



GEMTEC

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Submitted to:

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**Geotechnical, Hydrogeological,
and Environmental Services
Infrastructure Upgrades Project
Eganville, Ontario**

June 18, 2026
GEMTEC Project: 101260.004

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND TERMINOLOGY	V
1.0 INTRODUCTION.....	1
2.0 BACKGROUND.....	1
2.1 Project Description.....	1
2.2 Site Geology.....	1
3.0 SUBSURFACE INVESTIGATION	2
3.1 Geotechnical Investigation.....	2
3.2 Monitoring Well Installations	3
3.3 Hydraulic Response Testing	3
3.4 Water Quality Sampling	4
4.0 SUBSURFACE CONDITIONS.....	5
4.1 Existing Pavement Structure.....	5
4.2 Sand and Gravel.....	6
4.3 Silt	6
4.4 Glacial Till	6
4.5 Refusal and Bedrock.....	7
4.6 Groundwater Levels.....	8
4.7 Hydraulic Conductivity	8
4.8 Groundwater Quality	9
4.9 Soil and Groundwater Chemistry Relating to Corrosion	11
5.0 RECOMMENDATIONS	12
5.1 General.....	12
5.2 Excavation	12
5.2.1 Overburden Excavation	12
5.2.2 Bedrock Excavation	13
5.3 Excavation Adjacent to Existing Services.....	14
5.4 Groundwater Pumping and Management.....	14
5.4.1 Preliminary Dewatering Assessment.....	15
5.4.2 Soil Settlement from Dewatering.....	16
5.4.3 Groundwater Discharge	16
5.4.4 Water Taking Permitting and Approvals.....	16
5.5 Pipe Bedding	17
5.6 Thrust Restraint for Watermain	17
5.7 Trench Backfill	18
5.7.1 Seepage Barriers.....	Error! Bookmark not defined.

5.7.2	Corrosion of Buried Concrete and Steel.....	19
5.7.3	Winter Construction	19
6.0	ROADWAY RECONSTRUCTION	19
6.1	Subgrade Preparation.....	19
6.2	Pavement Design	20
6.2.1	Highway 41 and John Street (Northwest of Easement to Highway 41).....	20
6.2.2	Queen Street and John Street (East of Easement to Highway 41).....	20
6.3	Effects of Soil Disturbance and Construction	20
6.4	Compaction Requirements.....	21
6.5	Pavement Drainage	21
6.6	Pavement Transitions	21
7.0	ADDITIONAL CONSIDERATIONS.....	22
7.1	Effects of Construction Induced Vibration	22
7.2	Monitoring Well Abandonment	22
7.3	Excess Soil and Groundwater Management	22
8.0	CLOSURE.....	22

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LIST OF TABLES

Table 3.1: Borehole Details	2
Table 3.2: Summary of Hydraulic Testing.....	4
Table 3.3: Field Equipment Overview.....	4
Table 4.1: Summary of Grain Size Distribution Results – Base/Subbase Material.....	5
Table 4.2: Summary of Grain Size Distribution Results – Sand.....	6
Table 4.3: Summary of Grain Size Distribution Results – Glacial Till.....	7
Table 4.4: Groundwater Level Depths and Elevations.....	8
Table 4.5: Estimated Hydraulic Conductivities.....	9
Table 4.6: Water Quality Field Parameters.....	10
Table 4.7: Summary of Corrosion testing	12
Table 5.1: Peak Vibration Limits.....	13

LIST OF ATTACHMENTS

Conditions and Limitations of This Report
Borehole Location Plan

LIST OF APPENDICES

Appendix A	Bedrock Core Photos
Appendix B	Record of Borehole Sheets
Appendix C	Soil Classification Testing Results
Appendix D	Chemical Analysis of Soil and Water Samples Relating to Corrosion
Appendix E	Hydraulic Conductivity and Dewatering Calculations and Equations
Appendix F	Chemical Analysis of Water Samples Relating to Quality

1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by the Township of Bonnechere Valley to complete a geotechnical, hydrogeological, and environmental investigation to support the infrastructure upgrades project along John Street, Queen Street, and Highway 41 in Eganville, Ontario (see Borehole Location Plan, Figure 1).

The purpose of the investigation was to identify the general subsurface conditions at the site by means of a limited number of boreholes, and, based on the factual information obtained, to provide engineering guidelines and recommendations on the geotechnical design aspects of the project, including construction considerations that could influence design decisions. In addition, hydraulic testing was carried out in order to assess the hydraulic conductivity of the soil along the proposed alignment.

The geotechnical investigation was carried out in general accordance with our proposal dated February 13, 2026.

The report is subject to the Conditions and Limitations of This Report, which are provided following the text of this report, and which are considered an integral part of the report.

2.0 BACKGROUND

2.1 Project Description

Based on information provided to GEMTEC by J.L. Richards and Associates Ltd. (JLR), the project will consist of the replacement or upgrades to the existing storm and sanitary sewers, and watermain along three street sections within Eganville, Ontario (John Street, Highway 41, and Queen Street). A summary of the project limits is provided below.

- John Street from Highway 41, going east (about 530 metres)
- Easement from John Street to Highway 41 (about 100 metres)
- Highway 41 from Louise Street to Queen Street (about 140 metres)
- Queen Street from Highway 41 to Melanie Street (about 235 metres)

Based on the design drawings provided by JLR, the maximum invert depth of the services is expected to be about 3.5 metres below surface.

2.2 Site Geology

Available information from overburden maps indicate that the subsurface conditions at the site consist generally of glacial till underlain by sedimentary bedrock at varying depths across the different streets within the project area. The thickness of the overburden material is indicated to vary from about 1 to 2 metres along highway 41, the easement, and the centre of the John Street limits, to approximately 8 metres at the extents of the John Street limits, and along Queen Street.

Fill material associated with the existing roadway and buried services should also be expected.

3.0 SUBSURFACE INVESTIGATION

3.1 Geotechnical Investigation

The fieldwork for this investigation was carried out between April 7 and April 13, 2026. During that time, a total of eleven (11) boreholes, numbered 26-01 to 26-11, inclusive, were advanced within the project limits. Details of the boreholes are provided in Table 3.1.

Table 3.1: Borehole Details

Borehole	Ground Surface Elevation (Metres – Geodetic)	Borehole Depth (metres)	Well Screen Installed
26-01	169.3	2.94	X
26-02	168.3	4.37	✓
26-03	167.1	3.35	X
26-04	165.9	4.42	✓
26-05	162.8	3.56	X
26-06	160.0	3.20	✓
26-07	165.4	5.33	X
26-08	172.0	5.18	✓
26-09	173.9	5.18	X
26-10	174.2	5.94	X
26-11	174.7	5.94	✓

The boreholes were advanced using a truck mounted drill rig supplied and operated by George Downing Estate Drilling Ltd. of Grenville-Sur-La-Rouge, Quebec. Traffic control during the field work was provided by T.G. Carroll Cartage Ltd. of Carp, Ontario.

The fieldwork was observed by members of GEMTEC’s engineering staff who directed the drilling operations, observed the in-situ testing and logged the samples and boreholes. Standard penetration tests were carried out where possible within the overburden deposits and samples of the soils encountered were recovered using drive open sampling equipment. At select borehole locations the bedrock was cored using rotary drilling and HQ core was recovered.

Samples of the soil were sent to Paracel Laboratories Ltd. for basic chemical testing relating to corrosion of buried concrete and steel.

Following the borehole drilling work, the soil and bedrock samples were returned to our laboratory for examination by a geotechnical engineer. Selected samples of the soil were tested for water content and grain size distribution. Selected samples of the bedrock core were tested for compressive strength.

The boreholes were positioned at the site by GEMTEC personnel and placed relative to existing site features. The location and ground surface elevations at the boreholes were determined using a Trimble R10 GPS survey instrument. The elevations are referenced to metres above mean sea level, vertical datum CGVD2013(CGG2013a) (masl).

3.2 Monitoring Well Installations

Well screens were sealed in the overburden at Boreholes 26-02, 26-04, 26-06, 26-08, and 26-11 to measure the groundwater levels, carry out hydraulic testing, and allow for groundwater sampling. Well screens were installed with a surround of filter sand and sealed back to surface using bentonite sealant, drilling cutting, and/or sand. The monitoring wells were each fitted with a flush mounted protective cover. Details of the well screens are provided on the Record of Borehole sheets in Appendix B.

3.3 Hydraulic Response Testing

Single well in-situ hydraulic response tests were performed in the monitoring wells, as summarised in Table 3.2, to inform an estimate of the potential quantity of water that might enter the proposed excavations. Hydraulic response tests involved producing a known instantaneous head increase or decrease in the water column of the well and monitoring water level recovery to static conditions over time using a digital pressure transducer and an electronic water level meter. Purge and recovery tests were performed in wells with insufficient water column to perform slug tests.

The water level recovery data was analysed in Aqtesolv® Version 4.50 (HydroSOLVE Inc., 2007) to estimate the hydraulic conductivities of screened materials. Estimates of hydraulic conductivity were calculated from the results of the falling/rising head and recovery tests using the Hvorslev model of analysis. The Bouwer-Rice (1976) filter pack correction was applied for tests performed in wells screened across the water table.

Table 3.2: Summary of Hydraulic Testing

Borehole ID	Screened Geological Unit	Test Completed		
		Falling Head	Rising Head	Purge & Recovery
26-02	Sand (Glacial Till)	✓	✓	X
26-04	Bedrock	✓	✓	X
26-06	Sand (Glacial Till)	✓	✓	X
26-08	Sand (Glacial Till)	X	X	✓
26-11	Sand (Glacial Till)	X	X	✓

3.4 Water Quality Sampling

Wells were purged gurgle-dry using a Waterra foot valve and tubing on May 6, 2026, to develop the well screens. Groundwater samples were collected using a bailer on May 7, 2026, from Boreholes 26-02 and 26-04 and submitted to a CALA-accredited laboratory (Paracel Laboratories Limited in Ottawa) for the analyses of general inorganics, total and dissolved metals, volatiles, petroleum hydrocarbons, and semi-volatiles.

Field parameters were collected at the time of sampling using the equipment listed in Table 3.3.

Table 3.3: Field Equipment Overview

Field Parameters	Manufacturer	Model No.	Detection Limit
pH, temperature, conductivity, total dissolved solids	Hanna	HI 98129	-
Turbidity	Hanna	HI 98703	0.05 NTU

Notes:

1. Hanna HI 98129 calibration check using 4.0 and 7.0 pH solutions (within 5%).
2. Hanna HI98703 calibration check using <0.10, 15.0, 100 NTU (within 5%).

The analytical results provided by the lab were compared to the Provincial Water Quality Objectives and the City of Ottawa Sewer Use By-law (No. 2003-514) for reference. To note, the local sewer use By-Law 2009-044 for the Township of Bonnechere Valley does not prescribe any water quality limits, but indicates that:

No person shall cause or permit foreign substances, including, without limiting the generality of the foregoing, hazardous liquids or chemicals of any kind, to enter or have contact with water in the municipal water system.

4.0 SUBSURFACE CONDITIONS

The approximate locations of the boreholes are shown on the Borehole Location Plan, Figure 1. Descriptions of the subsurface conditions logged in the boreholes are provided on the Record of Borehole sheets in Appendix B. The results of the soil classification testing are provided in Appendix C.

4.1 Existing Pavement Structure

All the boreholes, except Borehole 26-07, were advanced through the existing pavement structure throughout the project area and encountered about 100 to 180 millimetres of asphaltic concrete. The asphaltic concrete is underlain by brown sand and gravel with trace to some silt (Base/Subbase material). At all boreholes advanced through the existing pavement structure, a distinct base/subbase could not be observed and the combined base/subbase thickness ranged from 0.6 to 1.4 metres.

Standard penetration tests carried out in the existing pavement structure gave N values of 8 to 95 blows per 0.3 metres of penetration, which reflect a loose to very dense relative density.

Grain size distribution tests were undertaken on samples of the base/subbase materials and the results are provided in Appendix C and are summarized in Table 4.1.

The moisture content of 5 samples of the existing base/subbase material ranged from about 3 to 8 percent.

Table 4.1: Summary of Grain Size Distribution Results – Base/Subbase Material

Borehole No. (Sample ID)	Depth (metres)	Gravel (%)	Sand (%)	Silt and Clay (%)
26-04 SA 1	0.15 – 0.61	44	41	15
26-06 SA 1	0.10 – 0.61	28	64	8
26-09 SA 1	0.10 – 0.61	23	60	15 2

4.2 Sand and Gravel

A layer of brown sand with varying amounts of gravel and silt was encountered below the pavement structure in Borehole 26-02 and 26-04, and below the fill material in borehole 26-07, at depths of about 0.8 metres below the existing surface grade. The sand layer has a thickness ranging from about 0.4 to 1.4 metres and extends to depths between about 1.1 to 2.5 metres (elevation 163.8 to 167.2 metres).

Standard penetration tests carried out in the sand gave N values of 4 to 28 blows per 0.3 metres of penetration, which reflect a very loose to compact relative density.

The moisture content of 3 samples of the native sand material ranged from about 6 and 13 percent.

A grain size distribution test was undertaken on 1 sample of the sand. The results are provided in Appendix C and are summarized in Table 4.2.

Table 4.2: Summary of Grain Size Distribution Results – Sand

Borehole No. (Sample ID)	Depth (metres)	Gravel (%)	Sand (%)	Silt and Clay (%)	
26-04 SA 3	0.76 – 1.37	58	39	10	1

4.3 Silt

A layer of dark brown silt, with some sand and trace gravel was encountered below the pavement structure in borehole 26-01 at a depth of about 0.8 metres below surface grade, with a thickness of about 1.1 metres extending to a depth of 1.8 metres.

Standard penetration tests carried out in the silt gave an N value of 29 blows per 0.3 metres of penetration, which reflects a compact relative density.

The moisture content on 1 sample of the native silt material was about 21 percent.

4.4 Glacial Till

A deposit of glacial till was encountered below the pavement structure in Boreholes 26-03, 26-05, 26-06, 26-08, 26-09, 26-10, and 26-11, and below the sand layer in Boreholes 26-02 and 26-07.

The glacial till was encountered at depths ranging from 0.8 to 1.5 metres below the existing ground surface. The glacial till extends to depths ranging from about 1.5 to 5.9 metres below the existing ground surface. Glacial till is a heterogeneous mixture of all grain sizes, which at this site, can generally be described as brown sand, varying amounts of gravel, varying amounts of silt, trace clay.

Standard penetration tests carried out in the glacial till gave N values ranging from 8 to 90 blows per 0.3 metres of penetration, which reflects a loose to very dense relative density.

11 grain size distribution tests were undertaken on selected samples of the glacial till material. The results are provided in Appendix B and are summarized in Table 4.3.

The moisture content of 13 samples of the native glacial till ranged from about 8 and 40 percent.

Table 4.3: Summary of Grain Size Distribution Results – Glacial Till

Borehole No. (Sample ID)	Depth (metres)	Gravel (%)	Sand (%)	Silt and Clay (%)	
26-02 SA 3	1.52 – 2.13	27	50	21	2
26-03 SA 2	0.76 – 1.37	39	30	31	
26-05 SA 2B	0.76 – 1.37	56	31	13	
26-06 SA 2	0.76 – 1.37	54	35	11	
26-07 SA 5	3.05 – 3.66	1	55	45	
26-08 SA 5	3.05 – 3.66	50	31	19	0
26-08 SA 7	4.57 – 5.18	14	45	41	
26-09 SA 4	2.29 – 2.90	9	48	43	
26-10 SA 2	0.76 – 1.37	10	58	32	
26-11 SA 3	1.52 – 2.13	12	55	31	2
26-11 SA 5	3.05 – 3.66	67	24	9	0

4.5 Refusal and Bedrock

Refusal to sampling was encountered in Boreholes 26-01 to 26-07, inclusive, at depths ranging from 1.6 to 3.8 metres below surface grade. Upon reaching refusal in these boreholes, core samples were obtained using rotary diamond drilling techniques to retrieve HQ sized bedrock core consisting of limestone and dolostone bedrock.

The recovered bedrock core samples had rock quality designation (RQD) values ranging from about 0 to 67. Based on these values the bedrock quality is considered to be poor to fair.

Compressive strength testing was carried out on 4 samples of the recovered bedrock core. The results range from 71 to 131 Megapascals, which according to the 5th Edition of the Canadian Foundation Manual, indicates Strong to Very Strong rock.

Photographs of the bedrock core are presented on Figures A1 to A14 in Appendix A.

4.6 Groundwater Levels

Table 4.4 summarizes the groundwater levels observed in Boreholes 26-02, 26-04, 26-06, 26-08, and 26-11 on May 6 and 7, 2026. The groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

Table 4.4: Groundwater Level Depths and Elevations

Borehole ID	Ground Surface Elevation (masl, CGVD2013)	Date of Measurement	Groundwater Depth (metres below ground surface)	Groundwater Elevation (masl, CGVD2013)
26-02	168.3	May 6, 2026	1.18	167.1
		May 7, 2026	1.17	167.1
26-04	165.9	May 6, 2026	2.86	163.0
		May 7, 2026	2.87	163.0
26-06 ¹	160.0	May 6, 2026	1.09	158.9
		May 7, 2026	1.10	158.9
26-08	172.0	May 6, 2026	1.93	170.1
		May 7, 2026	1.94	170.1
26-11 ¹	174.7	May 6, 2026	5.79	168.9
		May 7, 2026	5.92	168.8

Note:

1. All wells were completed with flushmount protective cases. Where the top of the PVC riser was not surveyed in the field (i.e., 26-06, 26-011), it was assumed that it was 0.15 metres below ground surface, the average of those that were measured for the site.

4.7 Hydraulic Conductivity

The bulk hydraulic conductivity of the geological units screened by the monitoring wells were estimated (see Appendix E), and the results are tabulated in Table 4.5. The purge and recovery tests (26-06 and 26-11) were conducted over 10 minutes using manual measurements only.

Table 4.5: Estimated Hydraulic Conductivities

Borehole ID	Screened Geological Unit	Calculated Hydraulic Conductivity (m/s)		
		Falling Head	Rising Head	Purge & Recovery
26-02	Sand (Glacial Till)	1×10^{-4}	2×10^{-4}	-
26-04	Bedrock	7×10^{-7}	1×10^{-6}	-
26-06	Sand (Glacial Till)	-	-	3×10^{-6}
26-08	Sand (Glacial Till)	8×10^{-7}	9×10^{-7}	-
26-11	Sand (Glacial Till)	-	-	2×10^{-6}

The following should be noted regarding the estimated values of hydraulic conductivity:

- The level of recovery during testing in Boreholes 26-06 and 26-11 was limited, which reduces the confidence that can be placed in the estimated hydraulic conductivity values. However, the estimates remain useful as indicative parameters when interpreted with appropriate caution and supported by other available information;
- The falling head test performed in borehole 26-08 had signal noise that interfered with the start of the test, but the late time data presented similarly to the rising head test;
- The range of literature values for hydraulic conductivity of limestone bedrock range from 1×10^{-9} to 1×10^{-6} m/s (Freeze & Cherry, 1979), which is consistent with field estimates derived from testing in borehole 26-04; and
- The range of literature values for hydraulic conductivity of glacial till and clean sand is from 1×10^{-12} to 1×10^{-6} m/s and 1×10^{-6} to 1×10^{-2} m/s respectively (Freeze & Cherry, 1979), which is generally consistent with the estimates of field results, i.e., the upper end of glacial till and lower end of clean sand.

The results of the testing represent the conditions in the immediate vicinity of the well screen and, as the distance increases from the well screen, the conditions may vary from those reported. Conditions between wells have not been established; therefore, variability in hydraulic conductivity across the site should be anticipated.

4.8 Groundwater Quality

Field parameters were collected prior to sample collection from Boreholes 26-02 and 26-04 on May 7, 2026, as summarised in Table 4.6.

