✓
Total Mercury in Water by CVAAS	E508	2289237	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2298661	1	9	11.1	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	2287313	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2298660	1	10	10.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	2283644	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	2283643	1	12	8.3	5.0	✓
Nitrite in Water by IC	E235.NO2	2283645	1	13	7.6	5.0	✓
Nitrate in Water by IC	E235.NO3	2283641	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2283642	1	14	7.1	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2288302	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2288305	1	6	16.6	5.0	✓
Total Mercury in Water by CVAAS	E508	2289237	1	5	20.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2298661	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	2298660	1	10	10.0	5.0	✓
VOCs (Prairies List) by Headspace GC-MS	E611E	2298662	1	12	8.3	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.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Calgary	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Calgary	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. 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. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID	E601 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A 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.
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 $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
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).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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).
F1-BTEX	EC580 ALS Environmental - Calgary	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 ALS Environmental - Calgary	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
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.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Calgary	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **CG2515185**	Page	: 1 of 17
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Kara Heckert	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	: 204 954 6832	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-05.004	Date Samples Received	: 17-Oct-2025 13:40
PO	: SWM.SWOP04071-05.004	Date Analysis Commenced	: 17-Oct-2025
C-O-C number	: CORD RDM SWS	Issue Date	: 25-Oct-2025 09:48
Sampler	: WV		
Site	: ----		
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*
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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: 2284222)											
CG2515181-001	Anonymous	pH	----	E108	0.10	pH units	7.88	7.88	0.00%	4%	----
Physical Tests (QC Lot: 2284223)											
CG2515181-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	6210	6220	0.161%	10%	----
Physical Tests (QC Lot: 2284224)											
CG2515185-001	SW-01	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	298	303	1.57%	20%	----
Anions and Nutrients (QC Lot: 2283641)											
CG2515171-001	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: 2283642)											
CG2515171-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	394	393	0.0490%	20%	----
Anions and Nutrients (QC Lot: 2283643)											
CG2515171-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.174	0.168	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2283644)											
CG2515171-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	3.78	3.68	0.10	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2283645)											
CG2515171-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Total Metals (QC Lot: 2288302)											
CG2515161-007	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0050 µg/L	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	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*
Total Metals (QC Lot: 2288302) - continued											
CG2515161-007	Anonymous	Potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 2289237)											
CG2515161-007	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2288305)											
CG2515081-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.500	mg/L	176	179	1.53%	20%	----
		Iron, dissolved	7439-89-6	E421	0.100	mg/L	4.07	4.14	1.66%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	247	251	1.89%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.347	0.355	2.20%	20%	----
		Potassium, dissolved	7440-09-7	E421	0.500	mg/L	188	188	0.204%	20%	----
		Sodium, dissolved	7440-23-5	E421	0.500	mg/L	673	685	1.75%	20%	----
Volatile Organic Compounds (QC Lot: 2298660)											
CG2515008-006	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 2298662)											
CG2515185-001	SW-01	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	----

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: 2298662) - continued											
CG2515185-001	SW-01	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	----
		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	----
		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	----
		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	----

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: 2298662) - continued											
CG2515185-001	SW-01	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	----
Hydrocarbons (QC Lot: 2298661)											
CG2515185-001	SW-01	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	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: 2284223)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2284224)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 2283641)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2283642)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2283643)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2283644)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2283645)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Total Metals (QCLot: 2288302)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 2288302) - continued						
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 2289237)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 2288305)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Volatile Organic Compounds (QCLot: 2298660)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 2298662)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 2298662) - continued						
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	----
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	----
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	----
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 2298662) - continued						
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	<1.0	----
Vinyl chloride	75-01-4	E611E	1	µg/L	<1.0	----
Hydrocarbons (QCLot: 2287313)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Hydrocarbons (QCLot: 2298661)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----

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: 2284222)									
pH	----	E108	----	pH units	7 pH units	102	98.0	102	----
Physical Tests (QCLot: 2284223)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	103	90.0	110	----
Physical Tests (QCLot: 2284224)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	93.3	85.0	115	----
Anions and Nutrients (QCLot: 2283641)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2283642)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2283643)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	106	90.0	110	----
Anions and Nutrients (QCLot: 2283644)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2283645)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	104	90.0	110	----
Total Metals (QCLot: 2288302)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	101	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	99.0	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	96.8	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.8	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	97.2	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	94.8	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	114	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.6	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.4	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 2288302) - continued									
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	95.3	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.2	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	99.1	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	100	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.4	80.0	120	----
Total Metals (QCLot: 2289237)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	94.1	80.0	120	----
Dissolved Metals (QCLot: 2288305)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.9	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	117	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	100.0	80.0	120	----
Volatile Organic Compounds (QCLot: 2298660)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	86.4	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	87.8	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	92.8	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	87.5	70.0	130	----
Volatile Organic Compounds (QCLot: 2298662)									
Bromobenzene	108-86-1	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Bromochloromethane	74-97-5	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Bromodichloromethane	75-27-4	E611E	1	µg/L	100 µg/L	113	70.0	130	----
Bromoform	75-25-2	E611E	1	µg/L	100 µg/L	99.4	70.0	130	----
Bromomethane	74-83-9	E611E	1	µg/L	100 µg/L	112	60.0	140	----
Butylbenzene, n-	104-51-8	E611E	1	µg/L	100 µg/L	92.6	70.0	130	----
Butylbenzene, sec-	135-98-8	E611E	1	µg/L	100 µg/L	105	70.0	130	----
Butylbenzene, tert-	98-06-6	E611E	1	µg/L	100 µg/L	97.5	70.0	130	----
Carbon tetrachloride	56-23-5	E611E	0.5	µg/L	100 µg/L	114	70.0	130	----
Chlorobenzene	108-90-7	E611E	1	µg/L	100 µg/L	101	70.0	130	----
Chloroethane	75-00-3	E611E	1	µg/L	100 µg/L	99.6	60.0	140	----
Chloroform	67-66-3	E611E	1	µg/L	100 µg/L	113	70.0	130	----

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: 2298662) - continued									
Chloromethane	74-87-3	E611E	5	µg/L	100 µg/L	95.1	60.0	140	----
Chlorotoluene, 2-	95-49-8	E611E	1	µg/L	100 µg/L	98.4	70.0	130	----
Chlorotoluene, 4-	106-43-4	E611E	1	µg/L	100 µg/L	109	70.0	130	----
Cymene, p-	99-87-6	E611E	1	µg/L	100 µg/L	93.2	70.0	130	----
Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	1	µg/L	100 µg/L	100	70.0	130	----
Dibromochloromethane	124-48-1	E611E	1	µg/L	100 µg/L	107	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E611E	1	µg/L	100 µg/L	102	70.0	130	----
Dibromomethane	74-95-3	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611E	0.5	µg/L	100 µg/L	102	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611E	1	µg/L	100 µg/L	103	60.0	140	----
Dichloroethane, 1,1-	75-34-3	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611E	1	µg/L	100 µg/L	97.9	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611E	1	µg/L	100 µg/L	107	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611E	1	µg/L	100 µg/L	108	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611E	1	µg/L	100 µg/L	114	70.0	130	----
Dichloromethane	75-09-2	E611E	1	µg/L	100 µg/L	112	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611E	1	µg/L	100 µg/L	104	70.0	130	----
Dichloropropane, 1,3-	142-28-9	E611E	1	µg/L	100 µg/L	91.2	70.0	130	----
Dichloropropane, 2,2-	594-20-7	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Dichloropropylene, 1,1-	563-58-6	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611E	1	µg/L	100 µg/L	90.6	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611E	1	µg/L	100 µg/L	88.8	70.0	130	----
Hexachlorobutadiene	87-68-3	E611E	1	µg/L	100 µg/L	103	70.0	130	----
Isopropylbenzene	98-82-8	E611E	1	µg/L	100 µg/L	89.7	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	0.5	µg/L	100 µg/L	104	70.0	130	----
Propylbenzene, n-	103-65-1	E611E	1	µg/L	100 µg/L	99.0	70.0	130	----
Styrene	100-42-5	E611E	0.5	µg/L	100 µg/L	92.6	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	1	µg/L	100 µg/L	93.4	70.0	130	----
Tetrachloroethylene	127-18-4	E611E	1	µg/L	100 µg/L	110	70.0	130	----
Trichlorobenzene, 1,2,3-	87-61-6	E611E	1	µg/L	100 µg/L	99.2	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E611E	1	µg/L	100 µg/L	95.7	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611E	1	µg/L	100 µg/L	116	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611E	1	µg/L	100 µg/L	100	70.0	130	----

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: 2298662) - continued									
Trichloroethylene	79-01-6	E611E	1	µg/L	100 µg/L	115	70.0	130	----
Trichlorofluoromethane	75-69-4	E611E	1	µg/L	100 µg/L	114	60.0	140	----
Trichloropropane, 1,2,3-	96-18-4	E611E	1	µg/L	100 µg/L	96.8	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E611E	1	µg/L	100 µg/L	98.8	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E611E	1	µg/L	100 µg/L	95.6	70.0	130	----
Vinyl chloride	75-01-4	E611E	1	µg/L	100 µg/L	97.8	60.0	140	----
Hydrocarbons (QCLot: 2287313)									
F2 (C10-C16)	----	E601	100	µg/L	3830 µg/L	95.5	70.0	130	----
Hydrocarbons (QCLot: 2298661)									
F1 (C6-C10)	----	E581.F1	100	µg/L	3090 µg/L	107	60.0	140	----

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: 2283641)										
CG2515171-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.54 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2283642)										
CG2515171-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 2283643)										
CG2515171-001	Anonymous	Fluoride	16984-48-8	E235.F	0.990 mg/L	1 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 2283644)										
CG2515171-001	Anonymous	Chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2283645)										
CG2515171-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.524 mg/L	0.5 mg/L	105	75.0	125	----
Total Metals (QCLot: 2288302)										
CG2515161-007	Anonymous	Aluminum, total	7429-90-5	E420	1.93 mg/L	2 mg/L	96.6	70.0	130	----
		Antimony, total	7440-36-0	E420	0.193 mg/L	0.2 mg/L	96.5	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.195 mg/L	0.2 mg/L	97.6	70.0	130	----
		Barium, total	7440-39-3	E420	0.196 mg/L	0.2 mg/L	98.2	70.0	130	----
		Boron, total	7440-42-8	E420	0.967 mg/L	1 mg/L	96.7	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	----
		Calcium, total	7440-70-2	E420	39.0 mg/L	40 mg/L	97.6	70.0	130	----
		Chromium, total	7440-47-3	E420	0.382 mg/L	0.4 mg/L	95.5	70.0	130	----
		Copper, total	7440-50-8	E420	0.187 mg/L	0.2 mg/L	93.7	70.0	130	----
		Iron, total	7439-89-6	E420	19.0 mg/L	20 mg/L	95.2	70.0	130	----
		Lead, total	7439-92-1	E420	0.197 mg/L	0.2 mg/L	98.4	70.0	130	----
		Magnesium, total	7439-95-4	E420	9.63 mg/L	10 mg/L	96.3	70.0	130	----
		Manganese, total	7439-96-5	E420	0.192 mg/L	0.2 mg/L	95.9	70.0	130	----
		Nickel, total	7440-02-0	E420	0.378 mg/L	0.4 mg/L	94.6	70.0	130	----
		Potassium, total	7440-09-7	E420	38.7 mg/L	40 mg/L	96.7	70.0	130	----
		Selenium, total	7782-49-2	E420	0.388 mg/L	0.4 mg/L	97.1	70.0	130	----
		Silver, total	7440-22-4	E420	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		Sodium, total	7440-23-5	E420	19.2 mg/L	20 mg/L	96.2	70.0	130	----
		Uranium, total	7440-61-1	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		Zinc, total	7440-66-6	E420	3.77 mg/L	4 mg/L	94.2	70.0	130	----
Total Metals (QCLot: 2289237)										
CG2515185-001	SW-01	Mercury, total	7439-97-6	E508	0.000116 mg/L	0 mg/L	116	70.0	130	----
Dissolved Metals (QCLot: 2288305)										
CG2515161-007	Anonymous	Calcium, dissolved	7440-70-2	E421	39.1 mg/L	40 mg/L	97.8	70.0	130	----
		Iron, dissolved	7439-89-6	E421	19.3 mg/L	20 mg/L	96.4	70.0	130	----

