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FOUNDATION INVESTIGATION REPORT
PINEIMUTA RIVER BRIDGE REPLACEMENT
DISCTRICT OF KENORA, ONTARIO
AGREEMENT NO.: 6021-E-0011
GWP 6046-21-00

GEOCRES NO.: 53B01-001

Location: Lat: 52.214011°, Long: -90.438015°

Client Name: HATCH
Date: March 24, 2026
File: 68438

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THURBER

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PART 1. FACTUAL INFORMATION

1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) has been retained by Hatch to carry out a foundation investigation for the replacement of a modular bridge on Highway 599/808 (Nort Road), approximately 135 km north of the Highway 599 / Pickle Lake Road Junction in the District of Kenora, Ontario.

The purpose of the investigation was to explore the subsurface conditions at the site and based on the data obtained, provide a borehole location plan, stratigraphic profile and sections, record of boreholes, laboratory test results, and a written description of the subsurface conditions.

It is a condition of this report that Thurber's performance of its professional services is subject to the attached Statement of Limitations and Conditions.

2. SITE DESCRIPTION

2.1 General

The existing Pineimuta River Modular Bridge (Site No. 41X-0108/B0) is located on Highway 599/808 (Nort Road), approximately 135 km north of the Highway 599 / Pickle Lake Road Junction in the District of Kenora, Ontario.

The existing modular structure carries a single lane of traffic over the Pineimuta River. The existing structure is single span and the foundation element of the abutments were unknown. A demolished bridge footprint (1969) is present west of the existing modular bridge, and the abutments are rock-filled timber cribs.

For project purposes, Highway 599/808 (Nort Road) is considered to be oriented north-south, and the river is described as oriented east-west at the bridge location.

The bridge is generally surrounded by a forested area.

Photographs showing the existing conditions at the project site at the time of the field investigation are included in Appendix F.

2.2 Regional Geology

Surficial geological mapping indicates that the site is characterized by glaciofluvial ice-contact deposits, comprising gravel and sand, minor till; includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits (Barnett, P.J., Henry, A.P. and Babuin, D. 1991. Quaternary geology of Ontario, west-central sheet; Ontario Geological Survey, Map 2553, scale 1:1,000,000).

Bedrock geology mapping indicates that the site is underlain by igneous and metamorphic rocks, comprised of granitic gneiss (Ontario Geological Survey 1991. Bedrock geology of Ontario, west-central sheet; Ontario Geological Survey, Map 2542, scale 1:1,000,000).

3. INVESTIGATION PROCEDURES

Borehole drilling was carried out between June 11 and June 15, 2024. The field program consisted of advancing six boreholes to sampling depths ranging from 12.8 to 17.8 m below the existing ground surface. Two probe boreholes were also advanced to confirm bedrock depths.

The borehole locations were marked in the field by Thurber staff. Public utility locates were obtained in the vicinity of the borehole locations before commencing the drilling.

The boreholes were drilled using a track-mounted CME-55 drill rig equipped with hollow stem augers, NW casing and NQ coring equipment.

Soil samples were obtained at selected intervals using a 50 mm nominal diameter split spoon sampler in conjunction with Standard Penetration Testing (SPT) in general accordance with ASTM D1586.

The drilling and sampling operations were observed on a full-time basis by a member of Thurber's technical staff who logged the boreholes and processed the recovered soil and rock core samples for transport to Thurber's laboratory for further examination and testing.

One 50 mm diameter standpipe piezometer was installed in each of Borehole 25-01 and 25-05 to allow for measurements of the groundwater level after drilling. The details of the standpipe piezometers are illustrated on the respective Record of Borehole sheets provided in Appendix B.

Upon completion of drilling, all boreholes were backfilled in general accordance with O. Reg. 903, as amended. The standpipe piezometers were decommissioned in general accordance with O. Reg. 903, as amended, on the last day of drilling.

The borehole locations and elevations were referenced to the base plan mapping provided by Hatch. The borehole coordinates are referenced to MTM NAD83 Zone 15. The borehole coordinates and elevations are shown on the Borehole Locations and Soil Strata Drawing included in Appendix A and on the individual Record of Borehole sheets included in Appendix B. A summary of the borehole locations and termination depths is provided in the table below.

Table 3-1 Borehole Summary

Borehole	Northing (m)	Easting (m)	Ground Surface Elevation (m)	Termination Depth Below Ground Surface (m)
25-01	5,786,694.0	274,848.4	351.9	16.8
25-02	5,786,681.6	274,842.6	352.2	16.6
25-02B*	5,786,681.2	274,842.6	352.1	13.6
25-03	5,786,691.4	274,825.5	353.0	12.8
25-04	5,786,666.1	274,887.1	352.1	17.8
25-05	5,786,658.7	274,881.0	352.1	16.6
25-05B*	5,786,658.8	274,878.0	352.0	13.2
25-05MW**	5,786,659.4	274,880.2	352.1	7.8
25-06	5,786,647.8	274,894.9	352.1	13.0

* Probe borehole drilled (not sampled) to confirm bedrock depths

** Separate borehole drilled (not sampled) to install shallow monitoring well at 25-05 location

3.1 Single Well Response Test

Single well response tests (slug tests) were carried out in both monitoring wells (25-01 and 25-05). The results of the slug tests are included in Appendix E.

4. LABORATORY TESTING

Laboratory testing was selected in general accordance with Section 5 of the MTO Guideline for Foundation Engineering Services, Version 3.0, dated April 2022. Geotechnical laboratory testing consisted of natural moisture content determination and visual identification of all recovered soil samples. Selected soil samples were subjected to grain size distribution and Atterberg Limits testing; point load test (PLT) and unconfined compressive strength (UCS) testing were carried out on selected rock cores in accordance with MTO and ASTM standards. The results of these tests are summarized on the Record of Borehole sheets included in Appendix B.

Two soil samples were submitted for analytical testing of corrosivity parameters and sulphate content. Four soil samples were collected and submitted to a certified and accredited laboratory to be tested analytically for petroleum hydrocarbons BTEX, F1 to F4, metals and some inorganic parameters.

All laboratory test results from the field investigation are provided in Appendix C.

5. DESCRIPTION OF SUBSURFACE CONDITIONS

Details of the encountered subsurface conditions are presented on the Record of Borehole sheets included in Appendix B and on the Borehole Locations and Soil Strata Drawing included in Appendix A. A general description of the stratigraphy, based on the conditions encountered in the boreholes, is given in the following sections. However, the factual data presented on the Record of Borehole sheets takes precedence over this general description for interpretation of the site conditions. It must be recognized that the soil, bedrock, and groundwater conditions will vary between and beyond the borehole locations.

The subsurface conditions encountered in the boreholes generally consisted of cohesionless sand to sand and gravel fill overlying a sand deposit, which is underlain by layers of silty clay and clayey silt to silt. A layer of silty sand to sand and gravel till underlies the cohesive deposits. Cobbles and boulders were encountered within the fill and lower cohesionless tills just above bedrock. The overburden soil was underlain by granitic gneiss bedrock.

5.1 Topsoil

A 200 to 250 mm thick layer of topsoil was encountered at the ground surface in Boreholes 25-02 and 25-03.

5.2 Sand to Sandy Gravel Fill

Cohesionless fill material consisting of sand to sandy gravel was encountered at ground surface or below the topsoil in all boreholes. The fill had a thickness ranging from 2.2 to 3.7 m (base Elev. 348.4 m to 350.0 m).

SPT N-values in the fill ranged from 4 to 72 blows per 0.3 m, indicating a loose to very dense condition. The moisture content varied from 3 percent to 22 percent.

Frequent auger grinding and spoon refusal were encountered in the fill material during investigation indicating presence of cobbles and boulders.

Four grain size distribution analyses were completed on the fill, and a summary of the results is presented in the table below and Figure C1 in Appendix C.

Table 5-1 Grain Size – Sand Fill

Grain Size Distribution		
Gravel (%)	**Sand (%)**	**Silt and Clay**
3 to 26	66 to 86	8 to 13

5.3 Sand to Sand and Gravel

A native deposit of sand to sand and gravel was encountered below the sand fill in all boreholes. The deposit had a thickness ranging from 4.1 to 5.0 m and extended to depths of 6.4 m to 7.9 m (base elev. 344.0 m to 345.8 m) in all boreholes.

SPT N-values in the sand to sand and gravel ranged from 2 per 0.3 m to over 50 blows per 0.125 m, indicating a very loose to very dense condition. The moisture content varied from 4 to 23 percent.

Frequent auger grinding/refusal was encountered in the material during investigation.

Six grain size distribution analyses were completed on the sand, and a summary of the results is presented in the table below and Figure C2 in Appendix C.

Table 5-2 Grain Size Tests – Sand, and Sand and Gravel

Soil Material	Grain Size Distribution				
	Gravel (%)	**Sand (%)**	**Silt (%)**	**Clay (%)**	**Silt and Clay (%)**
Sand	0 to 3	92 to 96	--	--	3 to 7
	9	76	13	2	15
Sand and Gravel	37	59	--	--	4

5.4 Silty Clay, Clayey Silt to Silt

Cohesive material consisting of silty slay, clayey silt to silt was encountered below the sand to sand and gravel deposit in all boreholes. The deposit had a thickness ranging from 3.8 to 4.7 m and extended to depths of 11.0 m to 12.5 m (base elev. 339.6 m to 341.1 m) in all boreholes, except Borehole 25-03. The deposit extended to the maximum investigated depth in Boreholes 25-03.

SPT N-values in the cohesive deposits ranged from 7 to 57 blows per 0.3 m, indicating a firm to hard consistency. The moisture content varied from 10 to 31 percent.

Eight grain size distribution analyses and six Atterberg Limits tests were completed on the deposit, and a summary of the results is presented in the table below and Figure C3, C4, C6 and C7 in Appendix C. The results of Atterberg Limits testing carried out on selected samples indicate that the clayey silt to silt has negligible to slight plasticity (ML, CL-ML) and the silty clay has low plasticity (CL).

Table 5-3 Grain Size and Atterberg Limits Tests – Silty Clay, Clayey Silt to Silt

Soil Material	Grain Size Distribution				Atterberg Limits		
	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
Clayey Silt to Silt	0 to 1	0 to 4	77 to 92	7 to 23	18 to 21	17 to 18	1 to 4
Silty Clay	0	0 to 3	73 to 67	27 to 30	25 to 26	17	8 to 9

5.5 Silty Sand Till

A deposit of silty sand till was encountered at a deeper depth below the cohesive soils in Boreholes 25-02, 25-04, 25-05 and 25-06. The deposit had a thickness of 1.0 to 2.0 m and extended to a depth of 13.6 to 13.7 m (base elev. 338.4 m to 339.1 m).

SPT N-values in the sand till ranged from 13 to 21 blows per 0.3 m indicating a compact condition. The moisture content varied from 4 to 8 percent.

Frequent auger grinding/refusal was encountered in the till during investigation indicating the presence of cobbles and boulders. Glacial tills inherently contain cobbles and boulders.

One grain size distribution analysis was completed on the deposit, and a summary of the results is presented in the table below and Figure C5 in Appendix C.

Table 5-4 Grain Size Tests – Lower Silty Sand Till

Grain Size Distribution			
Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0	55	38	7

5.6 Sand and Gravel Till

Sand and gravel till was encountered at a deeper depth below the cohesive deposit in Borehole 25-01. The deposit had a thickness of 2.0 m and extended to a depth of 13.7 m (base elev. 338.2m).

Frequent auger grinding/refusal was encountered in the sand and gravel material during investigation, indicating the presence of cobbles and boulders. Glacial tills inherently contain cobbles and boulders.

An SPT N-value in the sand and gravel was recorded as 9 blows per 0.3 m indicating a loose condition. The moisture content was 15 percent.

One grain size distribution analysis was completed on the sand and gravel, and a summary of the results is presented in the table below and Figure C5 in Appendix C.

Table 5-5 Grain Size Tests – Lower Sand and Gravel

Grain Size Distribution		
Gravel (%)	**Sand (%)**	**Silt and Clay (%)**
37	36	27

5.7 Cobbles and Boulders

Cobbles and boulders were inferred at several depths and confirmed by coring through the cobbles and boulder in Boreholes 25-01, 25-04, 25-05.

A 150 mm thick cobble was recovered in Boreholes 25-01 at a depth of 2.3 m (elev. 349.6).

The boulder fragments recovered from Boreholes 25-01 and 25-04 had a thickness ranging from approximately 375 mm to 450 mm and were encountered at depths ranging from 12.8 m to 13.7 (elev. 339.1 m to 338.4 m).

An approximately 450 mm thick, localized boulder within the sand deposit was encountered in Borehole 25-05 at a depth of 5.1 (elev. 347 m).

The cobbles and boulders were mainly encountered within the cohesionless soils at shallower depths and in the tills immediately above bedrock.

5.8 Bedrock

Bedrock was proven by rock core recovery underlying the lower silty sand to sand and gravel till (and boulders) at depths ranging between 13.0 and 14.6 m (elev. 337.5 m to 339.1 m) in all boreholes, except Boreholes 25-03 and 25-06 where casing refusal was encountered on probable boulders or bedrock.

Two probe boreholes (25-02B and 25-05B) were completed to further confirm the depth/elevation of the bedrock within the abutment foundation location.

Upon contact with bedrock in Boreholes 25-01, 25-02, 25-04 and 25-05, the bedrock was cored using HQ sized diamond rock coring equipment to the termination depths in the boreholes.

The table below summarizes the depths and elevations of the top of bedrock:

Table 5-6 Depths and Elevation of top of bedrock

Bridge	Location	Borehole	Top of Bedrock	
			Depth (m)	Elevation (m)
Existing Bridge Replacement	North Abutment	25-01	13.8	338.1
		25-02	13.6	338.6
	South Abutment	25-04	14.6	337.5
		25-05	13.0	339.1
Detour Bridge	North Abutment	25-02B*	13.6	338.5
	South Abutment	25-05B*	13.2	338.8

*Probe borehole to confirm bedrock depths

The bedrock encountered consisted of slightly weathered to fresh, grey and dark grey, very strong granitic gneiss. Photographs of the bedrock cores are provided in Appendix G.

The rock core recovery measurements, rock quality designation and rock core laboratory testing results are summarized in Table 5-8 below.

Table 5-7 Bedrock Details

Parameter	Range
Total Core Recovery (TCR), %	98 – 100
Solid Core Recovery (SCR), %	73 – 100
Rock Quality Designation (RQD), %	73 – 100
Unconfined Compressive Strength from UCS Tests (MPa)	124 – 222
Unconfined Compressive Strength Estimated from Point Load Tests (MPa)	154 – 236

Based on the RQD, the bedrock quality is described as good to excellent (CFEM 5th Edition, 2023). The results of UCS and point load testing indicate that the tested samples of the bedrock are very strong (CFEM 5th Edition, 2023). The results of the UCS and point load testing are included in Appendix C.

5.9 Groundwater Conditions

The measured groundwater levels from the standpipe piezometers are summarized in the table below.

Table 5-8 Groundwater Level Measurements

Well ID	Ground Surface Elevation (m)	Depth of Screened Interval (m)	Screened Material	Groundwater Level		Date of Reading
				Depth (m)	Elevation (m)	
25-01	351.9	10.7 – 13.7	Silt, sand, boulders	1.9	350.0	June 17, 2025
25-05	352.1	4.6 – 7.6	Sand / boulders	4.6	347.5	

It should be noted that the above values are considered short-term readings and may not reflect the stabilized groundwater level during investigation and at the time of construction. It is anticipated that the groundwater levels are governed by the river level at this site. Seasonal fluctuations of the groundwater level are to be expected. In particular, the groundwater level may be at a higher elevation after periods of significant and/or prolonged precipitation events.

5.10 Analytical Testing

Two soil samples were submitted for analytical testing of corrosivity parameters and sulphate content. The analytical results are included in Appendix D and are summarized in the table below.

Table 5-9 Analytical Test Results

Borehole	Sample	Sample Depth (m)	Conductivity (mS/cm)	pH	Resistivity (ohm-cm)	Chloride (mg/kg)	Sulphate (mg/kg)	Sulphide (%)
25-02	SS4	2.3 – 2.9	53	8.15	18900	2.8	1.4	< 0.01
25-04	SS4	2.3 – 2.9	132	8.00	7580	2.8	3.6	< 0.01

Four soil samples were also submitted for analytical testing of petroleum hydrocarbons BTEX, F1 to F4, metals, Electrical Conductivity (EC), and Sodium Adsorption Ratio (SAR). The analytical results are included in Appendix D.

6. MISCELLANEOUS

The borehole locations reflect existing site features and access constraints. The as-drilled borehole locations and ground surface elevation were estimated by Thurber based on physical landmarks and site features. The boreholes were drilled by Downing Drilling of Hawkesbury, Ontario. Traffic control was carried out in accordance with Ontario Traffic Manual Book 7 by Downing Drilling of Hawkesbury, Ontario.

Routine geotechnical laboratory testing of soil samples and point load testing of rock core samples was completed by Thurber's laboratory in Oakville, Ontario. Uniaxial compressive strength tests were carried out by Geomechanica Inc. in Oakville, Ontario. Analytical testing was completed by ALS Canada Ltd. in Waterloo, Ontario, and SGS in Mississauga, Ontario.

The field investigation was observed on a full-time basis by Mr. Smit Patel. Overall supervision of the field investigation program was provided by Mr. Yamlak Aragaw, P.Eng. and Mr. Rod de Castro, P.Eng.

This report was prepared by Mr. Yamlak Aragaw, P.Eng. and Mr. Rod de Castro, P.Eng. The report was reviewed by Messrs. Sydney Pang, P.Eng. and Jason Lee, P.Eng., a Designated Principal Contact for MTO Foundation Projects.

