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September 23, 2025

Hydrogeological Investigation Report
Proposed Commercial Development
12100 Creditview Road
Caledon, Ontario

GEMTEC Project: 102491.013

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Submitted to:

12100 Creditview Developments Limited
c/o Fieldgate Commercial
5400 Yonge Street, 1st Floor
Toronto, Ontario
M2N 5R5

Hydrogeological Investigation Report
Proposed Commercial Development
12100 Creditview Road
Caledon, Ontario

July 3, 2025

GEMTEC Project: 102491.013

experience • knowledge • integrity

GEMTEC Consulting Engineers and Scientists Limited
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July 3, 2025 File: 102491.013 – Rev3

12100 Creditview Developments Limited
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Attention: Stephanie Volpentesta

Re: Hydrogeological Investigation Report
Proposed Commercial Development, 12100 Creditview Road, Caledon, Ontario

Please find enclosed the Hydrogeological Investigation Report for the proposed commercial development to be located at 12100 Creditview Road, Caledon Ontario. This report was prepared by Hakyung Choi, M.Sc., and reviewed by Kimberly Gilder, P.Geo.

If there are any questions in the meantime, please contact the undersigned.

Yours truly,

GEMTEC Consulting Engineers and Scientists Limited

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TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PROJECT DESCRIPTION AND SETTING 1

2.1 Project Location and Description 1
2.2 Topography and Drainage 2
2.3 Surficial Geology and Physiography 2
2.4 MECP Water Well Records 2
2.5 Source Water Protection 3
2.6 Registered Water Takings 4

3.0 FIELD INVESTIGATION PROCEDURES 4

3.1 Previous Investigation 4
3.2 Current Investigation(s) 4
3.2.1 Geotechnical Investigation 4
3.2.2 Environmental Investigation 5
3.2.3 Hydrogeological Investigation 6

4.0 HYDROGEOLOGICAL ASSESSMENT 7

4.1 Subsurface Conditions 7
4.2 Water Level Monitoring 8
4.3 Hydraulic Response Test Results 8
4.4 Groundwater Quality Results 9
4.5 Infiltration Test Results 10

5.0 GROUNDWATER CONTROL 11

5.1 Temporary Construction Dewatering Assumptions 11
5.1.1 Underground Services 11
5.1.2 Underground Storage Tanks at The Gas Station 12
5.1.3 Building Foundations 12

5.2 Estimated Total Temporary Dewatering Rate and Permitting Requirements 13
5.3 Potential Dewatering-Related Impacts 14
5.4 Long-Term (Permanent) Drainage 14

6.0 HYDROLOGIC WATER BALANCE 14

6.1 Land Use 14
6.1.1 Pre-Development Conditions 14
6.1.2 Post-Development Conditions 15

6.2 Methods 15
6.2.1 Meteorological Data 16

6.3 Water Balance Parameters 16
6.4 Results 17
6.4.1 Pre-Development 17
6.4.2 Post-Development 18
6.5 LID Design Considerations 18
7.0 SUMMARY 19
8.0 CLOSURE 21
9.0 REFERENCES 22

LIST OF TABLES

Table 2.1 - Well Records Review Summary 3
Table 4.1 - Summary Hydraulic Conductivity Estimates 9
Table 4.2 - Guelph Permeameter – Estimated Infiltration Rates 11
Table 6.1 - Summary of Applied Water Holding Capacities and Infiltration Factors for Soil and Land Cover Combinations 17
Table 6.2 - Average Annual Pre-Development Water Balance Results 17
Table 6.3 - Average Annual Post-Development Water Balance Results 18

LIST OF APPENDICES

APPENDIX A	Report Conditions and Limitations
APPENDIX B	Figures
APPENDIX C	Supporting Documentation
APPENDIX D	MECP Water Well Records
APPENDIX E	Record of Borehole Logs
APPENDIX F	Tables
APPENDIX G	Hydraulic Conductivity Test Results
APPENDIX H	Water Quality Results
APPENDIX I	Infiltration Test Results
APPENDIX J	Water Balance
APPENDIX K	Previous Investigation

1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) has been retained by 12100 Creditview Developments Limited (Client), to carry out geotechnical, environmental, and hydrogeological investigations for a proposed commercial/retail development to be located at 12100 Creditview Road, Caledon, Ontario, herein referred to as the site.

Redevelopment plans include both a commercial development to the south of the site and a residential development to the north. A preliminary hydrogeological investigation was conducted by Terraprobe in 2022 (Terraprobe, 2022a) for the site; however, the area of the proposed commercial development site has since been expanded.

This report provides an update to the previous preliminary hydrogeological investigation for the site and should be read in conjunction with the geotechnical and environmental investigation report prepared by GEMTEC (issued under separate cover). The purpose of the hydrogeological investigation is to characterize the general subsurface soils and groundwater conditions at the site by means of a limited number of boreholes and monitoring wells and based on the information obtained, to estimate short-term (i.e., construction) and long term dewatering needs, assess the potential impacts of the water taking on existing resources, and conduct a water balance study.

This report is subject to the Conditions and Limitations of This Report, which are provided in Appendix A, and which are considered an integral part of the report.

2.0 PROJECT DESCRIPTION AND SETTING

2.1 Project Location and Description

The site is in the northwest quadrant of Creditview Road and Mayfield Road intersection in Caledon, Ontario and consists of an irregularly shaped parcel of land approximately 25 hectare (ha) (63 acres) in size. The land use at the site is agricultural with a residential dwelling accompanied by two accessory structures currently occupying the central portion of the site (Figure B.1, *Site Plan*, Appendix B). The site is bounded to the south by Mayfield Road and residential communities, east by Creditview Road and agricultural fields and to the north and west by agricultural fields.

It is understood that the site is proposed to be redeveloped for residential purposes along the north portion (approximately 11 ha (27 acres) and for commercial purposes in the south portion (approximately 14 ha (36 acres)).

Apart from the future residential development to the north, for which detailed plans have not been provided, an overall site plan for the proposed commercial development was provided to GEMTEC by Turner Fleischer (Figure B.2, *Proposed Concept Site Plan*, Appendix B). The proposed commercial development consists of nine retail buildings with associated asphalt driveways and parking lots.

2.2 Topography and Drainage

Based on visual observations and a recent topographic survey provided to GEMTEC by the Client, the site slopes towards the south and southeast. The ground surface Elevation (El.) ranges from about 260.8 m above mean sea level (m amsl) to 266.4 m amsl based on the boreholes advanced by Terraprobe (2022b) and GEMTEC (2024a). Topography is presented on Figure B.3, *Topography and Natural Heritage*, Appendix B. A detailed topographic survey of the site by J.D. Barnes is included in Appendix C.

The closest surface water features to the site are the tributaries of Fletchers Creek, to the east/southeast from the site, which eventually drains to the Credit Valley River, and a drainage feature to the west of the site, which discharges to tributaries of Etobicoke Creek.

Note that the site is mostly located within the jurisdictional boundaries of the Credit Valley Conservation Authority; however, a northern portion of the site is located within the boundary of the Toronto and Region Conservation Authority (TRCA). The jurisdictional boundary for the two conservation authorities generally aligns with the topographical high (watershed divide) on-site.

As shown in Figure B.3, there are two provincially significant wetlands within 500 m of the site, located approximately 185 m and 350 m south of the site.

2.3 Surficial Geology and Physiography

The site is located within the physiographic region known as the South Slope which is characterized by till plains (Chapman and Putnam, 1984).

Published surficial geology mapping (Ontario Geological Survey, 2010) indicates that the site is underlain by clay to silt textured till (Halton Till), and there are fine textured glacial lacustrine and modern alluvial deposits associated with the drainage feature to the west of the site (Figure B.4, *Surficial Geology*, Appendix B).

Paleozoic bedrock geology mapping (Armstrong and Dodge, 2007) indicates that the bedrock underlying the overburden consists of Queenston Formation shale. Bedrock was not encountered within the boreholes advanced at the site as part of this investigation; however, based on the review of the Groundwater Oakridges Moraine Program (ORMGP, 2024), the depth to bedrock ranges from approximately 9 m to 12 m below ground surface.

2.4 MECP Water Well Records

A review of the Ministry of the Environment, Conservation, and Parks (MECP) water well records (WWR) (MECP, 2024) indicates that there are 68 WWR located within approximately 500 m of the site limits (Figure B.5, *MECP Well Records within 500 metres*, Appendix B), including 2 public supply wells, 22 domestic wells, 3 livestock wells, 13 monitoring wells/test holes, and 28 wells no

longer in use or the use is not indicated. A summary of the information provided on the records is presented in Table 2.1 below.

Table 2.1 - Well Records Review Summary

Well Use	Depth (m)			Overburden Source	Bedrock Source	Unknown
	min	max	avg			
Domestic/Stock	8.5	29.2	14.8	9	14	2
Public Supply	4.9	11	8.7	-	2	-
Monitoring	6.1	20	6.8	8	5	-
Not Used/No information available	7.5	11.0	9.1	-	2	26
Totals	**-**	**-**	**-**	**17**	**23**	**28**

Notes:

- min = minimum
- max = maximum
- avg = geometric mean
- m = meter

According to the WWR, the depth to bedrock within 500 m of the site (where recorded) ranged between about 4.9 m and 18.9 m below ground surface (bgs). The overburden is recorded to consist primarily of loam, underlain by clayey silt to silty clayey till. Bedrock consisting of red shale and limestone was commonly reported in the WWR.

Static groundwater levels ranged from about 0.6 to 11.6 m bgs with a geometric mean of 4.9 m bgs (n=29). A summary of information from the WWR is presented in Table D.1, “MECP Online Well Database Summary (500-m Radius)” in Appendix D.

2.5 Source Water Protection

The MECP Source Protection Information Atlas (MECP, 2023) was reviewed to assess the presence of source water protection areas including: Wellhead Protection Areas (WHPA) associated with municipal groundwater supplies, Intake Protection Zones (IPZ) associated with municipal surface water supplies, Significant Groundwater Recharge Areas (SGRA), and Highly Vulnerable Aquifers (HVA).

The nearest WHPA is located about 6.5 km southwest of the site in Georgetown, Ontario. The nearest IPZ-2 is located about 24 km southeast of the site for surface water intakes in Lake Ontario. The nearest HVA is about 50 m southeast of the site and there is no SGRA within 3 km of the site.

2.6 Registered Water Takings

The Environmental Approvals and Registrations database (MECP, 2024) was reviewed for nearby registered water takings. No active permit to take water PTTW registrations or Environmental Activity Sector Registry (EASR) for water takings were identified within 1 km of the site at the time of preparation of this report.

3.0 FIELD INVESTIGATION PROCEDURES

3.1 Previous Investigation

Geotechnical and hydrogeological investigations were previously carried out at the Site by others in 2022 at which time 12 boreholes were advanced across the Site to depths about 6 m. Five of these boreholes were instrumented with shallow monitoring wells. The previous geotechnical and hydrogeological Site investigations are presented in the following reports:

- *Hydrogeological Assessment, Proposed Commercial Development, 12100 Creditview Road, Caledon, Ontario*, dated April 26, 2022 (Terraprobe, 2022a); and,
- *Preliminary Geotechnical Investigation, Proposed Commercial Development, 12100 Creditview Road, Caledon, Ontario*, dated April 5, 2022 (Terraprobe, 2022b).

The Terraprobe reports were provided to GEMTEC by the Client, and the subsurface information was reviewed by GEMTEC. The results of the previous investigations have been reviewed and the factual information has been considered in support of the recommendations and conclusions presented herein. The hydrogeological report is included in Appendix K.

3.2 Current Investigation(s)

3.2.1 Geotechnical Investigation

GEMTEC carried out a concurrent geotechnical field investigation along with the hydrogeological investigation between April 22 and 25, 2024. During that time, 10 boreholes (numbered Boreholes BH24-1 to BH23-10, inclusive) were advanced at the approximate locations shown on Figure B.1, Appendix B. The boreholes were advanced to approximate depths ranging from about 4.8 m to 6.7 m below ground surface (bgs). The results of the geotechnical investigation is provided under separate cover in the report entitled:

- Geotechnical Investigation, Proposed Commercial Development, 12100 Creditview Road, Caledon, Ontario, dated May 29, 2024, 102491.013 – (GEMTEC, 2024a).

The reader is referred to this report for additional details of the investigation methods and findings. Descriptions of the subsurface conditions observed in the boreholes are provided on the Record of Borehole Sheets in Appendix E.

The borehole locations were selected by GEMTEC and positioned on the site relative to existing features. The borehole coordinates were approximated using a cellular global position system (GPS) and the ground surface elevations were approximated based on the topographic survey (J.D. Barnes; Appendix C) provided by the client.

3.2.2 Environmental Investigation

As indicated above, GEMTEC carried out a concurrent environmental field investigation. The Phase Two Environmental Site Assessment (ESA) investigated the areas of potential environmental concern (APECs) identified in the 2024 Phase One ESA Update (GEMTEC, 2024b). The Phase One ESA and Phase Two ESA are provided in the reports entitled:

- *Phase One Environmental Site Assessment Update, 12100 Creditview Road, Caledon, Ontario*, dated May 16, 102491.013 (GEMTEC, 2024b); and,
- *Phase Two Environmental Site Assessment, 12100 Creditview Road, Caledon, Ontario*, ongoing, 102491.013 – DRAFT (GEMTEC, 2024c).

The reader is referred to these reports for additional details of the investigation methods and findings. There were six (6) APECS of which three (3) were noted to have potential impacts on groundwater quality. The following APECs were identified as part of the Phase One ESA:

- APEC 1 – Application of pesticides associated with farming activity on stie. Contaminants of Potential Concern (COPCs) include metal parameters as per the O.Reg 153/04 (including hydride forming metals [antimony, arsenic, selenium]), cyanide (CN), mercury (Hg), and organochlorine pesticides (OCP) with the potential for impacts in soil;
- APEC 2 – Presence of fill material under structures and the gravel driveway on-site. COPCs include metal parameters as per the O.Reg 153/04, other regulated parameters (including electrical conductivity, sodium absorption ratio, pH, hot water-soluble boron, hexavalent chromium, Hg and CN), petroleum hydrocarbon (PHC), benzene, toluene, ethylbenzene, xylenes (BTEX), and polycyclic aromatic hydrocarbon (PAH) with the potential for impacts in soil;
- APEC 3 - A concrete slab of former heating oil above ground storage (AST) is present on the Site which was formerly used to heat the building. COPCs include PHC and BTEX with the potential for impacts in soil and groundwater;
- APEC 4 – Empty diesel AST is present on the Site along the south side of Building 3 (the location of Building 3 is show on Figure 2 of the GEMTEC (2024b)) Phase One ESA report. COPCs include PHC and BTEX with the potential for impacts in soil and groundwater;
- APEC 5 – Building 3 used for storage and maintenance of commercial drilling equipment owned by the current tenant. COPCs include PHC and volatile organic compounds (VOC) with the potential for impacts in soil and groundwater; and,
- APEC 6 - A diesel spill of 25 gallons into a ditch in 2009. COPCs include PHC and BTEX with the potential for impacts in soil.

As part of the Phase Two ESA, groundwater samples were collected from four on-site monitoring wells (Boreholes BH24-4 to BH24-6 and BH24-8) on May 8, 2024 and submitted to an accredit laboratory for analysis of the following parameters: polycyclic hydrocarbons (PHC) including benzene, toluene, ethylbenzene, xylenes (BTEX), and volatile organic compounds (VOC).

3.2.3 Hydrogeological Investigation

3.2.3.1 Site Instrumentation

All of the boreholes advanced as part of the drilling program were completed with monitoring wells, five of which were installed as part of the concurrent Phase Two ESA (GEMTEC, 2024c). Monitoring well construction details for each location are presented in Table F.1, Appendix F.

Following installation, the monitoring wells were purged to remove drilling fluids (i.e., water and drilling mud at the cored bedrock monitoring well locations), and particles that may have been introduced into the monitoring well during drilling/installation, and to develop the formation. The monitoring wells were purged using dedicated 16 mm inside diameter low density polyethylene (LDPE) tubing and a D-25 Waterra™ foot valve. The monitoring wells were developed by removing three casing volumes and monitoring field parameters (pH, temperature and electrical conductivity) for stabilization, or until the monitoring well was purged dry.

3.2.3.2 Hydraulic Response Testing

In-situ hydraulic response testing was carried out in two monitoring wells (i.e. Boreholes BH24-2 and BH24-3) to estimate the bulk horizontal hydraulic conductivity (K_b) of the overburden materials adjacent to the screened intervals. Note that hydraulic response testing was carried out at three additional locations as part of the previous hydrogeological investigation by Terraprobe (2024a). The testing consisted of creating an instantaneous change through rapid purging of the well by removing a known volume of water, followed by the recording of water level recovery (i.e., rising head test). The data was analyzed with the Aqtesolv® version 4.50 software using the Bouwer and Rice (1976) solution for the unconfined aquifer scenario. A summary of current and previous hydraulic testing of Site monitoring wells is provided in Table F.3, Appendix F. A summary of the test data, analysis interval, input parameters and estimated bulk hydraulic conductivity for each test is provided in Appendix G.

3.2.3.3 Groundwater Sampling

To evaluate potential disposal options for pumped groundwater during potential future dewatering activities, one groundwater sample was collected from Borehole BH24-3 on May 7, 2024. Prior to collecting the groundwater sample, the monitoring well was developed by removing three casing volumes (see Section 3.2.3.1). The following day, the groundwater was sampled with the use of a dedicated bailer and poured directly into laboratory-supplied sample bottles. The groundwater was not field filtered to allow for comparison of the analytical results to the sewer use by-law discharge limits.

The sample obtained during this investigation was packed into a cooler with ice for transit to the analytical laboratory. The sample was hand-delivered on the day of collection to AGAT Laboratories (AGAT Labs) of Mississauga, Ontario. The sample was analyzed for the list of parameters included in the Peel's Wastewater By-Law (53-2010), *Table 1 – Limits for Sanitary Sewers Discharge* (Table 1 Limits) and *Table 2 – Limits for Storm Sewer Discharge* (Table 2 Limits). A summary of the water quality data with comparison to the Table 1 and Table 2 Limits as well as Provincial Water Quality Objectives (PWQO) is provided as Table H.1, Appendix H, and the laboratory Certificate of Analysis is provided in Appendix H.

3.2.3.4 Infiltration Testing

Infiltration testing was carried out on May 7, 2024 using a Guelph Permeameter in order to estimate the vertical hydraulic conductivity of the unsaturated surficial soils and to provide an estimate of the infiltration potential across the southern half of the site where the unsaturated overburden could be tested. Field results were analysed using the Guelph Permeameter Calculation spreadsheet provided by Soil Moisture, the makers of the Guelph Permeameter. The infiltration test locations are shown on Figure 1, Appendix B.

3.2.3.5 Private Well Survey

None of the well records identified as water supply wells were located within the calculated zone of influence, as discussed in Section 5.3. The well records located within the ZOI were, upon review of their construction details, were deemed to be test holes or monitoring wells, not water supply wells. Consequently, a door-to-door survey was not conducted at the time of the hydrogeological investigation.

4.0 HYDROGEOLOGICAL ASSESSMENT

4.1 Subsurface Conditions

As previously indicated, the soil and groundwater conditions identified in the boreholes as part of the current study are presented on the Record of Borehole sheets in Appendix E. The Record of Borehole sheets indicate the subsurface conditions at the specific borehole locations only. Boundaries between zones on the Record of Borehole sheets are often not distinct, but rather are transitional and have been interpreted from discontinuous drilling observations. The precision with which subsurface conditions are indicated depends on the method of drilling, the frequency and recovery of samples, the method of sampling, and the uniformity of the subsurface conditions. Subsurface conditions at locations other than the boreholes may vary from the conditions encountered in the boreholes, both laterally and with depth.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil and rock involves judgement and GEMTEC does not guarantee descriptions as exact but infers accuracy to the extent that is common in current geotechnical/hydrogeological practice.

Generally, the subsurface conditions encountered over the site consist of the following:

- Surficial topsoil and organics ranging in thickness from about 0.1 m to 0.8 m and fill materials were encountered at ground surface in two boreholes: Boreholes BH24-5 and BH24-7. The fill material extended to depths of about 0.2 to 0.8 m below grade and generally consisted of silty sand, some gravel, and variable clay (trace to some). The surficial topsoil, organics and/or fill was underlain by;
- A glacial till deposit generally comprised of clayey silt to silty clay, trace to some sand, trace gravel. The till extended to the termination depths of all of the boreholes, between about 4.8 m and 6.7 m bgs (El. 260.17 m to 255.5 m). Borehole BH24-9 terminated in a non-cohesive glacial till layer comprising silty sand, trace to some gravel, trace to some clay.

4.2 Water Level Monitoring

Groundwater levels were manually measured in the monitoring wells from April, 2024 to April, 2025. The groundwater depth and elevation data are provided in Table F.2, Appendix F. The groundwater levels were measured relative to the top of the PVC standpipe at each monitoring well location. The groundwater conditions described in this report refer only to those measured at the place and time of observation. Seasonal and annual fluctuations should be anticipated.

On May 21, 2024, the depth to groundwater in monitoring wells across the site ranged from about -0.2 m bgs (artesian condition; Borehole BH24-4) to 2.37 m bgs (Borehole BH24-3), and from El. 261.30 m amsl (Borehole BH24-4) to El. 264.29 m amsl (Borehole BH24-7). Borehole BH24-4 was noted to be at a relatively low elevation and field staff noted wet ground conditions during drilling. The groundwater elevation data and inferred groundwater elevation contours on May 21, 2024, are presented on Figure B.6, Shallow Groundwater Flow, Appendix B. The figure shows that the shallow groundwater in the silty clay/clayey silt till follows topography, where there is a topographic and groundwater flow divide in the middle of the site, and groundwater flows to the west in the northwest portion toward the tributary of the Etobicoke Creek and to the east in the southeastern portion toward tributaries of Fletcher's Creek.

4.3 Hydraulic Response Test Results

The results of the hydraulic response testing carried out in two of the monitoring wells installed by GEMTEC are presented in Appendix G. A summary of hydraulic conductivity values estimated from the rising head tests by Terraprobe (2022a) are presented in Table F.3, Appendix F. Table 4.1 provides a summary of the test results.

Table 4.1 - Summary Hydraulic Conductivity Estimates

Monitoring Well ID	Predominant Soil Unit	Hydraulic Conductivity [m/s]
BH24-2	Clayey Silt/Silty Clay Till	3×10^{-7}
BH24-3	Clayey Silt/Silty Clay Till	4×10^{-8}

Notes:

1. K_h = bulk hydraulic conductivity; m/s = metres per second
2. Filter pack effects noted in both monitoring wells, late-time data estimated for K_h considered to be representative of native soils.

The estimated hydraulic conductivity of the clayey silt to silty clay till are consistent with results from Terraprobe (2022a), where single well response testing completed at three (3) monitoring wells estimated the hydraulic conductivity of the native Till to range from 2×10^{-8} m/s to 2×10^{-7} m/s. The geometric mean of all five estimates of the hydraulic conductivity of the till was 8×10^{-8} m/s.

Estimates from both GEMTEC and Terraprobe's site investigations were within the range of literature values for glacial till of 10^{-12} m/s to 10^{-6} m/s (Freeze and Cherry, 1979), and is deemed to be reasonable for this site.

4.4 Groundwater Quality Results

A summary of the analytical results for the groundwater samples with comparison to the Peel's Wastewater By-Law (53-2010), Table 1 and 2 Limits and PWQO is presented in Table H.1 in Appendix H for the monitoring well installed in Borehole BH24-3. The laboratory Certificate of Analysis is also provided in Appendix H.

The following exceedances of the Table 1 (sanitary) and Table 2 (storm sewer) Limits and PWQO were identified in the sample collected from the monitoring well at Borehole BH24-3.

- Total Suspended Solids (TSS) (591 mg/L vs. the Table 1 Limit of 350 mg/L and Table 2 Limit of 15 mg/L);
- Phosphorous (1.26 mg/L vs. the Table 2 Limit of 0.4 mg/L and the PWQO of 0.03 mg/L);
- Manganese (0.185 mg/L vs. the Table 2 Limit of 0.05 mg/L); and,
- Phenols-4AAP (0.003 mg/L vs. PWQO of 0.001 mg/L).

The concentration of all sampled parameters met the Table 1 Limits with the exception of TSS. The concentration of all sampled parameters met the Table 2 Limits with the exceptions of TSS, manganese and phosphorous. The concentration of all sampled parameters met PWQO with the exception of Phosphorus and Phenols-4AAP.

The elevated TSS at Boreholes BH24-3 is considered to be due to the difficulty of developing a monitoring well in cohesive glacial till soils to a sediment-free condition prior to sampling. The

result is consistent with sampling conducted by Terraprobe (2022a) where a TSS result of 624 mg/L was obtained from the monitoring well sampled.

It is noted that aluminum exceeds the PWQO; however, only total aluminum was analysed and the PWQO only applies to dissolved aluminum. The elevated aluminum may be the result of dissolution of suspended sediment (e.g., clay minerals) during sample acidification rather than representing elevated concentrations of dissolved aluminum. It is expected that TSS removal will decrease aluminum concentrations.

Metals and phosphorus tend to attach to soils; therefore, the exceedances of Table 2 Limits for manganese and phosphorous may be related to the presence of suspended sediment in the sample.

Treatment of pumped water from construction excavations for sediment removal to meet the applicable limits for TSS at the point(s) of discharge should be anticipated. Treatment measures may include sediment or weir tanks, filter bags or cannisters, and the like. Further treatment for the removal of other exceeding parameters may also be required depending on the point of discharge, the applicable regulation, and the reduction in concentration of exceeding parameters after sediment removal. Prior to any groundwater discharge to a sewer system, necessary approvals are required from the Region of Peel.

In addition to sampling for discharge, four groundwater samples and one duplicate sample were collected as part of the Phase Two ESA (GEMTEC, 2024c) and submitted for analysis of PHC, BTEX, and/or VOC. The analytical results of the samples collected for this Phase Two ESA were compared to the Table 2 generic site condition standards for residential / parkland / institutional property use, medium to fine soil texture (Table 2 RPI) presented in the MOE document “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, dated April 15, 2011. All groundwater samples met the applicable site condition standards.

4.5 Infiltration Test Results

The infiltration rates at the hand auger locations were estimated based on in-situ testing completed using a Guelph Permeameter. The measured field saturated hydraulic conductivities (K_{fs}) and corresponding infiltration rates are 2.5 x 10^{-7} m/s and 32 mm/hr, respectively (Appendix I).

Table 4.2 - Guelph Permeameter – Estimated Infiltration Rates

Location	Soil Description	Hand Auger Hole Depth (m bgs)	Saturated Hydraulic Conductivity Field Estimate (m/s)	Field Measured Infiltration[1] (mm/hr)
GP24-01	Clayey Silt to Silty Clay	0.30	2.5×10^{-7}	32
GP24-02	Clayey Silt to Silty Clay	0.36	2.5×10^{-7}	32

Notes:
1. Infiltration based on the approximate relationship between infiltration rate and hydraulic conductivity (TRCA, 2012).

For the purpose of designing future subsurface best management practices (BMP), Credit River Conservation Stormwater Management Criteria (CVC, 2022) recommends that infiltration rates be divided by a safety factor in order to compensate for potential reductions in soil permeability due to compaction or smearing during construction. Where similar soil conditions are continuous within 1.5 m of the bottom of the proposed BMP, a safety factor of 2.5 is recommended (CVC, 2022).

5.0 GROUNDWATER CONTROL

This section provides a preliminary estimate of temporary construction dewatering needs and potential permitting requirements based on the design details available at the time of report preparation for the following features:

- underground services;
- underground storage tanks at the gas station; and,
- building foundations.

5.1 Temporary Construction Dewatering Assumptions

GEMTEC has estimated construction dewatering needs based on the “Grading Plan”, and “Servicing Plan” 2024 by KWA Site Development Consulting Inc., and “Overall Site Plan” 2024 by Turner Fleischer Architects Inc. (included in Appendix C). The analytical model assumptions and daily water taking volumes presented are for identifying dewatering permitting requirements only and do not constitute dewatering design recommendations.

5.1.1 Underground Services

Construction dewatering rate estimates for the underground services were based on the following assumptions:

- The bottom of the excavation is assumed to be 4 m bgs. The dewatering is assumed to be 1 m below the bottom of the excavation, or 5 m bgs.
- Trenches for the underground services would proceed in sequential segments using a daily cut and cover method. Trench segments are assumed to be 20 m in length with a width of 5 m.
- Artesian conditions 0.2 m above the ground surface have been observed at the site in the most eastern corner. Seasonal fluctuations should be anticipated. For the purposes of this assessment water level at ground surface was assumed.
- A hydraulic conductivity of 8x 10^{-8} m/s was assumed for till, which the geometric mean of monitoring wells tested at the site as described in Section 4.3.

5.1.2 Underground Storage Tanks at The Gas Station

"Overall Site Plan" shows that three (3) underground storage tanks are proposed at the gas station. Construction dewatering rate estimates for the underground services were based on the following assumptions:

- The existing ground surface in the vicinity of the gas station is approximately El. 262 m asl.
- The dimensions of each tank are estimated to be 14 m long and 3 m wide. In turn the excavation required for the tanks is estimated to be 15 m long and 13 m wide.
- The bottom of the excavation is assumed to be 4 m bgs. The dewatering is assumed to be 0.5 m below the bottom of the excavation, or an elevation of El. 257.5 m amsl.
- The groundwater elevation was estimated to be 261.5 m amsl based on groundwater contours presented in Figure B.6 of Appendix B. Seasonal fluctuations should be anticipated. For the purposes of this assessment, a seasonal high groundwater level of 0.5 m higher than the most recent measurement was assumed, or an elevation of El. 262.0 m amsl (the current ground surface).
- A hydraulic conductivity of 8 x 10^{-8} m/s was assumed for till, which the geometric mean of monitoring wells tested at the site as described in Section 4.3.

5.1.3 Building Foundations

There are nine (9) proposed buildings at the site. The dewatering assessment is based on the largest proposed building, "Retail A". Slab on grade foundations with strip footings are assumed. For the dewatering assessment, the building is conceptualized as a rectangle with four trenches around the perimeter to construct the strip footings on each side of the building using the following assumptions:

- The bottom of the excavation is assumed to be 1.5 m bgs. The dewatering is assumed to be 1 m below the bottom of the excavation, or 2.5 m bgs.
- All four trenches are assumed to be 2 m wide, the trenches on the long side of the building are assumed to be 150 m long, and on the short side of the building 100 m.

- The shallow monitoring well with the highest water level elevation in the vicinity of building “Retail A” is Borehole BH24-7; the maximum groundwater elevation was EL. 264.49 m amsl on the June 27, 2024 measurement. Seasonal fluctuations should be anticipated. For the purposes of this assessment, a seasonal high groundwater level of 0.5 m higher than the most recent measurement was assumed, or an elevation of El. 264.99 m amsl.
- A hydraulic conductivity of 8 x 10^{-8} m/s was assumed for till, which the geometric mean of monitoring wells tested at the site as described in Section 4.3.

5.2 Estimated Total Temporary Dewatering Rate and Permitting Requirements

Water takings in excess of 50,000 L/day are regulated by the Ministry of the Environment, Conservation and Parks (MECP). Certain takings of groundwater and stormwater for construction dewatering purposes with a combined total of less than 400,000 L/day qualify for self-registration on the MECP’s Environmental Activity and Sector Registry (EASR). A Water Taking Plan and a Discharge Plan prepared by a qualified professional are required by the MECP if water is taken under the EASR process. A Category 3 PTTW application, submitted to the MECP for review (90-day review service standard) and approval is required for water takings in excess of 400,000 L/day, accompanied by a hydrogeological investigation report.

Based on the assumptions stated above, the steady state groundwater inflow rate and initial removal of groundwater from storage for the:

- excavation for underground services individually should be less than 50 m^3/day;
- excavation for the underground storage tanks should be less than 50 m^3/day; and
- excavation for the construction of the largest proposed building proposed (Retail A) may exceed 50 m^3/day, but should be less than 400 m^3/day. It is understood that it is unlikely that all four walls of the foundation excavation will be open at one time.

In summary, an EASR for temporary construction dewatering should be anticipated at a minimum. If multiple features are dewatered simultaneously in close proximity to one another, the cumulative water takings could exceed 400,000 litres per day, and as such, a Category 3 PTTW would be required. A Category 3 PTTW, could provide the most flexibility for multiple excavations opened simultaneously, depending on sequencing. This dewatering assessment used geometric average hydraulic conductivity values; however, dewatering may vary across the site due to soil variability.

These findings are based on estimated elevations and excavation dimensions and should be re-evaluated as site designs progress and construction plans are developed. Prior to any groundwater discharge to a sewer system, necessary approvals are required from the Region of Peel.

The design of the construction dewatering method(s) should be carried out by a specialist dewatering contractor who is a MECP-licensed Water Well Contractor, based on their own

assessment of site conditions. It is recommended that a licensed, specialist dewatering subcontractor supervise the installation, operation and decommissioning of any dewatering systems for this project, in accordance with applicable legislation. A combination of dewatering methods may be used depending on the specialist dewatering contractor's preferences, equipment and their assessment of field conditions at the time of construction. In any event, dewatering should take place from properly filtered sumps and/or wellpoints/eductors to prevent loss of ground. The contractor should take care that surface runoff is diverted away from open excavations during construction the features discussed.

5.3 Potential Dewatering-Related Impacts

The dewatering zone of influence of the utility corridor excavations, underground storage tanks and building foundations are estimated to be proximal (in the order of 10 m or less) to each excavation and would not extend off-site. Accordingly, no impacts to off-Site groundwater users are anticipated as a result of construction dewatering activities.

5.4 Long-Term (Permanent) Drainage

It is recommended that the design of any permanent drainage systems, where proposed, consider the seasonal high groundwater level, basal stability, the practicality of collection and disposal of the daily dewatering volumes, the methods and maintenance required to pretreat and/or dispose of sequestered groundwater, and the potential impacts to identified receptors (or acceptability/permissions required in the case of municipal sewer discharge).

Trench plugs are recommended for the servicing trenches to limit the preferential migration of groundwater through pipe bedding materials.

6.0 HYDROLOGIC WATER BALANCE

Water balance assessment for the southern portion of the site, with the proposed commercial development was carried out to assess potential changes of on-site groundwater recharge under the post-development conditions without Low Impact Development (LID) features to enhance recharge. It is GEMTEC's understanding that the mitigation of reductions to infiltration will be addressed as part of detail design in the functional servicing report. The Conservation Ontario Guidelines (Conservation Ontario, 2013) suggest a post-development infiltration target of 80% of the pre-development infiltration rates to maintain groundwater recharge. Post-development infiltration can be mitigated using Low Impact Development (LID) techniques, such as buried infiltration chambers, rain gardens, infiltration swales, etc.

6.1 Land Use

6.1.1 Pre-Development Conditions

Land use at the site currently consists of cropped agricultural fields, a residential dwelling, and two accessory structures. The pre-development land use is shown on the satellite imagery of

Figure B.1, of Appendix B. Pre-development topography is shown on the topographic survey by J.D. Barnes.; Appendix C).

6.1.2 Post-Development Conditions

Post-development land use at the site will include nine (9) commercial buildings, a refuelling station, lawns/landscaping areas, paved parking lots and roads (see “Overall Site Plan” by Turner Fleischer and landscape plan provided by the client in Appendix C). Based on the grading plan provided by the client, the topography post-development will be relatively flat, with proposed elevations ranging from approximately 263 to 265 m.

6.2 Methods

A water balance is an accounting of the distribution of components of the hydrologic cycle and can be simplified in the following equation:

$$P = ET + S + R + I$$

where: P = precipitation;

ET = evapotranspiration;

S = change in soil water storage;

R = runoff; and

I = infiltration (groundwater recharge).

Precipitation is the amount of water that falls on land as either rain or snow.

Evapotranspiration refers to water lost to the atmosphere through a combination of evaporation and transpiration by vegetation. Potential evapotranspiration refers to the loss of water to the atmosphere under conditions with an unlimited water supply. Potential evapotranspiration is calculated based on temperature, heat index, and an adjusting factor for latitude. Actual evapotranspiration is typical less than the potential evapotranspiration, and is calculated using the inputted precipitation, calculated potential evapotranspiration, and change in soil water storage.

Water remains in soil after actual evapotranspiration has been removed from the sum precipitation. Change in soil water storage occurs on a seasonal basis (e.g. typically dry conditions in the summer months and wet conditions in the spring and winter); changes on an annual are assumed to be negligible. The maximum soil storage capacity for different combinations of soils and land use is quantified using water holding capacities (WHC).

A water surplus occurs when precipitation exceeds evapotranspiration and available soil water storage. A water surplus represents the amount of water available for either runoff or infiltration. The proportion of the water surplus that infiltrates was calculated using the method presented in

the Ontario Ministry of the Environment (MOE) now MECP, *Stormwater Management Planning and Design Manual* (MOE, 2003). There are three infiltration sub-factors that are used to determine the proportion of the water surplus that infiltrates:

- Soil: soils are grouped into five hydrologic soil types;
- Cover: either cultivated land or woodland; and
- Topography: average the slope.

The sum of these three sub-factors is used to estimate the infiltration factor, which is applied to estimate the proportion of water surplus that may infiltrate in an area with sufficient downward gradient. Runoff is calculated as the difference between the water surplus and infiltration.

No infiltration is assumed to occur under impervious areas, and the water surplus is assumed to be equal to 90% of precipitation.

The water balance assessment was calculated on an annual basis, and components of the hydrologic cycle are quantified as depths in millimetres (mm). These depth values are then converted to volumetric estimates, reported in cubic metres per (m^3), for areas with different land uses across the Site. The change in infiltration under pre- and post-development conditions across the whole Site are compared; the objective of the mitigated post-development condition is to maintain the pre-development infiltration rates.

6.2.1 Meteorological Data

The water balance assessment was completed using historical meteorological records (1980 to 2012) obtained from Environment and Climate Change Canada's (ECCC) datasets for the Georgetown WWTP Meteorological Station (ID 6152695) for soil with different WHC. Georgetown WWTP Meteorological Station is the closest station to the site with expected similar meteorologic conditions where a substantial historical record exists (1980 to 2012). Data regarding precipitation, potential and actual evapotranspiration, and water surplus for the soil with a WHC represented at the site were obtained from ECCC are presented in Tables J.1 of Appendix J.

The average annual precipitation between 1980 and 2012 at the Georgetown WWTP station was 861 mm/yr and the average annual potential evapotranspiration was 609 mm/yr.

6.3 Water Balance Parameters

In addition to meteorological data, the water balance assessment was carried out using information regarding the soil types at the site as identified through subsurface investigations, the current and proposed land uses, and the topography. Based on the observations of the subsurface investigation, the existing surficial soil was observed to be relatively consistent across the site. Soils were observed to be predominantly silty, are classified as silt loam for the water balance study. For this assessment, it assumed that surficial soil after grading will be of a similar hydrologic soil grouping to the pre-development condition soil.

Crop residue observed at the surface during site visits indicate that recent crops consist of cereal grains (moderately rooted crops). Post-development, land use cover will include lawns or other landscaping, and impervious areas (e.g. paved parking lots, walkway, roads, a refueling station, and buildings).

Water holding capacities for each soil group and land use combinations were selected from *Table 3.1: Hydrologic Cycle Component Values* in MOE (2003). The soil, land cover and topographic sub-factors applied pre- and post-are summarized in Table 6.1. No infiltration is assumed to occur under impervious areas.

Table 6.1 - Summary of Applied Water Holding Capacities and Infiltration Factors for Soil and Land Cover Combinations

Land Use: Soil Group	WHC (mm)	Infiltration Sub-Factors			
		Soil	Land Cover	Topography Factor	Infiltration Factor
Cultivated: Silt Loam	200	0.2	0.1	0.15	0.45
Lawns or Landscaping: Silt Loam	125	0.2	0.1	0.2 : 0.3	0.5
Impervious	-	-	-	-	0

6.4 Results

The pre-development and post-development water balance results and inputs including the areal estimates of each land use, the WHC applied to the soil group, and infiltrations factors and sub-factors for each land cover combination applied are summarized in Table J.2 to J.3 of Appendix J.

6.4.1 Pre-Development

The average annual pre-development water balance assessment for the commercial site is summarized in Table 6.2

Table 6.2 - Average Annual Pre-Development Water Balance Results

Hydrologic Cycle Components (m^3/year)			
Precipitation (P)	Evapotranspiration (ET)	Infiltration (I)	Runoff (R)
124,953	82,876	18,222	23,855

6.4.2 Post-Development

The average annual post-development water balance assessment for the site is summarized in Table 6.3.

Table 6.3 - Average Annual Post-Development Water Balance Results

Hydrologic Cycle Components (m^3/year)			
Precipitation (P)	Evapotranspiration (ET)	Infiltration (I)	Runoff (R)
124,952	19,880	2,554	102,518

As presented in the water balance assessment summaries (Table 6.2 and Table 6.3.), the proposed development water balance without mitigation is estimated to result in an increase in runoff of 330 % (from 23,855 m^3/year to 102,518 m^3/year) on annual basis and a decrease in infiltration across the entire site of 86 % (from 18,222 m^3/year to 2,554 m^3/year) on annual basis.

It is GEMTEC's understanding that the mitigation of reductions to infiltration will be addressed as part of detail design in the functional servicing report. Note that a separation distance of 1 m is typically required between the bottom of an infiltration BMP and seasonally high groundwater levels, and between the bottom of an infiltration BMP and the top of the bedrock (CVC, 2022).