Table 4.6: Water Quality Field Parameters

Borehole ID	Turbidity (NTU)	Temperature (Celsius)	pH	Electrical Conductivity (μ S)	Total Dissolved Solids (ppm)
26-02	824/800/776	10.3	7.54	2,679	1,332
26-04	136	10.2	7.33	1,889	932

The groundwater quality analytical results received from the lab (see Appendix F) were compared against the Ottawa Sewer Use By-law (No. 2025-94 superseding No. 2003-514) for reference, which is not an enforceable by-law in this jurisdiction, the PWQO, and the local sewer use By-Law 2009-044 for the Township of Bonnechere Valley. Exceedances of these water quality standards in one or more wells are summarised as follows:

Ottawa Sewer Use By-law – Storm Sewers (reference only):

- Total zinc exceeded the limit of 0.04 mg/L, but was non-detect following filtration of sediments, suggesting the exceedance was attributable to sediments.
- Total copper exceeded the limit of 0.04 mg/L, but was non-detect following filtration of sediments, suggesting the exceedance was attributable to sediments.
- Manganese exceeded the limit of 0.05 mg/L in both filtered and dissolved samples.
- Total phosphorous (unfiltered) exceeded the limit of 0.4 mg/L, but total phosphorous (filtered) fell below the limit, suggesting the exceedance was attributable to sediments.
- Total suspended solids exceeded the limit of 15 mg/L.
- Volatiles cis-1,2-Dichloroethylene, tetrachloroethylene, and toluene all exceeded their respective limits, and trace amounts of trichloroethylene and chloroform were also reported.

Ottawa Sewer Use By-law – Sanitary and Combined Sewers (reference only):

- Total suspended solids exceeded the limit of 350 mg/L.
- Total manganese in unfiltered samples exceeded the limit of 5 mg/L but fell below the limit following filtration of sediments (dissolved metals samples), suggesting the exceedance was attributable to sediments.

Provincial Water Quality Objectives:

- Total phosphorous (unfiltered) exceeded the limit of 0.01 mg/L, but total phosphorous (filtered) fell below the limit, suggesting the exceedance was attributable to sediments.
- Total metals concentrations including aluminum, arsenic, cobalt, copper, iron, lead, silver, tungsten, vanadium, and zinc exceeded their respective limits. The only metals exceedances sustained following filtration of sediments was copper, suggesting the others are associated with sediments.
- Toluene exceeded the regulatory limit of 0.8 mg/L, and trace amounts of other volatiles were noted but did not exceed their regulatory limit (where applicable).

Local Sewer use By-Law 2009-044 for the Township of Bonnechere Valley:

No person shall cause or permit foreign substances, including, without limiting the generality of the foregoing, hazardous liquids or chemicals of any kind, to enter or have contact with water in the municipal water system.

- The reported concentrations of volatiles are considered anthropogenic chemicals.

Soil results presented in the Soils Conditions Report prepared by GEMTEC, dated May 21, 2026, suggest widespread petroleum hydrocarbon contamination, despite no reported concentrations in groundwater quality samples being reported. Soil quality data interpreted in conjunction with the groundwater quality exceedances suggest that groundwater is unlikely to be suitable for discharge to storm sewer or the natural environment following sediment treatment. Remaining disposal options include discharge to sanitary sewer following sediment treatment (if petroleum hydrocarbons are not present and approval from the Township is obtained), a mobile Environmental Compliance Approval treatment system discharging to storm sewer, and/or discharge to tankers for disposal at an off-site facility. The Township should be contacted to obtain sewer use approvals, where applicable.

4.9 Soil and Groundwater Chemistry Relating to Corrosion

The results of chemical testing on two soil, from Boreholes 26-08 and 26-11, and two groundwater samples, recovered from Boreholes 26-02 and 26-04, are provided in Appendix C and are summarized in Table 4.7 below.

Table 4.7: Summary of Corrosion testing

Parameter	Borehole 26-08 Sample No. 3	Borehole 26-11 Sample no. 3	Borehole 26-02 groundwater sample	Borehole 26-04 groundwater sample
Chloride Content (µg/g)/(mg/L)	634	19	774	379
Resistivity (Ohm.m)	8.9	69.7	3.37	5.35
pH	7.82	7.95	7.6	7.6
Sulphate Content (µg/g)/(mg/L)	28	<10	47	33

5.0 RECOMMENDATIONS

5.1 General

The information in the following sections is provided for the guidance of the design engineers and is intended for the design of this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety and equipment capabilities.

5.2 Excavation

5.2.1 Overburden Excavation

Based on the results of the investigation, together with the planned invert levels, excavation for the proposed sanitary sewer and watermain will be carried through the existing pavement structures, sand, silt, glacial till, and bedrock in some areas. Based on the measured groundwater levels and the assumed invert elevations for the services, excavation for the services will likely extend below the measured groundwater levels.

The sides of the excavations within the overburden soils should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act. According to the Act, the soils at this site can be classified as Type 3 soils. Therefore, for design purposes, allowance should be made for 1 horizontal to 1 vertical, or flatter, excavation slopes for temporary excavations.

It is recommended that no excavated material be stockpiled within 6 metres from the edge of the excavation.

5.2.2 Bedrock Excavation

The bedrock surface was indicated to be less than 3 m from ground surface in all the boreholes advanced along John Street (i.e., Boreholes 26-01 to 26-06). Excavation within the shallow bedrock is therefore anticipated along John Street where services will be installed in new trenches (i.e., where existing service trenches are not suitable or exist). The rock is generally poor to fair quality strong to very strong limestone to dolostone.

It is anticipated that shallow removal of the bedrock at this site, if required, could be carried out using hoe ramming techniques in conjunction with line drilling on close centres. For the bedrock at this site, it is suggested that allowance be made for line drilling 75 to 100-millimetre diameter holes on 200 to 300-millimetre centres. This will however be slow and tedious. The vibration effects of hoe ramming are usually minor and localized.

Blasting may be considered for removal of significant rock volumes, however it is understood that blasting may not be allowed on this project. If considered, any blasting should be carried out under the supervision of a blasting specialist engineer.

As a guideline for blasting or rock removal using hoe ramming, the peak vibration limits suggested at the nearest structure or service are provided in Table 5.1.

Table 5.1: Peak Vibration Limits

Frequency of Vibration (Hz)	Vibration Limits (millimetres/second)
<10	5
10 to 40	5 to 50 (interpolated)
>40	50

It is pointed out that the limits provided in Table 5.1, although conservative, were established to prevent damage to existing buildings and services in good condition; more stringent criteria may be required to prevent damage to freshly placed (uncured) concrete or vibration sensitive equipment or utilities. Monitoring of the blasting or hoe-ramming should be carried out to ensure that the rock removal meets the limiting vibration criteria. Pre-construction condition surveys of any nearby structures and existing buried services should be carried out so that any claims can be handled in a fair manner.

The effects due to vibration from blasting can be controlled by limiting the size and amount of charge, using delayed detonation techniques, and the like. To reduce the effects of vibration on

nearby services, we suggest that the separation distance between any blasting and existing underground services be at least 6 metres. Any bedrock removal within these limits could be carried out using hoe ramming techniques in conjunction with line drilling on close centres. It is noted that the cost of bedrock removal generally increases the closer the bedrock removal is to any existing structures or services. Due to a relatively dense neighborhood with adjacent utilities within the project limits, blasting (with line drilling) may be extremely challenging.

Provided that good bedrock excavation techniques are used, the limestone bedrock could be excavated using vertical side walls. Any loose rock should be scaled from the sides of the excavation.

The bedrock contains near horizontal bedding planes. Therefore, some horizontal over break of the bedrock should be expected. The bedrock below pipe subgrade level will likely break at a horizontal bedding plane below the design invert depths of the new services, which may necessitate thickening of the bedding material.

5.3 Excavation Adjacent to Existing Services

We recommend that the excavations not encroach within a line extending downwards and outwards at an inclination of 1 vertical to 2 horizontal from the base of the existing services (i.e., sewers, watermains).

Where the recommended separation distance is not possible, a 1 horizontal to 1 vertical (1H:1V) encroachment zone between the horizontal excavation extent and the base of the existing service is acceptable provided that the contractor carries out the work using good practices to limit movement. Temporary intrusion within this 1H:1V zone is also acceptable provided that all measures to mitigate movement of the excavation sides slopes are undertaken (ex. filling space between trench box and excavation with sand, ensuring adequate compaction of all fill materials within encroachment zone, etc.) Field directions should be provided as required based on field conditions to ensure that the base of the adjacent services and the supporting soil are not compromised. Site visits by geotechnical personnel should be carried out daily where excavation is required within the 1 vertical to 2 horizontal zone described above.

5.4 Groundwater Pumping and Management

The amount of water entering the excavations for the installation of municipal services (i.e., storm sewers, sanitary sewers, and watermains) at this site will depend on the size of the excavation, as well as the water table level at each location.

Depending on inflow volumes, dewatering permits may be required. As part of the recent changes to *Ontario Regulation 387/04* under the *Ontario Water Resources Act* (effective July 1, 2025) all groundwater takings over 50,000 litres per day for construction dewatering will be subject to Environmental Activity and Sector Registry (EASR). A Category 3 Permit To Take Water (PTTW)

is no longer required for groundwater takings over 400,000 litres per day for construction dewatering.

It is anticipated that the groundwater inflow into the excavations can be managed using typical construction dewatering techniques. However, groundwater management is the responsibility of the contractor, based on their own assessment of dewatering requirements. The approach to dewatering the excavations should be designed and installed by a dewatering specialist and a groundwater management plan should be submitted for review and approval as part of the contract. Any groundwater disposal should be carried out in accordance with provincial and local regulations.

5.4.1 Preliminary Dewatering Assessment

The dewatering assessment presented herein is to provide an order-of-magnitude estimate of potential groundwater inflows for assessment of permitting requirements. It is based on conservative assumptions intended to represent upper bound conditions and does not constitute a prediction of actual dewatering volumes that will be encountered during construction, which may be significantly less. The dewatering calculations and equations are presented in Appendix E.

The assessment is limited by the nature of the available ground investigation data. In particular, the hydraulic conductivity values are obtained from point-specific testing, whereas subsurface conditions along the trench excavation are expected to vary spatially. As such, groundwater inflows will also vary along the excavation, and a precise or representative average inflow rate cannot be reliably provided. Excavations throughout the area are expected to be advanced through sands and shallow bedrock.

The following assumptions were employed in estimating dewatering rates (assuming the use of trench boxes):

- Excavation Length: 10 metres;
- Excavation Width: 3 metres;
- Excavation Depth from Surface: 4.5 metres;
- Initial Water Level Depth from Surface: 0.6 metre (i.e. 0.5 metre above measured);
- Final Water Level Depth from Surface: 4.5 metres;
- Assumed Hydraulic Conductivity: 1×10^{-4} metres per second; and
- The aquifer is continuous, homogeneous, isotropic, and of uniform thickness.

Depending on the time of excavation, the groundwater level may be higher than at the time of investigation, and so a groundwater table 0.5 metres shallower than the shallowest measured value was adopted.

Based on the outlined parameters, a steady state dewatering rate for the proposed excavations of 271,000 litres per day (L/day) was estimated. This value is provided as a realistic upper estimate of anticipated dewatering volumes with limited conservatism built into the calculation.

Conservatism in the water taking calculations for permitting is warranted to accommodate for the potential of higher groundwater levels, variability in subsurface conditions, precipitation and other factors. Incorporating a safety factor of 2 to account for higher-than-normal dewatering rates, groundwater inflow is estimated to be 542,000 L/day per open excavation (refer to Appendix B for Dewatering Estimates). This value is intentionally conservative and is not recommended for use in cost estimation or planning.

5.4.2 Soil Settlement from Dewatering

It is expected that short-term water level decline resulting from pumping during excavation will not have a significant effect on nearby structures and services.

5.4.3 Groundwater Discharge

Petroleum hydrocarbon contamination is anticipated in some locations proposed for excavation. Accordingly, recommended disposal options include discharge to sanitary sewer following sediment treatment (if no petroleum hydrocarbons are present or approval is obtained from the township), a mobile Environmental Compliance Approval treatment system discharging to storm sewer, and/or discharge to tankers for disposal at an off-site facility. Refer to Section 4.8 for a summary of the water quality exceedances informing these recommendations.

It is recommended that a groundwater discharge plan be prepared by a Qualified Person, who may undertake further investigations, sampling, or assessment to inform discharge options.

5.4.4 Water Taking Permitting and Approvals

An EASR is required for water taking over 50,000 litres per day, which is anticipated for the proposed works based on the field data collected. The dewatering estimates presented herein incorporate conservative assumptions and dewatering volumes may be lower than those estimated. Nonetheless, an EASR registration is recommended to avoid potential delays during construction (e.g., restrict pumping hours to maintain flows below 50,000 litres per day).

An EASR registration must be accompanied by a Water Taking and Discharge Plan report prepared by a Qualified Person. The Qualified Person preparing the EASR should independently review the available data to inform an appropriately conservative value to support the dewatering impact assessment and prevent delays that could arise from exceeding permitted water taking volumes.

It is recommended that the contractor submit a groundwater management and discharge plan for approval by the Township of Bonnechere Valley prior to construction.

5.5 Pipe Bedding

The pipe bedding material should consist of well graded crushed stone meeting OPSS requirements for Granular A. The minimum bedding thickness should be 150 millimetres for excavation within overburden. The granular materials used in the service trenches should be composed of virgin (i.e., not recycled) material only.

Some over-excavation may occur where water softened material is encountered. This material should be replaced with a subbedding layer OPSS Granular B Type II granular material, where required.

To provide adequate support for the services in the long term in areas where removal of material is required below the design subgrade level (bedding grade), the sub-excavated portion should be sized to allow a 1 horizontal to 2 vertical spread of granular material down and out from the bottom of the pipes.

Cover material, from pipe spring line to at least 300 millimetres above the top of the pipe, should consist of granular material, such as OPSS Granular A.

The bedding, any subbedding, and cover materials should be compacted in maximum 300-millimetre-thick lifts to at least 95 percent of the Standard Proctor dry density value.

5.6 Thrust Restraint for Watermain

In areas where the subgrade below the thrust block is disturbed or where unsuitable material (such as existing fill and trench backfill material) exists below the pipe subgrade level, the disturbed/unsuitable material should be removed and replaced with a layer of compacted granular material, such as that meeting OPSS Granular B Type II. Any Granular B Type II should extend at least 1.5 metres horizontally beyond the thrust block and should be compacted in maximum 200-millimetre-thick lifts to at least 95 percent of the Standard Proctor dry density value. Where removal of the existing fill material is not feasible, thrust restraint for the proposed watermains could be provided by friction (since we cannot provide a reliable bearing pressure for thrust blocks founded on fill material).

The following parameters could be used for design purposes:

Coefficient of friction between granular backfill and smooth plastic pipe:	0.25
Bearing pressure for thrust blocks bearing on undisturbed glacial till or on a pad of compacted granular material on native undisturbed soil:	150 kilopascals

Bearing pressure for thrust blocks bearing on bedrock or on a pad of compacted granular material on bedrock:

500 kilopascals

The above allowable bearing pressures for the thrust blocks assume that they are vertical and bear on native, undisturbed soil/bedrock, or on compacted engineered fill overlying native, undisturbed soil/bedrock.

5.7 Trench Backfill

The backfill materials within the zone of seasonal frost penetration (i.e., 1.8 metres below finished grade) should match the materials exposed on the trench walls. This will reduce the potential for differential frost heaving between the area over the trench and the adjacent roadway. Backfill below the zone of seasonal frost penetration could consist of either acceptable native material or imported granular material conforming to OPSS Granular B Type I or II or imported OPSS Select Subgrade Material. The existing roadway granular material could also be used for this purpose. Any organic soils or topsoil, if encountered, should be wasted from the excavation.

To minimize future settlement of the backfill and achieve an acceptable subgrade for any roadways, curbs, etc., the trench backfill should be compacted in maximum 300-millimetre-thick lifts to at least 95 percent of the Standard Proctor dry density value.

The deeper deposits of glacial till may have a moisture content that is too high for compaction. Furthermore, this material is sensitive to changes in moisture content due to precipitation. As such, the specified densities may not be possible to achieve, and, as a consequence, some settlement of these backfill materials could occur. Consideration could be given to implementing one or a combination of the following measures to reduce post construction settlement above the trenches, depending on the weather conditions encountered during the construction:

- Allow the overburden materials to dry prior to compaction;
- Reuse any wet materials in the lower part of the trenches and make provision to defer hard surfacing (i.e., paving, concrete, etc.) for 3 months, or longer, to allow the trench backfill settlement to occur and thereby improve the final appearance of the hard surfacing.
- Avoid reusing any wet material within the trench. If additional material is required for trench backfill, consideration could be given to using imported, relatively dry, earth fill material within the zone of frost penetration, and granular material conforming to OPSS Granular B Type I or II or imported OPSS Select Subgrade Material below the zone of frost penetration. The frost susceptibility of the earth fill should be assessed prior to use for frost compatibility with the material on the sides of the trench.

5.7.1 Corrosion of Buried Concrete and Steel

The measured sulphate concentration from soil and groundwater samples range from less than 10 to 28 micrograms per gram and 33 to 47 milligrams per litre, respectively. According to Canadian Standards Association (CSA) “Concrete Materials and Methods of Concrete Construction”, the concentration of soluble sulphate in the soil and groundwater is considered low. Therefore, any concrete in contact with the native soil or groundwater could be batched with General Use (GU) cement. The effects of freeze thaw in the presence of de-icing chemicals (sodium chloride) should be considered in selecting the air entrainment and the concrete mix proportions for any concrete.

Based on the resistivity, pH, and the measured chloride content of the tested soil samples and groundwater samples, the groundwater can be classified as corrosive to very corrosive towards unprotected steel. Selecting appropriate corrosion resistant material is recommended for buried steel components and this should be discussed with material suppliers to consider potential options. It is noted that the corrosivity of the soil/groundwater could vary throughout the year due to the application of sodium chloride for de-icing.

5.7.2 Winter Construction

Some of the overburden soils at this site are highly frost susceptible and are prone to significant ice lensing. In order to carry out the work during freezing temperatures, the service trenches should be opened for as short a time as practical and the excavations should be carried out only in lengths that allow all of the construction operations, including backfilling, to be fully completed in one working day. The materials on the sides of the trenches should not be allowed to freeze. In addition, the backfill should be excavated, stored and replaced without being disturbed by frost or contaminated by snow or ice.

6.0 ROADWAY RECONSTRUCTION

6.1 Subgrade Preparation

Following placement of trench backfill material, the roadway subgrade surfaces should be proof rolled with an 8-tonne or larger steel drum roller under dry conditions. Any soft areas should be subexcavated and replaced with suitable, compacted earth borrow that is similar to that exposed in adjacent subgrade areas, as directed by a geotechnical engineer, or material meeting the requirements of OPSS specifications for Granular B Type I or Granular B Type II.

Where subexcavation is required, grade raise fill material placed below the roadway should be placed in maximum 300-millimetre-thick lifts and compacted to at least 95 percent of the Standard Proctor maximum dry density value using vibratory compaction equipment.

6.2 Pavement Design

It is understood that following the construction of the sewers and watermain, the roadway above the trenches will be reinstated and the pavement reconstructed full depth. The following asphaltic concrete and granular thicknesses are recommended to approximately match the existing roadway pavement structure in at the respective locations. Traffic information was unavailable. The following pavement structures are based on the County of Renfrew standard pavement designs for Class 2 and Class 3 roadways.

6.2.1 Highway 41 and John Street (Northwest of Easement)

The following pavement structure may be used for trench reinstatements and full depth/width pavement reconstruction along Highway 41, from Louise Street to Queen Street and John Street northwest of the easement to Highway 41. These sections are considered Class 3 roadways.

- 120 millimetres of asphaltic concrete, comprising
 - o 50 millimetres of Superpave 12.5 PG 58-34, over
 - o 70 millimetres of Superpave 19 PG 58-34, over
- 150 millimetres of OPSS Granular A, over
- 350 millimetres of OPSS Granular B Type II.

6.2.2 Queen Street and John Street (Southeast of Easement)

The following pavement structure may be used for trench reinstatements and full depth/width pavement reconstruction along Queen Street, from Highway 41 to Melanie Street and John Street (southeast of easement). These sections are considered Class 2 roadways.

- 100 millimetres of asphaltic concrete, comprising
 - o 40 millimetres of Superpave 12.5 PG 58-34, over
 - o 60 millimetres of Superpave 19 PG 58-34, over
- 150 millimetres of OPSS Granular A, over
- 350 millimetres of OPSS Granular B Type II.