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THURBER

STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

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The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

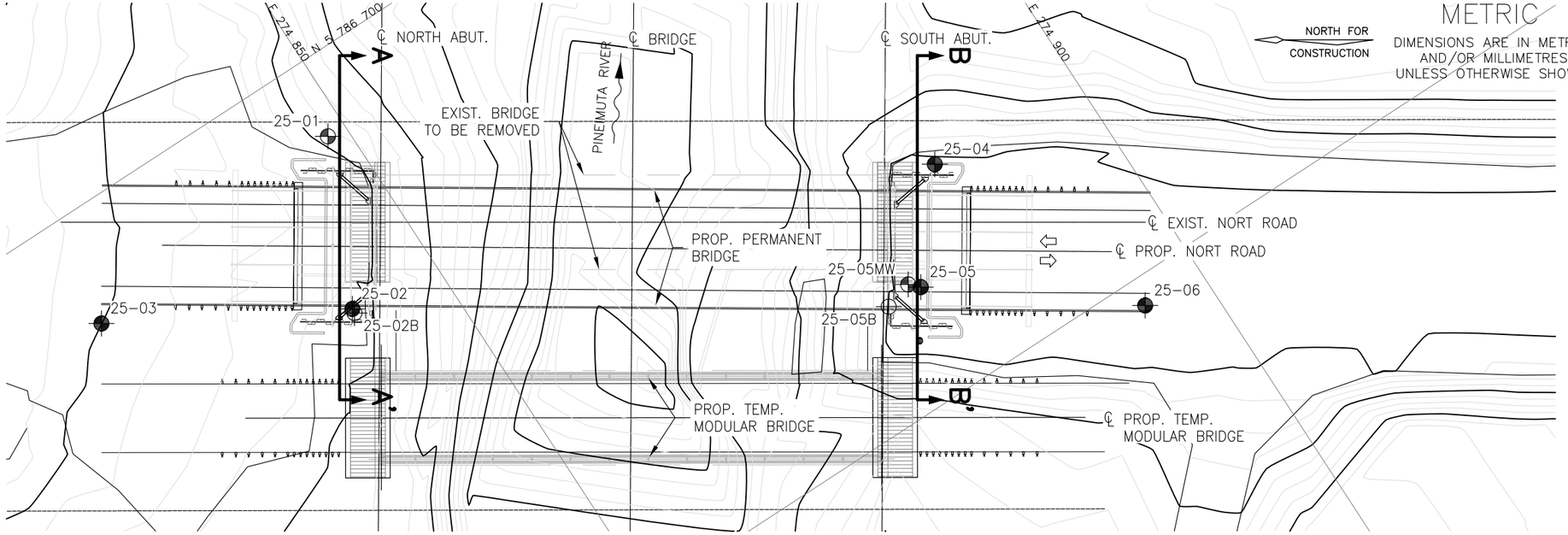
7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

APPENDIX A

Borehole Locations and Soil Strata Drawing

MINISTRY OF TRANSPORTATION, ONTARIO



PLAN

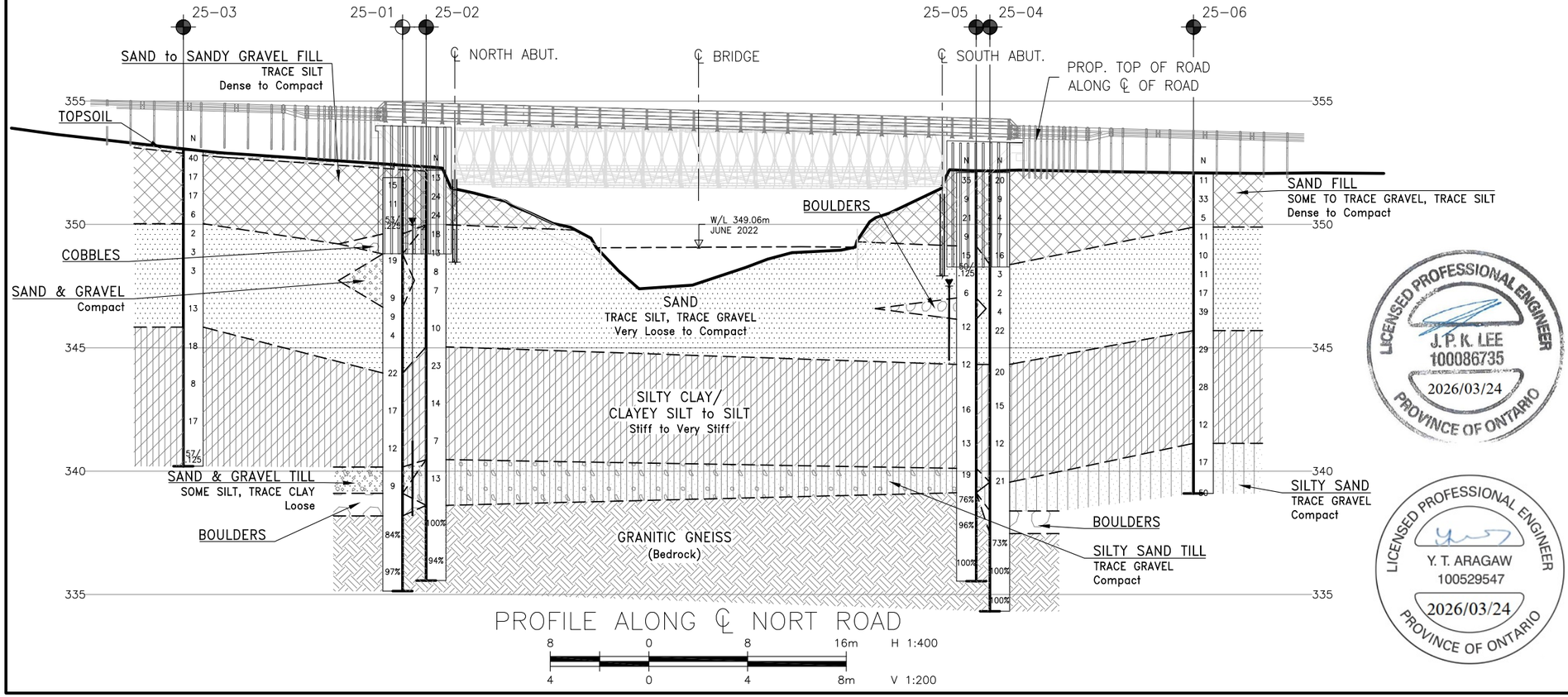
8 0 8 16m

SCALE 1:400

NORTH FOR CONSTRUCTION

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN



PROFILE ALONG ℄ NORT ROAD

8 0 8 16m H 1:400

4 0 4 8m V 1:200

CONT No
GWP No 6046-21-00

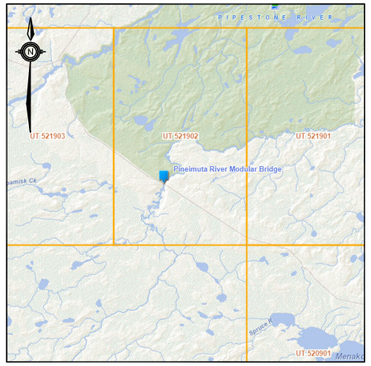
SHEET

BRIDGE REPLACEMENT AT PINEIMUTA RIVER AND NORT ROAD

BOREHOLE LOCATIONS PLAN AND SOIL STRATA

HATCH

THURBER



KEYPLAN

LEGEND

⊕	Borehole
⊕	Borehole with Monitoring Well
⊕	Probe Borehole
CONE	Blows /0.3m (60° Cone, 475J/blow)
PH	Pressure, Hydraulic
▽	Water Level Upon Completion of Drilling
▼	Water Level in Monitoring Well/Piezometer
▮	Monitoring Well/Piezometer Screen
90%	Rock Quality Designation (RQD)
A/R	Auger Refusal

NO	ELEVATION	NORTHING	EASTING
25-01	351.9	5 786 694.0	274 848.4
25-02	352.2	5 786 681.6	274 842.6
25-02B	352.1	5 786 681.2	274 842.6
25-03	353.0	5 786 691.4	274 825.5
25-04	352.1	5 786 666.1	274 887.1
25-05	352.1	5 786 658.7	274 881.0
25-05B	352.0	5 786 658.8	274 878.0
25-05MW	352.1	5 786 659.4	274 880.2
25-06	352.1	5 786 647.8	274 894.9

-NOTES-

1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
3) Coordinate system is MTM NAD 83 Zone 15.

GEOCRES No. 53B01-001

LICENSED PROFESSIONAL ENGINEER
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LICENSED PROFESSIONAL ENGINEER
Y. T. ARAGAW
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PROVINCE OF ONTARIO

REVISIONS			
DATE	BY	DESCRIPTION	
DESIGN YA	CHK RdC	CODE	LOAD
DRAWN AN	CHK YA	SITE	STRUCT
			DATE MAR 2026
			DWG 1

FILENAME: H:\Drafting\68000\68438\TED-68438-BHPP (Option 1).dwg
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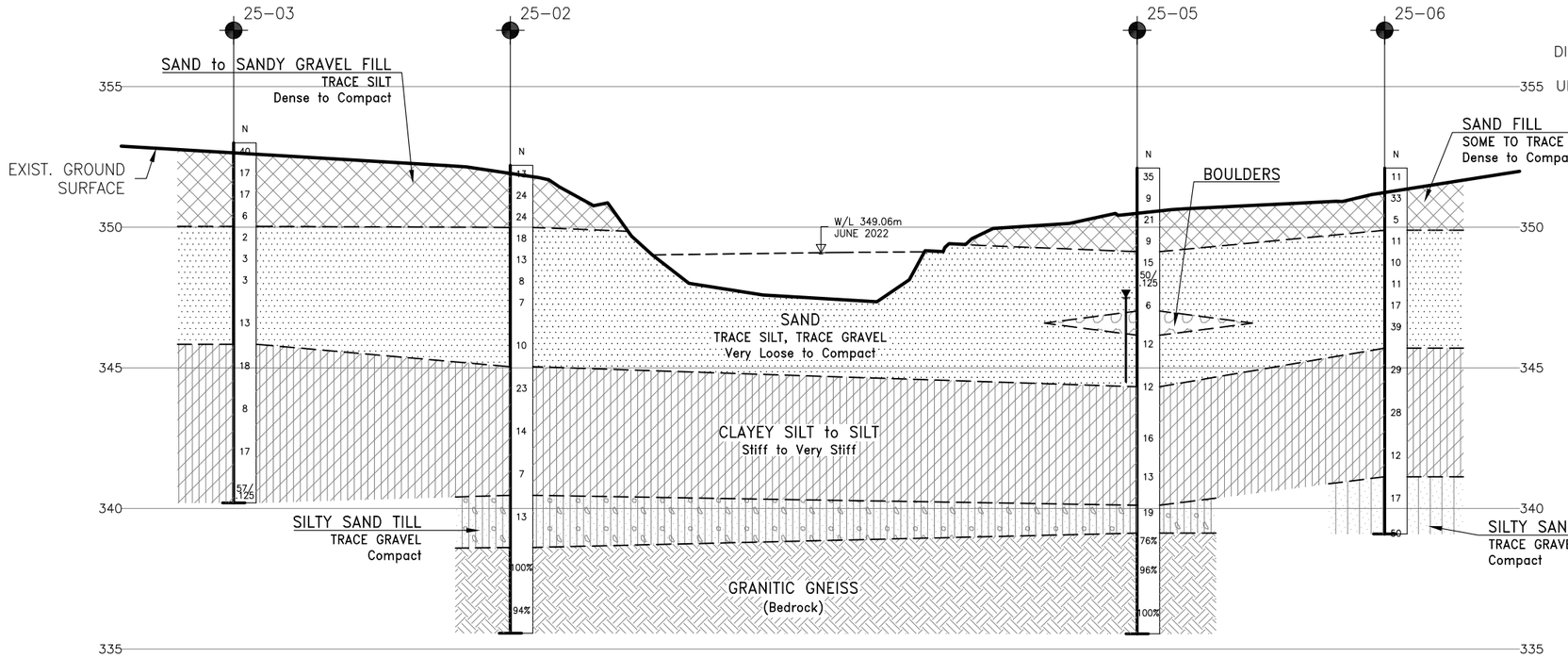
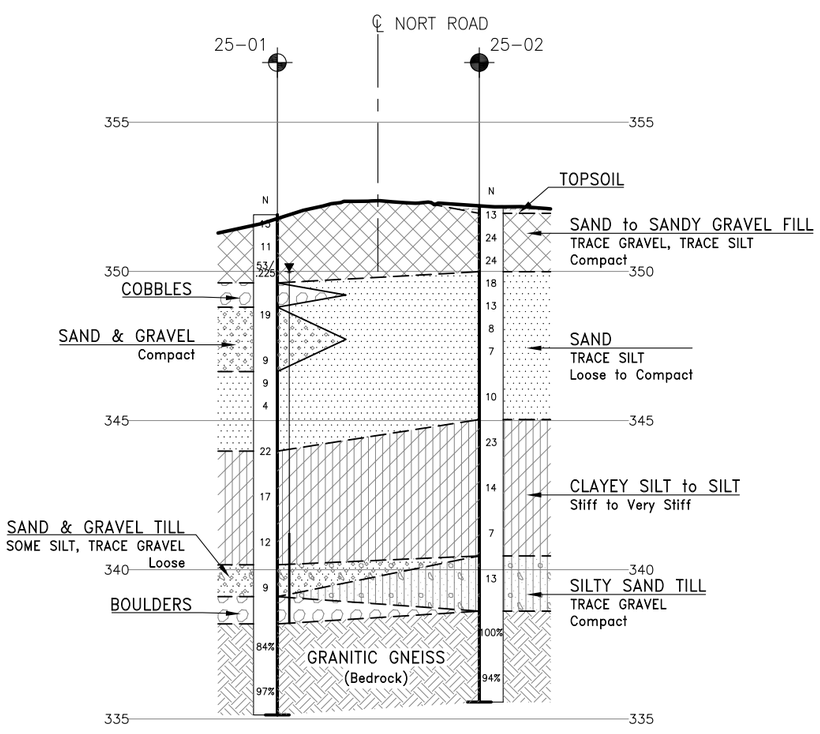
MINISTRY OF TRANSPORTATION, ONTARIO



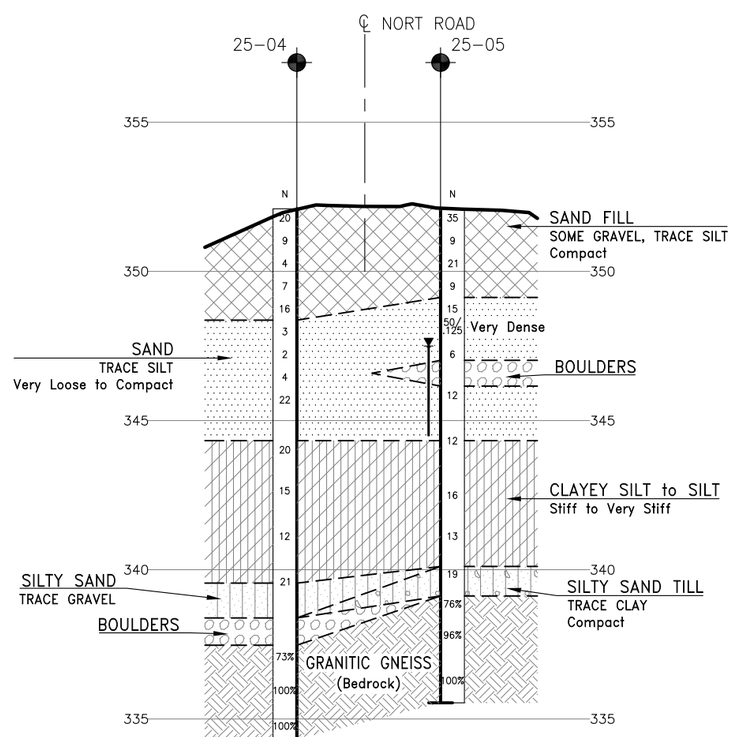
PROFILE ALONG ℄ PROP. TEMP. MODULAR BRIDGE



SECTION ALONG A–A'

8 0 8 16m H 1:400

4 0 4 8m V 1:200



SECTION ALONG B–B'

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

CONT No
GWP No 6046-21-00

BRIDGE REPLACEMENT AT PINEIMUTA RIVER AND NORT ROAD
BOREHOLE SOIL STRATA

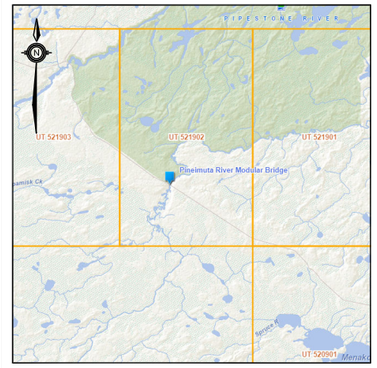
SHEET

HATCH

THURBER

LICENSED PROFESSIONAL ENGINEER
J.P.K. LEE
100086735
2026/03/24
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
Y. T. ARAGAW
100529547
2026/03/24
PROVINCE OF ONTARIO



KEYPLAN

LEGEND

⊕	Borehole
⊕	Borehole with Monitoring Well
	Probe Borehole
CONE	Blows /0.3m (60° Cone, 475J/blow)
PH	Pressure, Hydraulic
▽	Water Level Upon Completion of Drilling
▼	Water Level in Monitoring Well/Piezometer
	Monitoring Well/Piezometer Screen
90%	Rock Quality Designation (RQD)
A/R	Auger Refusal

NO	ELEVATION	NORTHING	EASTING
25-01	351.9	5 786 694.0	274 848.4
25-02	352.2	5 786 681.6	274 842.6
25-02B	352.1	5 786 681.2	274 842.6
25-03	353.0	5 786 691.4	274 825.5
25-04	352.1	5 786 666.1	274 887.1
25-05	352.1	5 786 658.7	274 881.0
25-05B	352.0	5 786 658.8	274 878.0
25-05MW	352.1	5 786 659.4	274 880.2
25-06	352.1	5 786 647.8	274 894.9

-NOTES-

1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
3) Coordinate system is MTM NAD 83 Zone 15.

GEOCRES No. 53B01-001

REVISIONS		
DATE	BY	DESCRIPTION

DESIGN	YA	CHK	RdC	CODE		LOAD	
DRAWN	AN	CHK	YA	SITE		STRUCT	
DATE	MAR 2026	DWG	2				

FILENAME: H:\Drafting\68000\68438\TED-68438-BHPP (Option 1).dwg
PLOTDATE: 3/25/2026 12:21 PM

APPENDIX B

Record of Borehole Sheets

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-01 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 694.0 E 274 848.4 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.13 - 2025.06.13 LATITUDE 52.214242 LONGITUDE -90.438256 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
351.9	GROUND SURFACE										
0.0	**SAND**, trace gravel, trace silt Compact Brown Moist (FILL)		1	SS	15		351				
			2	SS	11						
			3	SS	53/ 0.225	▼	350				
349.6											
2.3	**COBBLES** ~150mm thick cobble recovered		4	RC			349				
348.8											
3.1	**SAND** and **GRAVEL**, trace silt Compact Brown Wet		5	SS	19		348				37 59 4 (SI+CL)
			6	SS	9		347				No recovery
346.6											
5.3	**SAND**, trace gravel Loose Brown Wet		7	SS	9		346				
			8	SS	4		345				
344.0											
7.9	Silty **CLAY**, trace sand Very Stiff Grey Moist		9	SS	22		344				
			10	SS	17		343				0 3 67 30
							342				

Continued Next Page

+ ³, × ³: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-01 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 694.0 E 274 848.4 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.13 - 2025.06.13 LATITUDE 52.214242 LONGITUDE -90.438256 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Silty **CLAY**, trace sand Very Stiff Grey Moist										
	Stiff		11	SS	12		341				
340.2											
11.7	**SAND** and **GRAVEL**, some silt, trace clay Grey Moist (TILL)		12	SS	9		340				37 36 27 (SI+CL)
339.1											
12.8	**BOULDERS** ~375mm thick boulder recovered, Low recovery sand and gravel material below 13.3m		13	GS			339				
338.1			14	SS						FI	
13.8	**GRANITIC GNEISS** fresh to slightly weathered, very strong, light to medium grey		1	RUN			338			1 0 2 0 0	**RUN #1** TCR=98% SCR=84% RQD=84% UCS=124-157MPa
							337			1 0	
			2	RUN			336			0 0 0	**RUN #2** TCR=100% SCR=97% RQD=97%
335.1											
16.8	END OF BOREHOLE AT A DEPTH OF 16.8 m. Notes: 1. Well installation consists of 50mm diameter Schedule 40 PVC pipe with a 3.05m slotted screen. WATER LEVEL READINGS DATE DEPTH(m) ELEV.(m) 2025.06.17 1.9 350.0										

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE

$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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THURBER

RECORD OF BOREHOLE No 25-02 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 681.6 E 274 842.6 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.13 - 2025.06.13 LATITUDE 52.214131 LONGITUDE -90.438339 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
352.2	GROUND SURFACE						352				
0.0 / 351.9	**TOPSOIL:** (250mm)		1	SS	13				○		11 76 13 (SI+CL)
0.3 / 351.5	**SAND**, trace gravel, trace silt Compact Light Brown to Brown Moist (FILL)		2	SS	24		351		○		
0.7	Sandy **GRAVEL**, trace silt Compact Brown Moist (FILL)		3	SS	24				○		
350.0	Silt layer ar 2.0 m						350		○		
2.2	**SAND**, trace silt, trace gravel Loose to Compact Brown Wet		4	SS	18						
			5	SS	13		349		○		
			6	SS	8		348		○		3 92 5 (SI+CL)
			7	SS	7				○		
							347				
			8	SS	10		346		○		1 96 3 (SI+CL)
345.0											
7.2	Clayey **SILT** to **SILT** Stiff to Very Stiff Grey Moist		9	SS	23		345				
							344				
			10	SS	14		343		⊕		0 0 77 23

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 ⊕ 5 / 10 (%) STRAIN AT FAILURE

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Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-02 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 681.6 E 274 842.6 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.13 - 2025.06.13 LATITUDE 52.214131 LONGITUDE -90.438339 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Clayey **SILT** to **SILT** Stiff to Very Stiff Grey Moist						342				
	Wet sand		11	SS	7		341				
340.5											
11.7	Silty **SAND**, trace gravel Compact Grey Wet (TILL)		12	SS	13		340				
338.6							339				
13.6	**GRANITIC GNEISS** fresh, very strong, dark grey		1	RUN			338				**RUN #1** TCR=100% SCR=100% RQD=100%
			2	RUN			337				**RUN #2** TCR=100% SCR=94% RQD=94% UCS=164-236MPa
335.6							336				
16.6	END OF BOREHOLE AT A DEPTH OF 16.6 m.										