However, assuming that the design of the proposed LID features has been based on the spring high groundwater elevation data provided by GEMTEC, a separation of 0.5 m may be acceptable at the discretion of the municipality and the conservation authority. The spring high groundwater conditions typically provide an approximation of the highest level that the local groundwater table rises under spring conditions, with some minor variation from year to year (during typical years) but not including atypical seasons.

6.5 LID Design Considerations

In order to facilitate appropriate design of the LID features for the site, in addition to estimating the volume of infiltration to be captured, the feature locations and invert depths should be considered to ensure appropriate separation distances from seasonally high groundwater levels, low permeability soils and/or bedrock. It should be noted that high groundwater conditions were encountered on-site.

To balance the post-development infiltration with the pre-development water balance infiltration values, on-site retention/infiltration measures will be required to mitigate an estimated annual deficit of 15,668 m^3/yr of infiltration. This calculation is based on the difference between post-development and pre-development infiltration scenarios.

If only clean roof runoff will be collected into this system, the contributing area will be 28,020 m^2 (refer to Landscape Plan provided in Appendix C). The calculated surplus (runoff) from the roofs, after accounting for evapotranspiration (assumed to be 10%), is 21,715 m^3/yr. If this total volume is captured by the LID feature, this would already result in an increase in the calculated infiltration for the site compared to the pre-development scenario. A minimum of 72% of the captured roof runoff would need to be infiltrated in order to meet the pre-development annual infiltration volume.

If 40 precipitation events annually are assumed to produce runoff (MECP, 2003), based on the potential retained volume of 21,715 m^3/yr for a contributing area of 28,020 m^2 (rooftops only) a minimum required retention of 12.3 mm/event is calculated.

Additional testing at detailed design is recommended once the location and depth of any LID facility is known to confirm recommendations and calculations presented here. Long-term monitoring of groundwater levels for a minimum of one year at the site are also recommended to establish the seasonal high groundwater level. This parameter could have an impact on the design and placement of LID features at the site.

7.0 SUMMARY

GEMTEC has carried out a hydrogeological investigation for a proposed development located at 12100 Creditview Road, Caledon, Ontario. The site is in the northwest quadrant of Creditview Road and Mayfield Road intersection in Caledon, Ontario and consists of an irregularly shaped parcel of land approximately 25 ha. (63 acres) in size. Both commercial and residential redevelopment is proposed at the site, the proposal for northern portion of the site (approximately 11 ha. (27 acres)) is residential, and the proposal for the southern portion of site (approximately 14 ha (36 acres)) is commercial. A preliminary hydrogeological investigation was conducted by Terraprobe in 2022 (Terraprobe, 2022a) for the site; however, the area of the proposed commercial development site has since been expanded. Surficial geology mapping indicates that surficial geology at the site consists of silt to silty clay textured till (Halton Till) (OGS, 2010). Bedrock consists of Queenston shale, and is expected at depth between 9 m to 12 m bgs at the site.

Eleven (11) boreholes were advanced at the site as part of the field investigation, all eleven (11) were instrumented with shallow monitoring wells. On May 21, 2024, the depth to groundwater in monitoring wells across the site ranged from -0.2 m bgs to 2.37 m bgs, and from El. 261.30 m amsl to El. 264.29 m amsl. The site is located on a sub-watershed divide, the shallow groundwater generally follow topography and drains to the west on the northwest portion of the site to a drainage feature that discharges to tributaries of Etobicoke Creek and shallow groundwater over the remainder of the site flows to the east toward tributaries of Fletchers Creek.

In-situ hydraulic response testing was conducted at two monitoring wells, the geometric mean of hydraulic conductivity of these two (2) tests as well as three (3) test completed as part of a previous investigation was 8 x 10^{-8} m/s, which is consistent with literature values for till.

A water sample was collected on May 7, 2024, from one of the monitoring wells and compared Table 1 (sanitary) and Table 2 (storm sewer) Limits and PWQO, to assess the disposal options for construction dewatering. Treatment of pumped water from construction excavations for sediment removal to meet the applicable limits for TSS at the point(s) of discharge should be anticipated. Further treatment for the removal of other parameters which exceed one or more of the referred regulations which included total manganese, total phosphorus, and phenols (see Section 4.4) may also be required depending on the point of discharge, the applicable regulation and the reduction in concentration of exceeding parameters after sediment removal. Prior to any groundwater discharge to a sewer system, necessary approvals are required from the Region of Peel.

A dewatering assessment was carried out for features require subsurface excavations including underground services, underground storage tanks at the gas station and building foundations. Based on the stated assumptions, it is anticipated at this time that the total dewatering rate for the largest proposed building will exceed 50 m^3/day but less than 400 m^3/day if all four excavations for the construction of the strip footings are open at the same time. Accordingly, the need to obtain an EASR for temporary construction dewatering should be anticipated. If multiple dewatering activities occurs simultaneously such that the radius of influence overlap, a Category 3 PTTW may be required.

A water balance assessment was carried out for the southern portion of the site, with the proposed commercial development. Post-development, it is estimated that infiltration will decrease by 69 % and runoff will increase by 280 % over the entire site. According to the Guidance: Water Balance Assessment (CTC Source Protection Region, 2018), the maintenance of pre-development infiltration is general requirement of source protection plans. It is GEMTEC understanding that the mitigation of reductions to infiltration will be addressed as part of detail design in the functional servicing report. Note that a separation distance of 1 m is required between the bottom of an infiltration BMP and seasonally high groundwater levels, and between the bottom of an infiltration BMP and the top of the bedrock (CVC, 2022). However, assuming that the design of the proposed LID features has been based on the spring high groundwater elevation data provided by GEMTEC, a separation of 0.5 m may be acceptable at the discretion of the municipality and the conservation authority.

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.

Regards,

GEMTEC Consulting Engineers and Scientists Limited

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APPENDIX A

Report Conditions and Limitations

Conditions and Limitations of This Report

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 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

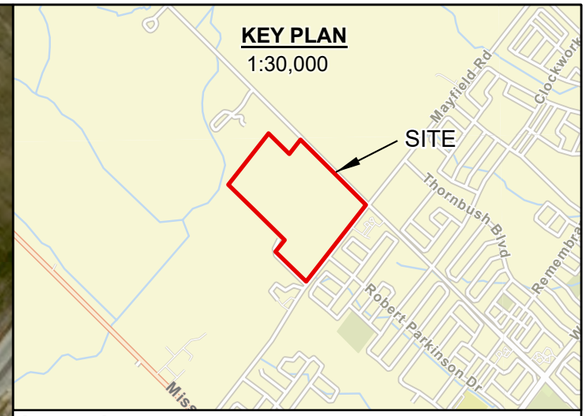
materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing 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.

APPENDIX B

Figures





Legend

TEST # TEST WELL ID
BH # BOREHOLE ID

- MONITORING WELL - GEMTEC (GEOTECHNICAL INVESTIGATION)
- MONITORING WELL - GEMTEC (PHASE TWO ENVIRONMENTAL SITE ASSESSMENT)
- HISTORICAL BOREHOLE LOCATION - PREVIOUS STUDIES
- INFILTRATION TEST LOCATION
- SITE BOUNDARY

NOTES:

1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: World Street Map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
World Imagery: Peel Region, Town of Oakville, Maxar, Microsoft

Scale:
1:3,500
0 25 50 100 150 200 250 Meters

Drawing
SITE PLAN

Client:
12100 CREDITVIEW DEVELOPMENTS LIMITED
C/O FIELDGATE COMMERCIAL

Project
HYDROGEOLOGICAL INVESTIGATION
12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C. / S.J.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025	**FIGURE B.1**	

GEMTEC
Consulting Engineers and Scientists
6695 Millcreek DR #7,
Mississauga, ON L5N 5M4
T: (416) 347-7427
www.gemtec.ca
graeme.skinner@gemtec.ca

Folder: N:\Projects\102400\102491.013\06_Civil Drafting\Sheets\1. Drawings\HydroG\102491_013_CreditView_HydroG_R0_2024_05_15\



Legend

BH # BOREHOLE ID
4901829 WELL ID

- MONITORING WELL - GEMTEC (GEOTECHNICAL INVESTIGATION)
- MONITORING WELL - GEMTEC (PHASE TWO ENVIRONMENTAL SITE ASSESSMENT)
- SITE BOUNDARY

WELL TYPE

- DEEP (> 10m) BORED
- DEEP (> 10m) DRILLED OVERBURDEN
- MONITORING WELL / TEST HOLE
- DRILLED BEDROCK
- NO INFORMATION / ALTERATION

WELL USE

- DOMESTIC, STOCK WATERING, A/C, WATER SUPPLY
- MUNICIPAL, PUBLIC SUPPLY
- OTHER USE (DEWATERING, RECHARGE, NOT USED, UNKNOWN USE)

NOTES:

1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Concept plans provided by GSAI (December 11, 2023) & Turner Fleischer (October 18, 2024).
6. Service Layer Credits: World Imagery: Peel Region, Town of Oakville, Maxar, Microsoft

Scale:
1:3,500
0 25 50 100 150 200 250 Meters

Drawing
PROPOSED CONCEPT PLAN

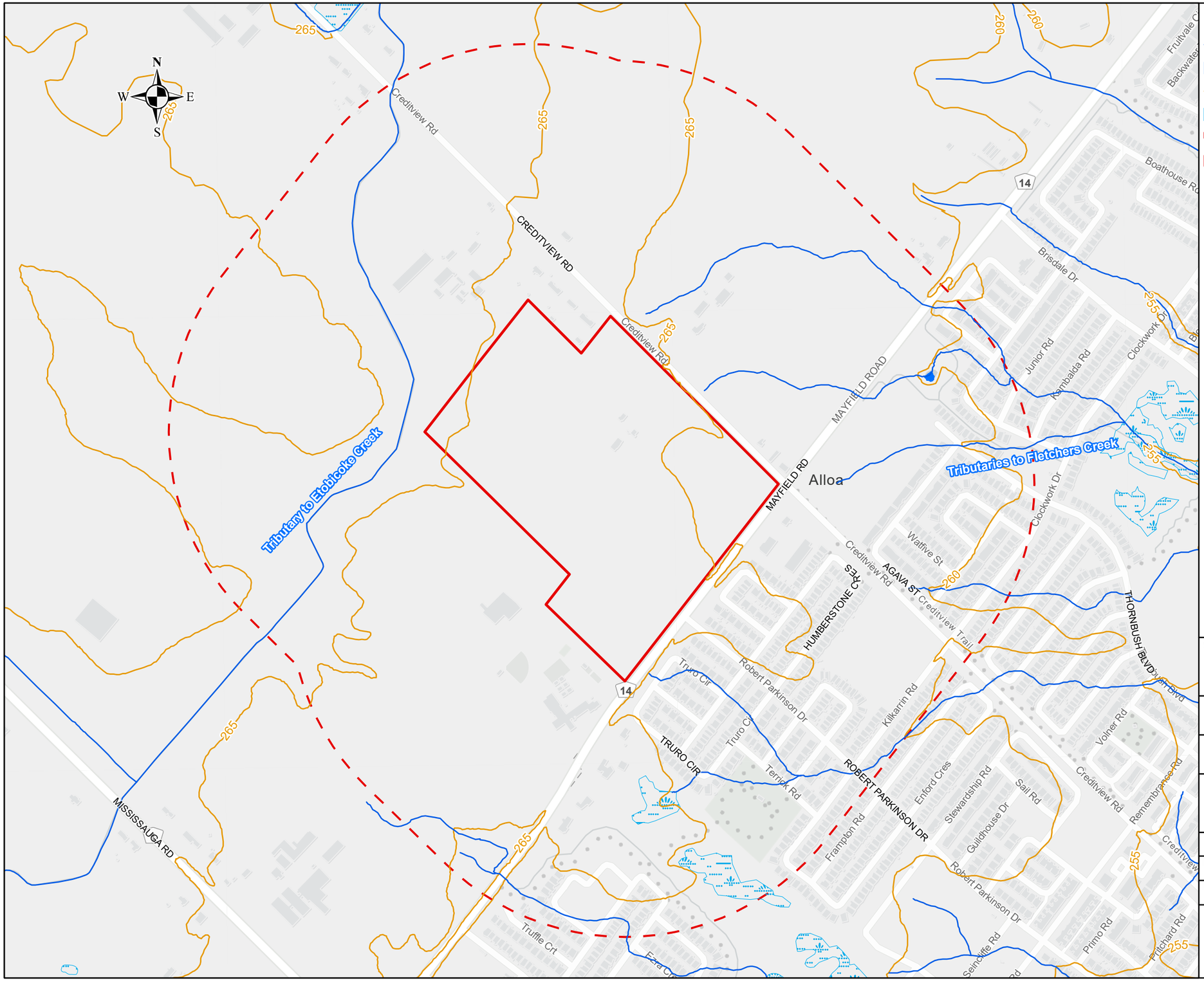
Client:
12100 CREDITVIEW DEVELOPMENTS LIMITED
C/O FIELDGATE COMMERCIAL

Project
HYDROGEOLOGICAL INVESTIGATION
12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C. / S.J.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025		**FIGURE B.2**

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Legend

- WATERCOURSE
- WATERBODIES
- ELEVATION CONTOUR (M AMSL)
- PROVINCIALLY SIGNIFICANT WETALANDS
- 500 M AROUND SITE BOUNDARY
- SITE BOUNDARY

NOTES:

1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. m amsl = meters above mean sea level.
6. Service Layer Credits: Light Grey Canvas Background:

Scale: 1:7,500

0 75 150 300 450 600 Meters

Drawing: TOPOGRAPHY AND NATURAL HERITAGE

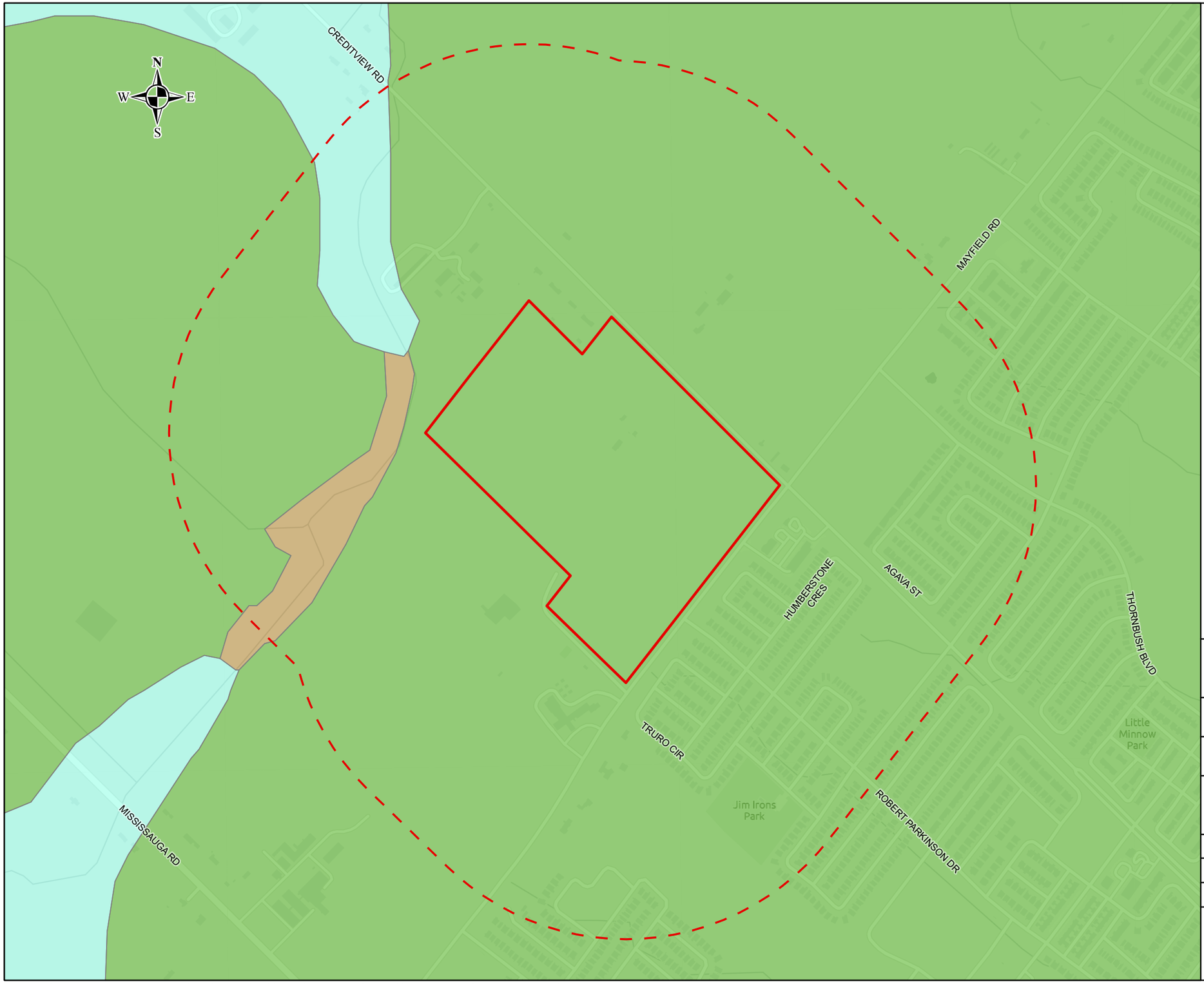
Client: 12100 CREDITVIEW DEVELOPMENTS LIMITED C/O FIELDGATE COMMERCIAL

Project: HYDROGEOLOGICAL INVESTIGATION 12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025		**FIGURE B.3**

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Legend

500 M AROUND SITE BOUNDARY

SITE BOUNDARY

SURFICIAL GEOLOGY

MODERN ALLUVIAL DEPOSITS (CLAY, SILT, SAND, GRAVEL, MAY CONTAIN ORGANIC REMAINS)

FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS (SILT AND CLAY, MINOR SAND AND GRAVEL)

HALTON TILL (CLAY TO SILT-TEXTURED TILL (DERIVED FROM GLACIOLACUSTRINE DEPOSITS OR SHALE))

NOTES:

1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: Light Grey Canvas Background:

Scale: 1:7,500

0 75 150 300 450 600 Meters

Drawing: SURFICIAL GEOLOGY

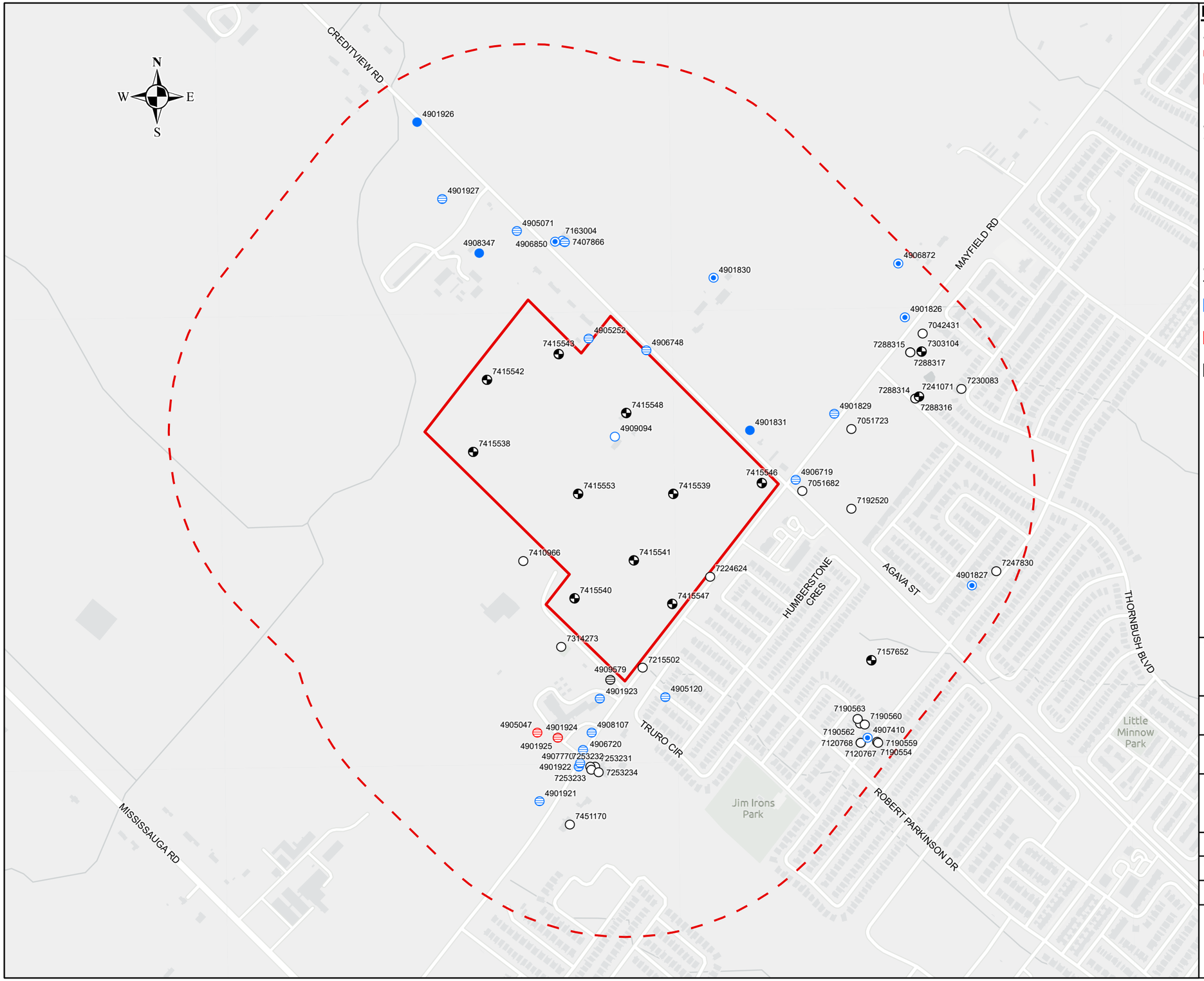
Client: 12100 CREDITVIEW DEVELOPMENTS LIMITED C/O FIELDGATE COMMERCIAL

Project: HYDROGEOLOGICAL INVESTIGATION 12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025	**FIGURE B.4**	

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Legend

4901829 WELL ID

500 m AROUND SITE BOUNDARY

SITE BOUNDARY

WELL TYPE

- DEEP (> 10m) BORED
- DEEP (> 10m) DRILLED OVERBURDEN
- MONITORING WELL / TEST HOLE
- DRILLED BEDROCK
- NO INFORMATION / ALTERATION

WELL USE

- DOMESTIC, STOCK WATERING, A/C, WATER SUPPLY
- MUNICIPAL, PUBLIC SUPPLY
- OTHER USE (DEWATERING, RECHARGE, NOT USED, UNKNOWN USE)

NOTES:

1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: Light Grey Canvas Background:

Scale: 1:7,500

0 75 150 300 450 600 Meters

Drawing: WATER WELL RECORDS WITHIN 500 m

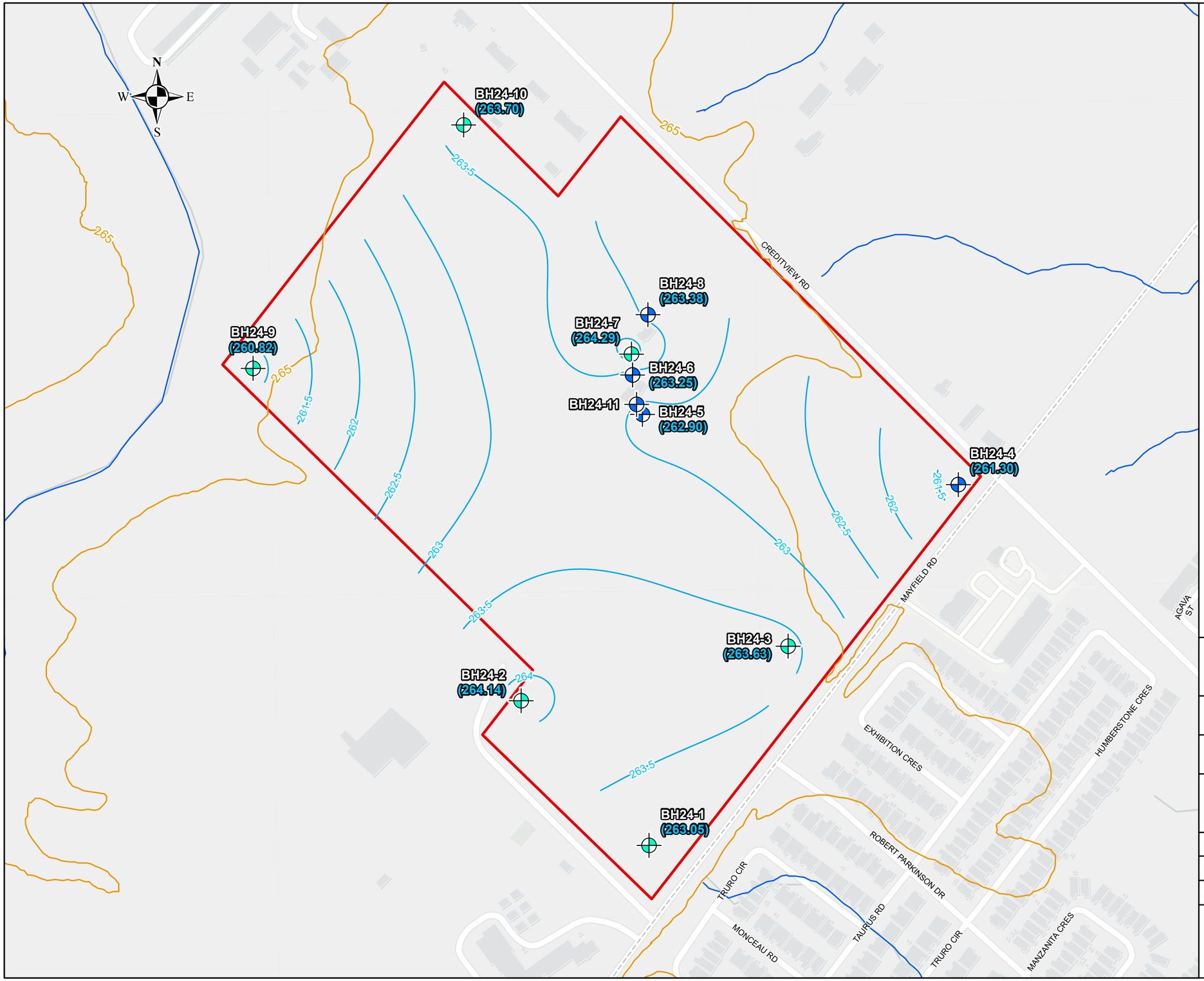
Client: 12100 CREDITVIEW DEVELOPMENTS LIMITED C/O FIELDGATE COMMERCIAL

Project: HYDROGEOLOGICAL INVESTIGATION 12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025	**FIGURE B.5**	

GEMTEC
Consulting Engineers and Scientists
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graeme.skinner@gemtec.ca

Folder: N:\Projects\102400\102491.013\06_Civil Drafting\Sheets\1. Drawings\HydroG\102491_013_CreditView_HydroG_R0_2024_05_15\



Legend

BH # BOREHOLE ID
XX.XX GROUNDWATER ELEVATION, m amsl (MAY 21, 2024)

- MONITORING WELL - GEMTEC (GEOTECHNICAL INVESTIGATION)
- MONITORING WELL - GEMTEC (PHASE TWO ENVIRONMENTAL SITE ASSESSMENT)
- GROUNDWATER CONTOUR (M AMSL)
- ELEVATION CONTOUR (M AMSL)
- WATERCOURSE
- SITE BOUNDARY

NOTES:
1. All locations are approximate
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. m amsl = metres above mean sea level.
6. Service Layer Credits: Light Grey Canvas Background:

Scale: 1:3,500

0 25 50 100 150 200 250 Meters

Drawing: SHALLOW GROUNDWATER FLOW

Client: 12100 CREDITVIEW DEVELOPMENTS LIMITED
C/O FIELDGATE COMMERCIAL

Project: HYDROGEOLOGICAL INVESTIGATION
12100 CREDITVIEW ROAD, CALEDON, ONTARIO

Drwn By:	K.C. / S.J.	Chkd By:	K.G.
Project No.	102491.013	Revision No.	0
Date	MAY 2025	**FIGURE B.6**	

GEMTEC
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graeme.skinner@gemtec.ca

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APPENDIX C

Supporting Documentation

PLAN OF SURVEY SHOWING TOPOGRAPHY OF

PART OF LOT 18
CONCESSION 4
WEST OF HURONTARIO STREET

(GEOGRAPHIC TOWNSHIP OF CHINGUACOUSY)

TOWN OF CALEDON

REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 600

10 0 10 20 40 metres

J.D. BARNES LIMITED

© COPYRIGHT

METRIC DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999669.

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (2010.0).

COORDINATES TO AN URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
ORP (A)	591 394.23	4 839 791.22
ORP (B)	591 676.93	4 839 512.92

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

THE RESULTANT TIE BETWEEN ORP (A) AND ORP (B) IS 396.80 N45°27'30"E

TOPOGRAPHIC LEGEND

◯	MH	DENOTES MANHOLE
•	HP	DENOTES HYDRO POLE
•	LS	DENOTES LIGHT STANDARD
•	TL	DENOTES TRAFFIC SIGNAL
⊣	H	DENOTES FIRE HYDRANT
⊸	WV	DENOTES WATER VALVE
	HDPE	DENOTES HIGH DENSITY POLYETHYLENE CULVERT
	BM	DENOTES BENCH MARK (LOCAL)
	MB	DENOTES MAIL BOX
		DENOTES CONIFEROUS TREE DIA=DIAMETER OF TRUNK IN METRES
		DENOTES DECIDUOUS TREE DIA=DIAMETER OF TRUNK IN METRES

PRIMARY CONTOURS ARE AT 1.00m INTERVALS.
SECONDARY CONTOURS ARE AT 0.25m INTERVALS.

ELEVATION NOTE

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BRAMPTON HORIZONTAL CONTROL MONUMENT: No. 042200357
ELEVATION=260.691m

LOCAL BENCHMARK

SET CUT CROSS 0.35m FROM SOUTH FACE OF CONCRETE HEAD WALL ALONG EAST SIDE OF ENTRANCE ROAD. 200m NORTH OF MAYFIELD ROAD.
ELEVATION=265.29m

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
P1	DENOTES	PLAN 43R-33709
MEAS	DENOTES	MEASURED
B	DENOTES	BURIED 0.4m

N=NORTH / S=SOUTH / E=EAST / W=WEST

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT LOCAL BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATIONS AGREE WITH THE INFORMATION SHOWN ON THIS PLAN.

AREA = 25.5918 Hectares

LOT 19, CONCESSION 4, WEST OF HURONTARIO STREET

PART 1, PLAN 43R-17493
PIN 14255-0100 (LT)

PART 1, PLAN 43R-5916
PLAN 43R-5099 (LT)
PIN 14255-0099 (LT)

PART 2, PLAN 43R-4439
PLAN 43R-4439
PIN 14255-0098 (LT)

PART 3, PLAN 43R-4439
PIN 14255-0097 (LT)

PART 2, PLAN 43R-14710

PIN 14255-0272 (LT)

PART 2, PLAN 43R-2478
PIN 14255-0267 (LT)
SUBJECT TO A RIGHT OF WAY AS IN PR471123

PART 1, PLAN 43R-24786

PART 1, EXPROPRIATION PLAN PR1808650
PIN 14255-0281 (LT)

PART 1, PLAN 43R-33709
PIN 14255-0282 (LT)

PART 2, EXPROPRIATION PLAN PR1808650

PIN 14255-0281 (LT)

EXPROPRIATION PLAN 30500

SUBJECT TO AN EASEMENT AS IN INSTRUMENT No. CH27917

PART 2, PLAN 43R-33709

KNOWN AS MAYFIELD ROAD
(ORIGINAL ROAD ALLOWANCE BETWEEN LOTS 17 AND 18)
PIN 14255-0121 (LT)

KNOWN AS CREDITVIEW ROAD
(ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 3 AND 4)
PIN 14252-0124 (LT)

MOST EASTERLY CORNER OF LOT 8, CONCESSION 4 WEST OF HURONTARIO STREET

LOCAL BENCHMARK
ELEVATION=265.29m

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2159970

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON DECEMBER 13th, 2021.

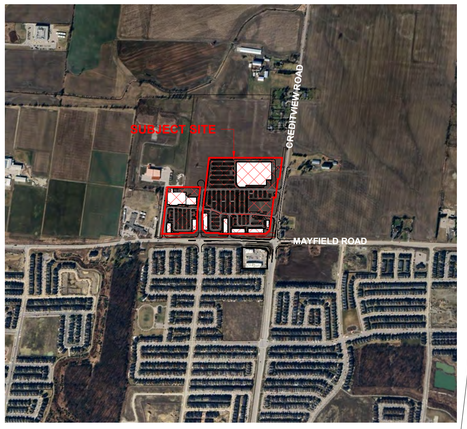
Jan. 10, 2022
DATE

THOMAS J. SALB
ONTARIO LAND SURVEYOR

J.D.BARNES LIMITED SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
401 WHEELABRATOR WAY, SUITE A, MILTON, ON L9T 3C1
T: (905) 875-9955 F: (905) 875-9956 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
AA	TS	21-30-763-00-A

FILE: G:\21-30-763\00\Drawing\21-30-763-00-A.dgn
DATED: 01/10/2021
PLOTTED: 1/10/2022



2 KEY PLAN
A100.0SPA : 12000

1 A100.1SPA

ADDITIONAL LANDS OWNED BY THE APPLICANT (NOT PART OF THE SUBDIVISION)

PIN 14255-0291 (LT)

EXPROPRIATION PLAN PR1808650

RETAIL C1 (± 47,000 S.F.)

MEZZANINE AREA 2366 S.F.

RETAIL C2 (± 17,000 S.F.)

RETAIL C3 (±8,544 S.F.)

RETAIL C4 (±6,126 S.F.)

SITE C (±6.67 ACRES)
SITE C PARKING SPACES = 323 CARS (3.89/1000 S.F.)

PATIO

PROPOSED ALL TURNS

PROPOSED ACCESS TRUCKS ONLY

PROPOSED R/IRO

PROPOSED SIGNALIZED INTERSECTION

CART CORRAL

FIRE TRUCK ROUTE

SITE A (±17.96 ACRES)
TOTAL PARKING = 991 CARS (6.11/1000 S.F.)

RETAIL A (± 162,226 S.F.)

TIRE FILL UP STATION

PROPANE STATION

TRANSFORMER

COMPACTORS

RETAIL B1 (± 13,811 S.F.)

SITE B1 PARKING SPACES = 131 CARS (4.79/1000 S.F.)

RETAIL B2 (± 13,468 S.F.)

SITE B (±6.05 ACRES)

SITE B2 PARKING SPACES = 171 CARS (5.52/1000 S.F.)

RETAIL B3 (± 12,266 S.F.)

RETAIL B4 (± 14,261 S.F.)

RETAIL B5 (± 4,400 S.F.)

STREET 'G' ROW (±1.12 ACRES)

PART 2 PLAN 43R-41107

PART 1, PLAN 43R-41107

PART 3, PLAN 43R-41107

PART 4 PLAN 43R-41107

EXPROPRIATION PLAN 30500

PART 1, PLAN 43R-39709

PIN 14255-0126 (LT)

BLOCK 3 ROAD WIDENING (INTERIM) 0.66ha (1.63ac)

BLOCK 8 0.3m RESERVE

BLOCK 6 ROAD WIDENING 0.65ha (1.61ac)

BLOCK 5 ROAD WIDENING (ULTIMATE) 0.11ha (0.27ac)

GAS BAR

PYLON SIGN

100 SETBACK

300 SETBACK

EXISTING INTERSECTION

PIN 14250-0124 (LT)

LEGAL CENTRELINE OF ROAD ALLOWANCE

CREDITVIEW ROAD

MAYFIELD ROAD

PIN 14255-0121 (LT)

1 OVERALL SITE PLAN
A100.0SPA 1 : 750

2025-02-21 10:42:16 AM

TURNER FLEISCHER

Turner Fleischer Architects Inc.

67 Lesmill Road
Toronto, ON, M3B 2T8
T 416 425 2222
turnerfleischer.com

This drawing, as an instrument of service, is provided by and is the property of Turner Fleischer Architects Inc. The contractor must verify and accept responsibility for all dimensions and conditions on site and must notify Turner Fleischer Architects Inc. of any variations from the supplied information. This drawing is not to be scaled. The architect is not responsible for the accuracy of existing site conditions and information. The contractor must review and take field verify all appropriate consultant's drawings before proceeding with the work. Construction must conform to all applicable codes and requirements of authorities having jurisdiction. The contractor working from drawings not specifically marked 'For Construction' must assume full responsibility and bear costs for any corrections or damages resulting from his work.

The site plan prepared by Turner Fleischer is reliant on a legal survey showing the boundaries of the lands together with the current location of any existing buildings, features or encroachment prepared by THOMAS J. SLAB, dated 2023-10-06 as provided by FIELEDGATE.

LEGEND

- PROPOSED ENTRANCE
- PROPOSED EXIT
- PROPOSED FIRE HYDRANT
- PROPOSED SIGNAGE
- PROPOSED FIRE & TRUCK ROUTE (HEAVY DUTY ASPHALT)
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CONCRETE PAD
- EV — PROPOSED ELECTRIC VEHICLE PARKING

STATISTICS

OVERALL SITE AREA	**± 35.93 ACRES**	**± 14.54 HA.**
SITE A	± 17.96 ACRES	± 7.27 HA.
SITE B	± 6.05 ACRES	± 2.45 HA.
SITE C	± 6.67 ACRES	± 2.78 HA.
BLOCK 3 ROAD WIDENING (INTERIM)	± 1.63 ACRES	± 0.66 HA.
BLOCK 4 ROAD WIDENING (ULTIMATE)	± 0.05 ACRES	± 0.02 HA.
BLOCK 5 ROAD WIDENING (ULTIMATE)	± 0.27 ACRES	± 0.11 HA.
BLOCK 6 ROAD WIDENING	± 1.61 ACRES	± 0.65 HA.
ROW	± 1.12 ACRES	± 0.45 HA.
ADDITIONAL LANDS OWNED BY THE APPLICANT...	± 0.37 ACRES	± 0.15 HA.
SITE A		
RETAIL A	± 162,226 S.F.	± 15,071 S.M.
SITE A PARKING PROVIDED	991 CARS (6.11/1000 S.F.)	(6.58/100 S.M.)
SITE B		
RETAIL B1	± 13,811 S.F.	± 1,283 S.M.
RETAIL B2	± 13,468 S.F.	± 1,251 S.M.
RETAIL B3	± 12,266 S.F.	± 1,140 S.M.
RETAIL B4	± 14,261 S.F.	± 1,325 S.M.
RETAIL B5	± 4,400 S.F.	± 409 S.M.
SITE B TOTAL GFA	± 58,206 S.F.	± 5,408 S.M.
SITE B PARKING PROVIDED	302 CARS (5.19/1000 S.F.)	(5.58/100 S.M.)
SITE A & B TOTAL BUILDING AREA	± 220,432 S.F.	± 20,479 S.M.
SITE A & B TOTAL PARKING	1293 CARS	
COVERAGE		21.08%
SITE C		
SITE AREA	± 6.67 ACRES	± 2.78 HA.
RETAIL C1	± 47,000 S.F.	± 4,366 S.M.
RETAIL C1 (MEZZANINE)	± 2,366 S.F.	± 220 S.M.
RETAIL C2	± 17,000 S.F.	± 1,579 S.M.
RETAIL C3	± 8,544 S.F.	± 794 S.M.
RETAIL C4	± 6,126 S.F.	± 755 S.M.
SITE C TOTAL GFA	± 83,036 S.F.	± 7,714 S.M.
SITE C PARKING PROVIDED	323 CARS (3.89/1000 S.F.)	(4.19/100 S.M.)
COVERAGE		27.75%
SITE A, B & C TOTAL GFA	± 465,694 S.F.	± 43,264 S.M.
TOTAL PARKING PROVIDED	1616 CARS (3.47/1000 S.F.)	(3.74/100 S.M.)