6.3 Effects of Soil Disturbance and Construction

The pavement structure provided above assumes that the roadway subgrade surface is properly prepared, and proof rolled at the time of construction (i.e., the subgrade is not disturbed or wetted due to construction operations or precipitation). If the roadway subgrade surface becomes disturbed or wetted due to construction operations or precipitation, the Granular B Type II thicknesses provided above may not be adequate and it may be necessary to increase the thickness of the Granular B Type II subbase and/or place a geotextile over the subgrade surface.

The required thickness of the subbase materials will depend on a number of factors, including schedule, contractor methodology, soil types and weather conditions, and should be assessed by

geotechnical personnel at the time of construction. In our opinion, the preferred approach from a geotechnical point of view is to:

- Proof roll the subgrade at the time of construction under the supervision of experienced geotechnical personnel; and,
- Adjust the thickness of the subbase material and include a woven geotextile, as required. Unit rate allowances should be made in the contract for a geotextile (woven, OPSS1860 Type II) and sub-excavation and replacement with OPSS Granular B Type II.

6.4 Compaction Requirements

All imported granular materials for the roadway structure should be placed in maximum 200-millimetre-thick lifts and should be compacted to at least 98 percent of the Standard Proctor dry density value using suitable vibratory compaction equipment.

6.5 Pavement Drainage

Adequate drainage of the pavement granular materials and subgrade is important for the long-term performance of the pavement at this site. Catch basins should be provided with minimum 3-metre-long perforated stub drains which extend in at least two directions from each catch basin at the pavement subgrade level.

6.6 Pavement Transitions

As part of the roadway reconstruction, the new pavements will abut existing pavements. The following is suggested to improve the performance of the joint between the new and the existing pavements:

- Neatly saw cut the existing asphaltic concrete;
- Remove the asphaltic concrete and slope the bottom of the excavation within the existing granular base and subbase at 3 horizontal to 1 vertical, or flatter, to avoid undermining of the existing asphaltic concrete and provide a gradual transition between the new and existing granular materials.
- Remove (mill off) 40 to 60 millimetres of the existing asphaltic concrete (to match the thickness of the wear course asphaltic concrete) to a distance of 300 millimetres at the joint and tack coat the asphaltic concrete at the joint in accordance with the requirements in OPSS 310.

Notwithstanding the above, based on our experience, there will likely be some unavoidable reflective cracking of the asphaltic concrete at the joint.

7.0 ADDITIONAL CONSIDERATIONS

7.1 Effects of Construction Induced Vibration

If blasting or hoe-ramming is used for rock excavation, the guidance provided in Section 5.1 should be considered. Monitoring of the rock removal should be carried out to ensure that the blasting/hoe ramming meets the limiting vibration criteria. Pre-construction condition surveys of any nearby structures and existing buried services should be carried out so that any claims can be handled in a fair manner.

Some of the other construction operations (such as granular material compaction, excavation, etc.) will cause ground vibration on and off of the site. The vibrations will attenuate with distance from the source but may be felt at nearby structures. The magnitude of the vibrations will likely be much less than that required to cause damage to the nearby structures or services in good condition. Precondition surveys of the adjacent structures should also be considered for these operations.

7.2 Monitoring Well Abandonment

All monitoring wells installed as part of this investigation should be decommissioned by a licensed well technician in accordance with Ontario Regulation 903, as amended by Ontario Regulation 128/03. The well abandonment could be carried out in advance of or during construction.

7.3 Excess Soil and Groundwater Management

The presence or implications of possible surface and/or subsurface contamination, including naturally occurring source of contamination, are outside the terms of reference for this report. Information regarding excess soil management will be provided in an Excess Soil Management reports prepared by GEMTEC and submitted at a later date.

8.0 CLOSURE

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

William (Bill) Cavers, P.Eng.
Principal Geotechnical Engineer



1. **Standard of Care:** GEMTEC has prepared this report in a manner consistent with generally accepted engineering or environmental consulting practice in the jurisdiction in which the services are provided at the time of the report. No other warranty, expressed or implied is made.
2. **Copyright:** The contents of this report are subject to copyright owned by GEMTEC, save to the extent that copyright has been legally assigned by us to another party or is used by GEMTEC under license. To the extent that GEMTEC owns the copyright in this report, it may not be copied without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of GEMTEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests.
3. **Complete Report:** This report is of a summary nature and is not intended to stand alone without reference to the instructions given to GEMTEC by the Client, communications between GEMTEC and the Client and to any other reports prepared by GEMTEC for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. GEMTEC can not be responsible for use of portions of the report without reference to the entire report.
4. **Basis of Report:** This Report has been prepared for the specific site, development, design objectives and purposes that were described to GEMTEC by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this report expressly addresses the proposed development, design objectives and purposes. Any change of site conditions, purpose or development plans may alter the validity of the report and GEMTEC cannot be responsible for use of this report, or portions thereof, unless GEMTEC is requested to review any changes and, if necessary, revise the report.
5. **Time Dependence:** If the proposed project is not undertaken by the Client within 18 months following the issuance of this report, or within the timeframe understood by GEMTEC to be contemplated by the Client, the guidance and recommendations within the report should not be considered valid unless reviewed and amended or validated by GEMTEC in writing.
6. **Use of This Report:** The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without GEMTEC's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, GEMTEC may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process.

Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.
7. **No Legal Representations:** GEMTEC makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

8. **Decrease in property value:** GEMTEC shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
9. **Reliance on Provided Information:** The evaluation and conclusions contained in this 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 us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
10. **Investigation Limitations:** Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions but even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions.

The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. Accordingly, GEMTEC does not warrant or guarantee the exactness of the subsurface descriptions.

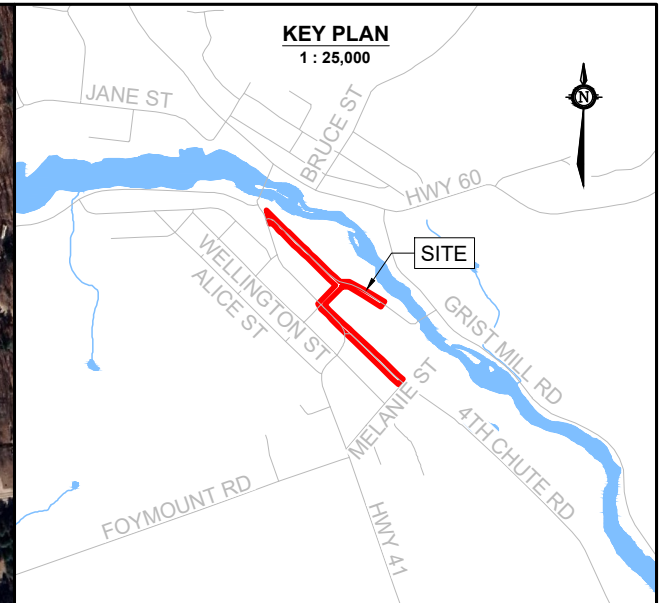
Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

In addition, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.


11. **Sample Disposal:** GEMTEC will dispose of all uncontaminated soil and/or rock samples 60 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.
12. **Follow-Up and Construction Services:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.
During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not

materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing during construction are necessary for GEMTEC to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, GEMTEC's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

13. **Changed Conditions:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEMTEC be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that GEMTEC be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.
14. **Drainage:** Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. GEMTEC takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

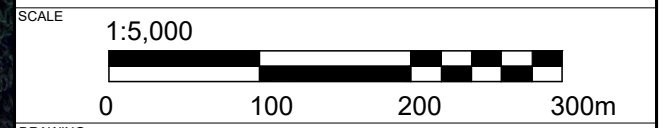


LEGEND

BH # ← BOREHOLE ID
XX.XX ← GROUND SURFACE ELEVATION, IN METRES
 GEODETIC DATUM
 BOREHOLE LOCATION
 (current investigation by GEMTEC)

DATA SOURCES AND REFERENCES

1. Coordinate system: CSRS.UTM-18N
2. Distances, elevations, and coordinates are shown in metres unless denoted otherwise
3. This drawing is a schematic representation and should not be taken as a substitute for a legal survey.
4. Image ©2026 Google Maps, CNES / Airbus, First Base Solutions, Maxar Technologies
5. Contains information licensed under the Open Government Licence – Ontario
6. Geographic dataset source: Ontario GeoHub



DRAWING **BOREHOLE LOCATION PLAN**

CLIENT **TOWNSHIP OF BONNECHERE VALLEY**

PROJECT **GEOTECHNICAL, HYDROGEOLOGICAL, AND ENVIRONMENTAL SERVICES
 JOHN STREET AND QUEEN STREET UPGRADES
 EGANVILLE, ONTARIO**

DRAWN BY **SL** CHECKED BY **BC**

PROJECT NO. **101260.004** REVISION NO. **0**

DATE **JUNE 2026** FIGURE NO. **FIGURE 1**



GEMTEC
 CONSULTING ENGINEERS
 AND SCIENTISTS

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APPENDIX A

Bedrock Core Photos

BOREHOLE: 26-01 - DRY
BORING DATE: APRIL 7, 2026
DEPTH: 2.95 to 4.37 METRES BELOW GROUND SURFACE



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TOWNSHIP OF BONNECHERE VALLEY
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EGANVILLE, ONTARIO

FIGURE A1

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-01 - DRY

BOREHOLE: 26-01 - WET
BORING DATE: APRIL 7, 2026
DEPTH: 2.95 to 4.37 METRES BELOW GROUND SURFACE



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FIGURE A2

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-01 - WET

BOREHOLE: 26-02 - DRY
BORING DATE: APRIL 10, 2026
DEPTH: 2.95 to 4.37 METRES BELOW GROUND SURFACE



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FIGURE A3

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-02 - DRY

BOREHOLE: 26-02 - WET
BORING DATE: APRIL 10, 2026
DEPTH: 2.95 to 4.37 METRES BELOW GROUND SURFACE



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FIGURE A4

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-02 - WET

BOREHOLE: 26-03 - DRY
BORING DATE: APRIL 10, 2026
DEPTH: 1.93 to 3.35 METRES BELOW GROUND SURFACE



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Project

TOWNSHIP OF BONNECHERE VALLEY
JOHN STREET AND QUEEN STREET UPGRADES
EGANVILLE, ONTARIO

FIGURE A5

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-03 - DRY

BOREHOLE: 26-03 - WET
BORING DATE: APRIL 10, 2026
DEPTH: 1.93 to 3.35 METRES BELOW GROUND SURFACE



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Project

TOWNSHIP OF BONNECHERE VALLEY
JOHN STREET AND QUEEN STREET UPGRADES
EGANVILLE, ONTARIO

FIGURE A6

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-03 - WET

BOREHOLE: 26-04 - DRY
BORING DATE: APRIL 10, 2026
DEPTH: 2.13 to 4.42 METRES BELOW GROUND SURFACE



BOREHOLE: 26-04 - WET
BORING DATE: APRIL 10, 2026
DEPTH: 2.13 to 4.42 METRES BELOW GROUND SURFACE



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Project

TOWNSHIP OF BONNECHERE VALLEY
JOHN STREET AND QUEEN STREET UPGRADES
EGANVILLE, ONTARIO

FIGURE A8

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-04 - WET

BOREHOLE: 26-05 - DRY
BORING DATE: APRIL 13, 2026
DEPTH: 1.93 to 3.56 METRES BELOW GROUND SURFACE



CONSULTING ENGINEERS
AND SCIENTISTS

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EGANVILLE, ONTARIO

FIGURE A9

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-05 - DRY

BOREHOLE: 26-05 - WET
BORING DATE: APRIL 13, 2026
DEPTH: 1.93 to 3.56 METRES BELOW GROUND SURFACE



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AND SCIENTISTS

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EGANVILLE, ONTARIO

FIGURE A10

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-05 - WET

BOREHOLE: 26-06 - DRY
BORING DATE: APRIL 13, 2026
DEPTH: 1.55 to 3.20 METRES BELOW GROUND SURFACE



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TOWNSHIP OF BONNECHERE VALLEY
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EGANVILLE, ONTARIO

FIGURE A11

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-06 - DRY

BOREHOLE: 26-06 - WET
BORING DATE: APRIL 13, 2026
DEPTH: 1.55 to 3.20 METRES BELOW GROUND SURFACE



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TOWNSHIP OF BONNECHERE VALLEY
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FIGURE A12

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-06 - WET

BOREHOLE: 26-07 - DRY
BORING DATE: APRIL 10, 2026
DEPTH: 3.81 to 5.33 METRES BELOW GROUND SURFACE



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TOWNSHIP OF BONNECHERE VALLEY
JOHN STREET AND QUEEN STREET UPGRADES
EGANVILLE, ONTARIO

FIGURE A13

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-07 - DRY

BOREHOLE: 26-07 - WET
BORING DATE: APRIL 10, 2026
DEPTH: 3.81 to 5.33 METRES BELOW GROUND SURFACE



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Project

TOWNSHIP OF BONNECHERE VALLEY
JOHN STREET AND QUEEN STREET UPGRADES
EGANVILLE, ONTARIO

FIGURE A14

File No.

101260.004

ROCKCORE PHOTOGRAPH
BOREHOLE 26-07 - WET



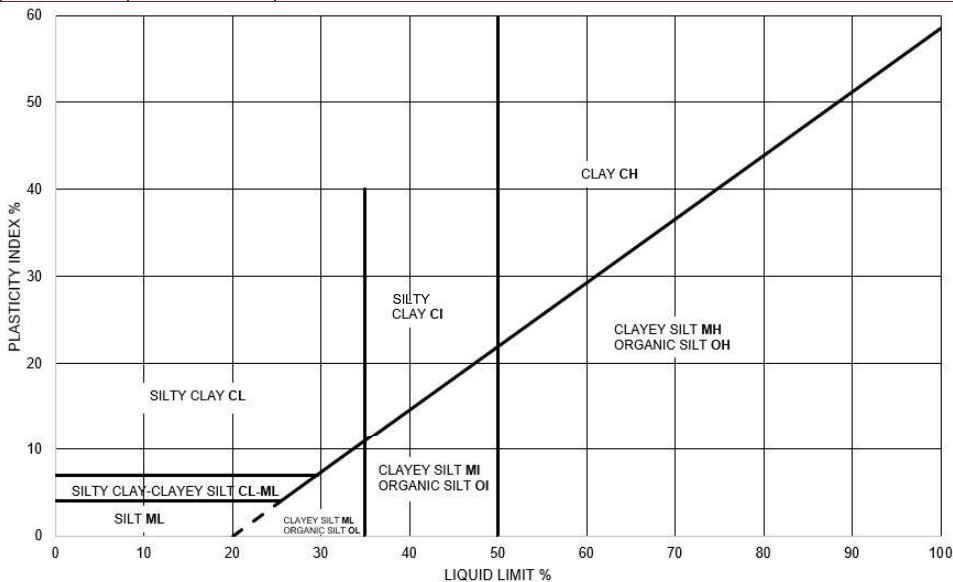
APPENDIX B

Record of Borehole Sheets
List of Abbreviations and Symbols

Method of Soil Classification

GEMTEC's Soil Classification is based on the MTC Soil Classification Manual (January 1980)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$C_u = \frac{D_{60}}{D_{10}}$	$C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$	USCS Group Symbol	Group Name		
Inorganic (Organic Content less than 30%)		Gravel (>50% of coarse fraction is > 4.75 mm)	Gravel with ≤12% fines	Poorly Graded	<4	≤1 or ≥3	GP	Gravel		
				Well Graded	≥4	1 to 3	GW	Gravel		
			Gravel with >12% fines	Below A Line	N/A		GM	Silty Gravel		
				Above A Line	N/A		GC	Clayey Gravel		
		Sand (≥50% coarse fraction is > 4.75 mm)	Sand with ≤12% fines	Poorly Graded	<6	≤1 or ≥3	SP	Sand		
				Well Graded	≥6	1 to 3	SW	Sand		
			Sand with >12% fines	Below A Line	N/A		SM	Silty Sand		
				Above A Line	N/A		SC	Clayey Sand		
			Soil Group	Type of Soil	Liquid Limit	Field Tests			USCS Group Symbol	Group Name
						Dilatancy	Thread Diameter	Toughness		
	Fine Grained Soils (≥50% is smaller than 0.075 mm)	Silts (Non-Plastic or PI and LL plot below A-Line)	<50	Rapid	>6 mm	N/A	ML	Silt		
				Slow	3 to 6 mm	None to low	ML	Clayey Silt		
				Slow to V. Slow	3 to 6 mm	Low	OL	Organic Silt		
			≥50	Slow to V. Slow	3 to 6 mm	Low to Medium	MH	Clayey Silt		
				None	1 to 3 mm	Medium to High	OH	Organic Silt		
Clays (PI and LL plot above A-Line)				Liquid Limit <35	None	~3 mm	Low to Medium	CL	Silty Clay	
		Liquid Limit 35 to 50	None	1 to 3 mm	Medium	CI	Silty Clay			
		Liquid Limit >50	None	<1 mm	High	CH	Clay			
Highly Organic (> 30%)		Peat (Amorphous or Fibrous)						PT	Peat	



Dual Symbol – Is used to indicate when soils are transitional. For coarse grained soils, it is used when the soil has between 5 and 12% fines (e.g., SP-SC, Sand to Silty Sand). For fine-grained soils it is used when the plasticity index and liquid limit values plot in the area shown in the plasticity chart on this page.

Borderline Symbol – Is used to indicate soils that are not clearly in one soil type but have similar behaviour and properties as similar materials (e.g., CL/CI or GM/SM).

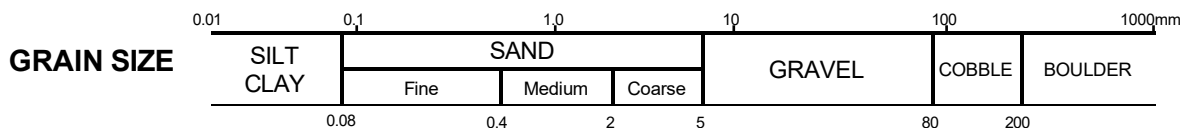
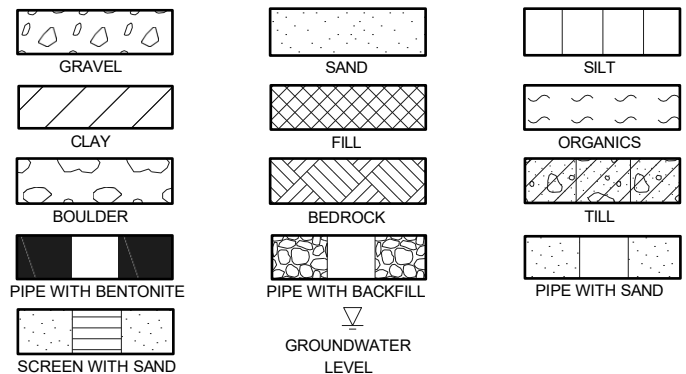
ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w _p	Plastic limit
LL, w _L	Liquid limit
C	Consolidation (oedometer) test
D _R	Relative density
DS	Direct shear test
G _s	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

PENETRATION RESISTANCE	
<p>Standard Penetration Resistance, N The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.</p>	
<p>Dynamic Penetration Resistance The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).</p>	
WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	Description	Cu, kPa	Description
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard







DESCRIPTIVE TERMINOLOGY

TRACE	SOME	ADJECTIVE	noun > 35% and main fraction
trace clay, etc	some gravel, etc.	silty, etc.	sand and gravel, etc.