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE

$+^3$, $\times^3$: Numbers refer to Sensitivity

$\frac{20}{15 \oplus 5}$ (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-03 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 691.4 E 274 825.5 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing with water and drilling mud COMPILED BY MC

DATUM Geodetic DATE 2025.06.14 - 2025.06.14 LATITUDE 52.214218 LONGITUDE -90.438591 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
353.0	GROUND SURFACE										
0.0	**TOPSOIL:** (200mm)										
0.2	Gravelly **SAND**, trace silt Compact to Dense Light Brown Moist (FILL)		1	SS	40				○		
			2	SS	17		352		○		
			3	SS	17		351		○		26 66 8 (SI+CL)
	Loose		4	SS	6				○		
350.0							350				
3.0	**SAND**, trace silt Very Loose Brown Wet		5	SS	2				○		
			6	SS	3		349		○		
			7	SS	3		348		○		
	Compact		8	SS	13		347		○		
345.8							346				
7.2	Clayey **SILT** to **SILT**, trace sand Stiff to Very Stiff Grey Moist		9	SS	18		345		○		0 1 91 8
			10	SS	8		344		○		

Continued Next Page

+ ^{3}, × ^{3}: Numbers refer to Sensitivity

$\frac{20}{15 \quad 5}$ (%) STRAIN AT FAILURE
10

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-03 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 691.4 E 274 825.5 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing with water and drilling mud COMPILED BY MC

DATUM Geodetic DATE 2025.06.14 - 2025.06.14 LATITUDE 52.214218 LONGITUDE -90.438591 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Clayey **SILT** to **SILT**, trace sand Stiff to Very Stiff Grey Moist										
	trace gravel		11	SS	17		342				1 4 81 14
							341				
340.2	Hard		12	SS	57/ 0.125						
12.8	END OF BOREHOLE AT A DEPTH OF 12.8 m UPON CASING REFUSAL ON PROBABLE BOULDERS OR BEDROCK.										

$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 25-04 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 666.1 E 274 887.1 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.15 - 2025.06.15 LATITUDE 52.213994 LONGITUDE -90.437687 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
352.1	GROUND SURFACE										
0.0	**SAND**, some gravel, trace silt Loose to Compact Brown Moist (FILL)		1	SS	20		352				
			2	SS	9		351				
			3	SS	4						10 81 9 (SI+CL)
			4	SS	7		350				
			5	SS	16		349				
348.4											
3.7	**SAND**, trace silt Very Loose Brown Wet		6	SS	3		348				
			7	SS	2						1 93 6 (SI+CL)
			8	SS	4		347				
	Compact		9	SS	22		346				
			10	GS			345				
344.3											
7.8	Clayey **SILT** to **SILT** Very Stiff Grey Moist		11	SS	20		344				0 1 92 7
343.3											
8.8	Silty **CLAY** Very Stiff Grey Moist		12	SS	15		343				0 0 73 27

Continued Next Page

+ ³, × ³: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-04 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 666.1 E 274 887.1 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.15 - 2025.06.15 LATITUDE 52.213994 LONGITUDE -90.437687 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Silty **CLAY** Very Stiff Grey Moist						342				
	Stiff		13	SS	12		341		○		
339.6			14	SS	21		340		●		
12.5	Silty **SAND**, trace gravel Grey Moist to Wet						339		○		
338.4											
13.7	**BOULDERS** ~450mm thick cobbles/boulder recovered		15	RC			338				
337.5											
14.6	**GRANITIC GNEISS** fresh to slightly weathered, very strong, light to medium grey		1	RUN			337				**RUN #1** TCR=97% SCR=73% RQD=73%
			2	RUN			336				**RUN #2** TCR=100% SCR=100% RQD=100%
			3	RUN			335				**RUN #3** TCR=100% SCR=100% RQD=100%
334.3											
17.8	END OF BOREHOLE AT A DEPTH OF 17.8 m.										

+ ^{3}, × ^{3}: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

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Ontario

THURBER

RECORD OF BOREHOLE No 25-05 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 658.7 E 274 881.0 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.11 - 2025.06.12 LATITUDE 52.213927 LONGITUDE -90.437777 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
352.1	GROUND SURFACE										
0.0	**SAND**, some silt, trace gravel Loose to Compact Moist (FILL)		1	SS	35		352				
			2	SS	9		351				3 86 11 (SI+CL)
			3	SS	21		350				
349.1			4	SS	9						
3.0	**SAND**, trace silt Loose to Compact Brown Wet		5	SS	15		349				
			6	SS	50/ 0.125		348				
347.0			7	SS	6		347				
5.1	**BOULDERS** ~450mm thick boulder recovered		8	RC							
346.2											
5.9	**SAND**, trace silt, trace gravel Compact Brown Wet		9	SS	12		346				
							345				
344.3			10	SS	12		344				
7.8	Clayey **SILT** to **SILT** Stiff to Very Stiff Grey Moist										
			11	SS	16		343				0 1 86 13

Continued Next Page

+ ³, × ³: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-05 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 658.7 E 274 881.0 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.11 - 2025.06.12 LATITUDE 52.213927 LONGITUDE -90.437777 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Clayey **SILT** to **SILT** Stiff to Very Stiff Grey Moist						342				
			12	SS	13		341		○		
340.1											
12.0	Silty **SAND**, trace clay Compact Grey Moist (TILL)		13	SS	19		340		○		0 55 38 7
339.1											
13.0	**GRANITIC GNEISS**, fresh to slightly weathered, very strong, grey		1	RUN			339				**RUN #1** TCR=95% SCR=76% RQD=76% UCS=154-194MPa
			2	RUN			338				**RUN #2** TCR=100% SCR=82% RQD=96%
			3	RUN			337				**RUN #3** TCR=100% SCR=100% RQD=100%
335.5							336				
16.6	END OF BOREHOLE AT A DEPTH OF 16.6 m. Notes: 1. Well installation consists of 50mm diameter Schedule 40 PVC pipe with a 3.05m slotted screen. WATER LEVEL READINGS DATE DEPTH(m) ELEV.(m) 2025.06.17 4.6 347.5										

$+^3$, $\times^3$: Numbers refer to Sensitivity

$\begin{matrix}20\\15\\10\end{matrix}$ 5 (%) STRAIN AT FAILURE

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Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-06 1 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 647.8 E 274 894.9 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.15 - 2025.06.15 LATITUDE 52.213830 LONGITUDE -90.437571 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
352.1	GROUND SURFACE						352				
0.0	**SAND**, some to trace gravel, trace silt Compact to Dense Brown Moist (FILL)		1	SS	11			○			
			2	SS	33		351	○			
	Loose		3	SS	5			○			
349.9							350				
2.2	**SAND**, trace to some silt Compact Brown Moist		4	SS	11			○			0 93 7 (SI+CL)
			5	SS	10		349	○			
			6	SS	11		348	○			
			7	SS	17			○			
	trace clay Dense		8	SS	39		347	○			9 76 13 2
345.7							346				
6.4	Clayey **SILT** to **SILT** Very Stiff Grey Moist		9	SS	29		345	○			
			10	SS	28		344	○			
							343				

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

$\frac{20}{15}\oplus\frac{5}{10}$ (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 25-06 2 OF 2 METRIC

GWP# 6046-21-00 LOCATION Pineimuta River Bridge Replacement N 5 786 647.8 E 274 894.9 ORIGINATED BY SP

DIST Northwest Region HWY 599/808 BOREHOLE TYPE CME 55 Track-Mount / Hollow Stem Augers / NW Casing / NQ Coring COMPILED BY MC

DATUM Geodetic DATE 2025.06.15 - 2025.06.15 LATITUDE 52.213830 LONGITUDE -90.437571 CHECKED BY JA

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	Clayey **SILT** to **SILT** Stiff Grey Moist		11	SS	12		342		○		0 1 77 22
341.1											
11.0	Silty **SAND**, trace gravel Compact Grey Moist		12	SS	17		341		○		
							340				
339.1			13	SS	50						
13.0	END OF BOREHOLE AT A DEPTH OF 13.0 m. UPON CASING REFUSAL ON PROBABLE BOULDERS OR BEDROCK.										

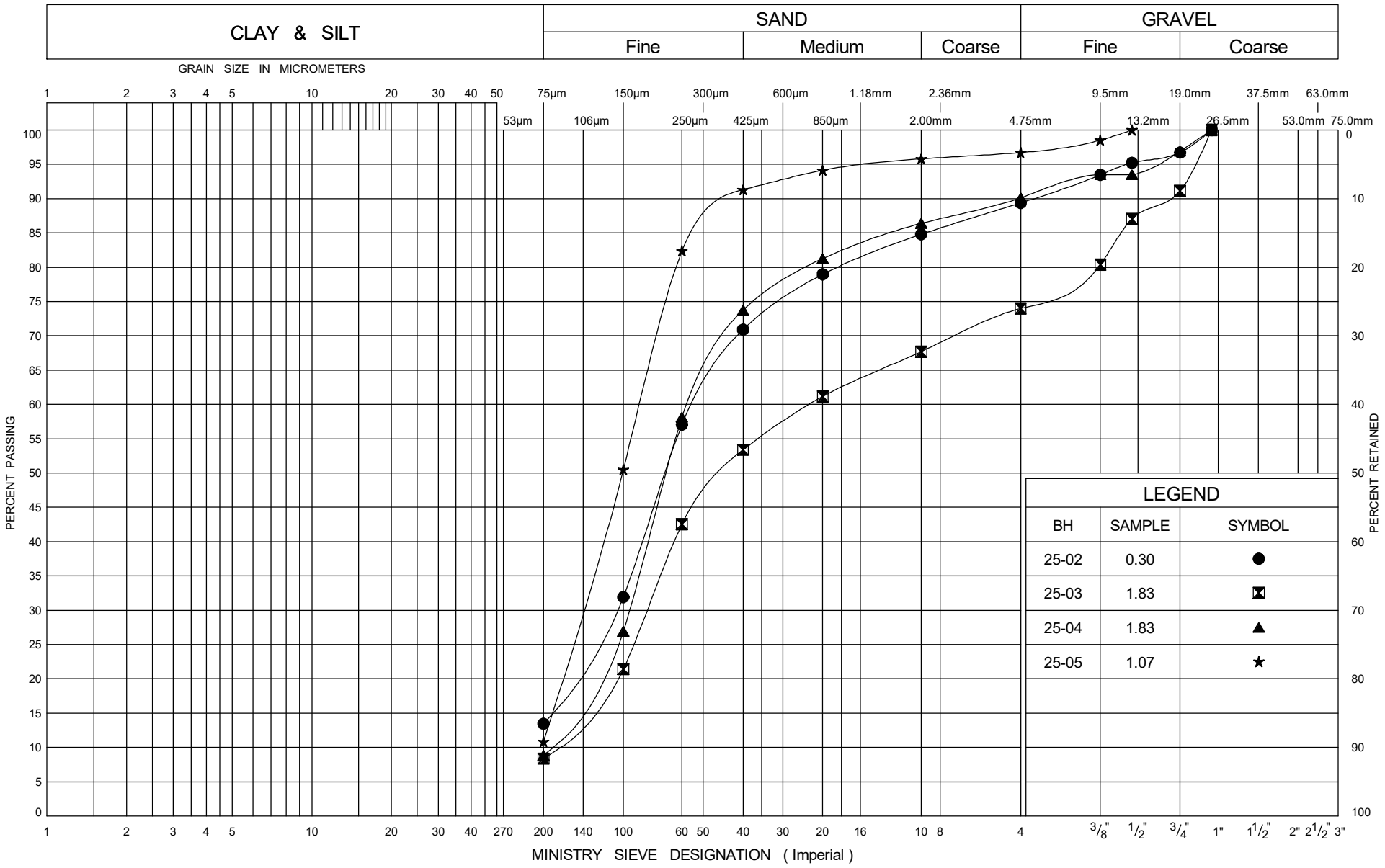
$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

ONTMT4S2 2020LIBRARY(MTO).GLB MTO-68438.GPJ 3-11-26

APPENDIX C

Laboratory Test Results



Ministry of Transportation
Ontario

GRAIN SIZE DISTRIBUTION

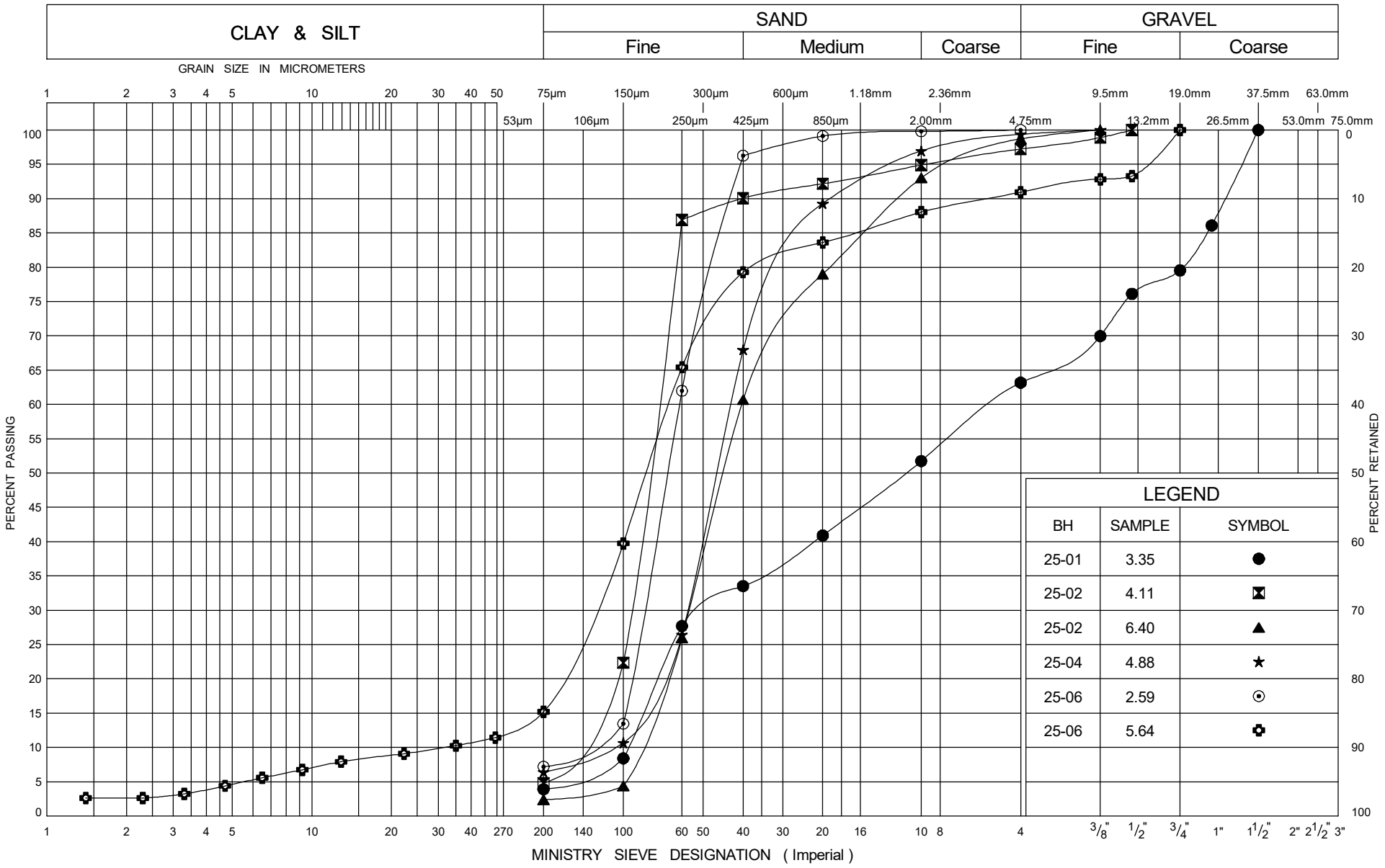
Sand/Gravel FILL

FIG No C1

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT GRAIN SIZE 2 MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25



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Ontario

GRAIN SIZE DISTRIBUTION

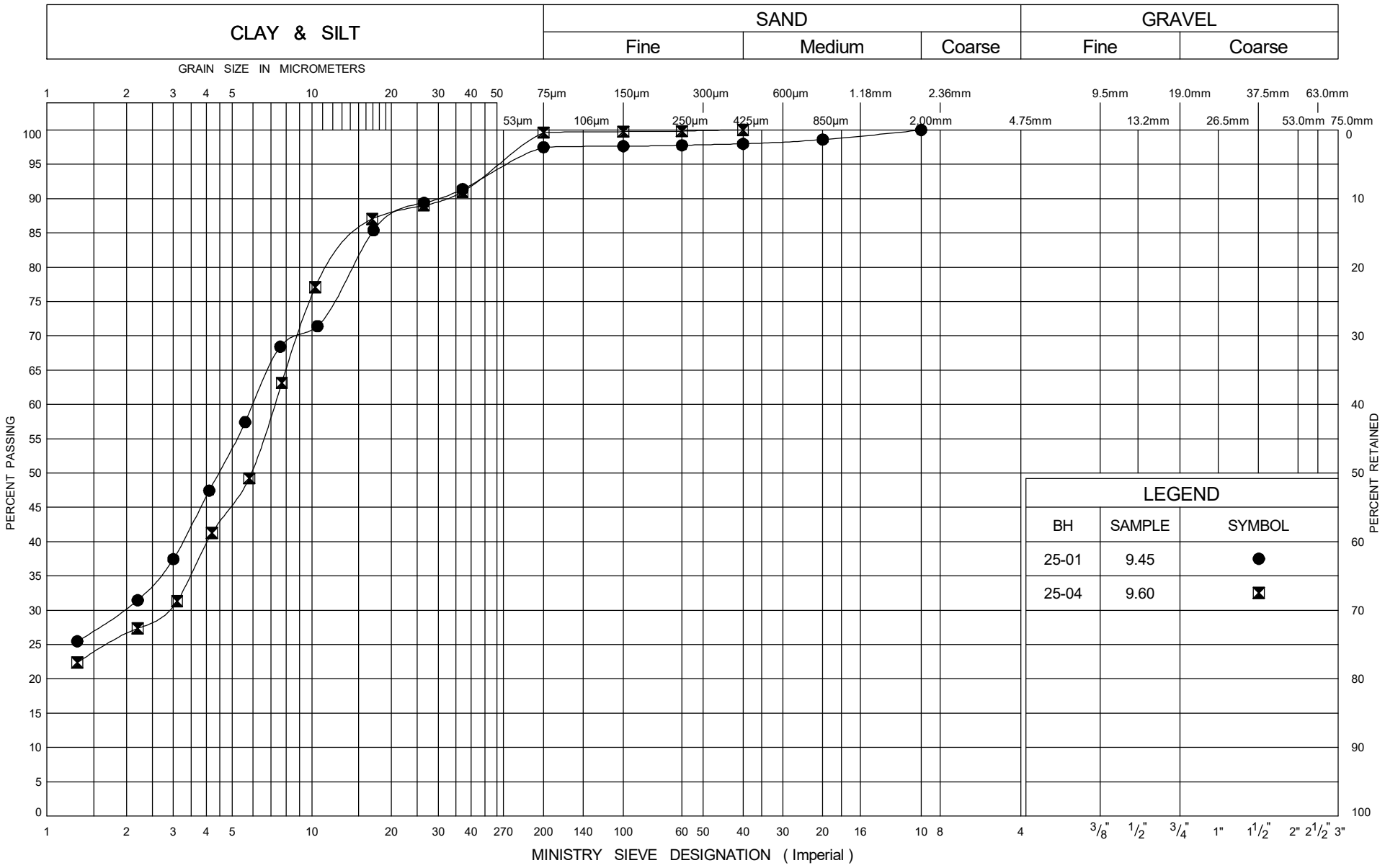
SAND to SAND and GRAVEL

FIG No C2

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT GRAIN SIZE 2 MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25