PROPOSED ZONING: **C GENERAL COMMERCIAL** TOWN OF CALEDON ZONING BY-LAW	**REQUIRED**	**PROPOSED**
MIN. LOT AREA	0.80 HA.	16.54 HA.
MIN. LOT FRONTAGE	30.0 M	440.6 M
MAX. BUILDING AREA	25%	19.88%
MAX. BUILDING HEIGHT	10.5 M	N/A
MIN. LANDSCAPED AREA	10%	10.52%
MIN. PLANTING STRIP WIDTH	3.0 M	3.0 M
MIN. FRONT YARD SETBACK	3.0 M	3.0 M
MIN. EXTERIOR SIDE YARD SETBACK	3.0 M	3.0 M
MIN. INTERIOR SIDE YARD SETBACK	3.0 M	3.0 M
MIN. REAR YARD SETBACK	9.0 M	15.0 M
PARKING SPACE DIMENSIONS	2.75M X 6.0M (16.5 SQM AREA)	2.75M X 6.0M (16.5 SQM AREA)
ACCESSIBLE PARKING DIMENSIONS (AODA)	TYPE A: 3.4M X 6.0 TYPE B: 2.4M X 6.0	TYPE A: 3.4M X 6.0 TYPE B: 2.4M X 6.0
MIN. PARKING SPACES (1/200 S.M.)	1447 CARS	1629 CARS
	5.00 /100 S.M	5.63 /100 S.M.
MIN. ACCESSIBLE PARKING SPACES (1 SPACES + 1% OF TOTAL PARKING)	27 SPACES	38 SPACES
MIN. LOADING SPACES	N/A	7 SPACES

#	DATE	DESCRIPTION	BY
1	2024-10-18	ISSUED FOR SPA	ETI

fieldgate

PROJECT
MAYFIELD ROAD & CREDITVIEW ROAD

CALEDON, ON

DRAWING
OVERALL SITE PLAN

PROJECT NO.	22.111P01
PROJECT DATE	2024-05-09
DRAWN BY	ETI
CHECKED BY	JJJ
SCALE	As indicated

DRAWING NO. A100.0SPA REV. 1

(NOT PART OF THIS APPLICATION)

(NOT PART OF THIS APPLICATION)

(NOT PART OF THIS APPLICATION)

STREET 'A'
(NOT PART OF THIS APPLICATION)

WILLOUGHBY ROAD

CREDITVIEW ROAD
KNOWN AS CREDITVIEW ROAD
(ORIGINAL ROAD ALLOWANCE BETWEEN CONCESSIONS 3 AND 4)

LEGAL CENTRELINE OF ROAD ALLOWANCE

PART 1, PLAN 43R-33703
PART 2, PLAN 43R-34255-0262
PIN 14255-0262

PART 4, PLAN 43R-41107
PIN 14252-0124 (LT)

(PLANNED 30m WIDE ROAD ALLOWANCE)

EXISTING STRUCTURES AND DRIVEWAY TO BE REMOVED

BRICK DWELLING

STEEL CLAD BARN

STEEL CLAD GARAGE

GRAVEL DRIVE

RETAIL A
FFE=265.00

265.00

263.80

EXISTING HYDRO POLE

EXISTING HYDRO POLE

PROPOSED ENTRANCE PER REGION STD. DWG. 5-1-8

PROPOSED ENTRANCE PER REGION STD. DWG. 5-1-8

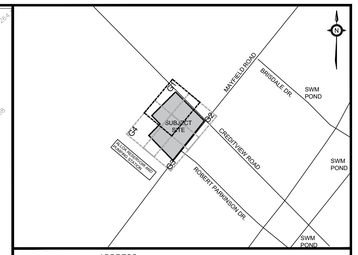
CONTROL MH 1 (1800Ø) TOP:263.54

CONTROL MH 2 (1200Ø) TOP:263.62

DGS A (STORMCEPTOR EF012) (1800Ø) TOP:263.23

264.75

REFER TO DRAWING G2 FOR CONTINUATION



KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED ITEMS
- EXISTING ITEMS
- LIMIT OF PROPERTY LINE
- LIMIT OF CONSTRUCTION
- LIMIT OF BUILDING STRUCTURE
- BUILDING ENTRANCE
- PROP ELEVATION TO MATCH EXISTING
- EMERGENCY OVERLAND FLOW ROUTE
- SANITARY MH
- STM MH / CBMH / DCBMH / OGS
- CB / DCB / AD / TD
- HYDRANT / SIAMESE / METER CHAMBER
- VALVE BOX / VALVE CHAMBER

BENCHMARK:	ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BRAMPTON HORIZONTAL CONTROL MONUMENT: No. 042200357 ELEVATION=260.691m
BEARING:	BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).
SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
1	SITE PLAN APPROVAL - SUBMISSION 1	241018	TF

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KWA SITE DEVELOPMENT CONSULTING INC. 2453 AUCKLAND DRIVE BURLINGTON, ON L7L 7A9

LICENSED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

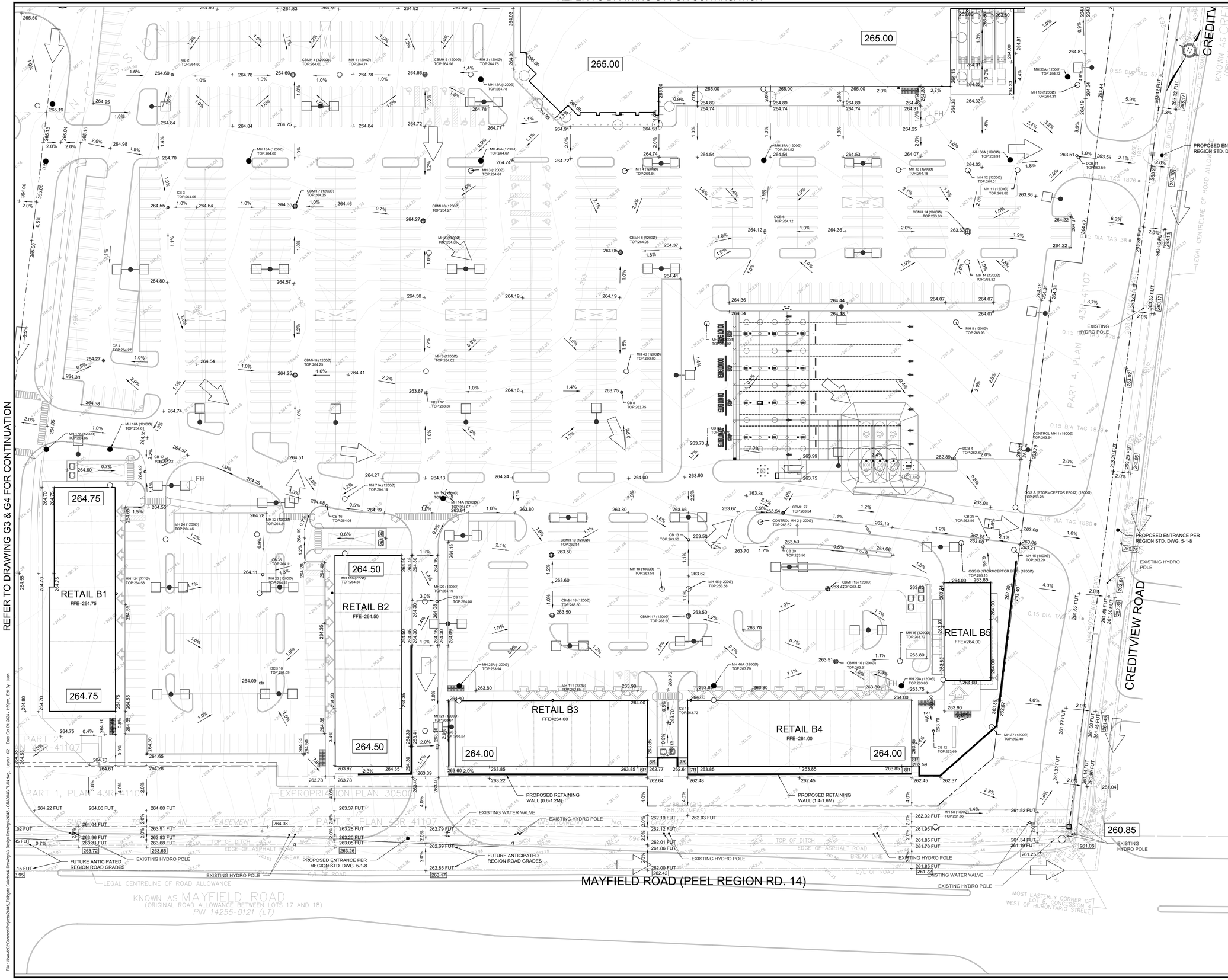
GRADING PLAN

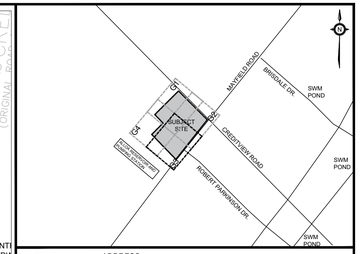
SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	G1
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: \\kwa-ds02\Common\Projects\24045_Fieldgate Caledon\4. Drawings\3. Design Drawings\24045 - GRADING PLAN.dwg, Layout: G1 Date: Oct 09, 2024 - 1:59pm, Edit By: Liam

REFER TO DRAWING G1 FOR CONTINUATION

REFER TO DRAWING G3 & G4 FOR CONTINUATION





KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED ITEMS
- EXISTING ITEMS
- LIMIT OF PROPERTY LINE
- LIMIT OF CONSTRUCTION
- LIMIT OF BUILDING STRUCTURE
- BUILDING ENTRANCE
- PROP ELEVATION TO MATCH EXISTING
- EMERGENCY OVERLAND FLOW ROUTE
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SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
1	SITE PLAN APPROVAL - SUBMISSION 1	241018	TF

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LICENSED PROFESSIONAL ENGINEER
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100176144
OCT 18, 2024
PROVINCE OF ONTARIO

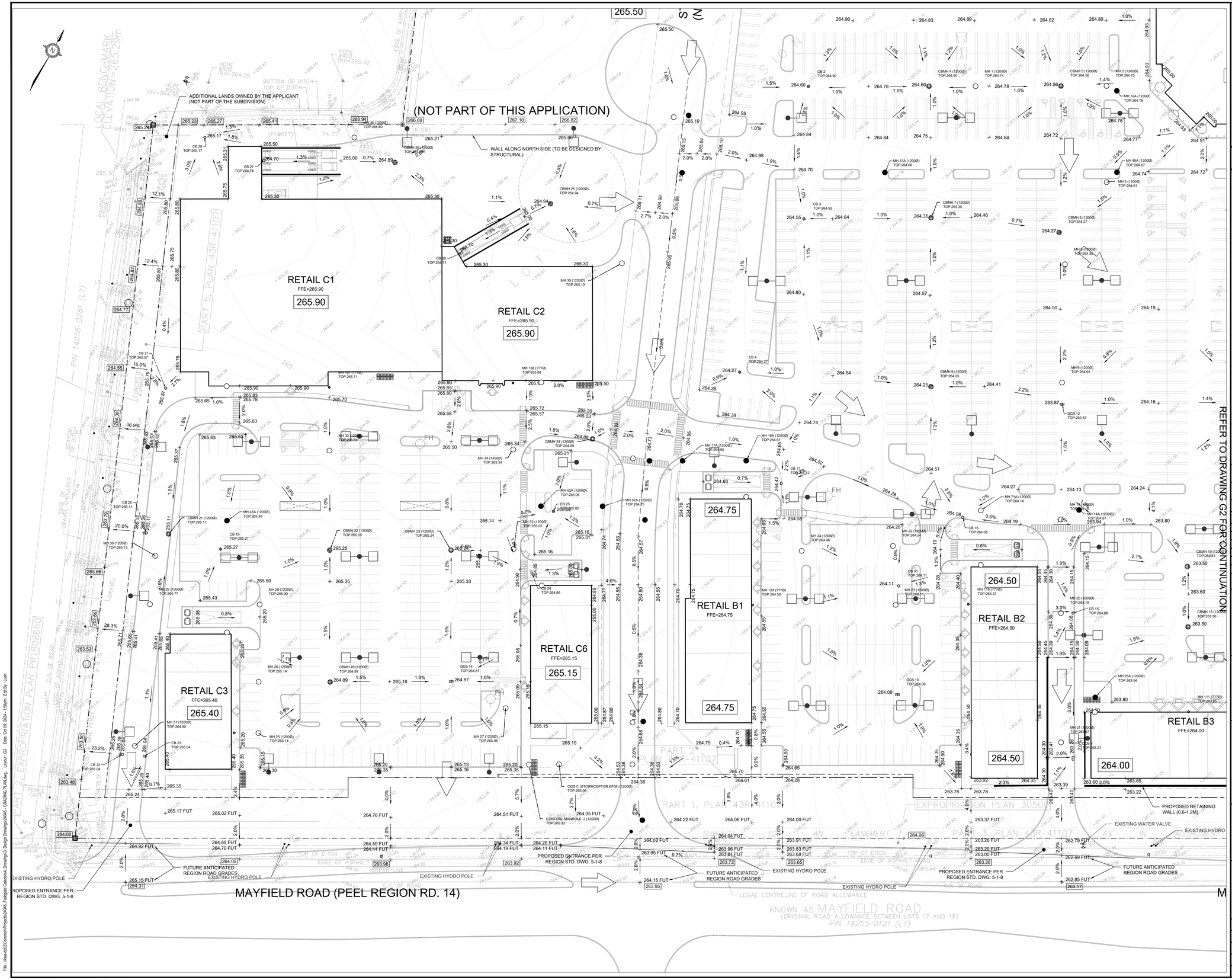
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12100 CREDITVIEW ROAD

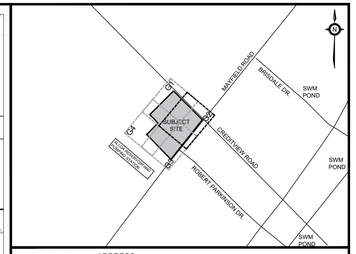
GRADING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	G2
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: \\kwa-ds02\Common\Projects\24045_Fallgate Caledon\4_Drawings\3_Design Drawings\24045 - GRADING PLAN.dwg, Layout: G2, Date: Oct 09, 2024 - 1:59pm, Edit By: Luan

REFER TO DRAWING G1 & G4 FOR CONTINUATION





KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED ITEMS
- EXISTING ITEMS
- LIMIT OF PROPERTY LINE
- LIMIT OF CONSTRUCTION
- LIMIT OF BUILDING STRUCTURE
- BUILDING ENTRANCE
- PROP ELEVATION TO MATCH EXISTING
- EMERGENCY OVERLAND FLOW ROUTE
- SANITARY MH
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SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
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KWA SITE DEVELOPMENT CONSULTING INC. 2453 AUCKLAND DRIVE BURLINGTON, ON L7L 7A9

LICENSED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

GRADING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	G3
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

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REFER TO DRAWING G1 FOR CONTINUATION

(NOT PART OF THIS APPLICATION)

STREET 'A'
(NOT PART OF THIS APPLICATION)

ADDITIONAL LANDS OWNED BY THE APPLICANT
(NOT PART OF THE SUBDIVISION)

(NOT PART OF THIS APPLICATION)

WALL ALONG NORTH SIDE (TO BE DESIGNED BY STRUCTURAL)

RETAIL C1
FFE=265.90
265.90

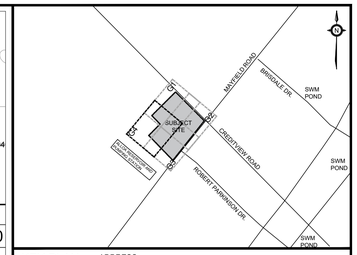
RETAIL C2
FFE=265.90
265.90

RETAIL B1
FFE=264.75
264.75

RETAIL B2
264.50

REFER TO DRAWING G3 FOR CONTINUATION

REFER TO DRAWING G2 FOR CONTINUATION



KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED ITEMS
- EXISTING ITEMS
- LIMIT OF PROPERTY LINE
- LIMIT OF CONSTRUCTION
- LIMIT OF BUILDING STRUCTURE
- BUILDING ENTRANCE
- PROP ELEVATION TO MATCH EXISTING
- EMERGENCY OVERLAND FLOW ROUTE
- SANITARY MH
- STM MH / CBMH / DCBMH / OGS
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SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
1	SITE PLAN APPROVAL - SUBMISSION 1	241018	TF

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KWA SITE DEVELOPMENT CONSULTING INC. 2453 AUCKLAND DRIVE BURLINGTON, ON L7L 7A9

LICENCED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

GRADING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	G4
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: I:\kwa\d02\Common\Projects\24045_Fallgate Caledon\4_Drawings\3_Design Drawings\24045 - GRADING PLAN.dwg, Layout: G4 Date: Oct 09, 2024 - 1:56pm, Ed By: Luan

SITE	REQ QUANTITY VOL.	REQ. RETAIN VOL.	PROVIDED QUANTITY	PROVIDED RETAINED
BLOCK A	3249.1m³	894.2m³	3262m³	935.5m³

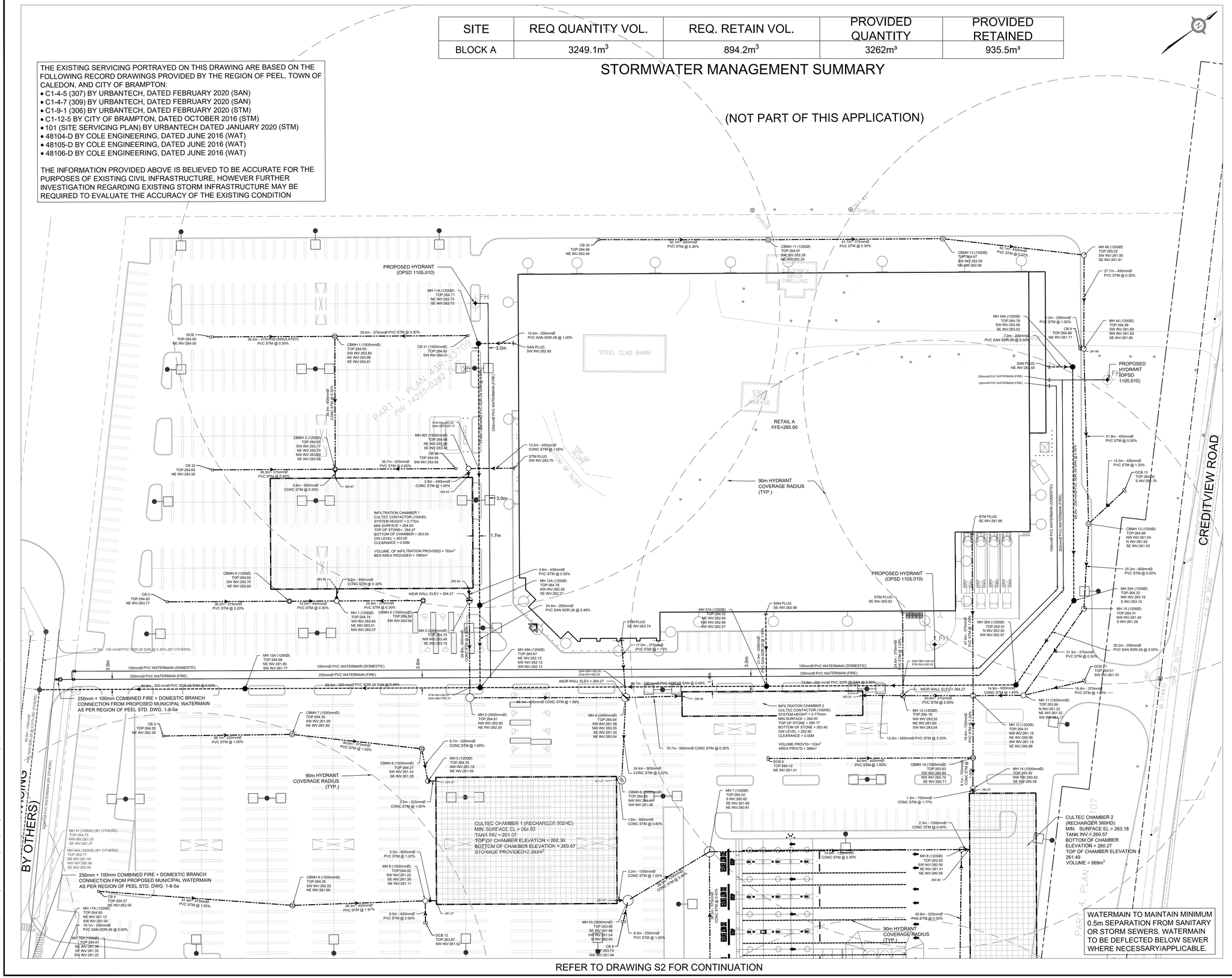
STORMWATER MANAGEMENT SUMMARY

(NOT PART OF THIS APPLICATION)

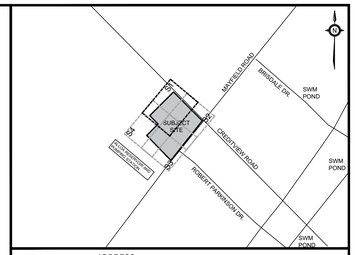
THE EXISTING SERVICING PORTRAYED ON THIS DRAWING ARE BASED ON THE FOLLOWING RECORD DRAWINGS PROVIDED BY THE REGION OF PEEL, TOWN OF CALEDON, AND CITY OF BRAMPTON:

- C1-4-5 (307) BY URBANTECH, DATED FEBRUARY 2020 (SAN)
- C1-4-7 (309) BY URBANTECH, DATED FEBRUARY 2020 (SAN)
- C1-9-1 (306) BY URBANTECH, DATED FEBRUARY 2020 (STM)
- C1-12-5 BY CITY OF BRAMPTON, DATED OCTOBER 2016 (STM)
- 101 (SITE SERVICING PLAN) BY URBANTECH DATED JANUARY 2020 (STM)
- 48104-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 48105-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 48106-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)

THE INFORMATION PROVIDED ABOVE IS BELIEVED TO BE ACCURATE FOR THE PURPOSES OF EXISTING CIVIL INFRASTRUCTURE, HOWEVER FURTHER INVESTIGATION REGARDING EXISTING STORM INFRASTRUCTURE MAY BE REQUIRED TO EVALUATE THE ACCURACY OF THE EXISTING CONDITION



REFER TO DRAWING S2 FOR CONTINUATION



KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER (BY OTHERS)
- PROPOSED STORM SEWER (BY OTHERS)
- PROPOSED WATERMAIN (BY OTHERS)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED SAN MH
- PROPOSED SAN MH (BY OTHERS)
- PROPOSED STM MH / OGS
- PROPOSED STM MH (BY OTHERS)
- PROPOSED STM CB/CBMH
- EXISTING STM MH
- EXISTING SAN MH
- PROPOSED HYDRANT
- DETECTOR CHECK VALVE / VALVE&BOX

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BEARING:	BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).
SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
1	SITE PLAN APPROVAL - SUBMISSION 1	241018	TF

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KWA SITE DEVELOPMENT CONSULTING INC. 2453 AUCKLAND DRIVE BURLINGTON, ON L7L 7A9

LICENSED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

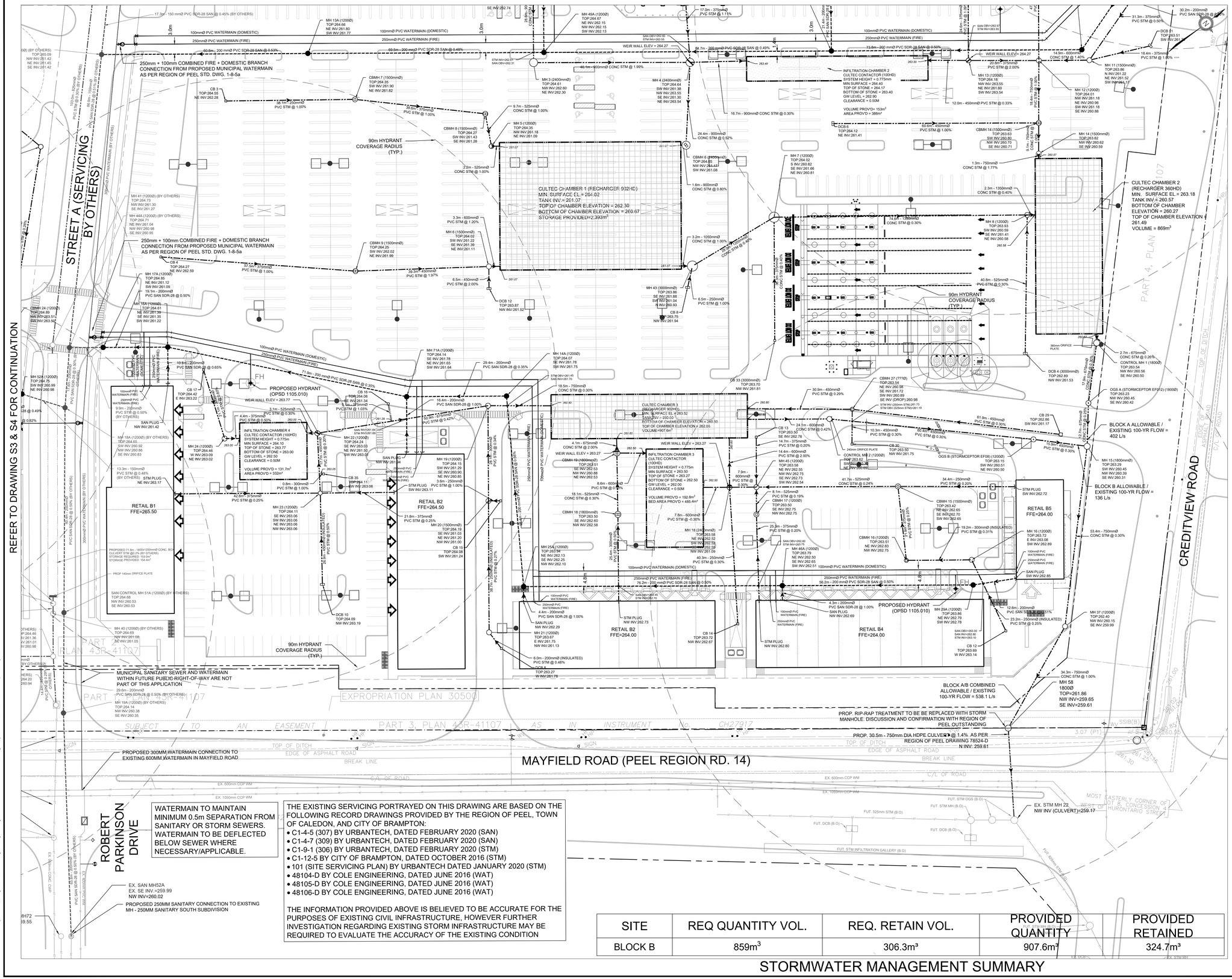
12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

SERVICING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	S1
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: \\kwa-dc02\Common\Projects\24045_Feldgate Caledon\4. Drawings\3. Design Drawings\24045 - SERVICING PLAN - KWA LP.dwg Layout: S1 Date: Oct 09, 2024 - 1:56pm Edit By: Luan

REFER TO DRAWING S1 FOR CONTINUATION



REFER TO DRAWING S3 & S4 FOR CONTINUATION

WATERMAIN TO MAINTAIN MINIMUM 0.5m SEPARATION FROM SANITARY OR STORM SEWERS. WATERMAIN TO BE DEFLECTED BELOW SEWER WHERE NECESSARY/APPLICABLE.

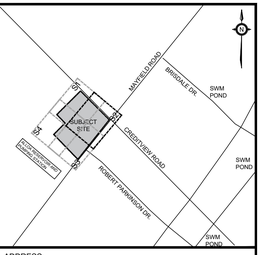
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STORMWATER MANAGEMENT SUMMARY

SITE	REQ QUANTITY VOL.	REQ. RETAIN VOL.	PROVIDED QUANTITY	PROVIDED RETAINED
BLOCK B	859m³	306.3m³	907.6m³	324.7m³



KEY PLAN N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER (BY OTHERS)
- PROPOSED STORM SEWER (BY OTHERS)
- PROPOSED WATERMAIN (BY OTHERS)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED SAN MH
- PROPOSED SAN MH (BY OTHERS)
- PROPOSED STM MH / OGS
- PROPOSED STM MH (BY OTHERS)
- PROPOSED STM CB/CBMH
- EXISTING STM MH
- EXISTING SAN MH
- PROPOSED HYDRANT
- DETECTOR CHECK VALVE / VALVE&BOX

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NO.	ISSUE	DATE	BY
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LICENSED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

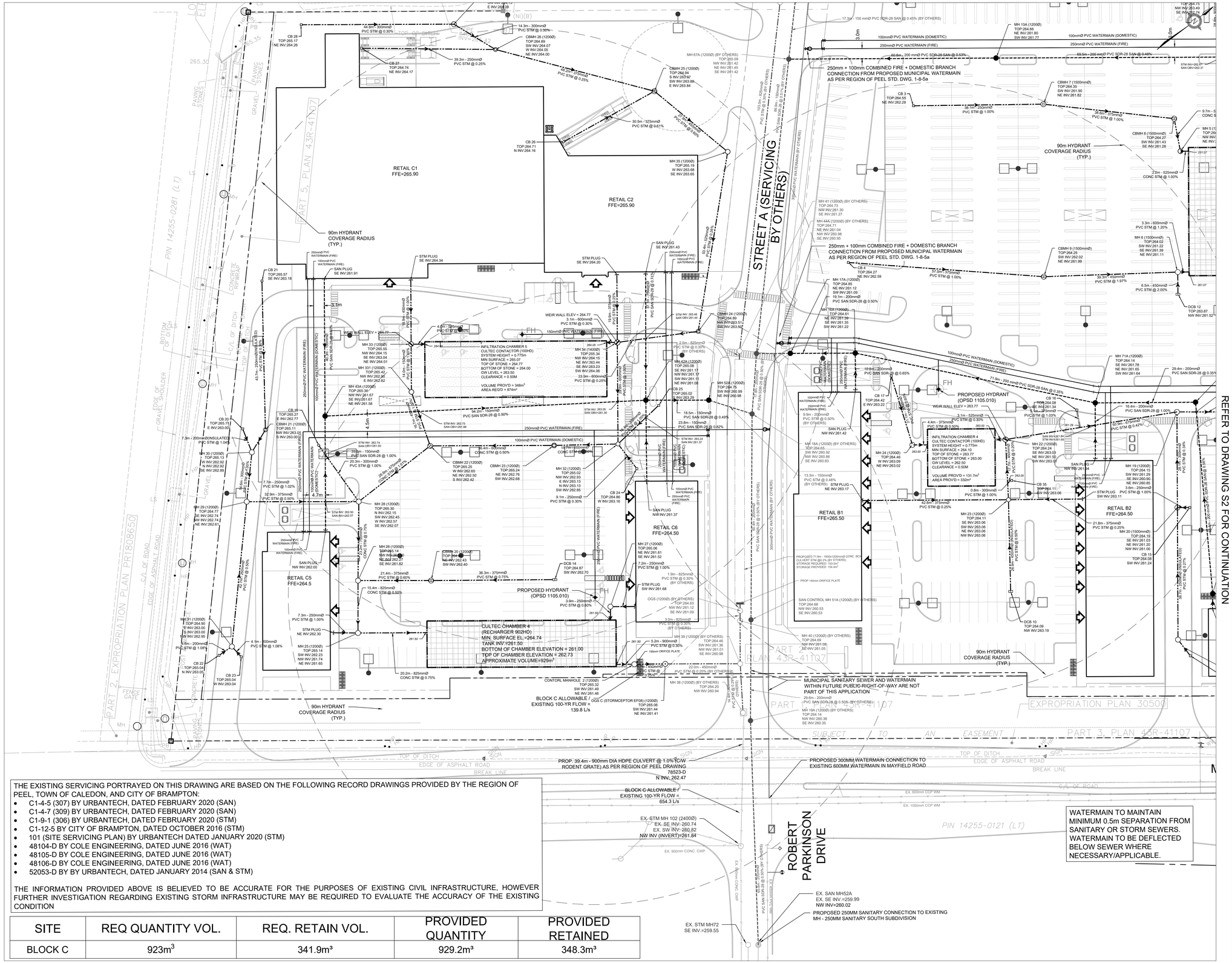
12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

SERVICING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	S2
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: \\kwa-dc02\Common\Projects\24045_Fieldgate Caledon\4_Drawings\3_Design Drawings\24045 - SERVICING PLAN - KWA-LP.dwg Layout: S2 Date: Oct 09, 2024 - 1:57pm Edit By: Luan

REFER TO DRAWING S1 & S4 FOR CONTINUATION



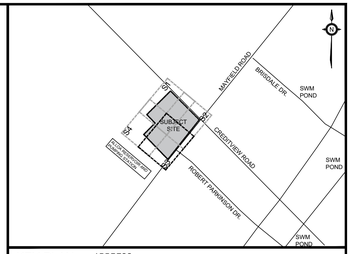
THE EXISTING SERVICING PORTRAYED ON THIS DRAWING ARE BASED ON THE FOLLOWING RECORD DRAWINGS PROVIDED BY THE REGION OF PEEL, TOWN OF CALEDON, AND CITY OF BRAMPTON:

- C1-4-5 (307) BY URBANTECH, DATED FEBRUARY 2020 (SAN)
- C1-4-7 (309) BY URBANTECH, DATED FEBRUARY 2020 (SAN)
- C1-9-1 (306) BY URBANTECH, DATED FEBRUARY 2020 (STM)
- C1-12-5 BY CITY OF BRAMPTON, DATED OCTOBER 2016 (STM)
- 101 (SITE SERVICING PLAN) BY URBANTECH DATED JANUARY 2020 (STM)
- 48104-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 48105-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 48106-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 52053-D BY BY URBANTECH, DATED JANUARY 2014 (SAN & STM)

THE INFORMATION PROVIDED ABOVE IS BELIEVED TO BE ACCURATE FOR THE PURPOSES OF EXISTING CIVIL INFRASTRUCTURE, HOWEVER FURTHER INVESTIGATION REGARDING EXISTING STORM INFRASTRUCTURE MAY BE REQUIRED TO EVALUATE THE ACCURACY OF THE EXISTING CONDITION

SITE	REQ QUANTITY VOL.	REQ. RETAIN VOL.	PROVIDED QUANTITY	PROVIDED RETAINED
BLOCK C	923m³	341.9m³	929.2m³	348.3m³

STORMWATER MANAGEMENT SUMMARY



KEY PLAN
N.T.S.

ADDRESS:
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED SANITARY SEWER (BY OTHERS)
- PROPOSED STORM SEWER (BY OTHERS)
- PROPOSED WATERMAIN (BY OTHERS)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED SAN MH
- PROPOSED SAN MH (BY OTHERS)
- PROPOSED STM MH / OGS
- PROPOSED STM MH (BY OTHERS)
- PROPOSED STM CB/CBMH
- EXISTING STM MH
- EXISTING SAN MH
- PROPOSED HYDRANT
- DETECTOR CHECK VALVE / VALVE&BOX

BENCHMARK:	ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM THE CITY OF BRAMPTON HORIZONTAL CONTROL MONUMENT: No. 042200357 ELEVATION=260.691m
BEARING:	BEARINGS ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).
SITE PLAN:	TURNER FLEISCHER, 241007
SURVEY:	J.D. BARNES, 231206

NO.	ISSUE	DATE	BY
1	SITE PLAN APPROVAL - SUBMISSION 1	241018	TF

NOT FOR CONSTRUCTION

1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KWA. THE REPRODUCTION OF ANY PART WITHOUT PRIOR WRITTEN CONSENT FROM KWA IS STRICTLY PROHIBITED.
2. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER DRAWINGS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
3. THIS DRAWING IS NOT TO BE ISSUED FOR CONSTRUCTION UNTIL ALL REQUIRED PERMITS HAVE BEEN ISSUED.
4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, INVERTS AND DATA ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO KWA 48 HOURS PRIOR TO ANY CONSTRUCTION.

KWA SITE DEVELOPMENT CONSULTING INC. 2453 AUCKLAND DRIVE BURLINGTON, ON L7L 7A9

LICENSED PROFESSIONAL ENGINEER
T. FAIR
100176144
OCT 18, 2024
PROVINCE OF ONTARIO

12100 CREDITVIEW DEVELOPMENTS LTD.
12100 CREDITVIEW ROAD

SERVICING PLAN

SCALE:	1:500 (10m)	PROJECT #	24045
DATE:	SEPT 2024		
DRAWN BY:	TG / TF	DRAWING #	S3
DESIGNED BY:	TG / TF / PB		
CHECKED BY:	TF / RA		

File: \\awa-dc02\Common\Projects\24045_Fieldgate Caledon\4_Drawings\3. Design Drawings\24045 - SERVICING PLAN - KWA.LP.dwg, Layout: S3 Date: Oct 09, 2024 - 1:48pm, Edit By: Luan

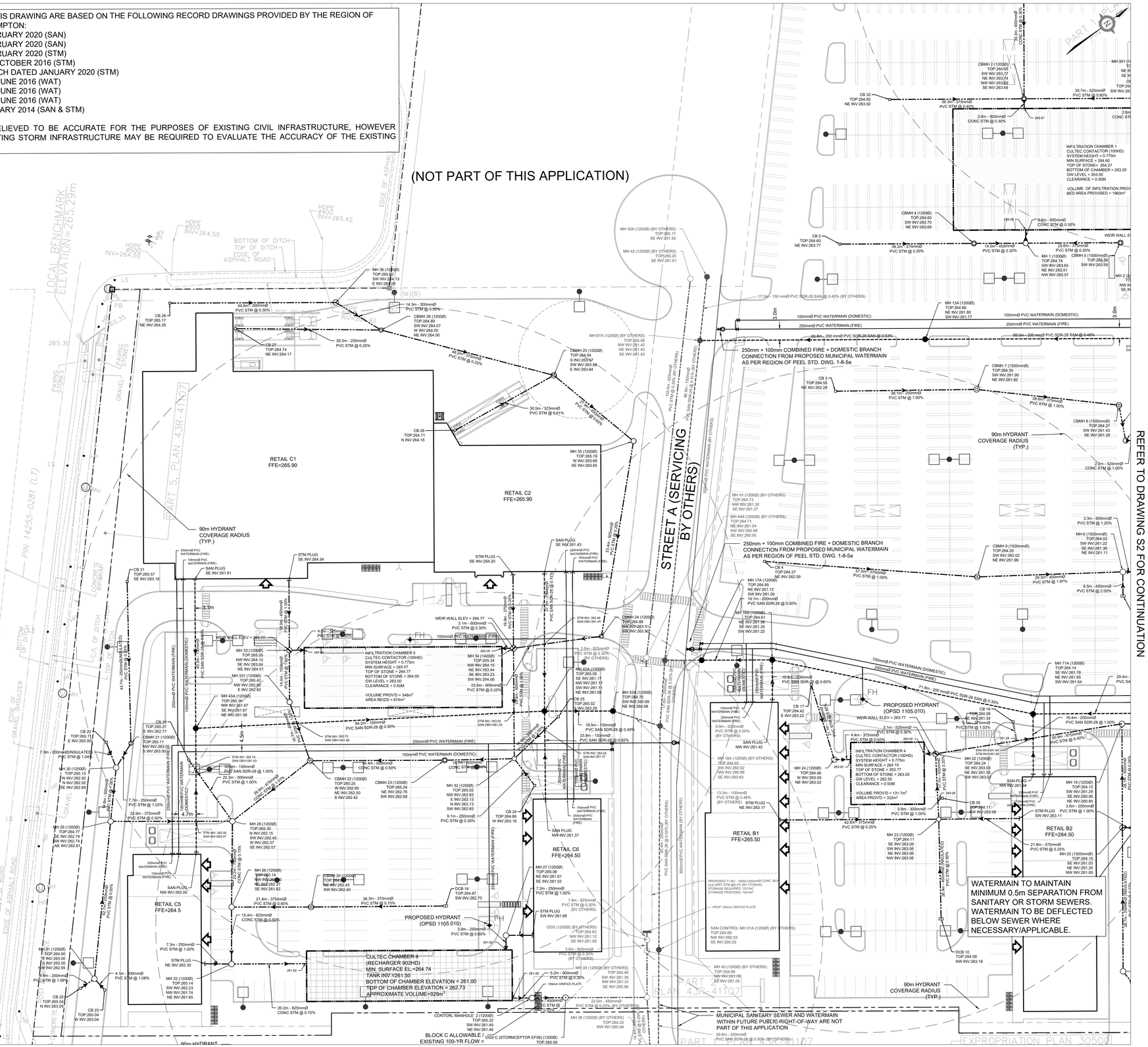
REFER TO DRAWING S1 FOR CONTINUATION

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- 48105-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 48106-D BY COLE ENGINEERING, DATED JUNE 2016 (WAT)
- 52053-D BY BY URBANTECH, DATED JANUARY 2014 (SAN & STM)

THE INFORMATION PROVIDED ABOVE IS BELIEVED TO BE ACCURATE FOR THE PURPOSES OF EXISTING CIVIL INFRASTRUCTURE, HOWEVER FURTHER INVESTIGATION REGARDING EXISTING STORM INFRASTRUCTURE MAY BE REQUIRED TO EVALUATE THE ACCURACY OF THE EXISTING CONDITION

(NOT PART OF THIS APPLICATION)


LOCAL BENCHMARK
ELEVATION=265.29m
EDGE OF ASPHALT
BOTTOM OF DITCH
TOP OF DITCH
EDGE OF ASPHALT ROAD
HDPE 450Ø INV=264.55
HDPE 450Ø INV=264.80
HDPE 2400 INV=265.42
MH 36 (1200Ø) TOP:265.60 SW INV:264.13 E INV:264.09
CB 28 TOP:265.17 NE INV:264.26
44.8m - 300mmØ PVC STM @ 0.30%
14.3m - 300mmØ PVC STM @ 0.30%
CBMH 26 (1200Ø) TOP:264.89 SW INV:264.07 W INV:264.05 NE INV:264.00
CB 27 TOP:264.74 NE INV:264.17
39.3m - 250mmØ PVC STM @ 0.25%
40.8m - 375mmØ PVC STM @ 0.25%
CBMH 25 (1200Ø) TOP:264.94 S INV:263.97 SW INV:263.88 E INV:263.84
30.5m - 375mmØ PVC STM @ 0.61%
27.8m - 375mmØ PVC STM @ 0.60%
CB 26 TOP:264.71 N INV:264.16
MH 35 (1200Ø) TOP:265.19 W INV:263.68 SE INV:263.65
RETAIL C1
FFE=265.90
RETAIL C2
FFE=265.90
90m HYDRANT COVERAGE RADIUS (TYP.)
MH 50A (1200Ø) (BY OTHERS) TOP:265.17 SE INV:261.50
MH 42 (1200Ø) (BY OTHERS) TOP:265.20 SE INV:261.61
MH 67A (1200Ø) (BY OTHERS) TOP:265.09 NW INV:261.42 NE INV:261.45 SE INV:261.42
STREET A (SERVICING BY OTHERS)
17.3m - 150 mmØ PVC SDR-28 SAN @ 0.45% (BY OTHERS)
100mmØ PVC WATERMAIN (DOMESTIC)
250mmØ PVC WATERMAIN (FIRE)
3.0m
MH 13A (1200Ø) TOP:264.66 NE INV:261.80 SW INV:261.77
69.6m - 200 mmØ PVC SDR-28 SAN @ 0.53%
69.5m - 200 mmØ PVC SDR-28 SAN @ 0.48%
250mm + 100mm COMBINED FIRE + DOMESTIC BRANCH CONNECTION FROM PROPOSED MUNICIPAL WATERMAIN AS PER REGION OF PEEL STD. DWG. 1-8-5a
CB 3 TOP:264.55 NE INV:262.28
58.1m - 200mmØ PVC STM @ 1.00%
CBMH 7 (1500mmØ) TOP:264.39 SW INV:261.90 NE INV:261.82
5.2m - 375mmØ PVC STM @ 1.00%
CBMH 8 (1500mmØ) TOP:264.27 SW INV:261.43 SE INV:261.28
2.8m - 525mmØ CONC STM @ 1.00%
90m HYDRANT COVERAGE RADIUS (TYP.)
MH 41 (1200Ø) (BY OTHERS) TOP:264.73 NW INV:261.30 SE INV:261.27
MH 44A (1200Ø) (BY OTHERS) TOP:264.71 NE INV:261.04 NW INV:260.98 SE INV:260.95
3.3m - 600mmØ PVC STM @ 1.20%
MH 6 (1500mmØ) TOP:264.02 SW INV:261.22 SE INV:261.39 NE INV:261.11
CBMH 9 (1500mmØ) TOP:264.25 SW INV:262.02 NE INV:261.99
6.5m - 450mmØ PVC STM @ 1.97%
6.5m - 450mmØ PVC STM @ 2.00%
CB 4 TOP:264.27 NE INV:262.59
57.5m - 375mmØ PVC STM @ 1.00%
MH 17A (1200Ø) TOP:264.85 NE INV:261.12 SW INV:261.09
19.1m - 200mmØ PVC SAN SDR-28 @ 0.50%
MH 16A (1200Ø) TOP:264.61 NE INV:261.39 SE INV:261.35 SW INV:261.22
INFILTRATION CHAMBER 1 CULTEC CONTACTOR (100HD) SYSTEM HEIGHT = 0.775m MIN SURFACE = 264.60 TOP OF STONE= 264.27 BOTTOM OF CHAMBER = 263.50 GW LEVEL = 263.00 CLEARANCE = 0.50M
VOLUME OF INFILTRATION PROV BED AREA PROVIDED = 1960m²
CBMH 4 (1200Ø) TOP:264.60 SW INV:263.70 NE INV:263.69
9.6m - 900mmØ CONC STM @ 0.30%
CB 2 TOP:264.60 NE INV:263.77
36.2m - 375mmØ PVC STM @ 0.20%
14.6m - 450mmØ PVC STM @ 0.30%
MH 1 (1200Ø) TOP:264.74 SW INV:263.65 NE INV:263.51 NW INV:263.57
25.6m - 375mmØ PVC STM @ 0.30%
CBMH 5 (1500mmØ) TOP:264.36 SW INV:263.59
WEIR WALL EL
MH 2 (1
T
NW IN
SE IN
2.6m - CONC ST
36.3m - 375mmØ PVC STM @ 0.40%
CB 32 TOP:264.65 NE INV:263.92
35.7m - 525mmØ PVC STM @ 0.60%
2.6m - 900mmØ CONC STM @ 0.30%
263.67
PART 1 PLAN 43R-41107
PART 2 PLAN 43R-41107
PART 5 PLAN 43R-41107
PART 2 EXPROPRIATION PLAN PR1808650
PART 2 EXPROPRIATION PLAN 30500
PIN 14255-0281 (LT)
EXISTING CONCRETE RIP WRAP
EXISTING CONCRETE HEADWALL
EXISTING CONCRETE SWALE
EXISTING CONCRETE SPILLWAY

FUTURE RESIDENTIAL

RETAIL A
(± 168,730 S.F.)