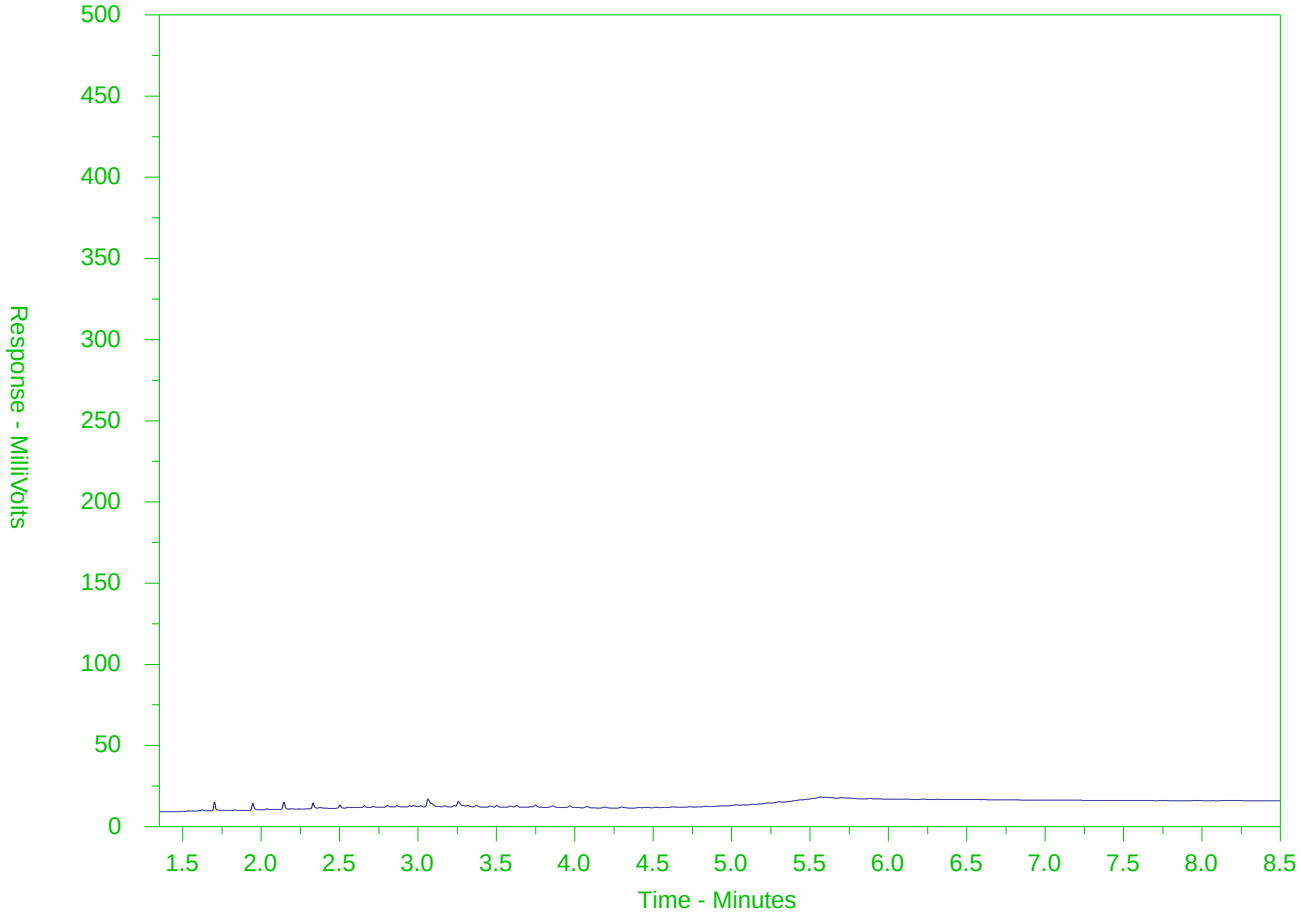
Sub-Matrix: **Water**

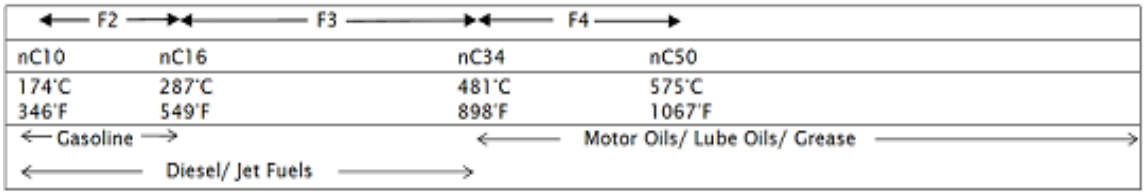
					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 2288305) - continued										
CG2515161-007	Anonymous	Magnesium, dissolved	7439-95-4	E421	9.97 mg/L	10 mg/L	99.7	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.191 mg/L	0.2 mg/L	95.7	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	39.5 mg/L	40 mg/L	98.7	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	19.6 mg/L	20 mg/L	98.0	70.0	130	----
Volatile Organic Compounds (QCLot: 2298660)										
CG2515008-006	Anonymous	Benzene	71-43-2	E611A	100 µg/L	100 µg/L	100	70.0	130	----
		Ethylbenzene	100-41-4	E611A	98.5 µg/L	100 µg/L	98.5	70.0	130	----
		Toluene	108-88-3	E611A	99.8 µg/L	100 µg/L	99.8	70.0	130	----
		Xylene, m+p-	179601-23-1	E611A	213 µg/L	200 µg/L	106	70.0	130	----
		Xylene, o-	95-47-6	E611A	100 µg/L	100 µg/L	100	70.0	130	----
Volatile Organic Compounds (QCLot: 2298662)										
CG2515185-001	SW-01	Bromobenzene	108-86-1	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Bromochloromethane	74-97-5	E611E	117 µg/L	100 µg/L	117	70.0	130	----
		Bromodichloromethane	75-27-4	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Bromoform	75-25-2	E611E	104 µg/L	100 µg/L	104	70.0	130	----
		Bromomethane	74-83-9	E611E	126 µg/L	100 µg/L	126	60.0	140	----
		Butylbenzene, n-	104-51-8	E611E	90.5 µg/L	100 µg/L	90.5	70.0	130	----
		Butylbenzene, sec-	135-98-8	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Butylbenzene, tert-	98-06-6	E611E	96.4 µg/L	100 µg/L	96.4	70.0	130	----
		Carbon tetrachloride	56-23-5	E611E	110 µg/L	100 µg/L	110	70.0	130	----
		Chlorobenzene	108-90-7	E611E	102 µg/L	100 µg/L	102	70.0	130	----
		Chloroethane	75-00-3	E611E	105 µg/L	100 µg/L	105	60.0	140	----
		Chloroform	67-66-3	E611E	106 µg/L	100 µg/L	106	70.0	130	----
		Chloromethane	74-87-3	E611E	100 µg/L	100 µg/L	100	60.0	140	----
		Chlorotoluene, 2-	95-49-8	E611E	99.7 µg/L	100 µg/L	99.7	70.0	130	----
		Chlorotoluene, 4-	106-43-4	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Cymene, p-	99-87-6	E611E	91.3 µg/L	100 µg/L	91.3	70.0	130	----
		Dibromo-3-chloropropane, 1,2-	96-12-8	E611E	101 µg/L	100 µg/L	101	70.0	130	----
		Dibromochloromethane	124-48-1	E611E	108 µg/L	100 µg/L	108	70.0	130	----
		Dibromoethane, 1,2-	106-93-4	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dibromomethane	74-95-3	E611E	111 µg/L	100 µg/L	111	70.0	130	----
		Dichlorobenzene, 1,2-	95-50-1	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dichlorobenzene, 1,3-	541-73-1	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Dichlorobenzene, 1,4-	106-46-7	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Dichlorodifluoromethane	75-71-8	E611E	109 µg/L	100 µg/L	109	60.0	140	----
		Dichloroethane, 1,1-	75-34-3	E611E	109 µg/L	100 µg/L	109	70.0	130	----
		Dichloroethane, 1,2-	107-06-2	E611E	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		Dichloroethylene, 1,1-	75-35-4	E611E	112 µg/L	100 µg/L	112	70.0	130	----
		Dichloroethylene, cis-1,2-	156-59-2	E611E	99.1 µg/L	100 µg/L	99.1	70.0	130	----
		Dichloroethylene, trans-1,2-	156-60-5	E611E	123 µg/L	100 µg/L	123	70.0	130	----
		Dichloromethane	75-09-2	E611E	126 µg/L	100 µg/L	126	70.0	130	----
		Dichloropropane, 1,2-	78-87-5	E611E	99.5 µg/L	100 µg/L	99.5	70.0	130	----
		Dichloropropane, 1,3-	142-28-9	E611E	91.0 µg/L	100 µg/L	91.0	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: 2298662) - continued										
CG2515185-001	SW-01	Dichloropropane, 2,2-	594-20-7	E611E	93.9 µg/L	100 µg/L	93.9	70.0	130	----
		Dichloropropylene, 1,1-	563-58-6	E611E	94.8 µg/L	100 µg/L	94.8	70.0	130	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611E	94.9 µg/L	100 µg/L	94.9	70.0	130	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611E	88.1 µg/L	100 µg/L	88.1	70.0	130	----
		Hexachlorobutadiene	87-68-3	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Isopropylbenzene	98-82-8	E611E	90.5 µg/L	100 µg/L	90.5	70.0	130	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611E	103 µg/L	100 µg/L	103	70.0	130	----
		Propylbenzene, n-	103-65-1	E611E	104 µg/L	100 µg/L	104	70.0	130	----
		Styrene	100-42-5	E611E	89.8 µg/L	100 µg/L	89.8	70.0	130	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611E	114 µg/L	100 µg/L	114	70.0	130	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611E	95.3 µg/L	100 µg/L	95.3	70.0	130	----
		Tetrachloroethylene	127-18-4	E611E	107 µg/L	100 µg/L	107	70.0	130	----
		Trichlorobenzene, 1,2,3-	87-61-6	E611E	99.3 µg/L	100 µg/L	99.3	70.0	130	----
		Trichlorobenzene, 1,2,4-	120-82-1	E611E	95.1 µg/L	100 µg/L	95.1	70.0	130	----
		Trichloroethane, 1,1,1-	71-55-6	E611E	110 µg/L	100 µg/L	110	70.0	130	----
		Trichloroethane, 1,1,2-	79-00-5	E611E	105 µg/L	100 µg/L	105	70.0	130	----
		Trichloroethylene	79-01-6	E611E	120 µg/L	100 µg/L	120	70.0	130	----
		Trichlorofluoromethane	75-69-4	E611E	124 µg/L	100 µg/L	124	60.0	140	----
		Trichloropropane, 1,2,3-	96-18-4	E611E	97.4 µg/L	100 µg/L	97.4	70.0	130	----
		Trimethylbenzene, 1,2,4-	95-63-6	E611E	97.6 µg/L	100 µg/L	97.6	70.0	130	----
		Trimethylbenzene, 1,3,5-	108-67-8	E611E	96.8 µg/L	100 µg/L	96.8	70.0	130	----
		Vinyl chloride	75-01-4	E611E	103 µg/L	100 µg/L	103	60.0	140	----
Hydrocarbons (QCLot: 2298661)										
CG2515185-001	SW-01	F1 (C6-C10)	----	E581.F1	2790 µg/L	3090 µg/L	90.4	60.0	140	----

ALS Sample ID: CG2515185-001-E601
Client Sample ID: SW-01





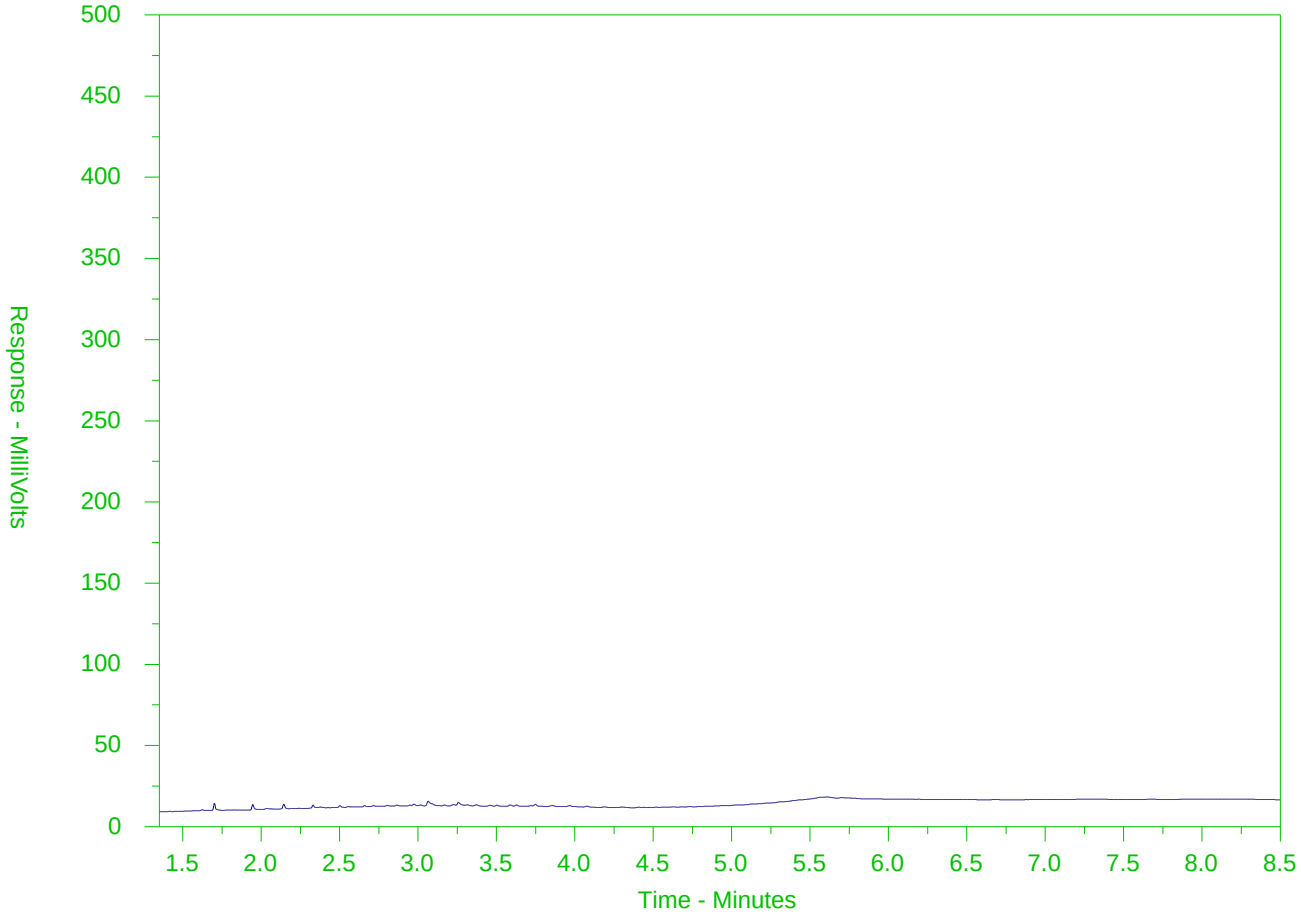
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

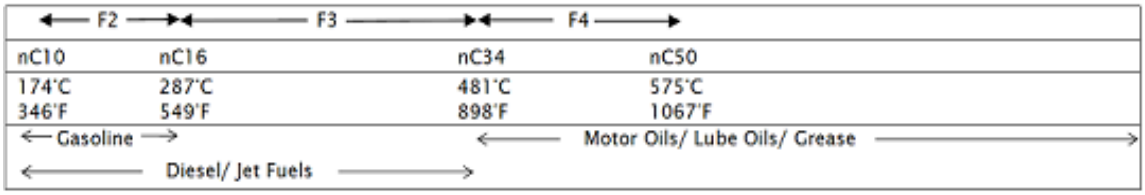
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2515185-002-E601
Client Sample ID: SW-02