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Ontario

GRAIN SIZE DISTRIBUTION

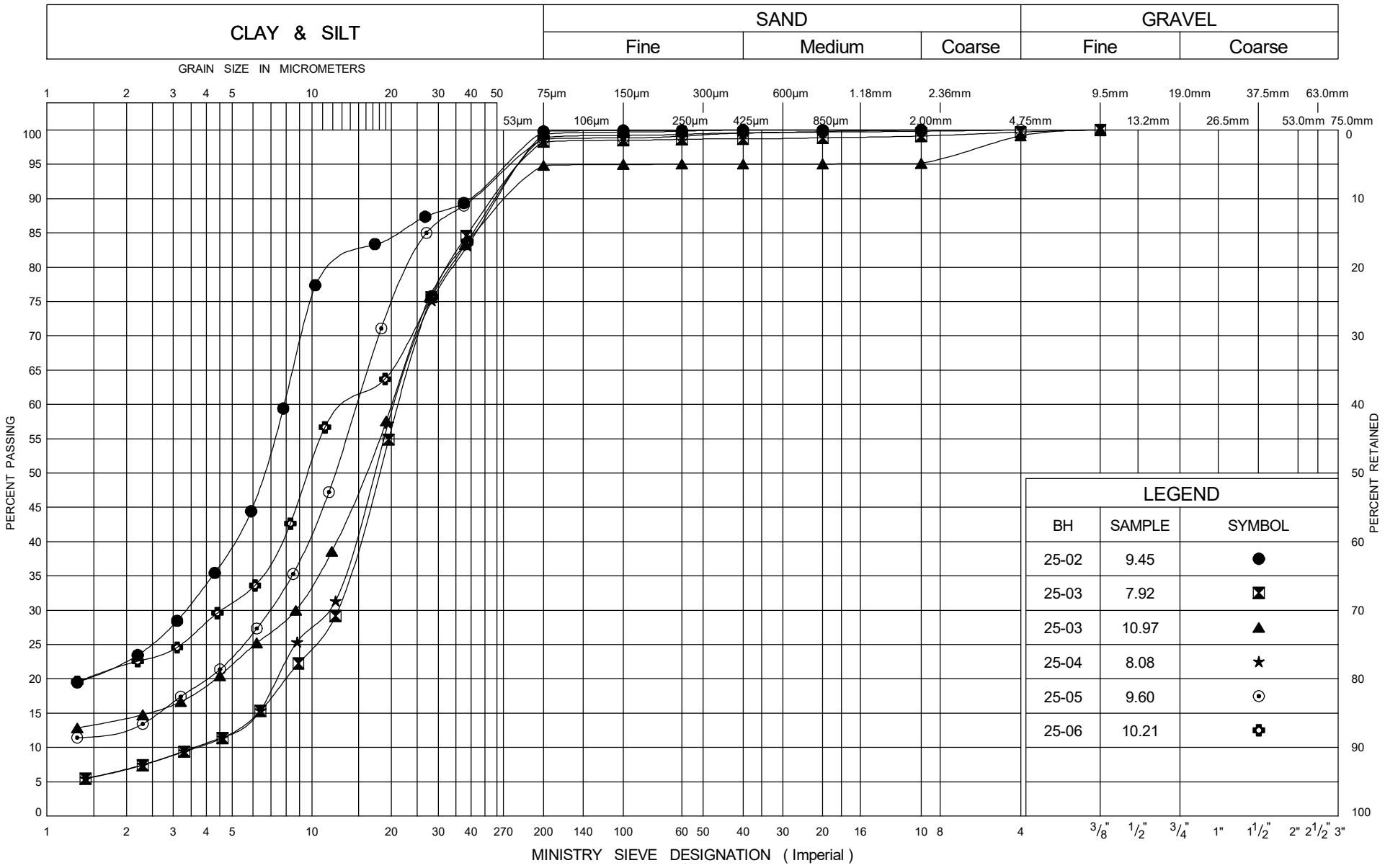
Silty CLAY

FIG No C3

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT GRAIN SIZE 2 MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25



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Ontario

GRAIN SIZE DISTRIBUTION

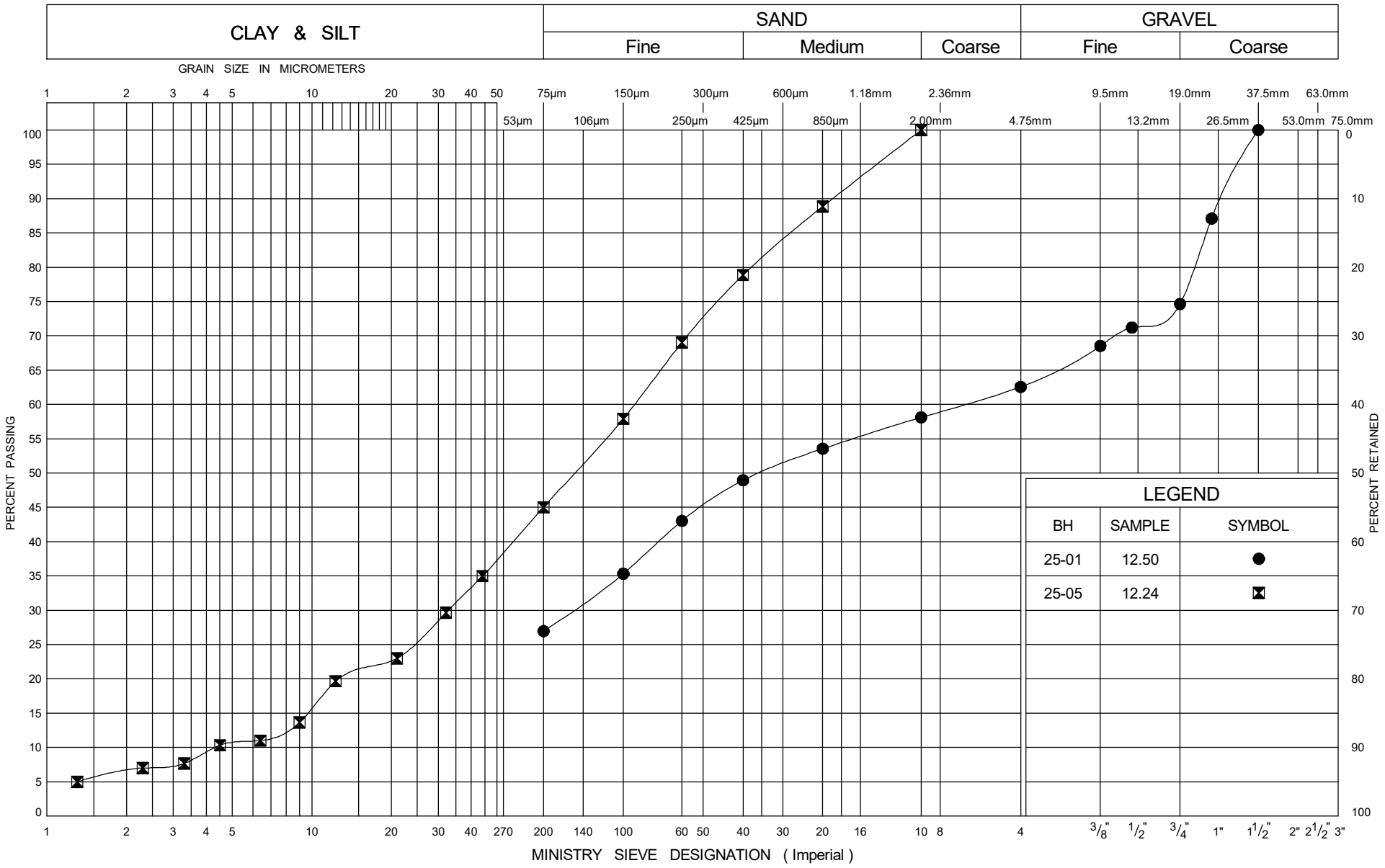
Clayey SILT to SILT

FIG No C4

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT GRAIN SIZE 2 MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25



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Ontario

GRAIN SIZE DISTRIBUTION

Silty SAND to SAND and GRAVEL

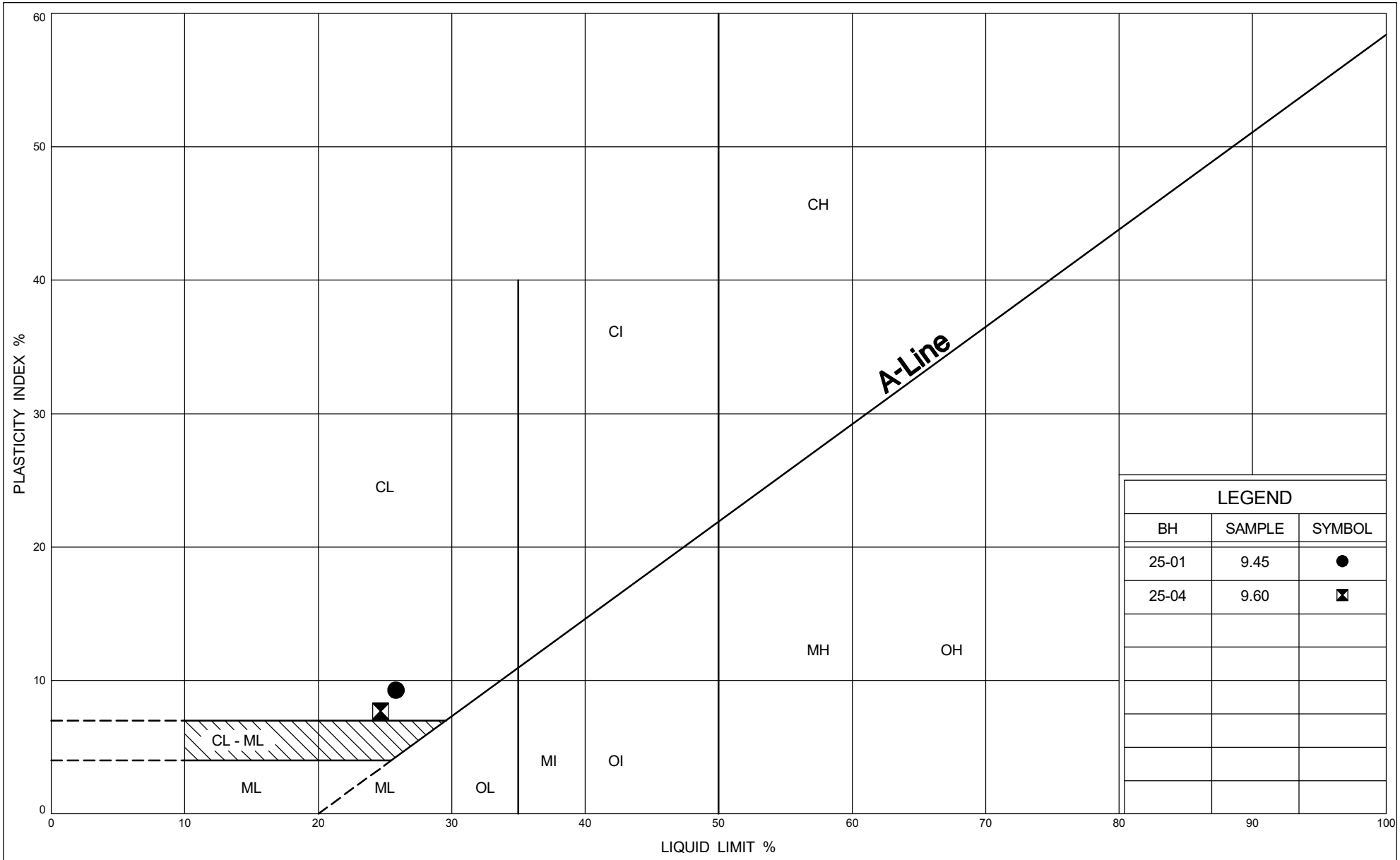
FIG No C5

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT GRAIN SIZE 2 MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25

Oct 75, FF - S - 21



ONTARIO MOT PLASTICITY CHART MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25

Ministry of Transportation
Ontario

PLASTICITY CHART

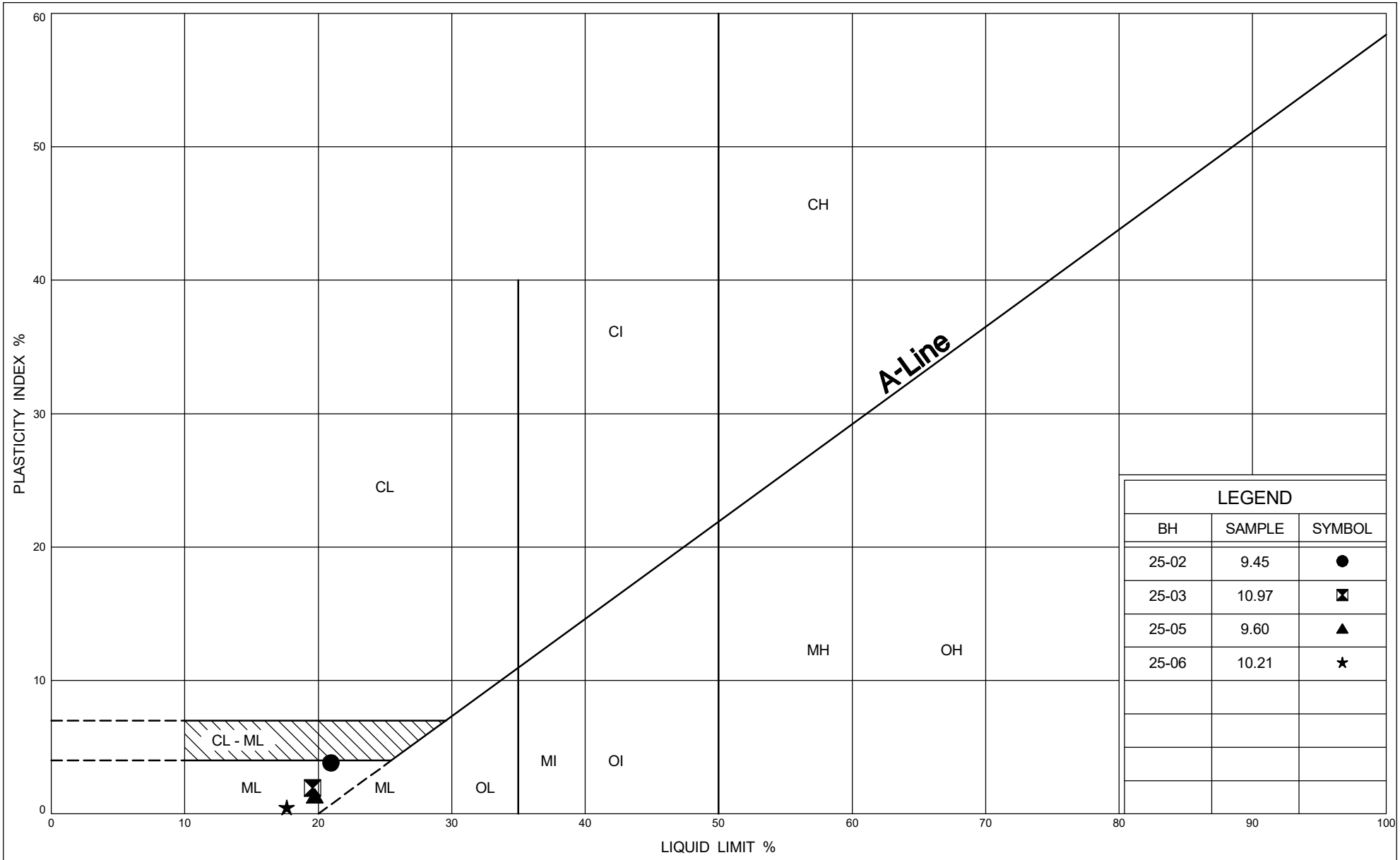
Silty CLAY

FIG No C6

GWP# 6046-21-00

Pineimuta River Bridge

Oct 75, FF - S - 21



LEGEND		
BH	SAMPLE	SYMBOL
25-02	9.45	●
25-03	10.97	⊠
25-05	9.60	▲
25-06	10.21	★

Ministry of Transportation
Ontario

PLASTICITY CHART

Clayey SILT to SILT

FIG No C7

GWP# 6046-21-00

Pineimuta River Bridge

ONTARIO MOT PLASTICITY CHART MTO-68438.GPJ ONTARIO MOT.GDT 11/20/25

Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada

July 25, 2025

Joshua Alexander
Thurber Engineering Ltd.
202 – 1908 Ironoak Way
Oakville, Ontario
Canada, L6H 0N1

Re: UCS Testing
(Thurber Engineering Ltd. Project No. 68438)

Dear Joshua Alexander:

On July 11, 2025 a series of core samples (HQ-sized) were received by Geomechanica Inc. via drop-off by Thurber personnel. These samples were identified as being from Thurber Engineering Ltd. Project No. 68438. From these samples, 2 Uniaxial Compressive Strength (UCS) tests were completed.

Details regarding the steps of specimen preparation and testing along with the test results are presented in the accompanying laboratory report and summary spreadsheet.

Sincerely,

Bryan Tatone, PhD, PEng

Geomechanica Inc.
Tel: +1-647-478-9767
lab@geomechanica.com

GEOMECHANICA

Rock Laboratory Testing Results

A report submitted to:

Joshua Alexander
Thurber Engineering Ltd.
202 – 1908 Ironoak Way
Oakville, Ontario
Canada, L6H 0N1

Prepared by:

Bryan Tatone, PhD, PEng

Omid Mahabadi, PhD, PEng
Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada
Tel: +1-647-478-9767
lab@geomechanica.com

July 25, 2025
Project number: 68438

Abstract

This document summarizes the results of 2 Uniaxial Compressive Strength (UCS) tests. The UCS values along with photographs of specimens before and after testing are presented.

In this document:

1 Uniaxial Compressive Strength Tests

1.1 Overview

This section summarizes the results of uniaxial compressive strength (UCS) testing. The testing was performed in Geomechanica Inc.'s rock testing laboratory using a 150 ton (1.3 MN) Forney loading frame equipped with pressure-compensated control valve to maintain an axial strain rate of approximately 0.05 mm/min (Figure 1). The preparation and testing procedure for each specimen included the following:

1. Unwrapping the core sample and inspecting it for damage.
2. Diamond cutting the core sample to obtain a cylindrical specimen with an appropriate length (length:diameter = 2:1) and nearly parallel end faces.
3. Diamond grinding the specimen to obtain flat (within ± 0.025 mm) and parallel end faces (within 0.25°).
4. Placing the specimen into the loading frame, applying a 1 kN axial seating load.
5. Axially loading the specimens to rupture while continuously recording axial force to determine the peak strength (UCS).

Figure 1: Forney loading frame setup for UCS testing.

Using a precision V-block mounted on the magnetic chuck of the surface grinder, test specimens met the end flatness, end parallelism, and perpendicularity criteria set out in ASTM D4543-19. The side straightness criteria, as checked with a feeler gauge, and the minimum length:diameter criteria were met for all specimens unless noted otherwise in Table 1. Testing of the specimens followed ASTM D7012-14 Method C.

1.2 Results

The results of UCS testing are summarized in Table 1. Additional specimen and test details are provided on the summary spreadsheet that accompanies this report.

Table 1: Summary of Uniaxial Compression test results.

