

Appendix L

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

PROPOSED BLATCHFORD BRIDGE REPLACEMENT WELLINGTON ROAD 32 COUNTY OF WELLINGTON, ONTARIO

CMT Project 25-888.R01 REVISED

PREPARED FOR:

**County of Wellington
c/o Gannett Flemming Canada ULC**

**Revision Date: March 31, 2026
Original Date of Issue: February 19, 2026**





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March 31, 2026

25-888.R01 REVISED

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Attention: William Van Ruyven, P.Eng, PMP, *Vice President/Bridges & Structures Lead*

Re: Geotechnical Investigation
Proposed Blatchford Bridge Replacement (B032085)
Wellington Road 32 (between Wellington Road 124 and Laird Road West)
County of Wellington, Ontario

As requested, CMT Engineering Inc. conducted a geotechnical investigation at the above-referenced site, and we are pleased to present the enclosed report.

This report has been revised from the original to include recommendations for deep foundations and updated location plan. The information and recommendations provided in this report supersedes that provided in the previous report dated February 19, 2026.

We trust that this information meets your present requirements, and we thank you for this opportunity to have been of service. Should you have any questions, please do not hesitate to contact our office.

Yours truly,

A handwritten signature in black ink that reads 'Brandon Figg'. The signature is stylized with a large, flowing 'B' and a cursive 'Figg'.

Brandon R Figg, C. Tech.

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1.0 INTRODUCTION

The services of CMT Engineering Inc. (CMT Inc.) were retained by William Van Ruyven, of Gannett Flemming Canada ULC, on behalf of the County of Wellington to carry out a geotechnical investigation for the proposed Blatchford Bridge replacement to be undertaken on Wellington Road 32 in the County of Welington, Ontario.

It is understood that the existing bridge is located on Wellington Road 32, approximately 560 m south of Wellington Road 124 within the County of Wellington. The existing bridge has an approximate width of 7.0 m (23.0 ft) and a length of approximately 33.0 m (108.3 ft) as noted during the field investigation. The anticipated proposed works include the removal and replacement of the existing bridge, as well as the general restoration of the roadway and watercourse in the surrounding areas. The location of the structure is shown on Drawing 1.

The purpose of the geotechnical investigation was to assess the existing soil and groundwater conditions encountered in the boreholes. Included in the assessment are the soil classification and groundwater observations, as well as comments and recommendations regarding geotechnical resistance (bearing capacity); serviceability limit states (anticipated settlement); dewatering considerations; site classification for seismic site response; soil properties; recommendations for site grading, excavations, and backfilling; pavement design; chemical analyses; and a summary of the laboratory results.

The recommendations in this report are solely based on the soil conditions encountered in the boreholes advanced during this investigation.

2.0 EXISTING SITE CONDITIONS

Wellington Road 32 is a two-lane paved road with an approximate width of approximately 7.0 m, with gravel shoulders and roadside ditches. The location of the site is provided on Drawing 1. The river level at the existing structure at the time of the investigation was measured to be at an elevation of approximately 294.41 m.

3.0 FIELD AND LABORATORY PROCEDURES

Prior to the commencement of the field drilling program, public underground service locates (Ontario One Call) were undertaken to ensure that underground utilities would not be damaged, or personnel injured.

The field investigation was conducted on January 8, 2026, and comprised the advancement of two (2) boreholes (referenced as Boreholes 1 and 2) utilizing a CME 75 drillrig operated by Aardvark Drilling Inc. Boreholes 1 and 2 were advanced adjacent to the existing structure on the paved roadway. Borehole 1 was advanced refusal on probable bedrock, to an approximate depth of 7.32 m (24.0 ft) below the ground surface elevation, while Borehole 2 was advanced to an approximate depth of 14.33 m (47.0 ft) below the ground surface elevation.

Standard penetration testing and sampling was carried out in the boreholes using 38 mm inside diameter split spoon sampling equipment and an automatic hammer, in accordance with ASTM D 1586 "*Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*". At Boreholes 1 and 2, SPT soil sampling were generally conducted at 0.76 m (2.50 ft) intervals to 4.57 m (15.0 ft) and at 1.52 m (5.0 ft) intervals to borehole termination. Technical staff from CMT Inc. observed the drilling operation and collected and logged the recovered soil samples. A small portion of each sample was placed in a sealed, marked jar for moisture content determinations.

Representative soil samples from the following boreholes and depths were submitted to the CMT Inc. laboratory in St. Clements, Ontario for grain size analyses:

- Borehole 2: depth – 6.10 m to 6.71 m (20.0 ft to 22.0 ft), and
- Borehole 2: depth – 13.72 m to 14.33 m (45.0 ft to 47.0 ft).

The borehole logs are provided in Appendix A. The resulting grain size analyses are presented in Appendix B.

The location and ground surface elevation of the boreholes were surveyed by CMT Inc. on January 14, 2026 utilizing GNSS surveying equipment. Coordinates noted in this report are referred to the UTM projection, Zone 17, NAD 83-CSRS (2010) coordinate system, with elevations converted to CGVD28 datum using geoid model HTv2.0. The top of the vertical culvert lid adjacent to the pump house was utilized as a temporary benchmark with a geodetic elevation of 297.73 m. As such, the ground surface elevations at the borehole locations ranged from approximately 298.14 m to 298.21 m. The locations of the boreholes and temporary benchmark are shown on Drawing 2.

4.0 SUBSOIL CONDITIONS

The soils encountered in the boreholes are described briefly below with a more detailed stratigraphic description is provided on the borehole logs in Appendix A. The following paragraphs have been simplified into terms of major soil strata. The soil boundaries indicated have been inferred from non-continuous samples and observations of sampling and drilling resistance and typically represent transitions from one soil type to another rather than exact planes of geological change. Further, the subsurface conditions are anticipated to vary beyond the borehole locations.

4.1 Asphaltic Concrete

Weathered, asphaltic concrete (asphalt) was encountered at the surface of both boreholes. The thickness of the asphalt at the borehole locations was approximately 120 mm. The asphalt thickness is anticipated to vary throughout the project area. It should be noted that the ground was frozen at the time of the investigation and may have caused difficulty in determining the actual transition between the asphalt and granular fill.

4.2 Granular Fill

Very dense, brown granular fill was encountered underlying the asphalt in Boreholes 1 and 2. The thickness of the granular fill at the borehole locations was approximately 300 mm, however the thickness of the granular fill is anticipated to vary throughout the project area.

4.3 Silty Sand Fill/Sand and Gravel Fill/Silty Sand and Gravel Fill/Sand Fill

Black, brown and/or dark brown fill material was encountered underlying the granular fill at Boreholes 1 and 2. The fill material was considered to be loose to compact, with SPT N-values ranging from 4 to 26 blows per 0.30 m (average 15 blows per 0.30 m). The fill material was considered to be moist to wet, with moisture contents ranging from about 2.7% to 12.9% (average 7.8%).

4.4 Buried Topsoil

Black, silty organic topsoil was encountered underlying the fill material in Boreholes 1 and 2. The thickness of the buried topsoil ranged from approximately 1,240 mm to 2,260 mm. It should be expected that the buried topsoil thickness will likely vary outside of the location of the boreholes. Materials noted as topsoil in this report were classified based on visual and textural evidence. Testing of organic content or for other nutrients was not carried out.

4.5 Gravel and Sand

Brown gravel and sand with trace silt and clay was encountered underlying the buried topsoil in Borehole 1 and underlying the sand in Borehole 2. The gravel and sand was considered to be dense to very dense, with SPT N-values ranging from 38 to greater than 100 blows per 0.30 m (average 69 blows per 0.30 m). The gravel and sand was considered to be saturated, with moisture contents ranging from about 9.2% to 9.6% (average 9.4%).

4.6 **Sand**

Grey sand was encountered underlying the buried topsoil in Borehole 2. The sand was considered to be loose, with a SPT N-value of approximately 4 blows per 0.30 m. The sand was considered to be wet at the time of the investigation.

4.7 **Sandy Clayey Silt**

Grey to dark grey sandy clayey silt, with trace gravel was encountered underlying the gravel and sand in Borehole 2. The sandy clayey silt was considered to be compact to dense, with SPT N-values ranging from 19 to 32 blows per 0.30 m (average 26 blows per 0.30 m). The sandy clayey silt was considered to be moist, with moisture contents ranging from about 8.4% to 18.7% (average 13.6%).

4.8 **Sandy Clayey Silt Till**

Grey sandy clayey silt till, with trace gravel was encountered underlying the sandy clayey silt at Borehole 2. The till was considered to be very dense, with SPT N-values ranging from 52 to greater than 100 blows per 0.30 m (average 76 blows per 0.30 m). The till was considered to be moist, with moisture contents ranging from about 10.3% to 14.5% (average 12.4%).

4.9 **Limestone Bedrock**

Presumed limestone bedrock was encountered at the termination of Borehole 1. The bedrock appeared to be severely weathered/fractured in the upper zone making it very difficult to discern the soil/bedrock interface. Bedrock was not proven by coring as part of the geotechnical investigation.

The approximate elevations that limestone was encountered (refusal of SPT and/or Augers) are summarized in the following table:

Borehole No.	Approximate Elevation Presumed Bedrock Was Encountered (m)	Quality
1	290.82	Weathered

Note: The approximate elevation that limestone was encountered, as noted above, reflect the presumed limestone surface. The presumed bedrock was not proven by coring.

The limestone bedrock surface is typically undulating in nature, and therefore, the elevation can vary significantly throughout the region. The degree of weathering and/or fracturing of the bedrock should also be expected to vary across the site. The bedrock elevation throughout the proposed construction zone should be expected to be influenced by previous excavations for existing services and/or structures.

4.10 Groundwater

Moist to saturated soils were encountered in the boreholes. The approximate zone of wet to saturated soils observed in boreholes, as well as the ground surface and bottom of borehole elevations, are provided in the following table:

Borehole No.	Ground Surface Elevation (m)	Estimated Zone of Wet to Saturated Soil at the Time of Investigation Elevation (m)	Approximate Depth Below Ground Surface of Estimated Zone of Wet to Saturated Soil at the Time of Investigation (m)	Bottom of Borehole Elevation (m)
BH 1	298.14	293.49 to 290.82 (termination)	4.65 to 7.32 (termination)	290.82
BH 2	298.21	295.16 to 294.40 293.16 to 290.59	3.05 to 3.81 5.05 to 7.62	283.88

It should be noted that groundwater levels (particularly perched water) are generally dependent on the amount of precipitation, control of surface water, as well as the time of year, and can fluctuate significantly in elevation and volume. The groundwater level and wet to saturated soil conditions encountered in the boreholes could make some excavations difficult. It should be expected that caving or sloughing of any excavation wall will occur. Dewatering considerations are discussed in Section 5.8 of this report.

5.0 DISCUSSION AND RECOMMENDATIONS

This section of the report provides an interpretation of the factual geotechnical data obtained during the investigation and is intended for the guidance of the owner and design engineer. Where comments are made on construction, they are provided only to highlight those aspects which could affect the design of the project. Contractors bidding on or undertaking the work should make their own independent interpretation of the factual subsurface information provided as it affects their proposed construction means and methods, equipment selection, scheduling, pricing, and the like.

Utilizing the information gathered during the geotechnical investigation and assuming that the borehole information is representative of the subsoil conditions throughout the site, the following comments and recommendations are provided.

5.1 Serviceability and Ultimate Limit Pressure

Based on the information obtained from the boreholes, the following table provides a summary of the estimated geotechnical reaction at the Serviceability Limit State (SLS) and the factored geotechnical resistance at the Ultimate Limit State (ULS) at the various elevations, including soil type:

BH No.	Ground Surface Elevation (m)	SLS kPa (psf)	ULS kPa (psf)	Estimated Highest Founding Elevations (m)	Depth Below Existing Grade to Founding Elevation (m)	Soil Type
1	298.14	250 (5,000)	325 (6,500)	293.49 to 290.82 (termination)	4.65	Gravel and Sand
2	298.21	200 (4,000)	300 (6,000)	291.99 to 287.54	6.22	Gravel and Sand/Sandy Clayey Silt
		250 (5,000)	325 (6,500)	287.54 to 283.88 (termination)	10.67	Sandy Clayey Silt Till

Note: The founding soils are recommended to be in a drained state at the time of construction.

Based on the information obtained from the investigation and summarized in the table above, suitable founding elevations for conventional foundations and/or structures designed with a minimum bearing capacity of 200 kPa (4,000 psf) at SLS and 300 kPa (6,000 psf) at ULS were encountered below the existing buried topsoil at depths ranging between approximately 4.65 m and 6.22 m, and approximate elevations ranging between 291.99 m and 293.49.

All existing relatively loose fill, buried topsoil, organic materials (if encountered during construction), and any native soils that are not considered capable of supporting the new structure, must be removed prior to the placement of the foundation or structure for the proposed bridge replacement.

Provisions for site dewatering and soil stabilization through the placement of a crushed clear stone base or concrete mud mat (as required) should be included in the tender documents.

It is recommended that the founding soils be assessed at the time of construction by qualified geotechnical personnel in order to confirm their founding suitability. Should the soils be unsuitable to support the footings at the proposed founding elevations, the unsuitable soils must be further subexcavated and either the footings be lowered to found on approved soils or the low bearing soil may be replaced with imported granular structural fill. Should footings be designed to be constructed at elevations higher than the elevations indicated in the table above, then structural fill will be required in order to achieve the design grades for the proposed foundations. The serviceability limit pressure for good quality structural fill (OPSS 1010 Granular 'A', OPSS 1010 Type II or Type III Granular 'B') placed on suitable subgrade soils and compacted in accordance with Section 5.6 of this report is estimated to be 150 kPa (3,000 psf) at SLS and 225 kPa (4,500 psf). Alternatively, given the depth to founding soils lean concrete fill could be used to achieve the design grades for the proposed foundations.

It should be noted that the footings require a minimum of 1.2 m (4.0 ft) of soil cover to protect against frost action. Additionally, the footings are recommended to be constructed at least 1.2 m below the maximum scour depth.

With respect to the Serviceability Limit State (SLS), the total differential footing settlements are not expected to exceed the generally acceptable limits of 25 mm (1") and 19 mm (3/4") respectively, assuming a minimum footing width of 0.6 m.

Alternatively, if shallow foundations are considered to be less feasible on the subject site, it would be recommended that deep foundations such as helical piles, driven piles, concrete caissons, or another deep structural method be utilized for the founding of the proposed structures. No large cobbles or boulders, which may hamper the advancement of piles, were encountered during the investigation. It should be noted that deep foundations can be installed with many different configurations based on the intended application. It would be prudent to contact a specialized deep foundation designer/installer for project-specific designs, if required for this project. A structural engineer should determine the size, depth and number of piles/caissons that are required, as well as any pile caps or grade beam foundations. If a deep foundation system is to be utilized a supplementary geotechnical investigation must be conducted.

CMT Inc. would be pleased to review design drawings when they become available and provide further recommendations with respect to bearing and foundation elevations.

5.2 Deep Foundations

If bearing capacities greater than those listed above are required for the construction of the proposed structure, then a deep foundation system such as helical piles, driven piles, or caissons, may be a more cost-effective option. Estimated soil design parameters for use in the design of deep foundations can be found in Section 5.9.5 of this report. The following are provided as general recommendations should deep foundations be required for this site.

5.2.1 Caissons

The soils encountered at the site are generally considered feasible for the support of drilled caisson foundations. It should be noted, however, that the groundwater may pose to be an issue with respect to caisson type excavations and therefore, certain precautions or preventative measures should be taken if this founding method is utilized.

Temporary lining is expected to be required throughout the entire caisson installation depth. This is to prevent the collapse of the soft/loose subsoil into the caisson excavation as well as to seal off inflow of groundwater. "Telescoping" of several liners may be required. Where workers have to enter the caisson for inspection or cleaning, a liner has to be provided. A pump should be present on site to remove any water which may accumulate at the base of the caisson prior to concreting. Final cleaning of the caisson base and insertion of the reinforcing cage should not be carried out unless a concrete truck is present on site ready to discharge concrete immediately. Use of a tremie pipe must be used for concreting of the caissons, to avoid segregation of the concrete mix.

The caissons need to be advanced through the loose upper fill, buried topsoil, gravel and sand and/or sand and/or sandy clayey silt into the underlying very dense sandy clayey silt till soils or on probable boulder/bedrock. The probable bedrock was encountered at a depth of approximately 7.32 m in Borehole 1 and the sandy clayey silt till soils were encountered in Borehole 2 at a depth of approximately 10.67 m. It should also be cautioned that conventional caisson installation as described above is only expected to be possible down to approximately 2.39 m depth. This is because groundwater was encountered with depth and water inflow may cause quickening/heaving at the base of the excavation. It is therefore expected that special installation methods involving the use of a bentonite slurry (likely combined with temporary lining through the upper subsoil), to balance the hydrostatic pressure will be required. Concreting of the caisson would then be carried out under water, using a tremie or a concrete pump. It is therefore recommended that the deep foundation contractor be prepared for such an eventuality regardless of the depth of the caisson. An experienced deep foundations contractor should be employed for this installation.

5.2.2 Helical Piles

The soils encountered at the site are considered feasible for the support of helical pile foundations. The helical piles will need to be advanced through the loose upper fill, buried topsoil, gravel and sand and/or sand and/or sandy clayey silt into the underlying very dense sandy clayey silt till soils or on probable boulder/bedrock. The probable bedrock was encountered at a depth of approximately 7.32 m in Borehole 1 and the sandy clayey silt till soils were encountered in Borehole 2 at a depth of approximately 10.67 m. For design, it is recommended that the piles penetrate into the dense sandy clayey silt till soils or on probable bedrock. The majority of the resistance of the helical piles will come from end bearing resistance, and it would be recommended to ignore skin friction during design, especially within any saturated zones. No cobbles, boulders or fill materials which may hinder the installation of helical piles were encountered in the boreholes advanced on the subject site.

It should be noted that helical piles can be installed with many different configurations based on the intended application. It would be prudent to contact a specialized helical pile designer/installer for project specific helical pile designs.

When installing helical piles, the required load value is typically converted to a torque value based on the specific equipment used for installation. The conversion factors and equipment specifications are typically provided by the contractor/installer.

A qualified structural engineer should be retained to design the grade beams, pile cap foundations and structural slab for the helical pile system, using the estimated soil design parameters outlined in Section 5.9.5 of this report.

It is recommended that regular inspections by qualified personnel be conducted during helical pile installation in order to confirm the founding strata and installation torque values.

5.2.3 Driven Piles

The soils encountered at the site are considered feasible for the support of driven steel (H-pile, Pipe pile, etc.) foundations. The piles will need to be driven through the loose upper fill, buried topsoil, gravel and sand and/or sand and/or sandy clayey silt into the underlying very dense sandy clayey silt till soils or on probable boulder/bedrock. The probable bedrock was encountered at a depth of approximately 7.32 m in Borehole 1 and the sandy clayey silt till soils were encountered in Borehole 2 at a depth of approximately 10.67 m. For design, it is recommended that the piles penetrate into the dense sandy clayey silt till soils or on probable bedrock. No cobbles, boulders or fill materials which may hinder the

installation of driven piles was encountered in the borehole advanced on the subject site.

Preliminary design of the piles should be carried out on the basis of the axial geotechnical resistance and designed to a factored Ultimate Limit States (ULS). The majority of the resistance strength of the piles will come from end bearing resistance, however skin friction should be ignored within any saturated soil zones. The bearing resistances for the soils encountered on the subject site which can be used in the design are provided in Section 5.1 of this report. The structural resistance of the pile must be checked by the structural engineer.

Pile capacity estimated were completed for H-piles 310 x110 for each side of the structure. As such, for the proposed bridge reconstructions the pile toe would be set into the compact to very dense silt and clay-based soils. The following factored geotechnical axial resistance at ultimate limit states (ULS) and serviceability limit states (SLS) for the following sections of steel piles is appropriate. The geotechnical reaction at SLS allows for 25 mm compression of a single pile in the founding medium.

East Side - Structure B032085

Pile Section	Factored Geotechnical Axial Resistance at ULS (kN)	Allowable Geotechnical Resistance at SLS (kN)
HP 310x110	1,200	840

Please note, the above noted capacities were estimated based on an 9.3 m (30.5 ft) embedment below 5.0 m depth (elevation 293.16 m) and the soil stratigraphy encountered in Borehole 2.

West Side - Structure B032085

Pile Section	Factored Geotechnical Axial Resistance at ULS (kN)	Allowable Geotechnical Resistance at SLS (kN)
HP 310x110	1,500	-

Please note, above noted capacities were estimated based on the soil stratigraphy encountered in Borehole 1 where refusal and presumed bedrock was encountered at a depth of 7.32 m. The settlement of deep foundations founded on bedrock is considered to be negligible.

It is anticipated that the working platforms to drive the piles will be cut into the existing embankment. Any additional fill that may be required at these locations should comprise OPSS Granular 'A' material to allow installation of the piles without damage. Alternative granular material such as Granular 'B' - Type II could be employed provided the maximum particle size does not exceed 75 mm.

The piles should be installed and monitored in accordance with the requirements of OPSS 903. This should involve confirmation of the founding elevation, alignment, plumbness, uniformity of set and quality of splices and should be done on a full-time basis by experienced geotechnical personnel. Piles must be driven a suitable depth to achieve the required end bearing resistance and the pile capacity must be verified in the field by the use of the Hiley formula (Standard Structural Drawing SS-103-11) or Pile Driving Analyzer (PDA). It is recommended that a pile driving log be kept for the entire driving of the pile. Normal tolerances during pile driving of 2% plumbness and 75 mm in location should not be exceeded.

Pile caps should be provided with at least 1.2 m of earth cover or equivalent thermal insulation as protection against frost action. A 25 mm thick layer of polystyrene insulation is thermally equivalent to 600 mm of soil cover.

5.3 Seismic Site Classification

The site classification for seismic response in Table 4.1.8.4-A of the 2024 Ontario Building Code relates to the average properties of the upper 30.0 m of strata. The information obtained in the geotechnical field investigation was gathered from the upper 7.32 m to 14.33 m of strata. Based on the information gathered in the geotechnical field investigation, the site classification for seismic site response would be considered Site Class D (stiff soil) for structures founded on the native soils at the recommended founding elevations provided in Section 5.1 of this report. For foundations constructed on structural fill, placed in accordance with Section 5.6 of this report, the site classification for seismic site response would also be considered Site Class D (stiff soil).

The structural engineer responsible for the design of the structure should review the earthquake loads and effects.

5.4 Existing Bridge Demolition/Removal or Relocation of Existing Services

All concrete components of the existing structure are to be removed, as well as all existing backfill material must be removed from areas of the demolished structure. The excavations must be inspected and backfilled (as required) according to the procedures outlined in Section 5.5 of this report. It is recommended that imported sand and gravel (OPSS 1010 Type I, II or III Granular 'B' or an approved alternative) be placed as structural fill to backfill the demolition area (as required).

Any existing underground services (if present) that may be located within the proposed new structure envelope should be removed/relocated. If left in place, the location of existing services must be reviewed to ensure that they do not conflict with proposed foundation locations. All terminated pipes must be completely sealed with watertight mechanical covers, concrete or grout at termination points to prevent the migration of soils into pipe voids which can result in potential settlement. All existing trench backfill material associated with any existing underground services must be subexcavated and the subsequent excavation should be backfilled with approved soils placed in accordance with Section 5.5 of this report.

5.5 Excavations

All excavations must be carried out in accordance with Ontario Regulation 213/91 (Reg 213/91) of the Occupational Health and Safety Act and Regulations for Construction Projects.

Type 3 Soils - The existing fill material and native soils, in a drained state (not saturated) would be classified as Type 3 soils under Reg 213/91 and must be sloped to the bottom of the excavation at a minimum gradient of 1 horizontal to 1 vertical. Soils that are underlain by Type 4 soils that are exposed in the excavation or soils that are in a saturated condition must be treated as Type 4 soils (addressed below).

Type 4 Soils - In general, wet to saturated sand soils would be classified as Type 4 soils under Reg 213/91. Type 4 soils must be sloped from the bottom of the excavation at a minimum gradient of 3 horizontal to 1 vertical.

If it is not practical to excavate according to the above requirements, then a trench support system (designed in accordance with the Ontario Health and Safety Act Regulations) may be utilized. When using a temporary trench support system consisting of trench boxes to reduce the lateral extent of the excavations, it should be noted that the support system is intended primarily to protect workers as opposed to controlling lateral soil movement. Any voids between the excavation walls and the support system should be immediately filled to reduce the potential for loss of ground and to provide support to existing adjacent utilities and structures, and it is recommended that the excavation be carried out in short sections, with the support system installed immediately upon excavation completion.

Sloughing/caving of the excavation walls should be expected when excavating into any wet to saturated soils. As such, it may be necessary to increase the planned width of the excavations to accommodate sloughing/caving soils.