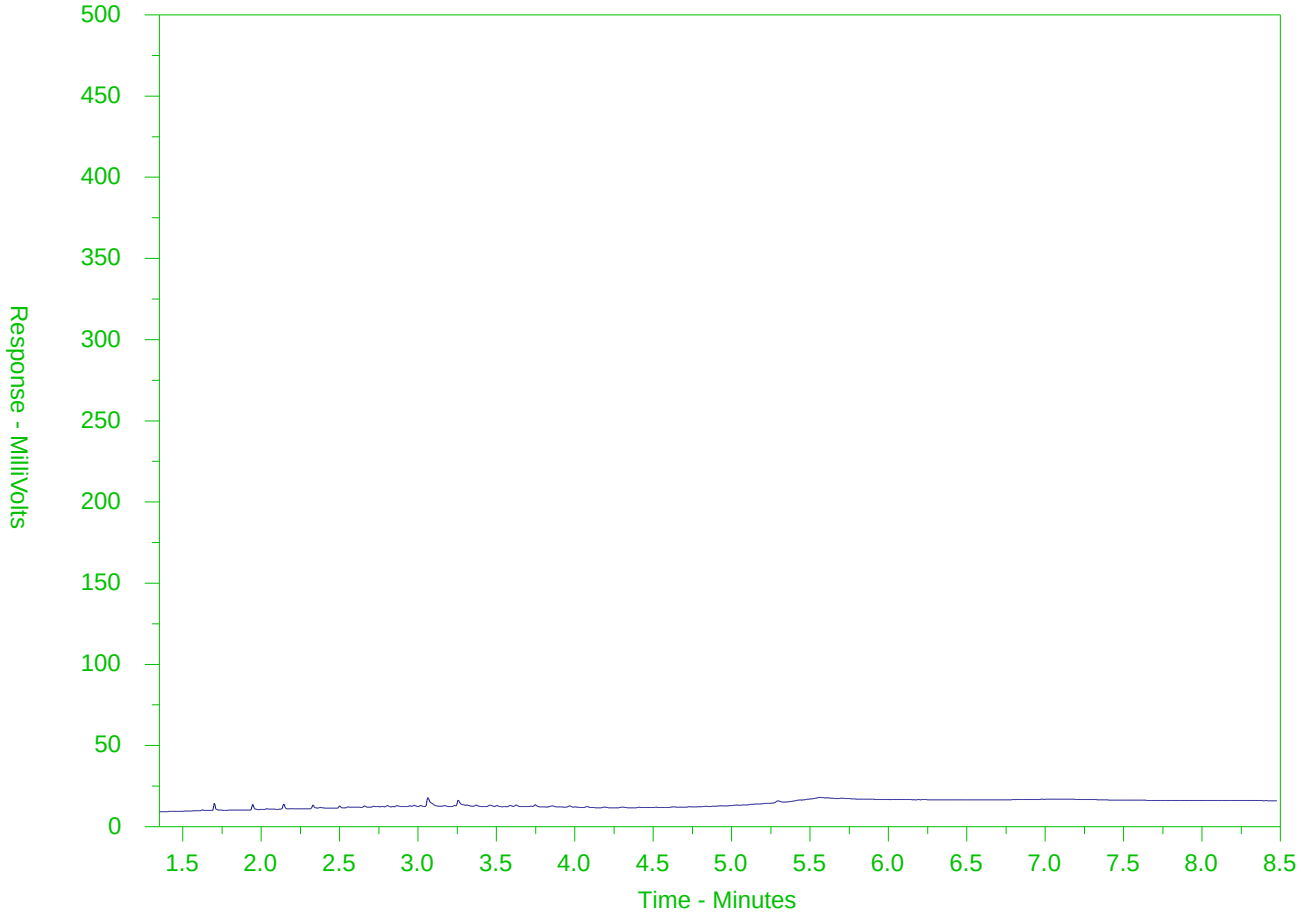
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

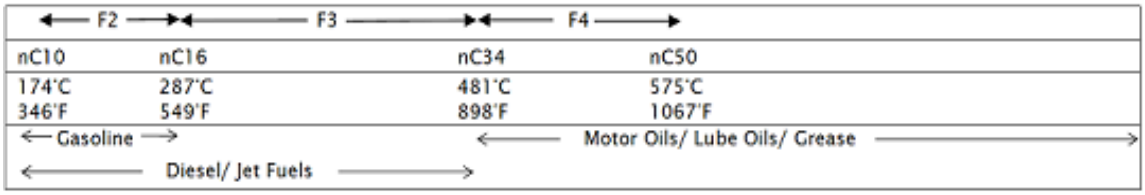
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2515185-003-E601
Client Sample ID: SW-03





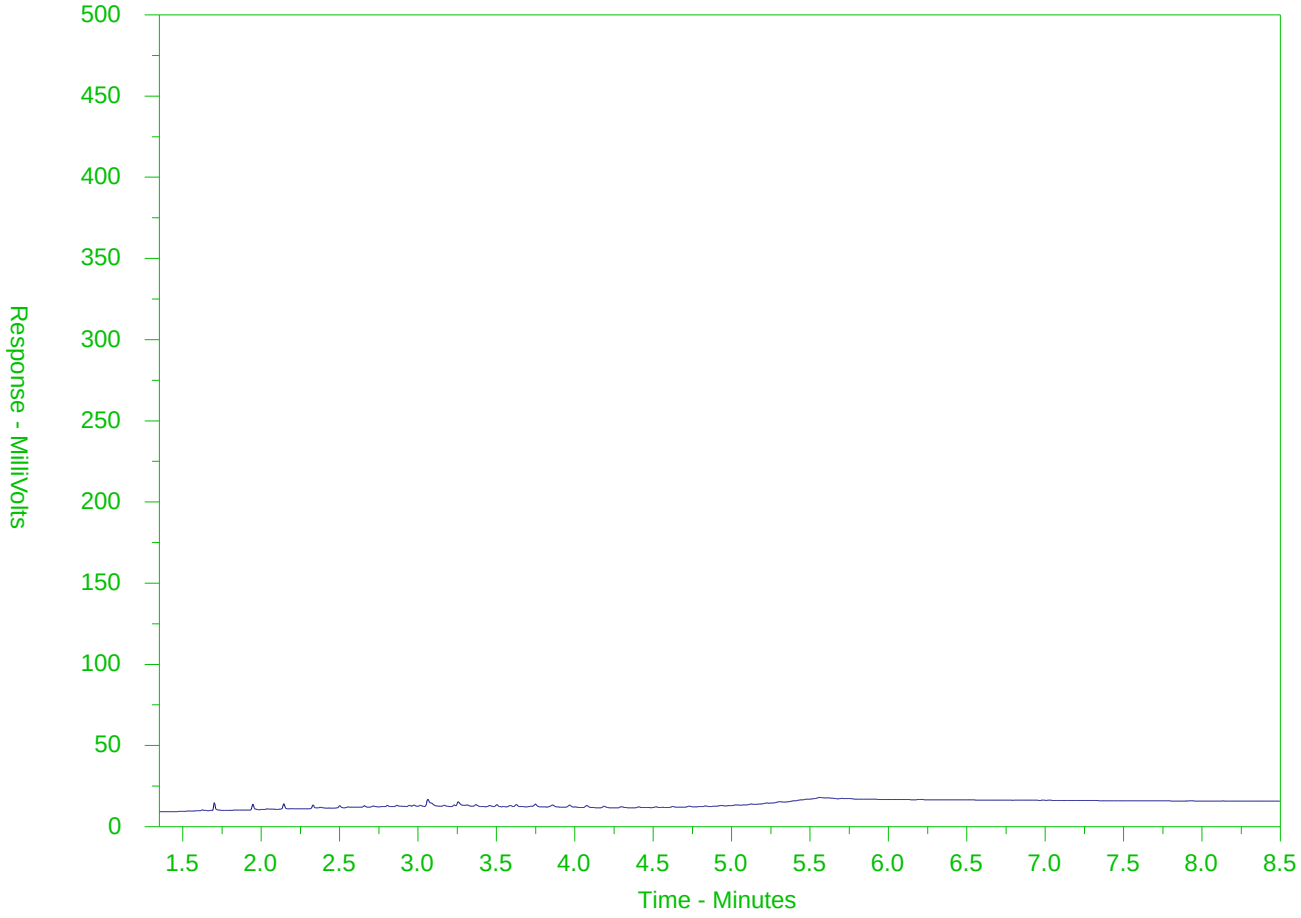
The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

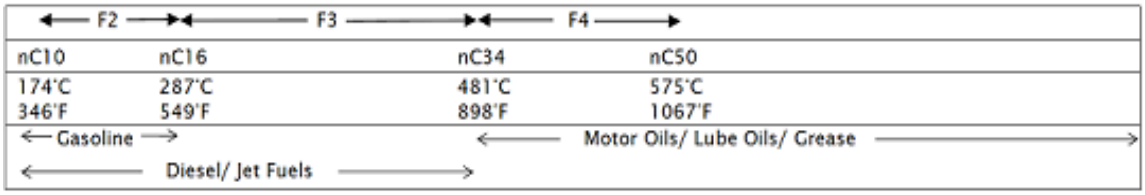
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Sample ID: CG2515185-004-E601
Client Sample ID: DUPLICATE





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # CORD RDM SWs

Report to:		**Report Format / Distribution**	**Service Requested:**
Company:	Tetra Tech Canada Inc.	☐ Standard ☐ Other	☑ Regular Service (Default)
Contact:	Kara Heckert	☑ PDF ☑ Excel ☐ Fax	☐ Rush Service (2-3 Days)
Address:	110, 140 Quarry Park Blvd SE, Calgary, AB T2C 3G3	Email 1: kara.heckert@tetratech.com	☐ Priority Service (1 Day or ASAP)
		Email 2: willem.verduyn@tetratech.com	☐ Emergency Service (<1 Day / Wkend) - Contact ALS
Phone:	431-554-1745 Fax: 403-203-3301	ALS Digital Crosstab results	**Analysis Request**
Invoice To:	☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →→	
Company:	SAME AS REPORT	**Client / Project Information:**	
Contact:		Job #: SWM.SWOP04071-05.004	
Address:		PO/AFE: SWM.SWOP04071-05.004	
Sample		Legal Site Description:	
Phone:	Fax:	Quote #: CG22-EBAE100-0021	
Lab Work Order # (lab use only)		ALS Contact: Patryk Wojciak	Sampler (Initials): WV Willem Verduyn

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	Routine	Total Metals	S665A,F (BTEX, F1 and F2)	E611E - VOCs
	SW-01	16-10-25	15:06	Water	X	X	X	X
	SW-02	↓	16:10	Water	X	X	X	X
	SW-03	↓	15:45	Water	X	X	X	X
	Duplicate	↓		Water	X	X	X	X

Environmental Division
Calgary
Work Order Reference
CG2515185

Telephone: ...

Guidelines / Regulations	Special Instructions / Hazardous Details
	QUOTE CG2022EBAE1000021

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 adjacent worksheet.

Relinquished By:	Willem Verduyn	Date & Time:	Oct 17/25	Received By:	[signature]	Date & Time:	10/17 13:40
Relinquished By:		Date & Time:		Received By:		Date & Time:	

Sample Condition (lab use only)
Temperature: 8.6
Samples Received in Good Condition? Y / N (if no provided details)

CERTIFICATE OF ANALYSIS

Work Order	:	**CG2517661**		
Client	:	**Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Calgary
Contact	:	Kara Heckert	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	:	204 954 6832	E-mail	: patryk.wojciak@alsglobal.com
Project	:	SWM.SWOP04071-05.004	Telephone	: +1 403 407 1800
PO	:	SWM.SWOP04071-05.004	Date Samples Received	: 04-Dec-2025 12:50
C-O-C number	:	CORD RDM VWs	Date Analysis Commenced	: 08-Dec-2025
Sampler	:	WV	Issue Date	: 18-Dec-2025 16:48
Site	:	----		
Quote number	:	CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	:	3		
No. of samples analysed	:	3		

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.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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	Client sample ID: 24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time: 03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
					CG2517661-001	CG2517661-002	CG2517661-003	----	----
					Result	Result	Result	----	----
Field Tests									
ID, batch proof	----	EF001/WT	-	-	251109.107	251104.203	251015.113	----	----
ID, canister	----	EF001/WT	-	-	01400-0748	01400-0782	01400-0704	----	----
ID, regulator	----	EF001/WT	-	-	G127	G141	G491	----	----
Pressure on receipt	----	EF001/WT	0.10	inches Hg	-8.58	-8.78	-10.2	----	----
Permanent Gases									
Carbon dioxide	124-38-9	E629B-H/WT	0.050	%	17.3	0.472	20.9	----	----
Carbon monoxide	630-08-0	E629B-H/WT	0.050	%	<0.050	<0.050	<0.050	----	----
Methane	74-82-8	E629B-H/WT	0.050	%	7.41	0.169	31.6	----	----
Nitrogen	7727-37-9	E629B-H/WT	1.0	%	70.9	76.9	43.9	----	----
Oxygen	7782-44-7	E629B-H/WT	0.10	%	2.81	23.4	2.48	----	----
Volatile Organic Compounds									
Acetone	67-64-1	E621B/WT	1.0	ppbv	<372 DLM	2.9	<4.7 DLQ	----	----
Acetone	67-64-1	EC621B/WT	2.4	µg/m³	<884	6.9	<11.2	----	----
Allyl chloride	107-05-1	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----
Allyl chloride	107-05-1	EC621B/WT	0.63	µg/m³	<233	<0.63	<0.66	----	----
Benzene	71-43-2	E621B/WT	0.10	ppbv	<37.2 DLM	0.68	1.31	----	----
Benzene	71-43-2	EC621B/WT	0.32	µg/m³	<119	2.17	4.19	----	----
Benzyl chloride	100-44-7	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----
Benzyl chloride	100-44-7	EC621B/WT	1.0	µg/m³	<385	<1.0	<1.1	----	----
Bromodichloromethane	75-27-4	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----
Bromodichloromethane	75-27-4	EC621B/WT	1.3	µg/m³	<498	<1.3	<1.4	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Bromoform	75-25-2	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Bromoform	75-25-2	EC621B/WT	2.1	µg/m³		<768	<2.1	<2.2	----	----
Bromomethane	74-83-9	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Bromomethane	74-83-9	EC621B/WT	0.78	µg/m³		<289	<0.78	<0.82	----	----
Butadiene, 1,3-	106-99-0	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<22.6 DLQ	----	----
Butadiene, 1,3-	106-99-0	EC621B/WT	0.44	µg/m³		<164	<0.44	<50.0	----	----
Carbon disulfide	75-15-0	E621B/WT	0.50	ppbv		<186 DLM	<0.51	<0.52	----	----
Carbon disulfide	75-15-0	EC621B/WT	1.6	µg/m³		<579	<1.6	<1.6	----	----
Carbon tetrachloride	56-23-5	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Carbon tetrachloride	56-23-5	EC621B/WT	1.30	µg/m³		<467	<1.26	<1.32	----	----
Chlorobenzene	108-90-7	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Chlorobenzene	108-90-7	EC621B/WT	0.92	µg/m³		<342	<0.92	<0.97	----	----
Chloroethane	75-00-3	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<4.34 DLQ	----	----
Chloroethane	75-00-3	EC621B/WT	0.53	µg/m³		<196	<0.53	<11.5	----	----
Chloroform	67-66-3	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Chloroform	67-66-3	EC621B/WT	0.98	µg/m³		<363	<0.98	<1.03	----	----
Chloromethane	74-87-3	E621B/WT	0.20	ppbv		<74.3 DLM	<0.43 DLQ	<12.4 DLQ	----	----
Chloromethane	74-87-3	EC621B/WT	0.41	µg/m³		<153	<0.89	<25.6	----	----
Cyclohexane	110-82-7	E621B/WT	0.20	ppbv		6900 DLM	5.19	0.43	----	----
Cyclohexane	110-82-7	EC621B/WT	0.69	µg/m³		23700	17.9	1.48	----	----
Dibromochloromethane	124-48-1	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Dibromochloromethane	124-48-1	EC621B/WT	1.7	µg/m³		<633	<1.7	<1.8	----	----
Dibromoethane, 1,2-	106-93-4	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dibromoethane, 1,2-	106-93-4	EC621B/WT	1.5	µg/m³		<571	<1.5	<1.6	----	----
Dichlorobenzene, 1,2-	95-50-1	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichlorobenzene, 1,2-	95-50-1	EC621B/WT	1.2	µg/m³		<447	<1.2	<1.3	----	----
Dichlorobenzene, 1,3-	541-73-1	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichlorobenzene, 1,3-	541-73-1	EC621B/WT	1.2	µg/m³		<447	<1.2	<1.3	----	----
Dichlorobenzene, 1,4-	106-46-7	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichlorobenzene, 1,4-	106-46-7	EC621B/WT	1.2	µg/m³		<447	<1.2	<1.3	----	----
Dichlorodifluoromethane	75-71-8	E621B/WT	0.20	ppbv		<74.3 DLM	1.43	1680	----	----
Dichlorodifluoromethane	75-71-8	EC621B/WT	1.0	µg/m³		<367	7.1	8310	----	----
Dichloroethane, 1,1-	75-34-3	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichloroethane, 1,1-	75-34-3	EC621B/WT	0.81	µg/m³		<301	<0.81	<0.85	----	----
Dichloroethane, 1,2-	107-06-2	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichloroethane, 1,2-	107-06-2	EC621B/WT	0.81	µg/m³		<301	<0.81	<0.85	----	----
Dichloroethylene, 1,1-	75-35-4	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichloroethylene, 1,1-	75-35-4	EC621B/WT	0.79	µg/m³		<295	<0.79	<0.83	----	----
Dichloroethylene, cis-1,2-	156-59-2	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichloroethylene, cis-1,2-	156-59-2	EC621B/WT	0.79	µg/m³		<295	<0.79	<0.83	----	----
Dichloroethylene, trans-1,2-	156-60-5	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Dichloroethylene, trans-1,2-	156-60-5	EC621B/WT	0.79	µg/m³		<295	<0.79	<0.83	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Dichloromethane	75-09-2	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Dichloromethane	75-09-2	EC621B/WT	0.69	µg/m³	<258	<0.69	<0.73	----	----	
Dichloropropane, 1,2-	78-87-5	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Dichloropropane, 1,2-	78-87-5	EC621B/WT	0.9	µg/m³	<343	<0.9	<1.0	----	----	
Dichloropropylene, cis-1,3-	10061-01-5	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Dichloropropylene, cis-1,3-	10061-01-5	EC621B/WT	0.9	µg/m³	<337	<0.9	<1.0	----	----	
Dichloropropylene, cis+trans-1,3-	542-75-6	E621B/WT	0.30	ppbv	<105 DLM	<0.30	<0.30	----	----	
Dichloropropylene, cis+trans-1,3-	542-75-6	EC621B/WT	1.3	µg/m³	<674	<1.8	<1.9	----	----	
Dichloropropylene, trans-1,3-	10061-02-6	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Dichloropropylene, trans-1,3-	10061-02-6	EC621B/WT	0.9	µg/m³	<337	<0.9	<1.0	----	----	
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<750 DLQ	----	----	
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	EC621B/WT	1.4	µg/m³	<519	<1.4	<5240	----	----	
Dioxane, 1,4-	123-91-1	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Dioxane, 1,4-	123-91-1	EC621B/WT	0.72	µg/m³	<268	<0.72	<0.76	----	----	
Ethyl acetate	141-78-6	E621B/WT	0.20	ppbv	<470 DLQ	<0.20	<0.21	----	----	
Ethyl acetate	141-78-6	EC621B/WT	0.72	µg/m³	<1690	<0.72	<0.76	----	----	
Ethylbenzene	100-41-4	E621B/WT	0.10	ppbv	<37.2 DLM	0.39	0.57	----	----	
Ethylbenzene	100-41-4	EC621B/WT	0.43	µg/m³	<162	1.69	2.47	----	----	
Ethyltoluene, 4-	622-96-8	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Ethyltoluene, 4-	622-96-8	EC621B/WT	1.0	µg/m³	<365	<1.0	<1.0	----	----	
Heptane, n-	142-82-5	E621B/WT	0.20	ppbv	2540 DLM	3.73	0.55	----	----	