Sample	Depth (m)	Bulk density ρ (g/cm^3)	UCS (MPa)	Lithology	Failure description
BH25-01 R1	13.92 - 14.22	2.743	123.6	Gneiss	1, 2
BH25-02 R2	14.30 - 14.71	2.709	221.7	Gneiss	3

[1] Inclined shear failure
[2] Failure along pre-existing structure
[3] Inclined shear fracture and axial splitting failure

1.3 Specimen photographs

Photographs of the specimens before and after testing are presented in the Appendix of this report.

Appendices

Specimen sheets

- BH25-01 R1
- BH25-02 R2

GEOMECHANICA

Uniaxial Compression Test

Client	Thurber Engineering Ltd.	**Project**	68438
Sample	BH25-01 R1	**Depth**	13.92 - 14.22

Specimen parameters	
Diameter (mm) [a]	62.91
Length (mm) [a]	130.12
Bulk density ρ (g/cm^3)	2.743
UCS (MPa)	123.6
Lithology	Gneiss
Failure description [b]	1, 2

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Failure description: [1] Inclined shear failure; [2] Failure along pre-existing structure;

Prior to testing

After testing

Remarks: Displacement rate: 0.05 mm/min.

Performed by	AA	**Date**	2025-07-14

GEOMECHANICA

Uniaxial Compression Test

Client	Thurber Engineering Ltd.	**Project**	68438
Sample	BH25-02 R2	**Depth**	14.30 - 14.71

Specimen parameters	
Diameter (mm) [a]	47.30
Length (mm) [a]	105.25
Bulk density ρ (g/cm^3)	2.709
UCS (MPa)	221.7
Lithology	Gneiss
Failure description [b]	3

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Failure description: [3] Inclined shear fracture and axial splitting failure;

Prior to testing

After testing

Remarks: Displacement rate: 0.05 mm/min.

Performed by	AA	**Date**	2025-07-14

THURBER ENGINEERING LTD.

POINT LOAD TEST SHEET

ASTM D5731-08

Job No:	68438	**Date Drilled:**	25-Jun-14
Client:	Hatch	**Date Tested:**	25-Jul-08
Project Name:	6021-E-0011-008 Pineimuta River Modular Bridge	**Tester:**	GA
Core Size:	HQ **BH No :** 25-01	**Reviewed by:**	GL

Test No.	Run No.	Depth (m)	Axial or Diametral	Gauge (MPa)	Diameter (mm)	Length (mm)	$I_{s(50)}$ (MPa)	UCS (MPa)	Rock Type	Rock Strength (after Hoek & Brown, 1997)
1	1	14.3	D	>25	63.4	196.4	>6.6	>157.3	Granite	Extremely Strong
2	1	15.1	D	25.0	63.4	186.4	6.6	157.3	Granite	Very Strong
3	2	15.3	D	>25	63.4	167.5	>6.6	>157.3	Granite	Extremely Strong
4	2	16.0	D	>25	63.5	173.9	>6.7	>157.4	Granite	Extremely Strong
5	2	16.5	D	>25	63.5	240.3	>6.8	>157.5	Granite	Extremely Strong
6										
7										
8										
9										
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

* Correlation factor to obtain UCS values is 24.

Last Modified: September 14, 2016

THURBER ENGINEERING LTD.

POINT LOAD TEST SHEET

ASTM D5731-08

Job No:	68438	**Date Drilled:**	25-Jun-13
Client:	Hatch	**Date Tested:**	25-Jul-08
Project Name:	6021-E-0011-008 Pineimuta River Modular Bridge	**Tester:**	GA
Core Size:	NQ **BH No :** 25-02	**Reviewed by:**	GL

Test No.	Run No.	Depth (m)	Axial or Diametral	Gauge (MPa)	Diameter (mm)	Length (mm)	$I_{s(50)}$ (MPa)	UCS (MPa)	Rock Type	Rock Strength (after Hoek & Brown, 1997)
1	CR1	13.7	D	>25	47.4	265.4	>9.6	>234	Granite	Extremely Strong
2	CR1	14.7	D	>25	47.4	110.3	>9.7	>235	Granite	Extremely Strong
3	CR1	14.9	D	>25	47.4	234.5	>9.8	>236	Granite	Extremely Strong
4	CR2	15.1	D	23.9	47.4	120.4	9.8	236.0	Granite	Very Strong
5	CR2	15.5	D	>25	47.4	111.6	>9.8	>236	Granite	Extremely Strong
6	CR2	16.1	D	16.7	47.4	146.7	6.9	164.7	Granite	Very Strong
7	CR2	16.4	D	>25	47.5	152.5	>9.8	>236	Granite	Extremely Strong
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35										

* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

* Correlation factor to obtain UCS values is 24.

THURBER ENGINEERING LTD.

POINT LOAD TEST SHEET

ASTM D5731-08

Job No:	68438	**Date Drilled:**	13-Jul-25
Client:	Hatch	**Date Tested:**	21-Jul-25
Project Name:	6021-E-0011-008 Pineimuta River Modular Bridge	**Tester:**	AR
Core Size:	HQ **BH No :** 25-04	**Reviewed by:**	GL

Test No.	Run No.	Depth (m)	Axial or Diametral	Gauge (MPa)	Diameter (mm)	Length (mm)	$I_{s(50)}$ (MPa)	UCS (MPa)	Rock Type	Rock Strength (after Hoek & Brown, 1997)
1	1	15.0	D	>25	63.1	145.2				
2	2	15.7	D	>25	63.2	143.8				
3	2	16.5	D	>25	63.2	141.4				
4	3	17.0	D	>25	63.1	139.5				
5	3	17.1	D	>25	63.1	144.2				
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
  Long pieces of core can be tested diametrically to produce suitable lengths for axial testing
* Diametral Test should have 0.7 x D on either side of test point.
* Correlation factor to obtain UCS values is 24.

THURBER ENGINEERING LTD.

POINT LOAD TEST SHEET

ASTM D5731-08

Job No:	68438	**Date Drilled:**	25-Jun-12
Client:	Hatch	**Date Tested:**	25-Jul-08
Project Name:	6021-E-0011-008 Pineimuta River Modular Bridge	**Tester:**	GA
Core Size:	NQ **BH No :** 25-05	**Reviewed by:**	GL

Test No.	Run No.	Depth (m)	Axial or Diametral	Gauge (MPa)	Diameter (mm)	Length (mm)	$I_{s(50)}$ (MPa)	UCS (MPa)	Rock Type	Rock Strength (after Hoek & Brown, 1997)
1	CR1	13.1	D	19.6	47.4	142.5	8.1	193.9	Granite	Very Strong
2	CR1	13.4	D	15.6	47.4	131.0	6.4	154.1	Granite	Very Strong
3	CR2	13.6	D	23.8	47.5	134.3	9.8	234.4	Granite	Very Strong
4	CR2	14.9	D	>25	47.4	210.4	>9.8	>234.4	Granite	Extremely Strong
5	CR3	15.2	D	>25	47.4	168.9	>9.8	>234.4	Granite	Extremely Strong
6	CR3	15.9	D	>25	47.4	231.4	>9.8	>234.4	Granite	Extremely Strong
7	CR3	16.3	D	>25	47.4	255.7	>9.8	>234.4	Granite	Extremely Strong
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* It is ideal to perform axial test on core specimens with D/L ratio of 1.1 ± 0.1
Long pieces of core can be tested diametrically to produce suitable lengths for axial testing

* Diametral Test should have 0.7 x D on either side of test point.

* Correlation factor to obtain UCS values is 24.

APPENDIX D

Analytical Chemical Testing Results

FINAL REPORT

CA40248-JUL25 R1

68438

Prepared for

Thurber Engineering Ltd.

FINAL REPORT

First Page

CLIENT DETAILS

Client	Thurber Engineering Ltd.
Address	1908 Ironoak Way, Suite 202 Oakville, ON L6H 0N1. Canada
Contact	Joshua Alexander
Telephone	613-606-7303
Facsimile	
Email	jalexander@thurber.ca
Project	68438
Order Number	
Samples	Soil (2)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA40248-JUL25
Received	07/24/2025
Approved	07/31/2025
Report Number	CA40248-JUL25 R1
Date Reported	07/31/2025

COMMENTS

Temperature of Sample upon Receipt: 4 degrees C
Cooling Agent Present:yes
Custody Seal Present:yes

Chain of Custody Number:N/A

Corrosivity Index is based on the American Water Works Corrosivity Scale according to AWWA C-105. An index greater than 10 indicates the soil matrix may be corrosive to cast iron alloys.

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

FINAL REPORT

CA40248-JUL25 R1

Client: Thurber Engineering Ltd.
Project: 68438
Project Manager: Joshua Alexander
Samplers: Lynda Dinh

MATRIX: SOIL

Sample Number	5	6
Sample Name	BH25-04 SS-4 7'6"-9'6"	BH25-02 SS-4 7'6"-9'6"
Sample Matrix	Soil	Soil
Sample Date	23/07/2025	23/07/2025

Parameter	Units	RL		Result	Result
Corrosivity Index					
Corrosivity Index	none	1		1	2
pH	pH Units	0.05		8.00	8.15
Soil Redox Potential	mV	no		262	219
Sulphide (Na2CO3)	%	0.01		< 0.01	< 0.01
Resistivity (calculated)	ohms.cm	-9999		7580	18900
General Chemistry					
Conductivity	uS/cm	2		132	53
Metals and Inorganics					
Sulphate	µg/g	0.4		3.6	1.4
Other (ORP)					
Chloride	µg/g	0.4		2.8	2.8

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0671-JUL25	µg/g	0.4	<0.4	2	35	100	80	120	103	75	125
Sulphate	DIO0671-JUL25	µg/g	0.4	<0.4	4	35	106	80	120	93	75	125

Carbon/Sulphur

Method: ASTM E1915-07A | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-020

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphide (Na2CO3)	ECS0097-JUL25	%	0.01	< 0.01								

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0617-JUL25	uS/cm	2	< 2	1	20	99	90	110	NA		

QC SUMMARY

pH

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0617-JUL25	pH Units	0.05	NA	1		100			NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

SGS Request for Laboratory Services and CHAIN OF CUSTODY

Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 1

Page 1 of 1

Laboratory Information Section - Lab use only

Received By: [signature] Received By (signature): [signature] CA 40248 JUL 25

Received Date: JUL 24, 2025 (mm/dd/yy) Custody Seal Present: Yes ☐ No ☐ Cooling Agent Present: Yes ☐ No ☐ Type: ice

Received Time: 9:26 (hr : min) Custody Seal Intact: Yes ☐ No ☐ Temperature Upon Receipt (°C) 4.0, 4.2 LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: Thurber Engineering Ltd.	☑ (same as Report Information)
Contact: Joshua Alexander	Company:
Address: 202 - 1908 Ironoak Way, Oakville, ON L6H 7G4	Contact:
Phone: 416-857-2439	Address:
Fax:	Phone:
Email: jalexander@thurber.ca	Email: accountingON@thurber.ca

Quotation #: P.O. #: 68438

Project #: 68438 Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days) TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

~~Regulation 153/04~~: O.Reg 406/19

☑ Table 1 ☑ Res/Park Soil Texture:
☑ Table 2 ☑ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☑ Medium/Fine
☐ Table ____

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☑ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH25-04 SS-4 7'6"-9'6"	23/07/2025	-	1	soil
2	BH25-02 SS-4 7'6"-9'6"	23/07/2025	-	1	soil
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb-As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni, Se-Ag,Tl,U,V,Zn	M&I	PAHs	SVOCs all incl PAHs, ABNs, CPs	SVOC	PCBs Total ☐ Aroclor ☐	PCB	F1-F4 + BTEX	F1-F4 only no BTEX	PHC	VOCs all incl BTEX	VOC	BTEX only	Pesticides Organochlorine or specify other	Pest	Corrosivity	Other (please specify)					Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	TCLP Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐gnit.	COMMENTS:
1																		✓								
2																		✓								
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): Lynda Dinh **Signature:** Lynda Dinh Digitally signed by Lynda Dinh DN: cn=Lynda Dinh, c=CA, email=ldinh@thurber.ca Date: 2025.07.23 15:28:19 -04'00' Date: 07 / 23 / 25 (mm/dd/yy)

Relinquished by (NAME): Lynda Dinh **Signature:** Lynda Dinh Digitally signed by Lynda Dinh DN: cn=Lynda Dinh, c=CA, email=ldinh@thurber.ca Date: 2025.07.23 15:28:31 -04'00' Date: 07 / 24 / 25 (mm/dd/yy)

Pink Copy - Client

Yellow & White Copy - SGS

Revision #: 1.3
Date of Issue: 13 Oct, 2019

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**TY2506918**			
Client	:	**Thurber Engineering Ltd.**	Laboratory	:	ALS Environmental - Thunder Bay
Contact	:	Donna Rein	Account Manager	:	Christine Paradis
Address	:	1908 Ironoak Way Suite 202 Oakville Ontario Canada L6H 0N1	Address	:	1081 Barton Street Thunder Bay ON Canada P7B 5N3
Telephone	:	----	Telephone	:	+1 807 623 6463
Project	:	Pineimuta Modular Bridge/ 68438	Date Samples Received	:	28-Jun-2025 09:01
PO	:	----	Date Analysis Commenced	:	02-Jul-2025
C-O-C number	:	----	Issue Date	:	08-Jul-2025 16:43
Sampler	:	----			
Site	:	----			
Quote number	:	Standing Offer Price List - 2025			
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.

Signatories	*Position*	*Laboratory Department*
David Tremblett		VOC, Waterloo, Ontario
Jeremy Gingras		Organics, Waterloo, Ontario
Josphin Masihi		Centralized Prep, Waterloo, Ontario
Nik Perkio		Metals, Waterloo, Ontario
Nik Perkio		Inorganics, Waterloo, Ontario

General Comments

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

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

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

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

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

LOR: Limit of Reporting (detection limit).

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

>: 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.

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

Analytical Results

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-05_SS2	----	----	----	----	----	----
					Client sampling date / time: 11-Jun-2025 12:00	----	----	----	----	----	----
					TY2506918-001	----	----	----	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	0.00500	mS/cm	0.0681	----	----	----	----	----	----
Moisture	----	E144/WT	0.25	%	3.80	----	----	----	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Arsenic	7440-38-2	E440C/WT	0.10	mg/kg	0.91	----	----	----	----	----	----
Barium	7440-39-3	E440C/WT	0.50	mg/kg	13.3	----	----	----	----	----	----
Beryllium	7440-41-7	E440C/WT	0.10	mg/kg	0.10	----	----	----	----	----	----
Boron	7440-42-8	E440C/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
Cadmium	7440-43-9	E440C/WT	0.020	mg/kg	<0.020	----	----	----	----	----	----
Calcium, soluble ion content	7440-70-2	E484/WT	0.50	mg/L	1.83	----	----	----	----	----	----
Chromium	7440-47-3	E440C/WT	0.50	mg/kg	10.1	----	----	----	----	----	----
Cobalt	7440-48-4	E440C/WT	0.10	mg/kg	2.21	----	----	----	----	----	----
Copper	7440-50-8	E440C/WT	0.50	mg/kg	4.91	----	----	----	----	----	----
Lead	7439-92-1	E440C/WT	0.50	mg/kg	1.58	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	0.50	mg/L	0.77	----	----	----	----	----	----
Molybdenum	7439-98-7	E440C/WT	0.10	mg/kg	0.11	----	----	----	----	----	----
Nickel	7440-02-0	E440C/WT	0.50	mg/kg	6.48	----	----	----	----	----	----
Selenium	7782-49-2	E440C/WT	0.20	mg/kg	<0.20	----	----	----	----	----	----
Silver	7440-22-4	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	0.50	mg/L	0.83	----	----	----	----	----	----
Thallium	7440-28-0	E440C/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Uranium	7440-61-1	E440C/WT	0.050	mg/kg	0.308	----	----	----	----	----	----
Vanadium	7440-62-2	E440C/WT	0.20	mg/kg	11.4	----	----	----	----	----	----
Zinc	7440-66-6	E440C/WT	2.0	mg/kg	10.0	----	----	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	0.10	-	0.13	----	----	----	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg	<0.015	----	----	----	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
BTEX, total	----	E611A/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	10	mg/kg	<10	----	----	----	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-05 SS2 Client sampling date / time: 11-Jun-2025 12:00 TY2506918-001	----	----	----	----	----	----
Hydrocarbons											
F1-BTEX	----	EC580/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	80	mg/kg	<80	----	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	-	YES	----	----	----	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	1.0	%	93.7	----	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	1.0	%	90.0	----	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%	91.9	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%	83.8	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Acenaphthylene	208-96-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Anthracene	120-12-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Chrysene	218-01-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluoranthene	206-44-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluorene	86-73-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Naphthalene	91-20-3	E641A/WT	0.010	mg/kg	<0.010	----	----	----	----	----	----
Phenanthrene	85-01-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Pyrene	129-00-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	0.1	%	85.0	----	----	----	----	----	----
Chrysene-d12	1719-03-5	E641A/WT	0.1	%	93.4	----	----	----	----	----	----
Naphthalene-d8	1146-65-2	E641A/WT	0.1	%	99.0	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	0.1	%	94.9	----	----	----	----	----	----

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

No Breaches Found

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-02 SS3						
					Client sampling date / time: 13-Jun-2025 12:00						
					TY2506918-002	----	----	----	----	----	----
						----	----	----	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	0.00500	mS/cm	0.0410	----	----	----	----	----	----
Moisture	----	E144/WT	0.25	%	14.2	----	----	----	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Arsenic	7440-38-2	E440C/WT	0.10	mg/kg	1.72	----	----	----	----	----	----
Barium	7440-39-3	E440C/WT	0.50	mg/kg	27.2	----	----	----	----	----	----
Beryllium	7440-41-7	E440C/WT	0.10	mg/kg	0.16	----	----	----	----	----	----
Boron	7440-42-8	E440C/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
Cadmium	7440-43-9	E440C/WT	0.020	mg/kg	0.030	----	----	----	----	----	----
Calcium, soluble ion content	7440-70-2	E484/WT	0.50	mg/L	1.62	----	----	----	----	----	----
Chromium	7440-47-3	E440C/WT	0.50	mg/kg	17.3	----	----	----	----	----	----
Cobalt	7440-48-4	E440C/WT	0.10	mg/kg	4.59	----	----	----	----	----	----
Copper	7440-50-8	E440C/WT	0.50	mg/kg	8.62	----	----	----	----	----	----
Lead	7439-92-1	E440C/WT	0.50	mg/kg	5.68	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	0.50	mg/L	0.66	----	----	----	----	----	----
Molybdenum	7439-98-7	E440C/WT	0.10	mg/kg	0.43	----	----	----	----	----	----
Nickel	7440-02-0	E440C/WT	0.50	mg/kg	8.56	----	----	----	----	----	----
Selenium	7782-49-2	E440C/WT	0.20	mg/kg	<0.20	----	----	----	----	----	----
Silver	7440-22-4	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	0.50	mg/L	0.56	----	----	----	----	----	----
Thallium	7440-28-0	E440C/WT	0.050	mg/kg	0.119	----	----	----	----	----	----
Uranium	7440-61-1	E440C/WT	0.050	mg/kg	0.673	----	----	----	----	----	----
Vanadium	7440-62-2	E440C/WT	0.20	mg/kg	26.9	----	----	----	----	----	----
Zinc	7440-66-6	E440C/WT	2.0	mg/kg	23.4	----	----	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	0.10	-	<0.10	----	----	----	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg	<0.015	----	----	----	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
BTEX, total	----	E611A/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	10	mg/kg	<10	----	----	----	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F1-BTEX	----	EC580/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-02 SS3 Client sampling date / time: 13-Jun-2025 12:00 TY2506918-002	----	----	----	----	----	----
Hydrocarbons											
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	80	mg/kg	<80	----	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	-	YES	----	----	----	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	1.0	%	92.8	----	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	1.0	%	70.7	----	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%	74.8	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%	79.4	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Acenaphthylene	208-96-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Anthracene	120-12-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Chrysene	218-01-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluoranthene	206-44-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluorene	86-73-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Naphthalene	91-20-3	E641A/WT	0.010	mg/kg	<0.010	----	----	----	----	----	----
Phenanthrene	85-01-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Pyrene	129-00-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	0.1	%	78.4	----	----	----	----	----	----
Chrysene-d12	1719-03-5	E641A/WT	0.1	%	91.3	----	----	----	----	----	----
Naphthalene-d8	1146-65-2	E641A/WT	0.1	%	93.2	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	0.1	%	90.8	----	----	----	----	----	----