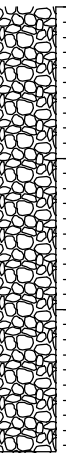
RECORD OF BOREHOLE 26-01

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 7 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	⊕ NATURAL ⊕ REMOULDED			WATER CONTENT, % Wp — W — Wl
0	Power Auger 4 1/4" Hoolow Stem Auger	Ground Surface		169.30										
		ASPHALTIC CONCRETE		169.17										
		Fill - (SP) SAND, some gravel, some silt, brown, non-cohesive, moist, compact		0.13	1	SS	390	23	○	●				
1	Rotary Drilling HQ Core	(ML) SILT, some sand, trace gravel, dark brown, non-cohesive, moist, compact		168.54										
				0.76	2	SS	180	29	○	●				
					3	SS	60	50+ for 6"						
2	Rotary Drilling HQ Core	Limestone and dolostone BEDROCK		167.47										
				1.83	4	RC	310	TCR	○	●	93% SCR = 80% RQD = 67%			
					5	RC	810	TCR	○	●	88% SCR = 46% RQD = 47%			
3		End of borehole		166.36										
				2.94										
4														
5														
6														
7														
8														
9														
10														

Backfilled with soil cuttings

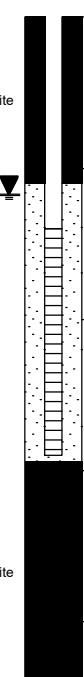


GEO - BOREHOLE LOG 101260.004 GINT_BH_LOGS_TM 2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

RECORD OF BOREHOLE 26-02

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 10 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	+ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		168.30								MH	
		ASPHALTIC CONCRETE		168.20									
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist		167.89	1	SS	430	24					
		FILL - (SP) SAND, some gravel, some silt; black, non-cohesive, moist		167.54									
1		(SP) SAND, trace silt; brown, non-cohesive, moist		167.18	2	SS	310	11					
2		(SP) gravelly, silty SAND, trace clay; brown (TILL); non-cohesive, wet, loose to compact		165.35	3	SS	180	8					
				2.95	4	SS	280	12					
3				163.93	5	RC	1219	TCR = 86% SCR = 7% ROD = 0%					
4	Rotary Drilling HQ Core	BEDROCK, highly fractured limestone and dolostone		2.95									
5		End of Borehole		4.37									
6													
7													
8													
9													
10													

GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
26/05/06	1.18	167.1
26/05/07	1.17	167.1

GEO - BOREHOLE LOG 101260.004 GINT_BH_LOGS_TM_2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26







LOGGED: J.G
 CHECKED: T.M

RECORD OF BOREHOLE 26-03

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 10 2026





DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	⊕ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		167.10								M	Backfilled with soil cuttings
		ASPHALTIC CONCRETE		166.92									
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist, loose		0.18	1	SS	370	8	●				
1	(GP) sandy, silty GRAVEL, trace clay; brown (TILL); non-cohesive, moist, compact		0.76	2	SS	380	14	●					
				166.34									
				0.76									
				165.17									
2	Rotary Drilling HQ Core	BEDROCK, limestone and dolostone		1.93									
					163.75								
				3.35									
3					4	RC	1270	TCR = 89% SCR = 39% RQD = 20%					
4		End of Borehole											
5													
6													
7													
8													
9													
10													

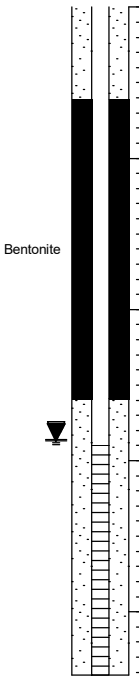
GEO - BOREHOLE LOG_101260.004_GINT_BH_LOGS_TM_2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

RECORD OF BOREHOLE 26-04

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 10 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m ○ WATER CONTENT, % W_p — W — W_L	SHEAR STRENGTH (Cu), kPa + NATURAL ⊕ REMOULDED	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm				
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		165.90							
		ASPHALTIC CONCRETE		165.75							
		FILL - (SP) silty SAND and GRAVEL; brown, non-cohesive, moist		0.15	1	SS	350	30	○	●	M
1	Power Auger 4 1/4" Hollow Stem Auger	(GP) sandy GRAVEL, some silt; brown, non-cohesive, moist, loose to compact		165.14							
				0.76	2	SS	420	4	●		
					3	SS	380	28	○	●	MH
2	Rotary Drilling HQ Core	BEDROCK, limestone and dolostone		163.77							
				2.13	4	RC	1016	TCR = 62% SCR = 12% RQD = 6%			
					5	RC	508	TCR = 80% SCR = 44% RQD = 24%			
3											
4											
5		End of Borehole		161.48							
				4.42							
6											
7											
8											
9											
10											




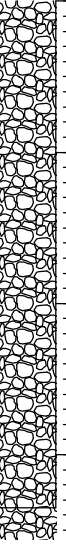

GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
26/05/06	2.86	163.0
26/05/07	2.87	163.0

GEO - BOREHOLE LOG 101260.004 GINT_BH_LOGS_TM 2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

RECORD OF BOREHOLE 26-05

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 13 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	⊕ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		162.80								M	
		ASPHALTIC CONCRETE		162.70									
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist, very dense		0.10	1	SS	440	51					
1	(GP) SAND and GRAVEL, some silt, trace clay; brown (TILL); non-cohesive, moist, loose to compact	0.91	2	SS	410	15							
2	Rotary Drilling HQ Core	BEDROCK, limestone and dolostone		160.87									
				1.93	3	SS	100	50+ for 4"					
3				160.87									
				1.93	4	RC	1524	TCR = 94% SCR = 38% RQD = 20%					
4		End of Borehole		159.24									
				3.56									
5													
6													
7													
8													
9													
10													

GEO - BOREHOLE LOG 101260.004_GINT_BH_LOGS_TM_2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

RECORD OF BOREHOLE 26-06

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 13 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m ○ WATER CONTENT, % W_p — W — W_L ⊕ NATURAL ⊖ REMOULDED	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm			
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		160.00						
		ASPHALT CONCRETE		159.90						
		FILL - (SP) gravelly SAND, some silt; brown, non-cohesive, moist, very dense		159.24	1	SS	410	67	○	●
1		(GP) SAND and GRAVEL, some silt, trace clay; brown (TILL); non-cohesive, moist, very dense		158.45	2	SS	410	85	○	●
2	Rotary Drilling HQ Core	BEDROCK, limestone and dolostone		158.45						
					156.80	3	RC	1575	TCR = 95% SCR = 49% RQD = 38%	
3		End of Borehole		156.80						
4				3.20						
5										
6										
7										
8										
9										
10										


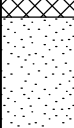


GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
26/05/06	1.09 ▽	158.9
26/05/07	1.10 ▽	158.9

GEO - BOREHOLE LOG_101260.004_GINT_BH_LOGS_TM_2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

RECORD OF BOREHOLE 26-07

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 10 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	+ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		165.40									
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist, loose				1	SS	350	7	●	○		
1		(SP) SAND, some gravel, some silt; brown; non-cohesive, moist, compact		164.64 0.76									
					2	SS	480	11	●				
2	Rotary Drilling HQ Core	(SP) SILT and SAND, trace gravel, trace clay; brown (TILL); non-cohesive, moist, loose to compact		163.88 1.52									
					3	SS	400	5	●				
					4	SS	210	5	●				
3					5	SS	300	16	●	○			
4		BEDROCK, limestone and dolostone		161.59 3.81									
5					6	RC	1448	TCR = 95% SCR = 65% RQD = 60%					
6		End of Borehole		160.07 5.33									
7													
8													
9													
10													

Backfilled with soil cuttings




M

GEO - BOREHOLE LOG, 101260.004, GINT, BH, LOGS, TM, 2026-04-21, GPJ, GEMTEC, 2018, GDT, 6/9/26

RECORD OF BOREHOLE 26-08

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 8 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	⊕ NATURAL ⊕ REMOULDED	WATER CONTENT, % Wp — W — Wl			
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		172.00											
		ASPHALT CONCRETE		171.87											
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist, compact to very dense		0.13	1	SS	310	18		●					
1					2	SS	220	57							
		(GP) silty SAND and GRAVEL, trace clay; brown (TILL); non-cohesive, moist, loose to dense		170.48	3	SS	430	11		●					
2				1.52	4	SS	570	12		●					
3					5	SS	610	49		○				MH	
4				6	SS	610	46		●						
5		(SP) gravelly SILT and SAND, trace clay; brown (TILL); non-cohesive, moist, loose to dense		167.43	7	SS	610	46		○				M	
		End of Borehole		166.82											
				5.18											
6															
7															
8															
9															
10															



GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
26/05/06	1.93	170.1
26/05/07	1.94	170.1

GEO - BOREHOLE LOG, 101260.004, GINT, BH, LOGS, TM, 2026-04-21, GPJ, GEMTEC, 2018, GDT, 6/9/26

RECORD OF BOREHOLE 26-09

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 8 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	+ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		173.90								MH	
		ASPHALT CONCRETE		173.80									
		FILL - (SP) gravelly, silty SAND, trace clay; brown, non-cohesive, moist, dense to very dense		0.10	1	SS	330	47	○	●			
1					2	SS	420	95	○		●		
		(SP) SILT and SAND, some gravel, trace clay; brown (TILL); non-cohesive, moist, compact to very dense		1.52	3	SS	450	71			●		
2					4	SS	570	17	○	●			
3					5	SS	610	28			●		
4				6	SS	560	56			●			
5				7	SS	610	74			●			
5.18		End of Borehole		168.72							M	Backfilled with soil cuttings	
6													
7													
8													
9													
10													

GEO - BOREHOLE LOG, 101260.004, GINT, BH, LOGS, TM, 2026-04-21, GPJ, GEMTEC, 2018, GDT, 6/9/26

RECORD OF BOREHOLE 26-10

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 9 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● PENETRATION RESISTANCE (N), BLOWS/0.3m	⊕ NATURAL ⊕ REMOULDED		
0	Power Auger 4 1/4" Hooplow Stem Auger	Ground Surface		174.20								M	
		ASPHALT CONCRETE		174.10									
		FILL - (SP) SILT and SAND, some gravel; brown, non-cohesive, moist, compact to dense	0.10	1	SS	330	38		○	●			
1				2	SS	480	17		○	●			
		(SP) SAND, some gravel, some silt, trace clay; brown (TILL); non-cohesive, moist, compact to very dense	172.68										
			1.52	3	SS	520	14			●			
2				4	SS	240	77				●		
3				5	SS	440	77				●		
4			6	SS	610	53		○	●				
5			7	SS	540	50			●				
6			8	SS	540	56			●				
6		End of Borehole											
				168.26									
				5.94									
7													
8													
9													
10													

GEO - BOREHOLE LOG, 101260.004, GINT, BH, LOGS, TM, 2026-04-21, GPJ, GEMTEC, 2018, GDT, 6/9/26

RECORD OF BOREHOLE 26-11

CLIENT: Township of Bonnechere Valley
 PROJECT: Geotechnical, Hydrogeological and Environmental Services, John Street and Queen Street Upgrades, Eganville, ON
 JOB#: 101260.004
 LOCATION: See Borehole Location Plan, Figure 1

SHEET: 1 OF 1
 DATUM: CGVD28
 BORING DATE: Apr 9 2026

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	● NATURAL ⊕ REMOULDED	WATER CONTENT, % W _p W W _L		
0	Power Auger 4 1/4" Hollow Stem Auger	Ground Surface		174.70									
		ASPHALT CONCRETE		174.60									
		FILL - (SP) SAND, some gravel, some silt; brown, non-cohesive, moist, compact to very dense		0.10	1	SS	290	51		●			
1					2	SS	510	24		●			
		(SP) SILT and SAND, some gravel, trace clay; brown, with cobbles and boulders (TILL); non-cohesive, moist, compact to very dense		173.18	1.52	3	SS	250	26	○	●		
2					4	SS	220	50+ for 4"	○				
3			(GP) sandy GRAVEL, some silt, trace clay; brown, with cobbles and boulders (TILL); non-cohesive, moist, compact to very dense		171.65	3.05	5	SS	420	50+ for 2"			
4					6	SS	0	50		●			
5				7	SS	280	63		●				
6				8	SS	380	90			●			
6		End of Borehole		168.76	5.94								
7													
8													
9													
10													

GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
26/05/06	5.79	168.9
26/05/07	5.92	168.8

GEO - BOREHOLE LOG_101260.004_GINT_BH_LOGS_TM_2026-04-21.GPJ GEMTEC 2018.GDT 6/9/26

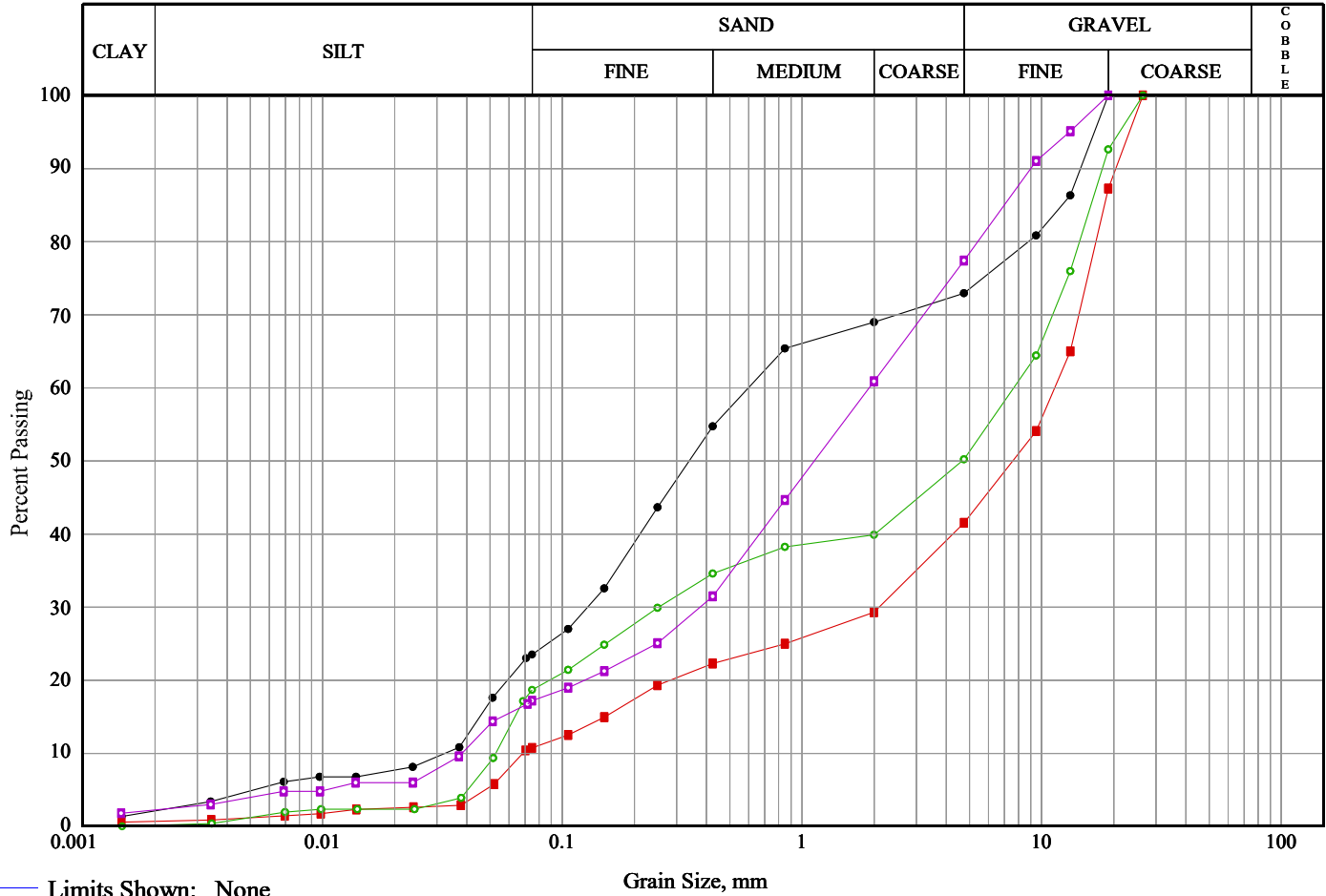


LOGGED: J.G
 CHECKED: T.M



APPENDIX C

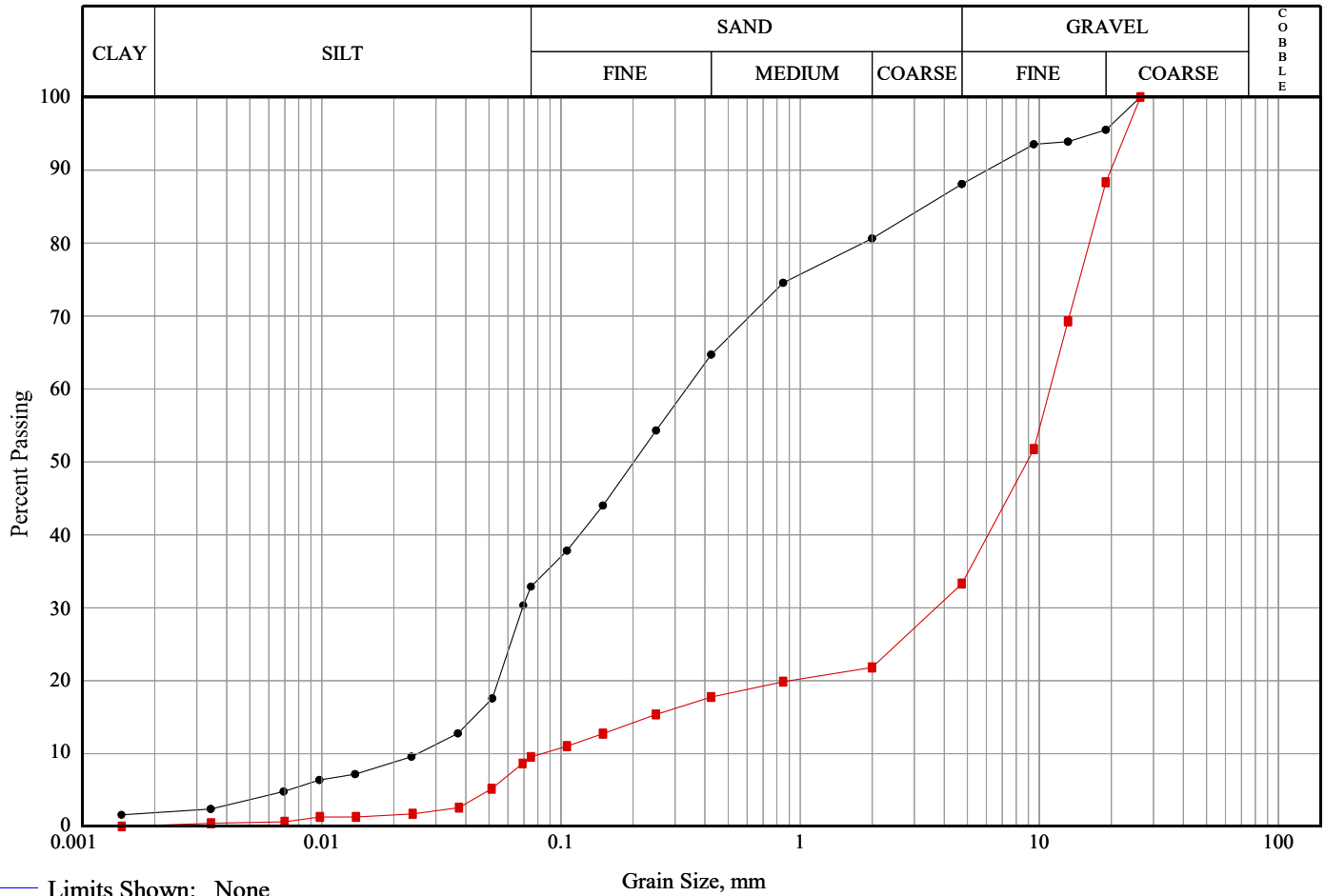
Soil Classification Testing Results

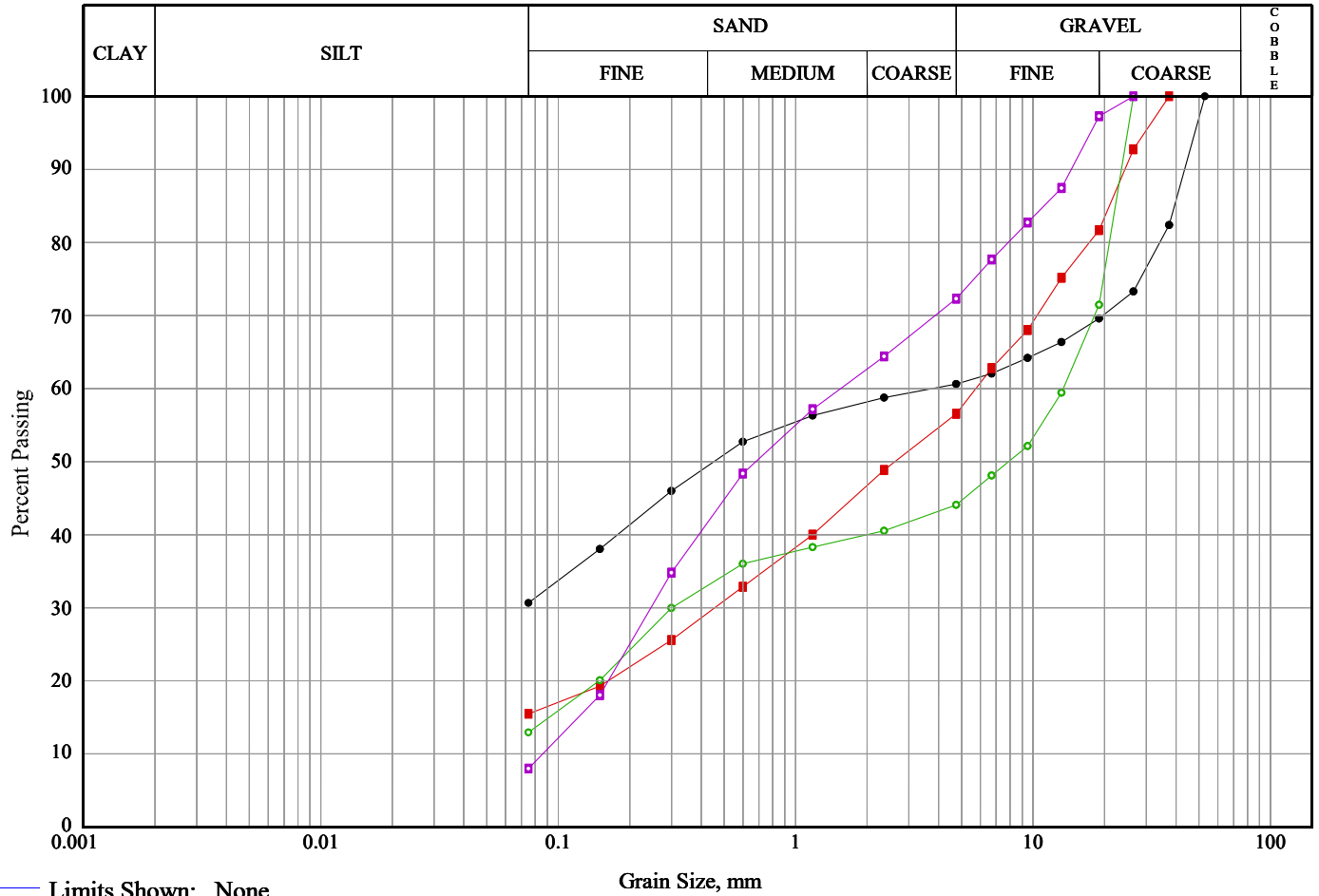


Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—		26-02	3		27.1	49.4	21.4	2.1
—■—		26-04	3		58.5	30.8	10.0	0.7
—○—		26-08	5		49.8	31.5	18.5	0.1
—□—		26-09	1		22.6	60.2	14.9	2.2