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Heptane, n-	142-82-5	EC621B/WT	0.82	µg/m³		10400	15.3	2.25	----	----
Hexachlorobutadiene	87-68-3	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Hexachlorobutadiene	87-68-3	EC621B/WT	2.1	µg/m³		<792	<2.1	<2.2	----	----
Hexane, n-	110-54-3	E621B/WT	0.20	ppbv		9300 DLM	8.26	22.6	----	----
Hexane, n-	110-54-3	EC621B/WT	0.70	µg/m³		32800	29.1	79.7	----	----
Hexanone, 2-	591-78-6	E621B/WT	1.0	ppbv		<1160 DLQ	<1.3 DLQ	<1.0	----	----
Hexanone, 2-	591-78-6	EC621B/WT	4.10	µg/m³		<4750	<5.33	<4.10	----	----
Isopropylbenzene	98-82-8	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Isopropylbenzene	98-82-8	EC621B/WT	1.0	µg/m³		<365	<1.0	<1.0	----	----
Methyl ethyl ketone [MEK]	78-93-3	E621B/WT	0.20	ppbv		<74.3 DLM	0.21	<0.21	----	----
Methyl ethyl ketone [MEK]	78-93-3	EC621B/WT	0.59	µg/m³		<219	0.62	<0.62	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	EC621B/WT	0.82	µg/m³		<304	<0.82	<0.86	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	EC621B/WT	0.72	µg/m³		<268	<0.72	<0.76	----	----
Naphthalene	91-20-3	E621B/WT	0.10	ppbv		<37.2 DLM	<0.10	<0.10	----	----
Naphthalene	91-20-3	EC621B/WT	0.52	µg/m³		<195	<0.52	<0.52	----	----
Propylene	115-07-1	E621B/WT	0.20	ppbv		<135 DLQ	<1.58 DLQ	<568 DLQ	----	----
Propylene	115-07-1	EC621B/WT	0.34	µg/m³		<232	<2.72	<978	----	----
Styrene	100-42-5	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Styrene	100-42-5	EC621B/WT	0.85	µg/m³		<317	<0.85	<0.89	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Tetrachloroethane, 1,1,2,2-	79-34-5	EC621B/WT	1.4	µg/m³	<510	<1.4	<1.4	----	----	
Tetrachloroethylene	127-18-4	E621B/WT	0.20	ppbv	<74.3 DLM	3.92	0.34	----	----	
Tetrachloroethylene	127-18-4	EC621B/WT	1.4	µg/m³	<504	26.6	2.3	----	----	
Tetrahydrofuran	109-99-9	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Tetrahydrofuran	109-99-9	EC621B/WT	0.59	µg/m³	<219	<0.59	<0.62	----	----	
Toluene	108-88-3	E621B/WT	0.10	ppbv	<37.2 DLM	1.88	3.95	----	----	
Toluene	108-88-3	EC621B/WT	0.38	µg/m³	<140	7.09	14.9	----	----	
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	EC621B/WT	1.5	µg/m³	<569	<1.5	<1.6	----	----	
Trichlorobenzene, 1,2,4-	120-82-1	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Trichlorobenzene, 1,2,4-	120-82-1	EC621B/WT	1.5	µg/m³	<551	<1.5	<1.6	----	----	
Trichloroethane, 1,1,1-	71-55-6	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Trichloroethane, 1,1,1-	71-55-6	EC621B/WT	1.1	µg/m³	<405	<1.1	<1.1	----	----	
Trichloroethane, 1,1,2-	79-00-5	E621B/WT	0.20	ppbv	<74.3 DLM	<0.20	<0.21	----	----	
Trichloroethane, 1,1,2-	79-00-5	EC621B/WT	1.1	µg/m³	<405	<1.1	<1.1	----	----	
Trichloroethylene	79-01-6	E621B/WT	0.20	ppbv	<74.3 DLM	5.04	20.7	----	----	
Trichloroethylene	79-01-6	EC621B/WT	1.1	µg/m³	<399	27.1	111	----	----	
Trichlorofluoromethane	75-69-4	E621B/WT	0.20	ppbv	<74.3 DLM	1.53	<0.62 DLQ	----	----	
Trichlorofluoromethane	75-69-4	EC621B/WT	1.1	µg/m³	<417	8.6	<3.5	----	----	
Trimethylbenzene, 1,2,4-	95-63-6	E621B/WT	0.20	ppbv	<74.3 DLM	0.46	0.50	----	----	

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Volatile Organic Compounds										
Trimethylbenzene, 1,2,4-	95-63-6	EC621B/WT	1.0	µg/m³		<365	2.3	2.5	----	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Trimethylbenzene, 1,3,5-	108-67-8	EC621B/WT	1.0	µg/m³		<365	<1.0	<1.0	----	----
Trimethylpentane, 2,2,4-	540-84-1	E621B/WT	0.20	ppbv		405 AI	0.54 AI	1.19	----	----
Trimethylpentane, 2,2,4-	540-84-1	EC621B/WT	0.9	µg/m³		1890	2.5	5.6	----	----
Vinyl acetate	108-05-4	E621B/WT	0.50	ppbv		<556 DLQ	<0.51	<29.5 DLQ	----	----
Vinyl acetate	108-05-4	EC621B/WT	1.8	µg/m³		<1960	<1.8	<104	----	----
Vinyl bromide	593-60-2	E621B/WT	0.20	ppbv		<74.3 DLM	<0.20	<0.21	----	----
Vinyl bromide	593-60-2	EC621B/WT	0.9	µg/m³		<325	<0.9	<0.9	----	----
Vinyl chloride	75-01-4	E621B/WT	0.20	ppbv		545 DLM	<0.20	<36.6 DLQ	----	----
Vinyl chloride	75-01-4	EC621B/WT	0.51	µg/m³		1390	<0.51	<93.5	----	----
Xylene, m+p-	179601-23-1	E621B/WT	0.20	ppbv		<74.3 DLM	1.60	2.29	----	----
Xylene, m+p-	179601-23-1	EC621B/WT	0.87	µg/m³		<323	6.95	9.94	----	----
Xylene, o-	95-47-6	E621B/WT	0.10	ppbv		<37.2 DLM	0.53	0.71	----	----
Xylene, o-	95-47-6	EC621B/WT	0.43	µg/m³		<162	2.30	3.08	----	----
Xylenes, total	1330-20-7	E621B/WT	0.30	ppbv		<83.1	2.13	3.00	----	----
Xylenes, total	1330-20-7	EC621B/WT	1.3	µg/m³		<484	9.2	13.0	----	----
BTEX, total	----	E621B/WT	0.30	ppbv		<105 DLM	5.08	8.83	----	----
BTEX, total	----	EC621B/WT	1.2	µg/m³		<905	20.2	34.6	----	----
Hydrocarbons										
Aliphatic (C10-C12)	----	E593C/WT	15	µg/m³		13900 DLHC	<15	<15	----	----

Analytical Results

Sub-Matrix: Canister
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	24VW-01 ----	VW-02 ----	25VW-04 ----	----	----
					Client sampling date / time	03-Dec-2025 08:44	03-Dec-2025 09:15	03-Dec-2025 09:34	----	----
						CG2517661-001	CG2517661-002	CG2517661-003	----	----
						Result	Result	Result	----	----
Hydrocarbons										
Aliphatic (C12-C16)	----	E593C/WT	30	µg/m³	<5430 DLHC	<30	<30	----	----	
Aliphatic (C6-C8)	----	E593C/WT	15	µg/m³	298000 DLHC	280	297	----	----	
Aliphatic (C8-C10)	----	E593C/WT	15	µg/m³	74300 DLHC	158	107	----	----	
Aromatic (C10-C12)	----	E593C/WT	15	µg/m³	<5520 DLHC	<15	<15	----	----	
Aromatic (C12-C16)	----	E593C/WT	30	µg/m³	<11000 DLHC	<30	<30	----	----	
Aromatic (C6-C8)	----	E593C/WT	15	µg/m³	<5520 DLHC	<15	<15	----	----	
Aromatic (C8-C10)	----	E593C/WT	15	µg/m³	<5520 DLHC	<15	<15	----	----	
F1 (C6-C10)	----	E593A/WT	15	µg/m³	354000 DLHC	454	417	----	----	
F1-BTEX	----	EC592A/WT	15	µg/m³	354000	434	382	----	----	
F2 (C10-C16)	----	E593A/WT	15	µg/m³	18700 DLHC	26	22	----	----	
F2-Naphthalene	----	EC593D/WT	15	µg/m³	18700	26	22	----	----	
TVOC (C10-C12)	----	E593C/WT	15	µg/m³	13900 DLHC	<15	<15	----	----	
TVOC (C12-C16)	----	E593C/WT	30	µg/m³	<11000 DLHC	<30	<30	----	----	
TVOC (C6-C8)	----	E593C/WT	15	µg/m³	298000 DLHC	280	297	----	----	
TVOC (C8-C10)	----	E593C/WT	15	µg/m³	74300 DLHC	158	107	----	----	
Hydrocarbons Surrogates										
Bromofluorobenzene, 4-	460-00-4	E593C/WT	1	%	97.7	98.5	92.7	----	----	
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E621B/WT	0.20	%	91.4 DLM	90.7	90.1	----	----	

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

Quality Control Interpretive Report

Work Order	:	**CG2517661**		
Client	:	Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	:	Kara Heckert	Account Manager	: Patryk Wojciak
Address	:	110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 2559 29th Street NE Calgary AB Canada T1Y 7B5
Telephone	:	204 954 6832	Telephone	: +1 403 407 1800
Project	:	SWM.SWOP04071-05.004	Date Samples Received	: 04-Dec-2025 12:50
PO	:	SWM.SWOP04071-05.004	Issue Date	: 18-Dec-2025 16:48
C-O-C number	:	CORD RDM VWs		
Sampler	:	WV		
Site	:	----		
Quote number	:	CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	:	3		
No. of samples analysed	:	3		

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 Services 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 Laboratory Control Sample Duplicate (LCSD) outliers occur
- No Matrix Spike outliers occur.
- No Matrix Spike Duplicate (MSD) 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)

- 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									
Volatile Organic Compounds	QC-2381255--002	----	Chloromethane	74-87-3	E621B	69.7 %	LCS-L	70.0-130%	Recovery less than lower control limit

Result Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. 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	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
						Rec	Actual			Rec	Actual	
Field Tests : Air Canister Information												
Air Canister												
24VW-01	001	2378490	EF001	03-Dec-2025	----	----	----		10-Dec-2025	----	----	
VW-02	002	2378490	EF001	03-Dec-2025	----	----	----		10-Dec-2025	----	----	
25VW-04	003	2378490	EF001	03-Dec-2025	----	----	----		10-Dec-2025	----	----	
Hydrocarbons : TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)												
Air Canister												
24VW-01	001	2381251	E593C	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
VW-02	002	2381251	E593C	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
25VW-04	003	2381251	E593C	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
Hydrocarbons : TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)												
Air Canister												
24VW-01	001	2381250	E593A	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
VW-02	002	2381250	E593A	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
25VW-04	003	2381250	E593A	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓

Matrix: Air

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

Analyte Group : Analytical Method / Container / Client sample ID	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
						Rec	Actual			Rec	Actual	
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)												
Air Canister												
24VW-01	001	2374447	E629B-H	03-Dec-2025	----	----	----		08-Dec-2025	30 days	5 days	✓
VW-02	002	2374447	E629B-H	03-Dec-2025	----	----	----		08-Dec-2025	30 days	5 days	✓
25VW-04	003	2374447	E629B-H	03-Dec-2025	----	----	----		08-Dec-2025	30 days	5 days	✓
Volatile Organic Compounds : VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)												
Air Canister												
24VW-01	001	2381255	E621B	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
VW-02	002	2381255	E621B	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
25VW-04	003	2381255	E621B	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓
25VW-04	003	2381255	E621B	03-Dec-2025	----	----	----		11-Dec-2025	30 days	8 days	✓