RETAIL C1
(± 35,000 S.F.)

RETAIL C2 (± 5,200 S.F.)
RETAIL C3 (± 4,000 S.F.)
RETAIL C4 (± 6,500 S.F.)

SITE A

REFUELING STATION

SITE C

SITE B

STREET 'A'

RETAIL C5 (± 11,050 S.F.)
RETAIL C6 (± 8,800 S.F.)
RETAIL B1 (± 15,540 S.F.)
RETAIL B2 (± 15,925 S.F.)
RETAIL B3 (± 13,000 S.F.)
RETAIL B4 (± 8,400 S.F.)
RETAIL B5 (± 5,000 S.F.)

APPENDIX D

Water Well Records

Table C.1 MECP Online Well Database Summary (500 m)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
4901826	BRAMPTON CITY (CHING HS W 03 017	5/4/1963	DO	13.4		13.4	6.1	FR 0044	BRWN LOAM CLAY 0012 GREY CLAY 0042 GRVL 0044
4901827	BRAMPTON CITY (CHING HS W 03 017	6/21/1963	DO	11.6		11.6	6.4	FR 0022	BRWN CLAY 0005 RED CLAY BLDR 0019 BLUE CLAY 0038
4901829	BRAMPTON CITY (CHING HS W 03 017	5/9/1964	DO	18.9	10.4	11.9	4.9	FR 0039 FR 0055	BLCK LOAM 0001 BRWN CLAY MSND 0014 GREY CLAY GRVL 0034 RED SHLE GRVL 0038 RED SHLE 0062
4901830	CALEDON TOWN (CHINGU HS W 03 018	12/22/1959	DO	11.0		11.0	4.9	FR 0036	BRWN LOAM CLAY 0008 GREY CLAY STNS 0034 MSND 0036
4901831	CALEDON TOWN (CHINGU HS W 03 018	8/24/1960	DO	9.8		9.8	4.3	FR 0032	BRWN CLAY 0013 BLUE CLAY BLDR 0032
4901921	BRAMPTON CITY (CHING HS W 04 017	1/15/1962	DO	12.5	10.1	10.1	7.0	FR 0033	PRDG 0033 RED SHLE 0041
4901922	BRAMPTON CITY (CHING HS W 04 017	3/2/1962	DO	27.4	10.4	10.4	10.7	FR 0080	PRDG 0024 BLUE CLAY 0034 RED SHLE 0090
4901923	BRAMPTON CITY (CHING HS W 04 017	4/21/1962	DO	13.4	8.5	13.4	7.3	FR 0044	BRWN LOAM CLAY 0028 RED SHLE 0044
4901924	CALEDON TOWN (CHINGU HS W 04 018	12/13/1960		11.0	8.5	11.0			RED CLAY 0028 RED SHLE 0036
4901925	CALEDON TOWN (CHINGU HS W 04 018	12/15/1960	PS	48.2	11.0	12.2	5.5	FR 0088	PRDG 0036 RED SHLE 0158
4901926	CALEDON TOWN (CHINGU HS W 04 019	5/21/1960	DO	9.1		9.1	4.6	FR 0024	BRWN CLAY 0006 BRWN MSND 0007 BRWN CLAY 0021 BRWN CLAY MSND 0030
4901927	CALEDON TOWN (CHINGU HS W 04 019	8/4/1962	ST	16.8	12.2	16.8	9.1	FR 0055	BRWN CLAY MSND 0013 BLUE CLAY BLDR 0040 RED SHLE 0055
4905047	CALEDON TOWN (CHINGU HS W 04 018	9/17/1976	PS	55.2	4.9	7.9		FR	LOAM 0001 BRWN CLAY 0004 RED CLAY 0016 RED SHLE 0181

AC = Cooling and A/C
CO = Commercial
DE = Dewatering
DO = Domestic
IN = Industrial
IR = Irrigation
MN = Municipal
MO = Monitoring
MT = Monitoring and Test Hole
NU = Not Used
OT = Other
PS = Public
ST = Livestock
TH = Test Hole

Table C.1 MECP Online Well Database Summary (500 m)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
4905071	CALEDON TOWN (CHINGU HS W 04 019	3/8/1977	DO	13.7	12.2	13.7	6.1	FR 0045	BRWN LOAM SNDY 0010 GREY CLAY 0040 RED SHLE WBRG 0045
4905120	BRAMPTON CITY (CHING HS W 04 017	5/23/1977	DO	8.5	6.1	8.5	3.7	UK 0028	BRWN LOAM 0010 GREY CLAY 0020 RED SHLE WBRG 0028
4905252	CALEDON TOWN (CHINGU HS W 04 018	8/15/1977	DO	14.6	12.2	14.6	4.6	FR 0032 FR 0045	BRWN LOAM 0001 BRWN CLAY 0015 BLUE CLAY SOFT 0022 RED CLAY PCKD 0024 GREY CLAY STNS 0026 CLAY
4906719	BRAMPTON CITY (CHING HS W 03 017	5/14/1986	DO	9.8	7.3	9.8	3.4	FR 0031	BRWN LOAM 0001 BRWN CLAY CLAY STNS 0024 RED SHLE 0032
4906720	BRAMPTON CITY (CHING HS W 03 017	9/18/1986	DO	14.9	9.1	13.4	11.0	FR 0040 FR 0045	BRWN LOAM 0001 BRWN CLAY CLAY 0030 RED SHLE SHLE 0049
4906748	CALEDON TOWN (CHINGU HS W 03 018	10/20/1987	DO	13.4	12.2	6.1	3.7	UK 0030	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0030 GREY GRVL LOOS 0040 RED SHLE
4906850	CALEDON TOWN (CHINGU HS W 04 019	1/10/1988	DO	18.9		10.4	3.0	UK 0050	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 GREY CLAY HARD 0050 GREY SAND LOOS 0062
4906872	CALEDON TOWN (CHINGU HS W 03 018	7/27/1987	DO	12.8		11.3	4.3	FR 0039	BRWN LOAM 0001 BRWN CLAY 0015 GREY CLAY PCKD 0022 GREY MUCK SOFT 0025 GREY CLAY 0039 GREY SAND 0042
4907410	BRAMPTON CITY (CHING HS W 03 017	8/28/1989	DO	17.4		17.4	6.1	UK 0030 UK 0040 UK 0050	BRWN LOAM HARD 0001 BRWN CLAY HARD 0020 RED CLAY HARD 0057
4907770	BRAMPTON CITY (CHING HS W 04 017	8/12/1993	DO	43.0	8.2	9.1	11.6	FR 0141	BRWN CLAY SILT 0015 RED CLAY SILT SAND 0018 GREN CLAY GRVL SILT 0027 RED SHLE LYRD SOFT 0141
4908107	BRAMPTON CITY (CHING HS W 03 017	7/27/1995	DO	29.3	15.2	16.8	5.5	FR 0070	BLCK LOAM 0001 GREY SAND GRVL CLAY 0018 RED CLAY 0050 RED SHLE 0096
4908347	CALEDON TOWN (CHINGU HS W 04 019	10/15/1997	DO ST	8.5		7.6	0.6	FR 0024	BRWN CLAY HARD 0011 BLUE CLAY HARD 0016 GREY CLAY HPAN 0024 RED SAND WBRG 0027 GREY CLAY SOFT 0028
4909094	CALEDON TOWN (CHINGU HS W 04 019	11/21/2002	ST						

AC = Cooling and A/C
IR = Irrigation
OT = Other

CO = Commercial
MN = Municipal
PS = Public

DE = Dewatering
MO = Monitoring
ST = Livestock

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MT = Monitoring and Test Hole
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IN = Industrial
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Table C.1 MECP Online Well Database Summary (500 m)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
4909579	CALEDON TOWN (CHINGU HS W 04 018	4/23/2004		7.5	6.4				BRWN CLAY SILT 0005 RED CLAY SILT 0013 BRWN SILT CLAY 0021 RED SHLE LMSN 0025
7042431	BRAMPTON CITY (CHING 03 017	3/1/2007	NU			12.2	4.3		
7051682	BRAMPTON CITY (CHING 03 017	10/22/2007				6.4			
7051723	BRAMPTON CITY (CHING 03 017	5/23/2007	NU			1.2			
7120767	BRAMPTON CITY (CHING HS W 04 017	12/5/2008	NU			18.3			
7120768	BRAMPTON CITY (CHING HS W 04 017	12/5/2008	NU			9.1			
7157652	BRAMPTON CITY (CHING HS W 04 017	1/5/2011	MT	6.1					BLCK LOAM LOOS 0001 BRWN SILT CLAY LOOS 0014 GREY CLAY SILT DNSE 0020
7163004	CALEDON TOWN (CHINGU	4/30/2011	DO			2.1	5.5		
7190554	BRAMPTON CITY (CHING HS W 04 016	8/31/2012	NU			5.2	1.5		
7190559	BRAMPTON CITY (CHING HS W 04 016	9/20/2012	NU						
7190560	BRAMPTON CITY (CHING HS W 04 017	10/18/2012	NU						
7190562	BRAMPTON CITY (CHING HS W 04 016	9/20/2012				3.7			
7190563	BRAMPTON CITY (CHING HS W 04 016	10/18/2012	NU						

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7192520	BRAMPTON CITY (CHING	11/17/2012							
7215502	BRAMPTON CITY (CHING	12/10/2013							
7224624	BRAMPTON CITY (CHING	2/1/2014							
7230083	BRAMPTON CITY (CHING	7/15/2014							
7241071	BRAMPTON CITY (CHING	1/19/2015	MT	6.1		3.0		OT	BRWN FILL SILT CLAY 0004 BRWN CLAY TILL GRVL 0020
7247830	BRAMPTON CITY (CHING	8/12/2015							
7253231	BRAMPTON CITY (CHING HS W 04 017	10/15/2015				11.3		FR 0009	
7253232	BRAMPTON CITY (CHING HS W 04 017	10/9/2015				25.9		FR 0012	
7253233	BRAMPTON CITY (CHING HS W 04 017	10/15/2015				42.1		FR 0044	
7253234	BRAMPTON CITY (CHING HS W 04 017	10/9/2015				13.1		FR 0009	
7288314	BRAMPTON CITY (CHING HS W 03 017	3/17/2017	NU			16.8	4.6		
7288315	BRAMPTON CITY (CHING HS W 03 017	3/17/2017	NU			13.7			
7288316	BRAMPTON CITY (CHING HS W 03 017	3/17/2017	NU			6.1			

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CO = Commercial
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Table C.1 MECP Online Well Database Summary (500 m)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
7288317	BRAMPTON CITY (CHING HS W 03 017	3/17/2017	NU			13.7	6.1		
7303104	BRAMPTON CITY (CHING	11/9/2017	MO	20.0		10.0		UT	BRWN SILT 0049 GREY SILT CLAY 0066
7314273	CALEDON TOWN (CHINGU HS W 04 018	6/8/2018							
7407866	CALEDON TOWN (CHINGU HS W 03 019	6/24/2021	DO	25.3		19.0	4.4	FR 0077	BLCK LOAM 0002 BRWN CLAY 0020 GREY CLAY 0050 GREY SAND 0062 RED SHLE 0083
7410966	CALEDON TOWN (CHINGU	11/16/2021							
7415538	CALEDON TOWN (CHINGU HS W 04 018	1/31/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0001 CLAY SLTY 0004 CLAY 0010 TILL 0018 SHLE 0020
7415539	CALEDON TOWN (CHINGU HS W 04 018	2/2/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0004 CLAY SLTY 0010 TILL 0018 SAND 0020
7415540	CALEDON TOWN (CHINGU HS W 04 018	2/2/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0004 CLAY SLTY 0010 TILL 0018 SAND 0020
7415541	CALEDON TOWN (CHINGU HS W 04 018	2/2/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0004 CLAY SLTY 0010 TILL 0018 SAND 0020
7415542	CALEDON TOWN (CHINGU HS W 04 018	1/31/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0001 CLAY SLTY 0004 CLAY 0010 TILL 0018 SHLE 0020
7415543	CALEDON TOWN (CHINGU HS W 04 018	1/31/2022	MO	6.1		3.05		UT 0002	SAND GRVL 0001 CLAY SLTY 0004 CLAY 0010 TILL 0018 SHLE 0020
7415546	CALEDON TOWN (CHINGU HS W 04 018	2/3/2022	MO	6.1		3.05		UT 0003	SAND GRVL 0005 CLAY SLTY 0010 TILL 0015 SAND 0020
7415547	CALEDON TOWN (CHINGU HS W 04 018	2/3/2022	MO	6.1		3.05		UT 0003	SAND GRVL 0005 CLAY SLTY 0010 TILL 0015 SAND 0020

AC = Cooling and A/C
CO = Commercial
DE = Dewatering
DO = Domestic
IN = Industrial
IR = Irrigation
MN = Municipal
MO = Monitoring
MT = Monitoring and Test Hole
NU = Not Used
OT = Other
PS = Public
ST = Livestock
TH = Test Hole

Table C.1 MECP Online Well Database Summary (500 m)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
7415548	CALEDON TOWN (CHINGU HS W 04 018	2/1/2022	MO	6.1		3.05			SAND GRVL 0001 CLAY SLTY 0004 CLAY 0010 TILL 0018 SHLE 0020
7415553	CALEDON TOWN (CHINGU HS W 04 018	2/1/2022	MO	6.1		3.05			SAND GRVL 0001 CLAY SLTY 0004 CLAY 0010 TILL 0018 SHLE 0020
7451170		6/6/2023							

AC = Cooling and A/C
IR = Irrigation
OT = Other

CO = Commercial
MN = Municipal
PS = Public

DE = Dewatering
MO = Monitoring
ST = Livestock

DO = Domestic
MT = Monitoring and Test Hole
TH = Test Hole

IN = Industrial
NU = Not Used

APPENDIX E

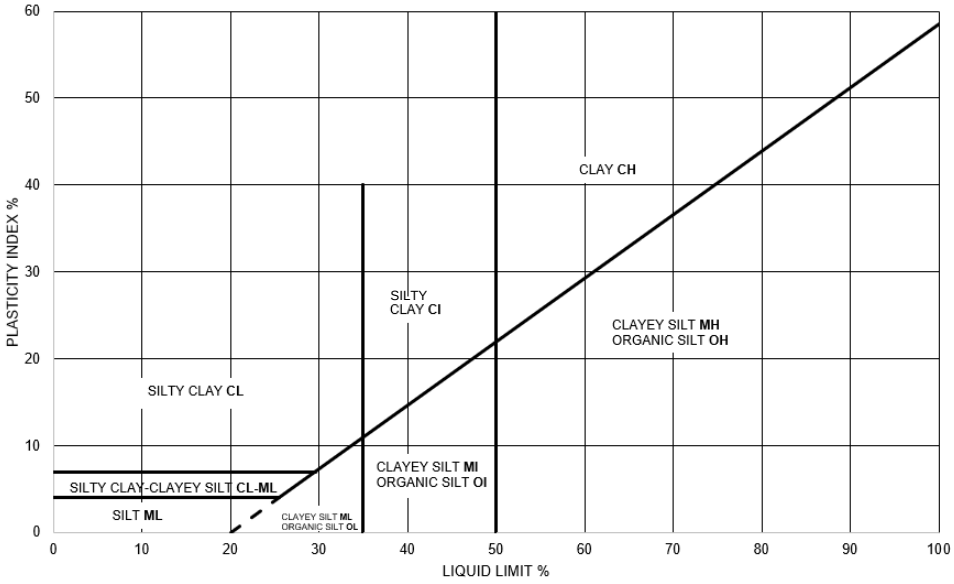
Record of Borehole Logs

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	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} X D_{60}}$	USCS Group Symbol	Group Name
Inorganic (Organic Content less than 30%)	Coarse Grained Soils (>50% is larger than 0.075 mm)	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

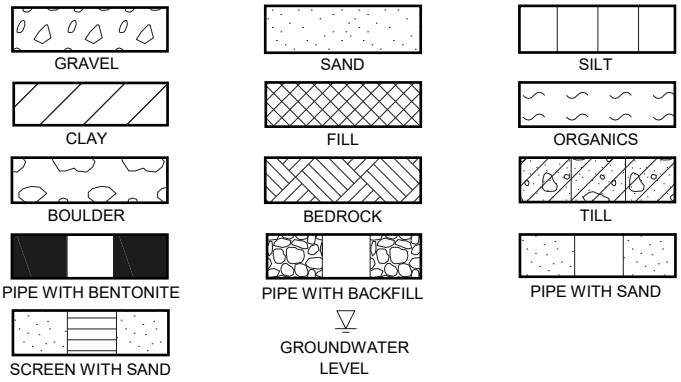
PENETRATION RESISTANCE

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.

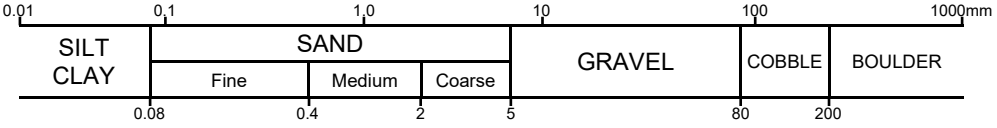
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

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

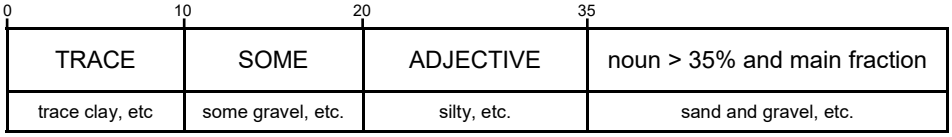


GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)



RECORD OF BOREHOLE BH24-1

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

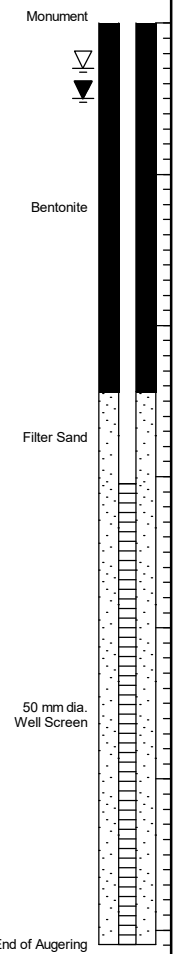
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		263.50				
0	Power Auger / Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 263.30	1A	SS	432	
		(ML- CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; brown; (TILL); oxidation, cohesive, w<PL, soft to hard		0.20	1B			3
1					2	SS	584	17
2					3	SS	610	20
					4	SS	610	30
3					5	SS	610	23
4					6	SS	432	90 / 0.28
		- Becoming grey at approximately 4.6 m depth			7	SS	203	50 / 0.05
5		- Auger grinding at approximately 4.6 m depth						
6		- Shale fragments at approximately 6.1 m depth		257.20	8	SS	203	50 / 0.05
		End of Borehole		6.30				
7		Notes: 1. Borehole open and dry upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.						
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, %: W_P, W, W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/05/06	0.3	263.2
24/05/21	0.5	263.0

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-2

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

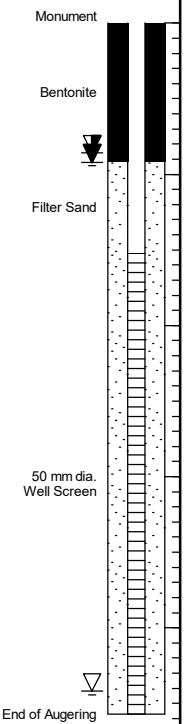
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 22 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		265.00					
0	Power Auger, Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 264.71	1A	SS	381		
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, trace to some sand, trace gravel; mottled brown (TILL); cohesive, w<PL, soft to stiff, to hard		0.29	1B			3	
1					2	SS	533	14	MH
2					3	SS	610	26	
					4	SS	610	30	MH
3		- Becoming grey at approximately 3.3 m depth			5	SS	610	28	
4					6	SS	610	27	
		- Auger grinding between approximately 4.4 to 4.6 m depths			7	SS	254	50	
5		End of Borehole		260.17 / 4.83					
6		Notes: 1. Groundwater measured at approximately 4.4 m depth in open borehole upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							
7									
8									
9									
10									

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/22	4.4	260.6
24/05/06	0.9	264.1
24/05/21	0.9	264.1

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-3

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

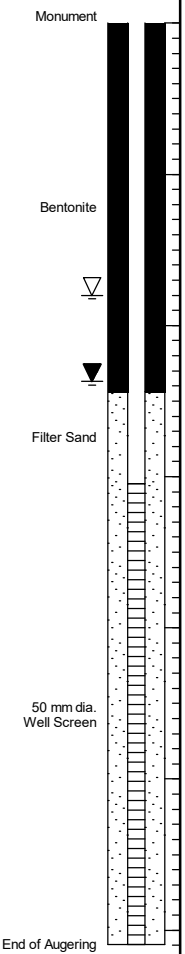
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		266.00				
0	Power Auger / Hollow Stem Auger (203 mm)	TOPSOIL		0.00	1A	SS		
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; brown (TILL); oxidation, cohesive, w<PL to w=PL, firm to very stiff		0.10	1B	SS	406	6
1					2	SS	610	27
2					3	SS	508	27
					4	SS	610	28
3		- Becoming grey at approximately 3.0 m depth			5	SS	610	23
4					6	SS	0	11
5					7	SS		14
6				259.90				
		(ML- CL) CLAYEY SILT, some sand, trace gravel; brown (TILL); oxidation, cohesive, w<PL to w=PL, stiff to very stiff		6.10	8	SS	584	17
		End of Borehole		259.29 6.71				
7		Notes:						
		1. Borehole open and dry upon completion of drilling.						
		2. Monitoring well installed as shown upon completion of drilling.						
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/05/06	1.8 ▽	264.2
24/05/21	2.4 ▼	263.6

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-4

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 25 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		261.10					
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL		0.00	1	SS	127	10	HEX: 0 IBL: 0
				260.26					
1		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; mottled brown-grey to brownish grey (TILL); oxidation, cohesive, w<PL, firm to hard		0.84	2	SS	381	8	HEX: 0 IBL: 0
2					3	SS	584	13	HEX: 0 IBL: 0
					4	SS	610	28	HEX: 0 IBL: 0
3		- Becoming grey at approximately 3.0 m depth			5	SS	610	25	HEX: 0 IBL: 0
4					6	SS	610	14	HEX: 0 IBL: 0
5					7	SS	610	16	HEX: 0 IBL: 0
6					8	SS	406	80 / 0.25	
				254.60					
		End of Borehole		6.50					
7		Notes: 1. Groundwater measured at approximately 5.8 m depth in open borehole upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							
8									
9									
10									

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION

Monument
Bentonite
Filter Sand
50 mm dia. Well Screen
End of Augering

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/25	5.8	255.3
24/05/06	-0.3	261.4
24/05/21	-0.2	261.3

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-5

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

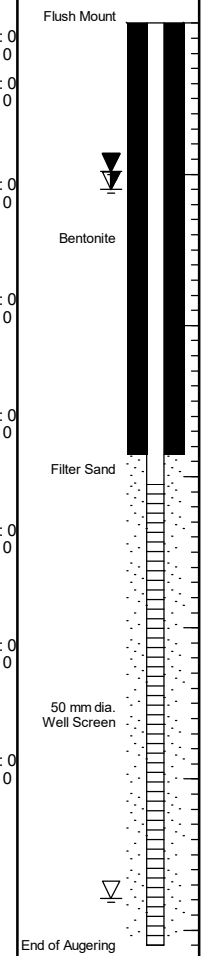
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		264.00					
0	Power Auger, Hollow Stem Auger (203 mm)	FILL - (SM) SILTY SAND, some gravel, mixed with topsoil, trace to some clay, asphalt fragments; black to dark brown; non-cohesive, moist, loose		0.00	1A				HEX: 0 IBL: 0
				0.18	1B	SS	457	6	HEX: 0 IBL: 0
1		FILL - (ML) clayey SILT, some sand, trace gravel, trace to some organics, wood fragments; brown to black; cohesive, very soft to stiff			2	SS	25	2	HEX: 0 IBL: 0
2		- Auger grinding between approximately 1.8 to 2.3 m depths			3	SS	559	8	HEX: 0 IBL: 0
				261.71					
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; mottled brown to grey (TILL); cohesive, w<PL to w=PL, stiff to hard		2.29	4	SS	533	14	HEX: 0 IBL: 0
3					5	SS	533	15	HEX: 0 IBL: 0
4		- Becoming grey at approximately 3.8 m depth			6	SS	610	15	HEX: 0 IBL: 0
5					7	SS	457	12	HEX: 0 IBL: 0
6					8	SS	483	38	
				257.29					
		End of Borehole		6.71					
7		Notes: 1. Groundwater measured at approximately 5.8 m depth in open borehole upon completion of drilling. 2. Borehole was backfilled with bentonite and soil cuttings upon completion of drilling.							
8									
9									
10									

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/23	5.8	258.2
24/05/06	1.0	263.0
24/05/21	1.1	262.9

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-6

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

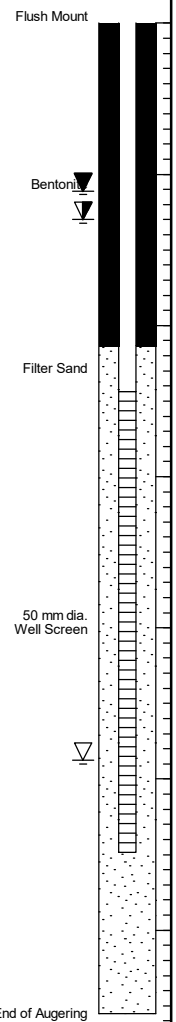
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		264.50					
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL		0.00 / 264.20					
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand and gravel; brown (TILL); cohesive, w<PL, stiff to very stiff		0.30	1	SS	432	10	HEX: 0 IBL: 0
1					2A				HEX: 0 IBL: 0
					2B	SS	432	9	HEX: 0 IBL: 0
2					3	SS	610	16	HEX: 0 IBL: 0
					4	SS	610	25	HEX: 0 IBL: 0
3					5	SS	610	21	HEX: 0 IBL: 0
4					6	SS	610	11	HEX: 0 IBL: 0
					7	SS	610	10	HEX: 0 IBL: 0
5		(ML) CLAYEY SILT, some sand and gravel; grey (TILL); wet, loose		259.01 / 5.49					
6					8	SS	610	6	
		End of Borehole		257.95 / 6.55					
7		Notes: 1. Groundwater measured at approximately 4.9 m depth in open borehole upon completion of drilling. 2. Monitoring well installed as shown upon completion of drilling.							
8									
9									
10									

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/23	4.9	259.6
24/05/06	1.1	263.4
24/05/21	1.3	263.2

GEMTEC
Consulting Engineers and Scientists

LOGGED: CC
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-7

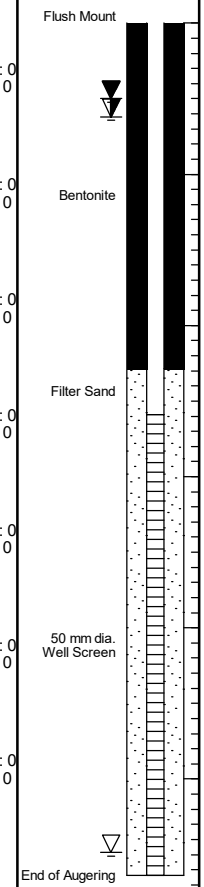
CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 23 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
		Ground Surface		264.90					
0	Power Auger Hollow Stem Auger (203 mm)	FILL - (SM) SILTY SAND, some gravel; brown; non-cohesive, moist, loose		0.00	1	SS	356	6	HEX: 0 IBL: 0
				264.14					
1		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace to some gravel; brown (TILL); cohesive, w<PL to w=PL, stiff to hard		0.76	2	SS	610	15	HEX: 0 IBL: 0
2					3	SS	584	19	HEX: 0 IBL: 0
					4	SS	610	19	HEX: 0 IBL: 0
3					5	SS	610	24	HEX: 0 IBL: 0
4		- Becoming grey at approximately 3.8 m depth			6	SS		33	HEX: 0 IBL: 0
5					7	SS	610	21	HEX: 0 IBL: 0
6				258.19	8	SS	610	16	HEX: 0 IBL: 0
		End of Borehole		6.71					
7		Notes: 1. Groundwater measured at approximately 5.5 m depth in open borehole upon completion of drilling. 2. Monitoring well sunk during the installation process, could not pull out.							
8									
9									
10									

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/23	5.5	259.4
24/05/06	0.5	264.4
24/05/21	0.6	264.3

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-8

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 24 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
0	Power Auger, Hollow Stem Auger (203 mm)	Ground Surface		264.40					
		TOPSOIL		0.00	1	SS	203	3	HEX: 0, IBL: 0
				263.64					
1		FILL - (CL) SILTY CLAY, some sand, trace gravel, trace organics; mottled brown-grey to brown, grey inclusions; cohesive, w<PL, stiff to very stiff		0.76	2	SS	533	21	MH, HEX: 0, IBL: 0
2					3	SS	610	21	HEX: 0, IBL: 0
				262.11					
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; brownish grey to grey (TILL); oxidation, cohesive, w<PL, stiff to very stiff to hard		2.29	4	SS	610	29	MH, HEX: 0, IBL: 0
3		- Becoming grey at approximately 3.3 m depth			5	SS	610	38	HEX: 0, IBL: 0
4					6	SS	610	15	HEX: 0, IBL: 0
5					7	SS	610	11	HEX: 0, IBL: 0
6					8	SS	610	16	
				257.69					
7		End of Borehole		6.71					
8		Notes:							
9		1. Groundwater measured at approximately 5.8 m depth in open borehole upon completion of drilling.							
10		2. Monitoring well installed as shown upon completion of drilling.							

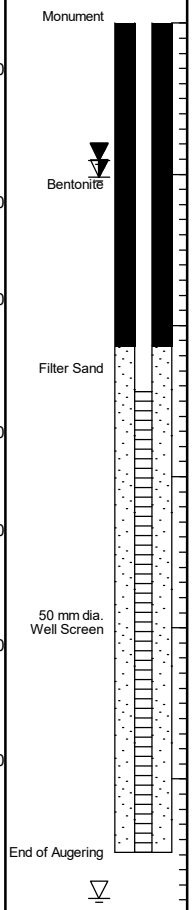
SAMPLES: PENETRATION RESISTANCE (N), BLOWS/0.3m; DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m

SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED

WATER CONTENT, %: W_P, W, W_L

10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/24	5.8	258.6
24/05/06	0.9	263.5
24/05/21	1.0	263.4

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-9

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 22 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		262.20				
0	Power Auger / Hollow Stem Auger (203 mm)	TOPSOIL		0.00	1A			
				261.74	1B	SS	356	6
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, some sand, trace gravel; mottled brown to grey to brown (TILL); cohesive, w<PL to w=PL, firm to stiff, reworked till		0.46				
1					2	SS	610	13
2					3	SS	610	22
					4	SS	610	31
3					5	SS	610	26
4					6	SS	610	17
5					7	SS	584	22
6				255.88				
		(SM) SILTY SAND, trace to some gravel, trace to some clay (TILL); non-cohesive, wet, compact		6.32	8	SS	381	26
				255.49				
		End of Borehole		6.71				
7								
8								
9								
10								

Notes:

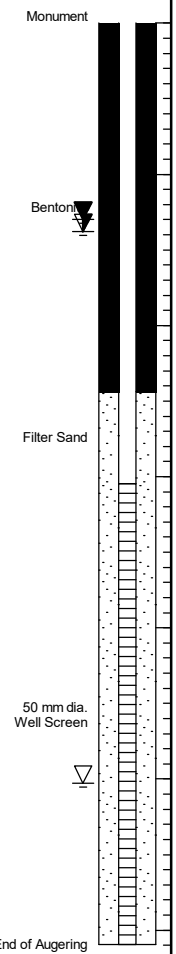
1. Groundwater measured at approximately 5.0 m depth in open borehole upon completion of drilling.

2. Monitoring well installed as shown upon completion of drilling.

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/04/22	5.0	257.2
24/05/06	1.3	260.9
24/05/21	1.4	260.8

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

RECORD OF BOREHOLE BH24-10

CLIENT: Fieldgate Group of Companies
Fieldgate Group of Companies
PROJECT: Commercial Development, 12100 Creditview Road, Caledon, Ontario
JOB#: 102491.013
LOCATION: See Borehole Location Plan

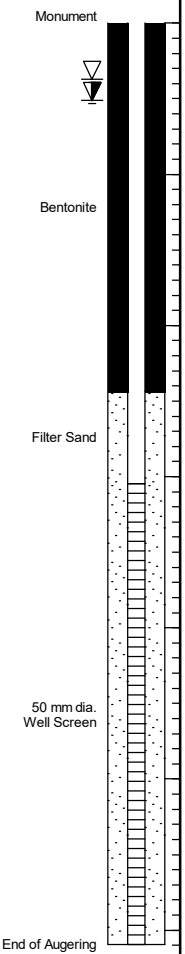
SHEET: 1 OF 1
DATUM: Geodetic
BORING DATE: Apr 22 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		264.20				
0	Power Auger Hollow Stem Auger (203 mm)	TOPSOIL		0.00	1A			
		(ML - CL/ CL) CLAYEY SILT to SILTY CLAY, trace to some samd, trace gravel, silty sand inclusions; mottled brown to grey (TILL); cohesive, w<PL, soft to very stiff		0.15	1B	SS	381	8
					2A			
1					2B	SS	533	21
					3	SS	305	21
2					4	SS	610	21
3					5	SS	457	20
		- Becoming grey at approximately 3.4 m depth						
4					6	SS	610	7
					7	SS	610	8
5								
6				257.95				
		(ML) CLAYEY SILT, some sand, trace gravel; grey (TILL); w=PL, cohesive, stiff		6.25	8	SS	457	10
		End of Borehole		257.49 6.71				
7		Notes:						
		1. Trace groundwater at bottom of borehole (less than 1 inch).						
8		2. Monitoring well installed as shown upon completion of drilling.						
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/05/06	0.4 ▽	263.8
24/05/21	0.5 ▼	263.7

GEMTEC
Consulting Engineers and Scientists

LOGGED: GG
CHECKED: JET

GEO - BOREHOLE LOG 102491.013_CREDITVIEWRD_GINT_GEOTECH_R0_2024_05_07 - REVISED.GPJ GEMTEC 2018.GDT 5/23/24

APPENDIX F

Tables

Table F.1: Monitoring Well Construction Information - 12100 Creditview Road, Caledon, Ontario

Well Name	UTM Coordinates[1]		Installation Date	Ground Surface Elevation[2]	Top of Casing Elevation[2]	Measured Stick up	Top of Screen	Bottom of Screen	Top of Screen	Bottom of Screen	Screened Lithology
	Easting	Northing		(m amsl)	(m amsl)	(m)	(m bgs)	(m bgs)	(m amsl)	(m amsl)	
BH24-1	591783	4839353	24-Apr-24	263.50	264.38	0.88	3.05	6.10	260.45	257.40	(ML- CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-2	591666	4839485	22-Apr-24	265.00	266.01	1.01	1.52	4.57	263.48	260.43	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-3	591910	4839535	24-Apr-24	266.00	267.20	1.20	3.05	6.10	262.95	259.90	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-4	592065	4839682	25-Apr-24	261.10	262.01	0.91	1.52	4.57	259.58	256.53	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-5	591777	4839746	23-Apr-24	264.00	265.08	1.08	3.05	6.10	260.95	257.90	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-6	591768	4839782	23-Apr-24	264.50	264.43	-0.07	2.44	5.49	262.06	259.01	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-7	591767	4839801	23-Apr-24	264.90	264.65	-0.25	2.59	5.64	262.31	259.26	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-8	591782	4839837	24-Apr-24	264.40	265.35	0.95	2.44	5.49	261.96	258.91	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-9	591422	4839788	22-Apr-24	262.20	263.21	1.01	3.05	6.10	259.15	256.10	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-10	591614	4840010	22-Apr-24	264.20	265.12	0.92	3.05	6.10	261.15	258.10	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY
BH24-11	591770	4839754	12-Jul-24	264.73	265.90	1.17	1.52	4.57	263.21	260.16	(ML - CL) SILTY CLAY

Notes:

[1] Approximated using a cellular Global Positioning System (GPS).