Line Symbol	USCS Classification	USCS Symbol	D ₁₀	D ₁₅	D ₃₀	D ₅₀	D ₆₀	D ₈₅	% 5-75µm
—●—		N/A	0.033	0.045	0.13	0.34	0.60	12.20	21.4
—■—		N/A	0.069	0.151	2.10	7.59	11.36	18.32	10.0
—○—		N/A	0.053	0.064	0.25	4.67	7.66	16.09	18.5
—□—		N/A	0.038	0.056	0.38	1.13	1.91	7.00	14.9

Note: More information available upon request



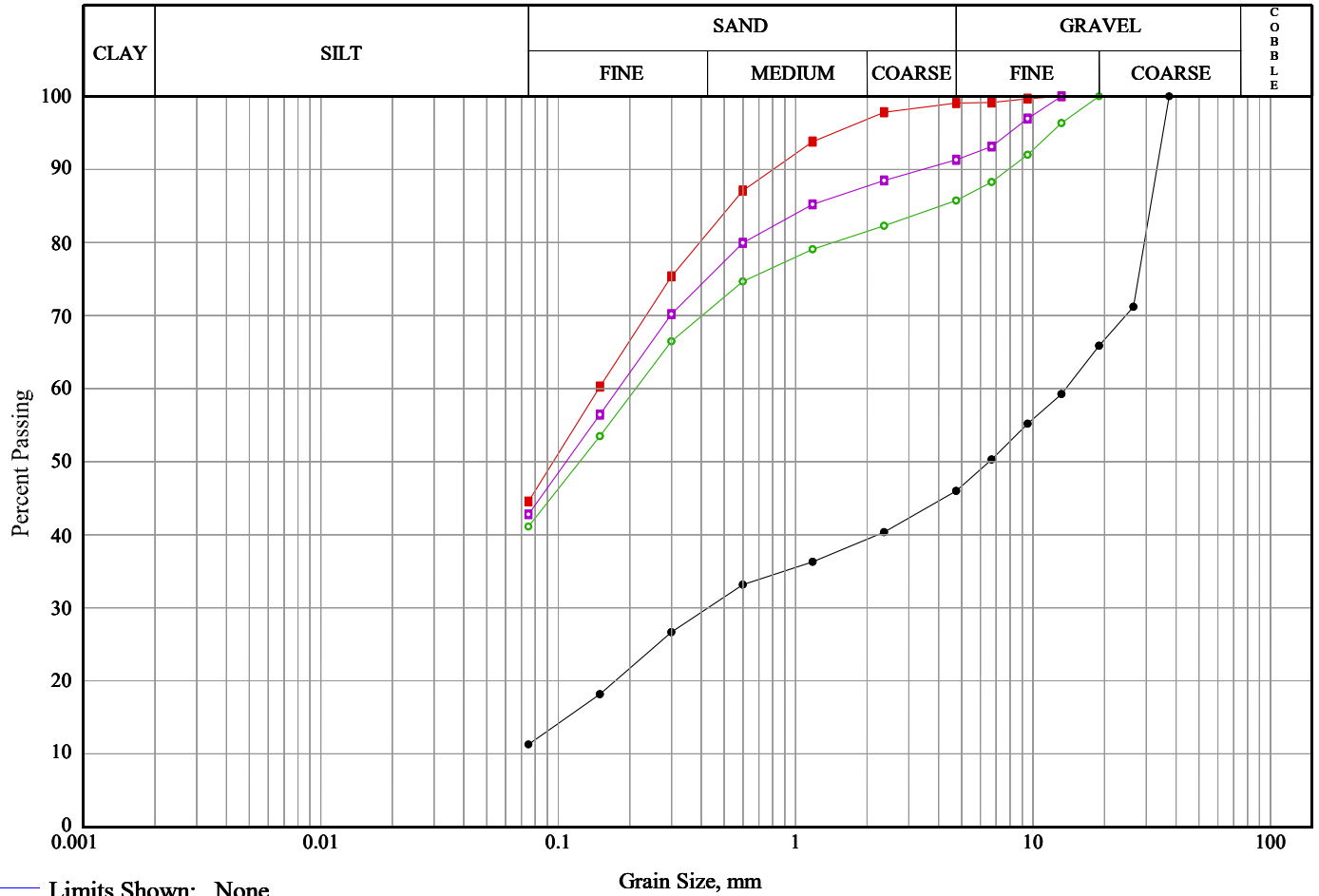


— Limits Shown: None

Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—		26-03	2	0.76-1.37	39.4	30.0	30.6	
—■—		26-04	1	0.15-0.61	43.5	41.1	15.4	
—○—		26-05	2B	0.76-1.37	55.9	31.2	12.9	
—□—		26-06	1	0.10-0.61	27.7	64.3	8.0	

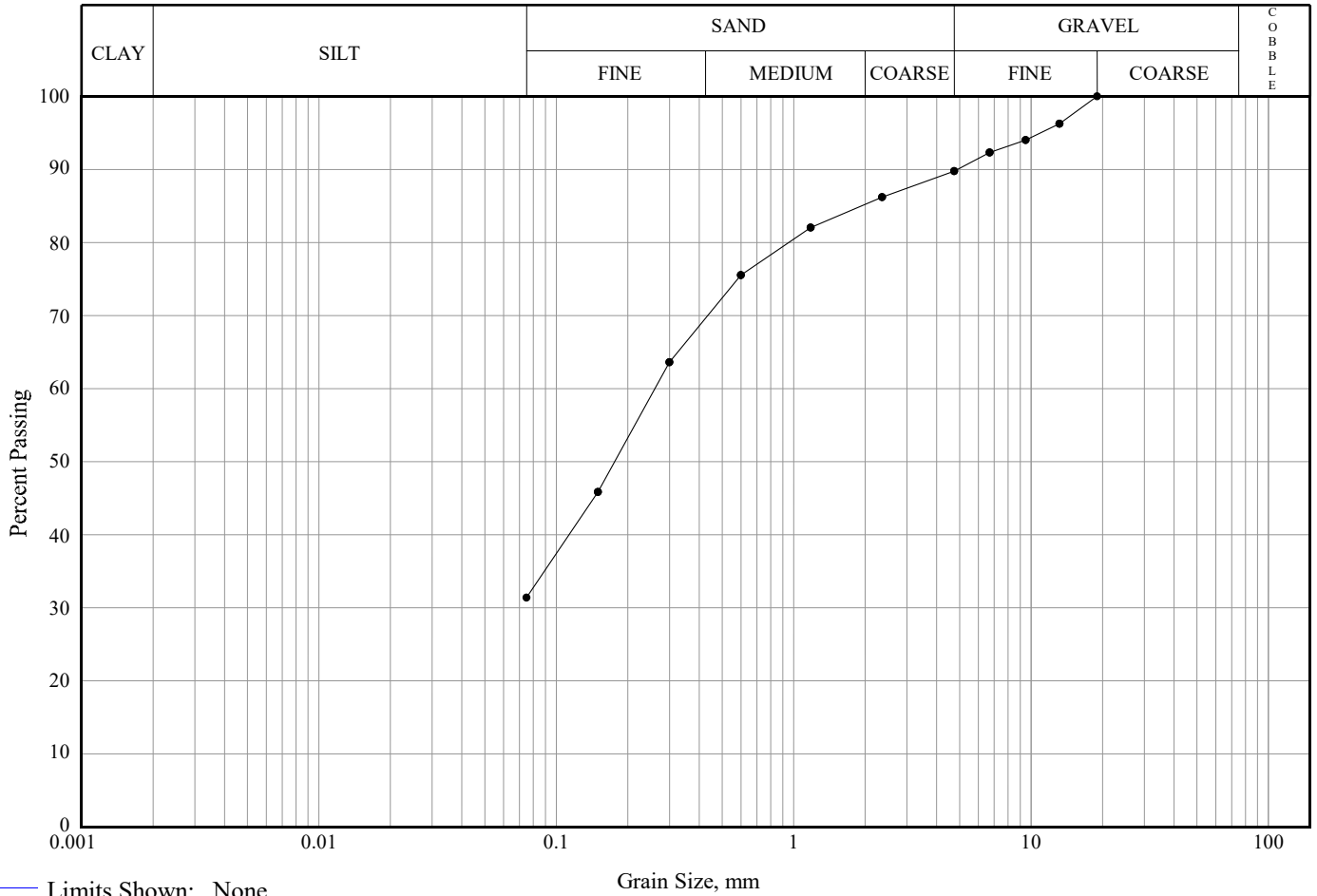
Line Symbol	USCS Classification	USCS Symbol	D ₁₀	D ₁₅	D ₃₀	D ₅₀	D ₆₀	D ₈₅	% 5-75µm
—●—		N/A	---	---	---	0.45	3.77	39.48	---
—■—		N/A	---	---	0.46	2.62	5.75	20.99	---
—○—		N/A	---	0.092	0.30	7.90	13.43	22.25	---
—□—		N/A	0.086	0.122	0.25	0.68	1.55	11.13	---

Note: More information available upon request



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—		26-06	2	0.76-1.37	54.0	34.7	11.3	
—■—		26-07	5	3.05-3.66	0.9	54.5	44.5	
—○—		26-08	7	4.57-5.18	14.3	44.6	41.1	
—□—		26-09	4	2.29-2.90	8.7	48.5	42.8	

Line Symbol	USCS Classification	USCS Symbol	D ₁₀	D ₁₅	D ₃₀	D ₅₀	D ₆₀	D ₈₅	% 5-75µm
—●—		N/A	---	0.109	0.43	6.55	13.77	31.30	---
—■—		N/A	---	---	---	0.10	0.15	0.53	---
—○—		N/A	---	---	---	0.12	0.21	4.10	---
—□—		N/A	---	---	---	0.11	0.18	1.15	---



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—		26-10	2	0.76-1.37	10.2	58.4	31.4	

Line Symbol	USCS Classification	USCS Symbol	D ₁₀	D ₁₅	D ₃₀	D ₅₀	D ₆₀	D ₈₅	% 5-75µm
—●—		N/A	---	---	---	0.18	0.26	1.93	---



Client: Township of Bonnechere Valley
Project: Geotechnical, Hydrogeological and Environmental Services, John Street upgrades, E
Project #: 101260004

Rock Core Compressive Strength

Date/Time Sampled: 26/05/01 10:11:38 AM Date/Time Tested: 26/05/01 10:11:38 AM

BH	Sample No	Depth	Description	Diameter, mm	Area, mm ²	Length After Capping, mm	L/D	Load, kN	Comp. Str., MPa
26-01	RC1	1.93-2.13		63.3	3147	122	1.92	323.240	102.1
26-03	RC1	2.99-3.17		63.3	3147	121	1.92	226.310	71.5
26-05	RC1	2.41-2.59		63.4	3157	120	1.90	417.090	131.3
26-07	RC1	5.05-5.33		63.3	3147	123	1.94	240.060	75.8



APPENDIX D

Chemical Analysis of Soil and Water Samples Relating to Corrosion
Paracel Laboratories Ltd. Order # 2619378 & #2619482

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Tim Meighen

Client PO:
Project: 101260.004
Custody:

Report Date: 13-May-2026
Order Date: 6-May-2026

Order #: 2619378

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
2619378-01	BH26-08 SA3
2619378-02	BH26-11 SA3

Approved By:

A. Tirca

Adriana Tirca, B.Eng (Chem)

Supervisor

Certificate of Analysis

Report Date: 13-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 6-May-2026

Client PO:

Project Description: 101260.004

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	Ottawa	12-May-26	12-May-26
Conductivity	MOE E3138 - probe @25 °C, water ext	Ottawa	11-May-26	11-May-26
pH, soil	MOE E3137 - probe @25 °C, CaCl2 ext	Ottawa	8-May-26	8-May-26
Resistivity	EPA 120.1 - probe, water extraction	Ottawa	11-May-26	11-May-26
Solids, %	CWS Tier 1 - Gravimetric		8-May-26	11-May-26

Certificate of Analysis

Report Date: 13-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 6-May-2026

Client PO:

Project Description: 101260.004

Client ID:	BH26-08 SA3	BH26-11 SA3	-	-	
Sample Date:	06-May-26 09:00	06-May-26 09:00	-	-	-
Sample ID:	2619378-01	2619378-02	-	-	-
Matrix:	Soil	Soil	-	-	-
MDL/Units					

Physical Characteristics

% Solids	0.1 % by Wt.	89.7	94.8	-	-	-
----------	--------------	------	------	---	---	---

General Inorganics

Conductivity	5 uS/cm	1130	143	-	-	-
pH	0.05 pH Units	7.82	7.95	-	-	-
Resistivity	0.1 Ohm.m	8.9	69.7	-	-	-

Anions

Chloride	10 ug/g	634	19	-	-	-
Sulphate	10 ug/g	28	<10	-	-	-

Certificate of Analysis

Report Date: 13-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 6-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	10	ug/g					
Sulphate	ND	10	ug/g					
General Inorganics								
Conductivity	ND	5	uS/cm					
Resistivity	ND	0.1	Ohm.m					

Certificate of Analysis

Report Date: 13-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 6-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	625	10	ug/g	600			4.1	35	
Sulphate	61.9	10	ug/g	60.0			3.2	35	
General Inorganics									
Conductivity	193	5	uS/cm	192			0.2	5	
pH	6.95	0.05	pH Units	7.00			0.7	2.3	
Resistivity	51.9	0.1	Ohm.m	52.0			0.2	20	
Physical Characteristics									
% Solids	81.0	0.1	% by Wt.	81.5			0.6	25	

Certificate of Analysis

Report Date: 13-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 6-May-2026

Client PO:

Project Description: **101260.004**

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	695	10	ug/g	600	94.7	82-118			
Sulphate	163	10	ug/g	60.0	103	80-120			

Certificate of Analysis

Report Date: 13-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 6-May-2026

Client PO:

Project Description: 101260.004

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
T: 1-800-749-1947
F: paracel@paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Gemtec
Project Reference: 101260004
Contact Name: Tim Mcighen
Quote #
Address: 32 Steacie Drive, Ottawa, Ontario, K2K 2A9
PO #
Telephone: 813-836-1422
Email Address: timothy.mcighen@gemtec.ca

Turnaround Time:
 1 Day 3 Day
 2 Day Regular
Date Required:

Criteria: O. Reg. 153/04 (As Amended) Table RSC Filing O. Reg. 558/00 PWQO CCME SUB (Storm) SUB (Sanitary) Municipality: Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Parcel Order Number:		Required Analyses														
Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken		Chloride	pH/SO4	Elec. Conductivity	Elec. Resistivity						
					Date	Time										
1	BH 26-08 SA3	S		1	May 6 26	AM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	BH 26-11 SA3	S		1	May 6 26	AM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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5							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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10							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: _____ Method of Delivery: Walker

Relinquished By (Sign): <i>KNS</i>	Received by Driver/Depot: <i>15 16 28</i>	Received at Lab: <i>WTS</i>	Verified By: <i>[Signature]</i>
Relinquished By (Print): <i>Karel Nal</i>	Date/Time: <i>May 6/26</i>	Date/Time: <i>2016/05/26 12:26</i>	Date/Time: <i>7/16/1909</i>
Date/Time: <i>May 6 26 4:02 PM</i>	Temperature: <i>21.9 °C</i>	Temperature: <i>18.8 °C</i>	pH Verified [] By: _____

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Andrius Paznekas

Client PO:
Project: 101260.004
Custody: 80265

Report Date: 14-May-2026
Order Date: 7-May-2026

Order #: 2619482

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
2619482-01	MW26-04-G
2619482-02	MW26-02-G

Approved By:



Adriana Tirca, B.Eng (Chem)

Supervisor

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	Ottawa	13-May-26	13-May-26
Conductivity	EPA 9050A- probe @25 °C	Ottawa	9-May-26	9-May-26
pH	SM 4500-H+	Ottawa	9-May-26	9-May-26
Resistivity	EPA 120.1 - probe	Ottawa	9-May-26	9-May-26

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04-G	MW26-02-G	-	-	
Sample Date:	07-May-26 12:00	07-May-26 15:00	-	-	-
Sample ID:	2619482-01	2619482-02	-	-	-
Matrix:	Ground Water	Ground Water	-	-	-
MDL/Units					

General Inorganics

Conductivity	5 uS/cm	1870	2970	-	-	-	-
pH	0.1 pH Units	7.6	7.6	-	-	-	-
Resistivity	0.01 Ohm.m	5.35	3.37	-	-	-	-

Anions

Chloride	1 mg/L	379	774	-	-	-	-
Sulphate	1 mg/L	33	47	-	-	-	-

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Conductivity	ND	5	uS/cm					
Resistivity	ND	0.01	Ohm.m					

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	102	1	mg/L	101			1.2	20	
Sulphate	29.6	1	mg/L	29.7			0.6	10	
General Inorganics									
Conductivity	334	5	uS/cm	334			0.1	5	
pH	7.6	0.1	pH Units	7.6			0.0	3.3	
Resistivity	29.9	0.01	Ohm.m	29.9			0.1	20	

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	112	1	mg/L	101	103	70-124			
Sulphate	38.8	1	mg/L	29.7	90.6	74-126			

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



ent Blvd.
KTG-4JB
labs.com
com

Parcel Order Number
(Lab Use Only)

2619482

Chain Of Custody

(Lab Use Only)

No 80265

Client Name: <u>Genfee</u>	Project Ref: <u>101260.004</u>	Page <u>1</u> of <u>1</u>
Contact Name: <u>A. Paznekas</u>	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Address:	PO #:	
Telephone: <u>613-295-8425</u>	E-mail: <u>daniel.cox@genfee.ca</u> <u>andrus.paznekas@genfee.ca</u>	Date Required: _____