5.6 Structural Fill

Following the sub-excavation of all fill, any organic soils that may be encountered, and any loose, native soils deemed unsuitable to support the design bearing capacity, the exposed subgrade must be thoroughly inspected by qualified geotechnical personnel and any soft or unstable areas observed must be subexcavated and replaced with approved fill materials. Any structural fill materials (if required) should be placed according to the following procedures:

- Prior to placement of any structural fill, the subgrade for the proposed foundations must be prepared large enough to accommodate a 1:1 slope commencing a distance of 1.0 m beyond the outside edges of the proposed foundations down to approved, competent native founding soils;
- If saturated founding soil conditions are encountered during construction, it will be necessary to construct either a crushed clear stone granular base (meeting the gradation and physical property requirements of OPSS 1004) or a concrete mud mat in order to prevent disturbance of the founding soils during construction. The contractor should have the crushed clear stone or concrete available for placement immediately following the completion of the excavation and subsequent inspection and approval by qualified geotechnical personnel;
- Imported granular fill (OPSS 1010 Type II or Type III Granular 'B' is recommended for use as structural fill) can be compacted utilizing adequate heavy vibratory smooth drum or padfoot compaction equipment (compaction with padfoot equipment requires that structural fill be placed a minimum 0.3 m above the design footing grade in order to account for the disturbance of the founding soils from the pads on the compaction equipment, or the final lift at the founding elevation can be compacted utilizing a smooth drum vibratory compactor or a large diesel vibratory plate compactor). Soils approved for use as structural fill must be placed in loose lifts not exceeding 0.3 m (12") in depth for granular soils (recommended fill materials) or the capacity of the compactor (whichever is less);
- Approved fill materials must be at suitable moisture contents to achieve the specified compaction. The saturated native soils observed in the boreholes would require extensive air-drying in order to achieve the specified density and therefore, are not recommended for use as structural fill. Soil moisture will also be dependent on weather conditions at the time of construction;
- Approved structural fill materials that will support the structure must be compacted to 100% Standard Proctor Maximum Dry Density (SPMDD);
- Approved bulk fill (backfill and bulk fill that will not support footings) must be compacted to a minimum 95% SPMDD.

All approved structural fill placed according to the above procedures will be considered capable of supporting foundations designed with a minimum bearing capacity of 150 kPa (3,000 psf) at SLS and 225 kPa (4,500 psf) at ULS.

It is imperative that when cohesive soils (clay and/or silt) are utilized as fill, the material must be broken down (pulverized) to minimize void space and reduce the potential for settlement. Problems associated with compacting cohesive soils include the potential for long-term settlement due to excessive void space caused by the generally blocky structure of the excavated soils. Therefore, the contractor must have equipment on-site that can effectively break down the cohesive excavated soil into workable sizes (as required). Backfilling utilizing this material must be performed in thin lifts with considerable compactive effort applied, thereby reducing the void space and minimizing long-term settlement. This process could be difficult and time-consuming. Based on the above, any cohesive silt/clayey silt soils should not be utilized as structural fill.

5.7 Foundation Subgrade Preparation

The native soils encountered in the boreholes are sensitive to changes in moisture content and can become loose/soft if the soils are subjected to additional water or precipitation. The native subgrade soils could also be easily disturbed if traveled on during construction. Once they become disturbed, they are no longer considered adequate for the support of shallow foundations. To ensure and protect the integrity of the founding soils during construction operations, the following is recommended:

- It is recommended to construct a concrete mud slab or crushed clear stone base to protect the structural integrity of the founding soils when cast-in-place footings are proposed. In the event that precast structures are proposed, a clear stone base is suggested in order to allow for more efficient levelling;
- During construction, the subgrade should be sloped or ditched (as required) to the outside of the structure footprint in the excavation to promote surface drainage of rainwater or seepage and the collected water should be pumped out of the excavation. It is critical that all water be controlled (not allowed to pond) and that the subgrade and foundation preparation commence in dry conditions;
- Construction equipment travel and foot traffic on the founding soils should be minimized;
- If construction is to be undertaken during subzero weather conditions, the founding native soils and any potential fill materials must be maintained above freezing;
- Prior to placing concrete for the footings, the footing area must be cleaned of all disturbed or caved materials;

- The foundation formwork and concrete should be installed as soon as practical following the excavation, inspection and approval of the founding soils. The longer that the excavated soils remain open to weather conditions and groundwater seepage, the greater the potential for construction problems to occur;
- If it is expected that the founding soils will be left open to exposure for an extended period of time, it is recommended that a 75 mm concrete mud slab be placed in order to protect the structural integrity of the founding soils.

It should be noted that the native soils and possible weathered bedrock were observed to become dense to very dense and as such may be difficult and/or slow to excavate with conventional excavation equipment.

5.8 Construction Dewatering

Seepage control requirements and groundwater conditions during construction are generally dependent on the water level of the river/creek, amount of precipitation, control of surface water, the time of year, the area of work on the site, as well as the depth of the excavations, and can fluctuate significantly in elevation and volume. Wet to saturated soil conditions were observed in both boreholes. As such, it is critical that provisions for site dewatering be part of the bridge reconstruction process. Seepage should generally be adequately controlled using conventional construction dewatering techniques such as ditching (as required) and pumping from sump pits. It may be required to excavate a larger working area in order to facilitate effective drainage of founding soils. Should heavy seepage be encountered, it may be necessary to increase the number of pumps during construction to effectively drain larger construction areas. Sloughing/caving of the excavation walls should be expected when excavating into any wet to saturated soils, as such a temporary shoring system may be required. It should also be expected that dewatering pumps and hoses may plug up with fine-grained soils, resulting in the requirement for continuous maintenance.

Dewatering works should be designed and constructed in accordance with requirements of regulatory agencies such as the Ministry of Natural Resources and the Ministry of the Environment, Conservation and Parks. Dewatering should be performed in accordance with OPSS 517 and the control of water must be in accordance with OPSS 518, as required. It is the responsibility of the contractor to propose a suitable dewatering system based on the groundwater elevation at the time of construction. Collected water should discharge a sufficient distance away from the excavation to prevent re-entry. Sediment control measures must be installed at the discharge point of the dewatering system to avoid any potential adverse impacts on the environment.

Seasonal variations in the groundwater should be expected, with higher levels generally occurring during the wet weather seasons in the spring and fall, and lower levels occurring during dry weather conditions. Therefore, in order to minimize the amount of water encountered during construction, it is recommended that the construction be performed during the typically drier summer months. It will be necessary to utilize a temporary dam technique in order to divert the water away from the construction area and prevent any surface water from flowing into the excavations. Products such as Nilex Aqua Barrier are commonly used for this application. Aqua Barrier is a water-inflated dam system that acts as a barricade and prevents water from entering the work area. The controlled water is then pumped around the construction area.

5.9 Wing Walls (if constructed)

5.9.1 Bridge/Abutments and Wing Wall Backfilling

To promote drainage behind the abutments and wing walls (if constructed) and alleviate hydrostatic pressure, the structures should be backfilled with a free-draining granular material such as Granular 'B' (OPSS 1010), extending out a minimum lateral distance of 1,200 mm from the wall. The backfill should be placed in accordance with OPSD 3101.150. It should be noted that the soils that are expected to be encountered in the excavations are not considered to be free-draining.

The backfill material used against the structure walls must be placed so that the allowable lateral earth pressures on the walls are not exceeded. Backfilling operations should be carried out with the following minimum requirements:

- Adequate vibratory compaction equipment (suited to soil type and proximity to walls) should be used to compact the soils;
- Loose lift thicknesses should not exceed 0.3 m (12") for granular soils or the capacity of the compactor (whichever is less);
- The soils must be at suitable moisture contents to achieve compaction to a minimum 100% SPMDD underlying the pavement structure;
- Backfill materials beyond the 1,200 mm distance from the structure walls and below the frost taper may consist of approved excavated native soils that are at suitable moisture contents to achieve the specified compaction and with no particles greater than 250 mm and no topsoil or other deleterious materials.

5.9.2 Abutment and Wing Wall Drainage

Drainage behind abutments and wing walls (if constructed) is of paramount importance. As such, it is recommended to install wall drains (as required) and a drainage system in accordance with OPSD 3101.150. It is recommended to install minimum 100 mm diameter perforated drainage tiles to collect and redirect water behind the abutments and wing walls. The perforated tiles should be installed at a depth that provides optimal drainage but must also allow for positive drainage towards a gravity outlet. The drainage tiles should be wrapped completely in a geotextile filter fabric such as Terrafix 270 or equivalent. The drainage tiles will reduce the potential for future hydrostatic pressures acting on the structure. A rodent guard should be installed at the outlet(s).

5.9.3 Frost Tapers

Frost tapers must be constructed in order to reduce the effects of differential frost action in the bridge/culvert approaches. The frost tapers should be constructed in accordance with OPSD 3101.150. According to the OPSD requirements, the required length of the frost taper must be at least 6.0 m, as measured from the outer limit of the bridge/abutment backfill. The frost taper must be constructed on both sides utilizing the OPSS 1010 granular material that is used for the bridge/abutment and wing wall backfill.

5.9.4 Lateral Earth Pressure

Permanent subsurface walls are to be designed to resist lateral earth pressures, which can be calculated by the following:

$$P = K (\gamma h + q)$$

where: P = horizontal pressure at depth

h = depth of soil to footing (m)

K = earth pressure coefficient

γ = bulk unit weight of soil (kN/m³)

q = complete surcharge loading (kPa) (kN/m²)

This equation assumes that the backfill is free-draining and that an adequate drainage system with a positive drainage outlet has been placed below the footing level.

Computation should be performed in accordance with the latest edition of the Canadian Highway Bridge Design Code. Soil properties presented in the following section should be utilized in the computation.

5.9.5 Soil Design Parameters

The following table provides the estimated soil design parameters for imported granular fill, as well as the existing native soils encountered on-site. It should be noted that earth pressure coefficients (K_a , K_p , K_o) provided are for flat ground surface conditions and will differ for areas with slopes or embankments.

The estimated soil design parameters can be utilized for the design of perimeter shoring, foundations/structures and retaining walls, as required:

Soil Type	Soil Density (kg/m ³)	Friction Angle (Degree)	Coefficient of Active Pressure (K_a)	Coefficient of Passive Pressure (K_p)	Coefficient of At-Rest Pressure (K_o)	Coefficient of Friction (μ)
Imported Granular 'A' (OPSS 1010)	2,100	34°	0.28	3.54	0.44	0.45
Imported Granular 'B' (OPSS 1010)	2,050	32°	0.31	3.25	0.47	0.41
Existing Fill	1,800	28°	0.36	2.77	0.53	0.35
Gravel and Sand	1,850	34°	0.28	3.54	0.44	0.45
Sand	1,800	32°	0.31	3.25	0.47	0.41
Sandy Clayey Silt	1,900	30°	0.34	3.00	0.50	0.39
Sandy Clayey Silt Till	1,900	30°	0.34	3.00	0.50	0.39

5.10 Service Pipe Bedding

The native soils encountered in the geotechnical investigation are generally considered suitable for indirect support of the site service pipes (if installed), with the exception of the buried topsoil. Should instability due to saturated soil conditions be encountered, it may be necessary to increase the thickness of the granular base and utilize 19 mm clear stone to create an adequate supporting base for the service pipes and/or manholes.

Pipe embedment, cover and backfill for both flexible and rigid pipes should be in accordance with all current and applicable OPSD, OPSS and OBC standards and guidelines and as follows:

Flexible Pipes – The pipe bedding should be shaped to receive the bottom of the pipe. If necessary, pipe bridge frost treatment should be undertaken in accordance with OPSD-803.031. The trench excavations should be symmetrical with respect to the centreline of the pipe. The granular material placed under the haunches of the pipe must be compacted to 95% SPMDD prior to the continued placement and compaction of the embedment material. The homogeneous granular material used for embedment should be placed and compacted uniformly around the pipe. Should wet conditions be encountered at the base of the trench, then the pipe bedding should consist of 19 mm clear stone (meeting OPS Specifications) wrapped completely in a geotextile fabric such as Terrafix 270 or equivalent.

Rigid Pipes - In general, the pipe installation recommendations for rigid pipes are the same as those for flexible pipes, except that the minimum bedding depth below a rigid pipe should be $0.15D$ (where D is the pipe diameter). In no case should this dimension be less than 150 mm or greater than 300 mm.

Any service pipes that are not provided with sufficient frost coverage must be protected with the necessary equivalent thermal insulation. The general contractor is responsible to protect service piping from damage by heavy equipment.

5.11 Pavement Design/Drainage

The existing granular base was not tested with respect to OPSS 1010 gradation requirements for Granular 'A' or Granular 'B'; however, typically granular base materials that have been in place for a prolonged period of time do not meet the gradation requirements of OPSS 1010 and are not generally considered suitable for reuse in the new pavement structure. In most cases, the materials exceed the allowable amount of fine soils (materials passing the #200 sieve). The elevated fines content can generally be attributed to mechanical breakdown of the aggregate which occurs over time due to vehicular traffic as well as freeze/thaw cycles. As such, it is recommended that imported OPSS 1010 Granular 'B' Type III and OPSS 1010 Granular 'A' materials be utilized in the new pavement structure. It is recommended that the existing granular base be utilized as bulk fill, as required.

The buried topsoil encountered in the boreholes is highly susceptible to frost heaving, low in permeability and has low strength values which can lead to frost boils during rapid thawing and subsequent failure of the pavement structure. It would be considered sound construction practice to subexcavate all existing buried topsoil. All buried topsoil must be removed from the bridge replacement footprint, however, if it is not financially viable to subexcavate the full extent of the buried topsoil under the roadway during the reconstruction project due to the depth or amount of buried topsoil present, then separation and additional strength can be provided to reduce the above-noted frost-related issues by installing a geotextile such as Terrafix 270R (or equivalent) for separation and then a biaxial geogrid such as a Tensar BX1200 (or equivalent) for reinforcement.

If the buried topsoil is left in place, it would be recommended to subexcavate the existing material an additional 150 mm (6") below the design subgrade elevation prior to installation of the Terrafix 270R (or equivalent). The Terrafix 270R (or equivalent) should be installed directly on the prepared subgrade, in accordance with the manufacturer's installation procedures. It is then recommended that a 150 mm (6") thick layer of good quality Granular 'B' (OPSS 1010 Type II or Type III) be installed on the geotextile, followed by the installation of the Tensar BX1200 (or equivalent) biaxial geogrid (installed according to manufacturer's installation procedures). Placement of the remaining portion of Granular 'B' subbase would follow (in compacted layers).

If the existing buried topsoil (or portions thereof) is left in place, ongoing frost heave and settlement should be anticipated. The geotextile and geogrid should help to minimize the differential movement however continued heaving within the frost zone could occur.

The native subgrade soils are sensitive to changes in moisture content and may become loose or soft if the soils are subject to inclement weather and seepage or severe drying. Furthermore, the subgrade soils could be easily disturbed if traveled on during construction. As such, where this material will be exposed, it is recommended that the granular subbase be placed immediately upon completion and inspection of the subgrade preparation to protect the structural integrity of the subgrade soils.

Prior to placement of the granular base, the subgrade should be proof-rolled under the supervision of qualified geotechnical personnel, and any soft or unstable areas observed should be subexcavated and replaced with suitable drier materials, compacted to a minimum of 95% SPMDD. Frost tapers must be constructed as per Section 5.9.3 of this report.

Should wet and/or soft conditions be encountered during construction, site assessments may be required to determine what options can be undertaken to construct a modified pavement base. These options may include subexcavation of wet soils and increasing the thickness of the granular base, the use of reinforcing geotextiles and/or geogrids, or a combination of all.

The subgrade should be graded smooth and be free of depressions with a minimum grade of 3% towards the curb line or roadside ditch (if constructed).

Rapid drainage of the pavement structure is critical to ensure long-term performance. In order to improve the lateral support and drainage of the road structure, it is recommended that the shoulder rounding be reconstructed in accordance with OPSD 200.010, OPSD 206.010 and/or OPSD 209.010, if feasible. The granular base as well as the granular subbase should daylight in the shoulder rounding which should be free of vegetation; the granular shoulder should also be sloped at 6% to the rounding breakpoint, all in accordance with OPSD 200.010, OPSD 206.010 and/or OPSD 209.010.

Any existing vegetation and generally minimal or negative slope on the existing shoulder would be expected to impede drainage of the granular base/subbase as well as surface drainage which can result in ponding of surface water (rain as well as melted snow and ice). In order to improve drainage of the road structure, it is recommended that, if feasible, the granular subbase should daylight in the shoulder rounding which should be free of vegetation; the granular shoulder should also be sloped at 6% to the rounding breakpoint, all in accordance with OPSD 200.010, OPSD 206.010 and/or OPSD 209.010. Consideration must be given in the road design to ensure that the gravel shoulder rounding is not subject to erosion by excessive overland flow of surface water.

It is expected that the road will be subjected to both heavy loading (delivery trucks, farm equipment, school buses, snow removal and maintenance equipment, waste services trucks and emergency vehicles), as well as light loading from passenger vehicles.

Considering anticipated loading and the frost-susceptibility of the subgrade soils, the following pavement design is recommended for the proposed road reconstruction areas:

Material	Recommended Thickness (Heavy Traffic)
Asphaltic Concrete	HL3 - 50 mm (2.0") HL4 or HL8 - 75 mm (3.0")
Granular 'A' Base (OPSS 1010)	150 mm (6.0")
Granular 'B' Subbase (OPSS 1010)	450 mm (18.0")

The granular subbase material and frost tapers must be compacted to 100% SPMDD. Asphaltic concrete should be supplied, placed and compacted to a minimum 92.0% Marshall maximum relative density in accordance with OPSS 1150 and OPSS 310.

Construction joints in the surface asphalt must be offset a minimum of 150 mm to 300 mm (6" to 12") from construction joints in the binder asphalt so that longitudinal joints do not coincide.

In areas where new asphalt will abut any existing asphalt, it is recommended that any joints in the existing asphalt be sawcut in a straight line prior to being milled to a depth of 80 mm and a width of 300 mm as per OPSD 509.010. It is recommended that a tack coat in conformance with OPSS 308 be applied to the edge and surface of all milled asphalt prior to placement of new asphalt.

The road should be designed to ensure that water will not pond on the road surface or road edge. It is imperative that a proper spillway be constructed to ensure that erosion of the shoulder rounding does not occur at all locations where surface flow is directed off the paved surface and into the ditch.

5.12 Chemical Analysis/Excess Soil Management

5.12.1 Chemical Testing

As requested, random representative samples of soil were obtained by CMT Inc. personnel and were submitted to ALS Laboratory Group in Waterloo, Ontario for geochemical analyses including Sodium Adsorption Ratio (SAR) testing.

Geochemical analyses samples were obtained from the following depths and locations:

- Borehole 1 - depth 0.12 m to 0.42 m (0.40 ft to 1.38 ft),
- Borehole 1 – depth 3.05 m to 3.66 m (10.00 ft to 12.00 ft),
- Borehole 2 – depth 1.52 m to 2.13 m (5.00 ft to 7.00 ft), and
- Borehole 2 – depth 3.81 m to 4.42 m (12.50 ft to 14.50 ft).

The samples were tested for the following various parameters:

- Metals and Inorganics as per O.Reg. 153 as amended by R511;
- PAH, BTEX and PHC F1-F4 as per O.Reg. 153 as amended by R511; and
- Volatile Organic Compounds (VOC) as per O.Reg. 153.

The chemical analysis results were compared to Ontario Regulation 153/04 - as amended by O.Reg. 511 – April 15, 2011 Standards = [Suite] – ON-511-T1/T2-SOIL-RPI. Specifically, the results were compared to *T1-Soil-Res/Park/Inst/Ind/Com/Comm Property Use*, *T2-Soil-Ind/Comm/Comm Property Use* and *T2-Soil-Res/Park/Inst. Property Use*. The following tables outline any exceedances noted in the testing completed by ALS Environmental and reported on January 16, 2026. Please refer to the chemical analyses test results in Appendix C for Guideline Limit Reference numbers.

- The following table details the parameters which exceed the site condition standards in Borehole 1, Sample 1 - depth 0.12 m to 0.42 m:

Parameter	T1-Soil-Res/Park/Inst/Inc/Com/Comm. Property Use	T2-Soil-Res/Park/Inst. Property Use (Coarse/Fine)	T2-Soil-Ind/Comm/Comm Property Use (Coarse/Fine)
Fixed-Ratio Extractables			
Sodium Adsorption Ratio (SAR)	Exceed	Exceed	Exceed
Hydrocarbons			
F2 (C10-C16)	Exceed	--	--

- The following table details the parameters which exceed the site condition standards in Borehole 1, Sample 5 – depth 3.05 m to 3.66 m:

Parameter	T1-Soil-Res/Park/Inst/Inc/Com/Comm. Property Use	T2-Soil-Res/Park/Inst. Property Use (Coarse/Fine)	T2-Soil-Ind/Comm/Comm Property Use (Coarse/Fine)
Physical Tests			
Conductivity	Exceed	Exceed	Exceed
Fixed-Ratio Extractables			
Sodium Adsorption Ratio (SAR)	Exceed	Exceed	Exceed
Metals			
Cadmium	Exceed	Exceed	Exceed
Zinc	Exceed	Exceed	Exceed

- The following table details the parameters which exceed the site condition standards in Borehole 2, Sample 3 – depth 1.52 m to 2.13 m:

Parameter	T1-Soil-Res/Park/Inst/Inc/Com/Comm. Property Use	T2-Soil-Res/Park/Inst. Property Use (Coarse/Fine)	T2-Soil-Ind/Comm/Comm Property Use (Coarse/Fine)
Physical Tests			
Conductivity	Exceed	Exceed	Exceed
Fixed-Ratio Extractables			
Sodium Adsorption Ratio (SAR)	Exceed	Exceed	Exceed
Hydrocarbons			
F4 (C34-C50)	Exceed	--	--
F4G - sg	Exceed	--	--

- The following table details the parameters which exceed the site condition standards in Borehole 2, Sample 6 – 3.81 m to 4.42 m:

Parameter	T1-Soil-Res/Park/Inst/Inc/Com/Comm. Property Use	T2-Soil-Res/Park/Inst. Property Use (Coarse/Fine)	T2-Soil-Ind/Comm/Comm Property Use (Coarse/Fine)
Physical Tests			
Conductivity	Exceed	Exceed	Exceed
Fixed-Ratio Extractables			
Sodium Adsorption Ratio (SAR)	Exceed	Exceed	Exceed
Metals			
Zinc	Exceed	Exceed	Exceed

It should be noted that it is very common for the Sodium Adsorption Ratio (SAR) standards to be exceeded in soils underlying or in close proximity to areas where chemicals, such as de-icing salts, may be utilized for vehicle and pedestrian safety. The elevated SAR levels are anticipated to be associated with the use of road salt as a de-icing mechanism.

The above test results are based on single soil samples extracted from each borehole and do not constitute as a guarantee for the entire site. It is the responsibility of the contractor to notify the owner/consultant of any changes in site conditions such as odours or staining that would warrant further testing. The boreholes completed as part of the geotechnical investigation were advanced in areas that have not been subjected to excavation for existing service pipe installation.

5.12.2 Leachate Testing

If soils are transported off-site, additional chemical testing may be required. The extent of the leachate testing will be determined by the results of the initial chemical testing as well as the requirements of the disposal site.

The chemical analysis results would be compared to the site condition standards of Ontario Regulation 406/19. Typically, the results are compared to; *T1-Leachate Screening Levels – Res/Park/Inst/Ind/Com/Commu Property Use*; *T2-Leachate Screening Levels – Ind/Com/Commu/Property Use*.

When transporting soils off-site, the following is recommended:

- All chemical analyses and environmental assessment reports must be fully disclosed to the receiving site owners/authorities, whom must agree to receive the material;
- An environmental consultant must confirm the land use at the receiving site is compatible to receive the material;
- An environmental consultant must monitor the transportation and placement of the materials to ensure that the material is placed appropriately at the pre-approved site;
- The excess materials may not be transported to a site that has previously had a Record of Site Condition (RSC) filed, unless the material meets the criteria outlined in the RSC.

It should be noted that landfill sites will generally only accept laboratory test results that have been completed within 30 days of exporting. Therefore, it is recommended that provisions for chemical analysis be included in the tender documents. It should also be noted that the laboratory testing generally takes five (5) working days to process with a regular turnaround time.

As requested, a random representative sample of soil was obtained by CMT Inc. personnel and was submitted to ALS Laboratory Group in Waterloo, Ontario for leachate testing (TCLP).

A sample was obtained from the following depth and location:

- Borehole 1 – depth 3.05 m to 3.66 m (10.00 ft to 12.00 ft),

The sample was tested for the following various parameters:

- Metals and Inorganics as per O.Reg. 153 as amended by R511;
- Volatile Organic Compounds (VOC) as per O.Reg. 153.