[2] Approximated based on the topographic survey data (J.D. Barnes, 2022) provided by the client.

m - metre
m amsl - metres above mean sea level
m bgs - metres below ground surface

UTM - Universal Transverse Mercator, Zone 17T

Table F.2: Groundwater Depths and Elevations - 12100 Creditview Road, Caledon, Ontario

Well Name	Ground Surface Elevation[1]	Top of Casing Elevation[1]	Top of Screen	Bottom of Screen	Screened Lithology	May 6, 2024		May 21, 2024		June 6, 2024		June 14, 2024		June 27, 2024		July 12, 2024		August 30, 2024		October 17, 2024		November 27, 2024		March 26, 2025		April 21, 2025	
						WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.	WL Below Ground	Approximate WL Elev.
	(m amsl)	(m amsl)	(m amsl)	(m amsl)		(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)	(m bgs)	(m amsl)
BH24-1	263.50	264.38	260.45	257.40	(ML- CL/ CL) CLAYEY SILT to SILTY CLAY	0.31	263.19	0.45	263.05	0.46	263.04	0.59	262.91	0.35	263.15	0.41	263.09	0.70	262.80	0.92	262.58	0.83	262.67	0.40	263.10	0.42	263.08
BH24-2	265.00	266.01	263.48	260.43	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	0.92	264.09	0.86	264.14	1.01	263.99	1.05	263.95	0.77	264.23	0.84	264.16	1.24	263.76	1.57	263.43	1.54	263.46	0.81	264.19	0.88	264.12
BH24-3	266.00	267.20	262.95	259.90	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	1.84	264.16	2.37	263.63	2.32	263.68	2.39	263.61	2.26	263.74	2.38	263.62	-	-	3.48	262.52	3.73	262.27	2.54	263.46	2.30	263.70
BH24-4	261.10	262.01	259.58	256.53	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	-0.25	261.35	-0.20	261.30	0.09	261.02	-0.11	261.21	-0.20	261.30	-0.14	261.24	0.09	261.02	0.54	260.57	0.73	260.38	-0.11	261.21	-0.27	261.37
BH24-5	264.00	265.08	260.95	257.90	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	0.98	263.02	1.10	262.91	1.25	262.75	1.29	262.71	0.94	263.06	0.98	263.02	1.35	262.65	1.56	262.44	1.51	262.49	0.94	263.06	1.03	262.97
BH24-6	264.50	264.43	262.06	259.01	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	1.11	263.39	1.25	263.25	-	-	1.39	263.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH24-7	264.90	264.65	262.31	259.26	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	0.53	264.37	0.62	264.29	0.60	264.30	0.89	264.01	0.41	264.49	0.50	264.40	1.23	263.67	1.63	263.27	1.15	263.75	0.64	264.26	0.64	264.26
BH24-8	264.40	265.35	261.96	258.91	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	0.91	263.49	1.02	263.39	1.07	263.34	1.17	263.24	0.95	263.46	1.60	262.81	1.39	263.02	1.76	262.65	1.95	262.46	1.05	263.36	1.07	263.34
BH24-9	262.20	263.21	259.15	256.10	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	1.30	260.90	1.38	260.82	1.45	260.75	1.45	260.75	1.05	261.15	1.24	260.96	1.61	260.59	1.69	260.51	1.64	260.56	1.28	260.92	1.34	260.86
BH24-10	264.20	265.12	261.15	258.10	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	0.37	263.84	0.51	263.70	0.74	263.46	0.77	263.43	0.55	263.65	0.66	263.54	1.02	263.18	1.60	262.60	1.48	262.72	0.48	263.72	0.56	263.64
BH24-11	264.73	265.90	263.21	260.16	(ML - CL) SILTY CLAY	-	-	-	-	-	-	-	-	-	-	0.76	263.97	0.95	263.78	1.12	263.61	0.92	263.81	0.43	264.30	0.62	264.11

Notes:

[1] Approximated based on the topographic survey data (J.D. Barnes, 2022) provided by the client.

- - Not Measured
Elev. - Elevation
m - metre
m amsl - metres above mean sea level
m bgs - metres below ground surface
m toc - metres below top of casing
WL - Water Level

Table F.3: Summary of Hydraulic Conductivity Values - Single Well Response Tests - 12100 Creditview Road, Caledon, Ontario

Well Name	Date of Test	Ground Surface Elevation[1] (m amsl)	Top of Screen (m bgs)	Bottom of Screen (m bgs)	Top of Screen (m amsl)	Bottom of Screen (m amsl)	Screened Lithology	Type of Test	Hydraulic Conductivity Estimate (m/s)	Notes
BH24-2	6-May-24	265.00	1.52	4.57	263.48	260.43	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	Rising Head	3E-07	Completed by GEMTEC
BH24-3	6-May-24	266.00	3.05	6.10	262.95	259.90	(ML - CL/ CL) CLAYEY SILT to SILTY CLAY	Rising Head	4E-08	Completed by GEMTEC
BH24-6	23-Feb-22	262.70	3.70	6.10	259.00	256.60	(ML) Sandy Silt Till	Rising Head	7E-08	Completed by Terraprobe
BH24-14	23-Feb-22	264.50	3.70	6.10	260.80	258.40	(ML) Clayey Silt Till	Rising Head	2E-08	Completed by Terraprobe
BH24-15	26-Feb-22	266.40	3.70	6.10	262.70	260.30	(ML) Clayey Silt Till	Rising Head	2E-07	Completed by Terraprobe

Notes:

All test were analysed using Bouwer and Rice (1976)

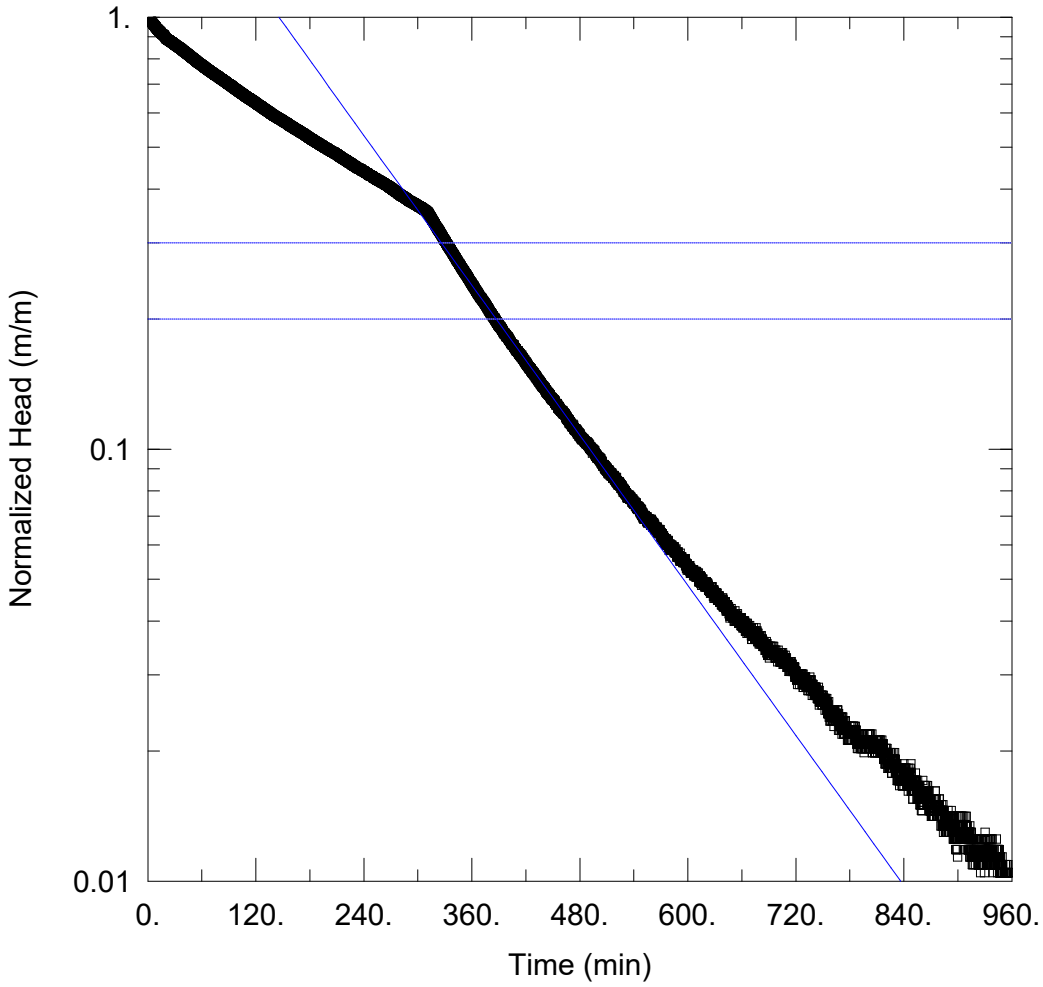
[1] Approximated based on the topographic survey data (J.D. Barnes, 2022) provided by the client.

m amsl - metres above mean sea level
m bgs - meters below groundsurface
m/s - meters per second

Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

APPENDIX G

Hydraulic Conductivity Test Results



MW24-02 RISING HEAD TEST

Data Set: N:\...\MW24-02_RHT_JB_AP.aqt
Date: 06/11/24 Time: 19:49:43

PROJECT INFORMATION

Company: GEMTEC
Client: Fieldgate Commercial
Project: 102491.013
Location: Caledon, ON
Test Well: MW24-02
Test Date: May 6, 2024

AQUIFER DATA

Saturated Thickness: 3.66 m Anisotropy Ratio (Kz/Kr): 0.1

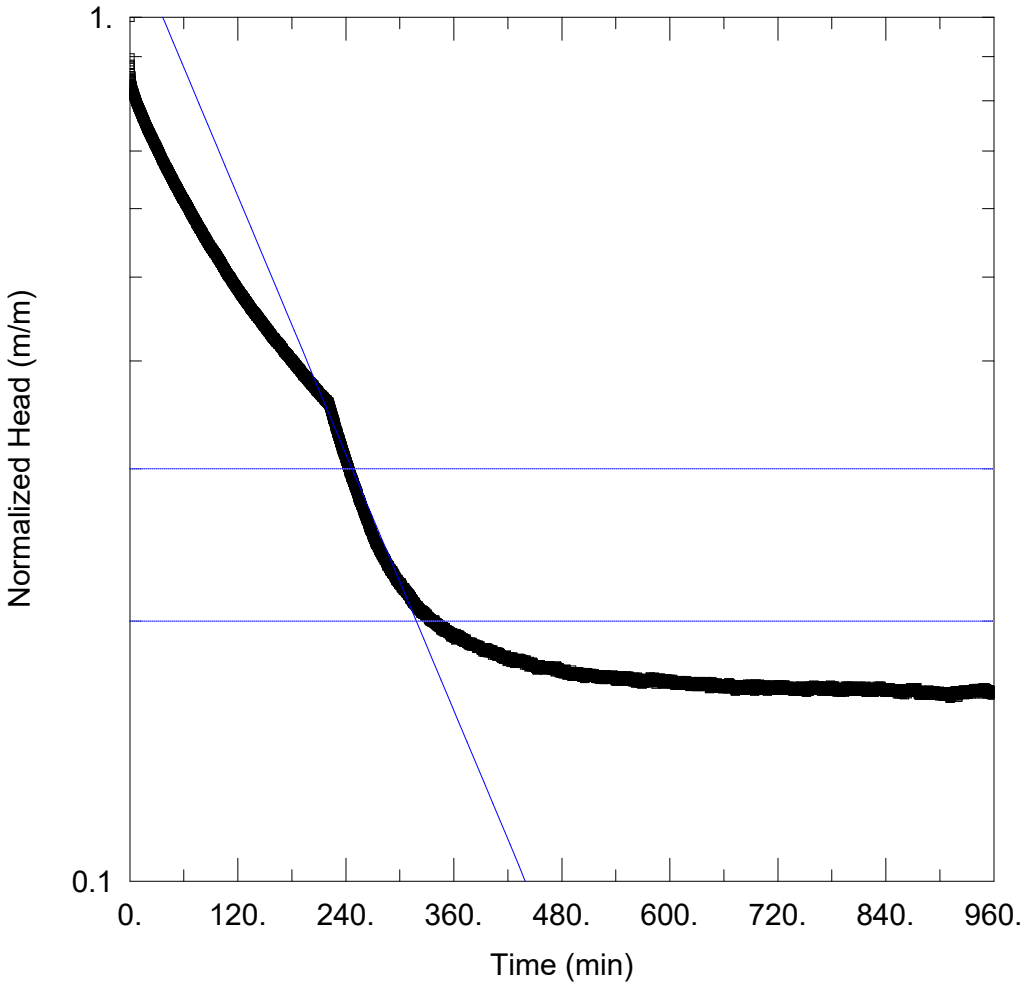
WELL DATA (MW24-02)

Initial Displacement: 2.55 m
Total Well Penetration Depth: 3.66 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.66 m
Screen Length: 3.05 m
Well Radius: 0.102 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.69E-7 m/sec
y0 = 6.724 m



MW24-03 RISING HEAD TEST

Data Set: N:\...\MW24-03_RHT_JB_AP.aqt
Date: 06/11/24 Time: 19:47:33

PROJECT INFORMATION

Company: GEMTEC
Client: Fieldgate Commercial
Project: 102491.013
Location: Caledon, ON
Test Well: MW24-03
Test Date: May 6, 2024

AQUIFER DATA

Saturated Thickness: 4.26 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW24-03)

Initial Displacement: 2.57 m
Total Well Penetration Depth: 4.26 m
Casing Radius: 0.0254 m
Static Water Column Height: 4.26 m
Screen Length: 3.05 m
Well Radius: 0.102 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.74E-8 m/sec
y0 = 3.162 m

APPENDIX H

Water Quality Results

Table H.1: Summary of Groundwater Quality Analytical Results
12100 Creditview Road, Caledon, Ontario

Sample Location					Caledon	Caledon	Caledon	Caledon	Caledon
Sample Date					05/07/2024	05/08/2024	05/08/2024	05/08/2024	05/08/2024
Sample ID					BH24-3	BH24-4	BH24-5	BH24-6	BH24-8
Sampling Company					GEMTEC	GEMTEC	GEMTEC	GEMTEC	GEMTEC
Laboratory					AGAT	AGAT	AGAT	AGAT	AGAT
Laboratory Work Order					24T148060	24T148827	24T148827	24T148827	24T148827
Laboratory Sample ID		Table 1	Table 2		5843376	5848865	5848866	5848868	5848871
Sample Matrix	Units	Sanitary	Storm	PWQO	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
General Chemistry									
Biochemical Oxygen Demand, Carbonaceous	mg/L	300	15	n/v	4	-	-	-	-
Cyanide	mg/L	2	0.02	0.005	<0.002	-	-	-	-
Fluoride	mg/L	10	n/v	n/v	<0.05	-	-	-	-
pH, lab	pH	5.5-10	6.0-9.0	6.5-8.5	7.61	-	-	-	-
Phenols-4AAP	mg/L	1	0.008	0.001	**0.003**	-	-	-	-
Phosphorus	mg/L	10	0.4	0.03	*1.26*	-	-	-	-
Sulphate, Dissolved	mg/L	1,500	n/v	n/v	97.4	-	-	-	-
Total Animal/Vegetable Oil and Grease, Calculated	mg/L	150	n/v	n/v	0.76	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	100	1	n/v	0.42	-	-	-	-
Total Suspended Solids	mg/L	350	15	n/v	**591**	-	-	-	-
Petroleum Hydrocarbons									
Total Oil & Grease, Mineral/Synthetic	mg/L	15	n/v	0.5	<0.5	-	-	-	-
Total Metals									
Aluminum	mg/L	50	n/v	0.075	**0.87**	-	-	-	-
Antimony	mg/L	5	n/v	0.02	<0.003	-	-	-	-
Arsenic	mg/L	1	0.02	0.1	<0.003	-	-	-	-
Cadmium	mg/L	0.7	0.008	0.0002	<0.0001	-	-	-	-
Chromium	mg/L	5	0.08	0.0099	<0.003	-	-	-	-
Cobalt	mg/L	5	n/v	0.0009	0.0009	-	-	-	-
Copper	mg/L	3	0.05	0.005	<0.002	-	-	-	-
Lead	mg/L	3	0.12	0.005	<0.0005	-	-	-	-
Manganese	mg/L	5	0.05	n/v	*0.185*	-	-	-	-
Mercury	mg/L	0.01	0.0004	0.0002	<0.0002	-	-	-	-
Molybdenum	mg/L	5	n/v	0.04	0.005	-	-	-	-
Nickel	mg/L	3	0.08	0.025	<0.003	-	-	-	-
Selenium	mg/L	1	0.02	0.1	<0.002	-	-	-	-
Silver	mg/L	5	0.12	0.0001	<0.0001	-	-	-	-
Tin	mg/L	5	n/v	n/v	<0.002	-	-	-	-
Titanium	mg/L	5	n/v	n/v	0.014	-	-	-	-
Zinc	mg/L	3	0.04	0.03	<0.020	-	-	-	-
Microbiological Analysis									
Escherichia coli (E.coli)	cfu/100mL	n/v	200	100	0	-	-	-	-
Fecal Coliforms	cfu/100mL	n/v	0	n/v	0	-	-	-	-
Nonyphenol & Nonylphenol Ethoxylates									
Total Nonyphenol	mg/L	0.02	n/v	0.00004	<0.001	-	-	-	-
Total Nonylphenol Ethoxylates	mg/L	0.2	n/v	n/v	<0.01	-	-	-	-
Polychlorinated Biphenyls									
Polychlorinated Biphenyls (PCBs)	mg/L	0.001	0.0004	0.000001	<0.0002	-	-	-	-
Organics									
Benzene	mg/L	0.01	0.002	0.1	<0.0002	<0.0002	-	-	<0.0002
Bis(2-Ethylhexyl)phthalate	mg/L	0.012	0.0088	0.0006	<0.0005	-	-	-	-
Chloroform	mg/L	0.04	0.002	n/v	<0.0002	-	<0.0002	<0.0002	-
cis-1,2-Dichloroethylene	mg/L	4	0.0056	0.2	<0.0002	-	<0.0002	<0.0002	-
Dichlorobenzene, 1,2-	mg/L	0.05	0.0056	0.0025	<0.0001	-	<0.0001	<0.0001	-
Dichlorobenzene, 1,4-	mg/L	0.08	0.0068	0.004	<0.0001	-	<0.0001	<0.0001	-
Di-n-butyl phthalate	mg/L	0.08	0.015	0.004	<0.0005	-	-	-	-
Ethylbenzene	mg/L	0.16	0.002	0.008	<0.0001	<0.0001	-	-	<0.0001
Methyl Ethyl Ketone	mg/L	8	n/v	0.4	<0.0009	-	<0.001	<0.001	-
Methylene Chloride (Dichloromethane)	mg/L	2	0.0052	0.1	<0.0003	-	<0.0003	<0.0003	-
Styrene	mg/L	0.2	n/v	0.004	<0.0001	-	<0.0001	<0.0001	-
Tetrachloroethane, 1,1,2,2-	mg/L	1.4	0.017	0.07	<0.0001	-	<0.0001	<0.0001	-
Tetrachloroethylene (PCE)	mg/L	1	0.0044	0.05	<0.0002	-	<0.0002	<0.0002	-
Toluene	mg/L	0.27	0.002	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Xylenes	mg/L	1.4	0.0044	n/v	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
trans-1,3-Dichloropropene	mg/L	0.14	0.0056	n/v	<0.0003	-	<0.0003	<0.0003	-
Trichloroethylene (TCE)	mg/L	0.4	0.008	0.02	<0.0002	-	<0.0002	<0.0002	-
Xylene, o-	mg/L	n/v	n/v	0.04	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Xylene, p+m-	mg/L	n/v	n/v	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:

Table 1 Sanitary	Peel Region Wastewater By-Law 53-2010, *Table 1 - Limits for Sanitary Sewer Discharge.*
Table 2 Storm	Peel Region Wastewater By-Law 53-2010, *Table 2 - Limits for Storm Sewer Discharge.*
PWQO	Provincial Water Quality Objectives, *Table 2 - Table of PWQOs and Interim PWQOs*
6.5	Bold font = concentration greater than Table 1 Sanitary Sewer Discharge Limit.
6.5	Italicized, underlined font = concentration greater than Table 2 Storm Sewer Discharge Limit.
6.5	Shaded cell with bold, underlined font = concentration greater than Table of PWQOs and Interim PWQOs Objective.
<	Concentration less than the accompanying reportable detection limit.
-	Parameter not analyzed.
n/v	No value.

APPENDIX I

Infiltration Test Results

Guelph Permeameter Calculations

GP24-1

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir): 35.22

Enter water Head Height ("H" in cm): 15

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.1000

Res Type	35.22		
H	15		
a	3	α^*= 0.04	cm^{-1}
H/a	5		
a*	0.04	C = 1.629144	
C0.01	1.518	Q = 0.0587	
C0.04	1.629		
C0.12	1.667	K_{fs} = 2.51E-05	cm/sec
C0.36	1.667	1.50E-03	cm/min
C	1.629	2.51E-07	m/sec
R	0.100	5.92E-04	inch/min
Q	0.059	9.87E-06	inch/sec
pi	3.142		
		Φ_m = 6.27E-04	cm^2/min

Single Head Method (2)

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):

Enter water Head Height ("H" in cm):

Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

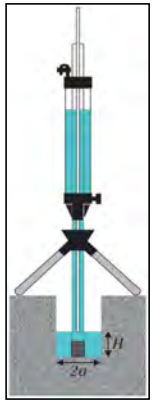
1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min):

Res Type	0		
H	0		
a	0	α^*= 0	cm^{-1}
H/a	#DIV/0!		
a*	0	C = 0	
C0.01	#DIV/0!	Q = 0	
C0.04	#DIV/0!		
C0.12	#DIV/0!	K_{fs} = #DIV/0!	cm/sec
C0.36	#DIV/0!	#DIV/0!	cm/min
C	0	#DIV/0!	m/ses
R	0.000	#DIV/0!	inch/min
Q	0	#DIV/0!	inch/sec
pi	3.1415		
		Φ_m = #DIV/0!	cm^2/min

Average

K_{fs} =	#DIV/0!	cm/sec
	#DIV/0!	cm/min
	#DIV/0!	m/s
	#DIV/0!	inch/min
	#DIV/0!	inch/sec
Φ_m =	#DIV/0!	cm^2/min



Double Head Method

Reservoir Cross-sectional area in cm^2 (enter "35.22" for Combined and "2.16" for Inner reservoir):

Enter the first water Head Height ("H1" in cm):

Enter the second water Head Height ("H2" in cm):

Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R1" in cm/min):

Steady State Rate of Water Level Change ("R2" in cm/min):

		α^*= 0	cm^{-1}
		α= #DIV/0!	
		Q_1 = 0	
		Q_2 = 0	
Res Type:	0		
H1/a:	#DIV/0!	C_1 = 0	
H2/a:	#DIV/0!		
C1-0.01:	#DIV/0!	C_2 = 0	
C2-0.01:	#DIV/0!		
C1-0.04:	#DIV/0!	G_1 = #DIV/0!	
C2-0.04:	#DIV/0!		
C1-0.12:	#DIV/0!	G_2 = #DIV/0!	
C2-0.12:	#DIV/0!		
C1-0.36:	#DIV/0!	G_3 = #DIV/0!	
C2-0.36:	#DIV/0!		
G-Denominator:	0	G_4 = #DIV/0!	
		K_{fs} = #DIV/0!	cm/sec
		#DIV/0!	cm/min
		#DIV/0!	m/sec
		#DIV/0!	inch/min
		#DIV/0!	inch/sec
		Φ_m = #DIV/0!	cm^2/min
		Θ_{fs} =	cm^3/cm^3
		Θ_i =	cm^3/cm^3
		Sorptivity #DIV/0!	$(cm\ min^{-\frac{1}{2}})$

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_1/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_2^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$

Guelph Permeameter Calculations

GP24-2

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2
(enter "35.22" for Combined and "2.16" for Inner reservoir): 35.22
Enter water Head Height ("H" in cm): 15
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.1000

Res Type	35.22		
H	15		
a	3	α*= 0.04	cm^{-1}
H/a	5		
a*	0.04	C = 1.629144	
C0.01	1.518	Q = 0.0587	
C0.04	1.629		
C0.12	1.667	K_{fs} = 2.51E-05	cm/sec
C0.36	1.667	1.50E-03	cm/min
C	1.629	2.51E-07	m/sec
R	0.100	5.92E-04	inch/min
Q	0.059	9.87E-06	inch/sec
pi	3.142		
		Φ_m = 6.27E-04	cm^2/min

Single Head Method (2)

Reservoir Cross-sectional area in cm^2
(enter "35.22" for Combined and "2.16" for Inner reservoir):
Enter water Head Height ("H" in cm):
Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

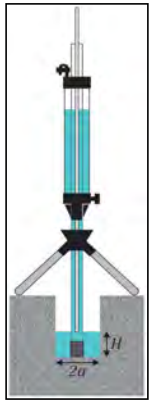
1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
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4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min):

Res Type	0		
H	0		
a	0	α*= 0	cm^{-1}
H/a	#DIV/0!		
a*	0	C = 0	
C0.01	#DIV/0!	Q = 0	
C0.04	#DIV/0!		
C0.12	#DIV/0!	K_{fs} = #DIV/0!	cm/sec
C0.36	#DIV/0!	#DIV/0!	cm/min
C	0	#DIV/0!	m/ses
R	0.000	#DIV/0!	inch/min
Q	0	#DIV/0!	inch/sec
pi	3.1415		
		Φ_m = #DIV/0!	cm^2/min

Average

K_{fs} =	#DIV/0!	cm/sec
	#DIV/0!	cm/min
	#DIV/0!	m/s
	#DIV/0!	inch/min
	#DIV/0!	inch/sec
Φ_m =	#DIV/0!	cm^2/min



Double Head Method

Reservoir Cross-sectional area in cm^2
(enter "35.22" for Combined and "2.16" for Inner reservoir):
Enter the first water Head Height ("H1" in cm):
Enter the second water Head Height ("H2" in cm):
Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R1" in cm/min):
Steady State Rate of Water Level Change ("R2" in cm/min):

		α*= 0	cm^{-1}
		α= #DIV/0!	
		Q_1 = 0	
		Q_2 = 0	
Res Type:	0		
H1/a:	#DIV/0!	C_1 = 0	
H2/a:	#DIV/0!		
C1-0.01:	#DIV/0!	C_2 = 0	
C2-0.01:	#DIV/0!		
C1-0.04:	#DIV/0!	G_1 = #DIV/0!	
C2-0.04:	#DIV/0!		
C1-0.12:	#DIV/0!	G_2 = #DIV/0!	
C2-0.12:	#DIV/0!		
C1-0.36:	#DIV/0!	G_3 = #DIV/0!	
C2-0.36:	#DIV/0!		
G-Denominator:	0	G_4 = #DIV/0!	
		K_{fs} = #DIV/0!	cm/sec
		#DIV/0!	cm/min
		#DIV/0!	m/sec
		#DIV/0!	inch/min
		#DIV/0!	inch/sec
		Φ_m = #DIV/0!	cm^2/min
		Θ_{fs} =	cm^3/cm^3
		Θ_i =	cm^3/cm^3
		Sorptivity #DIV/0!	(cm $min^{-\frac{1}{2}}$)

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998)

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_2 = \frac{H_1 C_2}{\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $K_{fs} = G_2Q_2 - G_1Q_1$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $G_4 = \frac{(2H_2^2 + a^2C_1)C_2}{2\pi\left(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1)\right)}$ $\Phi_m = G_3Q_1 - G_4Q_2$

APPENDIX J

Water Balance

Table J.1- Environment Canada Precipitation, Surplus Data Georgetown WWTP, Ontario
Hydrogeological Investigation
Caledon, Ontario

Georgetown WWTP Water Budget Means for the period 1965-2022 6152695

Water Holding Capacity	200	mm
Heat Index	36.28	
Lower Zone	60	mm
A	1.073	
Date Range	1980	2012

Date	Temperature (°C)	Precipitation (mm)	Rain (mm)	Melt (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm)	Deficit (mm)	Surplus (mm)	Snow (mm)	Soil (mm)	Accumulated Precipitation (mm)
January	-6.1	61	26	19	1	1	0	28	31	191	279
February	-5.2	56	22	31	2	2	0	46	34	197	336
March	-0.6	58	38	50	9	9	0	74	4	200	393
April	6.3	76	73	7	34	34	0	46	0	200	468
May	12.6	78	78	0	76	76	0	15	0	187	547
June	17.6	77	77	0	110	110	0	7	0	147	622
July	20.3	77	77	0	130	127	-4	1	0	95	697
August	19.3	79	79	0	115	98	-17	3	0	73	776
September	15.1	84	84	0	77	68	-9	8	0	81	861
October	8.6	70	70	0	39	37	-1	7	0	107	69
November	2.9	81	74	6	13	13	0	19	1	156	152
December	-2.8	66	32	20	3	3	0	27	15	177	218
Average	7.3										
Total		861	730	133	609	578	-31	281			

Entered by: CC
Checked by: KG

Client: 12100 Creditview Developments Limited
c/o Fieldgate Commercial
Project Number: 102491.013
July 2025

Table J.2: Pre-Development Water Budget, 12100 Creditview Road, Caledon, Ontario

Description	Units	Impervious (House, Barn, Shed, and Driveway)	Cultivated	TOTALS	Notes
Soil Type	**-**	**n/a**	**Silt Loam**		
Topography	**-**	**n/a**	**Rolling**		
WHC (mm)	**-**	**n/a**	**200**		
Pervious Area	m^2	0	143,081	143,081	
Impervious Area	m^2	2,044	0	2,044	
Total Area	m^2	2,044	143,081	145,125	
Infiltration Factor					
Soil Sub-Factor	-	n/a	0.2	-	
Land Cover Sub-Factor	-	n/a	0.1	-	
Topography Sub-Factor	-	n/a	0.15	-	
Infiltration Factor	-	0	0.45	-	
Runoff Factor	-	1	0.55	-	
Average Annual Water Balance (in mm/year)					
Inputs					
Precipitation	mm/yr	861	861	-	
Total Inputs	**mm/yr**	**861**	**861**	**-**	
Outputs					
Actual Evapotranspiration	mm/yr	86	578	-	
Surplus	mm/yr	775	281	-	
Infiltration	mm/yr	0	126	-	
Runoff	mm/yr	775	155	-	
Total Outputs	**mm/yr**	**861**	**859**	**-**	
Average Annual Water Balance (in m^3/year)					
Inputs					
Precipitation	m^3/yr	1,760	123,193	124,953	
Total Inputs	**m3/yr**	**1,760**	**123,193**	**124,953**	
Outputs					
Actual Evapotranspiration	m3/yr	176	82,701	82,876	
Surplus	m3/yr	1,584	40,492	42,077	
Infiltration	m3/yr	0	18222	18,222	
Runoff	m3/yr	1,584	22,270	23,855	
Total Outputs	**m3/yr**	**1,760**	**123,193**	**124,953**	

Entered by: CC
Checked by: KG

12100 Creditview Developments Limited
c/o Fieldgate Commercial
GEMTEC Project: 102491.013
July 2025

Table J.3: Post-Development Water Budget, 12100 Creditview Road, Caledon, Ontario

Description	Units	Impervious			Lawns or Landscaping	TOTALS	Notes
		Paved Parking Lots and Roads	Retail Buildings	Refueling Station			
Soil Type	**-**	**n/a**	**n/a**	**n/a**	**Silt Loam**		
Topography	**-**	**n/a**	**n/a**	**n/a**	**Rolling**		
WHC (mm)	**-**	**n/a**	**n/a**	**n/a**	**200**		
Pervious Area	m^2	0	0	0	15,040	15,040	
Impervious Area	m^2	98,975	28,020	3,090	0	130,085	
Total Area	m^2	98,975	28,020	3,090	15,040	145,125	
Infiltration Factor							
Soil Sub-Factor	-	n/a	n/a	n/a	0.2	-	
Land Cover Sub-Factor	-	n/a	n/a	n/a	0.1	-	
Topography Sub-Factor	-	n/a	n/a	n/a	0.3	-	
Infiltration Factor	-	0	0	0	0.6	-	
Runoff Factor	-	1	1	1	0.4	-	
Average Annual Water Balance (in mm/year)							
Inputs							
Precipitation	mm/yr	861	861	861	861	-	
Total Inputs	**mm/yr**	**861**	**861**	**861**	**861**	**-**	
Outputs							
Actual Evapotranspiration	mm/yr	86	86	86	578	-	
Surplus	mm/yr	775	775	775	281	-	
Infiltration	mm/yr	0	0	0	169	-	
Runoff	mm/yr	775	775	775	112	-	
Total Outputs	**mm/yr**	**861**	**861**	**861**	**859**	**-**	
Average Annual Water Balance (in m^3/year)							
Inputs							
Precipitation	m^3/yr	85,218	24,125	2,660	12,949	124,952	
Total Inputs	**m3/yr**	**85,218**	**24,125**	**2,660**	**12,949**	**124,952**	
Outputs							
Actual Evapotranspiration	m3/yr	8,512	2,410	266	8,693	19,880	
Surplus	m3/yr	76,706	21,715	2,394	4,256	105,072	
Infiltration	m3/yr	0	0	0	2,554	2,554	
Runoff	m3/yr	76,706	21,715	2,394	1,702	102,518	
Total Outputs	**m3/yr**	**85,218**	**24,125**	**2,660**	**12,949**	**124,952**	

APPENDIX K

Previous Investigation

Terraprobe

Consulting Geotechnical & Environmental Engineering
Construction Materials Inspection & Testing

HYDROGEOLOGICAL ASSESSMENT
PROPOSED COMMERCIAL DEVELOPMENT
12100 CREDITVIEW ROAD
CALEDON, ONTARIO

Prepared For: **12100 Creditview Developments Limited**
c/o Glen Schnarr & Associates Inc.
700-10 Kingsbridge Garden Circle
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Attention: Mr. Stephanie Matveeva

File No. 1-21-0516-46
Issued: April 26, 2022

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TABLE OF CONTENTS

SECTION		PAGE (S)
1.0	INTRODUCTION	1
2.0	SCOPE OF WORK	1
3.0	APPLICABLE REGULATIONS AND POLICIES	3
3.1	CREDIT VALLEY CONSERVATION AUTHORITY (CVC) POLICIES AND REGULATIONS (O. REG. 160/06)	3
3.2	SOURCE WATER PROTECTION	3
3.3	THIRD PARTY DEWATERING ACTIVITIES	4
3.4	HYDROGEOLOGICAL ASSESSMENT SUBMISSION GUIDELINES 2013	4
4.0	DESCRIPTION OF SITE CONDITIONS	5
4.1	SITE LOCATION AND DESCRIPTION	5
4.2	SITE TOPOGRAPHY AND DRAINAGE	5
4.3	REGIONAL GEOLOGY AND PHYSIOGRAPHY	5
4.4	REGIONAL AND LOCAL HYDROGEOLOGICAL SETTING	6
4.5	LOCAL SURFACE WATER AND NATURAL HERITAGE FEATURES	7
4.6	LOCAL GROUNDWATER RESOURCES	8
5.0	RESULTS OF SUBSURFACE INVESTIGATION	10
5.1	LOCAL SITE SETTING	10
	5.1.1 Surficial Topsoil/ Earth Fill Material	10
	5.1.2 Native Soils	10
5.2	MONITORING WELL INSTALLATION	11
5.3	GROUNDWATER ELEVATIONS	12
5.4	ESTIMATION OF HYDRAULIC CONDUCTIVITY	13
	5.4.1 Estimation from Grain Size Distribution	13
	5.4.2 Estimation from In-situ Hydraulic Testing	13
	5.4.3 Estimation from Literature	14
5.5	GROUNDWATER QUALITY ASSESSMENT	14
6.0	IMPACT ASSESSMENT	16
6.1	WATER BALANCE ASSESSMENT	16
	6.1.1 Water Balance Methodology	16

6.1.2 Water Balance Analysis: 17
6.2 SURFACE WATER IMPACT 19
6.3 GROUNDWATER QUALITY IMPACT 19
6.4 IMPACT TO LOCAL RESOURCES 19
6.5 ANTHROPOGENIC TRANSPORT PATHWAYS 19

7.0 MITIGATING MEASURES 21

7.1 MAINTENANCE OF GROUNDWATER RECHARGE 21
7.2 MAINTENANCE OF GROUNDWATER TRANSMISSION PATHWAYS 21

8.0 CLOSURE 22

LIMITATIONS 24

FIGURES:

Figure 1 – Site Location Plan
Figure 2 – Borehole and Monitoring Well Location Plan
Figure 3 – Groundwater Elevation and Contour Plan
Figure 4 – Subsurface Profile
Figure 5 – MECP Water Well Records Map

APPENDICES:

Appendix A Regulatory and Hydrogeological Mapping
Appendix B MECP Well Records
Appendix C Borehole Logs
Appendix D Grain Size Distribution Analysis
Appendix E Aquifer Response Tests
Appendix F Laboratory Certificates of Analysis
Appendix G Water Balance Analysis

1.0 INTRODUCTION

Terraprobe Inc. was retained by 12100 Creditview Developments Limited c/o Glen Schnarr & Associates Inc. to conduct a hydrogeological assessment for the property with municipal address 12100 Creditview Road, in the Town of Caledon, Ontario hereinafter referred to as the Property or Site. The Property is located northwest quadrant of the intersection of corner of the Mayfield Road and Creditview Road in the Town of Caledon, Ontario. The general location of the Site is shown on **Figure 1**.

The property currently consists of agricultural farmland and a rural residential dwelling and two accessory structures with an approximate area of 10.28 ha (25.30 acres). The property is currently in agricultural land use per Ontario Regulation 153/04 (O. Reg. 153/04). Based on the current development concept, it is understood that the property would be developed as commercial development (commercial structures of varying size and configurations). The proposed commercial development will be slab-on grade structures and will be serviced with municipal piped water and sanitary sewer system. The purpose of this report is to assess local and regional hydrogeological conditions and the potential impacts of the proposed development on the groundwater system.

2.0 SCOPE OF WORK

The scope of work for the study consisted of the following:

- **Review of available background information:** Available background information for the site and the project was reviewed. This included the results of geotechnical and environmental investigations of the property, and available information regarding the proposed design and construction concepts for the development. In addition, information from public sources including geologic mapping and MECP well record.
- **Detailed Site Inspection:** An inspection of the property was conducted to review existing Site conditions including identification of any hydrogeological features such as significant areas of potential groundwater recharge or areas of groundwater discharge. The topographic survey of the Site provided to Terraprobe was reviewed in order to provide a discussion regarding drainage conditions.
- **Borehole Drilling:** Prior to the commencement of drilling, the locations of underground utilities; including telephone, natural gas and electrical lines were marked out by local locating companies and individual borehole locations were cleared by private utility locating service providers. The field investigation was conducted on February 1 to 3, 2022 and consisted of drilling and sampling a total of twelve (12) boreholes extending to depth of about 6.6 m below existing ground surface, as follows:
- **Well Installation:** To measure the groundwater level and investigate the quality of groundwater, six (6) selected boreholes (BH2, BH4, BH6, BH7, BH14, BH15) were instrumented with a monitoring well. The monitoring well consisted of a 50 mm diameter PVC screen with a length of PVC riser pipe, 10-ft slotted screen. Upon installation, an elevation survey of the monitoring wells, relative to a local datum, was completed so that relative groundwater flow direction can be assessed.

- **Completion of hydraulic conductivity testing:** Single well response tests (Bail Tests) were conducted in the selected three (3) monitoring wells (BH6, BH14, BH15) to assess hydraulic conductivity of the screened strata.
- **Hydrogeology Report**: Following completion of the above-noted study, a detailed engineering report was prepared regarding the Site hydrogeology. The report provides the following information:
    - Presentation of all the factual information gathered during the study including the background information and results of site subsurface investigation;
    - Provision of a conceptual site model for local and regional hydrogeologic conditions. The conceptual site model will be used as a basis to assess impacts to local surface and groundwater features;
    - Calculations of water balance for existing (pre-development) and post-development conditions and assessment of infiltration rates to establish the requirements for maintaining groundwater recharge at the property;
    - Impact assessment and mitigation measures to maintain the hydrogeological functions;

3.0 APPLICABLE REGULATIONS AND POLICIES

3.1 Credit Valley Conservation Authority (CVC) Policies and Regulations (O. Reg. 160/06)

Under Section 28 of the Conservation Authorities Act, local conservation authorities are mandated to protect the health and integrity of the regional greenspace system and to maintain or improve the hydrological and ecological functions performed by valley and stream corridors. The CVCA, through its regulatory mandate, is responsible for issuing permits under Ontario Regulation (Ont. Reg. 160/06), *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* for development proposal or Site alteration work to shorelines and watercourses within the regulated areas.

CVCA Regulated Area online mapping was reviewed. It is our understanding that the Site is not located within a CVCA Regulated Area. As such, it is anticipated that a permit from the CVCA under Ont. Reg. 160/06 **will not be required** for the proposed development.

Refer to **Appendix A** for associated mapping details.

3.2 Source Water Protection

The MECP mandates the protection of existing and future sources of drinking water under the Clean Water Act, 2006 (CWA). Initiatives under the CWA include the delineation of Wellhead Protection Areas (WHPAs), Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs), as well as the assessment of drinking water quality and quantity threats within Source Protection Regions. Source Protection Plans are developed under the CWA and include the restriction and prohibition of certain types of activities and land uses within WHPAs. This plan dictates that any site within the Credit Valley Watershed of South Georgian Bay (SGBLS) region can be rated in terms of score indicating vulnerability to drinking water quality and quantity threats. Based on the review of MECP's Source Protection Information Atlas and Credit Valley Conservation Authority (CVC) regulated area mapping, the following information was obtained related to the subject property:

Associated Policy Area	Applicability
Conservation Authority	Credit Valley Conservation Authority
Source Protection Area	Credit Valley Source Protection Area
Watershed	Credit Valley Watershed
Subwatershed	Fletcher's Creeks (5)
CVC Regulated Area	No
Wellhead Protection Area (WHPA)	No
Significant Groundwater Recharge Area (SGRA).	No
Highly Vulnerable Aquifer (HVA)	No
Wellhead Protection Areas (WHPA - Q) or Recharge	No

Associated Policy Area	Applicability
Management Area	
Intake Protection Zone	No
Intake Protection Zone Q	No
Oak Ridges Moraine (ORM) Area	No
Niagara Escarpment Plan Area	No
Greenbelt Protection Act Area	No

Refer to **Appendix A** for associated regulatory mapping details.

3.3 Third Party Dewatering Activities

MECP website was reviewed for any active PTTW application records within a 1.0 km radius of the Site on April 14, 2022. Record review indicates that there are no active PTTW within 1.0 km from the Site. There are no other records of water extraction activities within 1 km of the Site, with the exception of the above noted municipal well activities.