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

No Breaches Found

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-04 SS3 Client sampling date / time: 15-Jun-2025 12:00 TY2506918-003	----	----	----	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	0.00500	mS/cm	0.0805	----	----	----	----	----	----
Moisture	----	E144/WT	0.25	%	5.73	----	----	----	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Arsenic	7440-38-2	E440C/WT	0.10	mg/kg	1.32	----	----	----	----	----	----
Barium	7440-39-3	E440C/WT	0.50	mg/kg	15.6	----	----	----	----	----	----
Beryllium	7440-41-7	E440C/WT	0.10	mg/kg	0.15	----	----	----	----	----	----
Boron	7440-42-8	E440C/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
Cadmium	7440-43-9	E440C/WT	0.020	mg/kg	0.022	----	----	----	----	----	----
Calcium, soluble ion content	7440-70-2	E484/WT	0.50	mg/L	3.09	----	----	----	----	----	----
Chromium	7440-47-3	E440C/WT	0.50	mg/kg	13.8	----	----	----	----	----	----
Cobalt	7440-48-4	E440C/WT	0.10	mg/kg	2.90	----	----	----	----	----	----
Copper	7440-50-8	E440C/WT	0.50	mg/kg	4.84	----	----	----	----	----	----
Lead	7439-92-1	E440C/WT	0.50	mg/kg	2.85	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	0.50	mg/L	0.56	----	----	----	----	----	----
Molybdenum	7439-98-7	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Nickel	7440-02-0	E440C/WT	0.50	mg/kg	8.59	----	----	----	----	----	----
Selenium	7782-49-2	E440C/WT	0.20	mg/kg	<0.20	----	----	----	----	----	----
Silver	7440-22-4	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	0.50	mg/L	<0.50	----	----	----	----	----	----
Thallium	7440-28-0	E440C/WT	0.050	mg/kg	0.051	----	----	----	----	----	----
Uranium	7440-61-1	E440C/WT	0.050	mg/kg	0.328	----	----	----	----	----	----
Vanadium	7440-62-2	E440C/WT	0.20	mg/kg	16.6	----	----	----	----	----	----
Zinc	7440-66-6	E440C/WT	2.0	mg/kg	12.8	----	----	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	0.10	-	<0.10	----	----	----	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg	<0.015	----	----	----	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
BTEX, total	----	E611A/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	10	mg/kg	<10	----	----	----	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F1-BTEX	----	EC580/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-04 SS3 Client sampling date / time: 15-Jun-2025 12:00 TY2506918-003	----	----	----	----	----	----
Hydrocarbons											
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	80	mg/kg	<80	----	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	-	YES	----	----	----	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	1.0	%	97.4	----	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	1.0	%	91.1	----	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%	87.7	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%	93.9	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Acenaphthylene	208-96-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Anthracene	120-12-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Chrysene	218-01-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluoranthene	206-44-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluorene	86-73-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Naphthalene	91-20-3	E641A/WT	0.010	mg/kg	<0.010	----	----	----	----	----	----
Phenanthrene	85-01-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Pyrene	129-00-0	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	0.1	%	74.7	----	----	----	----	----	----
Chrysene-d12	1719-03-5	E641A/WT	0.1	%	86.7	----	----	----	----	----	----
Naphthalene-d8	1146-65-2	E641A/WT	0.1	%	87.2	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	0.1	%	85.0	----	----	----	----	----	----

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

No Breaches Found

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-01 SS2	----	----	----	----	----	----
					Client sampling date / time: 13-Jun-2025 12:00	----	----	----	----	----	----
					TY2506918-004	----	----	----	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	0.00500	mS/cm	0.0940	----	----	----	----	----	----
Moisture	----	E144/WT	0.25	%	4.86	----	----	----	----	----	----
Metals											
Antimony	7440-36-0	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Arsenic	7440-38-2	E440C/WT	0.10	mg/kg	1.58	----	----	----	----	----	----
Barium	7440-39-3	E440C/WT	0.50	mg/kg	17.8	----	----	----	----	----	----
Beryllium	7440-41-7	E440C/WT	0.10	mg/kg	0.13	----	----	----	----	----	----
Boron	7440-42-8	E440C/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
Cadmium	7440-43-9	E440C/WT	0.020	mg/kg	0.025	----	----	----	----	----	----
Calcium, soluble ion content	7440-70-2	E484/WT	0.50	mg/L	3.59	----	----	----	----	----	----
Chromium	7440-47-3	E440C/WT	0.50	mg/kg	14.4	----	----	----	----	----	----
Cobalt	7440-48-4	E440C/WT	0.10	mg/kg	3.08	----	----	----	----	----	----
Copper	7440-50-8	E440C/WT	0.50	mg/kg	7.49	----	----	----	----	----	----
Lead	7439-92-1	E440C/WT	0.50	mg/kg	3.45	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	0.50	mg/L	0.99	----	----	----	----	----	----
Molybdenum	7439-98-7	E440C/WT	0.10	mg/kg	0.21	----	----	----	----	----	----
Nickel	7440-02-0	E440C/WT	0.50	mg/kg	8.83	----	----	----	----	----	----
Selenium	7782-49-2	E440C/WT	0.20	mg/kg	<0.20	----	----	----	----	----	----
Silver	7440-22-4	E440C/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	0.50	mg/L	0.67	----	----	----	----	----	----
Thallium	7440-28-0	E440C/WT	0.050	mg/kg	0.068	----	----	----	----	----	----
Uranium	7440-61-1	E440C/WT	0.050	mg/kg	0.471	----	----	----	----	----	----
Vanadium	7440-62-2	E440C/WT	0.20	mg/kg	16.7	----	----	----	----	----	----
Zinc	7440-66-6	E440C/WT	2.0	mg/kg	16.1	----	----	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	0.10	-	<0.10	----	----	----	----	----	----
Volatile Organic Compounds											
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg	<0.015	----	----	----	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
BTEX, total	----	E611A/WT	0.10	mg/kg	<0.10	----	----	----	----	----	----
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----
F2 (C10-C16)	----	E601.SG-L/WT	10	mg/kg	<10	----	----	----	----	----	----
F3 (C16-C34)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F4 (C34-C50)	----	E601.SG-L/WT	50	mg/kg	<50	----	----	----	----	----	----
F1-BTEX	----	EC580/WT	5.0	mg/kg	<5.0	----	----	----	----	----	----

SubMatrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 25-01 SS2 Client sampling date / time: 13-Jun-2025 12:00 TY2506918-004	----	----	----	----	----	----
Hydrocarbons											
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	80	mg/kg	<80	----	----	----	----	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	-	YES	----	----	----	----	----	----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	1.0	%	91.8	----	----	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	1.0	%	84.0	----	----	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%	89.4	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%	91.0	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Acenaphthylene	208-96-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Anthracene	120-12-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	0.050	mg/kg	0.088	----	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	0.050	mg/kg	0.216	----	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	0.050	mg/kg	0.118	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	0.050	mg/kg	0.077	----	----	----	----	----	----
Chrysene	218-01-9	E641A/WT	0.050	mg/kg	0.090	----	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Fluoranthene	206-44-0	E641A/WT	0.050	mg/kg	0.069	----	----	----	----	----	----
Fluorene	86-73-7	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	0.050	mg/kg	0.118	----	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	0.030	mg/kg	<0.030	----	----	----	----	----	----
Naphthalene	91-20-3	E641A/WT	0.010	mg/kg	<0.010	----	----	----	----	----	----
Phenanthrene	85-01-8	E641A/WT	0.050	mg/kg	<0.050	----	----	----	----	----	----
Pyrene	129-00-0	E641A/WT	0.050	mg/kg	0.072	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates											
Acridine-d9	34749-75-2	E641A/WT	0.1	%	82.6	----	----	----	----	----	----
Chrysene-d12	1719-03-5	E641A/WT	0.1	%	91.9	----	----	----	----	----	----
Naphthalene-d8	1146-65-2	E641A/WT	0.1	%	95.3	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	0.1	%	93.4	----	----	----	----	----	----

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

No Breaches Found

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **TY2506918**	Page	: 1 of 9
Client	: **Thurber Engineering Ltd.**	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Donna Rein	Account Manager	: Christine Paradis
Address	: 1908 Ironoak Way Suite 202 Oakville ON Canada L6H 0N1	Address	: 1081 Barton Street Thunder Bay, Ontario Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Pineimuta Modular Bridge/ 68438	Date Samples Received	: 28-Jun-2025 09:01
PO	: ----	Issue Date	: 08-Jul-2025 16:44
C-O-C number	: ----		
Sampler	: ----		
Site	:		
Quote number	: Standing Offer Price List - 2025		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] 25-04 SS3	E581.F1	15-Jun-2025	02-Jul-2025	14 days	17 days	× EHT	02-Jul-2025	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] 25-01 SS2	E581.F1	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	02-Jul-2025	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] 25-02 SS3	E581.F1	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	02-Jul-2025	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] 25-05 SS2	E581.F1	11-Jun-2025	02-Jul-2025	14 days	21 days	× EHTR	02-Jul-2025	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] 25-04 SS3	E601.SG-L	15-Jun-2025	02-Jul-2025	14 days	17 days	× EHT	03-Jul-2025	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] 25-01 SS2	E601.SG-L	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	03-Jul-2025	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] 25-02 SS3	E601.SG-L	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	03-Jul-2025	40 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E601.SG-L	11-Jun-2025	02-Jul-2025	14 days	21 days	× EHTR	03-Jul-2025	40 days	1 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-04 SS3	E440C	15-Jun-2025	07-Jul-2025	180 days	22 days	✓	07-Jul-2025	180 days	22 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-01 SS2	E440C	13-Jun-2025	07-Jul-2025	180 days	24 days	✓	07-Jul-2025	180 days	24 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-02 SS3	E440C	13-Jun-2025	07-Jul-2025	180 days	24 days	✓	07-Jul-2025	180 days	24 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E440C	11-Jun-2025	07-Jul-2025	180 days	26 days	✓	07-Jul-2025	180 days	26 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-04 SS3	E484	15-Jun-2025	07-Jul-2025	180 days	22 days	✓	07-Jul-2025	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-01 SS2	E484	13-Jun-2025	07-Jul-2025	180 days	24 days	✓	07-Jul-2025	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-02 SS3	E484	13-Jun-2025	07-Jul-2025	180 days	24 days	✓	07-Jul-2025	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E484	11-Jun-2025	07-Jul-2025	180 days	26 days	✓	07-Jul-2025	180 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-04 SS3	E100-L	15-Jun-2025	07-Jul-2025	30 days	22 days	✓	08-Jul-2025	30 days	22 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-01 SS2	E100-L	13-Jun-2025	07-Jul-2025	30 days	24 days	✓	08-Jul-2025	30 days	24 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-02 SS3	E100-L	13-Jun-2025	07-Jul-2025	30 days	24 days	✓	08-Jul-2025	30 days	24 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E100-L	11-Jun-2025	07-Jul-2025	30 days	26 days	✓	08-Jul-2025	30 days	26 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
25-01 SS2	E144	13-Jun-2025	----	----	----		07-Jul-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
25-02 SS3	E144	13-Jun-2025	----	----	----		07-Jul-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
25-04 SS3	E144	15-Jun-2025	----	----	----		07-Jul-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E144	11-Jun-2025	----	----	----		07-Jul-2025	----	----	
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP]										
25-04 SS3	E641A	15-Jun-2025	02-Jul-2025	60 days	17 days	✓	03-Jul-2025	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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP]										
25-01 SS2	E641A	13-Jun-2025	02-Jul-2025	60 days	19 days	✓	03-Jul-2025	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP]										
25-02 SS3	E641A	13-Jun-2025	02-Jul-2025	60 days	19 days	✓	03-Jul-2025	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP]										
25-05 SS2	E641A	11-Jun-2025	02-Jul-2025	60 days	21 days	✓	03-Jul-2025	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
25-04 SS3	E611A	15-Jun-2025	02-Jul-2025	14 days	17 days	× EHT	02-Jul-2025	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
25-01 SS2	E611A	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	02-Jul-2025	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
25-02 SS3	E611A	13-Jun-2025	02-Jul-2025	14 days	19 days	× EHTR	02-Jul-2025	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP]										
25-05 SS2	E611A	11-Jun-2025	02-Jul-2025	14 days	21 days	× EHTR	02-Jul-2025	40 days	0 days	✓

Legend & Qualifier Definitions

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

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Quality Control Parameter Frequency Compliance

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

Matrix: **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	2088837	1	16	6.2	5.0	✓
Moisture Content by Gravimetry	E144	2092349	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2088835	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2088838	1	16	6.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2085840	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2086214	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2085839	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2086215	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	2088837	2	16	12.5	10.0	✓
Moisture Content by Gravimetry	E144	2092349	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2088835	2	20	10.0	10.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2088838	2	16	12.5	10.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2085840	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2086214	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2085839	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2086215	1	4	25.0	5.0	✓
Method Blanks (MB)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	2088837	1	16	6.2	5.0	✓
Moisture Content by Gravimetry	E144	2092349	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	2088835	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	2088838	1	16	6.2	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2085840	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2086214	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2085839	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2086215	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
CCME PHC - F1 by Headspace GC-FID	E581.F1	2085840	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	2086214	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2085839	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	2086215	1	4	25.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in 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.
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.
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 HNO3 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.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
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. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
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.

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.
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.
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	: **TY2506918**	Page	: 1 of 10
Client	: Thurber Engineering Ltd.	Laboratory	: ALS Environmental - Thunder Bay
Contact	: Donna Rein	Account Manager	: Christine Paradis
Address	: 1908 Ironoak Way Suite 202 Oakville ON Canada L6H 0N1	Address	: 1081 Barton Street Thunder Bay, Ontario Canada P7B 5N3
Telephone	: ----	Telephone	: +1 807 623 6463
Project	: Pineimuta Modular Bridge/ 68438	Date Samples Received	: 28-Jun-2025 09:01
PO	: ----	Date Analysis Commenced	: 02-Jul-2025
C-O-C number	: ----	Issue Date	: 08-Jul-2025 16:45
Sampler	: ----		
Site	:		
Quote number	: Standing Offer Price List - 2025		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
David Tremblett	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Josphin Masihi	Supervisor I	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					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: 2088837)											
TY2506918-001	25-05 SS2	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.0681 mS/cm	63.8	6.52%	20%	----
Physical Tests (QC Lot: 2092349)											
TY2506918-003	25-04 SS3	Moisture	----	E144	0.25	%	5.73	5.46	4.83%	20%	----
Metals (QC Lot: 2088835)											
WT2517070-006	Anonymous	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	2.03	1.96	3.48%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	11.2	11.1	1.03%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.15	0.14	0.006	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	5.5	5.4	0.05	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.033	0.033	0.0006	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	8.71	8.97	3.00%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	2.52	2.57	1.99%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	11.1	11.1	0.418%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	4.21	4.00	5.14%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.27	0.27	0.004	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	4.30	4.25	1.11%	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	0.406	0.386	5.09%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	25.2	27.3	8.04%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	16.1	16.1	0.0944%	30%	----
Metals (QC Lot: 2088838)											
TY2506918-001	25-05 SS2	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.83	1.85	0.02	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	0.77	0.96	0.19	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	0.83	0.84	0.01	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 2085839)											
TY2506918-001	25-05 SS2	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	----

Sub-Matrix: **Soil/Solid**

					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: 2085839) - continued											
TY2506918-001	25-05 SS2	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: 2085840)											
TY2506918-001	25-05 SS2	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 2086214)											
TY2506918-001	25-05 SS2	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	53	3	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 2086215)											
TY2506918-001	25-05 SS2	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	----
		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 (QCLot: 2088837)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 2092349)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 2088835)						
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	----
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	<2.0	----
Metals (QCLot: 2088838)						
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	----
Volatile Organic Compounds (QCLot: 2085839)						
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	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 2085840)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 2086214)						
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	----
Polycyclic Aromatic Hydrocarbons (QCLot: 2086215)						
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	----
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	----

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/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2088837)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	91.1	90.0	110	----
Physical Tests (QCLot: 2092349)									
Moisture	----	E144	0.25	%	50 %	99.6	90.0	110	----
Metals (QCLot: 2088835)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	103	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	94.6	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	98.8	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	96.3	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	99.1	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	97.3	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	96.4	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	95.5	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	96.0	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	102	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	82.6	80.0	120	----
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	95.1	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	97.4	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	93.6	80.0	120	----
Metals (QCLot: 2088838)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	113	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	107	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	105	80.0	120	----
Volatile Organic Compounds (QCLot: 2085839)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	84.9	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	80.1	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	85.0	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	76.1	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 2085839) - continued									
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	80.9	70.0	130	----
Hydrocarbons (QCLot: 2085840)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	103	80.0	120	----
Hydrocarbons (QCLot: 2086214)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	671 mg/kg	104	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1380 mg/kg	108	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	748 mg/kg	109	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 2086215)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	92.0	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	90.7	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	87.6	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	87.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	90.8	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	92.2	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	95.1	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	96.7	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	94.2	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	93.9	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	93.7	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	92.1	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	92.6	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	84.0	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	89.0	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	80.3	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	87.5	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	92.1	60.0	130	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 2085839)										
TY2506918-001	25-05 SS2	Benzene	71-43-2	E611A	1.93 mg/kg	2.11 mg/kg	91.2	60.0	140	----
		Ethylbenzene	100-41-4	E611A	1.83 mg/kg	2.11 mg/kg	86.4	60.0	140	----
		Toluene	108-88-3	E611A	1.98 mg/kg	2.11 mg/kg	93.6	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	3.49 mg/kg	4.23 mg/kg	82.5	60.0	140	----
		Xylene, o-	95-47-6	E611A	1.84 mg/kg	2.11 mg/kg	86.8	60.0	140	----
Hydrocarbons (QCLot: 2085840)										
TY2506918-001	25-05 SS2	F1 (C6-C10)	----	E581.F1	39.6 mg/kg	42.3 mg/kg	93.8	60.0	140	----
Hydrocarbons (QCLot: 2086214)										
TY2506918-001	25-05 SS2	F2 (C10-C16)	----	E601.SG-L	500 mg/kg	521 mg/kg	96.1	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1160 mg/kg	1070 mg/kg	108	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	643 mg/kg	581 mg/kg	111	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 2086215)										
TY2506918-001	25-05 SS2	Acenaphthene	83-32-9	E641A	0.390 mg/kg	0.388 mg/kg	100	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.385 mg/kg	0.388 mg/kg	99.2	50.0	140	----
		Anthracene	120-12-7	E641A	0.369 mg/kg	0.388 mg/kg	95.0	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.350 mg/kg	0.388 mg/kg	90.2	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.388 mg/kg	0.388 mg/kg	100.0	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.376 mg/kg	0.388 mg/kg	96.9	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.374 mg/kg	0.388 mg/kg	96.4	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.399 mg/kg	0.388 mg/kg	103	50.0	140	----
		Chrysene	218-01-9	E641A	0.389 mg/kg	0.388 mg/kg	100	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.375 mg/kg	0.388 mg/kg	96.7	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.379 mg/kg	0.388 mg/kg	97.7	50.0	140	----
		Fluorene	86-73-7	E641A	0.381 mg/kg	0.388 mg/kg	98.0	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.375 mg/kg	0.388 mg/kg	96.5	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.371 mg/kg	0.388 mg/kg	95.5	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.398 mg/kg	0.388 mg/kg	102	50.0	140	----
		Naphthalene	91-20-3	E641A	0.382 mg/kg	0.388 mg/kg	98.4	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.370 mg/kg	0.388 mg/kg	95.3	50.0	140	----
		Pyrene	129-00-0	E641A	0.374 mg/kg	0.388 mg/kg	96.4	50.0	140	----