The sample from Borehole 1, from an approximate depth of 3.05 m to 3.66 m did not exceed any guideline limits noted in the testing completed by ALS Environmental and reported on January 26, 2026. Please refer to the chemical analyses test results in Appendix C for Guideline Limit Reference numbers.

6.0 SITE INSPECTIONS

Qualified geotechnical personnel should supervise excavation inspections as well as compaction testing for structural filling, site grading and site servicing. This will ensure that footings are founded in the proper strata and that proper material and techniques are used and the specified compaction is achieved. CMT Inc. would be pleased to review the design drawings and provide an inspection and testing program for the construction of the proposed development.

7.0 LIMITATIONS OF THE INVESTIGATION

The recommendations made in this report are in accordance with our present understanding of the project. We request that we be permitted to review our recommendations when the drawings and specifications are complete, or if the proposed construction should differ from that mentioned in this report.

It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments are based on the results obtained at the test locations only. It is therefore assumed that these results are representative of the subsoil conditions across the site. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations.

It should be noted that this report specifically addresses geotechnical aspects of the project and does not include any investigations or assessments relating to potential subsurface contamination. As such, there should be no assumptions or conclusions derived from this report with respect to potential soil or water contamination. Soil or water contamination is generally caused by the presence of xenobiotic (human-made) chemicals or other alteration processes in the natural soil and groundwater environment. If necessary, the investigation, assessment and rehabilitation of soil and water contaminants should be undertaken by qualified environmental specialists.

The samples obtained during the geotechnical investigation will be stored for a period of three months, after which time they will be disposed of unless alternative arrangements are made.

This report is intended solely for the client named. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the reliability of such third parties. The factual data, interpretation, and recommendations in this report pertain to a specific project as described in this report and are not applicable to any other project or site location. If the project is modified in concept, location or elevation, deviates from the assumptions stated herein, CMT Inc. should be given an opportunity to confirm that the recommendations are still valid. The subject geotechnical exploration and this report address only the geotechnical aspects of the proposed project; potential environmental impacts or related issues are beyond the defined scope of this work and have not been addressed.

We trust that this report meets your present requirements. Should you have any questions, please do not hesitate to contact our office.

Prepared by:



Brandon R Figg, C. Tech.
Senior Soil Technician

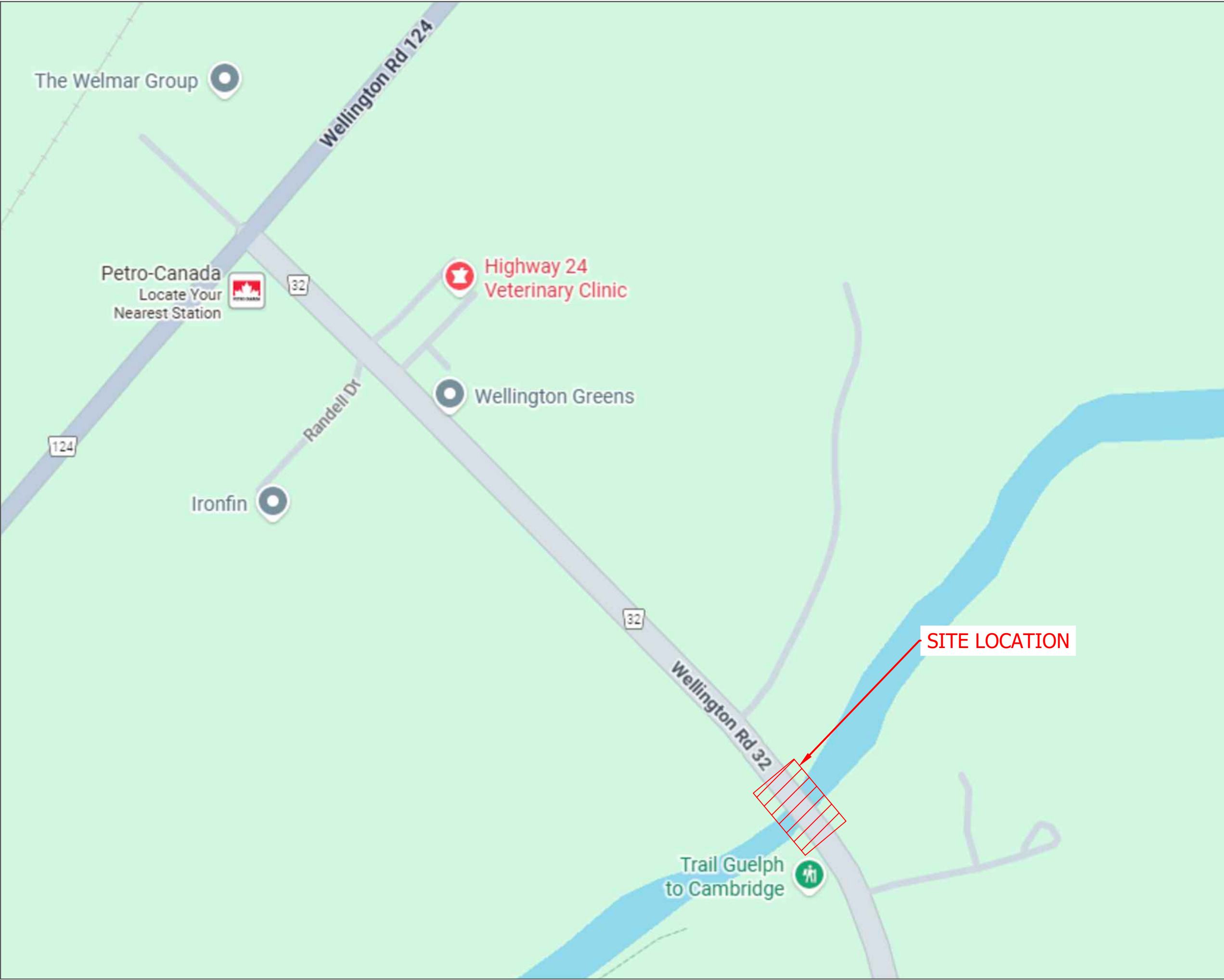
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Reviewed by:

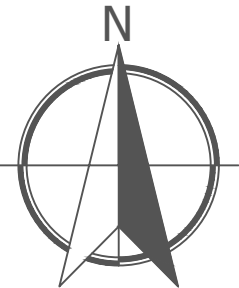


Nathan Chortos, P.Eng.
Senior Engineer



NOTES:

1. BASE MAP PROVIDED BY GOOGLE MAPS.



NO.	DESCRIPTION	DATE

REVISIONS



CMT ENGINEERING INC.

1011 Industrial Crescent, Unit 1

St. Clements, Ontario N0B 2M0

Tel.: 519-699-5775

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www.cmtinc.net

PROJECT:

Geotechnical Investigation
 Proposed Blatchford Bridge Replacement
 (B032085)
 Wellington Road 32,
 County of Wellington, Ontario

DRAWING TITLE:

SITE LOCATION MAP

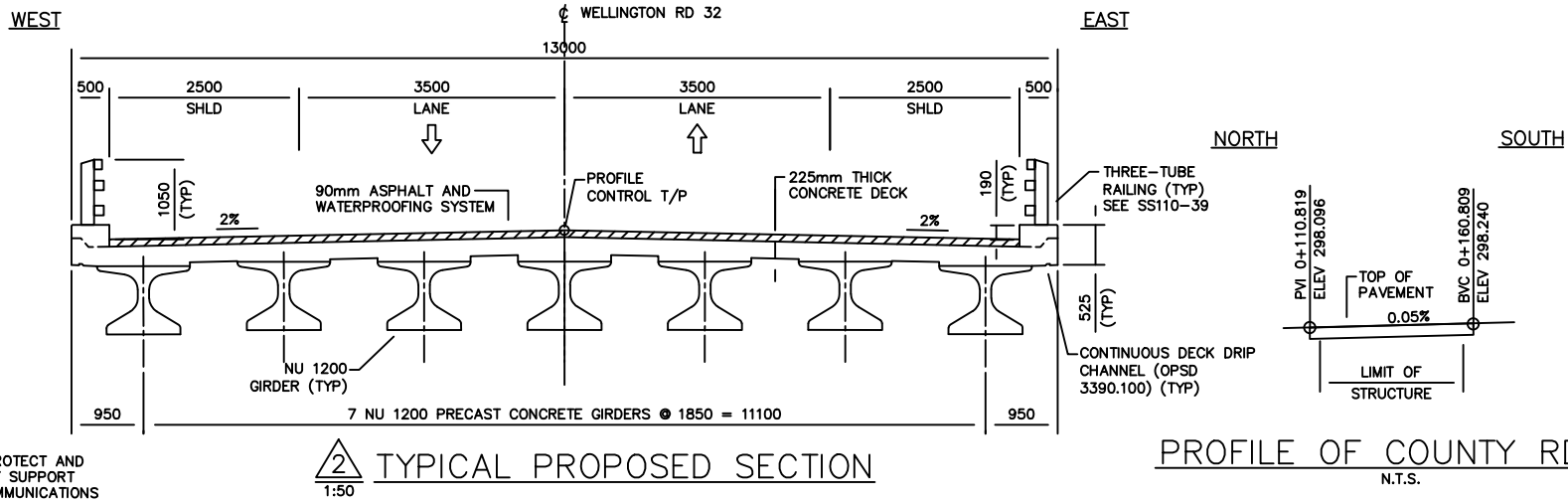
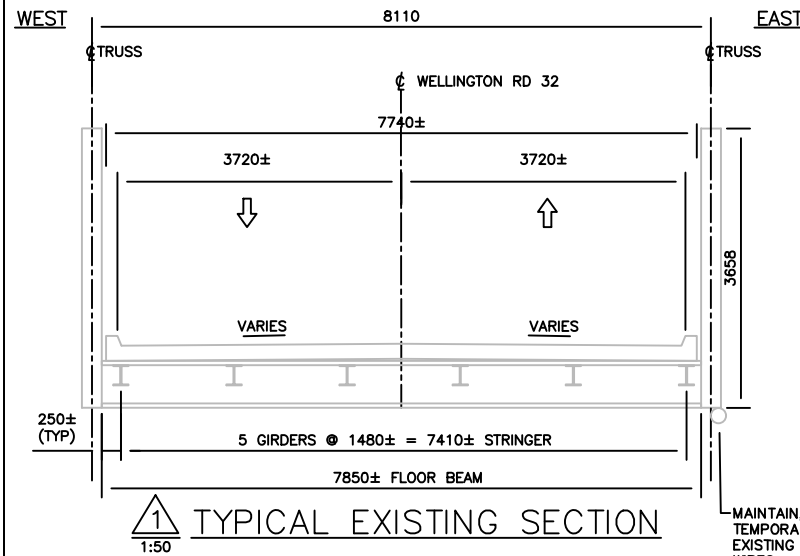
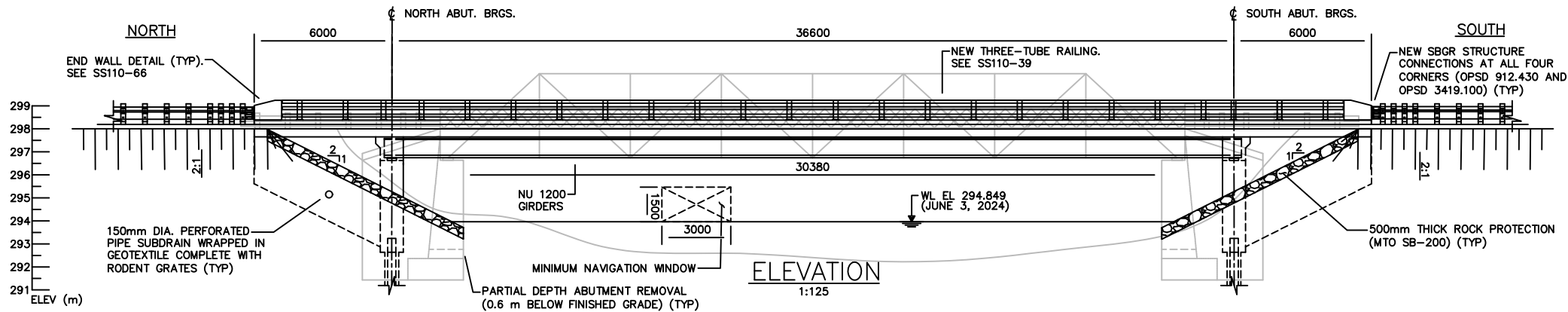
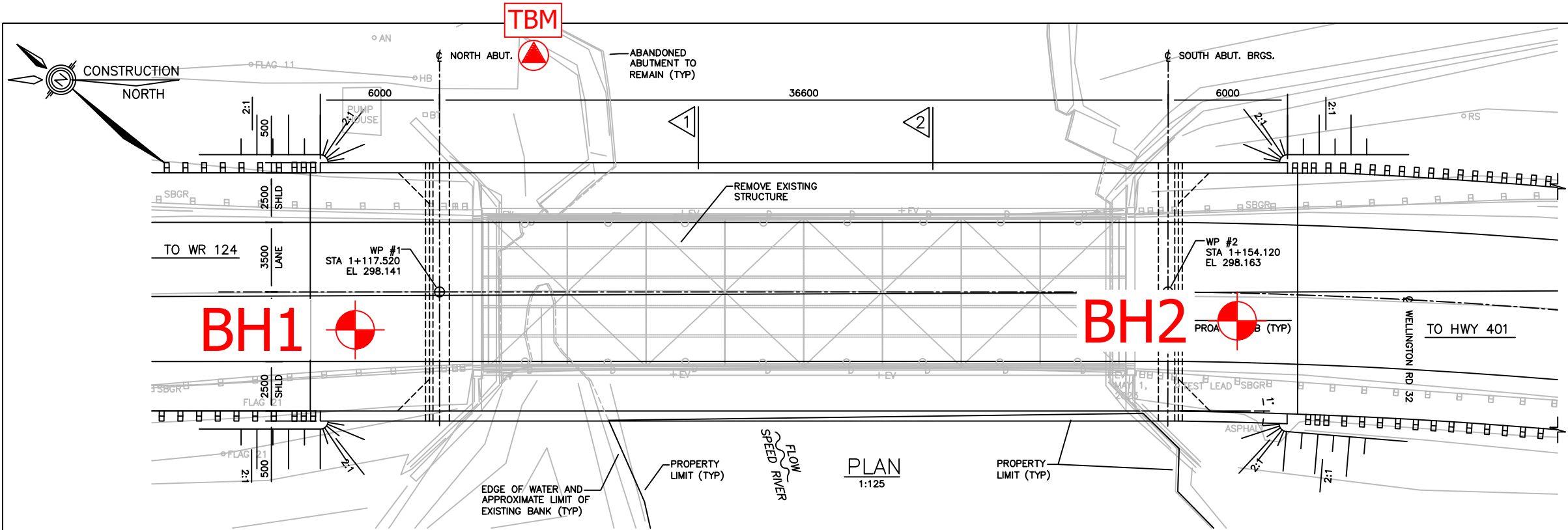
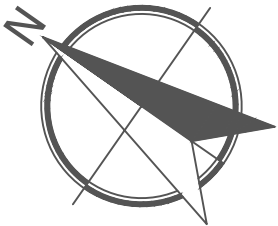
PROJECT NO.:	DATE:
24-888	January 27, 2026
SCALE:	DRAWING NO.
N.T.S.	1

NOTES:

1. DRAWING PROVIDED BY CLIENT.

 CMT Borehole - 2026

 Temporary Benchmark



PROFILE OF COUNTY RD
N.T.S.

NO.	DESCRIPTION	DATE
REVISIONS		
 CMT ENGINEERING INC. 1011 Industrial Crescent, Unit 1 St. Clements, Ontario N0B 2M0 Tel.: 519-699-5775 Fax: 519-699-4664 www.cmtinc.net		
PROJECT: Geotechnical Investigation Proposed Blatchford Bridge Replacement (B032085) Wellington Road 32, County of Wellington, Ontario		
DRAWING TITLE: PROPOSED STRUCTURAL DRAWING SHOWING APPROXIMATE BOREHOLE LOCATIONS AND TEMPORARY BENCHMARK LOCATION		
PROJECT NO.:	25-888	DATE: March 9, 2026
SCALE:	N.T.S.	DRAWING NO. 2

APPENDIX A

BOREHOLE LOGS



CMT Engineering Inc.
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BOREHOLE NUMBER BH1

PAGE 1 OF 1

PROJECT: Proposed Blatchford Bridge Replacement (B032085)

PROJECT ADDRESS: Wellington Road 32

PROJECT LOCATION: County of Wellington, Ontario

PROJECT NUMBER: 25-888

DRILLING DATE: 26-1-8

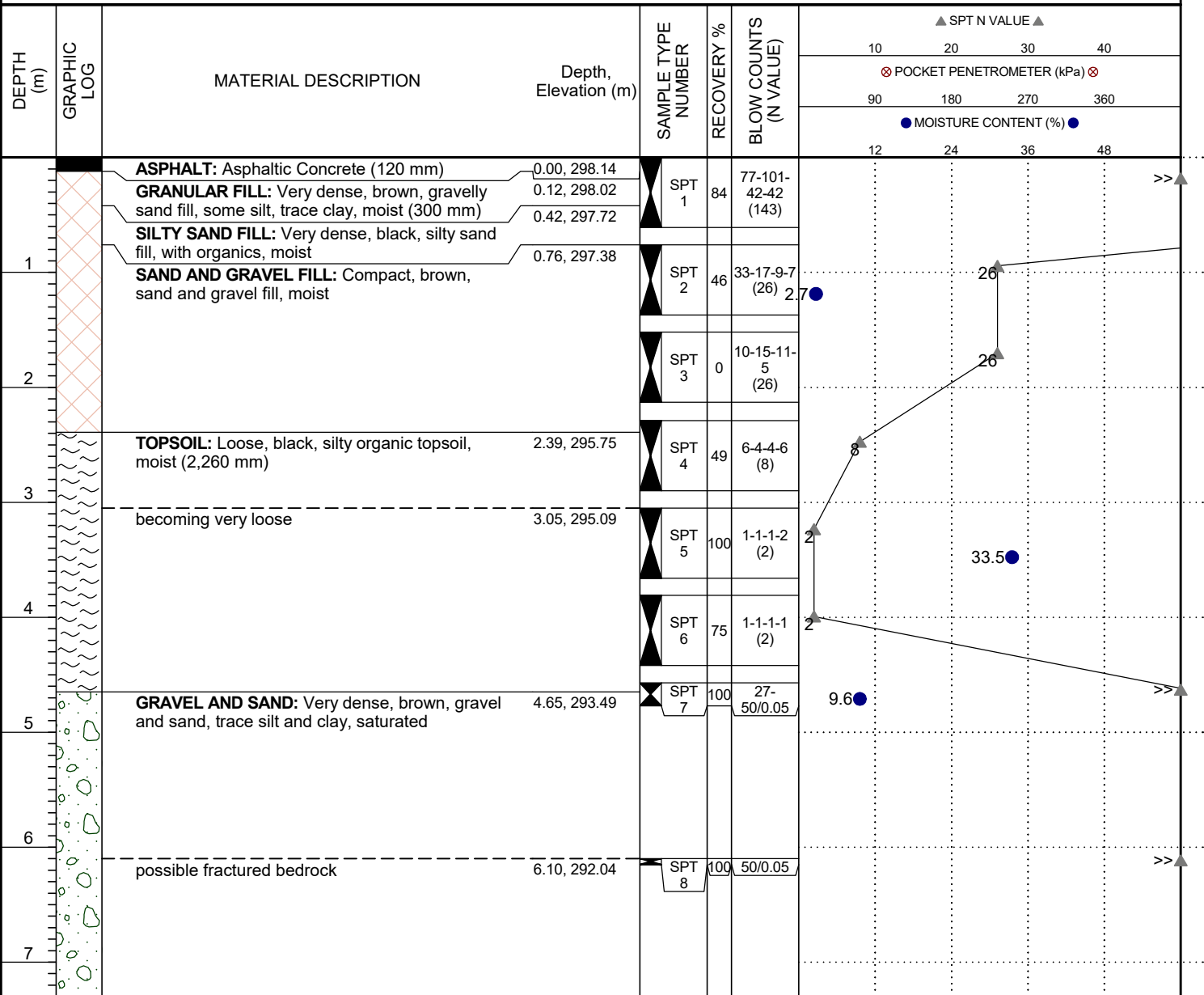
DRILLING CONTRACTOR: Aardvark Drilling Inc.

DRILLING EQUIPMENT: CME 75

GROUND ELEVATION: 298.14 m

LOGGED BY: BRF

SAMPLING METHOD: SPT



Auger refusal in the borehole was encountered at , a depth of approximately 7.32 m (El. 290.82 m) below ground surface on probable boulder/bedrock. Bottom of borehole at 7.32 m, Elevation 290.82 m.



CMT Engineering Inc.
1011 Industrial Crescent, Unit 1
St. Clements, ON, N0B 2M0
Telephone: 519-699-5775

BOREHOLE NUMBER BH2

PAGE 1 OF 2

PROJECT: Proposed Blatchford Bridge Replacement (B032085)

PROJECT ADDRESS: Wellington Road 32

PROJECT LOCATION: County of Wellington, Ontario

PROJECT NUMBER: 25-888

DRILLING DATE: 26-1-8

DRILLING CONTRACTOR: Aardvark Drilling Inc.