3.4 Hydrogeological Assessment Submission Guidelines 2013

The Conservation Authority Guidelines for Development Applications (June 2013) was reviewed as a part of this assessment. This guidance document provides a list of recommended requirements for hydrogeological investigations. Credit Valley Conservation Authority (CVC) has adopted these guidelines for hydrogeological assessments. The methodology adopted for conducting this hydrogeological assessment is based on the Conservation Authority Guidelines.

4.0 DESCRIPTION OF SITE CONDITIONS

4.1 Site Location and Description

The Property is located northwest quadrant of the intersection of corner of the Mayfield Road and Creditview Road. The general location of the Site is shown on **Figure 1**. The property currently consists of agricultural farmland and a rural residential dwelling and two accessory structures with an approximate area of 10.28 ha (25.30 acres). The property is currently in agricultural land use per Ontario Regulation 153/04 (O. Reg. 153/04). Based on the current development concept, it is understood that the property would be developed as commercial development (commercial structures of varying size and configurations). The proposed commercial development will be slab-on grade structures and will be serviced with municipal piped water and sanitary sewer system.

4.2 Site Topography and Drainage

Based on the boreholes advanced the Site elevation varies from approximately 260.8 ± masl to 266.4 ± masl (meters above sea level) towards east/southeast. Furthermore, based on the review of Oak Ridges Moraine Groundwater Program (OGRMP), it is also indicated that the Site slopes east/southeast towards Fletchers Creek (a tributary of Credit River) located approximately 3 km east/southeast from the Site. **Appendix A** further indicates the topography of the Site.

The nearest surface water features are network of tributaries of Fletcher's Creek located adjacent to the Site. The tributaries flow eastward following local topography towards Fletcher's creek which flows south/southeast towards the Credit River and ultimately drains to Lake Ontario. Regional and local groundwater flow direction is the expected to flow east/southeast following local topography.

4.3 Regional Geology and Physiography

The surficial geology of the area is representative of relatively complex sequence of interbedded silty to clayey tills with interstratified sand and silty to clayey glaciolacustrine beds. In general, the combined soil sequence varies in thickness from approximately 5 metres to greater than 30 metres fine textured derived from glaciolacustrine deposits or shale (5d) consisting of clay to silt-textured till. Mapped surficial geology for the Site and the surrounding area is provided in **Appendix A**.

From a regional perspective, the Site is situated within the physiographic feature known as the South Slope (32) and within the physiographic landform known as the Till Plains (6). The South Slope is the southern slope of the Oak Ridges Moraine but it includes the strip south of the Peel plain. The South Slope generally forms an undulating ground surface of limited relief sloping gently to the south towards Lake Ontario. It extends from the Niagara Escarpment to the Trent River covering approximately 2,435 square kilometers, encompassing the upper Credit subwatershed. (Chapman et, 2007). The location of the Site within the regional physiography map is provided in **Appendix A.**

Bedrock was not contacted over the current subsurface investigation. Bedrock in the area is Upper Ordovician Queenston formation consisting of reddish shales with interbeds of limestone and calcareous siltstone. The Queenston Formation is the youngest unit in the Upper Ordovician sequence with a thickness ranging from 45.0 to 335.0 m. Shale outcrops within the Fletchers Creek subwatershed were

observed at several locations along the main channel (CVC, 1996). Based on the review of Oak Ridges Moraine Groundwater Program (OGRMP) cross section tool, bedrock lies at an elevation of approximately ± 255 masl, and depth to bedrock at the Site is approximately ± 11 m below ground surface.

4.4 Regional and Local Hydrogeological Setting

The Fletcher Creek subwatershed is one of 20 subwatersheds that drain into Credit Valley. The Credit River drains into Lake Ontario. The Fletcher Creek subwatershed is located almost entirely within the City of Brampton, with small portions falling into the Town of Caledon and the City of Mississauga. The Fletcher Creek subwatershed is not as densely populated as some of its neighbouring subwatersheds, and has a total area of approximately 45 km^2 with the main watercourse extends over a distance of approximately 18 km (CVC 1996).

Based on the review of Fletcher's Creek Subwatershed Plan Study Report (August 1995), the hydrogeological regime in the Fletchers Creek subwatershed can be divided into the regional and local groundwater flow system. The regional system encompasses over the entire Credit River watershed. In general, regional groundwater flow occurs in the bedrock and the regional flow system can be thought of as "deep groundwater flow. Regional groundwater Row likely occurs from northeast to southwest, toward the Credit River, which is the expected discharge point for regional flow. The primary recharge areas for the regional groundwater system are located north of the Fletchers Creek subwatershed, in the northern part of the Credit River watershed.

In the Fletchers Creek subwatershed, groundwater supplies are obtained from both overburden and bedrock aquifers. There are no municipal water supply wells within the subwatershed. Low yield, domestic and agricultural wells obtain water from the bedrock or from sand and gravel lenses within the overburden. The Queenston shale bedrock forms the principal water-bearing unit based on the well records. However, yields from the bedrock are typically less than 10 lgpm and often of poor chemical quality due to high levels of naturally derived dissolved minerals. Permeable sand and gravel layers within the till comprise additional water-bearing zones although of limited lateral extent. These zones typically have well yields in the order of 2 to 3 lgpm.

Groundwater flow in the overburden deposits in the subwatershed is likely controlled by surface topography. Groundwater divides likely occur along the crest of hills with shallow groundwater flow directed downslope with eventual discharge to surface drainage channels. In the upper reaches of the watershed, shallow groundwater flow is inferred to occur primarily in a south-easterly direction, along the length of the watershed, with only minor groundwater components directed laterally to the swales and downward into the underlying shale bedrock. Due to the low permeability of the near-surface geologic materials, the downward percolation and infiltration of recharge is expected to be relatively low. (Fletcher's Creek Subwatershed Plan Study Report August 1995).

4.5 Local Surface Water and Natural Heritage Features

Mapping from the Ontario Ministry of Natural Resources and Forestry (MNRF) was to determine if water bodies, wetland and woodland features were present on the Property and within the Study Area. The Ontario Ministry of Natural Resources National Heritage Information Centre database for listings of Areas of Natural or Scientific Interest (ANSIs) was reviewed. The natural heritage map is presented in **Appendix A**. The information is summarized below.

Water Bodies	**Property**	• No waterbodies are present on the Property
	Study Area	• The nearest surface water features are network of tributaries of Fletcher's Creek located adjacent to the Site.
Wetlands	**Property**	Provincially Significant Evaluated Wetland • No Provincially Significant wetlands are present on the Property Non- Provincially Significant Evaluated Wetland • No Non- Provincially Significant wetlands are present on the Property. Unevaluated Wetland • No wetland features are present within the area of proposed development.
	Study Area	Provincially Significant Evaluated Wetland • The closest Provincially Significant Evaluated Wetland is present approximately 190 m south from the Site Non- Provincially Significant Evaluated Wetland • No Non-Provincially Significant Evaluated Wetland is present on the study area. Unevaluated Wetland • No Unevaluated wetland feature is present within the study area.
Woodlands	**Property**	• No Woodland areas are identified on the Property.
	Study Area	• The closest woodland area was identified in approximately 50m of the Property at the south corner.
ANSIs	**Property**	Provincially Significant Life Science ANSI • No Life Science ANSIs were identified on the Property. Provincially Significant Earth Science ANSI • No Earth Science ANSIs were identified on the Property.
	Study Area	Provincially Significant Life Science ANSI • No Life Science ANSIs were identified in the Study Area. Provincially Significant Earth Science ANSI • No Provincially Significant Earth Science ANSIs were identified in the Study Area

4.6 Local Groundwater Resources

MECP Water Well Records (WWRs) were reviewed for the registered wells located at the Site and within 500 m radius of the Site boundaries (study area). Information contained in these records provides data for determining the nature and use of local groundwater resources. A total of 52 well records were found. The locations of the well records in the Study Area are presented on **Figure 5,** with the details for each well summarized in **Appendix B**. A summary of data obtained from these MECP records is presented in Table below:

Total Number of Wells	**52**
Water Use	
Domestic Water Supply	23 (44%)
Public/ Municipal Water Supply	1 (2%)
Livestock Water Supply	1 (2%)
Monitoring/Test Holes/Observation Wells	3 (6%)
Not Used/ Abandoned	17 (33%)
Unknown	7 (13%)

The above summary indicates that approximately 48 % of the well records indicate the wells being used for water supply purposes with depths ranging from 5.5 mbgs - 43.0 mbgs constructed in years 1959 - 2011.The locations of the well records in the Study Area are presented on **Figure 5**. The water supply well record is summarized in the table below:

Map ID	MECP Well ID	Well Depth (mbgs)	Static Water Level (mbgs)	Well Use	Construction Date (mm/dd/yyyy)
1	4901926	9.0	4.6	Domestic	5/21/1960
2	4901927	16.8	9.2	Livestock	8/4/1962
3	4908347	-	0.6	Domestic	10/15/1997
4	4905071	13.7	6.1	Domestic	3/8/1977
5	4905047	5.5		Public	9/17/1976
6	4901921	12.5	7.0	Domestic	1/15/1962
7	4906850	18.9	3.1	Domestic	1/10/1988
10	7163004	-	5.5	Domestic	4/30/2011
11	4901922	27.4	10.7	Domestic	3/2/1962
12	4907770	43.0	11.6	Domestic	8/12/1993
13	4906720	14.9	11.0	Domestic	9/18/1986
14	4905252	14.5	4.6	Domestic	8/15/1977
17	4908107	29.3	5.5	Domestic	7/27/1995
20	4901923	13.4	7.3	Domestic	4/21/1962
24	4906748	13.4	3.7	Domestic	10/20/1987

Map ID	MECP Well ID	Well Depth (mbgs)	Static Water Level (mbgs)	Well Use	Construction Date (mm/dd/yyyy)
25	4905120	8.5	3.7	Domestic	5/23/1977
27	4901830	11.0	4.9	Domestic	12/22/1959
28	4901831	9.8	4.3	Domestic	8/24/1960
29	4906719	9.8	3.4	Domestic	5/14/1986
31	4901829	18.9	4.9	Domestic	5/9/1964
38	4907410	17.4	6.1	Domestic	8/28/1989
42	4906872	12.8	4.3	Domestic	7/27/1987
43	4901826	13.4	6.1	Domestic	5/4/1963
49	4901828	12.8	6.1	Domestic	4/4/1964
51	4901827	11.6	6.4	Domestic	6/21/1963

Note: mbgs: meters below ground surface

5.0 RESULTS OF SUBSURFACE INVESTIGATION

The field investigation was conducted on February 1 to 3, 2022 and consisted of drilling and sampling a total of twelve (12) boreholes extending to depth of about 6.6 m below existing ground surface. To measure the groundwater level and investigate the quality of groundwater, six (6) selected boreholes (BH2, BH4, BH6, BH7, BH14, BH15) were instrumented with a monitoring well. The monitoring well consisted of a 50 mm diameter PVC screen with a length of PVC riser pipe, 10-ft slotted screen. Upon installation, an elevation survey of the monitoring wells, relative to a local datum, was completed so that relative groundwater flow direction can be assessed. The locations of boreholes and monitoring wells are shown on the attached **Figure 2**.

The boreholes were drilled by a specialist drilling contractor using truck/track-mounted drilling rigs equipped with power augers. The borings were advanced using continuous flights of solid stem augers and were sampled at 0.75 m interval with conventional 50 mm diameter split barrel samplers. The drilling was conducted under the full-time supervision of a member of our field staff, who logged the borings and examined the samples as they were obtained. All samples obtained during the investigation were sealed into plastic jars, and transported to our geotechnical testing laboratory for detailed inspection and testing.

5.1 Local Site Setting

Based on the review of the geotechnical report **File No. 1-21-0516-01**; the subsurface soil stratigraphy is indicated below. The following stratigraphy is based on the borehole findings, as well as the geotechnical laboratory testing conducted on selected representative soil samples. The stratigraphic boundaries indicated on the Borehole Logs are inferred from non-continuous samples and observations of drilling resistance and typically represent a transition from one soil type to another. These boundaries should not be interpreted to represent exact planes of geological change. The subsurface conditions have been confirmed in a series of widely spaced boreholes and will vary between and beyond the borehole locations.

5.1.1 Surficial Topsoil/ Earth Fill Material

A surficial layer of **topsoil** was encountered at all borehole locations, and its thickness ranged from 100 mm to 350 mm. A zone of earth fill materials was encountered in all boreholes beneath the topsoil layer and extended to depths varying from about 0.8 m (BH2, BH10 to BH13 and BH15) to 1.5 m (BH4) below existing grade. The earth fill materials consisted of clayey silt with trace to some sand and trace amounts of gravel, as well as sporadic organic presence and brick pieces. The fill material indicated a very loose to compact relative density with moist condition. Weathered/ disturbed soils of generally similar composition to that of the underlying undisturbed native soil and including a trace amount of organics was encountered beneath the earth fill.

5.1.2 Native Soils

Undisturbed native soil deposits underlie the topsoil / earth fill deposits and extends to the full depth of investigation are as follows:

- **Clayey Silt Till**, with some sand to sandy and trace amounts of gravel was encountered in all boreholes at depths varying from about 0.8 m (BH1, BH10, BH11, BH12, BH13 and BH15) to about 1.5 m (BH4) and extended to depths varying from about 3.0 m (BH6) to 6.6 m (BH3, BH4, BH5, BH10, BH11, BH12 and BH14) below existing grade. Measured moisture content of the cohesive till soil samples indicated a moist to wet condition.
- **Sandy Silt/Silt and Sand to Silty Sand Till**, with trace to some clay and gravel was encountered in BH6 and BH15 at depths varying from about 3.0 m to about 6.1 m and extended to depths varying from about 6.1 m to 6.6 m (full depth of investigation) below existing grade, indicating a moist to wet condition.
- **Sand and Gravel**, with trace amounts of silt and clay encountered in BH3, BH6 and BH7 at about 6.1 m depth and extended to the full depth of investigation (up to about 6.6 m depth below grade). Silt with trace amounts of sand and clay encountered in BH13 at about 6.1 m depth and extended to the full depth of investigation (up to about 6.6 m depth below grade). Measured moisture content of the cohesionless sand and gravel samples indicating a wet condition.

The detailed stratigraphic conditions are presented on the accompanying borehole logs provided in **Appendix C**. A subsurface profile of Site is provided in **Figure 4**. Geotechnical characterization of the various soil types, including grain size analysis, was conducted and is presented in **Appendix D**. Additional information pertaining to soil stratigraphy is discussed in the geotechnical report by Terraprobe under a separate cover (**File No. 1-21-0516-01**).

5.2 Monitoring Well Installation

Monitoring wells were installed in six (6) selected boreholes (BH2, BH4, BH6, BH7, BH14, BH15). These boreholes were instrumented with a monitoring well for groundwater monitoring and to investigate groundwater quality. The monitoring wells were constructed using 50-mm diameter PVC riser pipes and screens, which were installed in each of the selected geotechnical boreholes in accordance with Ontario Regulation (O. Reg.) 903. Filter sand was placed around the well screen to approximately 0.6 m above the top of the screen. The wells were then backfilled with bentonite to approximately 0.3 m below ground surface. All monitoring wells were surveyed using an R10 Trimble GPS relative to a geodetic datum. The details are provided below:

Well ID	Well Diameter (mm)	Ground Surface Elevation (masl)	Top of Screen		Bottom of Screen		Screened Geological Units
			Depth (mbgs)	Elev. (masl)	Depth (mbgs)	Elev. (masl)	
BH 2	50	265.7	3.7	262.0	6.1	259.6	Clayey Silt Till
BH 4	50	260.8	3.7	257.1	6.1	254.7	Clayey Silt Till
BH 6	50	262.7	3.7	259.0	6.1	256.6	Sandy Silt Till
BH 7	50	266.1	3.7	262.4	6.1	260.0	Clayey Silt Till
BH 14	50	264.5	3.7	260.8	6.1	258.4	Clayey Silt Till

Well ID	Well Diameter	Ground Surface	Top of Screen		Bottom of Screen		Screened Geological Units
BH 15	50	266.4	3.7	262.7	6.1	260.3	Clayey Silt Till

Note: masl: meters above sea level, mbgs: meters below ground surface

Additional details of the monitoring well installation is presented on the enclosed borehole logs provided in **Appendix C**.

5.3 Groundwater Elevations

Observations pertaining to the depth of groundwater were made in the installed monitoring wells on February 21, 2022 before performing well development and March 09, 2022 after performing well development, as indicated below. The groundwater elevations observed are presented below and in **Appendix C**, along with borehole logs.

Monitoring Well	Ground Surface Elevation (masl)	February 21, 2022*		March 09, 2022**	
		Groundwater Depth (mbgs)	Groundwater Elevation (masl)	Groundwater Depth (mbgs)	Groundwater Elevation (masl)
BH 2	265.7	1.7	264.0	1.7	264.0
BH 4	260.8	damaged	damaged	damaged	damaged
BH 6	262.7	0.0	262.7	1.5	261.2
BH 7	266.1	3.2	262.9	3.4	262.7
BH 14	264.5	0.9	263.6	0.9	263.6
BH 15	266.4	1.7	264.7	1.7	264.7

Note: masl: meters above sea level, mbgs: meters below ground surface
*Unstabilized water levels - Before well development; **Stabilized water levels - After well development

Based on the stabilized groundwater level recordings dated March 9, 2022, it is noted that groundwater level in the overburden varies from 264.7 ± masl to 261.2 ± masl. It is noted that regional and local groundwater flow direction is expected to mimics the surface topography appears to be in the east/southeast towards Fletcher's creek. The groundwater flow direction is shown in **Figure 3**. It should be noted that the groundwater levels noted above may fluctuate seasonally depending on the amount of precipitation and surface runoff. Further, long term groundwater monitoring will be required to capture the seasonal groundwater flow fluctuations.

The monitoring wells installed at the Site need to be maintained in accordance with Ontario Water Resources Act, O. Reg. 903/90. When the wells are no longer required for monitoring or sampling purposes, these wells will need to be appropriately decommissioned by a licensed well contractor as outlined in the Regulation.

5.4 Estimation of Hydraulic Conductivity

5.4.1 Estimation from Grain Size Distribution

In order to estimate the hydraulic conductivity (*K*) from the grain size distribution curves an excel based tool/program HydrogeoSieveXL (Devlin, J.F. 2015) is used that calculates the hydraulic conductivity from grain size distribution curves using 15 different methods. HydrogeoSieveXL was found to calculate K values essentially identical to those reported in the literature, using the published grain-size distribution curves. This program is developed by J.F Devlin, Department of Geology, University of Kansas (Developed April 29, 2014, most recent update September, 2016). HydrogeoSieveXL presents the completed data table, a grain size distribution curve, an extensive list of grain size characteristics from which effective grain diameters are calculated, a histogram of grain size distribution presented in terms of conventional grain size classes and 15 estimates of *K* calculated from the formulas. Geometric and arithmetic means of the estimated K values are also calculated. The complete report for each sample is provided in along with the grain size results in **Appendix D**. The results of the estimates are summarized below:

Borehole No./Sample ID	Sampling Depth (mbgs)	Sampling Elevation (masl)	Soil Description (Native)	Estimated Hydraulic Conductivity (m/s) (Geometric Mean)
Borehole 4 Sample 3	1.8	259	CLAYEY SILT, some sand, trace clay	1.3×10^{-8}
Borehole 6 Sample 5	3.3	259.4	SANDY SILT, some clay, trace gravel	4.4×10^{-8}
Borehole 14 Sample 4	4.8	259.7	SANDY SILT, some clay, trace gravel	3.4×10^{-8}
Borehole 15 Sample 7	2.5	262	SILT AND SAND, some clay, some gravel	3.5×10^{-8}

Note: masl: meters above sea level, mbgs: meters below ground surface

Based on grain size distribution analysis, the hydraulic conductivity of the native glacial till deposit is estimated in the order of 10^{-8} m/s indicating a low permeability.

5.4.2 Estimation from In-situ Hydraulic Testing

The hydraulic conductivity was also determined based on single well response tests (Bail Tests) performed on the selected three (3) monitoring wells (BH6, BH14, BH15) The monitoring wells were developed in advance. Well development involves the purging and removal of groundwater from the monitoring wells to remove remnants of clay, silt and other debris introduced into the monitoring well during construction, and to induce the flow of formation groundwater through the well screens, thereby improving the transmissivity of the subsoil strata formation at the well screen depths.

The static water level was measured prior to the test. The Solinst Datalogger was programmed to record the water levels at one (1) second of the interval throughout each test. The data from the tests were

analysed using Bouwer and Rice method (1967) included in the Aquifer Test V.7 software Package. The results of the analysis are presented in **Appendix E**. The hydraulic properties of the strata applicable to the Site are as follows:

Monitoring Well ID	Top of Well Screen Elevation (masl)	Bottom of Well Screen Elevation (masl)	Screened Geological Units	Hydraulic Conductivity (m/s)
BH 6	259.0	256.6	Sandy Silt Till	6.9×10^{-8}
BH 14	260.8	258.4	Clayey Silt Till	1.9×10^{-8}
BH 15	262.7	260.3	Clayey Silt Till	1.7×10^{-7}

Note: masl: meters above sea level, mbgs: meters below ground surface

Based on the in-situ hydraulic testing, the hydraulic conductivity of the native soils is estimated in order ranging majorly from of 10^{-7} m/s to 10^{-8} m/s, indicating moderate to low permeabilities.

5.4.3 Estimation from Literature

According to Freeze and Cherry (1979), the typical hydraulic conductivity of the strata investigated at the site are:

Soil Unit	Estimated Hydraulic Conductivity Range (m/s)
Earth Fill	10^{-6}
Clayey Silt Glacial Till (Native)	10^{-6} - 10^{-12}
Sand and Silt to Sandy Silt Glacial Till (Native)	10^{-5} - 10^{-9}

Based on the analyses, the hydraulic conductivity calculated from the single well response testing and grain size analyses are consistent with the published values associated with the geological material tested.

5.5 Groundwater Quality Assessment

One (1) groundwater sample was collected by Terraprobe and analyzed by a Canadian laboratory accredited and licensed by Standards Council of Canada and or Canadian Association for Laboratory Accreditation. The sample was collected directly from monitoring well BH 15 on February 24, 2022. The monitoring well BH 15 was developed and purged prior to sample collection. The dissolved aluminium and dissolved mercury were filtered in the laboratory.

Upon sampling, all of the bottles were placed in ice and packed in a cooler for shipment to the analytical laboratory. Sample analysis was performed by AGAT Laboratories, a laboratory accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). The groundwater sample was compared to the Water Quality Assessment - PWQO Standards.

In summary, the results indicate the following:

- The groundwater sample **exceeds** the permissible limits for the Water Quality Assessment - PWQO Standards for the following parameters:
    - Total Cobalt (Guideline Limit: 0.0009 mg/L, Result: **0.0022** mg/L)
    - Total Cobalt (Guideline Limit: 0.005 mg/L, Result: **0.013** mg/L)
    - Total Iron (Guideline Limit: 0.3 mg/L, Result: **5.35 mg/L)**
    - Total Zinc (Guideline Limit: 0.03 mg/L, Result: **0.212 mg/L)**

The groundwater quality test results and the certificate of analysis are presented in **Appendix F**.

6.0 IMPACT ASSESSMENT

The impact assessment details that are applicable to the Property are discussed below:

6.1 Water Balance Assessment

An evaluation of water balance was completed in order to estimate the potential impacts that may occur due to proposed development in terms of recharge/discharge characteristics. The water balance is the amount of water entering and leaving a control volume during a given time period. The purpose of water balance analysis is to estimate the pre-development and post-development infiltration and run-off. The maintenance of pre-development 'recharge' is a general requirement in the Oak Ridges Moraine Conservation Plan, Credit Valley Protection Plan and the Provincial Policy Statement that is often captured in municipal Official Plans. The water balance analysis is conducted for the entire site considering it as one catchment and one drainage outlet.

6.1.1 Water Balance Methodology

One of the objectives during development should be to ensure that the overall volume of groundwater recharge is maintained or enhanced. A water balance for the Site was prepared to assess the distribution of rainfall, runoff, and infiltration for pre-development and post-development conditions. Based on the Canadian Climate Normals 1981-2010 Station for Georgetown WWTP station (Climate ID: 6152695), the mean annual **precipitation** is considered as 877 mm/yr. The mean annual **actual evapotranspiration** is considered as 539 mm/yr. using Thornthwaite and Matther approach.

The volume of surplus water i.e. 877 mm/yr. - 539 mm/yr.= 338 mm/yr., that infiltrates into the soil was determined by applying an infiltration factor to the surplus volume based on topography, soil type and land cover as per Table 3.1, MOE SWMPD Manual (2003). Based on the Table 3.1 approach, the infiltration factor is estimated as 0.4, considering the topography as rolling topography (0.2), soil type as impervious clay (0.1) and cover as cultivated lands (0.1). The infiltration factors for the post-development conditions were considered same as the pre-development conditions.

Based on above information, a conceptual model of groundwater flow and water balance was developed. The Thornthwaite method approach was used to calculate the relative balance between rainfall, evaporation, and evapotranspiration in a shallow soil zone. A water balance was conducted for the post-development conditions for the entire Site, using the proposed land use statistics information and property development plan. The post-development water balance accounts for hard-surfaced areas created by building and pavements. The post-development conditions will result in a surplus of water available from run-off. The surplus of water available from roof runoff can be used for infiltration into the shallow groundwater system.

The following assumptions were applied for the pre- and post-development water balance:

- No infiltration will occur beneath the hard surface areas including asphalt/concrete surfaced parking areas and walkways or driveways.
- It is assumed that there will be 10% of evaporation in hard-surface areas/impervious surface and remaining will contribute to run-off.

- Run-off from parking areas will be directed towards storm sewers, and is not included in the infiltration calculations.
- Iinfiltration rates in open areas of the property (landscaped areas) will occur at rates similar to those for pre- development conditions.
- There will be no infiltration beneath hard-surface areas including, building, pavements, and walkways.

6.1.2 Water Balance Analysis:

Based on the Climate data, annual precipitation of 877 mm/yr. is considered and an actual evapotranspiration of 539 mm/yr. There is a water surplus of 338 mm/yr. occurring at the Site that can either infiltrate into the subsurface or go as a run-off. As indicated above, the rate of infiltration was based on per Table 3.1, MOE SWMPD Manual (2003) and is considered as 135 mm/yr. The water balance for pre-development conditions for the entire Site is summarized in the Table below:

Summary of Site Statistics (Pre-development)

Land Use	Area (ha)	Area (m^2)
Building Footprint/Envelope	0	0
Hardscape/Impervious	0	0
Softscape/Pervious (Undeveloped Area)	10.28	102,800
Total	10.28	102,800

Pre- Development Water Balance (Entire Site)

	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Existing	102,800	90,156	55,409	0	13,899	20,848

Development of an area affects the natural water balance of the Site. The most significant difference is the addition of impervious surfaces as type of surface cover. Impervious surfaces prevent the infiltration of water into the soils. Net effect of the construction of impervious surfaces is that most of precipitation that falls onto the impervious surfaces becomes surplus water and direct runoff. The natural permeability of the ground surface changes by reducing the current undeveloped land/ open space and vegetation at the Site and replacing part of these areas with less permeable/ impervious surfaces such as building roofs, roads, and driveways. The development will result in an increased volume of runoff and reduction in infiltration. Pre-development conditions results in approximately 13,899 m^3 of water available for infiltration to the groundwater system as mentioned in the above table. Based on the post-development plan, a summary of proposed land use and water balance calculations for the post-development are provided below:

Summary of Site Statistics (Post-development)

Land Use	Area (ha)	Area (m^2)
Building Footprint/Envelope	1.97	19,661
Hardscape/Impervious (Roads)	6.80	68,000
Softscape/Pervious (Undeveloped Area)	1.51	15,139
Total	10.28	102,800

Post- Development Water Balance without Mitigation (Entire Site)

	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Proposed Development	102,800	90,156	8,160	7,688	2,047	72,261

In the post-development, the water balance calculations show that development has potential to reduce the natural infiltration by 11,852 m^3/yr. and to increase the runoff by 51,413 m^3/yr. Conservation Ontario Guidelines (Conservation Ontario, 2013) suggest a target of 80% of the predevelopment infiltration being maintained in the post-development conditions. Calculations for the Site are indicative of the post-development infiltration being at a level of about 14.7 % of the pre-development infiltration. As such, opportunities to capture run-off and provide secondary infiltration in greenspace areas will be required to increase post development infiltration. This indicates that, proper storm water management and mitigation measures are required to maintain the overall infiltration rates at the property. If low-impact development (LID) techniques are being considered as part of the post-development design, consideration should be given to conducting field percolation tests, at the proposed LID locations.

If roof top runoff water is re-infiltrated through storm water management features, a total of 13,967 m^3/yr. of water could be available for infiltration under post-development conditions (assuming 90% available of the roof run-off captured). The volume of roof run-off available is compared to the difference in infiltration between pre-development and post-development, as noted in the Table below:

Roof runoff Infiltration Deficit and Volume of Available Roof Run-off (Entire Site)

	Potential Post-Development Infiltration Deficit (m^3)	Volume of Roof Run-off Available (m^3)
Proposed Development	11,852	13,967

As noted, the volume of roof runoff exceeds the infiltration deficit. This indicates approximately 85 % of the effective roof runoff captured will be required to compensate the 80% of post-development infiltration deficit. This indicates that, with proper storm water management and mitigation measures, the overall infiltration rates at the property can be maintained.

The water balance calculations are provided in **Appendix G**.

6.2 Surface Water Impact

The nearest surface water features are network of tributaries of Fletcher's Creek located adjacent to the Site. The tributaries flow eastward following local topography towards Fletcher's creek which flows south/southeast towards the Credit River and ultimately drains to Lake Ontario. Due to the presence of low permeability soils the baseflow contribution towards the tributaries will be limited.

Furthermore, it is recommended that due to exceedances of PWQO standards, groundwater should not be discharged into natural water body. Any groundwater that will be taken from the site will be discharged (if required) into the City's sewer systems and not into any natural water body.

6.3 Groundwater Quality Impact

The area of the proposed development is not located in the Highly Vulnerable Aquifer (HVA). HVAs are those areas where an aquifer may be more prone to contamination. These areas have been identified where there is little or no protection from an overlying aquitard (a protective layer of low permeability materials). Furthermore, due to the presence of low permeability soils, the downward percolation and infiltration of recharge is expected to be relatively low.

Depending on the land use, runoff from urban developments may contain a variety of dilute contaminants such as suspended solids, chloride from road salt, oil and grease, metals, pesticide residues, bacteria and viruses. For groundwater, generally with the exception of the dissolved constituents such as nitrogen and salt, most contaminants are attenuated by filtration during groundwater flow through the soils. Under proposed development, the quality of water directed to pervious areas for infiltration is not expected to contain any contaminant of concerns.

6.4 Impact to Local Resources

The area is situated in a developed portion of Caledon. The Town of Caledon is serviced with piped municipal water. There might be future use of the groundwater resources in the area for water supply purposes. Since proactive construction dewatering is not anticipated to be required, potential impacts to water supply wells in the vicinity of the Site area are not anticipated. However, it is recommended that a door to door well inventory should be completed to confirm the locations and installation depths of water supply wells in the immediate vicinity of the Site. A request should also be submitted to the Municipality to confirm properties that are on a piped municipal water supply. Following completion of the door to door well inventory, a monitoring and contingency plan would be recommended for wells susceptible to interference during construction.

6.5 Anthropogenic Transport Pathways

No significant anthropogenic transport pathways were identified during investigations conducted on the Property. Six (6) monitoring wells were installed during site investigation conducted by Terraprobe with approximate depths of 6.0 mbgs to gather information regarding the groundwater quality and elevation at the Property. These are all installed in the shallow groundwater, and are therefore not considered to be a risk to the

groundwater resource; however, the wells will be abandoned when no longer in use for monitoring. All monitoring wells will be abandoned prior to the earth works of the proposed development at the Property.

The existence of groundwater transmission pathways is based on the interpretation made solely from the soil type encountered during the subsurface investigation. If any ground water transmission pathways are present on the property, all precautions must be taken to ensure that there is no disruption to the groundwater flow and hydrogeologic functions.

7.0 MITIGATING MEASURES

7.1 Maintenance of Groundwater Recharge

The existing groundwater recharge rates at the Site are approximated as 135 mm/yr. These recharge rates are based on the property specific conditions. This recharge occurs in a broad diffuse manner over the entire Site. Based on the site investigation results, the site is underlain by low permeable till deposits with permeabilities ranging as indicated in Section 5.4. Furthermore, due to the presence of low permeability soils, the downward percolation and infiltration of recharge is expected to be relatively low and the Site is not considered to be an area of significant groundwater recharge. However, the management of groundwater recharge at the Site following development is recommended where it is feasible and should be designed using a Best Management Practice approach.

The groundwater recharge at the Site can be maintained through the use of appropriate low-impact development (LID) techniques. Appropriate storm water control measures would be required to prevent erosion due to increased run off, for slow and delayed release to promote infiltration and prevent flooding. The implementation of these measures at the Site will assist in maintaining the shallow groundwater recharge and replicate the existing surface drainage. Runoff from the proposed development will conform to the stormwater management report for the Site.

As per CVC-TRCA (2010), the recommended vertical separation between the base of the given infiltration augmentation option and the high groundwater table is at least one meter; however, distances of less than one meter of separation in soils having higher infiltration potential may still be effective. Based on the stabilized groundwater level recordings dated March 9, 2022, it is noted that groundwater level in the overburden varies from 264.7 ± masl to 261.2 ± masl (0.9 to 3.4 mbgs). Final design of the LID measures should be reviewed in conjunction with the storm water management plan for the Site.

Furthermore, as indicated earlier, the water balance calculations show that development has the potential to reduce the natural infiltration by 11,852 m^3/yr. Conservation Ontario Guidelines (Conservation Ontario, 2013) suggest a target of 80% of the predevelopment infiltration being maintained in the post-development conditions. Final design of the infiltration measures provided in the FSR report should address these infiltration targets estimated in water balance calculations.

7.2 Maintenance of Groundwater Transmission Pathways

The future development will also be connected to municipal servicing through underground utility lines. The future development may disrupt the shallow groundwater flow, and its continuity should be maintained where practical. Generally, the groundwater transmission pathways can be maintained through the following means:

- Bedding material beneath underground services may serve as a subdrain to collect and convey groundwater. To prevent drainage of groundwater along bedding material, clay trench plugs should be provided at all manhole locations in order to cut-off the granular beddings.

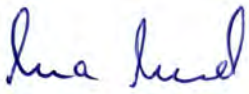
- The excavation of building foundation and any underground services or utilities across the site must be backfilled using material of similar permeabilities to minimize disruption to the groundwater regime.

8.0 CLOSURE

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

Terraprobe Inc.



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LIMITATIONS

This report was prepared by **Terraprobe Inc**., for the use of **12100 Creditview Developments Limited c/o Glen Schnarr & Associates Inc**, and is intended to provide an assessment of the hydrogeological condition the property located at **12100 Creditview Road, in the Town of Caledon**. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Terraprobe accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, including consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

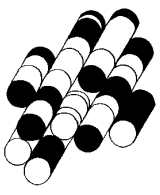
The assessment should not be considered a comprehensive audit that eliminates all risks. The information presented in this report is based on information collected during the completion of the subsurface investigation conducted by Terraprobe Inc. It is based on conditions at the property at the time of the site inspection. The subsurface conditions were assessed based on information collected at specific borehole and monitoring well locations. The actual subsurface conditions between the sampling points may vary.

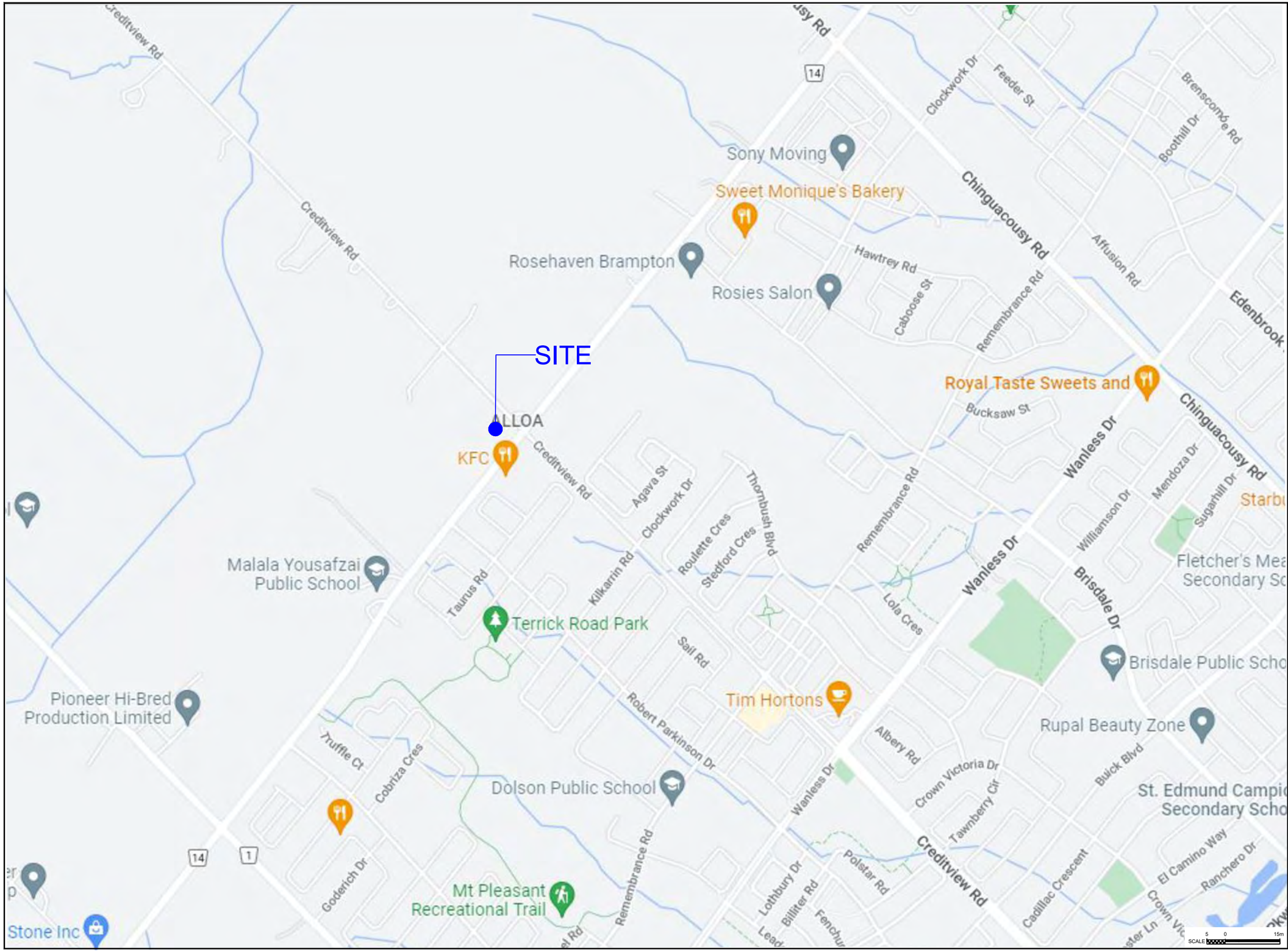
There is no warranty expressed or implied by this report regarding the condition of the property. Professional judgment was exercised in gathering and analyzing information collected by our staff, as well as that submitted by others. The conclusions presented are the product of professional care and competence, and cannot be construed as an absolute guarantee.

In the event that during future work new information regarding the condition of the property is encountered, or the proposed development is changed from that which was provided to Terraprobe with respect to the property, Terraprobe should be notified in order that we may re-evaluate the findings of this assessment and provide amendments, as required.

FIGURES

TERRAPROBE INC.