Reference Material (RM) Report

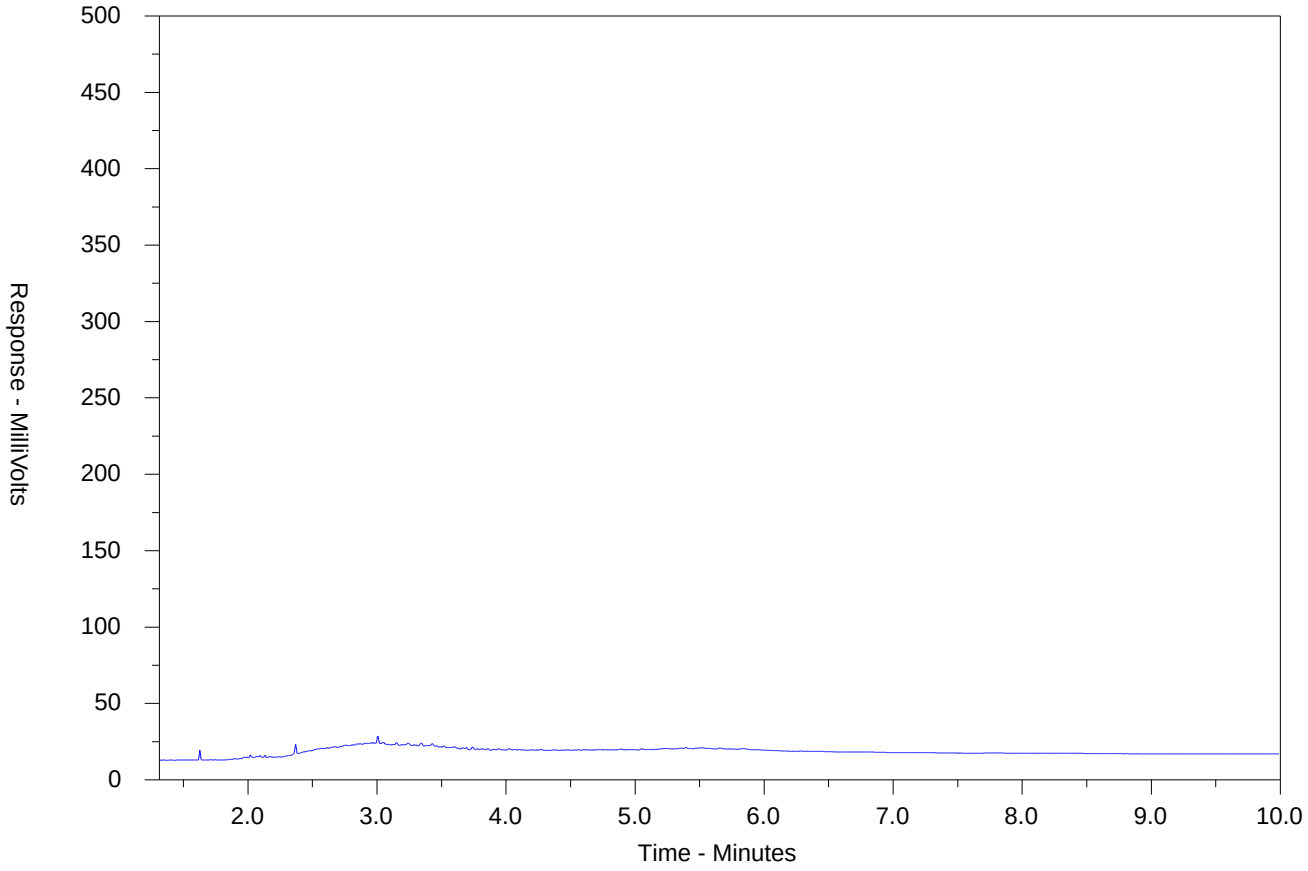
A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as 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:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 2088837)									
QC-2088837-003	RM	Conductivity (1:2 leachate)	----	E100-L	3130 µS/cm	101	70.0	130	----
Metals (QCLot: 2088835)									
QC-2088835-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	96.2	70.0	130	----
QC-2088835-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	89.2	70.0	130	----
QC-2088835-003	RM	Barium	7440-39-3	E440C	788 mg/kg	97.6	70.0	130	----
QC-2088835-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	94.6	70.0	130	----
QC-2088835-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	93.9	70.0	130	----
QC-2088835-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	94.8	70.0	130	----
QC-2088835-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	92.4	70.0	130	----
QC-2088835-003	RM	Copper	7440-50-8	E440C	969 mg/kg	93.9	70.0	130	----
QC-2088835-003	RM	Lead	7439-92-1	E440C	919 mg/kg	91.6	70.0	130	----
QC-2088835-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	95.3	70.0	130	----
QC-2088835-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	95.8	70.0	130	----
QC-2088835-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	97.2	60.0	140	----
QC-2088835-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	89.3	70.0	130	----
QC-2088835-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	93.6	70.0	130	----
QC-2088835-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	83.5	70.0	130	----
QC-2088835-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	94.6	70.0	130	----
QC-2088835-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	91.0	70.0	130	----
Metals (QCLot: 2088838)									
QC-2088838-003	RM	Calcium, soluble ion content	7440-70-2	E484	169 mg/L	105	70.0	130	----
QC-2088838-003	RM	Magnesium, soluble ion content	7439-95-4	E484	60.4 mg/L	103	70.0	130	----
QC-2088838-003	RM	Sodium, soluble ion content	17341-25-2	E484	107 mg/L	110	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: TY2506918-001-E601.SG-L
Client Sample ID: 25-05 SS2



←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 characterizin hydrocarbon products that may be present in your sample.

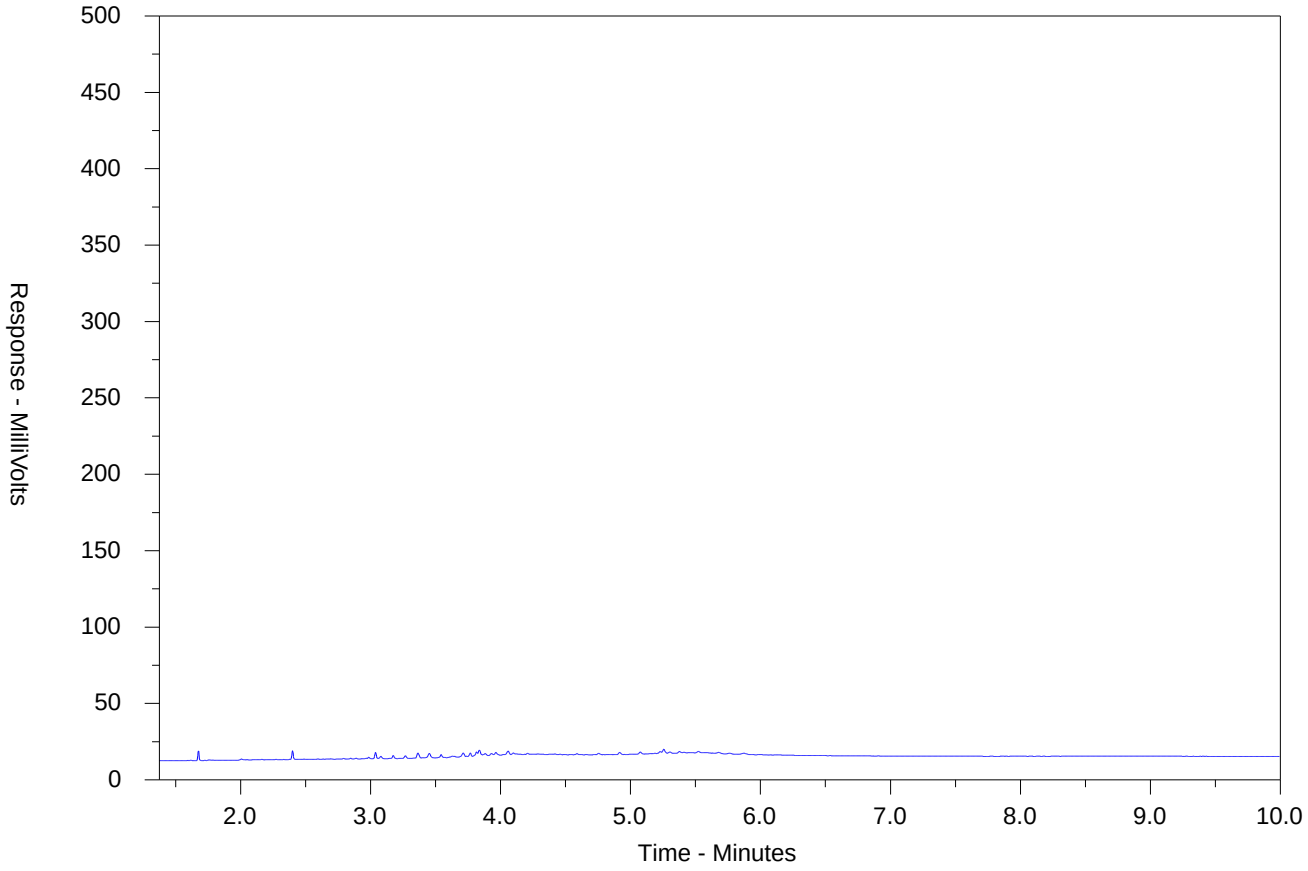
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th 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-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro 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: TY2506918-002-E601.SG-L
Client Sample ID: 25-02 SS3



←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 characterizin hydrocarbon products that may be present in your sample.

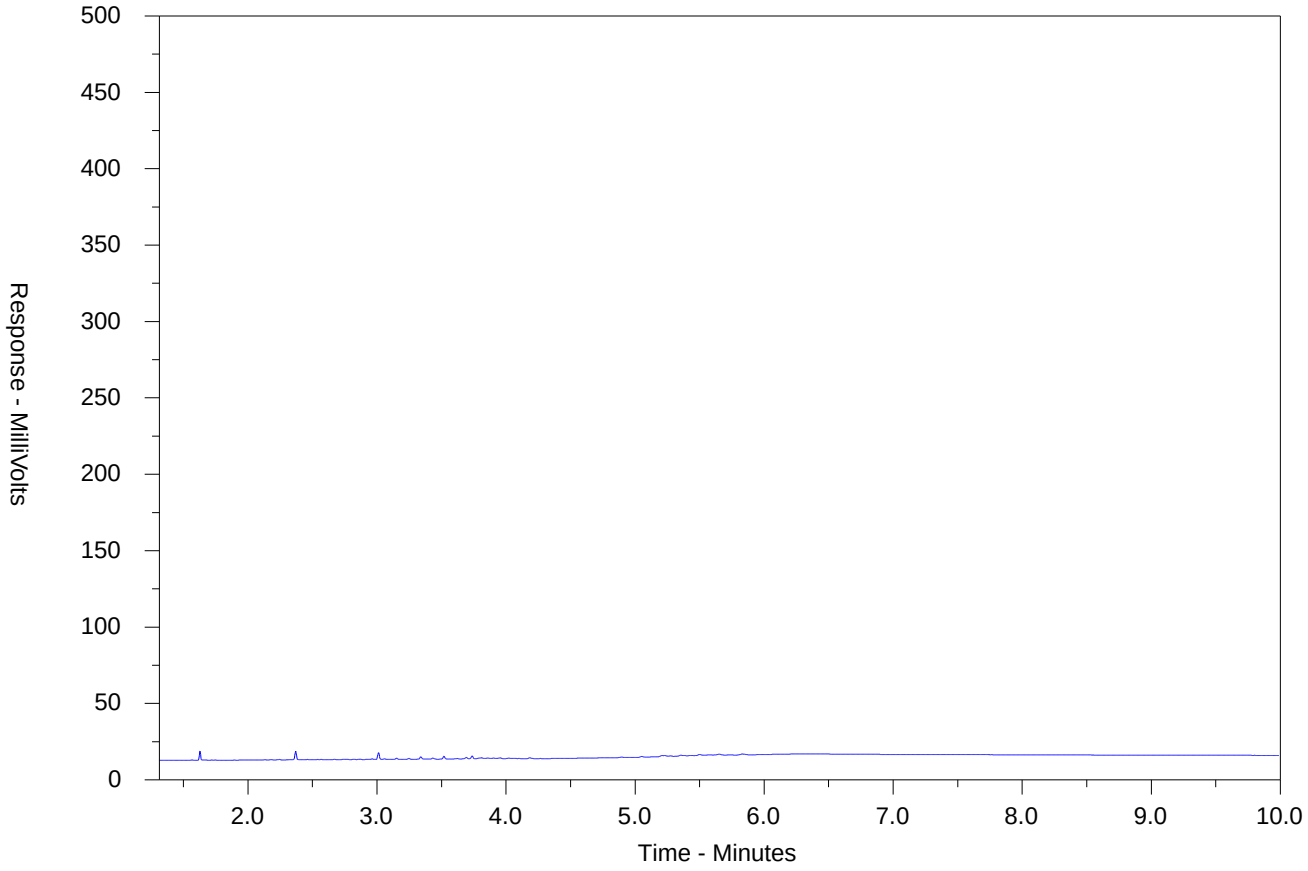
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th 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-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro 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: TY2506918-003-E601.SG-L
Client Sample ID: 25-04 SS3



←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 characterizin hydrocarbon products that may be present in your sample.

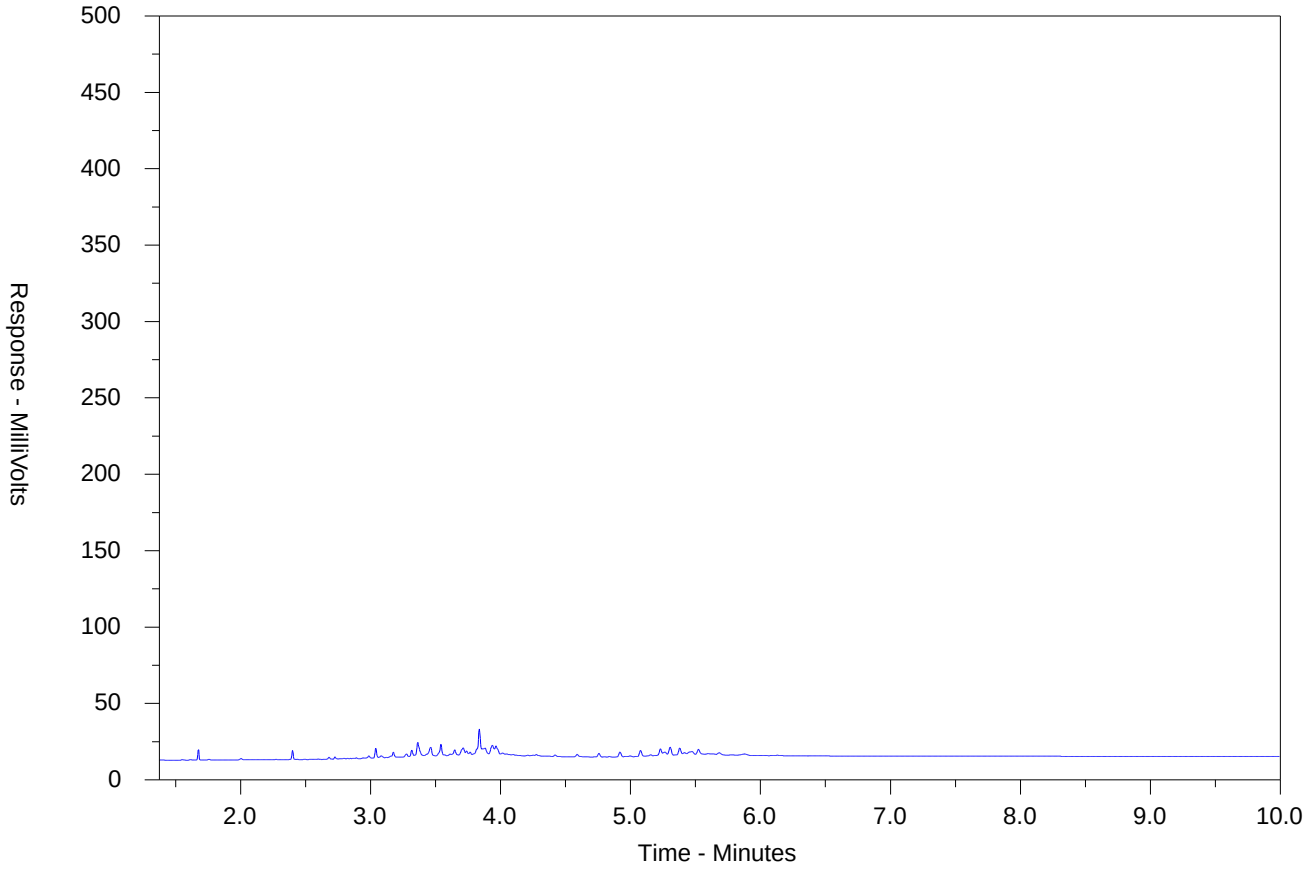
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th 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-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro 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: TY2506918-004-E601.SG-L
Client Sample ID: 25-01 SS2



←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 characterizin hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee 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, th 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-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 23 - 1098

Page of

Environmental Division
Thunder Bay
Work Order Reference
TY2506918

Telephone : +1 807 623 6463

Report To	Contact and company name below will appear on the final report
Company:	Thurber Eng Ltd.
Contact:	Yamlak Atagana
Phone:	+1 647 760 5744
	Company address below will appear on the final report
Street:	1909 Ironoak Way Suite 202
City/Province:	Oakville / ON
Postal Code:	L6H 0N1
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	Thurber Engineering Ltd.
Contact:	

Reports / Recipients

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

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: yatagana@thurber.ca
Email 2: rdecastro@thurber.ca

Turnaround Time (TAT) Requested

☐ Routine [R] If received by 3pm M-F - no surcharges apply
☐ 4 day [P4] If received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] If received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] If received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] If received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] If received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statuto
Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Client Code / QUOTE #:
Job / Project #: Pinemuta Modular Bridge / 68438
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

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

ALS Lab Work Order # (ALS use only): 6918

ALS Contact: Sampler:

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX/PHC F1-F2	Metals	EC	SAR	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	25-05 SS 2	11-Jun-25		1x250, 2 Vials	3	✓	✓	✓	✓			
	25-02 SS 3	13-Jun-25		"	3	✓	✓	✓	✓			
	25-04 SS 3	15-Jun-25		"	3	✓	✓	✓	✓			
	25-01 SS 2	13-Jun-25		"	3	✓	✓	✓	✓			

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human consumption/ use? ☐ YES ☐ NO

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

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
10.3							

SHIPMENT RELEASE (client use)

Released by: Smit Patel Date: 27/June/2025 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: GS Date: 28-June-25 Time: 9:01

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2025 FRONT

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

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

Drop-off 1x

Intake and Login Verification Form

SAMPLE INTAKE					
Priority/Emergency Service Requested				YES	NO
Time Sensitive Hold Time				YES	NO
Client:					
SAMPLE RECEIPT INFORMATION					
Mode of Delivery:	Courier			Drop Off	
Courier					
Waybill Number					
Temperature				Cooler Count	
Cooling Method	None	Ice		Ice Packs	
SAMPLE MATRIX/BOTTLE INFORMATION					
Matrix:	Water	Soil	Air	Biota	Other
DW Schedule 24 Bottles Correct?				Yes	No
DW Metals pH Check <2				Yes	No
Regulation Circled, Works # present			Yes	No - Reject?	
# of Bottles:	Sample Count				
Green/white					
Purple/white					
Warm red/white					
Yellow/black					
Light blue/white					
Orange/black					
Others (detail)					
-4 small jars.					
-4x2 vials.					
Comments on Samples and Bottles:					
- No time on CoC or on bottles.					
Samples Requiring Preservation or Filtering:					
Layout Staff Initials Date and Time of Layout	GS 28-June-23 9:17				