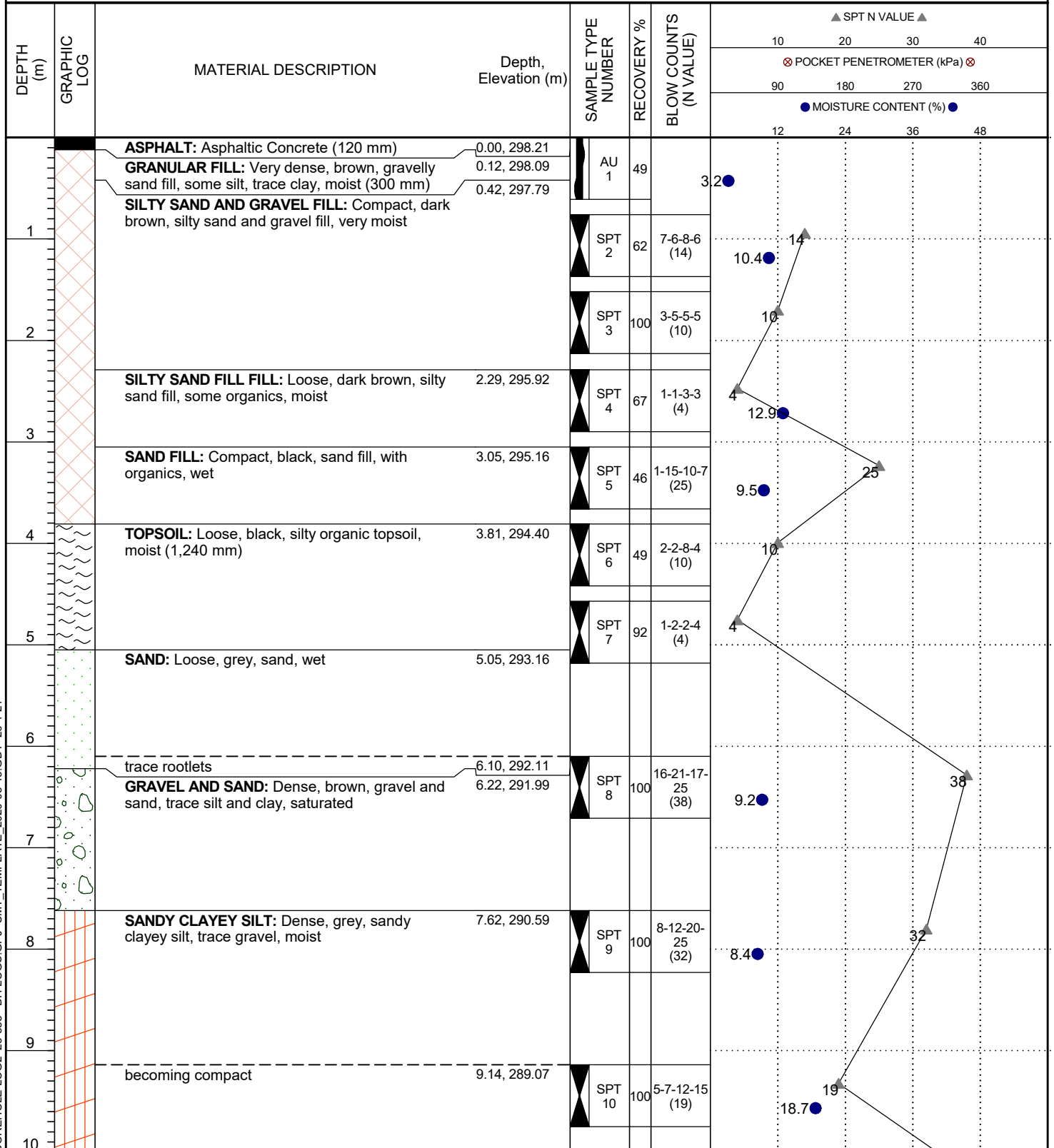
DRILLING EQUIPMENT: CME 75

GROUND ELEVATION: 298.21 m

LOGGED BY: BRF

SAMPLING METHOD: SPT

BOREHOLE LOG2 25-888 - BH LOGS.GPJ CMT TEMPLATE 2020-05-15.GDT 26-1-21



(Continued Next Page)



CMT Engineering Inc.
1011 Industrial Crescent, Unit 1
St. Clements, ON, N0B 2M0
Telephone: 519-699-5775

BOREHOLE NUMBER BH2

PAGE 2 OF 2

PROJECT: Proposed Blatchford Bridge Replacement (B032085)

PROJECT ADDRESS: Wellington Road 32

PROJECT NUMBER: 25-888

PROJECT LOCATION: County of Wellington, Ontario

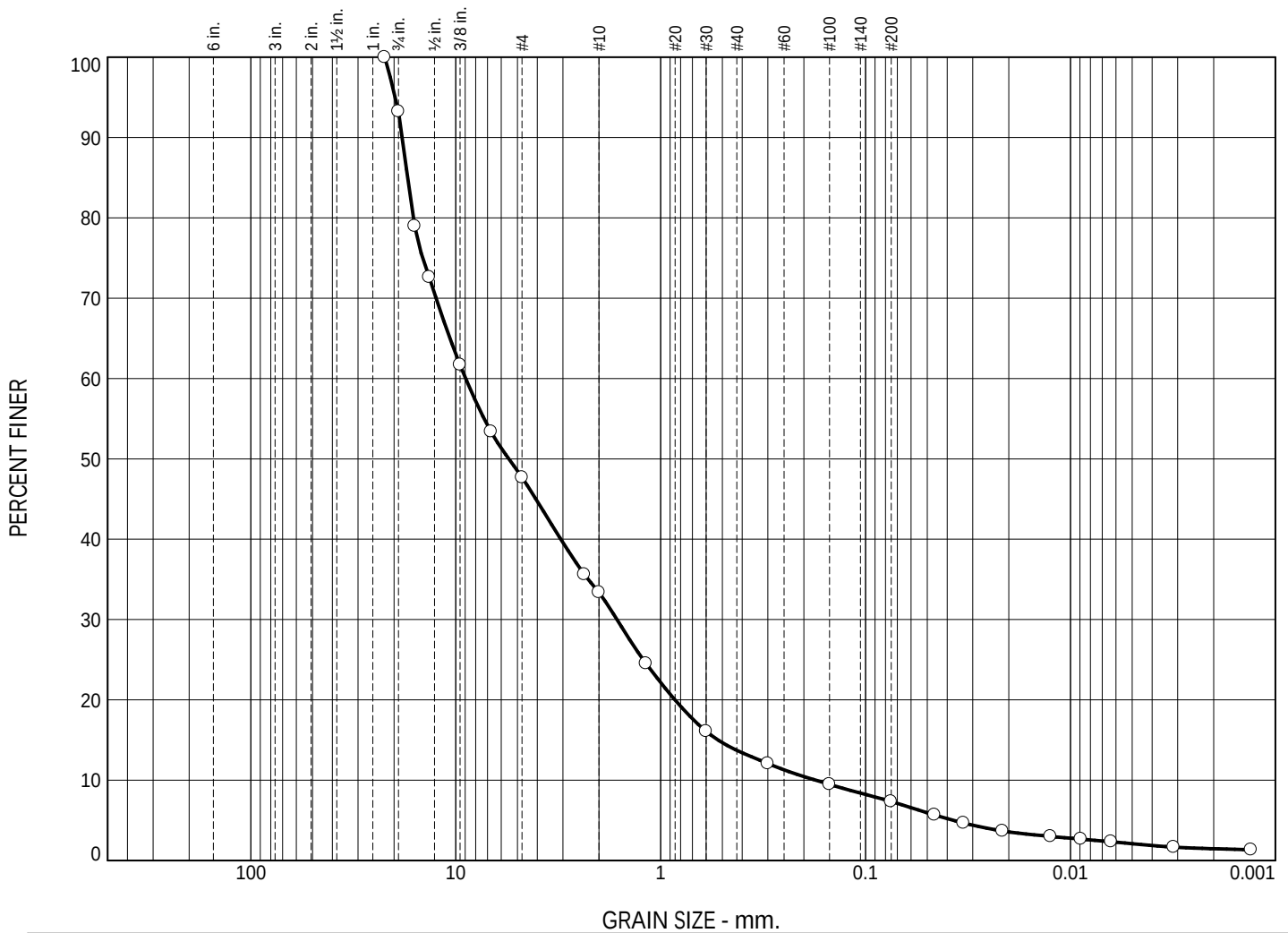
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Depth, Elevation (m)	SAMPLE TYPE NUMBER	RECOVERY %	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲					
							10	20	30	40		
							⊗ POCKET PENETROMETER (kPa) ⊗					
							90	180	270	360		
							● MOISTURE CONTENT (%) ●					
							12	24	36	48		
		becoming compact (<i>continued</i>)	9.14, 289.07 (<i>continued</i>)									
11		SANDY CLAYEY SILT TILL: Very dense, grey, sandy clayey silt till, trace gravel, moist	10.67, 287.54	SPT 11	100	17-21-31-30 (52)	10.3				>>▲	
12												>>▲
13				SPT 12	73	29-57-50/0.11	14.5					>>▲
14			becoming dark grey	13.72, 284.49	SPT 13	87	9-24-49-49 (73)	12.5				>>▲

Caving in the borehole was encountered at a
depth of approximately 11.28 m (El. 286.93 m)
below ground surface.
Bottom of borehole at 14.33 m, Elevation 283.88
m.

APPENDIX B

GRAIN SIZE ANALYSES

Particle Size Distribution Report



GRAIN SIZE - mm.

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	6.8	45.5	14.3	19.7	6.4	5.8	1.5

SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH2	8	6.10-6.71m	gravel and sand, trace silt and clay	GW-GM
				Sampled by BRF of CMT Engineering Inc. January 8, 2026	
				Tested by JM of CMT Engineering Inc. January 14, 2026	

CMT Engineering Inc.

St. Clements, ON

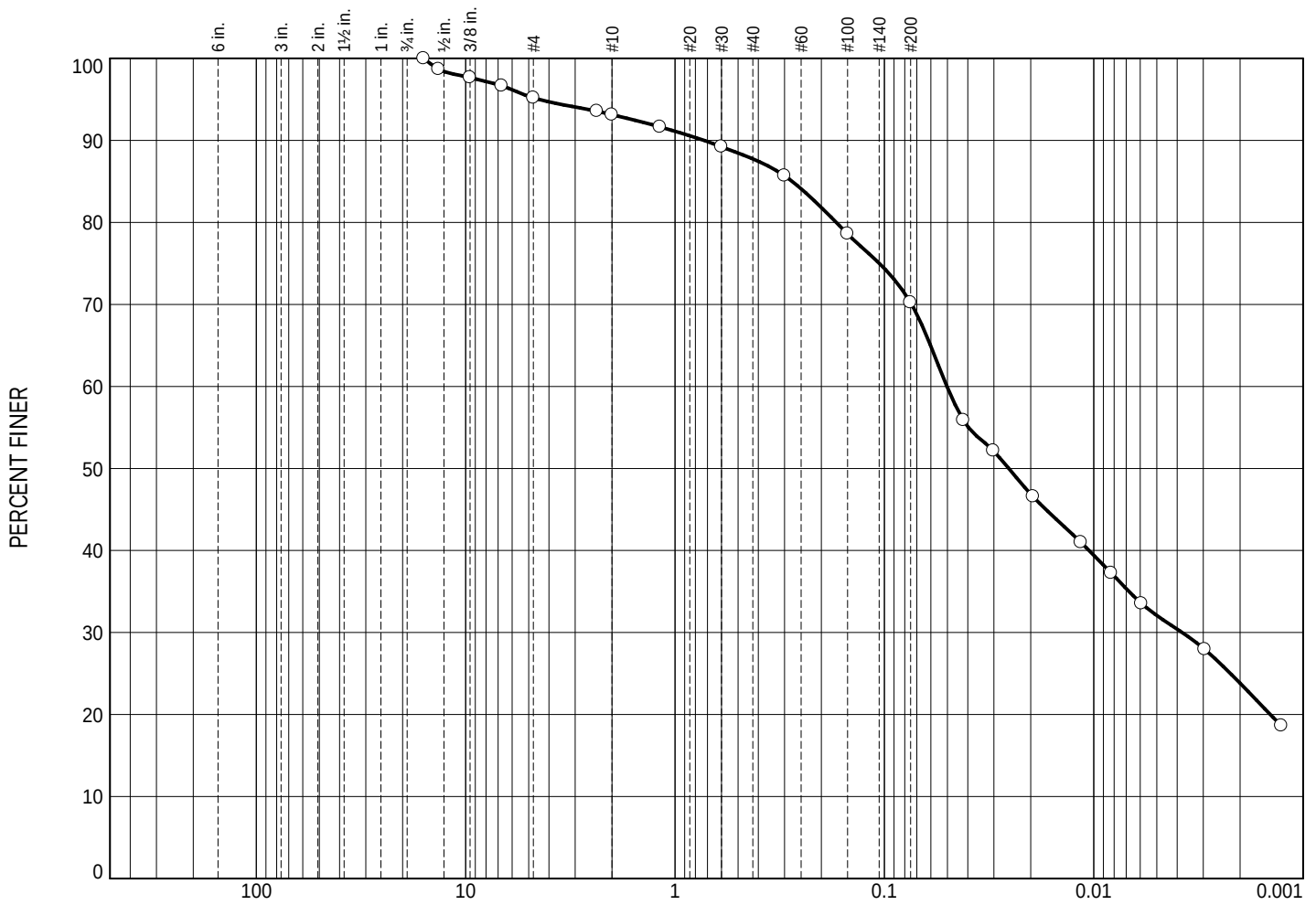
Client: Gannett Fleming Canada ULC

Project: Proposed Blatchford Bridge Replacement (B032085)
Wellington Road 32, County of Wellington, Ontario

Project No.: 25-888

Figure 1

Particle Size Distribution Report



GRAIN SIZE - mm.

	% Cobbles	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.8	2.1	5.4	17.5	46.4	23.8

SOIL DATA

	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	BH2	13	13.72-	sandy, clayey silt, trace gravel	ML
			14.33m	Sampled by BRF of CMT Engineering Inc. January 8, 2026	
				Tested by JM of CMT Engineering Inc. January 14, 2026	

CMT Engineering Inc.

St. Clements, ON

Client: Gannett Fleming Canada ULC

Project: Proposed Blatchford Bridge Replacement (B032085)
Wellington Road 32, County of Wellington, Ontario

Project No.: 25-888

Figure 2

APPENDIX C

CHEMICAL ANALYSES RESULTS



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2600489		
Client	: CMT Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jake Feeney	Account Manager	: Mathy Mahadeva
Address	: 1011 Industrial Crescent Unit 1 St. Clements Ontario Canada N0B 2M0	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 519 699 5775	Telephone	: +1 519 886 6910
Project	: 25-888 Blatchford Bridge, Guelph, ON	Date Samples Received	: 09-Jan-2026 15:40
PO	: ----	Date Analysis Commenced	: 12-Jan-2026
C-O-C number	: ----	Issue Date	: 19-Jan-2026 18:10
Sampler	: Brandon Figg		
Site	: ----		
Quote number	: Standing Offer 2026 Pricing		
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
- Guideline Comparison

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
David Tremblett	VOC Section Supervisor	VOC, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Laboratory Manager - Environmental	Metals, Waterloo, Ontario
Jon Fisher	Laboratory Manager - Environmental	Inorganics, Waterloo, Ontario
Josphin Masihi	Supervisor I	Centralized Prep, Waterloo, Ontario



Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH1S1 ----	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T1-RPIICC	8.03 -	2.4 -
	Soil/Solid	F2 (C10-C16)		ON153/04	T1-RPIICC	16 mg/kg	10 mg/kg
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-C	8.03 -	5 -
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-F	8.03 -	5 -
BH1S5 ----	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T1-RPIICC	1.57 mS/cm	0.57 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T1-RPIICC	16.1 -	2.4 -
	Soil/Solid	Cadmium		ON153/04	T1-RPIICC	3.87 mg/kg	1.2 mg/kg
	Soil/Solid	Zinc		ON153/04	T1-RPIICC	2350 mg/kg	290 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-C	1.57 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-C	16.1 -	12 -
	Soil/Solid	Cadmium		ON153/04	T2-ICC-C	3.87 mg/kg	1.9 mg/kg
	Soil/Solid	Zinc		ON153/04	T2-ICC-C	2350 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-F	1.57 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-F	16.1 -	12 -
	Soil/Solid	Cadmium		ON153/04	T2-ICC-F	3.87 mg/kg	1.9 mg/kg
	Soil/Solid	Zinc		ON153/04	T2-ICC-F	2350 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-C	1.57 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-C	16.1 -	5 -
	Soil/Solid	Cadmium		ON153/04	T2-RPI-C	3.87 mg/kg	1.2 mg/kg
	Soil/Solid	Zinc		ON153/04	T2-RPI-C	2350 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-F	1.57 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-F	16.1 -	5 -
	Soil/Solid	Cadmium		ON153/04	T2-RPI-F	3.87 mg/kg	1.2 mg/kg
	Soil/Solid	Zinc		ON153/04	T2-RPI-F	2350 mg/kg	340 mg/kg



BH2S3 ----	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T1-RPIIC	2.62 mS/cm	0.57 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T1-RPIIC	48.1 -	2.4 -
	Soil/Solid	F4 (C34-C50)		ON153/04	T1-RPIIC	440 mg/kg	120 mg/kg
	Soil/Solid	F4G-sg		ON153/04	T1-RPIIC	1780 mg/kg	120 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-C	2.62 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-C	48.1 -	12 -
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-F	2.62 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-F	48.1 -	12 -
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-C	2.62 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-C	48.1 -	5 -
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-F	2.62 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-F	48.1 -	5 -
BH2S6 ----	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T1-RPIIC	2.11 mS/cm	0.57 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T1-RPIIC	25.7 -	2.4 -
	Soil/Solid	Zinc		ON153/04	T1-RPIIC	378 mg/kg	290 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-C	2.11 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-C	25.7 -	12 -
	Soil/Solid	Zinc		ON153/04	T2-ICC-C	378 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-ICC-F	2.11 mS/cm	1.4 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-ICC-F	25.7 -	12 -
	Soil/Solid	Zinc		ON153/04	T2-ICC-F	378 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-C	2.11 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-C	25.7 -	5 -
	Soil/Solid	Zinc		ON153/04	T2-RPI-C	378 mg/kg	340 mg/kg
	Soil/Solid	Conductivity (1:2 leachate)		ON153/04	T2-RPI-F	2.11 mS/cm	0.7 mS/cm
	Soil/Solid	Sodium adsorption ratio [SAR]		ON153/04	T2-RPI-F	25.7 -	5 -
	Soil/Solid	Zinc		ON153/04	T2-RPI-F	378 mg/kg	340 mg/kg



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.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
mS/cm	millisiemens per centimetre
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	BH1S1 ----	BH1S5 ----	BH2S3 ----	BH2S6 ----	----	----	----
Client sampling date / time					08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
Sub-Matrix					Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----
					Result	Result	Result	Result	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm		0.352	1.57	2.62	2.11	----	----	----
Moisture	----	E144/WT	%		4.26	20.9	6.74	16.9	----	----	----
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units		8.19	6.96	8.28	7.43	----	----	----
Cyanides											
Cyanide, weak acid dissociable	----	E336A/WT	mg/kg		<0.050	<0.050	<0.050	<0.050	----	----	----
Fixed-Ratio Extractables											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L		1.98	18.5	4.26	13.9	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L		0.82	2.52	3.07	2.08	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L		53.2	279	533	388	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	-		8.03	16.1	48.1	25.7	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	mg/kg		<0.10	<0.10	<0.10	0.15	----	----	----
Arsenic	7440-38-2	E440C/WT	mg/kg		5.95	1.60	2.74	3.66	----	----	----
Barium	7440-39-3	E440C/WT	mg/kg		11.6	120	27.9	39.1	----	----	----
Beryllium	7440-41-7	E440C/WT	mg/kg		0.15	0.34	0.23	0.32	----	----	----
Boron	7440-42-8	E440C/WT	mg/kg		7.1	5.2	6.5	7.0	----	----	----
Boron, hot water soluble	7440-42-8	E487/WT	mg/kg		<0.10	0.41	0.18	0.58	----	----	----
Cadmium	7440-43-9	E440C/WT	mg/kg		0.308	3.87	0.395	1.06	----	----	----
Chromium	7440-47-3	E440C/WT	mg/kg		6.43	17.9	18.9	12.3	----	----	----



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S1 ----	BH1S5 ----	BH2S3 ----	BH2S6 ----	----	----	----
Client sampling date / time					08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
Sub-Matrix					Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----	
											Result
Metals											
Cobalt	7440-48-4	E440C/WT	mg/kg	2.17	4.23	3.45	3.76	----	----	----	
Copper	7440-50-8	E440C/WT	mg/kg	10.9	25.7	10.4	15.4	----	----	----	
Lead	7439-92-1	E440C/WT	mg/kg	18.7	28.6	32.4	25.3	----	----	----	
Mercury	7439-97-6	E510C/WT	mg/kg	<0.0050	0.119	0.0150	0.0724	----	----	----	
Molybdenum	7439-98-7	E440C/WT	mg/kg	0.51	0.26	0.49	0.55	----	----	----	
Nickel	7440-02-0	E440C/WT	mg/kg	4.82	8.96	6.83	8.24	----	----	----	
Selenium	7782-49-2	E440C/WT	mg/kg	<0.20	0.59	<0.20	0.34	----	----	----	
Silver	7440-22-4	E440C/WT	mg/kg	<0.10	<0.10	<0.10	<0.10	----	----	----	
Thallium	7440-28-0	E440C/WT	mg/kg	<0.050	0.250	0.076	0.104	----	----	----	
Uranium	7440-61-1	E440C/WT	mg/kg	0.379	0.433	0.424	0.509	----	----	----	
Vanadium	7440-62-2	E440C/WT	mg/kg	11.9	18.8	23.7	22.5	----	----	----	
Zinc	7440-66-6	E440C/WT	mg/kg	118	2350	183	378	----	----	----	
Speciated Metals											
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	mg/kg	<0.10	<0.10	<0.10	<0.10	----	----	----	
Volatile Organic Compounds											
Acetone	67-64-1	E611D/WT	mg/kg	<0.50	----	<0.50	----	----	----	----	
Benzene	71-43-2	E611D/WT	mg/kg	<0.0050	----	<0.0050	----	----	----	----	
Benzene	71-43-2	E611A/WT	mg/kg	----	<0.0050	----	<0.0050	----	----	----	
Bromodichloromethane	75-27-4	E611D/WT	mg/kg	<0.050	----	<0.050	----	----	----	----	
Bromoform	75-25-2	E611D/WT	mg/kg	<0.050	----	<0.050	----	----	----	----	



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S1	BH1S5	BH2S3	BH2S6	----	----	----
				Client sampling date / time	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----
					Result	Result	Result	Result	----	----	----
Volatile Organic Compounds											
Bromomethane	74-83-9	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Carbon tetrachloride	56-23-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Chlorobenzene	108-90-7	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Chloroform	67-66-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dibromochloromethane	124-48-1	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dibromoethane, 1,2-	106-93-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichlorobenzene, 1,2-	95-50-1	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichlorobenzene, 1,3-	541-73-1	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichlorodifluoromethane	75-71-8	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloroethane, 1,1-	75-34-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloroethane, 1,2-	107-06-2	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloromethane	75-09-2	E611D/WT	mg/kg		<0.045	----	<0.045	----	----	----	----
Dichloropropane, 1,2-	78-87-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D/WT	mg/kg		<0.030	----	<0.030	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D/WT	mg/kg		<0.030	----	<0.030	----	----	----	----



Matrix: Soil/Solid

				Client sample ID	BH1S1	BH1S5	BH2S3	BH2S6	----	----	----
				Client sampling date / time	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----
					Result	Result	Result	Result	----	----	----
Volatile Organic Compounds											
Ethylbenzene	100-41-4	E611D/WT	mg/kg		<0.015	----	<0.015	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	mg/kg		----	<0.015	----	<0.015	----	----	----
Hexane, n-	110-54-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Methyl ethyl ketone [MEK]	78-93-3	E611D/WT	mg/kg		<0.50	----	<0.50	----	----	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D/WT	mg/kg		<0.50	----	<0.50	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D/WT	mg/kg		<0.040	----	<0.040	----	----	----	----
Styrene	100-42-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Tetrachloroethylene	127-18-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Toluene	108-88-3	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Toluene	108-88-3	E611A/WT	mg/kg		----	<0.050	----	<0.050	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Trichloroethylene	79-01-6	E611D/WT	mg/kg		<0.010	----	<0.010	----	----	----	----
Trichlorofluoromethane	75-69-4	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Vinyl chloride	75-01-4	E611D/WT	mg/kg		<0.020	----	<0.020	----	----	----	----
Xylene, m+p-	179601-23-1	E611D/WT	mg/kg		<0.030	----	<0.030	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	mg/kg		----	<0.030	----	<0.030	----	----	----
Xylene, o-	95-47-6	E611D/WT	mg/kg		<0.030	----	<0.030	----	----	----	----



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S1	BH1S5	BH2S3	BH2S6	----	----	----
				Client sampling date / time	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----
					Result	Result	Result	Result	----	----	----
Volatile Organic Compounds											
Xylene, o-	95-47-6	E611A/WT	mg/kg		----	<0.030	----	<0.030	----	----	----
Xylenes, total	1330-20-7	E611D/WT	mg/kg		<0.050	----	<0.050	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	mg/kg		----	<0.050	----	<0.050	----	----	----
BTEX, total	----	E611D/WT	mg/kg		<0.10	----	<0.10	----	----	----	----
BTEX, total	----	E611A/WT	mg/kg		----	<0.10	----	<0.10	----	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	mg/kg		<5.0	<5.0	<5.0	<5.0	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	mg/kg		16	<10	<10	<10	----	----	----
F2-Naphthalene	----	EC600/WT	mg/kg		<25	<25	<25	<25	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	mg/kg		<50	<50	227	54	----	----	----
F3-PAH	n/a	EC600/WT	mg/kg		<50	<50	227	54	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	mg/kg		83	56	440	<50	----	----	----
F4G-sg	----	E601.F4G-L/WT	mg/kg		----	----	1780	----	----	----	----
F1-BTEX	----	EC580/WT	mg/kg		<5.0	<5.0	<5.0	<5.0	----	----	----
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	mg/kg		99	<80	667	<80	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-		YES	YES	NO	YES	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	%		93.8	95.3	94.1	92.2	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	%		77.7	79.3	100.0	74.8	----	----	----



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S1	BH1S5	BH2S3	BH2S6	----	----	----	
					Client sampling date / time	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
					Sub-Matrix	Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----		
				Result	Result	Result	Result	----	----	----		
Volatile Organic Compounds Surrogates												
Bromofluorobenzene, 4-	460-00-4	E611D/WT	%	83.7	----	105	----	----	----	----	----	
Bromofluorobenzene, 4-	460-00-4	E611A/WT	%	----	91.8	----	94.4	----	----	----	----	
Difluorobenzene, 1,4-	540-36-3	E611D/WT	%	83.5	----	105	----	----	----	----	----	
Difluorobenzene, 1,4-	540-36-3	E611A/WT	%	----	94.8	----	96.4	----	----	----	----	
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	83-32-9	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Acenaphthylene	208-96-8	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Anthracene	120-12-7	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Benz(a)anthracene	56-55-3	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Benzo(a)pyrene	50-32-8	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Benzo(b+j)fluoranthene	n/a	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Benzo(g,h,i)perylene	191-24-2	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Benzo(k)fluoranthene	207-08-9	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Chrysene	218-01-9	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Dibenz(a,h)anthracene	53-70-3	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Fluoranthene	206-44-0	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Fluorene	86-73-7	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	
Methylnaphthalene, 1-	90-12-0	E641A/WT	mg/kg	<0.030	<0.030	<0.030	<0.030	----	----	----	----	
Methylnaphthalene, 1+2-	----	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----	