<input type="checkbox"/> REG 153/04 <input type="checkbox"/> REG 406/19	Other Regulation <input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> MISA <input type="checkbox"/> SU - Sani <input type="checkbox"/> SU - Storm Mun: _____ <input type="checkbox"/> Other: _____	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis									
<input type="checkbox"/> Table 1 <input type="checkbox"/> Agri/Other <input type="checkbox"/> Med/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Res/Park <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Table _____ For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No												
Sample ID/Location Name		Matrix	Air Volume	# of Containers	Field Filtered	Sample Taken		Conductivity	pH	Resistivity	Chloride	Sulfate
						Date	Time					
1	MW26-04-6	GW		1	N	May 7, 2026	12pm	X	X	X	X	X
2	MW26-02-6	GW		1	N	May 7, 2026	3pm	X	X	X	X	X
3												
4												
5												
6												
7												
8												
9												
10												

Comments: _____

Method of Delivery: Walk In

Unless otherwise negotiated by the parties, by signing Paracel's Chain of Custody form, you are agreeing to Paracel Laboratories Terms and Conditions and are subject to the terms and conditions thereof. Available at www.paracellabs.com

Relinquished By (Sign): <u>[Signature]</u>	Received at Depot: <u>OB 1659</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>LITJ</u>
Relinquished By (Print): <u>Daniel Cox</u>	Date/Time: <u>May 7/26</u>	Date/Time: <u>08/05/2026 10:51</u>	Date/Time: <u>08/05/26 13:05</u>
Date/Time: <u>May 7, 2026 - 5pm</u>	Temperature: <u>13.1</u> °C	Temperature: <u>1.2</u> °C	pH Verified: <input type="checkbox"/> By: <u>NA</u>



APPENDIX E

Hydraulic Conductivity and Dewatering Calculations and Equations

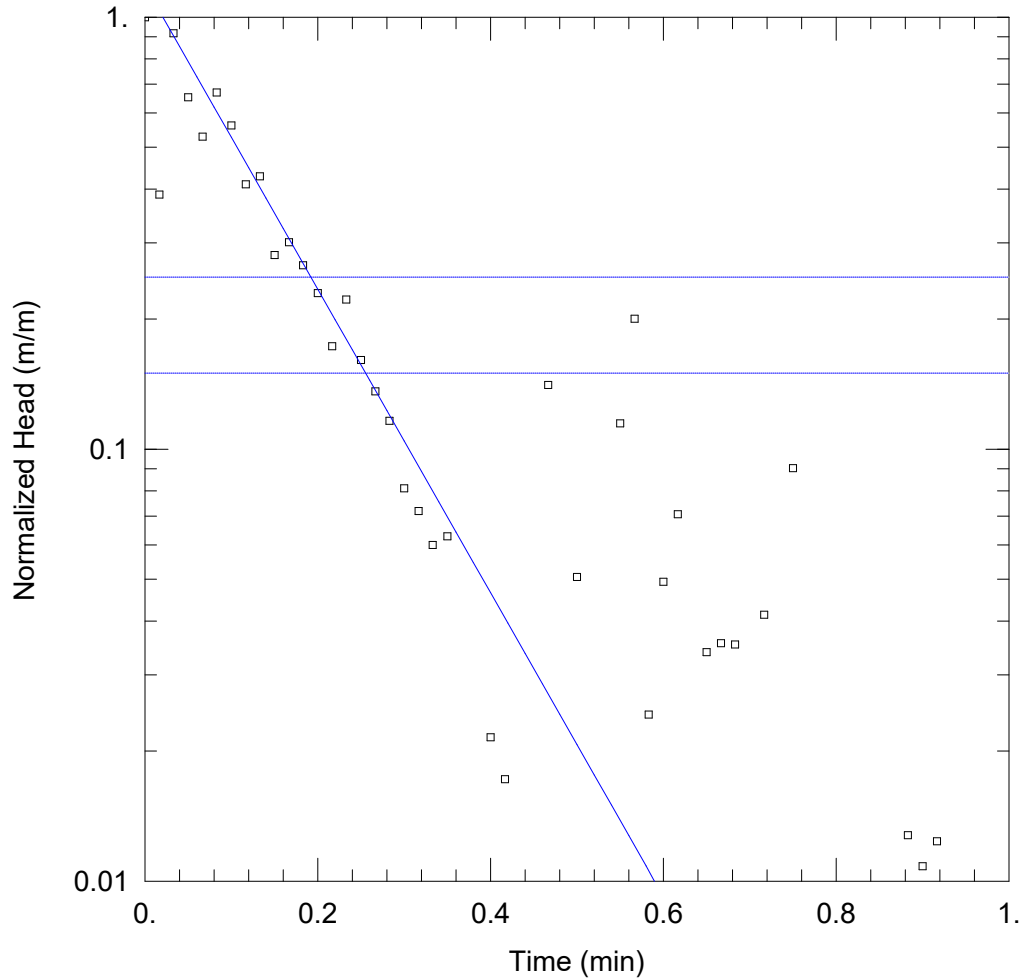
MW26-02: Falling Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-07

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 0.00013$ m/sec $y_0 = 0.71$ m

AQUIFER DATA

Saturated Thickness: 1.78 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-02)

Initial Displacement: 0.6 m

Static Water Column Height: 1.78 m

Total Well Penetration Depth: 1.78 m

Screen Length: 1.78 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

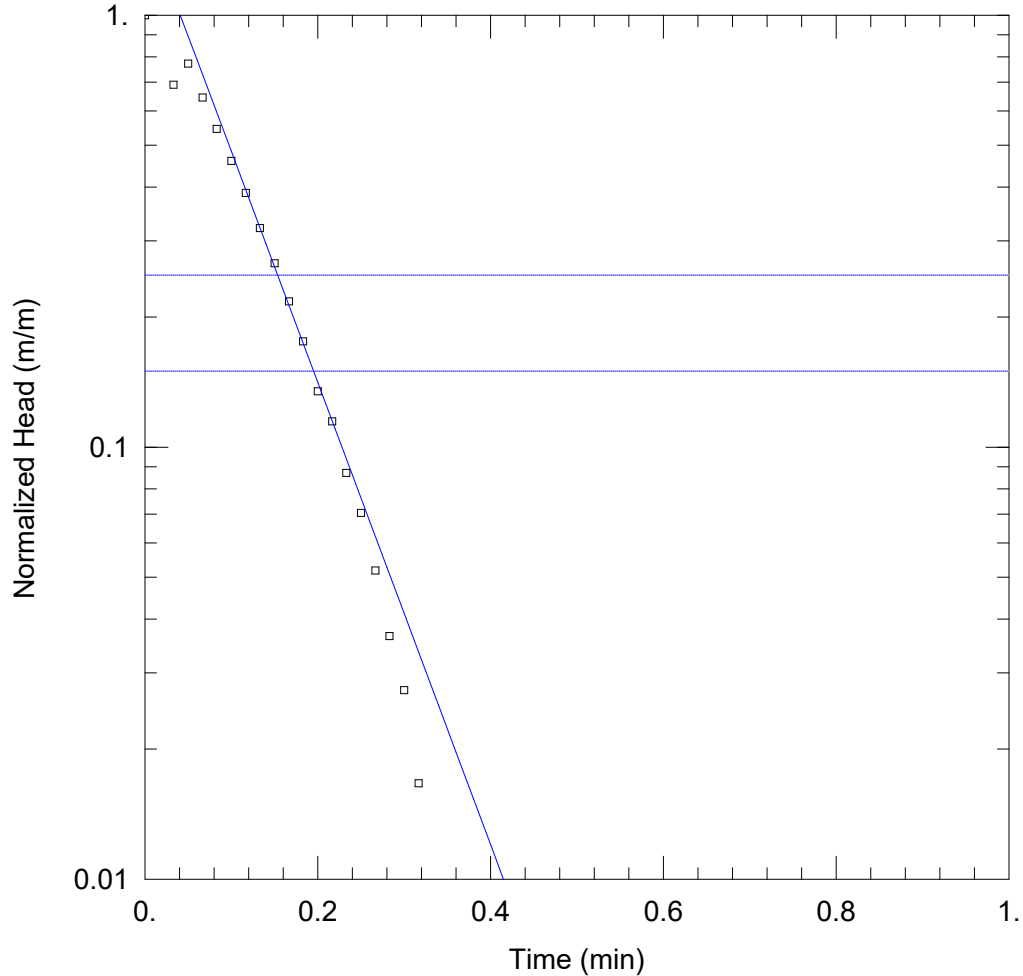
MW26-02: Rising Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-07

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 0.00020$ m/sec $y_0 = 0.99$ m

AQUIFER DATA

Saturated Thickness: 1.78 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-02)

Initial Displacement: 0.6 m

Static Water Column Height: 1.78 m

Total Well Penetration Depth: 1.78 m

Screen Length: 1.78 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

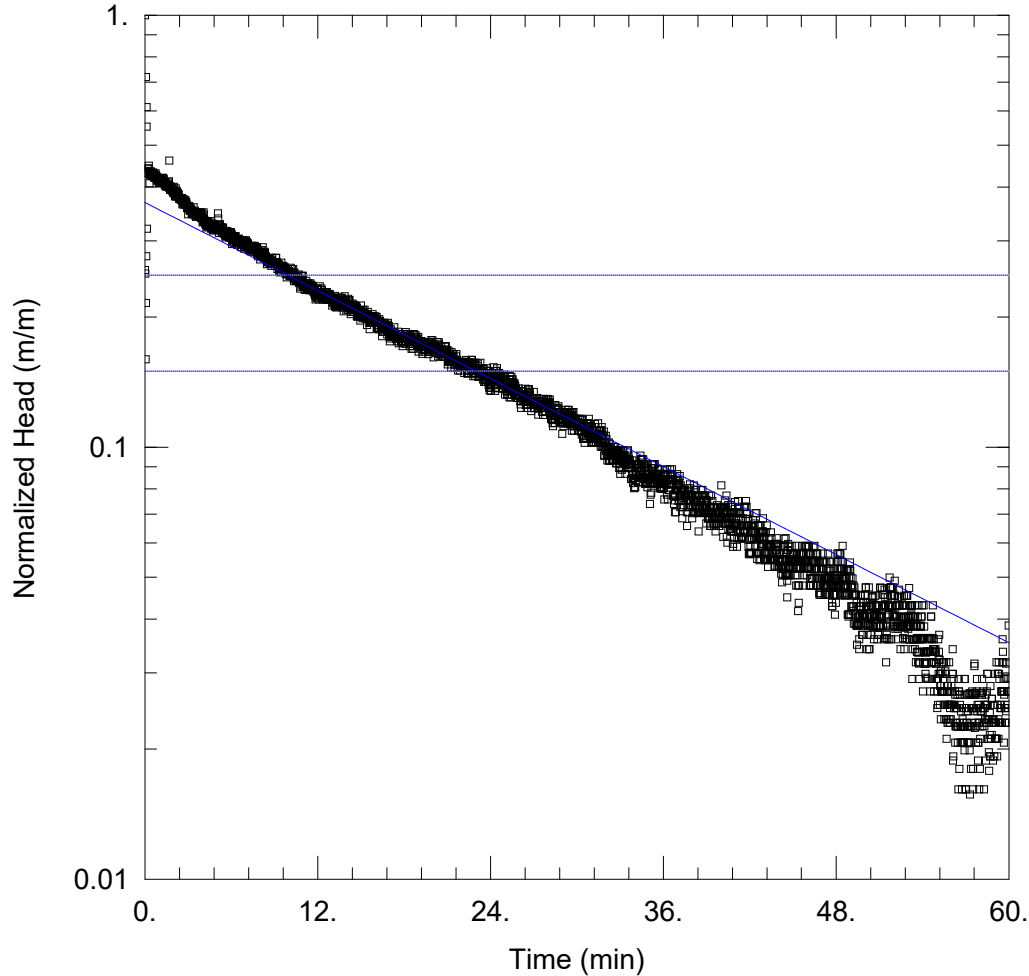
MW26-04: Falling Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-07

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 7.2E-7$ m/sec $y_0 = 0.15$ m

AQUIFER DATA

Saturated Thickness: 1.55 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-04)

Initial Displacement: 0.4 m

Static Water Column Height: 1.55 m

Total Well Penetration Depth: 1.55 m

Screen Length: 1.55 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

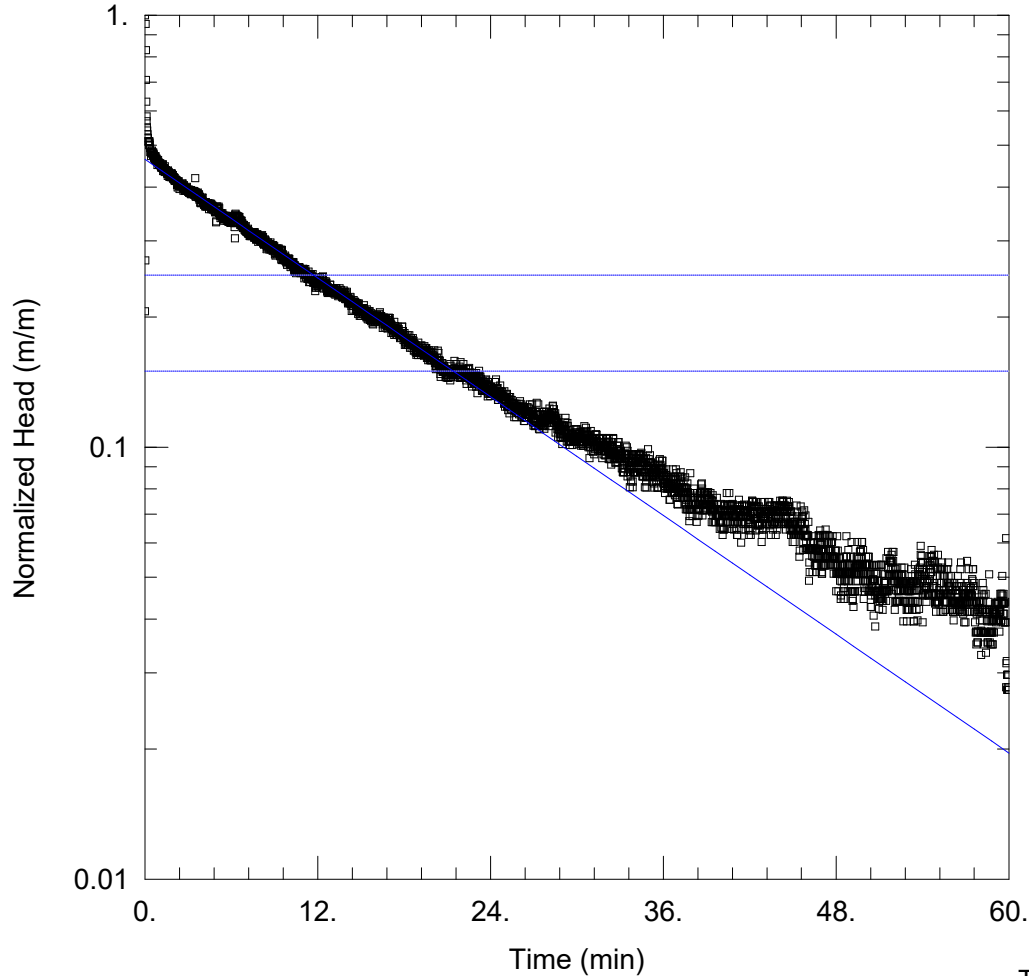
MW26-04: Rising Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 9.7E-7$ m/sec $y_0 = 0.19$ m

AQUIFER DATA

Saturated Thickness: 1.55 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-04)

Initial Displacement: 0.4 m

Static Water Column Height: 1.55 m

Total Well Penetration Depth: 1.55 m

Screen Length: 1.55 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

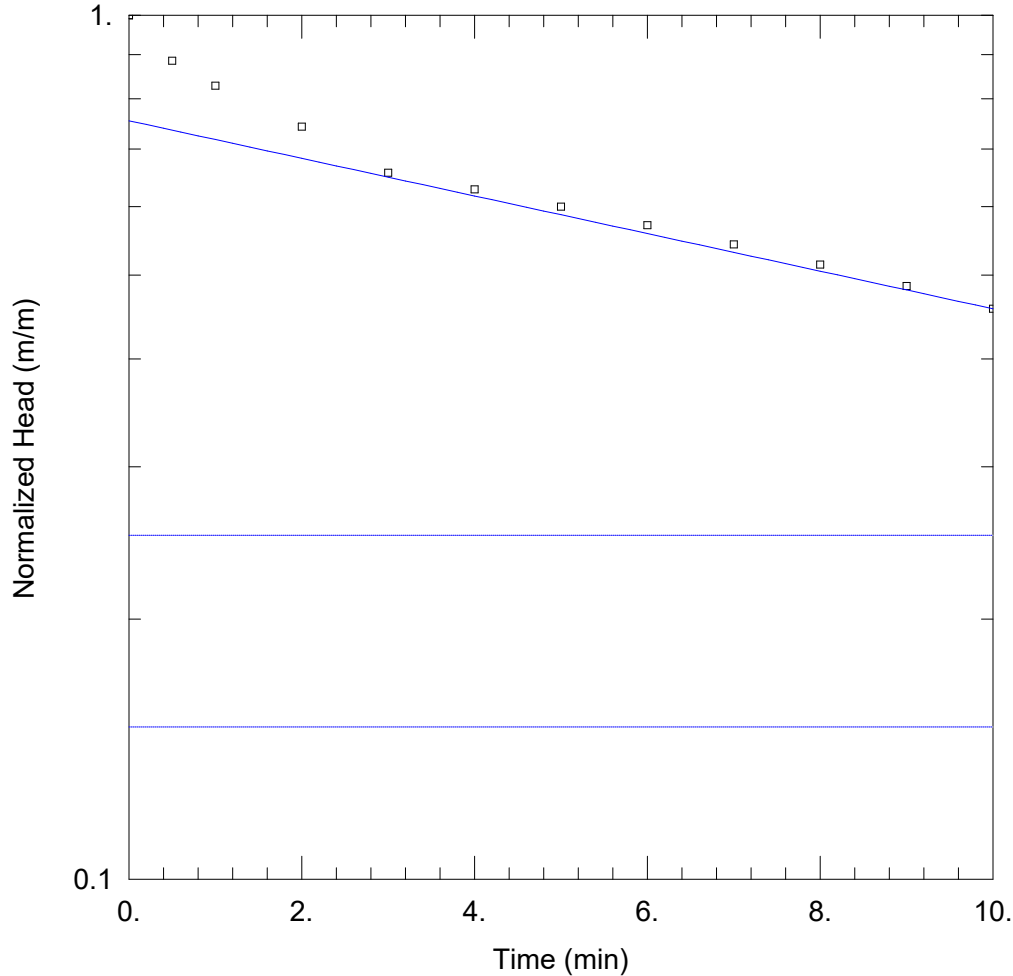
MW26-06: Purge & Recovery Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-06

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 3.2E-6$ m/sec $y_0 = 0.26$ m

AQUIFER DATA

Saturated Thickness: 0.45 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-06)