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	2381250	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	2381251	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	2381255	1	5	20.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	2374447	1	11	9.1	5.0	✓
Laboratory Control Samples (LCS)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	2381250	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	2381251	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	2381255	1	5	20.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	2374447	1	11	9.1	5.0	✓
Method Blanks (MB)							
TVOC (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A	2381250	1	5	20.0	5.0	✓
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C	2381251	1	5	20.0	5.0	✓
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ppbV)	E621B	2381255	1	5	20.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	2374447	1	11	9.1	5.0	✓
Air Canister Information	EF001	2378490	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
Air Canister Information	EF001 ALS Environmental - Calgary	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.
F1-BTEX in Canisters or Bags GC-MS (µg/m3)	EC592A ALS Environmental - Calgary	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 - Calgary	Air	CCME PHC	F2-PAH = CCME Fraction 2 (C10-C16) minus Naphthalene
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Calgary	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.
TVOC (C6-C16) Fractionation in Canisters or Bags by GC-MS (ug/m3)	E593C ALS Environmental - Calgary	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 (F1, F2) in Canisters or Bags by GC-MS (µg/m3)	E593A ALS Environmental - Calgary	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 - Calgary	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.
VOCs (TO-15 List) in Air by Canister or Bag by GC-MS (ug/m3)	EC621B ALS Environmental - Calgary	Air	unit conversion	Convert ppbV to ug/m3

QUALITY CONTROL REPORT

Work Order	: **CG2517661**	Page	: 1 of 11
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Calgary
Contact	: Kara Heckert	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	: 204 954 6832	Telephone	: +1 403 407 1800
Project	: SWM.SWOP04071-05.004	Date Samples Received	: 04-Dec-2025 12:50
PO	: SWM.SWOP04071-05.004	Date Analysis Commenced	: 08-Dec-2025
C-O-C number	: CORD RDM VWs	Issue Date	: 18-Dec-2025 16:48
Sampler	: WV		
Site	: ----		
Quote number	: CG22-EBAE100-0021 City of Red Deer (CORD) Pre-1972 Landfill Sites		
No. of samples received	: 3		
No. of samples analysed	: 3		

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: 2374447)											
CG2517660-001	Anonymous	Carbon dioxide	124-38-9	E629B-H	0.050	%	7.49	7.72	3.10%	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	%	73.9	76.7	3.65%	20%	----
		Oxygen	7782-44-7	E629B-H	0.10	%	13.5	14.1	4.65%	20%	----
Volatile Organic Compounds (QC Lot: 2381255)											
CG2517660-001	Anonymous	Acetone	67-64-1	E621B	1.0	ppbv	3.1	3.3	0.2	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	0.19	0.19	0.004	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	2.50	ppbv	7.29	7.43	0.14	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	0.60	0.60	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	0.29	0.29	0.004	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	0.20	ppbv	0.61	0.63	0.01	Diff <2x LOR	----
		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: 2381255) - continued											
CG2517660-001	Anonymous	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	0.30	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	0.20	ppbv	<0.20	<0.20	0	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	<0.20	<0.20	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E621B	0.10	ppbv	0.32	0.35	0.03	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	<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	0.26	0.25	0.004	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	1.74	ppbv	<1.64	<1.74	0.10	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	2.78	2.74	1.43%	30%	----
		Tetrahydrofuran	109-99-9	E621B	0.20	ppbv	<0.20	<0.20	0	Diff <2x LOR	----
		Toluene	108-88-3	E621B	0.50	ppbv	4.56	4.68	2.58%	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	3.09	3.11	0.531%	30%	----
		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: 2381255) - continued											
CG2517660-001	Anonymous	Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.20	ppbv	0.43	0.44	0.003	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	0.51	ppbv	<0.51	<0.51	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	1.37	1.37	0.489%	30%	----
		Xylene, o-	95-47-6	E621B	0.10	ppbv	0.53	0.53	0.001	Diff <2x LOR	----
Hydrocarbons (QC Lot: 2381250)											
CG2517660-001	Anonymous	F1 (C6-C10)	----	E593A	15	µg/m³	169	181	6.87%	30%	----
		F2 (C10-C16)	----	E593A	15	µg/m³	105	110	4.72%	30%	----
Hydrocarbons (QC Lot: 2381251)											
CG2517660-001	Anonymous	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	54	56	2	Diff <2x LOR	----
		TVOC (C12-C16)	----	E593C	30	µg/m³	<30	<30	0	Diff <2x LOR	----
		TVOC (C6-C8)	----	E593C	15	µg/m³	41	46	5	Diff <2x LOR	----
		TVOC (C8-C10)	----	E593C	15	µg/m³	90	98	8.53%	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: 2378490)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Permanent Gases (QCLot: 2374447)						
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: 2381255)						
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: 2381255) - 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: 2381255) - 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: 2381250)						
F1 (C6-C10)	----	E593A	15	µg/m³	<15	----
F2 (C10-C16)	----	E593A	15	µg/m³	<15	----
Hydrocarbons (QCLot: 2381251)						
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: 2374447)									
Carbon dioxide	124-38-9	E629B-H	0.05	%	4.98 %	96.8	70.0	130	----
Carbon monoxide	630-08-0	E629B-H	0.05	%	0.747 %	105	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 %	92.7	70.0	130	----
Oxygen	7782-44-7	E629B-H	0.1	%	7.41 %	106	70.0	130	----
Volatile Organic Compounds (QCLot: 2381255)									
Acetone	67-64-1	E621B	1	ppbv	1.03 ppbv	106	70.0	130	----
Allyl chloride	107-05-1	E621B	0.2	ppbv	1.04 ppbv	101	70.0	130	----
Benzene	71-43-2	E621B	0.1	ppbv	1.04 ppbv	104	70.0	130	----
Benzyl chloride	100-44-7	E621B	0.2	ppbv	0.99 ppbv	92.0	70.0	130	----
Bromodichloromethane	75-27-4	E621B	0.2	ppbv	1.07 ppbv	101	70.0	130	----
Bromoform	75-25-2	E621B	0.2	ppbv	1.03 ppbv	98.7	70.0	130	----
Bromomethane	74-83-9	E621B	0.2	ppbv	1.01 ppbv	101	70.0	130	----
Butadiene, 1,3-	106-99-0	E621B	0.2	ppbv	1.05 ppbv	97.7	70.0	130	----
Carbon disulfide	75-15-0	E621B	0.5	ppbv	0.99 ppbv	102	70.0	130	----
Carbon tetrachloride	56-23-5	E621B	0.2	ppbv	1.05 ppbv	107	70.0	130	----
Chlorobenzene	108-90-7	E621B	0.2	ppbv	1.03 ppbv	89.8	70.0	130	----
Chloroethane	75-00-3	E621B	0.2	ppbv	1.04 ppbv	95.2	70.0	130	----
Chloroform	67-66-3	E621B	0.2	ppbv	1.04 ppbv	106	70.0	130	----
Chloromethane	74-87-3	E621B	0.2	ppbv	1.03 ppbv	# 69.7	70.0	130	LCS-L
Cyclohexane	110-82-7	E621B	0.2	ppbv	1.06 ppbv	107	70.0	130	----
Dibromochloromethane	124-48-1	E621B	0.2	ppbv	1.05 ppbv	108	70.0	130	----
Dibromoethane, 1,2-	106-93-4	E621B	0.2	ppbv	1.04 ppbv	98.5	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E621B	0.2	ppbv	0.97 ppbv	88.0	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E621B	0.2	ppbv	0.99 ppbv	88.0	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E621B	0.2	ppbv	0.98 ppbv	84.2	70.0	130	----
Dichlorodifluoromethane	75-71-8	E621B	0.2	ppbv	1.05 ppbv	85.9	70.0	130	----
Dichloroethane, 1,1-	75-34-3	E621B	0.2	ppbv	1.01 ppbv	106	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	97.9	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E621B	0.2	ppbv	1.04 ppbv	106	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E621B	0.2	ppbv	1.06 ppbv	103	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: 2381255) - continued									
Dichloromethane	75-09-2	E621B	0.2	ppbv	1.02 ppbv	101	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E621B	0.2	ppbv	1.05 ppbv	104	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E621B	0.2	ppbv	1.04 ppbv	100	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E621B	0.2	ppbv	1.05 ppbv	100	70.0	130	----
Dichlorotetrafluoroethane, 1,2- [Freon 114]	76-14-2	E621B	0.2	ppbv	0.96 ppbv	95.3	70.0	130	----
Dioxane, 1,4-	123-91-1	E621B	0.2	ppbv	1.05 ppbv	100	70.0	130	----
Ethyl acetate	141-78-6	E621B	0.2	ppbv	1.04 ppbv	106	70.0	130	----
Ethylbenzene	100-41-4	E621B	0.1	ppbv	1.04 ppbv	92.7	70.0	130	----
Ethyltoluene, 4-	622-96-8	E621B	0.2	ppbv	1.01 ppbv	91.8	70.0	130	----
Heptane, n-	142-82-5	E621B	0.2	ppbv	1.06 ppbv	108	70.0	130	----
Hexachlorobutadiene	87-68-3	E621B	0.2	ppbv	1.02 ppbv	97.5	70.0	130	----
Hexane, n-	110-54-3	E621B	0.2	ppbv	1.06 ppbv	112	70.0	130	----
Hexanone, 2-	591-78-6	E621B	1	ppbv	1.04 ppbv	102	70.0	130	----
Isopropylbenzene	98-82-8	E621B	0.2	ppbv	1 ppbv	94.7	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E621B	0.2	ppbv	1.05 ppbv	110	70.0	130	----
Methyl isobutyl ketone [MIBK]	108-10-1	E621B	0.2	ppbv	0.99 ppbv	102	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E621B	0.2	ppbv	1.06 ppbv	104	70.0	130	----
Naphthalene	91-20-3	E621B	0.1	ppbv	0.98 ppbv	86.0	70.0	130	----
Propylene	115-07-1	E621B	0.2	ppbv	1.02 ppbv	101	70.0	130	----
Styrene	100-42-5	E621B	0.2	ppbv	1.04 ppbv	88.2	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E621B	0.2	ppbv	0.99 ppbv	106	70.0	130	----
Tetrachloroethylene	127-18-4	E621B	0.2	ppbv	1.04 ppbv	98.6	70.0	130	----
Tetrahydrofuran	109-99-9	E621B	0.2	ppbv	1.04 ppbv	108	70.0	130	----
Toluene	108-88-3	E621B	0.1	ppbv	1.04 ppbv	104	70.0	130	----
Trichloro-1,2,2-trifluoroethane, 1,1,2- [Freon 113]	76-13-1	E621B	0.2	ppbv	1.05 ppbv	94.3	70.0	130	----
Trichlorobenzene, 1,2,4-	120-82-1	E621B	0.2	ppbv	0.99 ppbv	89.0	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E621B	0.2	ppbv	1.05 ppbv	103	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E621B	0.2	ppbv	1.03 ppbv	102	70.0	130	----
Trichloroethylene	79-01-6	E621B	0.2	ppbv	1.01 ppbv	103	70.0	130	----
Trichlorofluoromethane	75-69-4	E621B	0.2	ppbv	1.04 ppbv	101	70.0	130	----
Trimethylbenzene, 1,2,4-	95-63-6	E621B	0.2	ppbv	1.05 ppbv	91.7	70.0	130	----
Trimethylbenzene, 1,3,5-	108-67-8	E621B	0.2	ppbv	1 ppbv	92.2	70.0	130	----
Trimethylpentane, 2,2,4-	540-84-1	E621B	0.2	ppbv	1.04 ppbv	110	70.0	130	----
Vinyl acetate	108-05-4	E621B	0.5	ppbv	1.05 ppbv	101	70.0	130	----
Vinyl bromide	593-60-2	E621B	0.2	ppbv	0.99 ppbv	96.1	70.0	130	----
Vinyl chloride	75-01-4	E621B	0.2	ppbv	1.04 ppbv	93.5	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: 2381255) - continued									
Xylene, m+p-	179601-23-1	E621B	0.2	ppbv	2.06 ppbv	94.7	70.0	130	----
Xylene, o-	95-47-6	E621B	0.1	ppbv	1.03 ppbv	94.9	70.0	130	----
Hydrocarbons (QCLot: 2381250)									
F1 (C6-C10)	----	E593A	15	µg/m³	815 µg/m³	116	50.0	150	----
Hydrocarbons (QCLot: 2381251)									
Aromatic (C10-C12)	----	E593C	15	µg/m³	60.8 µg/m³	94.0	50.0	150	----
Aromatic (C12-C16)	----	E593C	30	µg/m³	60.1 µg/m³	120	50.0	150	----
Aromatic (C6-C8)	----	E593C	15	µg/m³	60.1 µg/m³	98.1	50.0	150	----
Aromatic (C8-C10)	----	E593C	15	µg/m³	59.6 µg/m³	110	50.0	150	----
TVOC (C10-C12)	----	E593C	15	µg/m³	121 µg/m³	94.9	50.0	150	----
TVOC (C12-C16)	----	E593C	30	µg/m³	120 µg/m³	102	50.0	150	----
TVOC (C6-C8)	----	E593C	15	µg/m³	120 µg/m³	103	50.0	150	----
TVOC (C8-C10)	----	E593C	15	µg/m³	119 µg/m³	96.6	50.0	150	----

Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Batch Proof Report

Batch Proof ID: 251015.123
Canister ID: 01400-0137
Analysis Date: 11-Nov-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	<1.0	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	98.67	%

Batch Proof Report

Batch Proof ID: 251104.203
Canister ID: 01400-0782
Analysis Date: 26-Nov-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	<1.0	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	102.70	%

Batch Proof Report

Batch Proof ID: 251109.13
Canister ID: 01400-0374
Analysis Date: 26-Nov-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	<1.0	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	103.94	%

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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COC # CORD RDM VWs

Page 1 of 1

Report to:		Report Format / Distribution		Service Requested:	
Company:	Tetra Tech Canada Inc.	☐ Standard ☐ Other		☑	Regular Service (Default)
Contact:	Kara Heckert	☑ PDF ☑ Excel ☐ Fax		☐	Rush Service (2-3 Days)
Address:	110, 140 Quarry Park Blvd SE, Calgary, AB T2C 3G3	Email 1:	kara.heckert@tetratech.com	☐	Priority Service (1 Day or ASAP)
		Email 2:	willem.verduyn@tetratech.com	☐	Emergency Service (<1 Day / Wkend) - Contact ALS
Phone:	431-554-1745 Fax:	ALS Digital Crosstab results		Analysis Request	
Invoice To:	☑ Same as Report	Indicate Bottles: Filtered / Preserved (F/P) →			
Company:	SAME AS REPORT	**Client / Project Information:**			
Contact:		Job #:	SWM.SWOP04071-05.004		
Address:		PO/AFE:	SWM.SWOP04071-05.004		
Sample		Legal Site Description:			
Phone:	Fax:	Quote #:	CG22-EBAE100-0021		
Lab Work Order # (lab use only)		**ALS Contact:**	Patryk Wojciak	**Sampler** (Initials)	WV

Sample #	Sample Identification (This description will appear on the report)	Date dd-mmm-yy	Time hh:mm	Sample Type (Select from drop-down list)	EP592	S621E - Aliphatic and Aroma	S629B - Methane, CO2, CO
	24VW-01	03-Dec-25	8:44	Air	X	X	X
	VW-02	↓	9:15	Air	X	X	X
	25VW-04		9:34	Air	X	X	X

Environmental Division
Calgary
Work Order Reference
CG2517661

Telephone : +1 403 407 1800

Guidelines / Regulations	Special Instructions / Hazardous Details
	QUOTE CG2022EBAE1000021

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 adjacent worksheet.