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S1 ----	BH1S5 ----	BH2S3 ----	BH2S6 ----	----	----	----
				Client sampling date / time	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	08-Jan-2026 00:00	----	----	----
				Sub-Matrix	Soil	Soil	Soil	Soil	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2600489-001	WT2600489-002	WT2600489-003	WT2600489-004	----	----	----	
				Result	Result	Result	Result	----	----	----	
Polycyclic Aromatic Hydrocarbons											
Methylnaphthalene, 2-	91-57-6	E641A/WT	mg/kg	<0.030	<0.030	<0.030	<0.030	----	----	----	
Naphthalene	91-20-3	E641A/WT	mg/kg	<0.010	<0.010	<0.010	<0.010	----	----	----	
Phenanthrene	85-01-8	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	
Pyrene	129-00-0	E641A/WT	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	%	85.5	91.4	92.1	94.1	----	----	----	
Chrysene-d12	1719-03-5	E641A/WT	%	91.3	98.7	96.8	95.8	----	----	----	
Naphthalene-d8	1146-65-2	E641A/WT	%	95.9	103	102	98.7	----	----	----	
Phenanthrene-d10	1517-22-2	E641A/WT	%	94.4	102	99.7	98.4	----	----	----	

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



Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T1-RPICC	ON153/04 T2-ICC-C	ON153/04 T2-ICC-F	ON153/04 T2-RPI-C	ON153/04 T2-RPI-F		
Physical Tests									
Conductivity (1:2 leachate)		mS/cm	0.57 mS/cm	1.4 mS/cm	1.4 mS/cm	0.7 mS/cm	0.7 mS/cm	----	----
Moisture	----	%	----	----	----	----	----	----	----
pH (1:2 soil:CaCl2-aq)		pH units	----	----	----	----	----	----	----
Cyanides									
Cyanide, weak acid dissociable		mg/kg	0.051 mg/kg	0.051 mg/kg	0.051 mg/kg	0.051 mg/kg	0.051 mg/kg	----	----
Fixed-Ratio Extractables									
Calcium, soluble ion content	7440-70-2	mg/L	----	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	mg/L	----	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	mg/L	----	----	----	----	----	----	----
Sodium adsorption ratio [SAR]		-	2.4 -	12 -	12 -	5 -	5 -	----	----
Metals									
Antimony	7440-36-0	mg/kg	1.3 mg/kg	40 mg/kg	50 mg/kg	7.5 mg/kg	7.5 mg/kg	----	----
Arsenic	7440-38-2	mg/kg	18 mg/kg	18 mg/kg	18 mg/kg	18 mg/kg	18 mg/kg	----	----
Barium	7440-39-3	mg/kg	220 mg/kg	670 mg/kg	670 mg/kg	390 mg/kg	390 mg/kg	----	----
Beryllium	7440-41-7	mg/kg	2.5 mg/kg	8 mg/kg	10 mg/kg	4 mg/kg	5 mg/kg	----	----
Boron	7440-42-8	mg/kg	36 mg/kg	120 mg/kg	120 mg/kg	120 mg/kg	120 mg/kg	----	----
Boron, hot water soluble	7440-42-8	mg/kg	----	2 mg/kg	2 mg/kg	1.5 mg/kg	1.5 mg/kg	----	----
Cadmium	7440-43-9	mg/kg	1.2 mg/kg	1.9 mg/kg	1.9 mg/kg	1.2 mg/kg	1.2 mg/kg	----	----
Chromium	7440-47-3	mg/kg	70 mg/kg	160 mg/kg	160 mg/kg	160 mg/kg	160 mg/kg	----	----
Cobalt	7440-48-4	mg/kg	21 mg/kg	80 mg/kg	100 mg/kg	22 mg/kg	22 mg/kg	----	----
Copper	7440-50-8	mg/kg	92 mg/kg	230 mg/kg	300 mg/kg	140 mg/kg	180 mg/kg	----	----
Lead	7439-92-1	mg/kg	120 mg/kg	120 mg/kg	120 mg/kg	120 mg/kg	120 mg/kg	----	----
Mercury	7439-97-6	mg/kg	0.27 mg/kg	3.9 mg/kg	20 mg/kg	0.27 mg/kg	1.8 mg/kg	----	----



Molybdenum	7439-98-7	mg/kg	2 mg/kg	40 mg/kg	40 mg/kg	6.9 mg/kg	6.9 mg/kg	----	----
Nickel	7440-02-0	mg/kg	82 mg/kg	270 mg/kg	340 mg/kg	100 mg/kg	130 mg/kg	----	----
Selenium	7782-49-2	mg/kg	1.5 mg/kg	5.5 mg/kg	5.5 mg/kg	2.4 mg/kg	2.4 mg/kg	----	----
Silver	7440-22-4	mg/kg	0.5 mg/kg	40 mg/kg	50 mg/kg	20 mg/kg	25 mg/kg	----	----
Thallium	7440-28-0	mg/kg	1 mg/kg	3.3 mg/kg	3.3 mg/kg	1 mg/kg	1 mg/kg	----	----
Uranium	7440-61-1	mg/kg	2.5 mg/kg	33 mg/kg	33 mg/kg	23 mg/kg	23 mg/kg	----	----
Vanadium	7440-62-2	mg/kg	86 mg/kg	86 mg/kg	86 mg/kg	86 mg/kg	86 mg/kg	----	----
Zinc	7440-66-6	mg/kg	290 mg/kg	340 mg/kg	340 mg/kg	340 mg/kg	340 mg/kg	----	----

Speciated Metals

Chromium, hexavalent [Cr VI]	18540-29-9	mg/kg	0.66 mg/kg	8 mg/kg	10 mg/kg	8 mg/kg	10 mg/kg	----	----
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Volatile Organic Compounds

Acetone	67-64-1	mg/kg	0.5 mg/kg	16 mg/kg	28 mg/kg	16 mg/kg	28 mg/kg	----	----
Benzene	71-43-2	mg/kg	0.02 mg/kg	0.32 mg/kg	0.4 mg/kg	0.21 mg/kg	0.17 mg/kg	----	----
Bromodichloromethane	75-27-4	mg/kg	0.05 mg/kg	1.5 mg/kg	1.9 mg/kg	1.5 mg/kg	1.9 mg/kg	----	----
Bromoform	75-25-2	mg/kg	0.05 mg/kg	0.61 mg/kg	1.7 mg/kg	0.27 mg/kg	0.26 mg/kg	----	----
Bromomethane	74-83-9	mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----
Carbon tetrachloride	56-23-5	mg/kg	0.05 mg/kg	0.21 mg/kg	0.71 mg/kg	0.05 mg/kg	0.12 mg/kg	----	----
Chlorobenzene	108-90-7	mg/kg	0.05 mg/kg	2.4 mg/kg	2.7 mg/kg	2.4 mg/kg	2.7 mg/kg	----	----
Chloroform	67-66-3	mg/kg	0.05 mg/kg	0.47 mg/kg	0.18 mg/kg	0.05 mg/kg	0.18 mg/kg	----	----
Dibromochloromethane	124-48-1	mg/kg	0.05 mg/kg	2.3 mg/kg	2.9 mg/kg	2.3 mg/kg	2.9 mg/kg	----	----
Dibromoethane, 1,2-	106-93-4	mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----
Dichlorobenzene, 1,2-	95-50-1	mg/kg	0.05 mg/kg	1.2 mg/kg	1.7 mg/kg	1.2 mg/kg	1.7 mg/kg	----	----
Dichlorobenzene, 1,3-	541-73-1	mg/kg	0.05 mg/kg	9.6 mg/kg	12 mg/kg	4.8 mg/kg	6 mg/kg	----	----
Dichlorobenzene, 1,4-	106-46-7	mg/kg	0.05 mg/kg	0.2 mg/kg	0.57 mg/kg	0.083 mg/kg	0.097 mg/kg	----	----
Dichlorodifluoromethane	75-71-8	mg/kg	0.05 mg/kg	16 mg/kg	25 mg/kg	16 mg/kg	25 mg/kg	----	----
Dichloroethane, 1,1-	75-34-3	mg/kg	0.05 mg/kg	0.47 mg/kg	0.6 mg/kg	0.47 mg/kg	0.6 mg/kg	----	----
Dichloroethane, 1,2-	107-06-2	mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----



Dichloroethylene, 1,1-	75-35-4	mg/kg	0.05 mg/kg	0.064 mg/kg	0.48 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----
Dichloroethylene, cis-1,2-	156-59-2	mg/kg	0.05 mg/kg	1.9 mg/kg	2.5 mg/kg	1.9 mg/kg	2.5 mg/kg	----	----
Dichloroethylene, trans-1,2-	156-60-5	mg/kg	0.05 mg/kg	1.3 mg/kg	2.5 mg/kg	0.084 mg/kg	0.75 mg/kg	----	----
Dichloromethane	75-09-2	mg/kg	0.05 mg/kg	1.6 mg/kg	2 mg/kg	0.1 mg/kg	0.96 mg/kg	----	----
Dichloropropane, 1,2-	78-87-5	mg/kg	0.05 mg/kg	0.16 mg/kg	0.68 mg/kg	0.05 mg/kg	0.085 mg/kg	----	----
Dichloropropylene, cis-1,3-	10061-01-5	mg/kg	----	----	----	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	mg/kg	0.05 mg/kg	0.059 mg/kg	0.081 mg/kg	0.05 mg/kg	0.081 mg/kg	----	----
Dichloropropylene, trans-1,3-	10061-02-6	mg/kg	----	----	----	----	----	----	----
Ethylbenzene	100-41-4	mg/kg	0.05 mg/kg	1.1 mg/kg	1.6 mg/kg	1.1 mg/kg	1.6 mg/kg	----	----
Hexane, n-	110-54-3	mg/kg	0.05 mg/kg	46 mg/kg	88 mg/kg	2.8 mg/kg	34 mg/kg	----	----
Methyl ethyl ketone [MEK]	78-93-3	mg/kg	0.5 mg/kg	70 mg/kg	88 mg/kg	16 mg/kg	44 mg/kg	----	----
Methyl isobutyl ketone [MIBK]	108-10-1	mg/kg	0.5 mg/kg	31 mg/kg	210 mg/kg	1.7 mg/kg	4.3 mg/kg	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	mg/kg	0.05 mg/kg	1.6 mg/kg	2.3 mg/kg	0.75 mg/kg	1.4 mg/kg	----	----
Styrene	100-42-5	mg/kg	0.05 mg/kg	34 mg/kg	43 mg/kg	0.7 mg/kg	2.2 mg/kg	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	mg/kg	0.05 mg/kg	0.087 mg/kg	0.11 mg/kg	0.058 mg/kg	0.05 mg/kg	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	mg/kg	0.05 mg/kg	0.05 mg/kg	0.094 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----
Tetrachloroethylene	127-18-4	mg/kg	0.05 mg/kg	1.9 mg/kg	2.5 mg/kg	0.28 mg/kg	2.3 mg/kg	----	----
Toluene	108-88-3	mg/kg	0.2 mg/kg	6.4 mg/kg	9 mg/kg	2.3 mg/kg	6 mg/kg	----	----
Trichloroethane, 1,1,1-	71-55-6	mg/kg	0.05 mg/kg	6.1 mg/kg	12 mg/kg	0.38 mg/kg	3.4 mg/kg	----	----
Trichloroethane, 1,1,2-	79-00-5	mg/kg	0.05 mg/kg	0.05 mg/kg	0.11 mg/kg	0.05 mg/kg	0.05 mg/kg	----	----
Trichloroethylene	79-01-6	mg/kg	0.05 mg/kg	0.55 mg/kg	0.61 mg/kg	0.061 mg/kg	0.52 mg/kg	----	----
Trichlorofluoromethane	75-69-4	mg/kg	0.25 mg/kg	4 mg/kg	5.8 mg/kg	4 mg/kg	5.8 mg/kg	----	----
Vinyl chloride	75-01-4	mg/kg	0.02 mg/kg	0.032 mg/kg	0.25 mg/kg	0.02 mg/kg	0.022 mg/kg	----	----
Xylene, m+p-	179601-23-1	mg/kg	----	----	----	----	----	----	----
Xylene, o-	95-47-6	mg/kg	----	----	----	----	----	----	----
Xylenes, total	1330-20-7	mg/kg	0.05 mg/kg	26 mg/kg	30 mg/kg	3.1 mg/kg	25 mg/kg	----	----
BTEX, total		mg/kg	----	----	----	----	----	----	----



Hydrocarbons									
F1 (C6-C10)		mg/kg	25 mg/kg	55 mg/kg	65 mg/kg	55 mg/kg	65 mg/kg	----	----
F2 (C10-C16)	----	mg/kg	10 mg/kg	230 mg/kg	250 mg/kg	98 mg/kg	150 mg/kg	----	----
F2-Naphthalene		mg/kg	----	----	----	----	----	----	----
F3 (C16-C34)	----	mg/kg	240 mg/kg	1700 mg/kg	2500 mg/kg	300 mg/kg	1300 mg/kg	----	----
F3-PAH	n/a	mg/kg	----	----	----	----	----	----	----
F4 (C34-C50)	----	mg/kg	120 mg/kg	3300 mg/kg	6600 mg/kg	2800 mg/kg	5600 mg/kg	----	----
F4G-sg		mg/kg	120 mg/kg	3300 mg/kg	6600 mg/kg	2800 mg/kg	5600 mg/kg	----	----
F1-BTEX		mg/kg	25 mg/kg	55 mg/kg	65 mg/kg	55 mg/kg	65 mg/kg	----	----
Hydrocarbons, total (C6-C50)	n/a	mg/kg	----	----	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	-	----	----	----	----	----	----	----
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	%	----	----	----	----	----	----	----
Bromofluorobenzene, 4-	460-00-4	%	----	----	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	%	----	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	%	----	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	mg/kg	0.072 mg/kg	21 mg/kg	29 mg/kg	7.9 mg/kg	29 mg/kg	----	----
Acenaphthylene	208-96-8	mg/kg	0.093 mg/kg	0.15 mg/kg	0.17 mg/kg	0.15 mg/kg	0.17 mg/kg	----	----
Anthracene	120-12-7	mg/kg	0.16 mg/kg	0.67 mg/kg	0.74 mg/kg	0.67 mg/kg	0.74 mg/kg	----	----
Benz(a)anthracene	56-55-3	mg/kg	0.36 mg/kg	0.96 mg/kg	0.96 mg/kg	0.5 mg/kg	0.63 mg/kg	----	----
Benzo(a)pyrene	50-32-8	mg/kg	0.3 mg/kg	0.3 mg/kg	0.3 mg/kg	0.3 mg/kg	0.3 mg/kg	----	----
Benzo(b+j)fluoranthene	n/a	mg/kg	0.47 mg/kg	0.96 mg/kg	0.96 mg/kg	0.78 mg/kg	0.78 mg/kg	----	----
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.68 mg/kg	9.6 mg/kg	9.6 mg/kg	6.6 mg/kg	7.8 mg/kg	----	----
Benzo(k)fluoranthene	207-08-9	mg/kg	0.48 mg/kg	0.96 mg/kg	0.96 mg/kg	0.78 mg/kg	0.78 mg/kg	----	----
Chrysene	218-01-9	mg/kg	2.8 mg/kg	9.6 mg/kg	9.6 mg/kg	7 mg/kg	7.8 mg/kg	----	----
Dibenz(a,h)anthracene	53-70-3	mg/kg	0.1 mg/kg	0.1 mg/kg	0.1 mg/kg	0.1 mg/kg	0.1 mg/kg	----	----
Fluoranthene	206-44-0	mg/kg	0.56 mg/kg	9.6 mg/kg	9.6 mg/kg	0.69 mg/kg	0.69 mg/kg	----	----



Fluorene	86-73-7	mg/kg	0.12 mg/kg	62 mg/kg	69 mg/kg	62 mg/kg	69 mg/kg	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	0.23 mg/kg	0.76 mg/kg	0.95 mg/kg	0.38 mg/kg	0.48 mg/kg	----	----
Methylnaphthalene, 1-	90-12-0	mg/kg	0.59 mg/kg	30 mg/kg	42 mg/kg	0.99 mg/kg	3.4 mg/kg	----	----
Methylnaphthalene, 1+2-	----	mg/kg	0.59 mg/kg	30 mg/kg	42 mg/kg	0.99 mg/kg	3.4 mg/kg	----	----
Methylnaphthalene, 2-	91-57-6	mg/kg	0.59 mg/kg	30 mg/kg	42 mg/kg	0.99 mg/kg	3.4 mg/kg	----	----
Naphthalene	91-20-3	mg/kg	0.09 mg/kg	9.6 mg/kg	28 mg/kg	0.6 mg/kg	0.75 mg/kg	----	----
Phenanthrene	85-01-8	mg/kg	0.69 mg/kg	12 mg/kg	16 mg/kg	6.2 mg/kg	7.8 mg/kg	----	----
Pyrene	129-00-0	mg/kg	1 mg/kg	96 mg/kg	96 mg/kg	78 mg/kg	78 mg/kg	----	----
Acridine-d9	34749-75-2	%	----	----	----	----	----	----	----
Chrysene-d12	1719-03-5	%	----	----	----	----	----	----	----
Naphthalene-d8	1146-65-2	%	----	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	%	----	----	----	----	----	----	----

Key:

ON153/04	Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
T1-RPIICC	153 Soil T1 Res/Park/Inst/Ind/Com/Commu Property Use
T2-ICC-C	153 Soil T2 Ind/Com/Commu Property Use (Coarse)
T2-ICC-F	153 Soil T2 Ind/Com/Commu Property Use (Fine)
T2-RPI-C	153 Soil T2 Res/Park/Inst. Property Use (Coarse)
T2-RPI-F	153 Soil T2 Res/Park/Inst. Property Use (Fine)

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2600489	Page	: 1 of 16
Client	: CMT Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jake Feeney	Account Manager	: Mathy Mahadeva
Address	: 1011 Industrial Crescent Unit 1 St. Clements ON Canada N0B 2M0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 699 5775	Telephone	: +1 519 886 6910
Project	: 25-888 Blatchford Bridge, Guelph, ON	Date Samples Received	: 09-Jan-2026 15:40
PO	: ----	Issue Date	: 19-Jan-2026 18:10
C-O-C number	: ----		
Sampler	: Brandon Figg		
Site	: ----		
Quote number	: Standing Offer 2026 Pricing		
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 Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

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



Outliers : Quality Control Samples
Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Metals	QC-MRG2-2415778 001	----	Zinc	7440-66-6	E440C	30.1 ^{MB-LOR} mg/kg	2 mg/kg	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.



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: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E336A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E336A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E336A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E336A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	14 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1S1	E581.F1	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1S5	E581.F1	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH2S3	E581.F1	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓



Matrix: Soil/Solid

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	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH2S6	E581.F1	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E601.F4G-L	08-Jan-2026	15-Jan-2026	14 days	8 days	✓	19-Jan-2026	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E601.SG-L	08-Jan-2026	15-Jan-2026	14 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E601.SG-L	08-Jan-2026	15-Jan-2026	14 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E601.SG-L	08-Jan-2026	15-Jan-2026	14 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E601.SG-L	08-Jan-2026	15-Jan-2026	14 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E487	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E487	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E487	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓



Matrix: Soil/Solid

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	
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E487	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E510C	08-Jan-2026	14-Jan-2026	28 days	7 days	✓	15-Jan-2026	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E510C	08-Jan-2026	14-Jan-2026	28 days	7 days	✓	15-Jan-2026	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E510C	08-Jan-2026	14-Jan-2026	28 days	7 days	✓	15-Jan-2026	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E510C	08-Jan-2026	14-Jan-2026	28 days	7 days	✓	15-Jan-2026	28 days	0 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E440C	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E440C	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E440C	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E440C	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	7 days	✓



Matrix: Soil/Solid

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	
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E484	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E484	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E484	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E484	08-Jan-2026	14-Jan-2026	180 days	7 days	✓	15-Jan-2026	180 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E100-L	08-Jan-2026	14-Jan-2026	30 days	7 days	✓	15-Jan-2026	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E100-L	08-Jan-2026	14-Jan-2026	30 days	7 days	✓	15-Jan-2026	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E100-L	08-Jan-2026	14-Jan-2026	30 days	7 days	✓	15-Jan-2026	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E100-L	08-Jan-2026	14-Jan-2026	30 days	7 days	✓	15-Jan-2026	30 days	7 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E144	08-Jan-2026	----	----	----		12-Jan-2026	----	----	

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 Work Order : WT2600489
 Client : CMT Engineering Inc.
 Project : 25-888 Blatchford Bridge, Guelph, ON



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E144	08-Jan-2026	----	----	----		12-Jan-2026	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E144	08-Jan-2026	----	----	----		12-Jan-2026	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E144	08-Jan-2026	----	----	----		12-Jan-2026	----	----	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E108A	08-Jan-2026	12-Jan-2026	30 days	5 days	✓	14-Jan-2026	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E108A	08-Jan-2026	12-Jan-2026	30 days	5 days	✓	14-Jan-2026	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E108A	08-Jan-2026	12-Jan-2026	30 days	5 days	✓	14-Jan-2026	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E108A	08-Jan-2026	12-Jan-2026	30 days	5 days	✓	14-Jan-2026	30 days	5 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E641A	08-Jan-2026	15-Jan-2026	60 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E641A	08-Jan-2026	15-Jan-2026	60 days	8 days	✓	16-Jan-2026	40 days	1 days	✓

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 Work Order : WT2600489
 Client : CMT Engineering Inc.
 Project : 25-888 Blatchford Bridge, Guelph, ON



Matrix: Soil/Solid

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	
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex: Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E641A	08-Jan-2026	15-Jan-2026	60 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex: Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E641A	08-Jan-2026	15-Jan-2026	60 days	8 days	✓	16-Jan-2026	40 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH1S1	E532	08-Jan-2026	14-Jan-2026	30 days	6 days	✓	14-Jan-2026	7 days	0 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH1S5	E532	08-Jan-2026	14-Jan-2026	30 days	6 days	✓	14-Jan-2026	7 days	0 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH2S3	E532	08-Jan-2026	14-Jan-2026	30 days	6 days	✓	14-Jan-2026	7 days	0 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH2S6	E532	08-Jan-2026	14-Jan-2026	30 days	6 days	✓	14-Jan-2026	7 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH1S5	E611A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH2S6	E611A	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH1S1	E611D	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓

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 Work Order : WT2600489
 Client : CMT Engineering Inc.
 Project : 25-888 Blatchford Bridge, Guelph, ON



Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method			Method	Sampling Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Preparation Date	Holding Times			Eval	Analysis Date	Holding Times		Eval	
		Rec					Actual	Rec		Actual
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH2S3	E611D	08-Jan-2026	12-Jan-2026	14 days	5 days	✓	13-Jan-2026	40 days	0 days	✓

Legend & Qualifier Definitions

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



Quality Control Parameter Frequency Compliance

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

Matrix: Soil/Solid

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 Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	2415776	1	10	10.0	5.0	✔
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	2413528	1	11	9.0	5.0	✔
Moisture Content by Gravimetry	E144	2413534	1	5	20.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	2413524	1	9	11.1	5.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2415779	1	10	10.0	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2415775	1	10	10.0	5.0	✔
Boron-Hot Water Extractable by ICPOES	E487	2415777	1	10	10.0	5.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	2415778	1	10	10.0	5.0	✔
Hexavalent Chromium (Cr VI) by IC	E532	2415774	1	4	25.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	2413626	2	37	5.4	5.0	✔
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	2420466	0	1	0.0	5.0	✖
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2413526	1	9	11.1	5.0	✔
BTEX by Headspace GC-MS	E611A	2413736	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2413624	1	20	5.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2413525	1	9	11.1	5.0	✔
Laboratory Control Samples (LCS)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	2415776	2	10	20.0	10.0	✔
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	2413528	1	11	9.0	5.0	✔
Moisture Content by Gravimetry	E144	2413534	1	5	20.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	2413524	1	9	11.1	5.0	✔
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2415779	2	10	20.0	10.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2415775	2	10	20.0	10.0	✔
Boron-Hot Water Extractable by ICPOES	E487	2415777	2	10	20.0	10.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	2415778	2	10	20.0	10.0	✔
Hexavalent Chromium (Cr VI) by IC	E532	2415774	2	4	50.0	10.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	2413626	2	37	5.4	5.0	✔
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	2420466	1	1	100.0	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2413526	1	9	11.1	5.0	✔
BTEX by Headspace GC-MS	E611A	2413736	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2413624	1	20	5.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2413525	1	9	11.1	5.0	✔
Method Blanks (MB)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	2415776	1	10	10.0	5.0	✔
Moisture Content by Gravimetry	E144	2413534	1	5	20.0	5.0	✔
WAD Cyanide (0.01M NaOH Extraction)	E336A	2413524	1	9	11.1	5.0	✔



Matrix: Soil/Solid

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							
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2415779	1	10	10.0	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2415775	1	10	10.0	5.0	✔
Boron-Hot Water Extractable by ICPOES	E487	2415777	1	10	10.0	5.0	✔
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	2415778	1	10	10.0	5.0	✔
Hexavalent Chromium (Cr VI) by IC	E532	2415774	1	4	25.0	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	2413626	2	37	5.4	5.0	✔
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	2420466	1	1	100.0	5.0	✔
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2413526	1	9	11.1	5.0	✔
BTEX by Headspace GC-MS	E611A	2413736	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2413624	1	20	5.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2413525	1	9	11.1	5.0	✔
Matrix Spikes (MS)							
WAD Cyanide (0.01M NaOH Extraction)	E336A	2413524	1	9	11.1	5.0	✔
CCME PHC - F1 by Headspace GC-FID	E581.F1	2413626	2	37	5.4	5.0	✔
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	2420466	0	1	0.0	5.0	✖
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2413526	1	9	11.1	5.0	✔
BTEX by Headspace GC-MS	E611A	2413736	1	18	5.5	5.0	✔
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	2413624	1	20	5.0	5.0	✔
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2413525	1	9	11.1	5.0	✔



Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/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 soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl ₂ Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourimetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO ₃ and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO ₃ and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	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. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	A portion of the silica gel treated sample extract is filtered and dried at 105°C and the mass of the residual gravimetric heavy hydrocarbons (F4G) is determined gravimetrically. Where both F4 and F4G are reported, the greater of both results must be used for comparison to CWS PHC F4 guidelines.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis 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. Test results are expressed on a dry weight basis. 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 - Waterloo	Soil/Solid	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.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Soil/Solid	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.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. Benzo(b+j+k)fluoranthene is reported as the arithmetic sum of Benzo(b+j)fluoranthene and Benzo(k)fluoranthene; the limit of reporting (LOR) for this sum is calculated by the root-sum-of-squares (RSS) of the component LORs (per CCME Vol. 4). Where reported, the Index of Additive Cancer Risk (IACR; unitless) and Benzo[a]pyrene toxic potency equivalents (B[a]P-TEQ; in soil concentration units) are calculated per the CCME PAH Soil Quality Guidelines fact sheet (2010) and/or AB Tier 1 using the individually measured PAH results (not pre-summed groupings). For these calculations, any included PAH that is not detected is assigned one-half of its limit of reporting (LOR).
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then 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.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.



QUALITY CONTROL REPORT

Work Order : **WT2600489**

Client : CMT Engineering Inc.
 Contact : Jake Feeney
 Address : 1011 Industrial Crescent Unit 1
 St. Clements ON Canada N0B 2M0
 Telephone : 519 699 5775
 Project : 25-888 Blatchford Bridge, Guelph, ON
 PO : ----
 C-O-C number : ----
 Sampler : Brandon Figg
 Site : ----
 Quote number : Standing Offer 2026 Pricing
 No. of samples received : 4
 No. of samples analysed : 4

Laboratory : ALS Environmental - Waterloo
 Account Manager : Mathy Mahadeva
 Address : 60 Northland Road, Unit 1
 Waterloo ON Canada N2V 2B8
 Telephone : +1 519 886 6910
 Date Samples Received : 09-Jan-2026 15:40
 Date Analysis Commenced : 12-Jan-2026
 Issue Date : 19-Jan-2026 18:10

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
- @ReferenceMaterial!
- 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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
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Jon Fisher	Laboratory Manager - Environmental	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Laboratory Manager - Environmental	Waterloo Metals, Waterloo, Ontario
Josphin Masihi	Supervisor I	Waterloo Centralized Prep, 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: Soil

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: 2413528)											
WT2600458-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.87	7.92	0.633 %	5%	---
Physical Tests(QC Lot: 2413534)											
WT2600489-001	BH1S1	Moisture	----	E144	0.25	%	4.26	3.92	8.39 %	20%	---
Physical Tests(QC Lot: 2415776)											
WT2600489-002	BH1S5	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	1.57 mS/cm	1490	5.43 %	20%	---
Cyanides(QC Lot: 2413524)											
WT2600489-001	BH1S1	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
Metals(QC Lot: 2415775)											
WT2600489-002	BH1S5	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	18.5	17.1	7.87 %	30%	---
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	2.52	2.35	0.17	Diff <2x LOR	---
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	279	267	4.40 %	30%	---
Metals(QC Lot: 2415777)											
WT2600489-001	BH1S1	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	---
Metals(QC Lot: 2415778)											
WT2600489-001	BH1S1	Mercury	7439-97-6	E510C	0.0050	mg/kg	<0.0050	0.0057	0.0007	Diff <2x LOR	---
Metals(QC Lot: 2415779)											
WT2600489-001	BH1S1	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	---
		Arsenic	7440-38-2	E440C	0.10	mg/kg	5.95	6.07	1.96 %	30%	---
		Barium	7440-39-3	E440C	0.50	mg/kg	11.6	11.4	1.07 %	40%	---
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.15	0.15	0.003	Diff <2x LOR	---
		Boron	7440-42-8	E440C	5.0	mg/kg	7.1	7.6	0.5	Diff <2x LOR	---
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.308	0.288	7.02 %	30%	---
		Chromium	7440-47-3	E440C	0.50	mg/kg	6.43	6.81	5.72 %	30%	---
		Cobalt	7440-48-4	E440C	0.10	mg/kg	2.17	2.22	2.38 %	30%	---
		Copper	7440-50-8	E440C	0.50	mg/kg	10.9	10.8	1.53 %	30%	---
		Lead	7439-92-1	E440C	0.50	mg/kg	18.7	20.8	10.5 %	40%	---
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.51	0.57	11.1 %	40%	---
		Nickel	7440-02-0	E440C	0.50	mg/kg	4.82	4.99	3.32 %	30%	---
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	---
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	---
		Thallium	7440-28-0	E440C	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.379	0.367	3.17 %	30%	---
		Vanadium	7440-62-2	E440C	0.20	mg/kg	11.9	13.1	9.36 %	30%	---
		Zinc	7440-66-6	E440C	40.0	mg/kg	118	116	2.2	Diff <2x LOR	---



Sub-Matrix: Soil

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
Speciated Metals(QC Lot: 2415774)											
WT2600489-001	BH1S1	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	---
Volatile Organic Compounds(QC Lot: 2413624)											
WT2600489-001	BH1S1	Acetone	67-64-1	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	---
		Benzene	71-43-2	E611D	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	---
		Bromodichloromethane	75-27-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Bromoform	75-25-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Bromomethane	74-83-9	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Carbon tetrachloride	56-23-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Chlorobenzene	108-90-7	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Chloroform	67-66-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dibromochloromethane	124-48-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dibromoethane, 1,2-	106-93-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichlorobenzene, 1,3-	541-73-1	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichlorodifluoromethane	75-71-8	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloroethane, 1,1-	75-34-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloroethane, 1,2-	107-06-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloroethylene, 1,1-	75-35-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloroethylene, trans-1,2-	156-60-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloromethane	75-09-2	E611D	0.045	mg/kg	<0.045	<0.045	0	Diff <2x LOR	---
		Dichloropropane, 1,2-	78-87-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Ethylbenzene	100-41-4	E611D	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	---
		Hexane, n-	110-54-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Methyl ethyl ketone [MEK]	78-93-3	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	---
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	---
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.040	mg/kg	<0.040	<0.040	0	Diff <2x LOR	---
		Styrene	100-42-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Tetrachloroethylene	127-18-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Toluene	108-88-3	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Trichloroethane, 1,1,1-	71-55-6	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---



Sub-Matrix: Soil

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: 2413624)											
		Trichloroethane, 1,1,2-	79-00-5	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Trichloroethylene	79-01-6	E611D	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	---
		Trichlorofluoromethane	75-69-4	E611D	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Vinyl chloride	75-01-4	E611D	0.020	mg/kg	<0.020	<0.020	0	Diff <2x LOR	---
		Xylene, m+p-	179601-23-1	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Xylene, o-	95-47-6	E611D	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
Volatile Organic Compounds(QC Lot: 2413736)											
WT2600419-002	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	---
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	---
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
Hydrocarbons(QC Lot: 2413526)											
WT2600489-001	BH1S1	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	16	16	0.3	Diff <2x LOR	---
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	---
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	83	73	10	Diff <2x LOR	---
Hydrocarbons(QC Lot: 2413736)											
WT2600489-001	BH1S1	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	---
Hydrocarbons(QC Lot: 2413737)											
WT2600419-002	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	---
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)											
WT2600489-001	BH1S1	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Anthracene	120-12-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Chrysene	218-01-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	---
		Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	---



Sub-Matrix: Soil

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
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)											
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	---
		Pyrene	129-00-0	E641A	0.050	mg/kg	<0.050	<0.050	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: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests(QC Lot: 2413528)						
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	----	----
Physical Tests(QC Lot: 2413534)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests(QC Lot: 2415776)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Cyanides(QC Lot: 2413524)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals(QC Lot: 2415775)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals(QC Lot: 2415777)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals(QC Lot: 2415778)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals(QC Lot: 2415779)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals(QC Lot: 2415779)						
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	# 30.1	MB-LOR
Speciated Metals(QC Lot: 2415774)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds(QC Lot: 2413624)						
Acetone	67-64-1	E611D	0.5	mg/kg	<0.50	----
Benzene	71-43-2	E611D	0.005	mg/kg	<0.0050	----
Bromodichloromethane	75-27-4	E611D	0.05	mg/kg	<0.050	----
Bromoform	75-25-2	E611D	0.05	mg/kg	<0.050	----
Bromomethane	74-83-9	E611D	0.05	mg/kg	<0.050	----
Carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	<0.050	----
Chlorobenzene	108-90-7	E611D	0.05	mg/kg	<0.050	----
Chloroform	67-66-3	E611D	0.05	mg/kg	<0.050	----
Dibromochloromethane	124-48-1	E611D	0.05	mg/kg	<0.050	----
Dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	<0.050	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	<0.050	----
Dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	<0.050	----
Dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	<0.050	----
Dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	<0.050	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	<0.050	----
Dichloromethane	75-09-2	E611D	0.045	mg/kg	<0.045	----
Dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	<0.050	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	<0.030	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	<0.030	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds(QC Lot: 2413624)						
Ethylbenzene	100-41-4	E611D	0.015	mg/kg	<0.015	----
Hexane, n-	110-54-3	E611D	0.05	mg/kg	<0.050	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	<0.50	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	<0.50	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	<0.040	----
Styrene	100-42-5	E611D	0.05	mg/kg	<0.050	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.05	mg/kg	<0.050	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.05	mg/kg	<0.050	----
Tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	<0.050	----
Toluene	108-88-3	E611D	0.05	mg/kg	<0.050	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.05	mg/kg	<0.050	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.05	mg/kg	<0.050	----
Trichloroethylene	79-01-6	E611D	0.01	mg/kg	<0.010	----
Trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	<0.050	----
Vinyl chloride	75-01-4	E611D	0.02	mg/kg	<0.020	----
Xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611D	0.03	mg/kg	<0.030	----
Volatile Organic Compounds(QC Lot: 2413736)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons(QC Lot: 2413526)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons(QC Lot: 2413626)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbons(QC Lot: 2413737)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbons(QC Lot: 2420466)						
F4G-sg	----	E601.F4G-L	250	mg/kg	<250	----
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)						
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Qualifiers

Qualifier	Description
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

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: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests(QC Lot: 2413528)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests(QC Lot: 2413534)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Physical Tests(QC Lot: 2415776)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	102	90.0	110	----
Cyanides(QC Lot: 2413524)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	92.8	80.0	120	----



Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals(QC Lot: 2415775)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	105	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Metals(QC Lot: 2415777)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	101	70.0	130	----
Metals(QC Lot: 2415778)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	103	80.0	120	----
Metals(QC Lot: 2415779)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	101	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	105	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	102	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	99.3	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	100.0	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	99.7	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	99.0	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	99.7	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	102	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	99.3	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	99.8	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	98.5	80.0	120	----
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	99.1	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	100	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	102	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	99.4	80.0	120	----
Speciated Metals(QC Lot: 2415774)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	97.8	80.0	120	----
Volatile Organic Compounds(QC Lot: 2413624)									
Acetone	67-64-1	E611D	0.5	mg/kg	3.475 mg/kg	105	60.0	140	----
Benzene	71-43-2	E611D	0.005	mg/kg	3.475 mg/kg	96.8	70.0	130	----
Bromodichloromethane	75-27-4	E611D	0.05	mg/kg	3.475 mg/kg	100	50.0	140	----
Bromoform	75-25-2	E611D	0.05	mg/kg	3.475 mg/kg	102	70.0	130	----
Bromomethane	74-83-9	E611D	0.05	mg/kg	3.475 mg/kg	70.9	50.0	140	----
Carbon tetrachloride	56-23-5	E611D	0.05	mg/kg	3.475 mg/kg	90.3	70.0	130	----
Chlorobenzene	108-90-7	E611D	0.05	mg/kg	3.475 mg/kg	97.5	70.0	130	----
Chloroform	67-66-3	E611D	0.05	mg/kg	3.475 mg/kg	95.3	70.0	130	----
Dibromochloromethane	124-48-1	E611D	0.05	mg/kg	3.475 mg/kg	100	60.0	130	----



Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds(QC Lot: 2413624)									
Dibromoethane, 1,2-	106-93-4	E611D	0.05	mg/kg	3.475 mg/kg	100	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.05	mg/kg	3.475 mg/kg	97.9	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611D	0.05	mg/kg	3.475 mg/kg	98.2	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.05	mg/kg	3.475 mg/kg	98.2	70.0	130	----
Dichlorodifluoromethane	75-71-8	E611D	0.05	mg/kg	3.475 mg/kg	72.3	50.0	140	----
Dichloroethane, 1,1-	75-34-3	E611D	0.05	mg/kg	3.475 mg/kg	97.0	60.0	130	----
Dichloroethane, 1,2-	107-06-2	E611D	0.05	mg/kg	3.475 mg/kg	96.8	60.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611D	0.05	mg/kg	3.475 mg/kg	91.6	60.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.05	mg/kg	3.475 mg/kg	96.4	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611D	0.05	mg/kg	3.475 mg/kg	94.4	60.0	130	----
Dichloromethane	75-09-2	E611D	0.045	mg/kg	3.475 mg/kg	96.2	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611D	0.05	mg/kg	3.475 mg/kg	96.5	70.0	130	----
Dichloropropylene, cis-1,3-	10061-01-5	E611D	0.03	mg/kg	3.475 mg/kg	103	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.03	mg/kg	3.475 mg/kg	101	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.015	mg/kg	3.475 mg/kg	96.5	70.0	130	----
Hexane, n-	110-54-3	E611D	0.05	mg/kg	3.475 mg/kg	94.0	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	0.5	mg/kg	3.475 mg/kg	110	60.0	140	----
Methyl isobutyl ketone [MIBK]	108-10-1	E611D	0.5	mg/kg	3.475 mg/kg	105	60.0	140	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.04	mg/kg	3.475 mg/kg	94.3	70.0	130	----
Styrene	100-42-5	E611D	0.05	mg/kg	3.475 mg/kg	94.4	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.05	mg/kg	3.475 mg/kg	91.3	60.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.05	mg/kg	3.475 mg/kg	103	60.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.05	mg/kg	3.475 mg/kg	85.4	60.0	130	----
Toluene	108-88-3	E611D	0.05	mg/kg	3.475 mg/kg	98.4	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611D	0.05	mg/kg	3.475 mg/kg	90.0	60.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611D	0.05	mg/kg	3.475 mg/kg	99.2	60.0	130	----
Trichloroethylene	79-01-6	E611D	0.01	mg/kg	3.475 mg/kg	94.4	60.0	130	----
Trichlorofluoromethane	75-69-4	E611D	0.05	mg/kg	3.475 mg/kg	85.5	50.0	140	----
Vinyl chloride	75-01-4	E611D	0.02	mg/kg	3.475 mg/kg	84.9	60.0	140	----
Xylene, m+p-	179601-23-1	E611D	0.03	mg/kg	6.95 mg/kg	96.6	70.0	130	----
Xylene, o-	95-47-6	E611D	0.03	mg/kg	3.475 mg/kg	98.1	70.0	130	----
Volatile Organic Compounds(QC Lot: 2413736)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	111	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	98.4	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	108	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	94.9	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	99.1	70.0	130	----



Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Hydrocarbons(QC Lot: 2413526)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	670.9 mg/kg	101	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1382 mg/kg	105	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	748.2 mg/kg	105	70.0	130	----
Hydrocarbons(QC Lot: 2413626)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.19 mg/kg	110	80.0	120	----
Hydrocarbons(QC Lot: 2413737)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.19 mg/kg	104	80.0	120	----
Hydrocarbons(QC Lot: 2420466)									
F4G-sg	----	E601.F4G-L	250	mg/kg	1299 mg/kg	90.2	70.0	130	----
Hydrocarbons Surrogates(QC Lot: 2413526)									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L	1	mg/kg	562.5 mg/kg	92.5	60	140	----
Hydrocarbons Surrogates(QC Lot: 2413626)									
Dichlorotoluene, 3,4-	95-75-0	E581.F1	1	mg/kg	34.62 mg/kg	110	60	140	----
Hydrocarbons Surrogates(QC Lot: 2413737)									
Dichlorotoluene, 3,4-	95-75-0	E581.F1	1	mg/kg	34.62 mg/kg	94.0	60	140	----
Volatile Organic Compounds Surrogates(QC Lot: 2413624)									
Bromofluorobenzene, 4-	460-00-4	E611D	0.1	mg/kg	0.3475 mg/kg	110	60	130	----
Difluorobenzene, 1,4-	540-36-3	E611D	0.1	mg/kg	0.3475 mg/kg	110	60	130	----
Volatile Organic Compounds Surrogates(QC Lot: 2413736)									
Bromofluorobenzene, 4-	460-00-4	E611A	0.1	mg/kg	0.3475 mg/kg	105	60	130	----
Difluorobenzene, 1,4-	540-36-3	E611A	0.1	mg/kg	0.3475 mg/kg	105	60	130	----
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	96.6	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	93.4	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	88.6	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	88.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	91.4	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	90.7	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	95.2	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	93.4	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	94.7	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	89.8	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	93.5	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	91.0	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	93.1	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	88.0	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	95.8	60.0	130	----



Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)									
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	85.4	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	89.2	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	91.9	60.0	130	----
Polycyclic Aromatic Hydrocarbons Surrogates(QC Lot: 2413525)									
Acridine-d9	34749-75-2	E641A	0.1	mg/kg	0.375 mg/kg	90.1	60	130	----
Chrysene-d12	1719-03-5	E641A	0.1	mg/kg	0.375 mg/kg	95.0	60	130	----
Naphthalene-d8	1146-65-2	E641A	0.1	mg/kg	0.375 mg/kg	99.0	60	130	----
Phenanthrene-d10	1517-22-2	E641A	0.1	mg/kg	0.375 mg/kg	97.8	60	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

Sub-Matrix: Soil

					Matrix Spike (MS) Report				
					Spike	Recovery (%)	Recovery (%)		Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High
Cyanides(QC Lot: 2413524)									
WT2600489-001	BH1S1	Cyanide, weak acid dissociable	----	E336A	1.23 mg/kg	1.247 mg/kg	98.9	70.0	130
Volatile Organic Compounds(QC Lot: 2413624)									
WT2600489-001	BH1S1	Acetone	67-64-1	E611D	3.00 mg/kg	2.524 mg/kg	119	50.0	140
		Benzene	71-43-2	E611D	2.25 mg/kg	2.524 mg/kg	89.1	50.0	140
		Bromodichloromethane	75-27-4	E611D	2.49 mg/kg	2.524 mg/kg	98.5	50.0	140
		Bromoform	75-25-2	E611D	2.61 mg/kg	2.524 mg/kg	103	50.0	140
		Bromomethane	74-83-9	E611D	1.67 mg/kg	2.524 mg/kg	66.0	50.0	140
		Carbon tetrachloride	56-23-5	E611D	1.99 mg/kg	2.524 mg/kg	78.9	50.0	140
		Chlorobenzene	108-90-7	E611D	2.31 mg/kg	2.524 mg/kg	91.4	50.0	140
		Chloroform	67-66-3	E611D	2.27 mg/kg	2.524 mg/kg	90.0	50.0	140
		Dibromochloromethane	124-48-1	E611D	2.53 mg/kg	2.524 mg/kg	100	50.0	140
		Dibromoethane, 1,2-	106-93-4	E611D	2.58 mg/kg	2.524 mg/kg	102	50.0	140
		Dichlorobenzene, 1,2-	95-50-1	E611D	2.39 mg/kg	2.524 mg/kg	94.7	50.0	140
		Dichlorobenzene, 1,3-	541-73-1	E611D	2.37 mg/kg	2.524 mg/kg	93.7	50.0	140
		Dichlorobenzene, 1,4-	106-46-7	E611D	2.39 mg/kg	2.524 mg/kg	94.7	50.0	140
		Dichlorodifluoromethane	75-71-8	E611D	1.85 mg/kg	2.524 mg/kg	73.4	50.0	140



Sub-Matrix: Soil

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery (%)		Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	
Volatile Organic Compounds(QC Lot: 2413624)										
		Dichloroethane, 1,1-	75-34-3	E611D	2.13 mg/kg	2.524 mg/kg	84.2	50.0	140	---
		Dichloroethane, 1,2-	107-06-2	E611D	2.46 mg/kg	2.524 mg/kg	97.6	50.0	140	---
		Dichloroethylene, 1,1-	75-35-4	E611D	2.03 mg/kg	2.524 mg/kg	80.6	50.0	140	---
		Dichloroethylene, cis-1,2-	156-59-2	E611D	2.27 mg/kg	2.524 mg/kg	90.1	50.0	140	---
		Dichloroethylene, trans-1,2-	156-60-5	E611D	2.12 mg/kg	2.524 mg/kg	84.2	50.0	140	---
		Dichloromethane	75-09-2	E611D	2.35 mg/kg	2.524 mg/kg	93.1	50.0	140	---
		Dichloropropane, 1,2-	78-87-5	E611D	2.35 mg/kg	2.524 mg/kg	93.1	50.0	140	---
		Dichloropropylene, cis-1,3-	10061-01-5	E611D	2.52 mg/kg	2.524 mg/kg	99.8	50.0	140	---
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	2.51 mg/kg	2.524 mg/kg	99.6	50.0	140	---
		Ethylbenzene	100-41-4	E611D	2.24 mg/kg	2.524 mg/kg	88.9	50.0	140	---
		Hexane, n-	110-54-3	E611D	1.79 mg/kg	2.524 mg/kg	71.1	50.0	140	---
		Methyl ethyl ketone [MEK]	78-93-3	E611D	3.05 mg/kg	2.524 mg/kg	121	50.0	140	---
		Methyl isobutyl ketone [MIBK]	108-10-1	E611D	2.81 mg/kg	2.524 mg/kg	111	50.0	140	---
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	2.29 mg/kg	2.524 mg/kg	90.9	50.0	140	---
		Styrene	100-42-5	E611D	2.25 mg/kg	2.524 mg/kg	89.0	50.0	140	---
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611D	2.22 mg/kg	2.524 mg/kg	88.0	50.0	140	---
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	2.92 mg/kg	2.524 mg/kg	116	50.0	140	---
		Tetrachloroethylene	127-18-4	E611D	1.97 mg/kg	2.524 mg/kg	77.9	50.0	140	---
		Toluene	108-88-3	E611D	2.28 mg/kg	2.524 mg/kg	90.4	50.0	140	---
		Trichloroethane, 1,1,1-	71-55-6	E611D	2.02 mg/kg	2.524 mg/kg	80.2	50.0	140	---
		Trichloroethane, 1,1,2-	79-00-5	E611D	2.54 mg/kg	2.524 mg/kg	101	50.0	140	---
		Trichloroethylene	79-01-6	E611D	2.18 mg/kg	2.524 mg/kg	86.2	50.0	140	---
		Trichlorofluoromethane	75-69-4	E611D	1.91 mg/kg	2.524 mg/kg	75.5	50.0	140	---
		Vinyl chloride	75-01-4	E611D	1.94 mg/kg	2.524 mg/kg	76.8	50.0	140	---
		Xylene, m+p-	179601-23-1	E611D	4.54 mg/kg	5.047 mg/kg	90.0	50.0	140	---
		Xylene, o-	95-47-6	E611D	2.33 mg/kg	2.524 mg/kg	92.4	50.0	140	---
Volatile Organic Compounds(QC Lot: 2413736)										
WT2600419-002	Anonymous	Benzene	71-43-2	E611A	2.77 mg/kg	2.365 mg/kg	117	60.0	140	---
		Ethylbenzene	100-41-4	E611A	2.43 mg/kg	2.365 mg/kg	103	60.0	140	---
		Toluene	108-88-3	E611A	2.66 mg/kg	2.365 mg/kg	113	60.0	140	---
		Xylene, m+p-	179601-23-1	E611A	4.68 mg/kg	4.73 mg/kg	98.9	60.0	140	---
		Xylene, o-	95-47-6	E611A	2.44 mg/kg	2.365 mg/kg	103	60.0	140	---
Hydrocarbons(QC Lot: 2413526)										
WT2600489-001	BH1S1	F2 (C10-C16)	----	E601.SG-L	532 mg/kg	534.2 mg/kg	99.6	60.0	140	---
		F3 (C16-C34)	----	E601.SG-L	1150 mg/kg	1101 mg/kg	104	60.0	140	---
		F4 (C34-C50)	----	E601.SG-L	593 mg/kg	595.8 mg/kg	99.6	60.0	140	---