Initial Displacement: 0.35 m

Static Water Column Height: 0.45 m

Total Well Penetration Depth: 0.45 m

Screen Length: 0.45 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

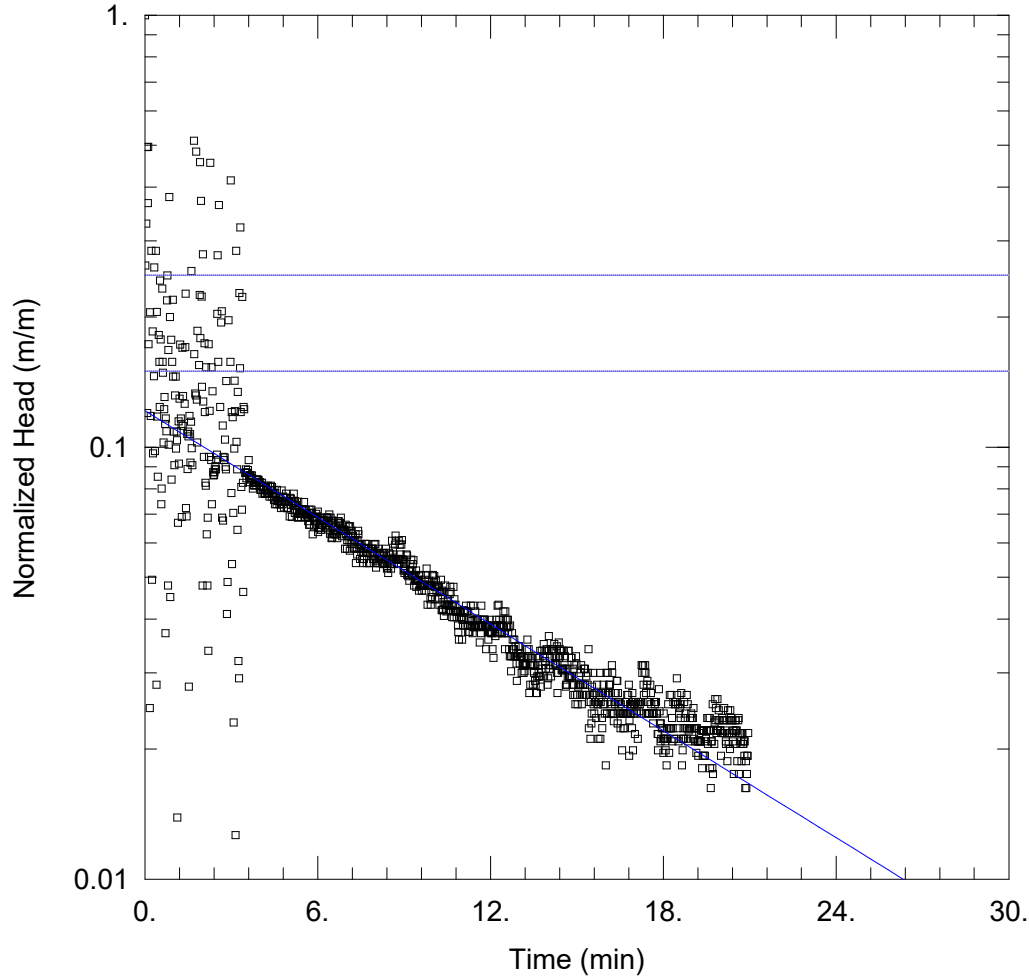
MW26-08: Falling Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-07

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 8.3E-7$ m/sec $y_0 = 0.073$ m

AQUIFER DATA

Saturated Thickness: 3.25 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-08)

Initial Displacement: 0.6 m

Static Water Column Height: 3.25 m

Total Well Penetration Depth: 3.25 m

Screen Length: 3.25 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

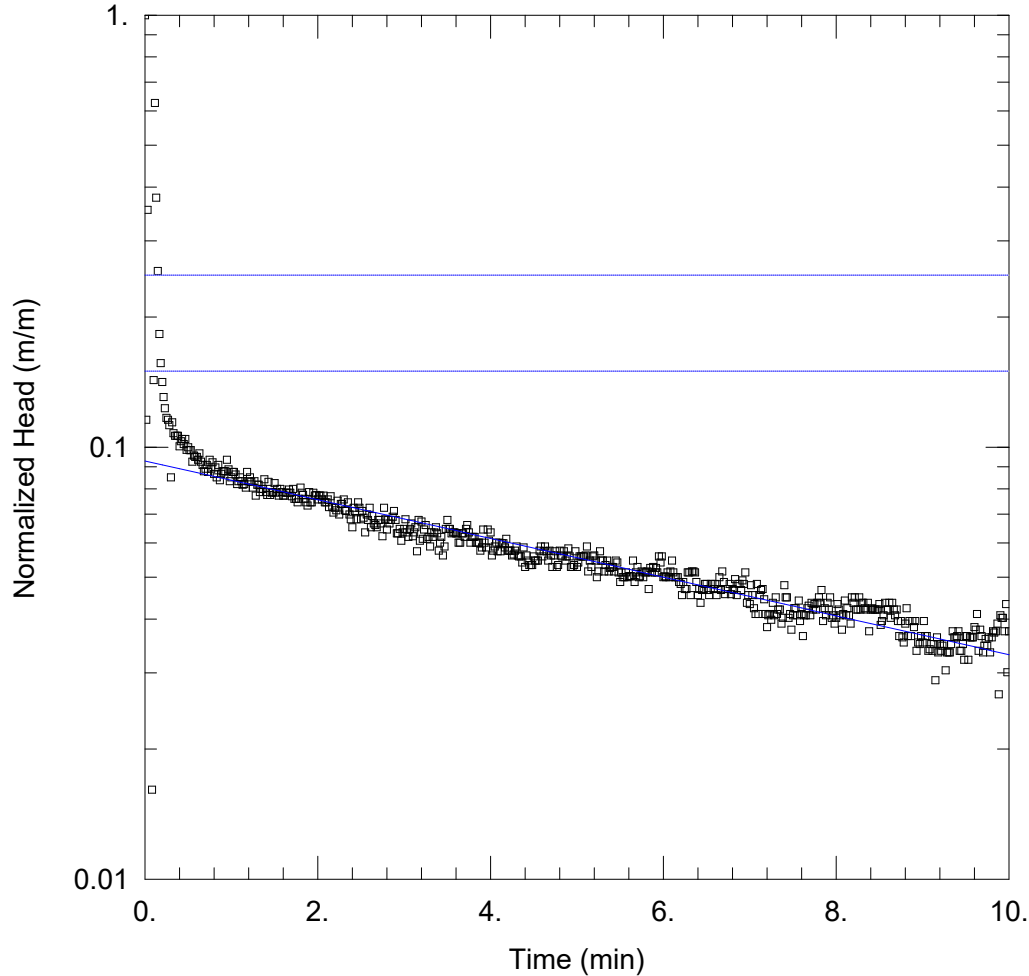
MW26-08: Rising Head Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-07

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 9.0E-7$ m/sec $y_0 = 0.056$ m

AQUIFER DATA

Saturated Thickness: 3.25 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-08)

Initial Displacement: 0.6 m

Static Water Column Height: 3.25 m

Total Well Penetration Depth: 3.25 m

Screen Length: 3.25 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3

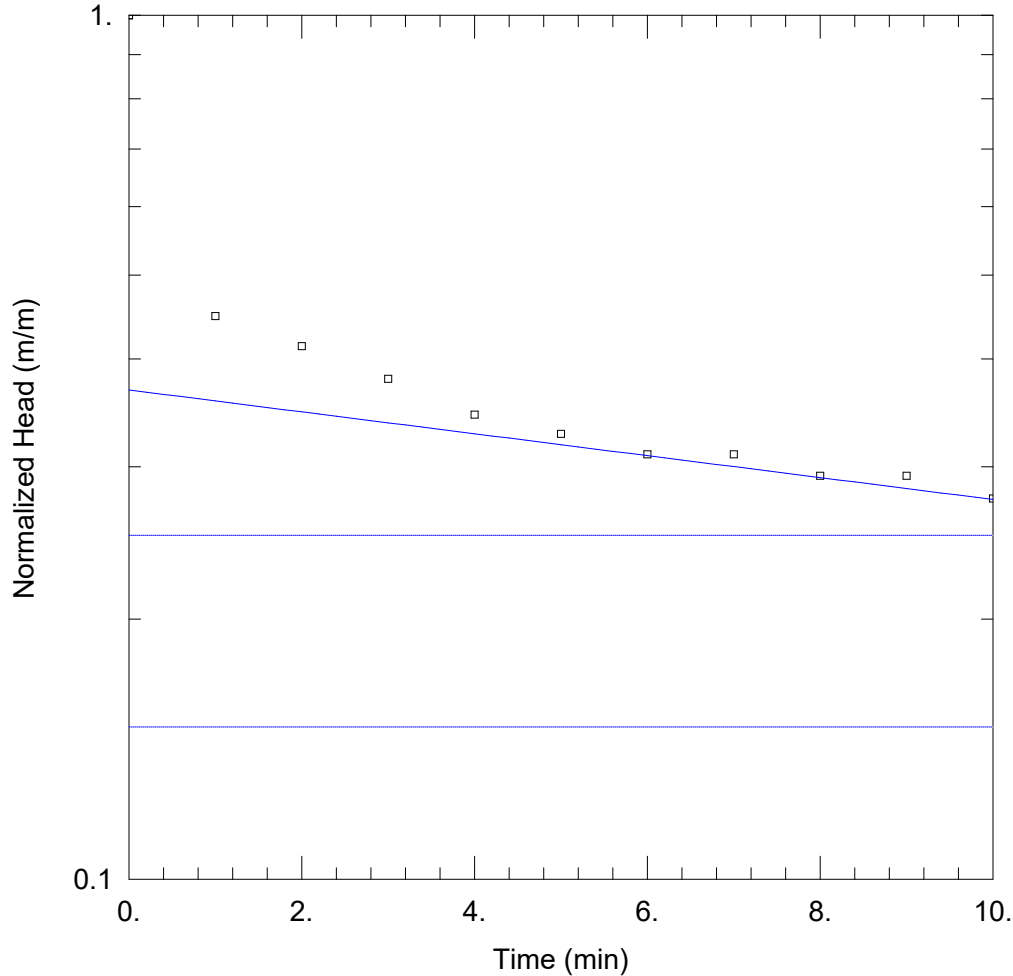
MW26-11: Purge & Recovery Test

Prepared By:
GEMTEC

Prepared For:
Township of Bonnechere Valley

Project:
101260.004

Location:
Eganville



Test Date: 2026-05-06

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

$K = 2.4E-6$ m/sec $y_0 = 0.11$ m

AQUIFER DATA

Saturated Thickness: 0.34 m

Anisotropy Ratio (K_z/K_r): 1.

WELL DATA (MW26-11)

Initial Displacement: 0.29 m

Static Water Column Height: 0.34 m

Total Well Penetration Depth: 0.34 m

Screen Length: 0.34 m

Casing Radius: 0.0254 m

Well Radius: 0.0254 m

Gravel Pack Porosity: 0.3



APPENDIX F

Chemical Analysis of Water Samples Relating to Quality
Paracel Laboratories Limited Order # 2619492

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Andrius Paznekas

Client PO:
Project: 101260.004
Custody: 18932

Report Date: 14-May-2026
Order Date: 7-May-2026

Order #: 2619492

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
2619492-01	MW26-04
2619492-02	MW26-04 (dissolved)
2619492-03	MW26-02
2619492-04	MW26-02 (dissolved)

Approved By:



Mark Foto, M.Sc.

Laboratory Director

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

 Project Description: **101260.004**
Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Extraction Date	Analysis Date
Colour	SM2120 - Spectrophotometric	Ottawa	9-May-26	9-May-26
Colour, apparent	SM2120 - Spectrophotometric	Ottawa	9-May-26	9-May-26
Mercury, dissolved	EPA 245.2 - Cold Vapour AA	Ottawa	13-May-26	13-May-26
Metals, ICP-MS	EPA 200.8 - ICP-MS	Ottawa	11-May-26	12-May-26
PAHs by GC-MS	EPA 625 - GC-MS, extraction	Ottawa	13-May-26	13-May-26
pH	SM 4500-H+	Ottawa	9-May-26	9-May-26
PHC F1	CWS Tier 1 - P&T GC-FID	Ottawa	11-May-26	11-May-26
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	Ottawa	11-May-26	11-May-26
Phosphorus, total dissolved	EPA 365.4; IC, filtration	Ottawa	12-May-26	12-May-26
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	Ottawa	12-May-26	12-May-26
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	Ottawa	12-May-26	12-May-26
Total Suspended Solids	SM 2540D - Gravimetric	Ottawa	13-May-26	13-May-26
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	Ottawa	11-May-26	11-May-26
Volatile Suspended Solids	SM 2540D - Gravimetric, 550C	Ottawa	13-May-26	13-May-26

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

General Inorganics

Colour, apparent	2 ACU	13100	-	6350	-	-
Colour	2 TCU	<2	-	3	-	-
pH	0.1 pH Units	7.8	-	7.9	-	-
Phosphorus, total	0.01 mg/L	3.23	-	4.47	-	-
Phosphorus, total dissolved	0.01 mg/L	-	0.01	-	<0.01	-
Total Suspended Solids	2 mg/L	4270	-	1730	-	-
Volatile Suspended Solids	2 mg/L	104	-	160	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	-	2.7	-	-

Metals

Mercury, dissolved	0.1 ug/L	-	<0.1	-	<0.1	-
Aluminum	1 ug/L	-	3	-	3	-
Antimony	0.5 ug/L	-	<0.5	-	0.7	-
Arsenic	1 ug/L	-	<1	-	<1	-
Barium	1 ug/L	-	66	-	124	-
Beryllium	0.5 ug/L	-	<0.5	-	<0.5	-
Bismuth	1 ug/L	-	<1	-	<1	-
Boron	10 ug/L	-	37	-	33	-
Cadmium	0.1 ug/L	-	<0.1	-	<0.1	-
Calcium	100 ug/L	-	133000	-	146000	-
Chromium	1 ug/L	-	<1	-	2	-
Cobalt	0.5 ug/L	-	<0.5	-	0.9	-
Copper	0.5 ug/L	-	4.0	-	2.3	-
Iron	100 ug/L	-	<100	-	<100	-
Lead	0.1 ug/L	-	<0.1	-	<0.1	-
Magnesium	200 ug/L	-	26300	-	38000	-
Manganese	5 ug/L	-	52	-	2820	-

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

Metals

Molybdenum	0.5 ug/L	-	3.7	-	14.8	-	-
Nickel	1 ug/L	-	2	-	2	-	-
Potassium	100 ug/L	-	5220	-	10400	-	-
Selenium	1 ug/L	-	<1	-	<1	-	-
Silver	0.1 ug/L	-	<0.1	-	<0.1	-	-
Sodium	200 ug/L	-	218000	-	444000	-	-
Strontium	10 ug/L	-	273	-	421	-	-
Thallium	0.1 ug/L	-	<0.1	-	<0.1	-	-
Tin	5 ug/L	-	<5	-	<5	-	-
Titanium	5 ug/L	-	<5	-	<5	-	-
Tungsten	10 ug/L	-	<10	-	<10	-	-
Uranium	0.1 ug/L	-	0.5	-	1.1	-	-
Vanadium	0.5 ug/L	-	<0.5	-	<0.5	-	-
Zinc	5 ug/L	-	<5	-	<5	-	-
Zirconium	1 ug/L	-	<1	-	<1	-	-

Metals - Total

Aluminum	1 ug/L	3340	-	11700	-	-	-
Antimony	0.5 ug/L	<0.5	-	1.0	-	-	-
Arsenic	1 ug/L	7	-	7	-	-	-
Barium	1 ug/L	82	-	306	-	-	-
Beryllium	0.5 ug/L	<0.5	-	0.6	-	-	-
Bismuth	1 ug/L	<1	-	<1	-	-	-
Boron	50 ug/L	<50	-	<50	-	-	-
Cadmium	0.1 ug/L	<0.1	-	0.2	-	-	-
Calcium	100 ug/L	492000	-	237000	-	-	-
Chromium	5 ug/L	16	-	24	-	-	-

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

Metals - Total

Cobalt	0.5 ug/L	5.3	-	9.7	-	-
Copper	0.5 ug/L	46.1	-	28.8	-	-
Iron	100 ug/L	38000	-	46800	-	-
Lead	0.1 ug/L	4.7	-	36.2	-	-
Magnesium	200 ug/L	213000	-	78800	-	-
Manganese	5 ug/L	5280	-	7750	-	-
Molybdenum	0.5 ug/L	9.9	-	9.8	-	-
Nickel	1 ug/L	15	-	20	-	-
Potassium	100 ug/L	6550	-	10900	-	-
Selenium	1 ug/L	16	-	12	-	-
Silver	0.1 ug/L	6.1	-	0.5	-	-
Sodium	200 ug/L	210000	-	448000	-	-
Strontium	10 ug/L	656	-	602	-	-
Thallium	0.1 ug/L	0.1	-	0.3	-	-
Tin	5 ug/L	<5	-	<5	-	-
Titanium	5 ug/L	121	-	439	-	-
Tungsten	10 ug/L	35	-	<10	-	-
Uranium	0.1 ug/L	0.8	-	1.6	-	-
Vanadium	0.5 ug/L	7.9	-	23.1	-	-
Zinc	5 ug/L	22	-	55	-	-
Zirconium	1 ug/L	3	-	<1	-	-

Volatiles

Acetone	5.0 ug/L	<5.0	-	<5.0	-	-
Benzene	0.5 ug/L	<0.5	-	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	-	<0.5	-	-

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

Volatiles

Bromomethane	0.5 ug/L	<0.5	-	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	-	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	-	1.2	-	-
Chloromethane	3.0 ug/L	<3.0	-	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	-	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	6.7	-	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	-	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	<0.5	-	-
Hexane	1.0 ug/L	<1.0	-	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	-	<10.0	-	-

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

Volatiles

Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	<5.0	-	-
Styrene	0.5 ug/L	<0.5	-	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	13.1	-	<0.5	-	-
Toluene	0.5 ug/L	11.1	-	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	<0.5	-	-
Trichloroethylene	0.5 ug/L	3.9	-	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	-	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	-	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	-	<0.5	-	-
4-Bromofluorobenzene	Surrogate	95.2%	-	97.2%	-	-
Dibromofluoromethane	Surrogate	92.4%	-	101%	-	-
Toluene-d8	Surrogate	101%	-	82.0%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	-	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	<100	-	-

Semi-Volatiles

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Client ID:	MW26-04	MW26-04 (dissolved)	MW26-02	MW26-02 (dissolved)	-	-
Sample Date:	07-May-26 12:00	07-May-26 12:00	07-May-26 15:00	07-May-26 15:00	-	-
Sample ID:	2619492-01	2619492-02	2619492-03	2619492-04	-	-
Matrix:	Ground Water	Ground Water	Ground Water	Ground Water	-	-
MDL/Units						

Semi-Volatiles

	0.05 ug/L	<0.05	-	<0.05	-	-
Acenaphthene	0.05 ug/L	<0.05	-	<0.05	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	<0.05	-	-
Anthracene	0.01 ug/L	<0.01	-	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	<0.05	-	-
Biphenyl	0.05 ug/L	<0.05	-	<0.05	-	-
Chrysene	0.05 ug/L	<0.05	-	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.01	-	<0.01	-	-
Fluorene	0.05 ug/L	<0.05	-	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	<0.10	-	-
Naphthalene	0.05 ug/L	<0.05	-	<0.05	-	-
Phenanthrene	0.05 ug/L	<0.05	-	<0.05	-	-
Pyrene	0.01 ug/L	<0.01	-	<0.01	-	-
2-Fluorobiphenyl	Surrogate	84.1%	-	81.4%	-	-
Terphenyl-d14	Surrogate	91.2%	-	91.4%	-	-

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics								
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Phosphorus, total	ND	0.01	mg/L					
Phosphorus, total dissolved	ND	0.01	mg/L					
Total Suspended Solids	ND	2	mg/L					
Volatile Suspended Solids	ND	2	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Hydrocarbons								
F1 PHCs (C6-C10)	ND	25	ug/L					
F2 PHCs (C10-C16)	ND	100	ug/L					
F3 PHCs (C16-C34)	ND	100	ug/L					
F4 PHCs (C34-C50)	ND	100	ug/L					
Metals								
Aluminum	ND	1	ug/L					
Antimony	ND	0.5	ug/L					
Arsenic	ND	1	ug/L					
Barium	ND	1	ug/L					
Beryllium	ND	0.5	ug/L					
Bismuth	ND	1	ug/L					
Boron	ND	10	ug/L					
Cadmium	ND	0.1	ug/L					
Calcium	ND	100	ug/L					
Chromium	ND	1	ug/L					
Cobalt	ND	0.5	ug/L					
Copper	ND	0.5	ug/L					
Iron	ND	100	ug/L					
Lead	ND	0.1	ug/L					
Magnesium	ND	200	ug/L					
Manganese	ND	5	ug/L					
Mercury, dissolved	ND	0.1	ug/L					
Molybdenum	ND	0.5	ug/L					
Nickel	ND	1	ug/L					