								Sample Condition (lab use only)	
Relinquished By:	Willem Verduyn	Date & Time:	Dec 3/25 4 12:45	Received By:		Date & Time:	12/4 1250	Temperature	Samples Received in Good Condition? Y / N (if no provided details)
Relinquished By:		Date & Time:		Received By:		Date & Time:		17	

APPENDIX E

HISTORICAL ANALYTICAL REPORTS

Table 1
Elevations for Soil Vapour and Groundwater Monitoring Wells

Test Location	Well Depth (m)	Elevations				Screen Length (m)
		Ground (m)	Top of Pipe (m)	Screen Interval		
				Bottom	Top	
MW-01	6.1	874.014	875.099	867.914	872.514	4.6
MW-02	6.6	877.302	878.096	870.702	- -	- -
MW-03	5.1	877.297	877.307	872.197	- -	- -
VW-01	3.5	874.194	874.943	870.694	870.994	0.3
VW-02	4.6	877.321	878.166	872.721	873.021	0.3
VW-03	4.0	877.316	878.017	873.316	873.616	0.3
TH-03	No Well	875.332	- -	- -	- -	- -
TH-05	No Well	875.567	- -	- -	- -	- -
TH-06	No Well	876.597	- -	- -	- -	- -
TH-07	No Well	876.925	- -	- -	- -	- -
TH-08	No Well	876.812	- -	- -	- -	- -
TH-09	No Well	875.907	- -	- -	- -	- -

Notes:

1) Geodetic elevations are referenced to multiple ASCM Nos. 269191, 376673 and 384792.
2) MW - Monitoring Well.
3) VW - Soil Vapour Well.
4) TH - Testhole.
5) Well depth, screen interval derived from borehole logs by others, where avalable.
6) - - No value established.

Table 2
Site Monitoring Results

Test Location	Elevations		Groundwater Elevation (m)		Headspace Vapour			
					03/08/13			
	Ground (m)	Top of Pipe (m)	03/08/13		Combustible	Volatile	Combustible	Volatile
MW-01	874.014	875.099	869.841		230	43		
MW-02	877.302	878.096	874.276		ND	ND		
MW-03	877.297	877.307	NM		NM	NM		
VW-01	874.194	874.943	- -	- -	1,600	64		
VW-02	877.321	878.166	- -	- -	20	2		
VW-03	877.316	878.017	- -	- -	25	ND		
TH-03	875.332	NA	- -	- -	- -	- -	- -	- -
TH-05	875.567	NA	- -	- -	- -	- -	- -	- -
TH-06	876.597	NA	- -	- -	- -	- -	- -	- -
TH-07	876.925	NA	- -	- -	- -	- -	- -	- -
TH-08	876.812	NA	- -	- -	- -	- -	- -	- -
TH-09	875.907	NA	- -	- -	- -	- -	- -	- -

Notes:

1) Geodetic elevations are referenced to multiple ASCM Nos 269191, 376673 and 384792.
2) Measurement of combustible and volatile vapours by RKI Eagle 2. Units ppmv.
   Combustible vapour sensor calibrated to hexane and photoionization detector calibrated to isobutylene.
3) NA - Not Applicable.
4) ND - Not Detected, less than the limit of instrument detection.
5) NM - Not Measured.
6) - - No applicable value.

Table 3A
Analytical Results - Soil - Drill Cuttings (Soil Bag)

Parameter	Detection Limit	Soil Bag 1 of 1	Class II Landfill Acceptance Criteria
pH	0.10	7.71	2-12.5
Flash Point (°C)	30.0	>75	>61
Paint Filter Test	-	PASS	PASS
TCLP Hydrocarbons			
Benzene	0.0050	ND	0.5
Toluene	0.0050	ND	0.5
Ethylbenzene	0.0050	ND	0.5
Xylenes	0.0050	ND	0.5
TCLP Metals			
Antimony (Sb)	5.0	ND	500
Arsenic (As)	0.20	ND	5
Barium (Ba)	5.0	ND	100
Beryllium (Be)	0.50	ND	5
Boron (B)	5.0	ND	500
Cadmium (Cd)	0.050	ND	1
Chromium (Cr)	0.50	ND	5
Cobalt (Co)	5.0	ND	100
Copper (Cu)	5.0	ND	100
Iron (Fe)	5.0	ND	1,000
Lead (Pb)	0.50	ND	5
Mercury (Hg)	0.010	ND	0.2
Nickel (Ni)	0.50	ND	5
Selenium (Se)	0.20	ND	1
Silver (Ag)	0.50	ND	5
Thallium (Tl)	0.50	ND	5
Uranium (U)	1.0	ND	2
Vanadium (V)	5.0	ND	100
Zinc (Zn)	5.0	ND	500
Zirconium (Zr)	5.0	ND	500

Notes:

1) Applicance waste screening process for The City of Red Deer Class II Waste Managment Facility.
2) Class II Landfill Acceptable Criteria - per Table 2, Part 4 Schedule to the Alberta User Guide for Waste Managers 3/95.
3) All units are mg/L unless otherwise stated.
4) ND - Not Detected
5) Soil Bags were sampled June 26, 2013.
6) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 3B
Analytical Results - Soil - General Indices and Heavy Metals

Parameters	Units	Detection Limit	TH-01 @ 5.2 m 06/26/2013	Tier 1 Guideline
Chloride (Cl)	mg/kg	15	188	- -
Nitrate-N	mg/kg	0.74	ND	- -
Nitrite-N	mg/kg	0.74	ND	- -
Metals				
Antimony (Sb)	mg/kg	0.20	0.44	20
Arsenic (As)	mg/kg	0.20	7.18	17
Barium (Ba)	mg/kg	5.0	242	500
Beryllium (Be)	mg/kg	1.0	ND	5
Cadmium (Cd)	mg/kg	0.50	ND	10
Chromium (Cr)	mg/kg	0.50	35.7	64
Cobalt (Co)	mg/kg	1.0	7.8	20
Copper (Cu)	mg/kg	2.0	18.3	63
Lead (Pb)	mg/kg	5.0	8.0	140
Mercury (Hg)	mg/kg	0.05	ND	6.6
Molybdenum (Mo)	mg/kg	1.0	1.2	4
Nickel (Ni)	mg/kg	2.0	28.6	50
Selenium (Se)	mg/kg	0.50	ND	1.0
Silver (Ag)	mg/kg	1.0	ND	20
Thallium (Tl)	mg/kg	0.5	ND	1.0
Tin (Sn)	mg/kg	2.0	ND	5
Uranium (U)	mg/kg	2.0	ND	23
Vanadium (V)	mg/kg	1.0	38.4	130
Zinc (Zn)	mg/kg	10	63	200
Hexavalent Chromium	mg/kg	0.10	ND	0.4
Boron (B), Hot Water Ext.	mg/kg	0.10	1.26	2

Notes:

1) Tier 1 Guideline - Alberta Tier 1 Soil and Groundwater Remediation Guidelines, December 2010 and amendments. Coarse-grained criteria for residential/parkland land use.
2) ND - Not Detected, less than the limit of method detection.
3) - - No value established in the referenced criteria.
4) Bold & Shaded - Exceeds the referenced Alberta Tier 1 Guidelines.
5) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 3C
Analytical Results - Soil - VOCs

Parameters	Units	Detection Limit	TH-01 @ 5.2 m 06/26/2013	Tier 1 Guideline
Hydrocarbons				
F1 (C_6-C_{10})	mg/kg	10	ND	24
F2 (C_{10}-C_{16})	mg/kg	25	ND	130
F3 (C_{16}-C_{34})	mg/kg	50	117	300
F4 (C_{34}-C_{50})	mg/kg	50	ND	2,800
Total Hydrocarbons (C_6-C_{50})	mg/kg	50	117	- -
Volatile Organic Compounds				
Benzene	mg/kg	0.0050	ND	0.073
Bromobenzene	mg/kg	0.010	ND	- -
Bromochloromethane	mg/kg	0.010	ND	- -
Bromodichloromethane	mg/kg	0.010	ND	- -
Bromoform	mg/kg	0.010	ND	- -
Bromomethane	mg/kg	0.10	ND	- -
n-Butylbenzene	mg/kg	0.010	ND	- -
sec-Butylbenzene	mg/kg	0.010	ND	- -
tert-Butylbenzene	mg/kg	0.010	ND	- -
Carbon tetrachloride	mg/kg	0.010	ND	0.00056
Chlorobenzene	mg/kg	0.010	ND	0.018
Dibromochloromethane	mg/kg	0.010	ND	0.27
Chloroethane	mg/kg	0.10	ND	- -
Chloroform	mg/kg	0.010	ND	0.0010
Chloromethane	mg/kg	0.10	ND	- -
2-Chlorotoluene	mg/kg	0.010	ND	- -
4-Chlorotoluene	mg/kg	0.010	ND	- -
1,2-Dibromo-3-chloropropane	mg/kg	0.010	ND	- -
1,2-Dibromoethane	mg/kg	0.010	ND	- -
Dibromomethane	mg/kg	0.010	ND	- -
1,2-Dichlorobenzene	mg/kg	0.010	ND	0.18
1,3-Dichlorobenzene	mg/kg	0.010	ND	- -
1,4-Dichlorobenzene	mg/kg	0.010	ND	0.098
Dichlorodifluoromethane	mg/kg	0.010	ND	- -
1,1-Dichloroethane	mg/kg	0.010	ND	- -
1,2-Dichloroethane	mg/kg	0.010	ND	0.0027
1,1-Dichloroethene	mg/kg	0.010	ND	0.021
cis-1,2-Dichloroethene	mg/kg	0.010	ND	- -
trans-1,2-Dichloroethene	mg/kg	0.010	ND	- -
Methylene chloride	mg/kg	0.010	ND	0.095
1,2-Dichloropropane	mg/kg	0.010	ND	- -
1,3-Dichloropropane	mg/kg	0.010	ND	- -
2,2-Dichloropropane	mg/kg	0.010	ND	- -
1,1-Dichloropropene	mg/kg	0.010	ND	- -
cis-1,3-Dichloropropene	mg/kg	0.010	ND	- -
trans-1,3-Dichloropropene	mg/kg	0.010	ND	- -
Ethylbenzene	mg/kg	0.015	ND	0.21
Hexachlorobutadiene	mg/kg	0.010	ND	0.0067
Isopropylbenzene	mg/kg	0.010	ND	- -
p-Isopropyltoluene	mg/kg	0.010	ND	- -
n-Propylbenzene	mg/kg	0.010	ND	- -
Styrene	mg/kg	0.050	ND	0.8
1,1,1,2-Tetrachloroethane	mg/kg	0.010	ND	- -
1,1,2,2-Tetrachloroethane	mg/kg	0.050	ND	- -
Tetrachloroethene	mg/kg	0.010	ND	0.16
Toluene	mg/kg	0.050	ND	0.49
1,2,3-Trichlorobenzene	mg/kg	0.010	ND	0.26
1,2,4-Trichlorobenzene	mg/kg	0.010	ND	0.23
1,1,1-Trichloroethane	mg/kg	0.010	ND	- -
1,1,2-Trichloroethane	mg/kg	0.010	ND	- -
Trichloroethene	mg/kg	0.010	ND	0.012
Trichlorofluoromethane	mg/kg	0.010	ND	- -
1,2,3-Trichloropropane	mg/kg	0.020	ND	- -
1,2,4-Trimethylbenzene	mg/kg	0.010	0.013	- -
1,3,5-Trimethylbenzene	mg/kg	0.010	ND	- -
Vinyl chloride	mg/kg	0.20	ND	0.00034
Xylenes	mg/kg	0.1	ND	12

Notes:

1) Tier 1 Guideline - Alberta Tier 1 Soil and Groundwater Remediation Guidelines, December 2010 and amendments. Coarse-grained criteria for residential/parkland land use.
2) ND - Not Detected, less than the limit of method detection.
3) - - No value established in the reference criteria.
4) Bold & Shaded - Exceeds the referenced Alberta Tier 1 Guidelines.
5) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 4A
Groundwater Indices Measured at Time of Sampling

Monitoring Well	pH	Electrical Conductivity (µg/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Total Dissolved Solid (mg/L)	Potential Redox (±mV)
MW-01	8.11	1,437	6.9	0.77	1,404.00	-83.6
MW-02	7.89	641	6.9	1.56	637.00	+42.3
MW-03	- -	- -	- -	- -	- -	- -

Notes:

1) Samples collected on Saturday, August 3, 2013.
2) Groundwater indices are field measured by YSI Pro Plus multi-meter.

Table 4B
Analytical Results - Groundwater - Routine Water Quality

Parameter	Unit	Detection Limit	MW-01	MW-02	Tier 1 Guideline
			08/03/2013		
General Water Quality					
Biochemical Oxygen Demand	mg/L	2.0	11	2	- -
Chemical Oxygen Demand	mg/L	5.0	350	16	- -
Conductivity	µS/cm	1.0	2,400	1,100	- -
pH	Unitless	NA	7.20	7.51	6.5-8.5
Total Organic Carbon (C)	mg/L	0.50	10	3.5	- -
Dissolved Cadmium (Cd)	µg/L	0.0050	0.037	0.025	- -
Total Cadmium (Cd)	µg/L	0.0050	**3.4**	0.025	0.060*
Alkalinity ($CaCO_3$)	mg/L	0.50	570	490	- -
Bicarbonate (HCO_3)	mg/L	0.50	700	600	- -
Carbonate (CO_3)	mg/L	0.50	ND	ND	- -
Hydroxide (OH)	mg/L	0.50	ND	ND	- -
Sulphates (SO_4)	mg/L	1.0	100	48	- -
Chlorides (Cl)	mg/L	1.0 - 5.0	360	36	- -
Total Ammonia (NH_3-N)	mg/L	0.050 - 0.50	**9**	0.1	1.37*
Total Phosphorus (P)	mg/L	0.0030 - 0.0150	4.6	0.015	- -
Total Nitrogen (N)	mg/L	0.050	12	0.26	- -
Nitrate plus Nitrite (N)	mg/L	0.0030 - .015	0.019	ND	- -
Total Kjeldahl Nitrogen (TKN)	mg/L	0.050 - 0.5	12	0.25	- -
Nitrite (NO_2)	mg/L	0.0030 - 0.015	ND	ND	- -
Nitrate (NO_3)	mg/L	0.0030	0.019	0.013	- -
Trace Organics					
Acetic Acid	mg/L	50	ND	ND	- -
Formic Acid	mg/L	50	ND	ND	- -
Propionic Acid	mg/L	50	ND	ND	- -
Adsorbable Organic Halogen	mg/L	0.004 - 0.02	0.29	0.016	- -

Notes:

1) Tier 1 Guideline - Alberta Tier 1 Soil and Groundwater Remediation Guidelines, December 2010 and amendments. Coarse-grained criteria for residential/parkland land use.
2) * Surface Water Quality Guidelines for Use in Alberta (AENV, 1999) on aquatic life pathway. Canadian Council of Ministers of the Environment (CCME) Guidelines as referenced in the Tier 1 Guidelines.
3) ND - Not Detected, less than the limit of method detection.
4) - - No value established in the reference criteria.
5) Bold & Shaded - Exceeds the referenced Alberta Tier 1 Guideline.
6) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 4C
Analytical Results - Groundwater - Metals

Parameter	Detection Limit	MW-01	MW-02	Tier 1 Guideline
		08/03/2013		
Total Metals				
Aluminum (Al)	0.0030	**34**	**0.29**	0.1*
Antimony (Sb)	0.00060	0.0017	ND	0.006
Arsenic (As)	0.00020	**0.085**	0.00072	0.005
Barium (Ba)	0.010	**1.8**	0.15	1
Beryllium (Be)	0.0010	0.0024	ND	- -
Boron (B)	0.020	0.11	0.065	1.5
Calcium (Ca)	0.30	330	150	- -
Chromium (Cr)	0.0010	**0.11**	ND	0.001*
Cobalt (Co)	0.00030	0.078	0.0022	- -
Copper (Cu)	0.00020	**0.16**	0.0023	0.003*
Iron (Fe)	0.060	**180**	**0.98**	0.3
Lead (Pb)	0.00020	**0.10**	0.00057	0.004*
Lithium (Li)	0.020	0.12	0.051	- -
Magnesium (Mg)	0.20	170	52	- -
Manganese (Mn)	0.0040	**5.6**	**1.8**	0.05
Molybdenum (Mo)	0.00020	0.0071	0.00034	0.073*
Nickel (Ni)	0.00050	**0.20**	0.0034	0.11*
Phosphorus (P)	0.10	3.4	ND	- -
Potassium (K)	0.30	22	6.6	- -
Selenium (Se)	0.00020	**0.0026**	ND	0.001
Silicon (Si)	0.10 - 0.50	100	9.9	- -
Silver (Ag)	0.00010	**0.00058**	ND	0.0001*
Sodium (Na)	0.50	140	16	- -
Strontium (Sr)	0.020	1.8	0.97	- -
Sulphur (S)	0.20	32	15	- -
Thallium (Tl)	0.00020	**0.00097**	ND	0.0008*
Tin (Sn)	0.0010	0.0029	ND	- -
Titanium (Ti)	0.0010	0.71	0.015	- -
Uranium (U)	0.00010	0.006	0.0097	0.02
Vanadium (V)	0.0010	0.17	0.0015	- -
Zinc (Zn)	0.0030	**0.41**	0.0097	0.03
Dissolved Metals				
Aluminum (Al)	0.0030	0.017	0.011	- -
Antimony (Sb)	0.00060	ND	ND	- -
Arsenic (As)	0.00020	0.0230	ND	- -
Barium (Ba)	0.010	0.68	0.13	- -
Beryllium (Be)	0.0010	ND	ND	- -
Boron (B)	0.020	0.074	0.063	- -
Calcium (Ca)	0.30	160	140	- -
Chromium (Cr)	0.0010	ND	ND	- -
Cobalt (Co)	0.00030	0.012	0.0017	- -
Copper (Cu)	0.00020	0.00078	0.002	- -
Iron (Fe)	0.060	27	0.11	- -
Lead (Pb)	0.00020	ND	ND	- -
Lithium (Li)	0.020	0.051	0.049	- -
Magnesium (Mg)	0.20	110	49	- -
Manganese (Mn)	0.0040	1.9	1.8	- -
Molybdenum (Mo)	0.00020	0.0015	0.00026	- -
Nickel (Ni)	0.00050	0.022	0.002	- -
Phosphorus (P)	0.10	ND	ND	- -
Potassium (K)	0.30	14	6.6	- -
Selenium (Se)	0.00020	ND	ND	- -
Silicon (Si)	0.10	15	9.1	- -
Silver (Ag)	0.00010	ND	ND	- -
Sodium (Na)	0.50	140	17	- -
Strontium (Sr)	0.020	1.60	0.98	- -
Sulphur (S)	0.20	32	15	- -
Thallium (Tl)	0.00020	ND	ND	- -
Tin (Sn)	0.0010	ND	ND	- -
Titanium (Ti)	0.0010	ND	ND	- -
Uranium (U)	0.00010	0.0011	0.0092	- -
Vanadium (V)	0.0010	ND	ND	- -
Zinc (Zn)	0.0030	0.0067	0.0062	- -

Notes:

1) Tier 1 Guideline - Alberta Tier 1 Soil and Groundwater Remediation Guidelines, December 2010 and amendments. Coarse-grained criteria for residential/parkland land use.
2) * Surface Water Quality Guidelines for Use in Alberta (AENV, 1999) on aquatic life pathway. Canadian Council of Ministers of the Environment (CCME) Guidelines as referenced in the Tier 1 Guidelines.
3) ND - Not Detected, less than the limit of method detection.
4) Unless specified all units are mg/L.
5) - - No value established in the reference criteria.
6) Bold & Shaded - Exceeds the referenced Alberta Tier 1 Guideline.
7) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 4D
Analytical Results - Groundwater -VOCs

Parameter	Detection Limit	MW-01	MW-02	Tier 1 Guideline
		08/03/2013		
Volatile Organic Compounds				
Benzene	0.00040	0.0015	ND	0.005
Toluene	0.00040	ND	ND	0.024
Ethylbenzene	0.00040	ND	ND	0.0024
Xylenes (Total)	0.00080	0.0018	ND	0.3
F1 (C_6-C_{10})	0.10	ND	ND	0.81
F2 (C_{10}-C_{16})	0.10	ND	ND	1.1
Total Trihalomethanes	0.0020	ND	ND	0.1
Bromodichloromethane	0.00050	ND	ND	- -
Bromoform	0.00050	ND	ND	- -
Bromomethane	0.0020	ND	ND	- -
Carbon tetrachloride	0.00050	ND	ND	0.00056
Chlorobenzene	0.00050	ND	ND	0.0013
Chlorodibromomethane	0.0010	ND	ND	- -
Chloroethane	0.0010	ND	ND	- -
Chloroform	0.00050	ND	ND	0.0018
Chloromethane	0.0020	ND	ND	- -
1,2-dibromoethane	0.00050	ND	ND	- -
1,2-dichlorobenzene	0.00050	ND	ND	0.0007
1,3-dichlorobenzene	0.00050	ND	ND	- -
1,4-dichlorobenzene	0.00050	ND	ND	0.001
1,1-dichloroethane	0.00050	ND	ND	- -
1,2-dichloroethane	0.00050	ND	ND	0.005
1,1-dichloroethene	0.00050	ND	ND	0.014
cis-1,2-dichloroethene	0.00050	0.033	ND	- -
trans-1,2-dichloroethene	0.00050	0.0034	ND	- -
Dichloromethane	0.0020	ND	ND	0.05
1,2-dichloropropane	0.00050	ND	ND	- -
cis-1,3-dichloropropene	0.00050	ND	ND	- -
trans-1,3-dichloropropene	0.00050	ND	ND	- -
Methyl methacrylate	0.00050	ND	ND	0.47
Methyl-tert-butyl ether (MTBE)	0.00050	ND	ND	0.015
Styrene	0.00050	ND	ND	0.072
1,1,1,2-tetrachloroethane	0.0020	ND	ND	- -
1,1,2,2-tetrachloroethane	0.0020	ND	ND	- -
Tetrachloroethene	0.00050	ND	ND	0.03
1,2,3-trichlorobenzene	0.0010	ND	ND	0.008
1,2,4-trichlorobenzene	0.0010	ND	ND	0.015
1,3,5-trichlorobenzene	0.00050	ND	ND	0.014
1,1,1-trichloroethane	0.00050	ND	ND	- -
1,1,2-trichloroethane	0.00050	ND	ND	- -
Trichloroethene	0.00050	ND	ND	0.005
Trichlorofluoromethane	0.00050	ND	ND	- -
1,2,4-trimethylbenzene	0.00050	0.004	ND	- -
1,3,5-trimethylbenzene	0.00050	0.0018	ND	- -
Vinyl chloride	0.00050	**0.003**	ND	0.0011

Notes:

1) Tier 1 Guideline - Alberta Tier 1 Soil and Groundwater Remediation Guidelines, December 2010 and amendments. Coarse-grained criteria for residential/parkland land use.
2) ND - Not Detected, less than the limit of method detection.
3) Unless specified all units are mg/L (ppm).
4) - - No value established in the reference criteria.
5) Bold & Shaded - Exceeds the referenced Alberta Tier 1 Guidelines.
6) For further laboratory information, refer to the specific laboratory report in Appendix A.

Table 5A
Summary of Parameters Measured During Sampling of Soil Vapour

Parameter	Well Diameter (mm)	Screen Length (cm)	Well Depth (m)	Headspace Volume (cm^3)	Purge Rate (cm^3/min)	Purge Time (min)	Pressure	
							Ambient (psi)	Vapour Well (psi)
VW-01	25	30	3.5	1,718.06	943.3	4	15.00	15.00
VW-02	25	30	4.6	2,258.02	943.3	7	15.10	15.06
VW-03	25	30	4.0	1,963.50	943.3	5	15.14	15.08

Notes:

1) Measurement of pressure by digital Cole-Parmer absolute pressure gauge.
2) Purge time is minimum elapsed time prior to the collection of a soil vapour sample.
3) Screen set at base of well.
4) Soil vapour sampling was completed on Saturday, August 3, 2013.

Table 5B
Analytical Results - Soil Vapour - General Indices

Parameter	Unit	Detection Limit	VW-01	VW-02	VW-03
Gauge Pressure					
Following sampling	psi	- -	-5.0	NA	-5.0
Reported by laboratory	psi	- -	-1.4	-3.6	-3.4
Fixed Gases					
Oxygen	% v/v	0.2 - 0.3	8.4	17.2	19.8
Nitrogen	% v/v	0.2 - 0.3	52.5	77.8	78.3
Carbon monoxide	% v/v	0.2 - 0.3	ND	ND	ND
Methane	% v/v	0.2 - 0.3	26	ND	ND
Carbon dioxide	% v/v	0.2 - 0.3	13.1	4.6	1.9

Notes:

1) Soil vapour sample collected on Saturday, August 3, 2013.
2) ND - Not Detected, less than the limit of method detection.
3) NA - Not Available.
4) - - No value established in the detection limit.
5) For further information, the reader should refer to the laboratory report in Appendix A.

Table 5C
Analytical Results - Soil Vapour - VOCs

Parameter	Unit	Detection Limit	VW-01	VW-02	VW-03
				08/03/13	
Hydrocarbon Fractions					
Aliphatic >C_5-C_6	µg/m^3	5.0 - 480	53,000	332	6.8
Aliphatic >C_6-C_8	µg/m^3	5.0 - 480	88,300	2,990	34.4
Aliphatic >C_8-C_{10}	µg/m^3	5.0 - 480	ND	577	73.1
Aliphatic >C_{10}-C_{12}	µg/m^3	5.0 - 480	664	345	202
Aliphatic >C_{12}-C_{16}	µg/m^3	5.0 - 480	ND	106	105
Aromatic >C_7-C_8 (TEX excluded)	µg/m^3	5.0 - 480	ND	ND	ND
Aromatic >C_8-C_{10}	µg/m^3	5.0 - 480	ND	44.8	30.9
Aromatic >C_{10}-C_{12}	µg/m^3	5.0 - 480	ND	78.4	58.1
Aromatic >C_{12}-C_{16}	µg/m^3	5.0 - 480	ND	ND	ND
Select Volatile Gases					
Acetylene	ppm	0.19 - 0.34	ND	ND	ND
Ethane	ppm	0.19 - 0.34	1.1	ND	ND
Ethylene	ppm	0.19 - 0.34	0.67	ND	ND
Methane	ppm	5.6 - 6.8	260,000	67	ND
n-Butane	ppm	0.358 - 0.68	2.4	ND	ND
n-Pentane	ppm	0.19 - 0.34	14	ND	ND
Propane	**ppm**	**0.19 - 0.34**	**0.34**	**ND**	**ND**
Propene	ppm	0.19 - 0.34	0.22	ND	ND
Propyne	ppm	0.38 - 0.68	ND	ND	ND
Volatile Organic Compounds					
Dichlorodifluoromethane (FREON 12)	ppbv	0.20 - 58	ND	348	1.60
1,2-Dichlorotetrafluoroethane	ppbv	0.17 - 16	ND	34.4	0.58
Chloromethane	ppbv	0.30 - 29	ND	ND	1.03
Vinyl chloride	ppbv	0.18 - 17	519	0.51	ND
Chloroethane	ppbv	0.30 - 29	ND	ND	ND
1,3-Butadiene	ppbv	0.50 - 48	ND	ND	ND
Trichlorofluoromethane (FREON 11)	ppbv	0.20 - 19	ND	50.6	0.42
Ethanol (ethyl alcohol)	ppbv	23 - 220	322	180	648
Trichlorotrifluoroethane	ppbv	0.15 - 14	ND	ND	ND
2-propanol	ppbv	3.0 - 290	ND	3.6	5.1
2-Propanone	ppbv	0.80 - 76	ND	36.5	18
Methyl ethyl ketone (MEK) (2-Butanone)	ppbv	3.0 - 290	ND	ND	5.8
Methyl isobutyl ketone	ppbv	3.2 - 300	ND	ND	ND
Methyl butyl ketone (MBK) (2-Hexanone)	ppbv	2.0 - 190	ND	ND	ND
Methyl t-butyl ether (MTBE)	ppbv	0.20 - 19	ND	ND	ND
Ethyl acetate	ppbv	2.2 - 210	ND	ND	ND
1,1-Dichloroethylene	ppbv	0.25 - 24	ND	1.41	ND
cis-1,2-Dichloroethylene	ppbv	0.19 - 18	123	13.2	0.42
trans-1,2-Dichloroethylene	ppbv	0.20 - 19	30	ND	ND
Methylene chloride(Dichloromethane)	ppbv	0.80 - 120	ND	1.47	1.06
Chloroform	ppbv	0.15 - 14	ND	18.2	0.52
Carbon tetrachloride	ppbv	0.30 - 29	ND	ND	ND
1,1-Dichloroethane	ppbv	0.20 - 19	ND	ND	ND
1,2-Dichloroethane	ppbv	0.20 - 19	ND	ND	ND
Ethylene dibromide	ppbv	0.17 - 16	ND	ND	ND
1,1,1-Trichloroethane	ppbv	0.30 - 29	ND	3.45	ND
1,1,2-Trichloroethane	ppbv	0.15 - 14	ND	ND	ND
1,1,2,2-Tetrachloroethane	ppbv	0.20 - 19	ND	ND	ND
cis-1,3-Dichloropropene	ppbv	0.18 - 17	ND	ND	ND
trans-1,3-Dichloropropene	ppbv	0.17 - 16	ND	ND	ND
1,2-Dichloropropane	ppbv	0.40 - 38	ND	ND	ND
Bromomethane	ppbv	0.18 - 17	ND	ND	ND
Bromoform	ppbv	0.20 - 19	ND	ND	ND
Bromodichloromethane	ppbv	0.20 - 19	ND	ND	ND
Dibromochloromethane	ppbv	0.20 - 19	ND	ND	ND
Trichloroethylene (TCE)	ppbv	0.30 - 29	ND	81.9	1.32
Tetrachloroethylene (PCE)	ppbv	0.20 - 19	ND	221	ND
Benzene	ppbv	0.18 - 17	ND	5.17	0.79
Toluene	ppbv	0.20 - 81	ND	4.80	3.95
Ethylbenzene	ppbv	0.20 - 27	ND	0.75	0.92
p+m-xylene	ppbv	0.37 - 99	ND	1.89	3.65
o-xylene	ppbv	0.20 - 19	ND	1.22	1.67
Styrene	ppbv	0.20 - 19	42	ND	0.37
4-ethyltoluene	ppbv	2.2 - 210	ND	ND	ND
1,3,5-Trimethylbenzene	ppbv	1.9 - 48	ND	4.05	ND
1,2,4-Trimethylbenzene	ppbv	0.50 - 48	ND	2.31	2.74
Chlorobenzene	ppbv	0.20 - 19	ND	ND	ND
Benzyl chloride	ppbv	1.0 - 95	ND	ND	ND
1,3-Dichlorobenzene	ppbv	0.40 - 38	ND	ND	ND
1,4-Dichlorobenzene	ppbv	0.40 - 38	ND	ND	ND
1,2-Dichlorobenzene	ppbv	0.40 - 38	ND	ND	ND
1,2,4-Trichlorobenzene	ppbv	2.0 - 190	ND	ND	ND
Hexachlorobutadiene	ppbv	3.0 - 290	ND	ND	ND
Hexane	ppbv	1.3 - 29	17,800	142	ND
Heptane	ppbv	0.30 - 29	1,970	181	0.58
Cyclohexane	ppbv	0.20 - 19	4,900	219	0.35
Tetrahydrofuran	ppbv	0.40 - 38	ND	ND	5.14
1,4-Dioxane	ppbv	2.0 - 190	ND	ND	ND
Xylene (Total)	ppbv	0.60 - 99	ND	3.11	5.31
Vinyl bromide	ppbv	0.20 - 19	ND	ND	ND
Propene	ppbv	3.9 - 29	371	ND	ND
2,2,4-Trimethylpentane	ppbv	0.20 - 19	ND	ND	0.64
Carbon disulfide	ppbv	0.50 - 48	ND	40.5	3.21
Vinyl acetate	ppbv	0.20 - 19	ND	ND	ND