Sub-Matrix: Soil

Sub-Matrix: Soil					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery (%)		Qualification
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	
Hydrocarbons(QC Lot: 2413626)										
WT2600489-001	BH1S1	F1 (C6-C10)	----	E581.F1	49.7 mg/kg	50.47 mg/kg	98.5	60.0	140	---
Hydrocarbons(QC Lot: 2413737)										
WT2600419-002	Anonymous	F1 (C6-C10)	----	E581.F1	31.4 mg/kg	47.3 mg/kg	66.5	60.0	140	---
Hydrocarbons Surrogates(QC Lot: 2413526)										
		Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L	416 mg/kg	447.9 mg/kg	93.0	60.0	140	---
Hydrocarbons Surrogates(QC Lot: 2413626)										
		Dichlorotoluene, 3,4-	95-75-0	E581.F1	19.2 mg/kg	25.26 mg/kg	76.1	60.0	140	---
Hydrocarbons Surrogates(QC Lot: 2413737)										
		Dichlorotoluene, 3,4-	95-75-0	E581.F1	19.4 mg/kg	23.67 mg/kg	82.1	60.0	140	---
Volatile Organic Compounds Surrogates(QC Lot: 2413624)										
		Bromofluorobenzene, 4-	460-00-4	E611D	0.26 mg/kg	0.2524 mg/kg	102	50.0	140	---
		Difluorobenzene, 1,4-	540-36-3	E611D	0.27 mg/kg	0.2524 mg/kg	106	50.0	140	---
Volatile Organic Compounds Surrogates(QC Lot: 2413736)										
		Bromofluorobenzene, 4-	460-00-4	E611A	0.26 mg/kg	0.2365 mg/kg	108	50.0	140	---
		Difluorobenzene, 1,4-	540-36-3	E611A	0.26 mg/kg	0.2365 mg/kg	109	50.0	140	---
Polycyclic Aromatic Hydrocarbons(QC Lot: 2413525)										
WT2600489-001	BH1S1	Acenaphthene	83-32-9	E641A	0.386 mg/kg	0.3982 mg/kg	97.0	50.0	140	---
		Acenaphthylene	208-96-8	E641A	0.376 mg/kg	0.3982 mg/kg	94.4	50.0	140	---
		Anthracene	120-12-7	E641A	0.362 mg/kg	0.3982 mg/kg	90.8	50.0	140	---
		Benz(a)anthracene	56-55-3	E641A	0.361 mg/kg	0.3982 mg/kg	90.6	50.0	140	---
		Benzo(a)pyrene	50-32-8	E641A	0.373 mg/kg	0.3982 mg/kg	93.6	50.0	140	---
		Benzo(b+j)fluoranthene	n/a	E641A	0.370 mg/kg	0.3982 mg/kg	93.0	50.0	140	---
		Benzo(g,h,i)perylene	191-24-2	E641A	0.380 mg/kg	0.3982 mg/kg	95.4	50.0	140	---
		Benzo(k)fluoranthene	207-08-9	E641A	0.378 mg/kg	0.3982 mg/kg	94.8	50.0	140	---
		Chrysene	218-01-9	E641A	0.379 mg/kg	0.3982 mg/kg	95.3	50.0	140	---
		Dibenz(a,h)anthracene	53-70-3	E641A	0.359 mg/kg	0.3982 mg/kg	90.3	50.0	140	---
		Fluoranthene	206-44-0	E641A	0.371 mg/kg	0.3982 mg/kg	93.1	50.0	140	---
		Fluorene	86-73-7	E641A	0.367 mg/kg	0.3982 mg/kg	92.2	50.0	140	---
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.376 mg/kg	0.3982 mg/kg	94.5	50.0	140	---
		Methylnaphthalene, 1-	90-12-0	E641A	0.354 mg/kg	0.3982 mg/kg	88.9	50.0	140	---
		Methylnaphthalene, 2-	91-57-6	E641A	0.388 mg/kg	0.3982 mg/kg	97.4	50.0	140	---
		Naphthalene	91-20-3	E641A	0.349 mg/kg	0.3982 mg/kg	87.6	50.0	140	---
		Phenanthrene	85-01-8	E641A	0.360 mg/kg	0.3982 mg/kg	90.3	50.0	140	---
		Pyrene	129-00-0	E641A	0.366 mg/kg	0.3982 mg/kg	92.0	50.0	140	---
Polycyclic Aromatic Hydrocarbons Surrogates(QC Lot: 2413525)										
		Acridine-d9	34749-75-2	E641A	0.3 mg/kg	0.2986 mg/kg	94.2	60.0	130	---
		Chrysene-d12	1719-03-5	E641A	0.3 mg/kg	0.2986 mg/kg	98.5	60.0	130	---



Sub-Matrix: Soil

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery (%)		Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	
Polycyclic Aromatic Hydrocarbons Surrogates(QC Lot: 2413525)										
		Naphthalene-d8	1146-65-2	E641A	0.3 mg/kg	0.2986 mg/kg	102	60.0	130	---
		Phenanthrene-d10	1517-22-2	E641A	0.3 mg/kg	0.2986 mg/kg	100.0	60.0	130	---

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).



Sub-Matrix: Soil

Sub-Matrix: Soil					Reference Material (RM) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Target Concentration	Original Result	LCS	Low	High	Qualifier
Physical Tests(QC Lot: 2415776)										
QC-MRG2-2415775001		Conductivity (1:2 leachate)	----	E100-L	714.1 µS/cm	714.1 µS/cm		70.0	130	----
Metals(QC Lot: 2415775)										
QC-MRG2-2415775001		Calcium, soluble ion content	7440-70-2	E484	77.21 mg/L	77.21 mg/L		70.0	130	----
		Magnesium, soluble ion content	7439-95-4	E484	8.343 mg/L	8.343 mg/L		70.0	130	----
		Sodium, soluble ion content	17341-25-2	E484	38.56 mg/L	38.56 mg/L		70.0	130	----
Metals(QC Lot: 2415777)										
QC-2415777-001		Boron, hot water soluble	7440-42-8	E487	0.487 mg/kg	0.487 mg/kg		60.0	140	----
Metals(QC Lot: 2415778)										
QC-MRG2-2415778001		Mercury	7439-97-6	E510C	0.0675 mg/kg	0.0675 mg/kg		70.0	130	----
Metals(QC Lot: 2415779)										
QC-MRG2-2415778001		Antimony	7440-36-0	E440C	24.8 mg/kg	24.8 mg/kg		70.0	130	----
		Arsenic	7440-38-2	E440C	21.2 mg/kg	21.2 mg/kg		70.0	130	----
		Barium	7440-39-3	E440C	788 mg/kg	788 mg/kg		70.0	130	----
		Beryllium	7440-41-7	E440C	1.82 mg/kg	1.82 mg/kg		70.0	130	----
		Cadmium	7440-43-9	E440C	2.15 mg/kg	2.15 mg/kg		70.0	130	----
		Chromium	7440-47-3	E440C	56.9 mg/kg	56.9 mg/kg		70.0	130	----
		Cobalt	7440-48-4	E440C	32 mg/kg	32 mg/kg		70.0	130	----
		Copper	7440-50-8	E440C	969 mg/kg	969 mg/kg		70.0	130	----
		Lead	7439-92-1	E440C	919 mg/kg	919 mg/kg		70.0	130	----
		Molybdenum	7439-98-7	E440C	25.1 mg/kg	25.1 mg/kg		70.0	130	----
		Nickel	7440-02-0	E440C	1004 mg/kg	1004 mg/kg		70.0	130	----
		Selenium	7782-49-2	E440C	1.04 mg/kg	1.04 mg/kg		60.0	140	----
		Silver	7440-22-4	E440C	8.98 mg/kg	8.98 mg/kg		70.0	130	----
		Thallium	7440-28-0	E440C	0.907 mg/kg	0.907 mg/kg		70.0	130	----
		Uranium	7440-61-1	E440C	3.97 mg/kg	3.97 mg/kg		70.0	130	----



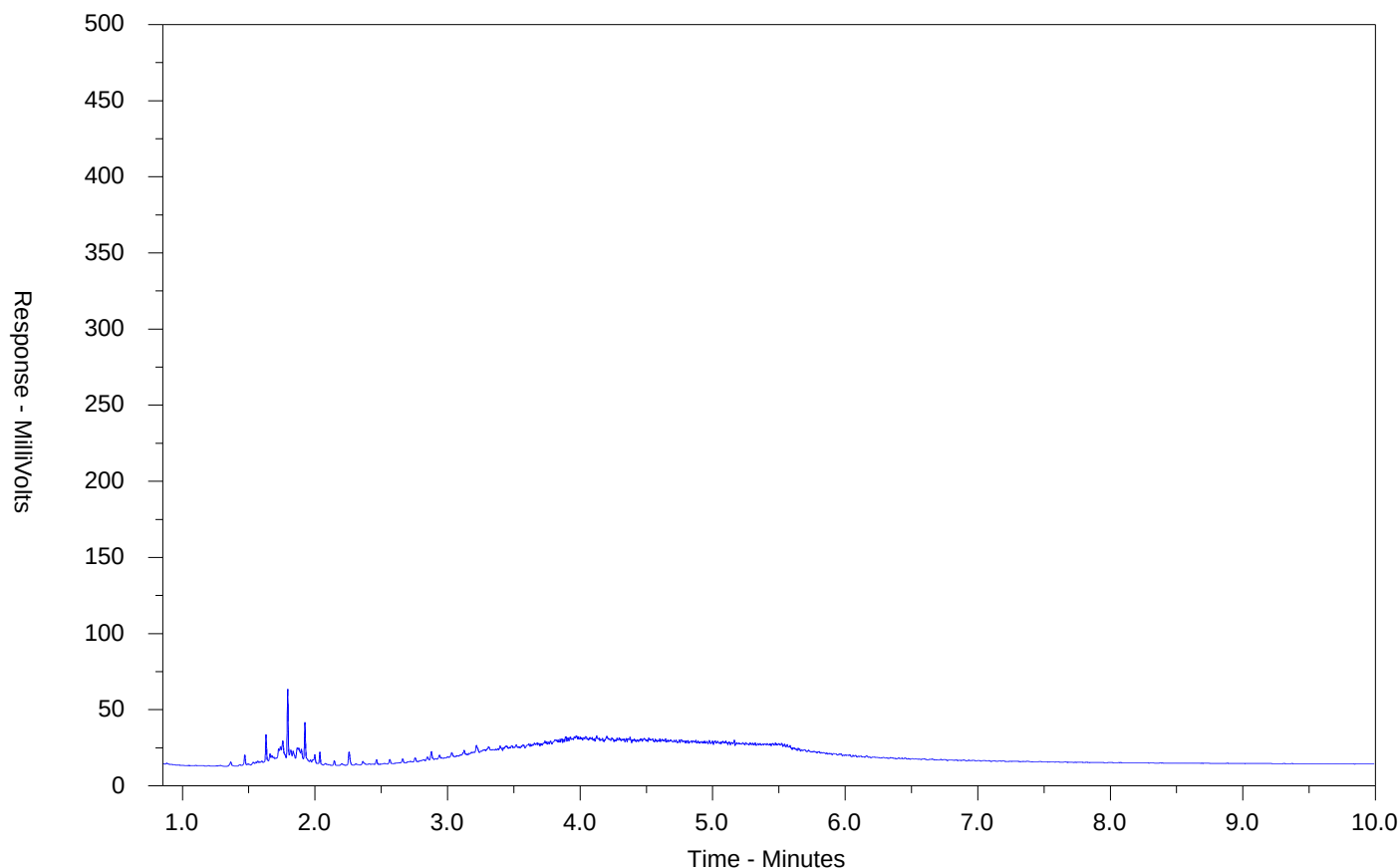
Sub-Matrix: Soil

					Reference Material (RM) Report				
					Spike		Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Target Concentration	Original Result	LCS	Low	High
Metals(QC Lot: 2415779)									
		Vanadium	7440-62-2	E440C	66.2 mg/kg	66.2 mg/kg		70.0	130
		Zinc	7440-66-6	E440C	828 mg/kg	828 mg/kg		70.0	130
Speciated Metals(QC Lot: 2415774)									
QC-2415774-001		Chromium, hexavalent [Cr VI]	18540-29-9	E532	197 mg/kg	197 mg/kg		70.0	130

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2600489-001-E601.SG-L
Client Sample ID: BH1S1



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.

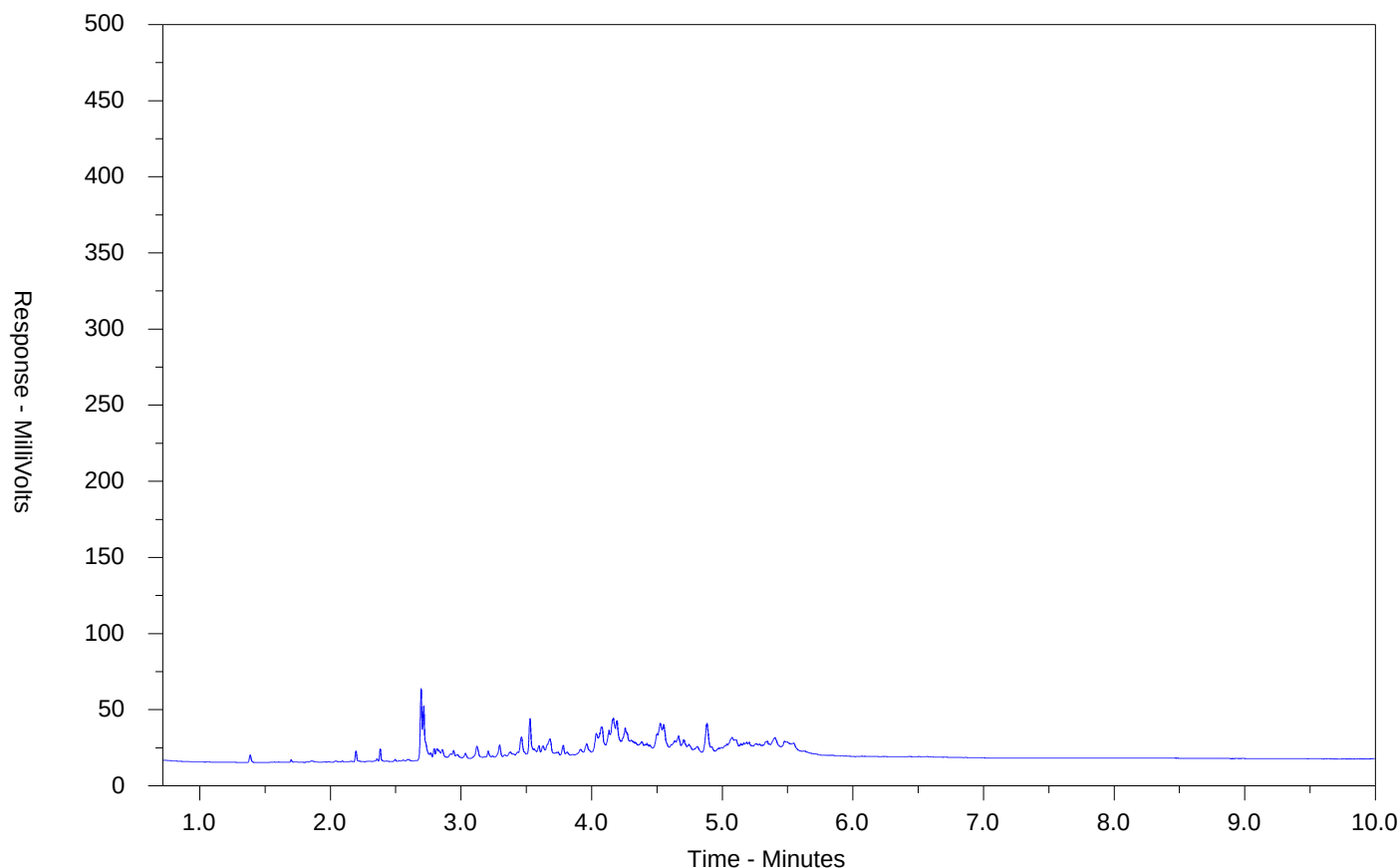
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2600489-002-E601.SG-L
Client Sample ID: BH1S5



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.

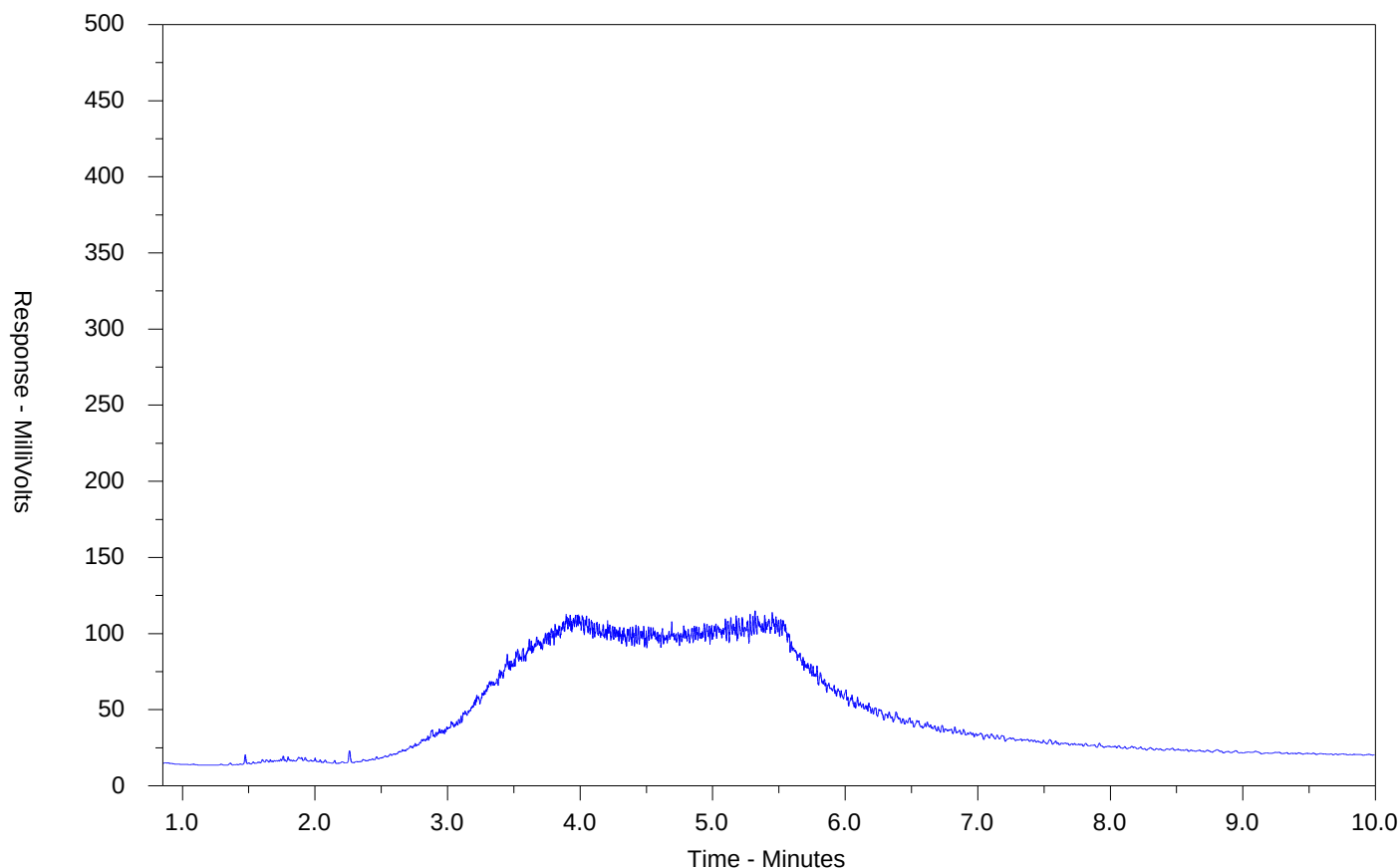
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2600489-003-E601.SG-L
Client Sample ID: BH2S3



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.

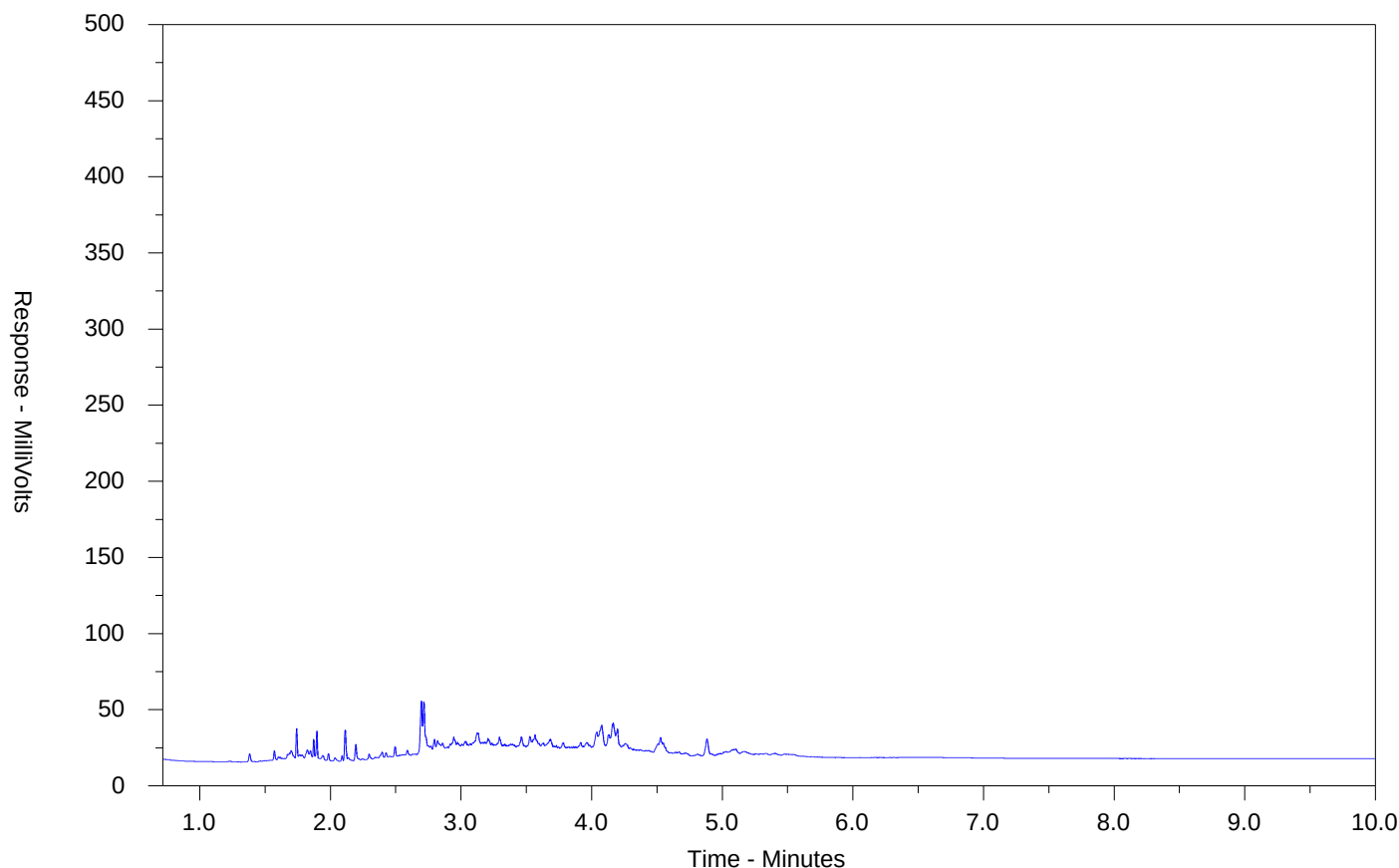
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WT2600489-004-E601.SG-L
Client Sample ID: BH2S6



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 the 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.