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Potassium	ND	100	ug/L					
Selenium	ND	1	ug/L					
Silver	ND	0.1	ug/L					
Sodium	ND	200	ug/L					
Strontium	ND	10	ug/L					
Thallium	ND	0.1	ug/L					
Tin	ND	5	ug/L					
Titanium	ND	5	ug/L					
Tungsten	ND	10	ug/L					
Uranium	ND	0.1	ug/L					
Vanadium	ND	0.5	ug/L					
Zinc	ND	5	ug/L					
Zirconium	ND	1	ug/L					
Metals - Total								
Aluminum	ND	1	ug/L					
Antimony	ND	0.5	ug/L					
Arsenic	ND	1	ug/L					
Barium	ND	1	ug/L					
Beryllium	ND	0.5	ug/L					
Bismuth	ND	1	ug/L					
Boron	ND	50	ug/L					
Cadmium	ND	0.1	ug/L					
Calcium	ND	100	ug/L					
Chromium	ND	5	ug/L					
Cobalt	ND	0.5	ug/L					
Copper	ND	0.5	ug/L					
Iron	ND	100	ug/L					
Lead	ND	0.1	ug/L					
Magnesium	ND	200	ug/L					
Manganese	ND	5	ug/L					
Molybdenum	ND	0.5	ug/L					
Nickel	ND	1	ug/L					
Potassium	ND	100	ug/L					

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Selenium	ND	1	ug/L					
Silver	ND	0.1	ug/L					
Sodium	ND	200	ug/L					
Strontium	ND	10	ug/L					
Thallium	ND	0.1	ug/L					
Tin	ND	5	ug/L					
Titanium	ND	5	ug/L					
Tungsten	ND	10	ug/L					
Uranium	ND	0.1	ug/L					
Vanadium	ND	0.5	ug/L					
Zinc	ND	5	ug/L					
Zirconium	ND	1	ug/L					
Volatiles								
Acetone	ND	5.0	ug/L					
Benzene	ND	0.5	ug/L					
Bromodichloromethane	ND	0.5	ug/L					
Bromoform	ND	0.5	ug/L					
Bromomethane	ND	0.5	ug/L					
Carbon Tetrachloride	ND	0.2	ug/L					
Chlorobenzene	ND	0.5	ug/L					
Chloroethane	ND	1.0	ug/L					
Chloroform	ND	0.5	ug/L					
Chloromethane	ND	3.0	ug/L					
Dibromochloromethane	ND	0.5	ug/L					
Dichlorodifluoromethane	ND	1.0	ug/L					
1,2-Dibromoethane	ND	0.2	ug/L					
1,2-Dichlorobenzene	ND	0.5	ug/L					
1,3-Dichlorobenzene	ND	0.5	ug/L					
1,4-Dichlorobenzene	ND	0.5	ug/L					
1,1-Dichloroethane	ND	0.5	ug/L					
1,2-Dichloroethane	ND	0.5	ug/L					
1,1-Dichloroethylene	ND	0.5	ug/L					
cis-1,2-Dichloroethylene	ND	0.5	ug/L					

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
trans-1,2-Dichloroethylene	ND	0.5	ug/L					
1,2-Dichloroethylene, total	ND	0.5	ug/L					
1,2-Dichloropropane	ND	0.5	ug/L					
cis-1,3-Dichloropropylene	ND	0.5	ug/L					
trans-1,3-Dichloropropylene	ND	0.5	ug/L					
1,3-Dichloropropene, total	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Hexane	ND	1.0	ug/L					
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L					
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L					
Methyl Isobutyl Ketone	ND	5.0	ug/L					
Methyl tert-butyl ether	ND	2.0	ug/L					
Methylene Chloride	ND	5.0	ug/L					
Styrene	ND	0.5	ug/L					
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L					
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L					
Tetrachloroethylene	ND	0.5	ug/L					
Toluene	ND	0.5	ug/L					
1,1,1-Trichloroethane	ND	0.5	ug/L					
1,1,2-Trichloroethane	ND	0.5	ug/L					
Trichloroethylene	ND	0.5	ug/L					
Trichlorofluoromethane	ND	1.0	ug/L					
1,3,5-Trimethylbenzene	ND	0.5	ug/L					
Vinyl chloride	ND	0.5	ug/L					
m,p-Xylenes	ND	0.5	ug/L					
o-Xylene	ND	0.5	ug/L					
Xylenes, total	ND	0.5	ug/L					
Surrogate: 4-Bromofluorobenzene	77.8		%	97.2	50-140			
Surrogate: Dibromofluoromethane	74.3		%	92.9	50-140			
Surrogate: Toluene-d8	65.7		%	82.2	50-140			

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Colour	ND	2	TCU	ND			NC	20	
Colour, apparent	12900	100	ACU	13100			1.5	20	
pH	7.6	0.1	pH Units	7.6			0.0	3.3	
Phosphorus, total	ND	0.01	mg/L	ND			NC	15	
Phosphorus, total dissolved	ND	0.01	mg/L	ND			NC	10	
Total Suspended Solids	4020	4	mg/L	4270			6.2	10	
Volatile Suspended Solids	112	4	mg/L	104			7.4	10	
Total Kjeldahl Nitrogen	0.20	0.1	mg/L	0.18			14.0	20	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
F2 PHCs (C10-C16)	ND	100	ug/L	ND			NC	30	
F3 PHCs (C16-C34)	ND	100	ug/L	ND			NC	30	
F4 PHCs (C34-C50)	ND	100	ug/L	ND			NC	30	
Metals									
Mercury, dissolved	ND	0.1	ug/L	ND			NC	20	
Aluminum	13.1	1	ug/L	13.5			3.5	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	21.9	1	ug/L	23.1			5.0	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Bismuth	ND	1	ug/L	ND			NC	30	
Boron	20	10	ug/L	19			2.3	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	35300	100	ug/L	34300			3.0	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	3.72	0.5	ug/L	3.34			11.0	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	8810	200	ug/L	8130			8.0	20	

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Manganese	ND	5	ug/L	ND			NC	20	
Molybdenum	1.28	0.5	ug/L	1.29			0.7	20	
Nickel	ND	1	ug/L	ND			NC	20	
Potassium	1650	100	ug/L	1620			2.1	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	17400	200	ug/L	17000			2.2	20	
Strontium	181	10	ug/L	181			0.0	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Tin	ND	5	ug/L	ND			NC	20	
Titanium	ND	5	ug/L	ND			NC	20	
Tungsten	ND	10	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	5	5	ug/L	5			5.7	20	
Zirconium	ND	1	ug/L	ND			NC	20	
Metals - Total									
Antimony	0.62	0.5	ug/L	ND			NC	20	
Arsenic	7.3	1	ug/L	7.1			3.2	20	
Barium	86.3	1	ug/L	81.8			5.4	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Bismuth	ND	1	ug/L	ND			NC	20	
Boron	ND	50	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	524000	932	ug/L	492000			6.1	20	
Chromium	15.5	5	ug/L	16.3			4.6	20	
Cobalt	5.37	0.5	ug/L	5.35			0.5	20	
Copper	47.5	0.5	ug/L	46.1			3.1	20	
Iron	38700	932	ug/L	38000			1.8	20	
Lead	4.94	0.1	ug/L	4.68			5.3	20	
Magnesium	234000	1860	ug/L	213000			9.7	20	

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Manganese	5490	47	ug/L	5280			3.8	20	
Molybdenum	10.3	0.5	ug/L	9.90			4.1	20	
Nickel	15.2	1	ug/L	14.6			4.1	20	
Potassium	6510	100	ug/L	6550			0.5	20	
Selenium	16.9	1	ug/L	16.0			5.3	20	
Silver	6.09	0.1	ug/L	6.11			0.4	20	
Sodium	234000	1860	ug/L	210000			10.9	20	
Strontium	512	10	ug/L	656			24.7	20	QR-03
Thallium	0.14	0.1	ug/L	0.14			5.5	20	
Tin	ND	5	ug/L	ND			NC	20	
Titanium	62.0	5	ug/L	121			64.7	20	QR-03
Tungsten	36.7	10	ug/L	34.9			4.9	20	
Uranium	0.8	0.1	ug/L	0.8			1.6	20	
Vanadium	7.06	0.5	ug/L	7.95			11.8	20	
Zinc	23	5	ug/L	22			3.5	20	
Zirconium	2.4	1	ug/L	2.8			14.3	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	85.6		%		107	50-140			

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Dibromofluoromethane	75.3		%		94.2	50-140			
Surrogate: Toluene-d8	65.1		%		81.3	50-140			

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: **101260.004**

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Phosphorus, total	0.971	0.01	mg/L	ND	97.1	80-120			
Phosphorus, total dissolved	0.97	0.01	mg/L	ND	96.6	80-120			
Total Suspended Solids	24.0	2	mg/L	ND	108	84-124			
Total Kjeldahl Nitrogen	1.15	0.1	mg/L	0.18	97.8	75-125			
Hydrocarbons									
F1 PHCs (C6-C10)	1920	25	ug/L	ND	96.2	85-115			
F2 PHCs (C10-C16)	1210	100	ug/L	ND	75.9	60-140			
F3 PHCs (C16-C34)	3720	100	ug/L	ND	94.9	60-140			
F4 PHCs (C34-C50)	2340	100	ug/L	ND	94.6	60-140			
Metals									
Mercury, dissolved	2.7	0.1	ug/L	ND	90.1	70-130			
Aluminum	61.2	1	ug/L	13.5	95.3	80-120			
Arsenic	52.5	1	ug/L	ND	104	80-120			
Barium	66.7	1	ug/L	23.1	87.3	80-120			
Beryllium	51.0	0.5	ug/L	ND	102	80-120			
Bismuth	37.1	1	ug/L	ND	74.2	70-120			
Boron	64	10	ug/L	19	90.0	80-120			
Cadmium	46.3	0.1	ug/L	ND	92.6	80-120			
Calcium	42500	100	ug/L	34300	81.9	80-120			
Chromium	53.2	1	ug/L	ND	106	80-120			
Cobalt	51.0	0.5	ug/L	ND	102	80-120			
Copper	51.6	0.5	ug/L	3.34	96.4	80-120			
Iron	2280	100	ug/L	ND	90.1	80-120			
Lead	43.0	0.1	ug/L	ND	85.9	80-120			
Magnesium	17700	200	ug/L	8130	95.6	80-120			
Manganese	51.9	5	ug/L	ND	100	80-120			
Molybdenum	46.2	0.5	ug/L	1.29	89.8	80-120			
Nickel	49.8	1	ug/L	ND	98.4	80-120			
Potassium	11200	100	ug/L	1620	96.3	80-120			
Selenium	48.7	1	ug/L	ND	97.2	80-120			

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Silver	42.8	0.1	ug/L	ND	85.5	80-120			
Sodium	27100	200	ug/L	17000	101	80-120			
Strontium	216	10	ug/L	181	69.8	80-120			QM-07
Thallium	45.2	0.1	ug/L	ND	90.4	80-120			
Tin	45.3	5	ug/L	ND	90.6	80-120			
Titanium	53.7	5	ug/L	ND	107	80-120			
Tungsten	43.6	10	ug/L	ND	87.0	80-120			
Uranium	46.7	0.1	ug/L	ND	93.4	80-120			
Vanadium	52.9	0.5	ug/L	ND	106	80-120			
Zinc	50	5	ug/L	5	90.2	80-120			
Zirconium	47.5	1	ug/L	ND	95.0	80-120			
Metals - Total									
Aluminum	59.6	1	ug/L	ND	119	80-120			
Antimony	41.3	0.5	ug/L	ND	82.6	80-120			
Arsenic	58.1	1	ug/L	ND	116	80-120			
Barium	61.2	1	ug/L	ND	122	80-120			QS-02
Beryllium	59.5	0.5	ug/L	ND	119	80-120			
Bismuth	49.7	1	ug/L	ND	99.4	80-120			
Boron	57	50	ug/L	ND	114	80-120			
Cadmium	60.9	0.1	ug/L	ND	122	80-120			QS-02
Calcium	10700	100	ug/L	ND	107	80-120			
Chromium	60.2	5	ug/L	ND	120	80-120			QS-02
Cobalt	58.6	0.5	ug/L	ND	117	80-120			
Copper	57.0	0.5	ug/L	ND	114	80-120			
Iron	2560	100	ug/L	ND	102	80-120			
Lead	54.9	0.1	ug/L	ND	110	80-120			
Magnesium	11000	200	ug/L	ND	110	80-120			
Manganese	58.6	5	ug/L	ND	117	80-120			
Molybdenum	55.0	0.5	ug/L	ND	110	80-120			
Nickel	58.6	1	ug/L	ND	117	80-120			
Potassium	10900	100	ug/L	ND	109	80-120			

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Selenium	55.3	1	ug/L	ND	111	80-120			
Silver	57.0	0.1	ug/L	ND	114	80-120			
Sodium	11600	200	ug/L	ND	116	80-120			
Strontium	55	10	ug/L	ND	110	80-120			
Thallium	59.9	0.1	ug/L	ND	120	80-120			
Tin	58.5	5	ug/L	ND	117	80-120			
Titanium	59.1	5	ug/L	ND	118	80-120			
Tungsten	61.2	10	ug/L	ND	122	80-120			QS-02
Uranium	58.5	0.1	ug/L	ND	117	80-120			
Vanadium	61.1	0.5	ug/L	ND	122	80-120			QS-02
Zinc	55	5	ug/L	ND	111	80-120			
Zirconium	56.7	1	ug/L	ND	113	80-120			
Volatiles									
Acetone	95.4	5.0	ug/L	ND	95.4	50-140			
Benzene	49.8	0.5	ug/L	ND	125	60-130			
Bromodichloromethane	44.5	0.5	ug/L	ND	111	60-130			
Bromoform	36.4	0.5	ug/L	ND	91.0	60-130			
Bromomethane	46.9	0.5	ug/L	ND	117	50-140			
Carbon Tetrachloride	36.6	0.2	ug/L	ND	91.4	60-130			
Chlorobenzene	35.4	0.5	ug/L	ND	88.5	60-130			
Chloroethane	40.6	1.0	ug/L	ND	102	50-140			
Chloroform	43.5	0.5	ug/L	ND	109	60-130			
Chloromethane	46.9	3.0	ug/L	ND	117	50-140			
Dibromochloromethane	30.8	0.5	ug/L	ND	77.1	60-130			
Dichlorodifluoromethane	42.3	1.0	ug/L	ND	106	50-140			
1,2-Dibromoethane	29.8	0.2	ug/L	ND	74.6	60-130			
1,2-Dichlorobenzene	38.1	0.5	ug/L	ND	95.4	60-130			
1,3-Dichlorobenzene	37.1	0.5	ug/L	ND	92.6	60-130			
1,4-Dichlorobenzene	38.2	0.5	ug/L	ND	95.6	60-130			
1,1-Dichloroethane	47.0	0.5	ug/L	ND	118	60-130			
1,2-Dichloroethane	40.4	0.5	ug/L	ND	101	60-130			

Certificate of Analysis

Report Date: 14-May-2026

 Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1-Dichloroethylene	39.8	0.5	ug/L	ND	99.4	60-130			
cis-1,2-Dichloroethylene	41.8	0.5	ug/L	ND	105	60-130			
trans-1,2-Dichloroethylene	38.3	0.5	ug/L	ND	95.8	60-130			
1,2-Dichloropropane	40.8	0.5	ug/L	ND	102	60-130			
cis-1,3-Dichloropropylene	40.7	0.5	ug/L	ND	102	60-130			
trans-1,3-Dichloropropylene	35.6	0.5	ug/L	ND	89.1	60-130			
Ethylbenzene	40.8	0.5	ug/L	ND	102	60-130			
Hexane	36.3	1.0	ug/L	ND	90.7	60-130			
Methyl Ethyl Ketone (2-Butanone)	127	5.0	ug/L	ND	127	50-140			
Methyl Butyl Ketone (2-Hexanone)	127	10.0	ug/L	ND	127	50-140			
Methyl Isobutyl Ketone	114	5.0	ug/L	ND	114	50-140			
Methyl tert-butyl ether	111	2.0	ug/L	ND	111	50-140			
Methylene Chloride	41.5	5.0	ug/L	ND	104	60-130			
Styrene	34.7	0.5	ug/L	ND	86.7	60-130			
1,1,1,2-Tetrachloroethane	29.5	0.5	ug/L	ND	73.8	60-130			
1,1,2,2-Tetrachloroethane	35.5	0.5	ug/L	ND	88.8	60-130			
Tetrachloroethylene	32.7	0.5	ug/L	ND	81.8	60-130			
Toluene	37.8	0.5	ug/L	ND	94.5	60-130			
1,1,1-Trichloroethane	38.3	0.5	ug/L	ND	95.6	60-130			
1,1,2-Trichloroethane	41.8	0.5	ug/L	ND	104	60-130			
Trichloroethylene	45.1	0.5	ug/L	ND	113	60-130			
Trichlorofluoromethane	32.0	1.0	ug/L	ND	79.9	60-130			
1,3,5-Trimethylbenzene	41.5	0.5	ug/L	ND	104	60-130			
Vinyl chloride	43.8	0.5	ug/L	ND	110	50-140			
m,p-Xylenes	72.9	0.5	ug/L	ND	91.2	60-130			
o-Xylene	38.9	0.5	ug/L	ND	97.3	60-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>80.3</i>		%		<i>100</i>	<i>50-140</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>91.2</i>		%		<i>114</i>	<i>50-140</i>			
<i>Surrogate: Toluene-d8</i>	<i>66.9</i>		%		<i>83.7</i>	<i>50-140</i>			

Certificate of Analysis

Report Date: 14-May-2026

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Qualifier Notes:

QC Qualifiers:

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- QS-02 Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 14-May-2026

Client: GEMTEC Consulting Engineers and Scientists Limited

Order Date: 7-May-2026

Client PO:

Project Description: 101260.004

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Benzo[b]fluoranthene results may be biased high due to co-elution with Benzo[j]fluoranthene

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Parcel ID: 2619492



rent Blvd.
K1G 4J8
ellabs.com
com

Parcel Order Number

Chain Of Custody
Ontario Drinking Water Samples
No 18932

Client Name: <u>Grenlec</u>	Project Ref: <u>101260.004</u>	Waterworks Name:	Samples Taken By:
Contact Name: <u>A. Paznokas</u>	Quote #:	Waterworks Number:	Name: <u>Daniel Cox</u>
Address:	<u>PO Box 1</u>	Address:	Signature: <u>[Signature]</u>
After Hours Contact: <u>613-295-8425</u>	E-mail: <u>andrews.paznokas@grenlec.ca</u>	Public Health Unit:	Page <u>1</u> of <u>1</u> Turn Around Time Required: <input type="checkbox"/> 1 day <input type="checkbox"/> 2 day <input type="checkbox"/> 3 day <input checked="" type="checkbox"/> 4 day
Telephone:	Fax:		

Samples Submitted Under: (Indicate ONLY one)		Sample Type: R = Raw; T = Treated; D = Distribution; P = Plumbing		Required Analyses														
<input type="checkbox"/> ON REG 170/03 <input type="checkbox"/> ON REG 319/08 <input type="checkbox"/> Private Well <input type="checkbox"/> ON REG 243/07 <input checked="" type="checkbox"/> Other <u>PW 90</u>		Source Type: G = Ground Water; S = Surface Water																
Have LSN forms been submitted to MOE/MOHLTC?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		Reportable: Requires AWQI reporting as per Regulation - Y = Yes; N = No																
Are these samples for human consumption?: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																		
All information must be completed before samples will be processed.																		
LOCATION NAME	SAMPLE ID	Sample Type: R/T/D/P	Source Type: G/S	Reportable: Y/N	Resample	SAMPLE COLLECTED		# of Containers	Free/Combined Chlorine Residual mg/L	Standing / Flushed: S / F (REG 243)	Total Coliform/E. Coli	HPC	THM	gen. organics	Metals - dissolved	Phosphorus	VOC's, Polyaromatic Hydrocarbons	
						DATE	TIME											
1	\	MW26-07	R	G	N	-	May 7, 2026	12 pm	13		S	X	X	X	X	X	X	X
2	\	MW26-02	R	G	N	-	May 7, 2026	3 pm	13		S	X	X	X	X	X	X	X
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: <u>rdow in ACU for TUV</u> <u>+ Trace Metals (total dissolved)</u>		Method of Delivery: <u>walk in</u>	
Relinquished By (Sign): <u>[Signature]</u>	Received By Driver/Depot: <u>[Signature]</u> <u>1659</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>LTJ</u>
Relinquished By (Print): <u>Daniel Cox</u>	Date/Time: <u>May 7 / 2026</u>	Date/Time: <u>8 May 2026 10:57</u>	Date/Time: <u>08/05/26; 17:20</u>
Date/Time: <u>May 7, 2026 - 5pm</u>	Temperature: <u>13.1</u> °C	Temperature: <u>1.0</u> °C	pH Verified: <input checked="" type="checkbox"/> By: <u>[Signature]</u>

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité