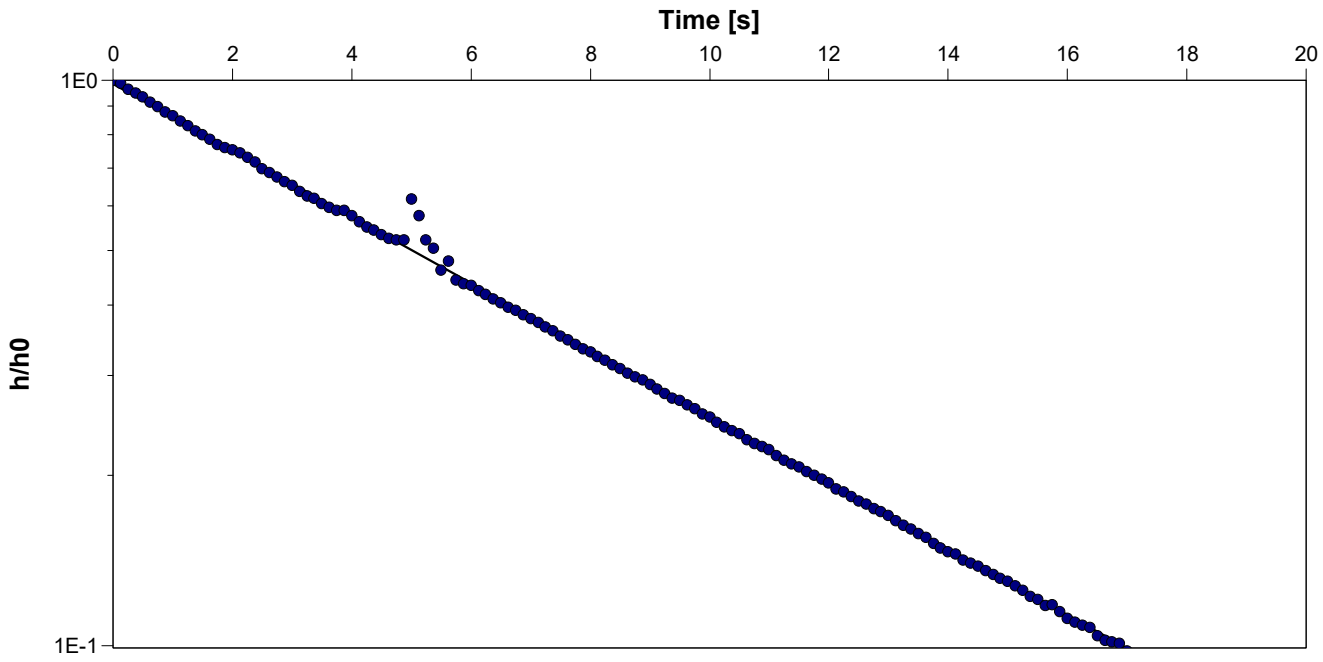
ACCOUNT INFO VERIFICATION		
Priority/Emergency Service Requested	YES	NO
Confirmed all as accurate as per COC, Sample Remarks or PM		
Client ✓ / Work Contact ✓ / Quote ✓		
RECEIPT DETAIL		
Project ✓ / PO ✓ / Site/LSD ✓		
Overall Description Entered ✓	Yes	NA
Received date/time as per COC ✓		
Recipients match CoC or Sample Remarks	Yes	No
Billing Instruction added to remarks	Yes	NA
Sample Remarks/Specification Doc checked ✓		
Submission Issues communicated	Yes	NA
Sample Info communicated via Remarks	Yes	NA
VERIFICATION CHECKLIST		
Plannned Event Submission ✓	Yes	No
Sample Name entered as per CoC ✓		
Sampling Date and time entered as per CoC ✓		
Containers selected in layout order ✓		
Sales items entered from QUOTE ONLY (and/or verified as correct) ✓		
Field Data/EC298A removed if not on COC	Yes	NA
Bottle Allocation Verified ✓		
Guideline added or auto-allocated ✓		
Due dates updated ✓		
VALIDATION		
Validation errors resolved?	Yes	No
Internal Sublet CoC created	Yes	NA
Login Comments: ✓		
Login Staff Initials:	SS	

APPENDIX E

Single Well Response Test Results

THURBER	**Slug Test Analysis Report**
	Project: Pinemuta River Modular Bridge Replacement
	Number: 68438
	Client: HATCH

Location: Kenora, ON	Slug Test: 25-05 SWRT Test 1	Test Well: 25-05
Test Conducted by: SP		Test Date: 2025-06-26
Analysis Performed by: JM	25-05 SWRT Analysis	Analysis Date: 2025-06-26
Aquifer Thickness:		
Checked By: AH		

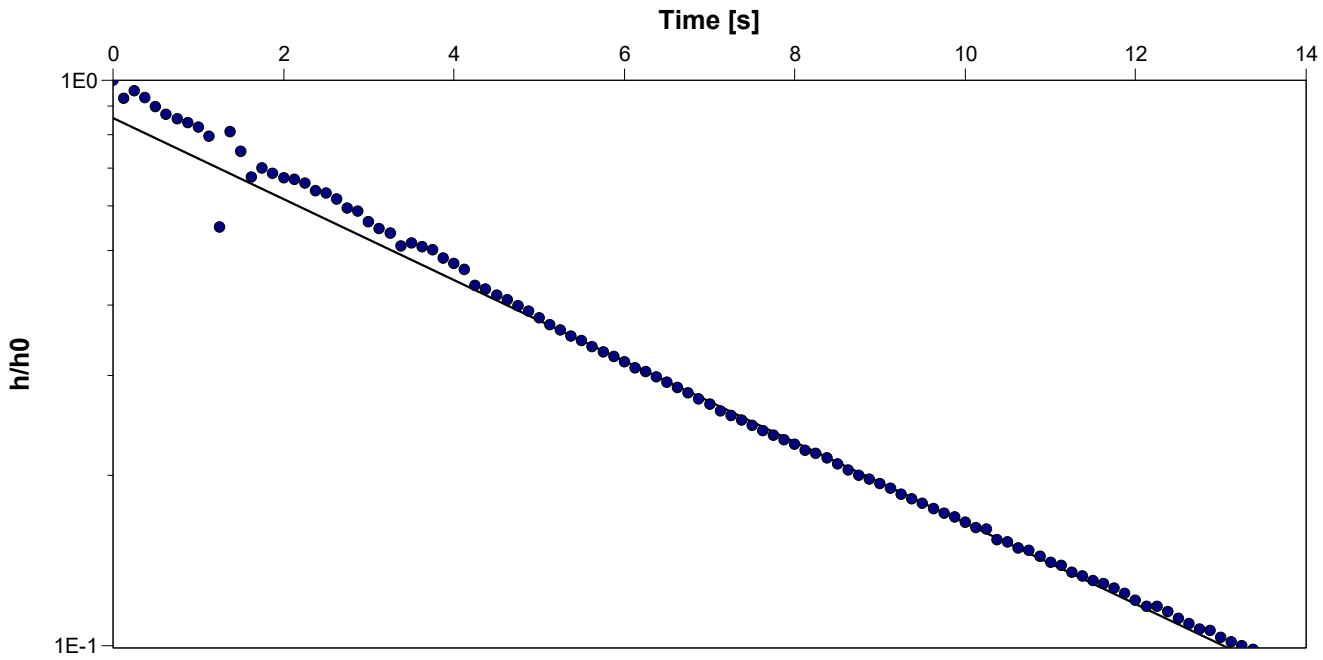


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
25-05	6.8×10^{-5}	

THURBER	**Slug Test Analysis Report**
	Project: Pinemuta River Modular Bridge Replacement
	Number: 68438
	Client: HATCH

Location: Kenora, ON	Slug Test: 25-05 SWRT Test 2	Test Well: 25-05
Test Conducted by: SP		Test Date: 2025-06-17
Analysis Performed by: JM	25-05 SWRT Analysis	Analysis Date: 2025-06-20
Aquifer Thickness:		
Checked By: AH		

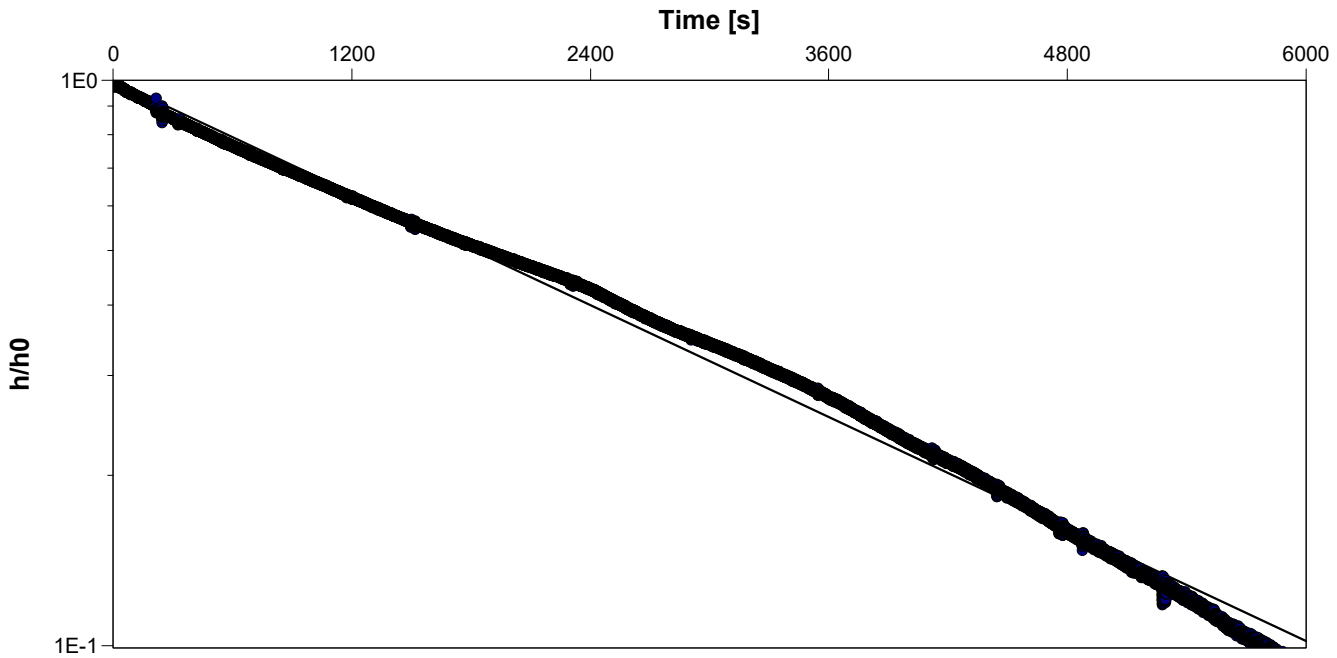


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
25-05	8.3×10^{-5}	

THURBER	**Slug Test Analysis Report**
	Project: Pinemuta River Modular Bridge Replacement
	Number: 68438
	Client: HATCH

Location: Kenora, ON	Slug Test: 25-01 SWRT	Test Well: 25-01
Test Conducted by: SP		Test Date: 2025-06-17
Analysis Performed by: JM	25-05 SWRT Analysis	Analysis Date: 2025-06-20
Aquifer Thickness:		
Checked By: AH		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
25-01	1.9×10^{-7}	

APPENDIX F

Site Pictures

Photo 1: Looking northwest at existing bridge structure (June 11, 2025).

Photo 2: Looking southeast at existing east structure (June 11, 2025).

Photo 3: Looking southwest at Pineimuta River from modular bridge (June 11, 2025).

Photo 4: Looking west at Pineimuta River from modular bridge (June 11, 2025).

Photo 5: Looking north at Pineimuta River and modular bridge (June 11, 2025).

Photo 6: Looking north at Pineimuta River modular bridge (June 11, 2025).

Photo 7: Looking north at Pineimuta River from under the bridge (June 11, 2025).

Photo 8: Looking east below the bridge (June 11, 2025).

Photo 9: Looking northwest at the bridge embankment fill (June 11, 2025).

Photo 10: Looking northwest at the bridge embankment fill (June 11, 2025).

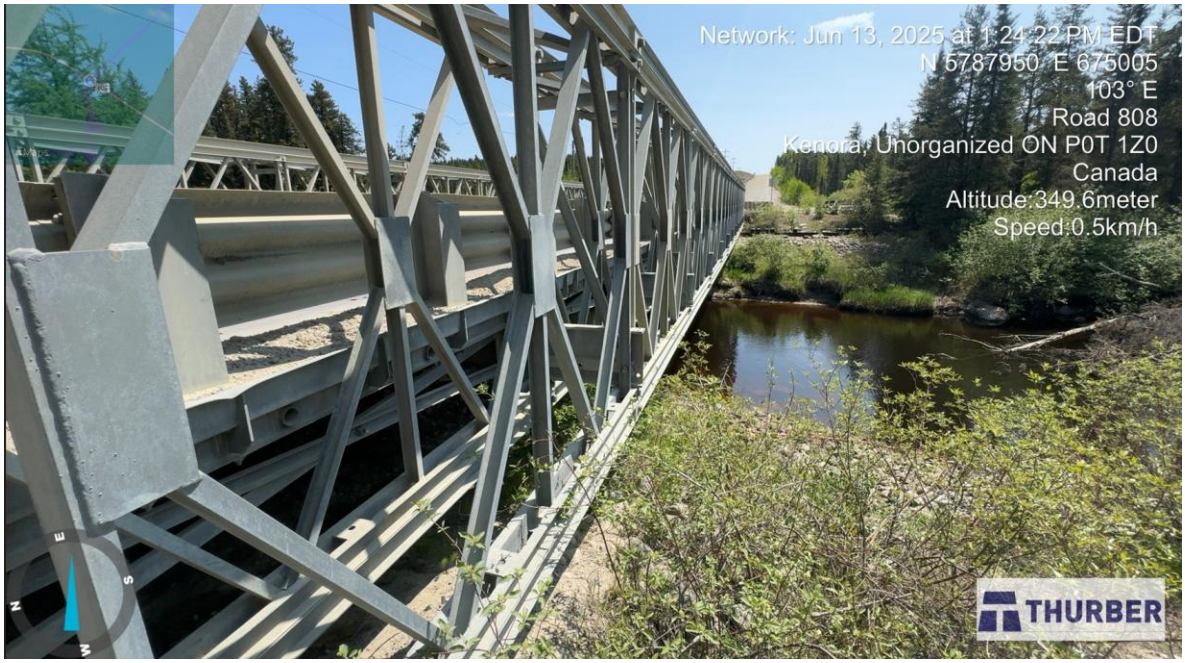


Photo 11: Looking east at the bridge from the embankment fill (June 13, 2025).

Photo 12: Looking southeast at the bridge and the embankment fill (June 13, 2025).

Photo 13: Looking southeast below the bridge and the embankment fill (June 13, 2025).

Photo 14: Looking west below the bridge (June 13, 2025).

Photo 15: Looking north at the bridge approach (June 13, 2025).

Photo 16: Looking south at the river, below the bridge (June 13, 2025).

Photo 17: Looking at the river, below the bridge (June 13, 2025).

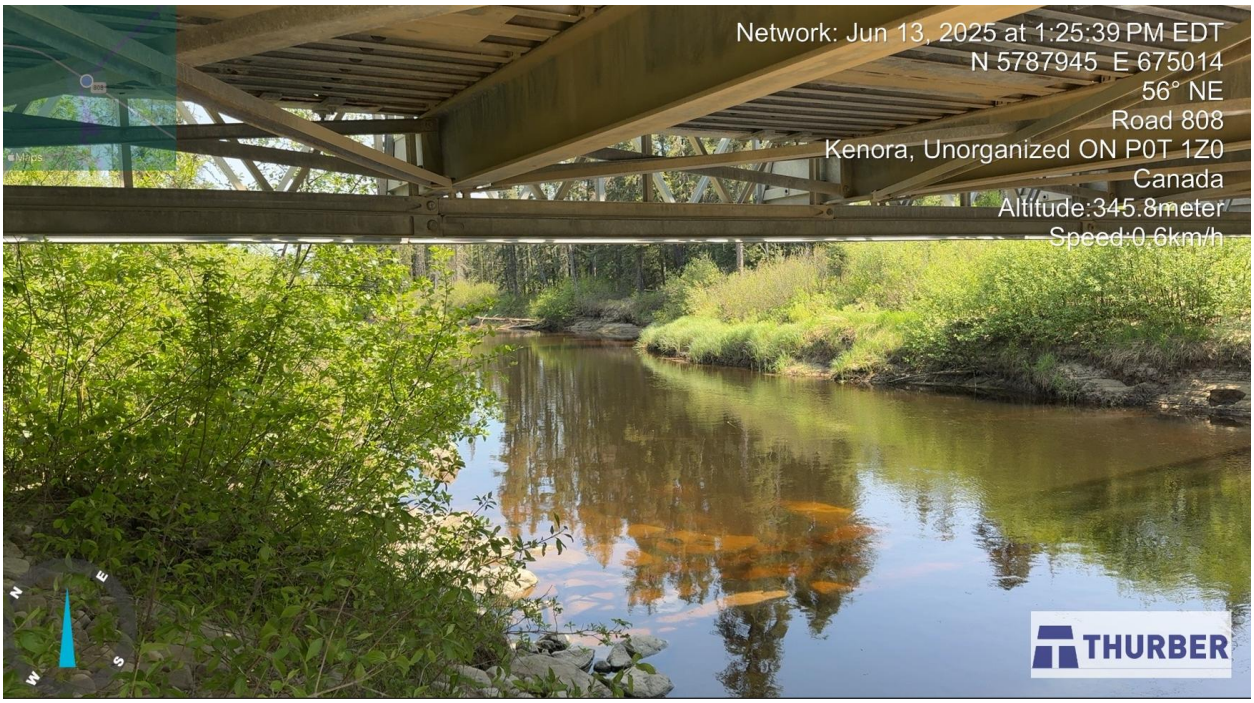


Photo 18: Looking northeast at the river, below the bridge (June 13, 2025)

APPENDIX G

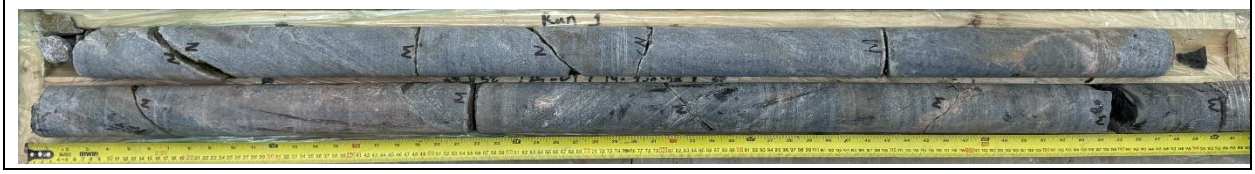
Bedrock Core Pictures

THURBER

PINEIMUTA RIVER MODULAR BRIDGE

Photographs of Rock Core

Borehole 25-01 - Run 1 and 2 - 13.7 m to 16.8 m



Borehole 25-02 - Run 1 - 13.6 m to 15 m

Borehole 25-02 - Run 2 - 15 m to 16.6 m

PINEIMUTA RIVER MODULAR BRIDGE

Photographs of Rock Core

Borehole 25-02B - Run 1 – 13.3 m to 15.3 m

Borehole 25-04 - Run 1 and 2 – 14.6 m to 16.9 m

Borehole 25-04 - Run 3 – 16.9 m to 17.8 m

PINEIMUTA RIVER MODULAR BRIDGE

Photographs of Rock Core

Borehole 25-05 - Run 1 and 2 – 13 m to 15 m

Borehole 25-05 - Run 3 – 15 m to 16.6 m

PINEIMUTA RIVER MODULAR BRIDGE

Photographs of Rock Core

Borehole 25-05B - Run 1 – 13.2 m to 14.35 m

Borehole 25-05B - Run 3 – 14.35 m to 14.8 m