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Reference:
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Notes:

Legend:

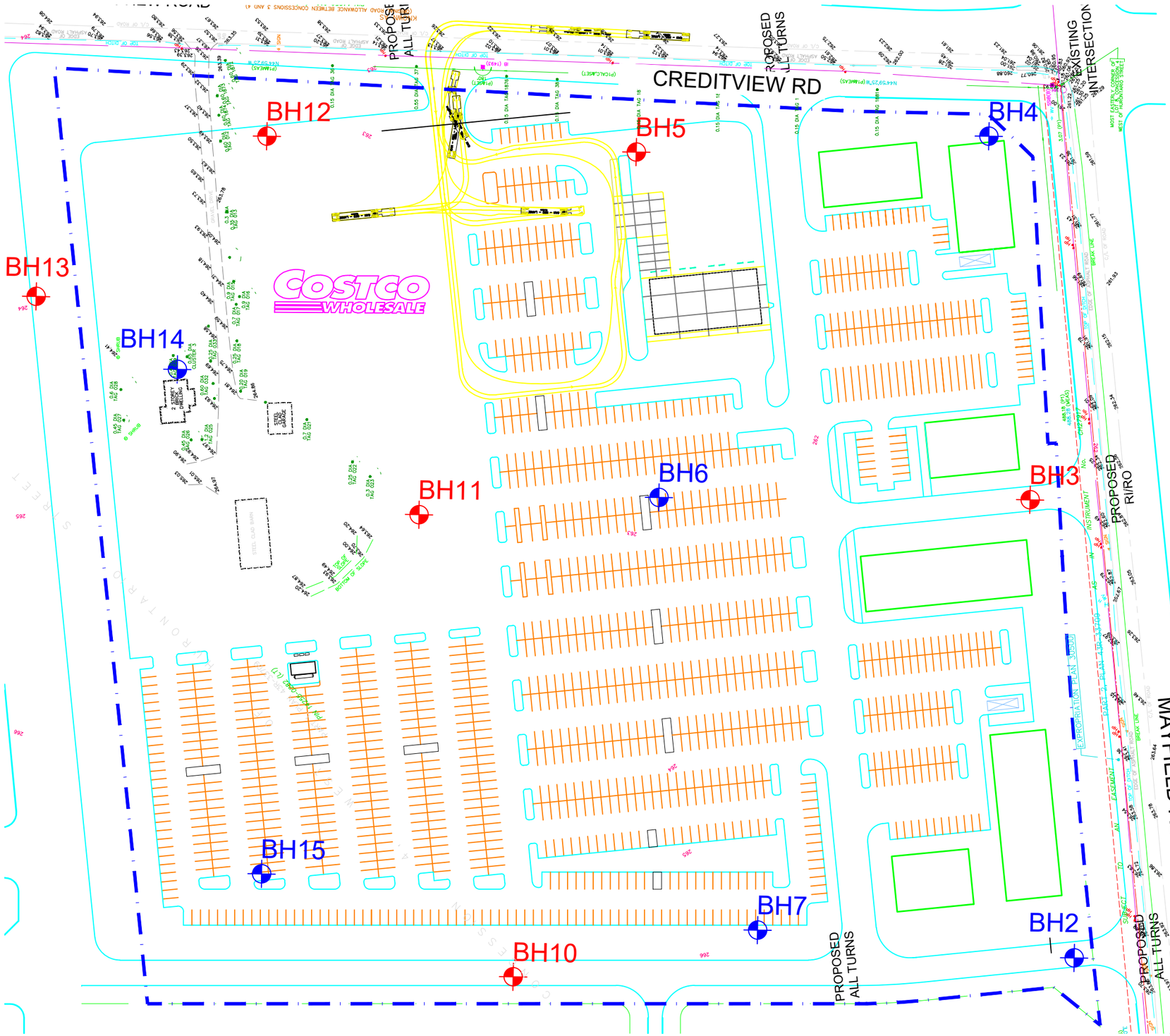
Project Title:
Hydrogeological Assessment

Site Location:
12100 Creditview Road, Caledon

Figure Title:
Sitel Location Plan

Designed By:	***File No.:*** 1-21-0516-46
Drawn By: HK	***Scale:*** As Shown
Reviewed By: MS	***Figure No.:*** 1
Date: April 2022	

Y:\Shared\CA\Terraprobe\Brampton\1-Project Files\2021\1-21-0516 - 12100 Creditview Road, Caledon\46-Hydrogeological Study\A. Dwgs, Logs\AutoCAD\1-21-0516-46 FIGURE 1.dwg,
4/22/2022 9:30:08 AM, DWG To PDF.pc3



Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:
Site Plan, SP-1 Dated February 3, 2022
Made by: Gsai (Glen Schnarr & Associates Inc)

Notes:

Legend:

- Approximate Borehole Location
- Approximate Monitoring Well Location

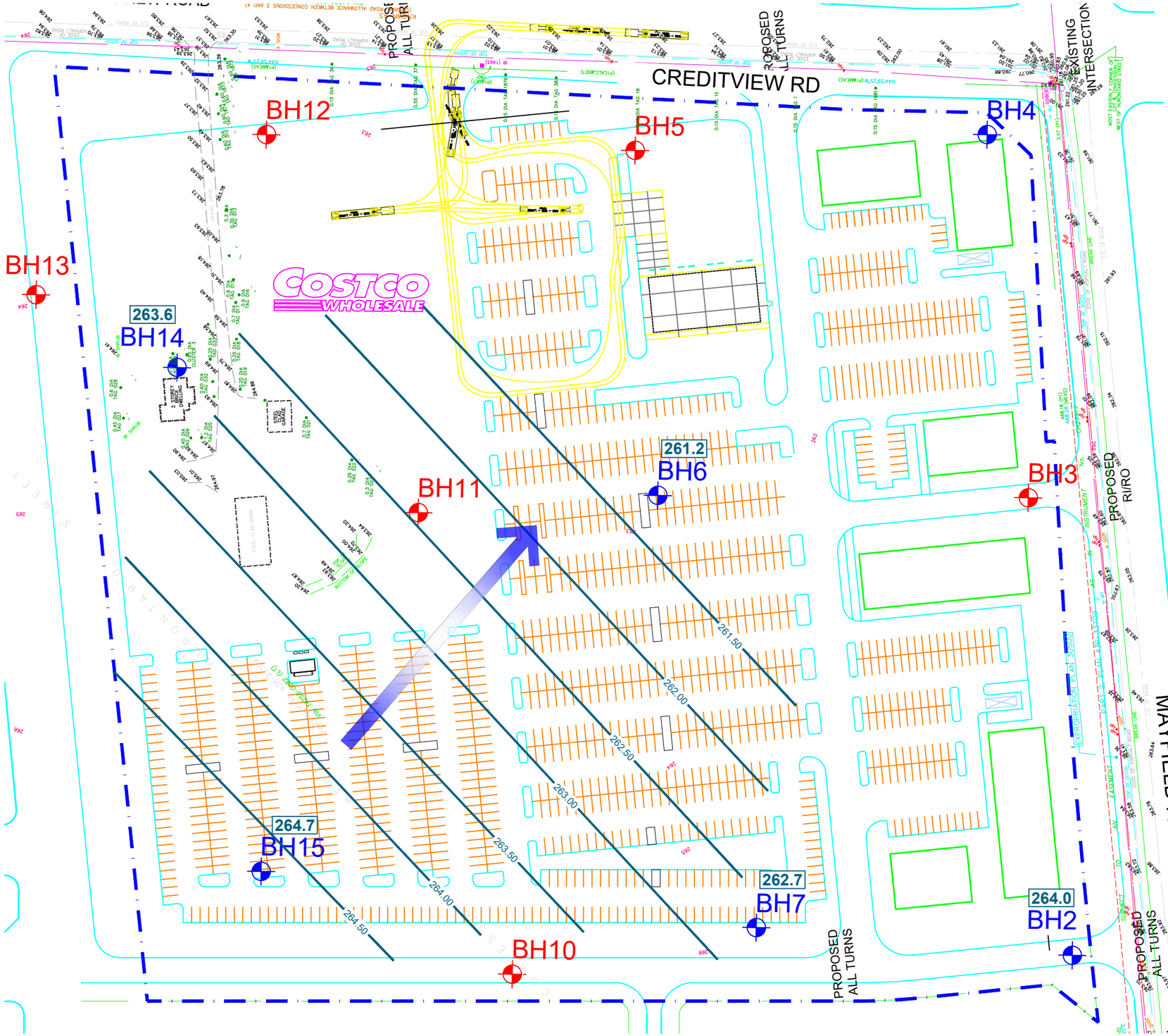
Project Title:
Hydrogeological Assessment

Site Location:
12100 Creditview Road, Caledon

Figure Title:
Borehole and Monitoring Well Location Plan

Designed By: MM	***File No.:*** 1-21-0516-46
Drawn By: HK	***Scale:*** As Shown
Reviewed By: MS	***Figure No.:*** 2
Date: April 2022	

Y:\Shared\CA\Terraprobe\Brampton\1-Project Files\2021\1-21-0516 - 12100 Creditview Road, Caledon\46-Hydrogeological Study\A. Dwgs, Logs\AutoCAD\1-21-0516 (commercial) BLP FIGURE 2 & 3.dwg,
4/26/2022 12:51:08 PM, DWG To PDF.pc3



Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:
Site Plan, SP-1 Dated February 3, 2022
Made by: Gsai (Glen Schnarr & Associates Inc)

Notes:

Legend:

- Phase Two Property Boundary
- Approximate Borehole Location
- Approximate Monitoring Well Location
- 264.00 Ground Water Elevations; March 09, 2022
- Ground Water Contours
- Ground Water Flow Direction

Project Title:
Hydrogeological Assessment

Site Location:
12100 Creditview Road, Caledon

Figure Title:
Groundwater Elevation and Contour Plan

Designed By: MM	***File No.:*** 1-21-0516-46
Drawn By: HK	***Scale:*** As Shown
Reviewed By: MS	***Figure No.:*** 3
Date: April 2022	

Y:\Shared\CA\Terraprobe\Brampton\1-Project Files\2021\1-21-0516 - 12100 Creditview Road, Caledon\46-Hydrogeological Study\A. Dwgs. Logs\AutoCAD\1-21-0516 (commercial) BLP FIGURE 2 & 3.dwg,
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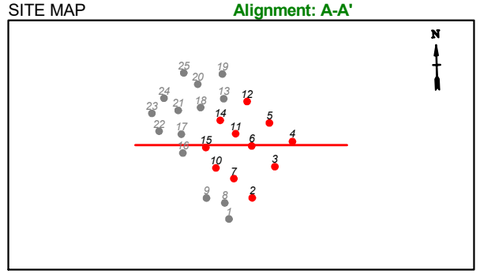
Alignment: A-A'
From E:591388, N:4839697,
to E:592287, N:4839669

Elevation (m)

BH 15 — 50 mm dia. monitoring well
BH 10
BH 14 — 50 mm dia. monitoring well
BH 7 — 50 mm dia. monitoring well
BH 11
BH 12
BH 6 — 50 mm dia. monitoring well
BH 2 — 50 mm dia. monitoring well
BH 5
BH 3
BH 4 — 50 mm dia. monitoring well

SITE MAP

Alignment: A-A'



LITHOLOGY GRAPHIC LEGEND

- Topsoil
- Fill
- Clayey Silt Till
- Sand and Gravel
- Clayey Silt
- Sandy Silt Till
- Silt and Sand Till

Boreholes Equally Spaced

INTERPRETIVE LEGEND

- WL on completion of drilling
- Stabilized WL, most recent

- *FILL*
- *GRAVELS (gravel to gravelly sand)*
- *SILT TO SAND (not till)*
- *COHESIONLESS TILLS*
- *COHESIVE SOILS (clayey silt to clay, incl. tills)*
- *DISTURBED/REWORKED SOILS*

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title: **SUBSURFACE PROFILE A-A'**

File No.: **1-21-0516-46**

Figure No.: **4**

Report: !SECTION - TABLOID - ELEV

590500 591000 591500 592000 592500 593000

4840500 4840000 4839500 4839000

Creditview Rd
Mayfield Rd
Brisdale Dr
Fruitvale Cir
Tractor Ln
Block R
Creditview Rd
Mayfield Rd
Taurus Rd
Robert Parkinson Dr
Truro Cir
Kilkarrin Rd
Thornbush Blvd
Clockwork
Sall Rd
Frampton Rd
Robert Parkinson Dr
Quillberry C
Mississauga Rd
Truffle Ct

Alloa

1 2 3 4 7 10 27 42 49 43 48 44 47 50 46 45 14 24 22 31 33 28 29 30 32 26 51 52 9 21 23 20 25 39 5 8 17 13 12 11 18 16 19 6 37 34 36 35 40 38 41

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0 40 80 160 240 320 m

tss/1-Project Files/2018/1-18-0298-1300 Lakeshore Road East, Mississauga/46.1/ A. Drawings, Logs//GIS

Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing

N W E S

References:
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Key Map



Notes:

Legend:

- Approximate Site Boundary
- 500 m Study Area

Final_Status

- Unknown
- Abandoned-Other
- Abandoned-Quality
- Abandoned-Supply
- Monitoring and Test Hole
- Observation Wells
- Water Supply
- <all other values>

Project Title:
Hydrogeological Assessment

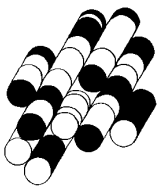
Site Location:
12100 Creditview Road, Caledon

Figure Title:
MECP Well Records Map

Designed By: MM	*File No.:* 1-21-0516-46
Drawn By: HK	*Scale:* As Shown
Reviewed By:	*Figure No.:* 5
Date: April 22, 2022	

APPENDIX A

TERRAPROBE INC.



Regulation Screening- Credit Valley Conservation



4/13/2022, 8:34:21 PM

Credit River Watershed Boundary

Parcels around Regulated Area

Generic Regulation Mapping

1:18,056

0 0.1 0.2 0.4 mi

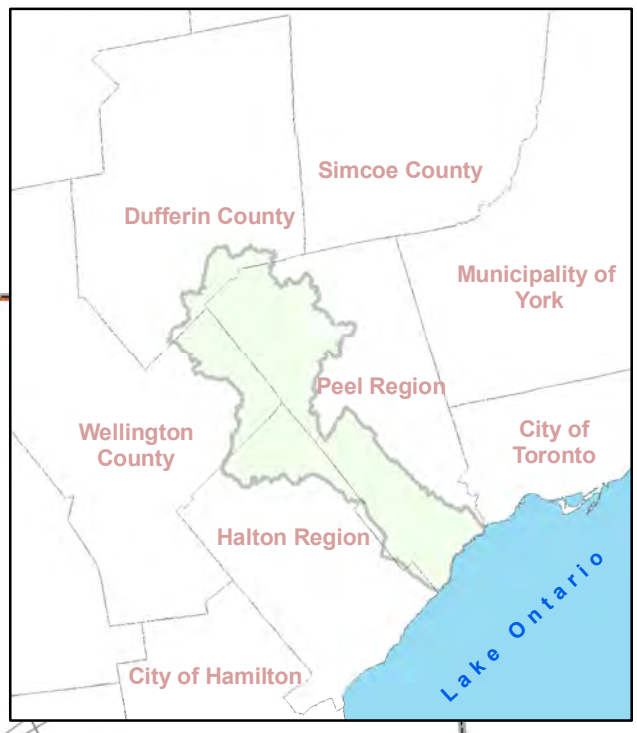
0 0.17 0.35 0.7 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Credit Valley Conservation

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The Credit Valley Conservation Watershed



Sub #	Subwatershed Name
1	Loyalist Creek
2	Carolyn Creek
3	Saw mill Creek
4	Mullett Creek
5	Fletcher's Creek
6	Levi Creek
7	Huttonville Creek
8a	Springbrook Tributary
8b	Churchville Tributary
9	Norval to Port Credit
10	Black Creek
11	Silver Creek
12	Credit River - Cheltenham to Glen Williams
13	East Credit River
14	Credit River - Glen Williams to Norval
15	West Credit River
16	Caledon Creek
17	Shaw 's Creek
18	Credit River - Melville to Forks of the Credit
19	Orangeville
20	Credit River - Forks of the Credit to Churchville
21	Lake Ontario Shoreline West Tributaries
22	Lake Ontario Shoreline East Tributaries

WHO WE ARE

The Credit River watershed is comprised of 1,000 square kilometers of land, drained by the Credit River and its 1,500 kilometers of tributaries. It is located in one of the most rapidly urbanizing parts of Canada, within the Greater Toronto area. The river's headwaters are located above the Niagara Escarpment. This area is the source of four rivers: the Credit, Humber, Etobicoke and Nottawasaga. A small part of the Oak Ridges Moraine, as well as a number of other moraines are located within the watershed's boundary.

WHAT IS A WATERSHED?

A watershed is an area of land that drains into a river or a lake. The boundary of a watershed is based on the elevation of a landscape. A drop of water that lands anywhere inside this boundary will eventually end up at the Credit River, before emptying into Lake Ontario. This determination of oundaries is based on the natural shape of the land and therefore the watershed falls across many municipal boundaries. Credit Valley Conservation helps to manage the natural resources found in the Credit River watershed.

WHAT IS A SUBWATERSHED?

A smaller basin within a larger drainage area where all of runoff or base flow drains to a central point of the larger watershed is called subwatershed. Fletcher Creek drains runoff and baseflow from surrounding areas and brings into the central point of the watershed or the Credit River.

0 1 2 4 6 8 Km

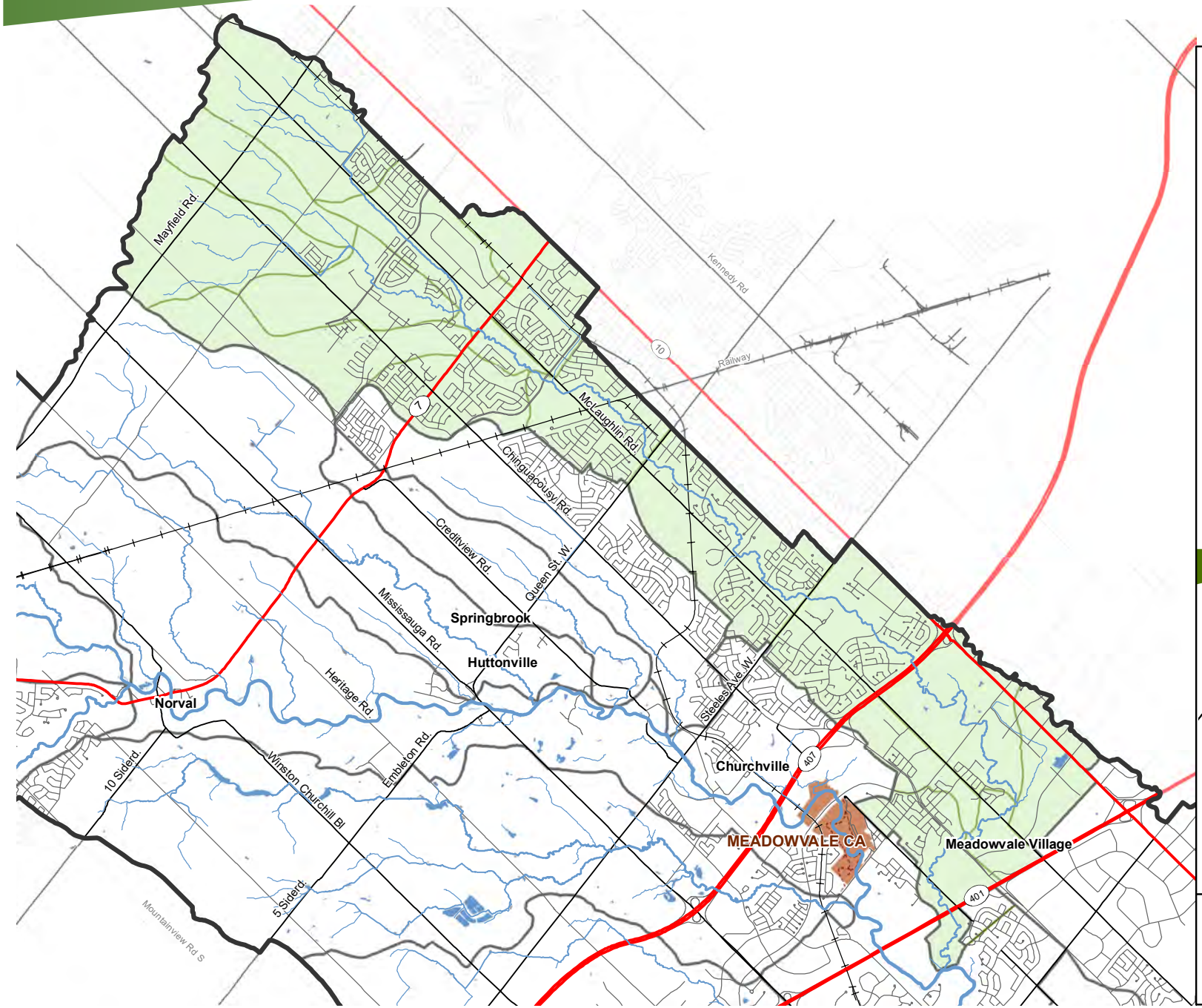
CVC Boundary
Subwatersheds
Lakes and Ponds
Rivers and Streams

Major Transportation Network
Highway
Major road
Railroad

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5 - Fletcher's Creek Subwatershed



CVC Conservation Areas
Trail Network
Rivers and Streams
Lakes and Ponds
CVC Watershed Boundary
Subwatershed Boundary
Subcatchment Boundary

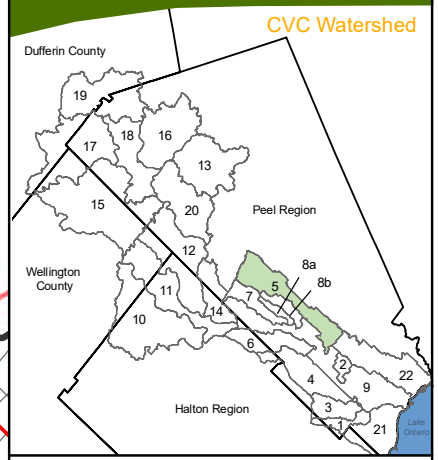
Transportation Network

Highway
Railroad
Major Road
Street

N

0 1 2 4
km

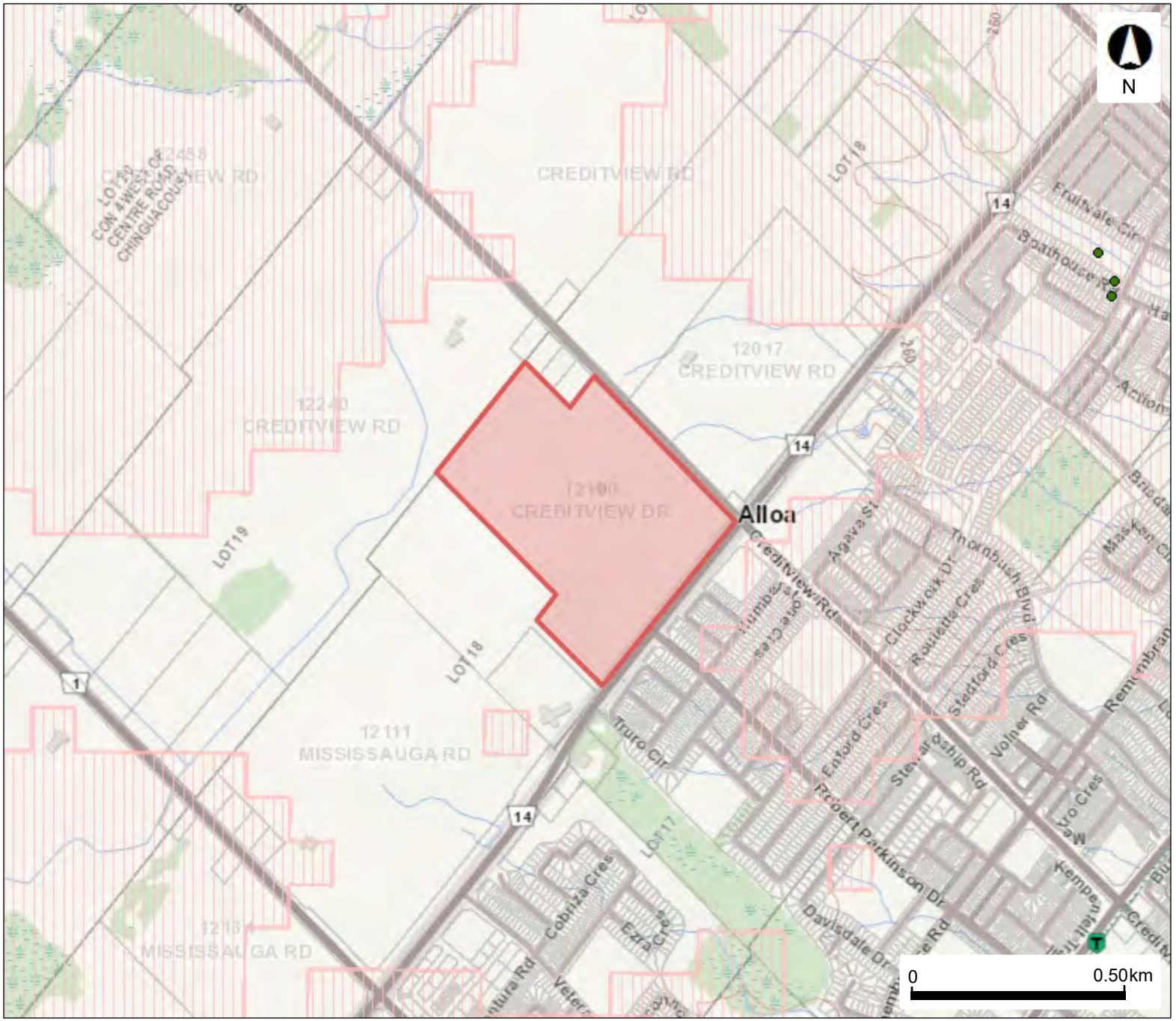
CVC Watershed



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Source Protection Map



Legend

- Watercourse Direction
- Source Protection Areas
- Permits To Take Water: Active
- Intake Protection Zone Q
- Wellhead Protection Area Q1
- Wellhead Protection Area Q2
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Area
  - 0
  - 2
  - 4
  - 6
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Intake Protection Zone 2
- Intake Protection Zone 3
- Assessment Parcel with Addre

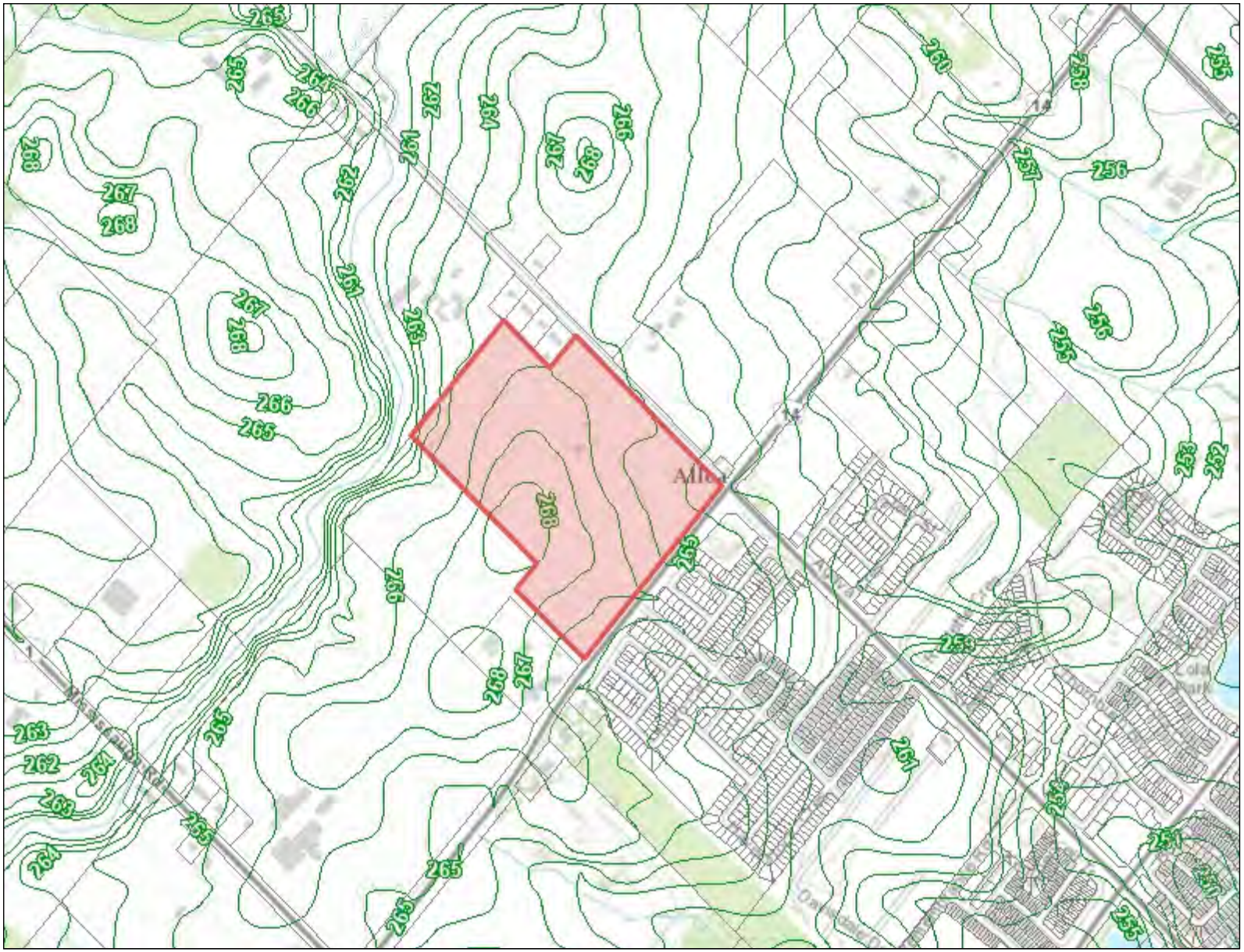
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Ontario

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Map Created: 4/13/2022
Map Center: 43.70472 N, -79.86131 W

Topography (masl)



Legend

- ORMGP Boundary
- ORM Plan Boundary
- Niagara Escarpment Plan Boundary
- Address Points - City of Peterborough
- Address Points - York
- Address Points - City of Barrie
- Address Points - Peel
- Address Points - Durham
- Address Points - Hastings County
- Address Points - City of Toronto
- Assessment Parcel Partners
- DEM Contour (1m)
- Contour (1m)
- Contour (2m)
- Contour (5m)
- Contour (10m)
- Contour (25m)
- Contour (50m)

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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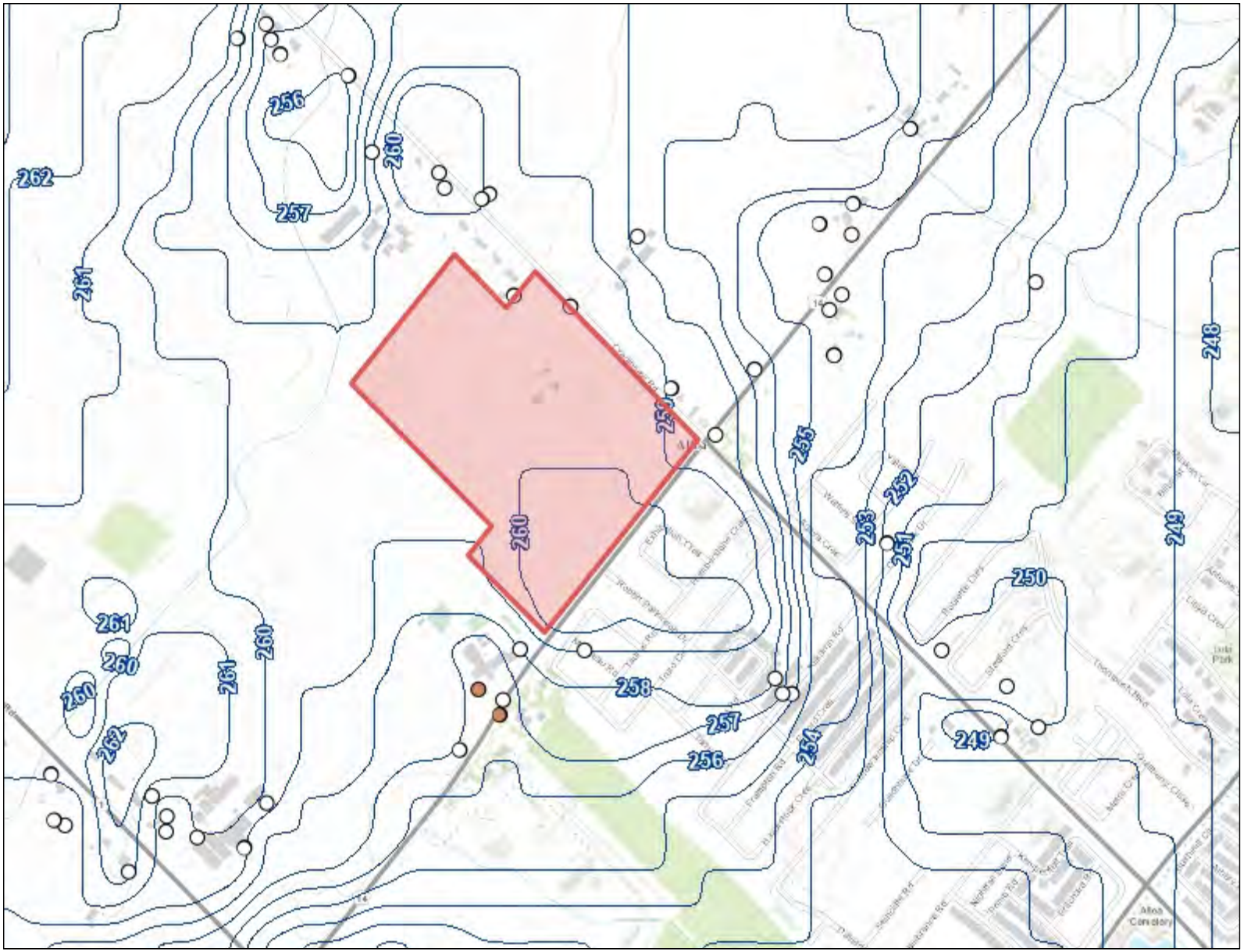
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PROJECTION: WGS_1984_Web_Mercator_Auxiliary_Sphere

DATE PRINTED: April 13, 2022

Water Table (masl)



Legend

- Shallow Wells (<20 m deep)
- Deep Wells (>40 m deep)
- Water Bodies
- Streams (Strahler > Class 3)
- Water Table Contour (1m)
- Contour (1m)
- Contour (2m)
- Contour (5m)
- Contour (10m)
- Contour (25m)
- Contour (50m)

York Region

0.8 0 0.41 0.8 Km

1: 16,187

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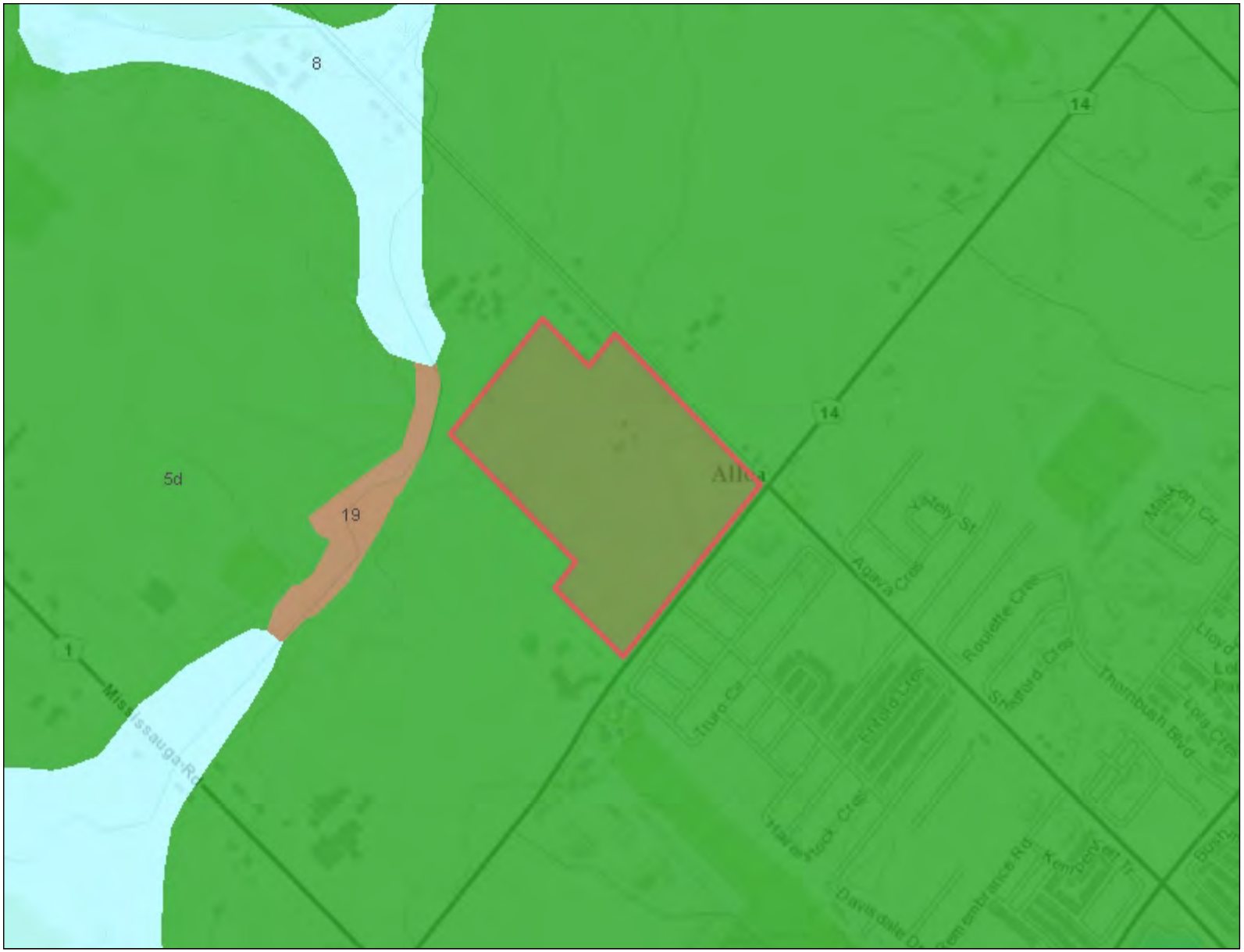
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DATE PRINTED: April 13, 2022

Surficial Geology



Legend

Surficial Geology (OGS MNDM)

- 1: Precambrian bedrock
- 2: Precambrian bedrock-drift complex
- 3: Paleozoic bedrock
- 4: Paleozoic bedrock-drift complex
- 5a: Shield-derived silty to sandy till
- 5b: Stone-poor, carbonate-derived silty to sa
- 5c: Stony, carbonate-derived silty to sandy t
- 5d: Glaciolacustrine-derived silty to clayey ti
- 5e: Undifferentiated older till and stratified s
- 6: Ice-contact stratified deposits
- 7: Glaciofluvial deposits
- 8: Fine-textured glaciolacustrine deposits
- 9: Coarse-textured glaciolacustrine deposits
- 12: Older alluvial deposits
- 13: Fine-textured lacustrine deposits
- 14: Coarse-textured lacustrine deposits
- 17: Eolian deposits
- 19: Modern alluvial deposits
- 20: Organic deposits
- 21: Man-made deposits

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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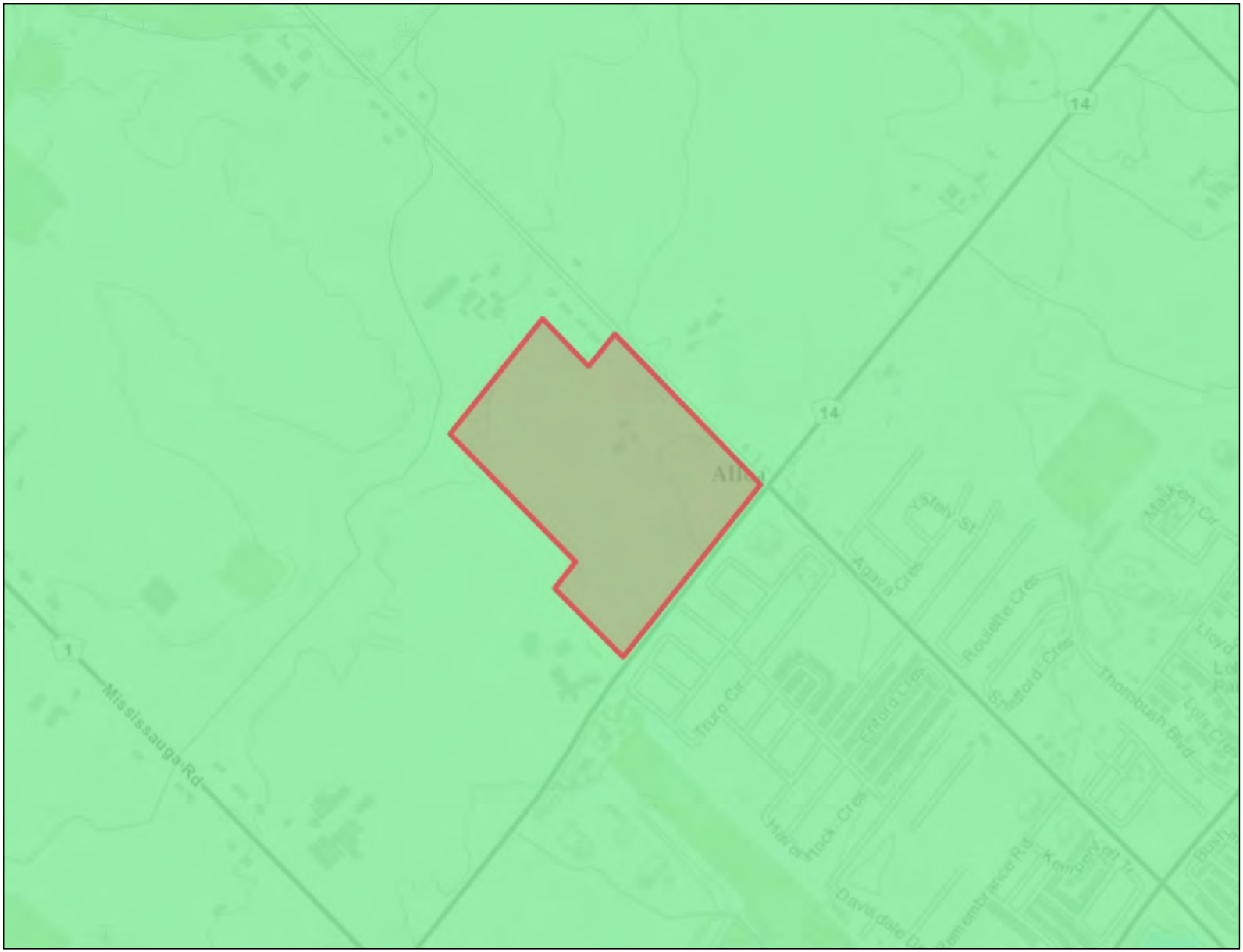
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DATE PRINTED: April 13, 2022

Physiographic Regions (OGS)



Legend

Physiographic Regions (OGS)