Notes:
1) Results are from sampling completed on Saturday, August 03, 2013.
2) ND - Not Detected, less than the limit of method detection.
3) For further information, the reader should refer to the laboratory report in Appendix A.

Table 5D
Analytics Results - Soil Vapour - Siloxanes

Parameter	Detection Limit		VW-01		VW-02		VW-03	
			08/03/13					
	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm
Trimethylsilyl Fluoride	- -	- -	ND	ND	ND	ND	ND	ND
Tetramethylsilane	0.00010 - 0.0022	0.0001 - 0.0006	ND	ND	ND	ND	ND	ND
Methoxytrimethylsilane	0.0032 - 0.0563	0.0007 - 0.0132	ND	ND	ND	ND	ND	ND
Ethoxytrimethylsilane	0.0031 - 0.0543	0.0006 - 0.0112	ND	ND	ND	ND	ND	ND
Trimethylsilanol	- -	- -	0.0338	0.0092	ND	ND	0.0098	0.0027
Isopropoxytrimethylsilane	0.0013 - 0.0229	0.00020 - 0.0042	ND	ND	ND	ND	ND	ND
Trimethoxymethyl Silane #	- -	- -	ND	ND	ND	ND	ND	ND
Hexamethyl Disiloxane - L2	0.00010 - 0.0021	0.0001 - 0.0003	ND	ND	ND	ND	ND	ND
Propoxytrimethylsilane	0.0035 - 0.0621	0.0006 - 0.0115	ND	ND	ND	ND	ND	ND
1-Methylbutoxytrimethylsilane *	- -	- -	ND	ND	ND	ND	ND	ND
Butoxytrimethylsilane *	- -	- -	ND	ND	ND	ND	ND	ND
Trimethoxyvinyl Silane #	- -	- -	ND	ND	ND	ND	ND	ND
Hexamethyl Cyclotrisiloxane - D3	- -	- -	0.1927	0.0212	0.0844	0.0093	0.0146	0.0016
Octamethyl Trisiloxane - L3	0.0002 - 0.0041	0.0001 - 0.0004	ND	ND	ND	ND	ND	ND
Triethoxyvinyl Silane #	- -	- -	ND	ND	ND	ND	ND	ND
Triethoxyethyl Silane #	- -	- -	ND	ND	ND	ND	ND	ND
Octamethyl Cyclotetrasiloxane - D4	- -	- -	0.0739	0.0061	0.0299	0.0025	0.0234	0.0019
Decamethyl Tetrasiloxane - L4	0.0003 - 0.0053	0.0001 - 0.0004	ND	ND	ND	ND	ND	ND
Tetraethylsilicate #	- -	- -	ND	ND	ND	ND	ND	ND
Decamethyl Cyclopentasiloxane - D5	- -	- -	0.0349	0.0023	0.0321	0.0021	0.0420	0.0028
Dodecamethyl Pentasiloxane - L5	0.0030 - 0.0528	0.0002 - 0.0034	ND	ND	ND	ND	ND	ND
Dodecamethyl Cyclohexasiloxane - D6	0.0531	0.0029	ND	ND	0.1454	0.0080	0.1513	0.0083
Sum	- -	- -	0.6503	0.0870	0.4152	0.0432	0.2559	0.0198

Notes:

1) Soil vapour samples collected on Saturday, August 3, 2013.
2) ND - Not Detected, less than the limit of method detection.
3) - - No value established in the detection limit.
4) VW-01 V=10.0mL, VW-02 V=25mL, VW-03 V=200 mL, where V is volume of air/gas sampled.
5) * - Semiquanititative (response factor set at 5).
6) # - Unstable, poor detectability, commercial standards tested.
7) For further information, the reader should refer to the laboratory report in Appendix A.

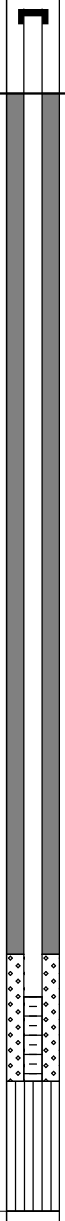
APPENDIX F

BOREHOLE LOGS

Borehole No: **24VW-01**

Project: Red Deer Motors	Project No: SWM.SWOP04071-04.004
Location: Taylor Avenue and 32 Street	
Red Deer, Alberta	UTM: 307584 E; 5792656 N; Z 12

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
0	Solid Stem Auger	ORGANICS - rootlets, (150 mm thick)		0
		CLAY - silty, trace sand, poorly graded, damp, firm, to stiff, low to meidum plastic, brown		
1		- very stiff		3
		- some silt, moist, firm, medium to high plastic, black		5
2		- soft to firm, woody debris		7
3		- silty, damp, stiff, medium plastic, black, grey mottling		10
4		END OF BOREHOLE (3.96 metres) slough - 3.50 metres at completion Soil vapour well installed to 3.50 metres		13
5				16



Contractor: Ernco Environmental	Completion Depth: 3.96 m
Equipment Type: Geoprobe 3230DT	Start Date: 2024 September 4
Logged By: WV	Completion Date: 2024 September 4
Reviewed By: CW	Page 1 of 1

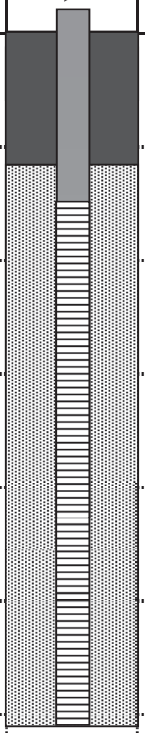
PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** MW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Red Deer Motors Site	**GROUND ELEVATION:** 874.014 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/26/2013

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

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

Notes: Groundwater Monitoring Well is ~ 6 m east of trees along Taylor Drive and ~7 m south of 32 Street, near the northwest corner of the site.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)
0.0	Grass/loam - soft, silty, sandy, moist, olive. (~ 3 cm thick).				
	Sand (fill) - dense to compact, silty, trace clay, damp, yellow.				
1.0	Loam (fill) - compact, silty, sandy, trace clay, damp, dark olive.				
	Clay (fill) - firm, loamy, silty, trace fine rounded gravel, distinctive slough gas odour, moist, dark olive. wood debris at 1.8 m to 2.4 m.				
2.0	No obvious waste material.		J		
3.0	Sand (fill) - compact to loose, silty, trace clay, mild hydrocarbon odour, moist, light olive.				
	becomes wet and trace silt at 3.8 m.				
4.0	some gravel at 4.3 m.				
	Clay (fill) - stiff, trace silt, trace sand, moist, olive. mild hydrocarbon odour at 4.6 m - 5.2 m				
5.0			J		
6.0	End of hole at 6.1 m. 51 mm diameter 4.6 m length 010 PVC screen. Aboveground lockable steel 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	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-01
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Red Deer Motors Site	**GROUND ELEVATION:** 874.194 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 ~ 2 m east of MW-01, near the northwest corner of the site.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Grass (~ 3 cm thick). Sand (fill) - compact, silty, clayey, damp, light olive brown.					
1.0	becomes dark olive and loamy at 0.8 m. Silt (fill) - firm, clayey, moist, dark olive.					
2.0	wood fragments at 2.3 m.					
3.0	mild hydrocarbon odour at 3 m. End of hole at 3.5 m. 25 mm diameter 30 cm length 020 PVC screen. Aboveground lockable steel 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): 3.5
Depth to Groundwater :	Checked By: LTM
Logged By: JAL	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-02
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Red Deer Motors Site	**GROUND ELEVATION:** 877.321 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 located on the southeast side of the site.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)	Well Details
0.0	Grass (~ 3 cm thick).					
	Sand (fill) - loose, trace silt, trace loam, trace clay, damp, light olive brown.					
	trace rootlets to 1.2 m					
	trace plastic bags at 0.9 m to 1.1 m.					
1.0						
	Clay (fill) - stiff, silty, trace sand, moist, light olive.					
2.0						
	No obvious waste material.					
3.0	Sand (fill) - compact, silty, moist, light olive.					
	trace coal at 3 m.					
4.0	trace gravel at 4 m.					
	becomes loose at 4.6 m					
5.0	trace gravel and becomes wet at 5 m.					
6.0	End of hole at 6.1 m.					
	25 mm diameter 30 cm length 020 PVC screen.					
	Aboveground lockable steel 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	Page: 1 of 1

PROJECT: Phase II Environmental Site Assessment	**BOREHOLE No.:** VW-03
PROJECT No.: 12-435	**DRILL TYPE:** SS Auger
LOCATION: Red Deer Motors Site	**GROUND ELEVATION:** 877.316 m
CLIENT: The City of Red Deer	**COMPLETION DATE:** 06/27/2013

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 near the northeast corner of the site.

Depth (m)	Soil Description	Sample Type	Sample No.	SPT (N)	Combustible Soil Vapours (ppm)		Well Details
0.0	Grass. (~ 3 cm thick).						
	Clay (fill) - firm to stiff, silty, moist, olive.						
	trace plastic bags at 0.9 m.						
1.0							
2.0	trace coal at 2.1 m.						
	trace gravel at 2.6 m.						
3.0	No obvious waste material.						
4.0	becomes wet at 4 m.						
5.0							
6.0	Sand (fill) - loose, silty, wet, olive.						
7.0							
	End of hole at 7.6 m.						
	25 mm diameter 30 cm length 020 PVC screen.						
8.0	Flush mount lockable steel casing set in concrete.						
9.0							
10.0							
11.0							
12.0							

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

Borehole No: **VW-04**

Project: Red Deer Motors Vapour Probe Installation	Project No: SWM.SWOP04071-02.008
Location: Red Deer Motors	
Red Deer, Alberta	UTM: 307335 E; 5792605 N; Z 12

Depth (m)	Method	Soil Description	Notes and Comments	VW04	Depth (ft)
0					0
	Solid stem auger	TOPSOIL - organics, roots, dry, black			
1		WASTE - sandy clay, some gravel, dry, wires, bags, plastic, glass, strong odour			1 2 3 4 5 6 7 8 9
2					
3		CLAY - sandy, damp, brown and black			10 11 12 13
4		END OF BOREHOLE (4.0 metres) Vapour well installed to 2.4 metres			14 15 16
5					

TETRA TECH

Contractor: CP Drilling	Completion Depth: 4 m
Equipment Type: Truck mounted	Start Date: 2021 May 4
Logged By: MR	Completion Date: 2021 May 4
Reviewed By: FH	Page 1 of 1

Borehole No: **25VW-04**

Project: Red Deer Motors Pre-1972 Site	Project No: SWM.SWOP04071-04
Location: SE 1/4, Sec. 8-38-27 W4M	
Red Deer, Alberta	UTM: 307637 E; 5792603 N; Z 12

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
0				0
	Solid Stem Auger	ORGANICS AND TOPSOIL - (300 mm thick)	Pipe stickup = 0.98 metres	
		SILT (FILL) - sandy, trace clay, well graded, dry, stiff, brown		
1				1
				2
				3
				4
		CLAY AND WASTE (FILL) - sandy, trace silt, damp, firm, dark grey, waste (glass, plastic bags, fabrics, plastic), ambient waste odour		5
2				6
				7
				8
		- some silt, trace sand, wet		9
3				10
		END OF BOREHOLE (3.05 metres) water - 2.92 metres at completion Monitoring well installed to 2.50 metres		11
				12
4				13
				14
				15
				16
5				

0 hrs.

0 hrs.

Contractor: Ernco Environmental Drilling & Coring Inc.	Completion Depth: 3.05 m
Equipment Type: GeoProbe 3230DT	Start Date: 2025 January 15
Logged By: WV	Completion Date: 2025 January 15
Reviewed By: SB	Page 1 of 1