COC Number: 20 -

Canada Toll Free: 1 800 668 9878

Page

Environmental Division
Waterloo

Work Order Reference

WT2600489



Telephone : + 1 519 886 6910

[illegible]

BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

Complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy. If samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

VS-225

SOL-38.5

AUG 2020 EBCY



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2601267		
Client	: CMT Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jake Feeney	Account Manager	: Mathy Mahadeva
Address	: 1011 Industrial Crescent Unit 1 St. Clements Ontario Canada N0B 2M0	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 519 699 5775	Telephone	: +1 519 886 6910
Project	: 25-888 Blatchford Bridge, Guelph, ON	Date Samples Received	: 20-Jan-2026 15:17
PO	: ----	Date Analysis Commenced	: 21-Jan-2026
C-O-C number	: ----	Issue Date	: 26-Jan-2026 15:34
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer 2026 Pricing		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	VOC, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Robert Braun	Soils Team Supervisor	Inorganics, Waterloo, Ontario



No Breaches Found

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.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	Description
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Qualifiers

Qualifier	Description
SFPR	Suspected False Positive Result, based on detection in Lab Blanks and/or Field Blanks, or other known issues.



Analytical Results Evaluation

Matrix: Soil/Solid

Client sample ID				BH1S5	----	----	----	----	----	----
Client sampling date / time				08-Jan-2026 00:00	----	----	----	----	----	----
Sub-Matrix				Soil	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2601267-002	----	----	----	----	----	----
				Result	----	----	----	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/WT	pH units	8.36	----	----	----	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/WT	pH units	5.03	----	----	----	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/WT	pH units	2.88	----	----	----	----	----	----
pH, TCLP final	----	EPP444/WT	pH units	4.48	----	----	----	----	----	----
Antimony, TCLP	7440-36-0	E444/WT	mg/L	<0.10	----	----	----	----	----	----
Arsenic, TCLP	7440-38-2	E444/WT	mg/L	<1.0	----	----	----	----	----	----
Barium, TCLP	7440-39-3	E444/WT	mg/L	2.8	----	----	----	----	----	----
Beryllium, TCLP	7440-41-7	E444/WT	mg/L	<0.025	----	----	----	----	----	----
Boron, TCLP	7440-42-8	E444/WT	mg/L	<0.50	----	----	----	----	----	----
Cadmium, TCLP	7440-43-9	E444/WT	mg/L	0.054	----	----	----	----	----	----
Calcium, TCLP	7440-70-2	E444/WT	mg/L	579	----	----	----	----	----	----
Chromium, TCLP	7440-47-3	E444/WT	mg/L	<0.25	----	----	----	----	----	----
Cobalt, TCLP	7440-48-4	E444/WT	mg/L	0.083	----	----	----	----	----	----
Copper, TCLP	7440-50-8	E444/WT	mg/L	<0.050	----	----	----	----	----	----
Iron, TCLP	7439-89-6	E444/WT	mg/L	65.2	----	----	----	----	----	----
Lead, TCLP	7439-92-1	E444/WT	mg/L	<0.25	----	----	----	----	----	----
Magnesium, TCLP	7439-95-4	E444/WT	mg/L	131	----	----	----	----	----	----
Mercury, TCLP	7439-97-6	E512/WT	mg/L	<0.0010	----	----	----	----	----	----
Nickel, TCLP	7440-02-0	E444/WT	mg/L	<0.25	----	----	----	----	----	----



Matrix: Soil/Solid

Client sample ID				BH1S5	----	----	----	----	----	----
Client sampling date / time				08-Jan-2026 00:00	----	----	----	----	----	----
Sub-Matrix				Soil	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2601267-002	----	----	----	----	----	----
				Result	----	----	----	----	----	----
TCLP Metals										
Selenium, TCLP	7782-49-2	E444/WT	mg/L	<0.10	----	----	----	----	----	----
Silver, TCLP	7440-22-4	E444/WT	mg/L	<0.050	----	----	----	----	----	----
Thallium, TCLP	7440-28-0	E444/WT	mg/L	<1.0	----	----	----	----	----	----
Uranium, TCLP	7440-61-1	E444/WT	mg/L	<0.20	----	----	----	----	----	----
Vanadium, TCLP	7440-62-2	E444/WT	mg/L	<0.15	----	----	----	----	----	----
Zinc, TCLP	7440-66-6	E444/WT	mg/L	18.9	----	----	----	----	----	----
Zirconium, TCLP	7440-67-7	E444/WT	mg/L	<10	----	----	----	----	----	----
TCLP VOCs										
Benzene, TCLP	71-43-2	E615B/WT	mg/L	<0.0050	----	----	----	----	----	----
Carbon tetrachloride, TCLP	56-23-5	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Chlorobenzene, TCLP	108-90-7	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Chloroform, TCLP	67-66-3	E615B/WT	mg/L	<0.10	----	----	----	----	----	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Dichloromethane, TCLP	75-09-2	E615B/WT	mg/L	<0.24 ^{SFPR}	----	----	----	----	----	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B/WT	mg/L	<0.10	----	----	----	----	----	----
Tetrachloroethylene, TCLP	127-18-4	E615B/WT	mg/L	<0.025	----	----	----	----	----	----
Trichloroethylene, TCLP	79-01-6	E615B/WT	mg/L	<0.025	----	----	----	----	----	----



Matrix: Soil/Solid

Matrix: Soil/Solid				Client sample ID	BH1S5	----	----	----	----	----	----
				Client sampling date / time	08-Jan-2026 00:00	----	----	----	----	----	----
				Sub-Matrix	Soil	----	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2601267-002	----	----	----	----	----	----	----
				Result	----	----	----	----	----	----	----
TCLP VOCs											
Vinyl chloride, TCLP	75-01-4	E615B/WT	mg/L	<0.050	----	----	----	----	----	----	----
TCLP VOCs Surrogates											
Bromofluorobenzene, 4-, TCLP	460-00-4	E615B/WT	%	99.9	----	----	----	----	----	----	----
Difluorobenzene, 1,4-, TCLP	540-36-3	E615B/WT	%	96.2	----	----	----	----	----	----	----

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



Summary of Guideline Limits

Analyte	CAS Number	Unit	ONWCR Sch. 4						
TCLP Metals									
pH, TCLP 1st preliminary	----	pH units	----	----	----	----	----	----	----
pH, TCLP 2nd preliminary	----	pH units	----	----	----	----	----	----	----
pH, TCLP extraction fluid initial	----	pH units	----	----	----	----	----	----	----
pH, TCLP final	----	pH units	----	----	----	----	----	----	----
Antimony, TCLP	7440-36-0	mg/L	----	----	----	----	----	----	----
Arsenic, TCLP	7440-38-2	mg/L	2.5 mg/L	----	----	----	----	----	----
Barium, TCLP	7440-39-3	mg/L	100 mg/L	----	----	----	----	----	----
Beryllium, TCLP	7440-41-7	mg/L	----	----	----	----	----	----	----
Boron, TCLP	7440-42-8	mg/L	500 mg/L	----	----	----	----	----	----
Cadmium, TCLP	7440-43-9	mg/L	0.5 mg/L	----	----	----	----	----	----
Calcium, TCLP	7440-70-2	mg/L	----	----	----	----	----	----	----
Chromium, TCLP	7440-47-3	mg/L	5 mg/L	----	----	----	----	----	----
Cobalt, TCLP	7440-48-4	mg/L	----	----	----	----	----	----	----
Copper, TCLP	7440-50-8	mg/L	----	----	----	----	----	----	----
Iron, TCLP	7439-89-6	mg/L	----	----	----	----	----	----	----
Lead, TCLP	7439-92-1	mg/L	5 mg/L	----	----	----	----	----	----
Magnesium, TCLP	7439-95-4	mg/L	----	----	----	----	----	----	----
Mercury, TCLP	7439-97-6	mg/L	0.1 mg/L	----	----	----	----	----	----
Nickel, TCLP	7440-02-0	mg/L	----	----	----	----	----	----	----
Selenium, TCLP	7782-49-2	mg/L	1 mg/L	----	----	----	----	----	----
Silver, TCLP	7440-22-4	mg/L	5 mg/L	----	----	----	----	----	----
Thallium, TCLP	7440-28-0	mg/L	----	----	----	----	----	----	----
Uranium, TCLP	7440-61-1	mg/L	10 mg/L	----	----	----	----	----	----



Vanadium, TCLP	7440-62-2	mg/L	----	----	----	----	----	----	----
Zinc, TCLP	7440-66-6	mg/L	----	----	----	----	----	----	----
Zirconium, TCLP	7440-67-7	mg/L	----	----	----	----	----	----	----
TCLP VOCs									
Benzene, TCLP	71-43-2	mg/L	0.5 mg/L	----	----	----	----	----	----
Carbon tetrachloride, TCLP	56-23-5	mg/L	0.5 mg/L	----	----	----	----	----	----
Chlorobenzene, TCLP	108-90-7	mg/L	8 mg/L	----	----	----	----	----	----
Chloroform, TCLP	67-66-3	mg/L	10 mg/L	----	----	----	----	----	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	mg/L	20 mg/L	----	----	----	----	----	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	mg/L	0.5 mg/L	----	----	----	----	----	----
Dichloroethane, 1,2-, TCLP	107-06-2	mg/L	0.5 mg/L	----	----	----	----	----	----
Dichloroethylene, 1,1-, TCLP	75-35-4	mg/L	1.4 mg/L	----	----	----	----	----	----
Dichloromethane, TCLP	75-09-2	mg/L	5 mg/L	----	----	----	----	----	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	mg/L	200 mg/L	----	----	----	----	----	----
Tetrachloroethylene, TCLP	127-18-4	mg/L	3 mg/L	----	----	----	----	----	----
Trichloroethylene, TCLP	79-01-6	mg/L	5 mg/L	----	----	----	----	----	----
Vinyl chloride, TCLP	75-01-4	mg/L	0.2 mg/L	----	----	----	----	----	----
Bromofluorobenzene, 4-, TCLP	460-00-4	%	----	----	----	----	----	----	----
Difluorobenzene, 1,4-, TCLP	540-36-3	%	----	----	----	----	----	----	----

Key:

ONWCR

Sch. 4

Ontario MECP, General Waste Control Regulation No.
 347/90,558/00
 Schedule 4 Leachate Quality Criteria

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2601267	Page	: 1 of 5
Client	: CMT Engineering Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jake Feeney	Account Manager	: Mathy Mahadeva
Address	: 1011 Industrial Crescent Unit 1 St. Clements ON Canada N0B 2M0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 699 5775	Telephone	: +1 519 886 6910
Project	: 25-888 Blatchford Bridge, Guelph, ON	Date Samples Received	: 20-Jan-2026 15:17
PO	: ----	Issue Date	: 26-Jan-2026 15:34
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer 2026 Pricing		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- 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)

- No Analysis Holding Time Outliers exist.

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: **Soil/Solid**

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	
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BH1S5	E512	21-Jan-2026	22-Jan-2026	41 days	14 days	✓	22-Jan-2026	41 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BH1S5	E444	21-Jan-2026	22-Jan-2026	193 days	14 days	✓	22-Jan-2026	193 days	14 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 14 day HT (e.g. CN,SVOC) BH1S5	EPP444	08-Jan-2026	21-Jan-2026	----	----		----	14 days	13 days	✓
TCLP VOCs : VOCs by Headspace GC-MS (TCLP)										
Glass vial (sodium bisulfate) BH1S5	E615B	21-Jan-2026	22-Jan-2026	27 days	15 days	✓	23-Jan-2026	27 days	15 days	✓

Legend & Qualifier Definitions

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



Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

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)							
Metals by CRC ICPMS (TCLP)	E444	2426240	1	4	25.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	2426267	1	5	20.0	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	2427412	1	3	33.3	5.0	✔
Laboratory Control Samples (LCS)							
Metals by CRC ICPMS (TCLP)	E444	2426240	1	4	25.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	2426267	1	5	20.0	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	2427412	1	3	33.3	5.0	✔
Method Blanks (MB)							
Metals by CRC ICPMS (TCLP)	E444	2426240	1	4	25.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	2426267	1	5	20.0	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	2427412	1	3	33.3	5.0	✔
Matrix Spikes (MS)							
Metals by CRC ICPMS (TCLP)	E444	2426240	1	4	25.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	2426267	1	5	20.0	5.0	✔
VOCs by Headspace GC-MS (TCLP)	E615B	2427412	1	3	33.3	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
Metals by CRC ICPMS (TCLP)	E444 ALS Environmental - Waterloo	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Waterloo	Soil/Solid	EPA 1311/245.1 (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
VOCs by Headspace GC-MS (TCLP)	E615B ALS Environmental - Waterloo	Soil/Solid	EPA 1311/8260D (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.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis (TCLP)	EP582 ALS Environmental - Waterloo	Soil/Solid	EPA 5021A (mod)	Liquid obtained after the TCLP process is 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.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Waterloo	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.
TCLP Leachate Preparation (VOCs)	EPP582 ALS Environmental - Waterloo	Soil/Solid	EPA 1311	An extract produced by the Toxicity Characteristic Leaching Procedure (TCLP) as per EPA 1311.



QUALITY CONTROL REPORT

Work Order : WT2601267

Client : CMT Engineering Inc.
Contact : Jake Feeney
Address : 1011 Industrial Crescent Unit 1
St. Clements ON Canada N0B 2M0
Telephone : 519 699 5775
Project : 25-888 Blatchford Bridge, Guelph, ON
PO : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Standing Offer 2026 Pricing
No. of samples received : 1
No. of samples analysed : 1

Laboratory : ALS Environmental - Waterloo
Account Manager : Mathy Mahadeva
Address : 60 Northland Road, Unit 1
Waterloo ON Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 20-Jan-2026 15:17
Date Analysis Commenced : 21-Jan-2026
Issue Date : 26-Jan-2026 15:34

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Robert Braun	Soils Team Supervisor	Waterloo Inorganics, 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: Soil

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
TCLP Metals(QC Lot: 2426240)											
WT2601267-002	BH1S5	Antimony, TCLP	7440-36-0	E444	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	---
		Arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	---
		Barium, TCLP	7440-39-3	E444	2.5	mg/L	2.8	2.8	0.005	Diff <2x LOR	---
		Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	0	Diff <2x LOR	---
		Boron, TCLP	7440-42-8	E444	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	---
		Cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.054	0.055	0.001	Diff <2x LOR	---
		Calcium, TCLP	7440-70-2	E444	10	mg/L	579	557	3.80 %	30%	---
		Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	---
		Cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.083	0.084	0.002	Diff <2x LOR	---
		Copper, TCLP	7440-50-8	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	---
		Iron, TCLP	7439-89-6	E444	5.0	mg/L	65.2	65.9	1.00 %	30%	---
		Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	---
		Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	131	134	2.54 %	30%	---
		Nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	---
		Selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	---
		Silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	---
		Thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	---
		Uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	---
		Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	0	Diff <2x LOR	---
		Zinc, TCLP	7440-66-6	E444	0.50	mg/L	18.9	19.2	1.74 %	30%	---
		Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	0	Diff <2x LOR	---
TCLP Metals(QC Lot: 2426267)											
WT2601267-002	BH1S5	Mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	---
TCLP VOCs(QC Lot: 2427412)											
WT2601267-002	BH1S5	Benzene, TCLP	71-43-2	E615B	5.0	µg/L	<0.0050 mg/L	<5.0	0	Diff <2x LOR	---
		Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Chloroform, TCLP	67-66-3	E615B	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	---
		Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Dichloromethane, TCLP	75-09-2	E615B	240	µg/L	<0.24 mg/L	<240	0	Diff <2x LOR	---
		Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	<0.10 mg/L	<100	0	Diff <2x LOR	---
		Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	---
		Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	<0.050 mg/L	<50	0	Diff <2x LOR	---



Method Blank (MB) Report

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



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
TCLP Metals(QC Lot: 2426240)						
Antimony, TCLP	7440-36-0	E444	0.1	mg/L	<0.10	----
Arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
Calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
Cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
Copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
Iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
Nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
Thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
Zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	----
TCLP Metals(QC Lot: 2426267)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP VOCs(QC Lot: 2427412)						
Benzene, TCLP	71-43-2	E615B	5	µg/L	<5.0	----
Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	<25	----
Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	<25	----
Chloroform, TCLP	67-66-3	E615B	100	µg/L	<100	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	<25	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	<25	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	<25	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	<25	----
Dichloromethane, TCLP	75-09-2	E615B	100	µg/L	<100	----
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	<100	----
Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	<25	----
Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	<25	----
Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	<50	----



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: Soil

					Laboratory Control Sample (LCS) Report				
					Spike Target Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit			Low	High	
TCLP Metals(QC Lot: 2426240)									
Antimony, TCLP	7440-36-0	E444	0.1	mg/L	0.05 mg/L	105	70.0	130	----
Arsenic, TCLP	7440-38-2	E444	1	mg/L	0.05 mg/L	107	70.0	130	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	0.0125 mg/L	106	70.0	130	----
Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	0.005 mg/L	104	70.0	130	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	0.05 mg/L	100	70.0	130	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	0.005 mg/L	104	70.0	130	----
Calcium, TCLP	7440-70-2	E444	10	mg/L	2.5 mg/L	101	70.0	130	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	0.0125 mg/L	102	70.0	130	----
Cobalt, TCLP	7440-48-4	E444	0.05	mg/L	0.0125 mg/L	101	70.0	130	----
Copper, TCLP	7440-50-8	E444	0.05	mg/L	0.0125 mg/L	101	70.0	130	----
Iron, TCLP	7439-89-6	E444	5	mg/L	0.05 mg/L	102	70.0	130	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	0.025 mg/L	102	70.0	130	----
Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	2.5 mg/L	112	70.0	130	----
Nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.025 mg/L	101	70.0	130	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	0.05 mg/L	101	70.0	130	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	0.005 mg/L	106	70.0	130	----
Thallium, TCLP	7440-28-0	E444	1	mg/L	0.05 mg/L	100	70.0	130	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	0.0002 mg/L	107	70.0	130	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	0.025 mg/L	104	70.0	130	----
Zinc, TCLP	7440-66-6	E444	0.5	mg/L	0.025 mg/L	101	70.0	130	----
Zirconium, TCLP	7440-67-7	E444	10	mg/L	0.005 mg/L	102	70.0	130	----
TCLP Metals(QC Lot: 2426267)									
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	0.0001 mg/L	102	70.0	130	----
TCLP VOCs(QC Lot: 2427412)									
Benzene, TCLP	71-43-2	E615B	5	µg/L	100 µg/L	104	70.0	130	----
Carbon tetrachloride, TCLP	56-23-5	E615B	25	µg/L	100 µg/L	105	60.0	140	----
Chlorobenzene, TCLP	108-90-7	E615B	25	µg/L	100 µg/L	95.7	70.0	130	----
Chloroform, TCLP	67-66-3	E615B	100	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	25	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	25	µg/L	100 µg/L	102	70.0	130	----
Dichloroethane, 1,2-, TCLP	107-06-2	E615B	25	µg/L	100 µg/L	103	70.0	130	----
Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	25	µg/L	100 µg/L	98.6	70.0	130	----
Dichloromethane, TCLP	75-09-2	E615B	100	µg/L	100 µg/L	98.4	70.0	130	----



Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
TCLP VOCs(QC Lot: 2427412)									
Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	100	µg/L	100 µg/L	93.2	50.0	150	----
Tetrachloroethylene, TCLP	127-18-4	E615B	25	µg/L	100 µg/L	101	70.0	130	----
Trichloroethylene, TCLP	79-01-6	E615B	25	µg/L	100 µg/L	106	70.0	130	----
Vinyl chloride, TCLP	75-01-4	E615B	50	µg/L	100 µg/L	97.8	60.0	130	----
TCLP VOCs Surrogates(QC Lot: 2427412)									
Bromofluorobenzene, 4-, TCLP	460-00-4	E615B	1	µg/L	10 µg/L	101	70	130	----
Difluorobenzene, 1,4-, TCLP	540-36-3	E615B	1	µg/L	10 µg/L	96.8	70	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

Sub-Matrix: Soil

					Matrix Spike (MS) Report				
					Spike		Recovery (%)	Recovery (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High
TCLP Metals(QC Lot: 2426240)									
WT2601267-002	BH1S5	Antimony, TCLP	7440-36-0	E444	5.33 mg/L	5 mg/L	107	50.0	140
		Arsenic, TCLP	7440-38-2	E444	5.5 mg/L	5 mg/L	109	50.0	140
		Barium, TCLP	7440-39-3	E444	14.1 mg/L	12.5 mg/L	113	50.0	140
		Beryllium, TCLP	7440-41-7	E444	0.259 mg/L	0.25 mg/L	103	50.0	140
		Boron, TCLP	7440-42-8	E444	9.90 mg/L	10 mg/L	99.0	50.0	140
		Cadmium, TCLP	7440-43-9	E444	0.263 mg/L	0.25 mg/L	105	50.0	140
		Calcium, TCLP	7440-70-2	E444	ND	----	ND	50.0	140
		Chromium, TCLP	7440-47-3	E444	1.30 mg/L	1.25 mg/L	104	50.0	140
		Cobalt, TCLP	7440-48-4	E444	0.257 mg/L	0.25 mg/L	103	50.0	140
		Copper, TCLP	7440-50-8	E444	2.51 mg/L	2.5 mg/L	100	50.0	140
		Iron, TCLP	7439-89-6	E444	257 mg/L	250 mg/L	103	50.0	140
		Lead, TCLP	7439-92-1	E444	10.1 mg/L	10 mg/L	101	50.0	140
		Magnesium, TCLP	7439-95-4	E444	277 mg/L	250 mg/L	111	50.0	140
		Nickel, TCLP	7440-02-0	E444	2.52 mg/L	2.5 mg/L	101	50.0	140
		Selenium, TCLP	7782-49-2	E444	5.27 mg/L	5 mg/L	105	50.0	140
		Silver, TCLP	7440-22-4	E444	0.112 mg/L	0.1 mg/L	112	50.0	140
		Thallium, TCLP	7440-28-0	E444	5.0 mg/L	5 mg/L	101	50.0	140



Sub-Matrix: Soil

Sub-Matrix: Soil					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery (%)		Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	
TCLP Metals(QC Lot: 2426240)										
		Uranium, TCLP	7440-61-1	E444	5.23 mg/L	5 mg/L	105	50.0	140	---
		Vanadium, TCLP	7440-62-2	E444	0.79 mg/L	0.75 mg/L	105	50.0	140	---
		Zinc, TCLP	7440-66-6	E444	ND	----	ND	50.0	140	---
		Zirconium, TCLP	7440-67-7	E444	1 mg/L	1 mg/L	102	50.0	140	---
TCLP Metals(QC Lot: 2426267)										
WT2601267-002	BH1S5	Mercury, TCLP	7439-97-6	E512	0.0031 mg/L	0.003 mg/L	102	50.0	140	---
TCLP VOCs(QC Lot: 2427412)										
WT2601267-002	BH1S5	Benzene, TCLP	71-43-2	E615B	235 µg/L	250 µg/L	94.1	50.0	140	---
		Carbon tetrachloride, TCLP	56-23-5	E615B	218 µg/L	250 µg/L	87.4	50.0	140	---
		Chlorobenzene, TCLP	108-90-7	E615B	223 µg/L	250 µg/L	89.1	50.0	140	---
		Chloroform, TCLP	67-66-3	E615B	240 µg/L	250 µg/L	96.2	50.0	140	---
		Dichlorobenzene, 1,2-, TCLP	95-50-1	E615B	245 µg/L	250 µg/L	98.0	50.0	140	---
		Dichlorobenzene, 1,4-, TCLP	106-46-7	E615B	236 µg/L	250 µg/L	94.3	50.0	140	---
		Dichloroethane, 1,2-, TCLP	107-06-2	E615B	265 µg/L	250 µg/L	106	50.0	140	---
		Dichloroethylene, 1,1-, TCLP	75-35-4	E615B	207 µg/L	250 µg/L	82.7	50.0	140	---
		Dichloromethane, TCLP	75-09-2	E615B	270 µg/L	250 µg/L	106	50.0	140	---
		Methyl ethyl ketone [MEK], TCLP	78-93-3	E615B	290 µg/L	250 µg/L	116	50.0	140	---
		Tetrachloroethylene, TCLP	127-18-4	E615B	209 µg/L	250 µg/L	83.5	50.0	140	---
		Trichloroethylene, TCLP	79-01-6	E615B	232 µg/L	250 µg/L	92.7	50.0	140	---
		Vinyl chloride, TCLP	75-01-4	E615B	206 µg/L	250 µg/L	82.5	50.0	140	---
TCLP VOCs Surrogates(QC Lot: 2427412)										
		Bromofluorobenzene, 4-, TCLP	460-00-4	E615B	25.9 µg/L	25 µg/L	103	70.0	130	---
		Difluorobenzene, 1,4-, TCLP	540-36-3	E615B	24.1 µg/L	25 µg/L	96.3	70.0	130	---



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Environmental Division
Waterloo

Work Order Reference

WT2600489



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