- Algonquin Highlands
- Beaver Valley
- Carden Plain
- Dummer Moraines
- Dundalk Till Plain
- Flamborough Plain
- Georgian Bay Fringe
- Guelph Drumlin Field
- Hillsburgh Sandhills
- Horseshoe Moraines
- Iroquois Plain
- Napanee Plain
- Niagara Escarpment
- Number 11 Strip
- Oak Ridges Moraine
- Peel Plain
- Peterborough Drumlin Field
- Prince Edward Peninsula
- Schomberg Clay Plains
- Simcoe Lowlands
- Simcoe Uplands
- South Slope
- Haldimand Clay Plain
- Norfolk Sand Plain

0.9 0 0.46 0.9 Km

1: 18,056

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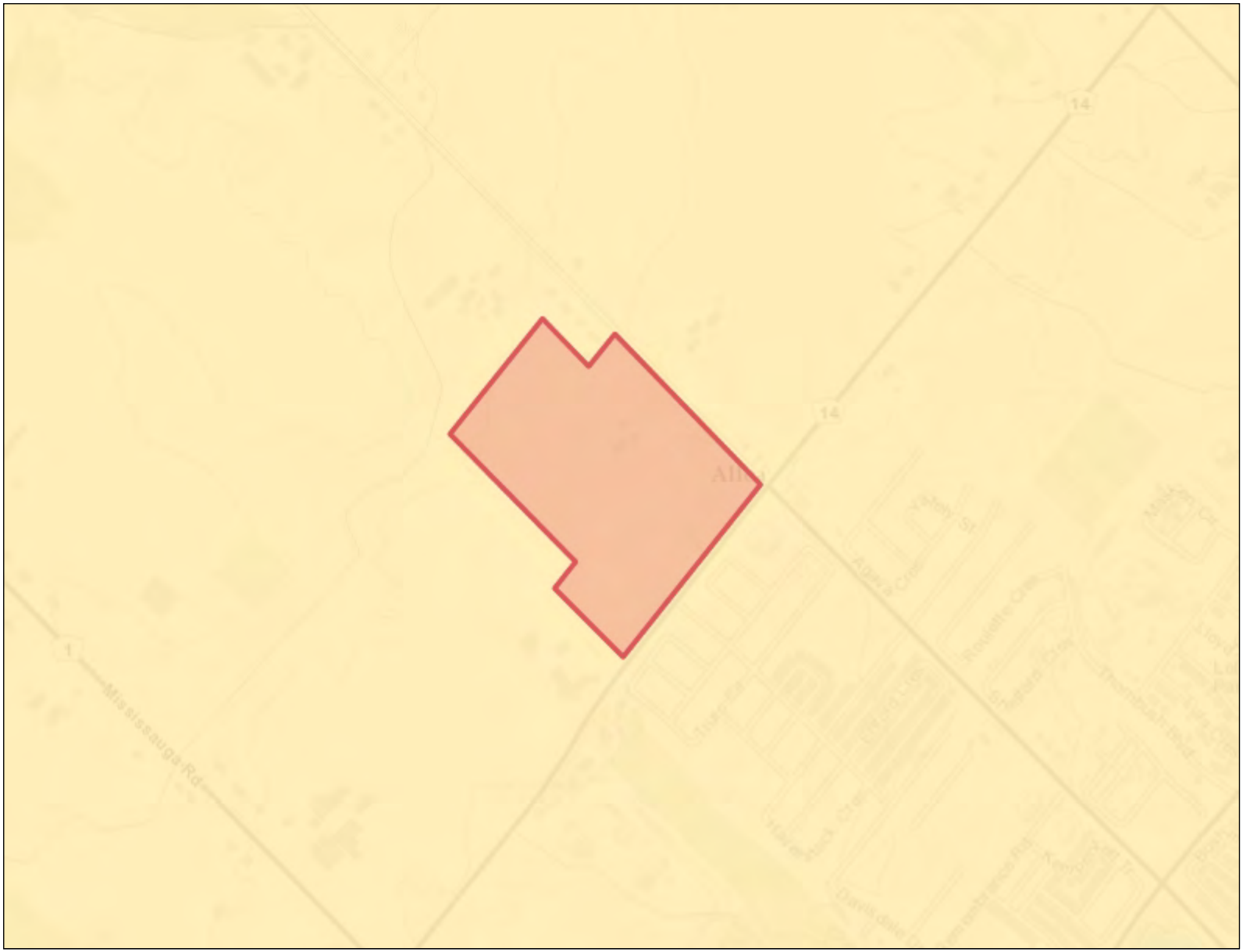
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Physiographic Landform



Legend

Physiography (OGS)

- Bare Rock Ridges And Shallow Till
- Beaches
- Bevelled Till Plains
- Clay Plains
- Drumlins
- Escarpments
- Eskers
- Kame Moraines
- Limestone Plains
- Peat And Muck
- Sand Plains
- Shale Plains
- Shallow Till And Rock Ridges
- Spillways
- Till Moraines
- Till Plains (Drumlinized)
- Till Plains (Undrumlinized)

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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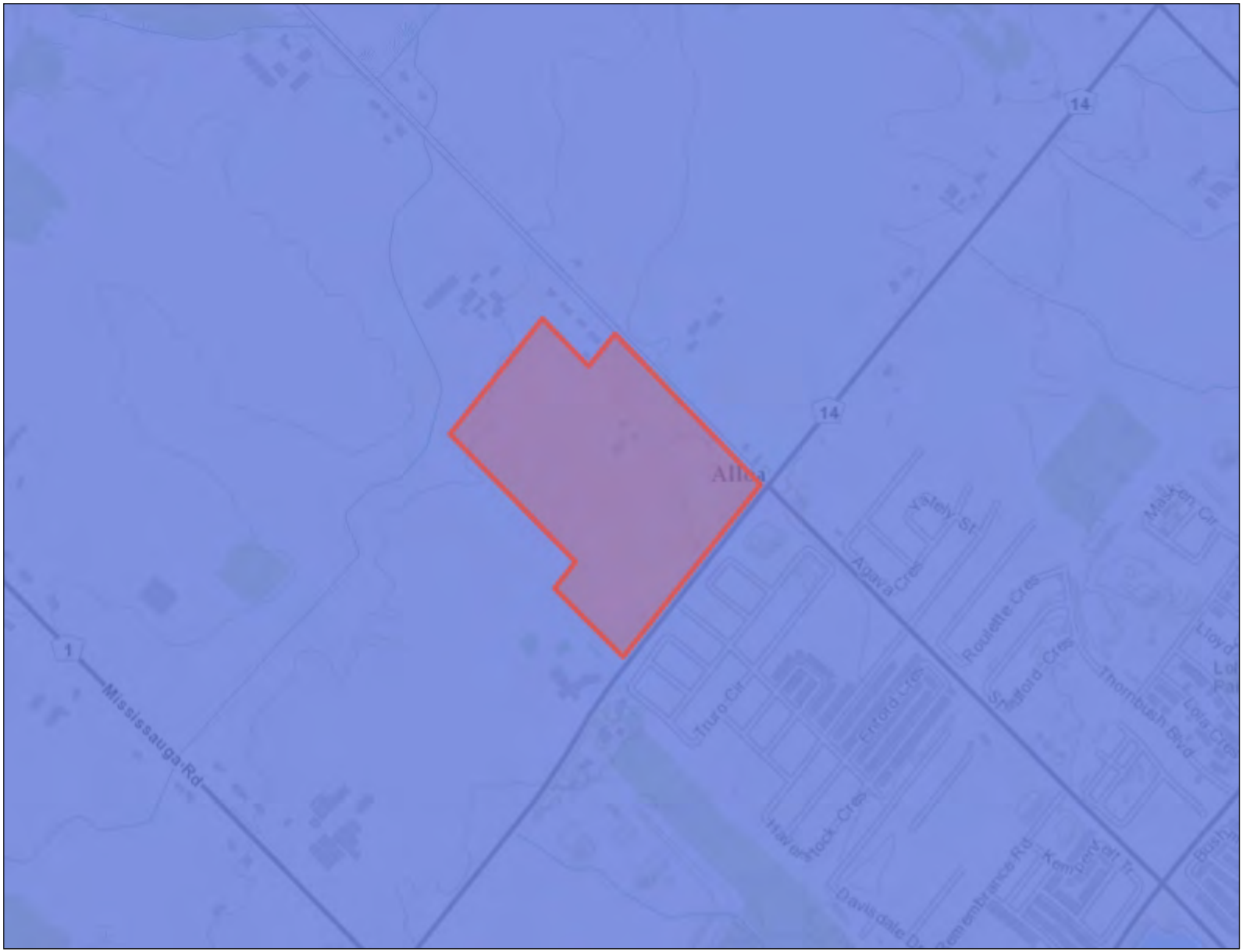
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Bedrock Geology



Legend

Bedrock Geology (OGS)

- 1: Precambrian
- 7: Shadow Lake
- 8: Gull River
- 9: Bobcaygeon
- 10: Verulam
- 11: Lindsay
- 12: Blue Mountain
- 14: Georgian Bay
- 16: Queenston
- 17: Clinton-Cataract Group
- 18: Lockport
- 19: Amabel
- 20: Guelph

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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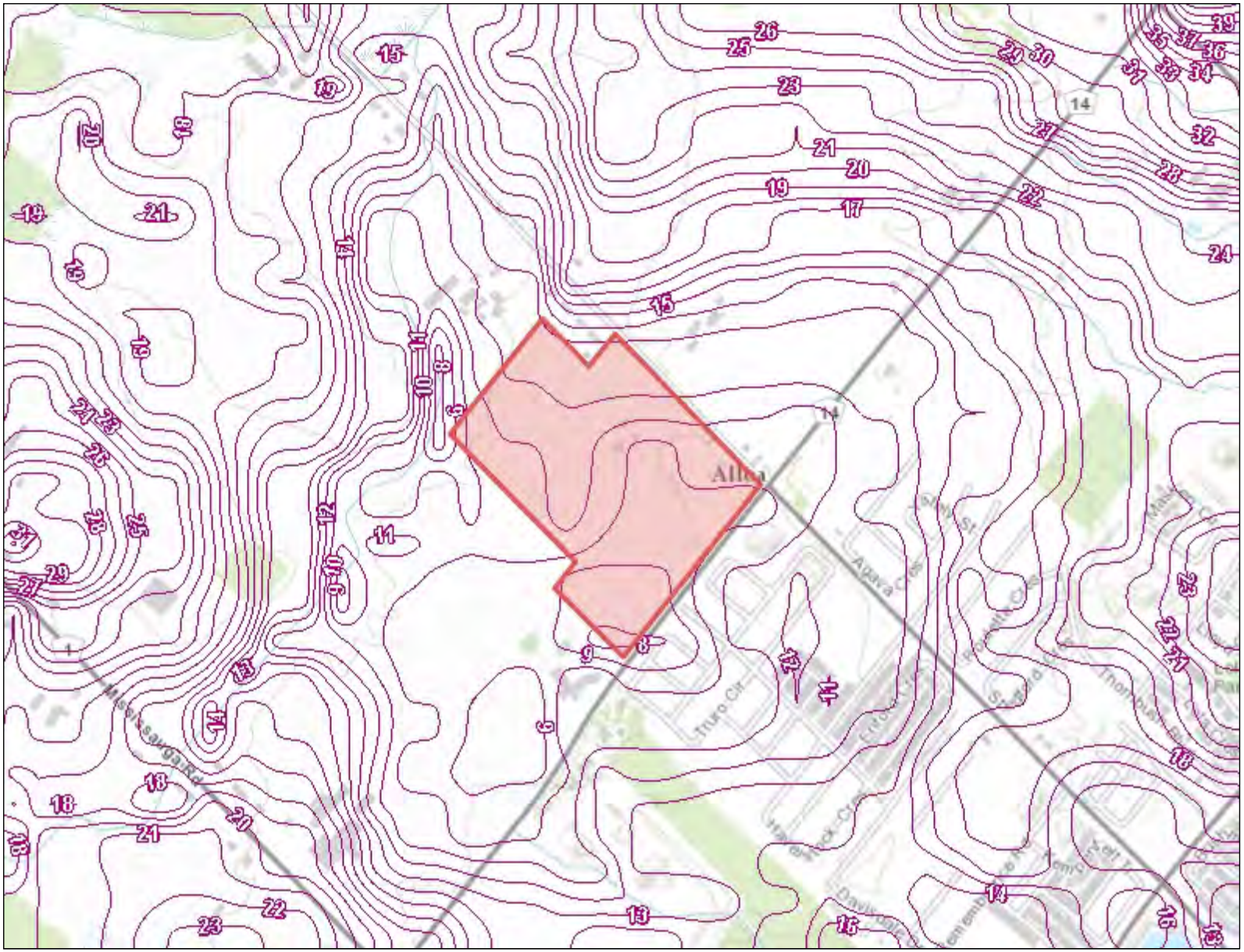
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PROJECTION: WGS_1984_Web_Mercator_Auxiliary_Sphere

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Depth to Bedrock (m)



Legend

Quaternary Sediment Thickness Contour (1

- Contour (1m)
- Contour (2m)
- Contour (5m)
- Contour (10m)
- Contour (25m)
- Contour (50m)

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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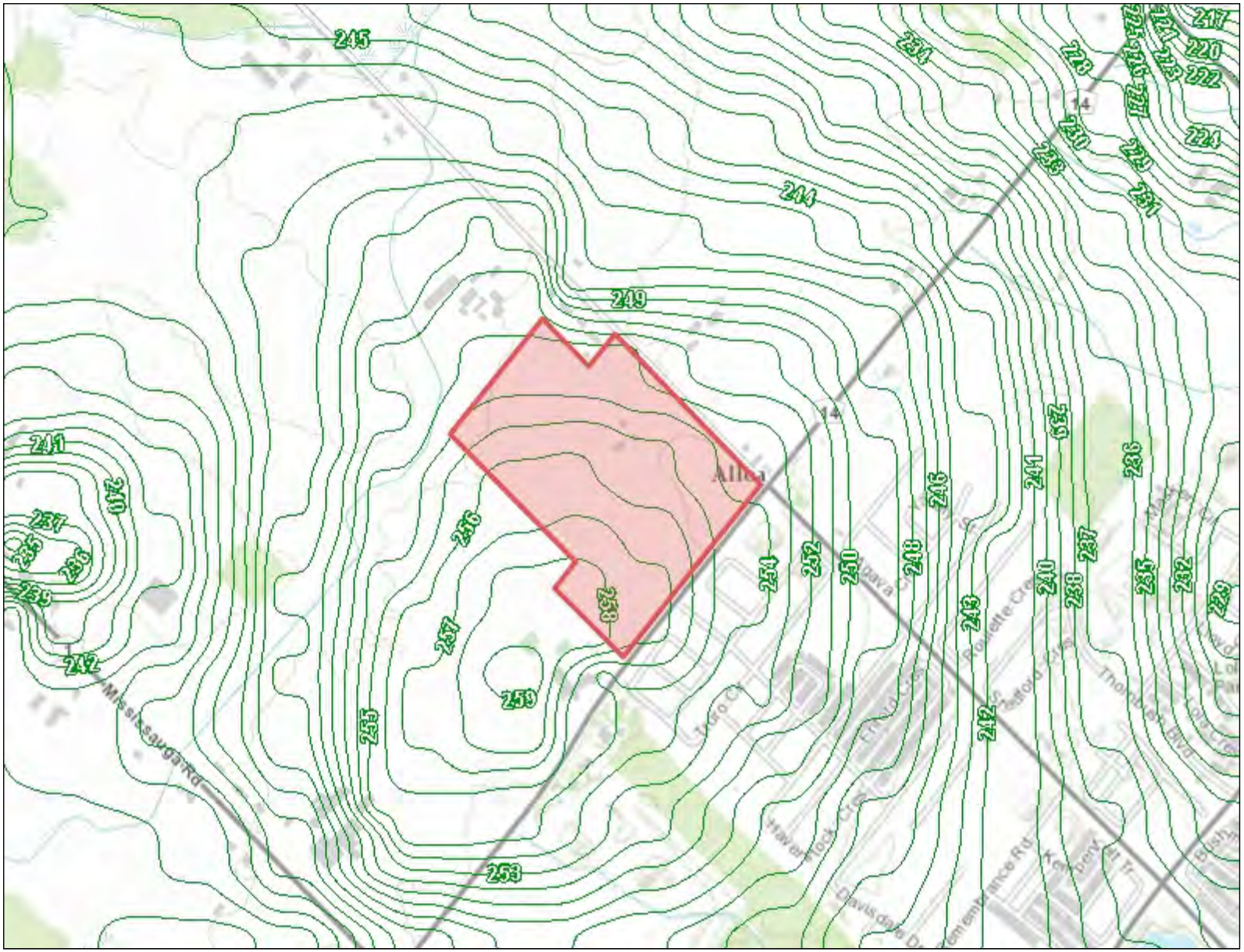
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Bedrock Topography (masl)



Legend

Bedrock Topography Contour (1m)

- Contour (1m)
- Contour (2m)
- Contour (5m)
- Contour (10m)
- Contour (25m)
- Contour (50m)

York Region

0.9 0 0.46 0.9 Km

1: 18,056

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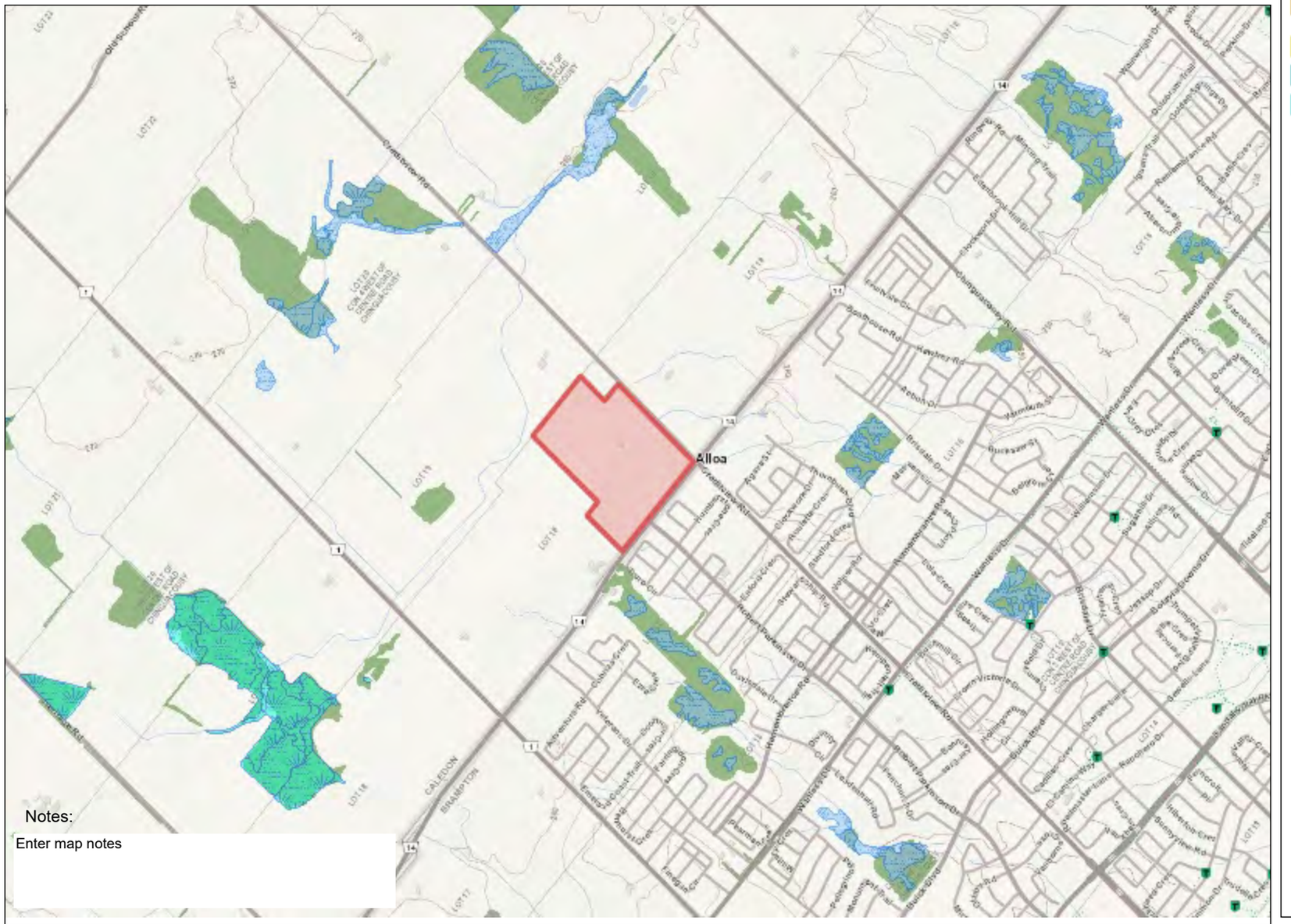
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Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Natural Heritage

Map created:4/13/2022



Legend

- Assessment Parcel
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
- Provincially Significant/considérée d'importance provinciale
- Non-Provincially Significant/non considérée d'importance provinciale
- Unevaluated Wetland
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System

Notes:

Enter map notes

1.3 0 0.64 1.3 Kilometres

Absence of a feature in the map does not mean they do not exist in this area.



This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

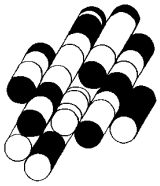
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APPENDIX B

TERRAPROBE INC.



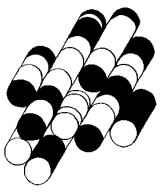
MECP Well Records Summary										
WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Water Found (mbgs)**	Static Water Level (mbgs)**	Top of Screen Depth (mbgs)**	Bottom of Screen Depth (mbgs)**	Date Completed
				Final Status	First Use					
1	4901926	Boring	9.0	Water Supply	Domestic	7.3	4.6			5/21/1960
2	4901927	Boring	16.8	Water Supply	Livestock	16.8	9.2			8/4/1962
3	4908347	Boring		Water Supply	Domestic	7.3	0.6	6.1	9.2	10/15/1997
4	4905071	Boring	13.7	Water Supply	Domestic	13.7	6.1			3/8/1977
5	4905047	Rotary (Reverse)	5.5	Water Supply	Public					9/17/1976
6	4901921	Boring	12.5	Water Supply	Domestic	10.1	7.0			1/15/1962
7	4906850	Boring	18.9	Water Supply	Domestic	15.3	3.1			1/10/1988
8	4901924	Boring	11.0	Abandoned-Supply						12/13/1960
9	7314273		2.4	Abandoned-Other						6/8/2018
10	7163004	Boring		Water Supply	Domestic		5.5			4/30/2011
11	4901922	Cable Tool	27.4	Water Supply	Domestic	24.4	10.7			3/2/1962
12	4907770	Rotary (Convent.)	43.0	Water Supply	Domestic	42.7	11.6			8/12/1993
13	4906720	Boring	14.9	Water Supply	Domestic	13.7	11.0			9/18/1986
14	4905252	Boring	14.5	Water Supply	Domestic	13.7	4.6			8/15/1977
15	7253232		7.9	Abandoned-Other		3.6				10/9/2015
16	7253233		12.8	Abandoned-Other		13.4				10/15/2015
17	4908107	Cable Tool	29.3	Water Supply	Domestic	21.4	5.5			7/27/1995
18	7253231		11.3	Abandoned-Other		2.7				10/15/2015
19	7253234		13.1	Abandoned-Other		2.7				10/9/2015
20	4901923	Boring	13.4	Water Supply	Domestic	13.4	7.3			4/21/1962
21	4909579	Other Method	7.5	Observation Wells				6.0	7.5	4/23/2004
22	4909094	Cable Tool	25.9	Abandoned-Quality	Livestock					11/21/2002
23	7215502		7.5							12/10/2013
24	4906748	Boring	13.4	Water Supply	Domestic	9.2	3.7			10/20/1987
25	4905120	Boring	8.5	Water Supply	Domestic	8.5	3.7			5/23/1977
26	7224624		6.1					6.1	3.1	2/1/2014
27	4901830	Boring	11.0	Water Supply	Domestic	11.0	4.9			12/22/1959
28	4901831	Boring	9.8	Water Supply	Domestic	9.8	4.3			8/24/1960
29	4906719	Boring	9.8	Water Supply	Domestic	9.5	3.4			5/14/1986
30	7051682		6.4	Abandoned-Other						10/22/2007
31	4901829	Cable Tool	18.9	Water Supply	Domestic	16.8	4.9			5/9/1964
32	7192520		6.6							11/17/2012
33	7051723		18.3	Abandoned-Other	Not Used					5/23/2007
34	7190563		2.4	Abandoned-Other	Not Used					10/18/2012
35	7190562		3.7				0.0			9/20/2012
36	7120768	Boring	9.1	Abandoned-Other	Not Used					12/5/2008
37	7190560	Boring	3.4	Abandoned-Other	Not Used					10/18/2012
38	4907410	Boring	17.4	Water Supply	Domestic	15.3	6.1			8/28/1989
39	7157652	Other Method	6.1	Monitoring and Test Hole	Monitoring and Test Hole			3.1	6.1	1/5/2011
40	7190554		5.2	Abandoned-Other	Not Used		1.5			8/31/2012
41	7190559		6.7	Abandoned-Other	Not Used					9/20/2012
42	4906872	Boring	12.8	Water Supply	Domestic	11.9	4.3			7/27/1987
43	4901826	Boring	13.4	Water Supply	Domestic	13.4	6.1			5/4/1963
44	7288317		13.7	Abandoned-Other	Not Used		6.1			3/17/2017
45	7288316		14.6	Abandoned-Other	Not Used		0.0			3/17/2017
46	7241071	Rotary (Convent.)	6.1	Monitoring and Test Hole	Monitoring and Test Hole			3.1	6.1	1/19/2015
47	7303104	Rotary (Convent.)	20.0		Monitoring			10.0	20.0	11/9/2017
48	7042431	Digging	12.2	Abandoned-Other	Not Used		4.3			3/1/2007
49	4901828	Boring	12.8	Water Supply	Domestic	12.8	6.1			4/4/1964
50	7230083									7/15/2014
51	4901827	Boring	11.6	Water Supply	Domestic	6.7	6.4			6/21/1963
52	7247830									8/12/2015

MECP*: Ministry of the Environment, Conservation and Parks

mbgs**: meters below ground surface

APPENDIX C

TERRAPROBE INC.



LOG OF BOREHOLE 2

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 3, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591878, N: 4839457 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Sample Number	Sample Type	SPT 'N' Value
0	265.7	**GROUND SURFACE**				
		100mm **TOPSOIL**				
		FILL, clayey silt, trace to some sand, trace gravel, trace organics, stiff, brown, moist		1	SS	15
	264.9					
1	0.8	**CLAYEY SILT**, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		2	SS	20
				3	SS	21
2				4	SS	23
3				5	SS	40
4		...brownish grey below		6	SS	18
5						
6		...sand lens, wet		7	SS	37
	259.1					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 265, 264, 263, 262, 261, 260

Penetration Test Values (Blows / 0.3m): Dynamic Cone (10, 20, 30, 40)

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40, 80, 120, 160)

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) (10, 20, 30)

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	1.7	264.0
Mar 9, 2022	1.7	264.0

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 3

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 3, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591978, N: 4839587 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	261.1	**GROUND SURFACE**				
0	260.8	250mm **TOPSOIL**				
	0.3	**FILL**, clayey silt, trace to some sand, trace gravel, trace organics, firm to stiff, brown, moist		1	SS	7
1	260.0			2	SS	13
	1.1	**CLAYEY SILT**, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		3	SS	17
2				4	SS	26
3		...silty sand lense, wet		5	SS	39
4		...brownish grey		6	SS	29
5						
6	255.0					
	6.1	**SAND AND GRAVEL**, trace silt, trace clay, dense, brown, wet		7	SS	31
	254.5					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 261, 260, 259, 258, 257, 256, 255

Penetration Test Values (Blows / 0.3m)
× Dynamic Cone
10 20 30 40
Undrained Shear Strength (kPa)
○ Unconfined + Field Vane
● Pocket Penetrometer ■ Lab Vane
40 80 120 160

Moisture / Plasticity
Plastic Limit | Natural Water Content | Liquid Limit
PL MC LL
10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)
GR SA SI CL

Unstabilized water level measured at 2.4 m below ground surface; borehole was open upon completion of drilling.

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 4

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 3, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 592056, N: 4839691 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Graphic Log	Sample Number	Sample Type	SPT 'N' Value
0	260.8	**GROUND SURFACE**				
	260.5	250mm **TOPSOIL**				
	0.3	**FILL**, clayey silt, trace to some sand, trace gravel, trace organics, stiff, brown, moist		1	SS	15
1		...organic inclusions		2	SS	9
	259.3					
	1.5	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)		3	SS	9
2				4	SS	27
3				5	SS	36
4						
		...sandy silt lens, wet		6	SS	11
5						
6		...grey		7	SS	27
	254.2					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 260, 259, 258, 257, 256, 255

Penetration Test Values (Blows / 0.3m): Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit; PL MC LL; 10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)

GR SA SI CL

2 19 53 26

Unstabilized water level measured at 4.9 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	damaged	n/a

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 5

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 2, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591961, N: 4839773 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	262.8	**GROUND SURFACE**				
0	262.6	200mm **TOPSOIL**				
	0.2	**FILL**, clayey silt, trace to some sand, trace gravel, trace organics, firm to stiff, brown, moist		1	SS	5
	261.9					
1	0.9	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to very stiff, brown, moist (GLACIAL TILL)		2	SS	11
				3	SS	18
2				4	SS	25
3				5	SS	21
4		...brown, grey		6	SS	15
5						
6		...sand lens inclusions, wet		7	SS	26
	256.2					
	6.6	**END OF BOREHOLE**				

Borehole was dry and open upon completion of drilling.

Elevation Scale (m): 262, 261, 260, 259, 258, 257

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane 40 80 120 160

Moisture / Plasticity: Plastic Limit (PL) 10, Natural Water Content (MC) 20, Liquid Limit (LL) 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 6

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 2, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591882, N: 4839678 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Graphic Log	Sample Number	Sample Type	SPT 'N' Value
0	262.7	**GROUND SURFACE**				
	262.5	200mm **TOPSOIL**				
	0.2	Trace organics (WEATHERED/DISTURBED)		1	SS	13
	261.8					
1	0.9	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to very stiff, brown, moist (GLACIAL TILL)		2	SS	12
				3	SS	21
2				4	SS	23
3	259.7					
	3.0	**SANDY SILT**, trace to some clay, trace to some gravel, compact, brown, moist (GLACIAL TILL)		5	SS	24
4						
		...brownish grey, wet		6	SS	26
5						
6	256.6					
	6.1	**SAND AND GRAVEL**, trace silt, trace clay, dense, brown, wet		7	SS	36
	256.1					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 262, 261, 260, 259, 258, 257

Penetration Test Values (Blows / 0.3m): Dynamic Cone (10, 20, 30, 40)

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40, 80, 120, 160)

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) (10, 20, 30)

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)

GR SA SI CL

7 23 58 12

Unstabilized water level measured at 0.5 m below ground surface; borehole caved to 5.8 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	0.0	262.7
Mar 9, 2022	1.5	261.2

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 7

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 2, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591802, N: 4839541 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	266.1	**GROUND SURFACE**				
0	265.9	200mm **TOPSOIL**				
	0.2	Trace organics (WEATHERED/DISTURBED)		1	SS	13
	265.2					
1	0.9	**CLAYEY SILT**, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		2	SS	23
				3	SS	19
2						
				4	SS	24
3						
				5	SS	29
4		...brownish grey				
				6	SS	33
5						
6	260.0					
	6.1	**SAND AND GRAVEL**, trace silt, trace clay, very dense, brown, wet		7	SS	85
	259.5					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 266, 265, 264, 263, 262, 261, 260

Penetration Test Values (Blows / 0.3m): Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL); 10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Unstabilized water level measured at 5.2 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	3.2	262.9
Mar 9, 2022	3.4	262.7

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 10

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591727, N: 4839589 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	266.2	**GROUND SURFACE**				
0	265.9 / 0.3	250mm **TOPSOIL**, .				
		Trace organics (WEATHERED/DISTURBED)		1	SS	12
	265.4 / 0.8	**CLAYEY SILT**, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		2	SS	21
1				3	SS	31
2				4	SS	25
3				5	SS	34
4		...brownish grey		6	SS	19
5						
6		...reddish brown, stone pieces inclusion		7	SS	32
	259.6 / 6.6	**END OF BOREHOLE**				

Elevation Scale (m): 266, 265, 264, 263, 262, 261, 260

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane — 40 80 120 160

Moisture / Plasticity: Plastic Limit (PL) — Natural Water Content (MC) — Liquid Limit (LL); 10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 11

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591816, N: 4839732 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	263.1	**GROUND SURFACE**				
0	262.7	350mm **TOPSOIL**, .		1	SS	16
	0.4	Trace organics (WEATHERED/DISTURBED)				
	262.3					
	0.8	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)		2	SS	12
1				3	SS	18
2				4	SS	30
3				5	SS	29
4		...brownish grey below		6	SS	22
5						
6				7	SS	36
	256.5					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 263, 262, 261, 260, 259, 258, 257

Penetration Test Values (Blows / 0.3m)
Dynamic Cone: 10 20 30 40
Undrained Shear Strength (kPa)
Unconfined, Pocket Penetrometer, Field Vane, Lab Vane: 40 80 120 160

Moisture / Plasticity
Plastic Limit, Natural Water Content, Liquid Limit
PL MC LL: 10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)
GR SA SI CL

Unstabilized water level measured at 5.8 m below ground surface; borehole was open upon completion of drilling.

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 12

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591869, N: 4839868 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa)	Moisture / Plasticity	Headspace Vapour (ppm)	Instrument Details	Lab Data and Comments
0	262.9 **GROUND SURFACE**											
	262.6 0.3	300mm **TOPSOIL**										
	262.1 0.8	**FILL**, clayey silt, trace to some sand, trace gravel, trace organics, stiff, brown, moist		1	SS	14				PID: 0 FID: 0		
1		**CLAYEY SILT**, some sand to sandy, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		2	SS	16	262			PID: 0 FID: 0		
2				3	SS	20	261			PID: 0 FID: 0		
				4	SS	42				PID: 0 FID: 0		
3				5	SS	37	260			PID: 0 FID: 0		
4							259					
				6	SS	15	258			PID: 0 FID: 0		
5												
6				7	SS	48	257			PID: 0 FID: 0		
	256.3 6.6	**END OF BOREHOLE**										

Penetration Test Values (Blows / 0.3m): Dynamic Cone — 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane — 40 80 120 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit — PL MC LL — 10 20 30

Unstabilized Water Level

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 13

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591770, N: 4839882 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
	263.9	**GROUND SURFACE**				
0	263.7	200mm **TOPSOIL**				
	0.2	Trace organics (WEATHERED/DISTURBED)		1	SS	19
	263.1					
	0.8	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)		2	SS	23
1						
				3	SS	18
2						
				4	SS	36
3						
				5	SS	32
4						
		...brownish grey below		6	SS	21
5						
6	257.8					
	6.1	**SILT**, trace sand, trace clay, dilatant, stiff, brownish grey, wet		7	SS	10
	257.3					
	6.6	**END OF BOREHOLE**				

Elevation Scale (m): 263, 262, 261, 260, 259, 258

Penetration Test Values (Blows / 0.3m): Dynamic Cone — 10, 20, 30, 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane — 40, 80, 120, 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit — PL, MC, LL — 10, 20, 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) — GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 14

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591752, N: 4839791 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa)	Moisture / Plasticity (PL MC LL)	Headspace Vapour (ppm)	Instrument Details	Lab Data and Comments
0	264.5	**GROUND SURFACE**					264					
	264.3 / 0.2	200mm **TOPSOIL**										
		FILL, clayey silt, trace to some sand, trace gravel, trace organics, trace brick pieces inclusion, stiff, brown / dark brown, moist		1	SS	36						
1	263.4 / 1.1	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)		2	SS	8	263					
				3	SS	14						
2		...sandy silt, some clay, trace gravel		4	SS	18	262					3 27 55 15
3				5	SS	22	261					
4		...brownish grey below		6	SS	16	260					
5							259					
6	257.9 / 6.6			7	SS	14	258					

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	0.9	263.6
Mar 9, 2022	0.9	263.6

file: 1-21-0516-01 bh logs.gpj

LOG OF BOREHOLE 15

Terraprobe

Project No. : 1-21-0516-01	Client : 12100 Creditview Developments Limited	Originated by : MT
Date started : February 1, 2022	Project : 12100 Creditview Road	Compiled by : AS
Sheet No. : 1 of 1	Location : Caledon, Ontario	Checked by : MMT

Position : E: 591687, N: 4839677 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Elev Depth (m)	Description	Number	Type	SPT 'N' Value
266.4	**GROUND SURFACE**			
266.2 / 0.2	150mm **TOPSOIL**			
	Trace organics (WEATHERED/DISTURBED)	1	SS	30
265.6 / 0.8	**CLAYEY SILT**, some sand to sandy, trace gravel, stiff to hard, brown, moist (GLACIAL TILL)	2	SS	19
		3	SS	20
		4	SS	28
	...coarse sand lens, wet	5	SS	30
		6	SS	21
260.3 / 6.1	**SILT AND SAND to SILTY SAND**, trace to some gravel, trace to some clay, compact, brown, wet (GLACIAL TILL)	7	SS	29
259.8 / 6.6	**END OF BOREHOLE**			

Unstabilized water level measured at 3.7 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

Penetration Test Values (Blows / 0.3m): Dynamic Cone (10, 20, 30, 40)

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40, 80, 120, 160)

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) (10, 20, 30)

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL — 11 37 39 13

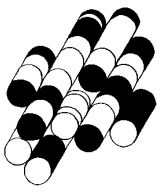
WATER LEVEL READINGS

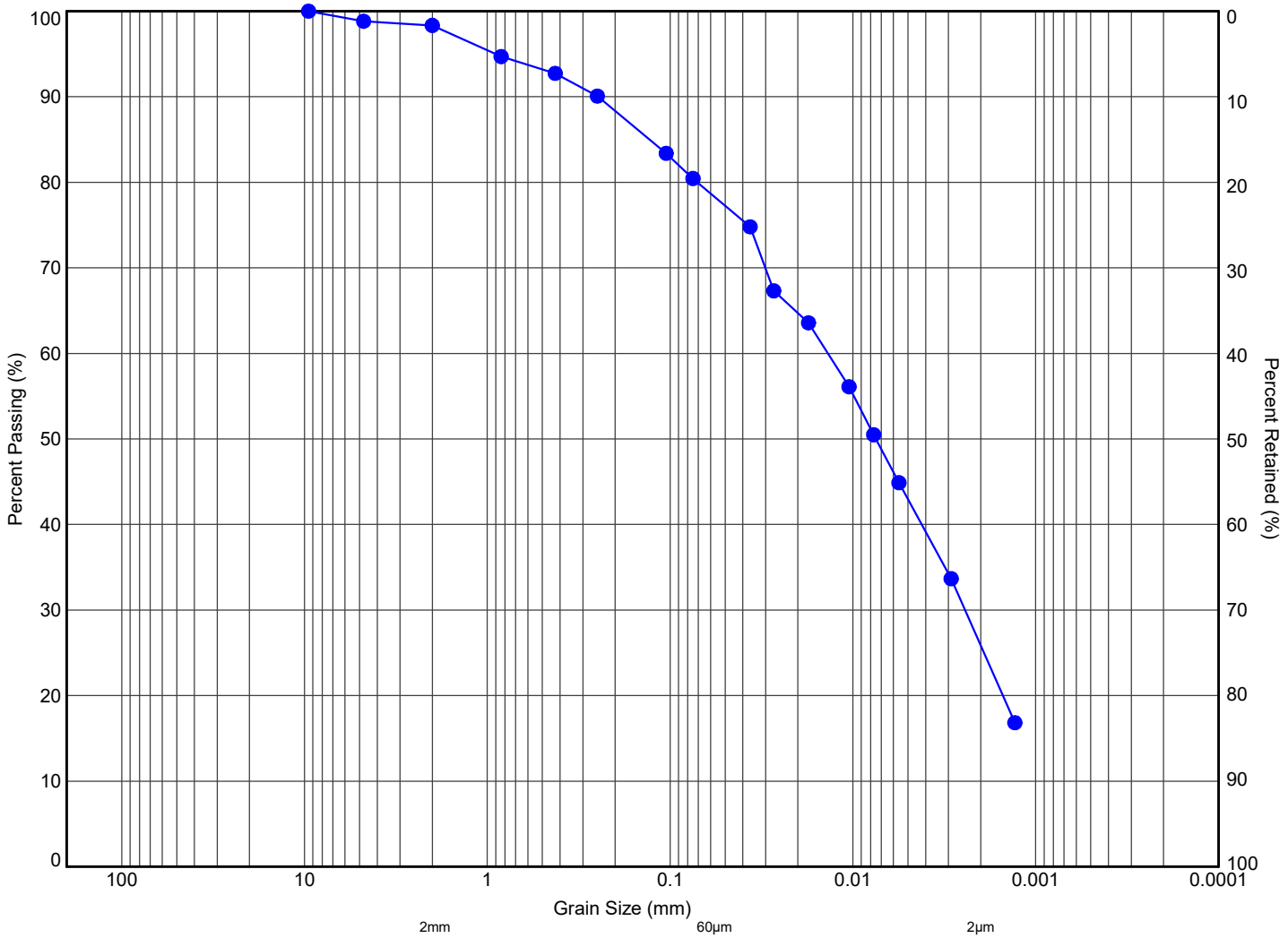
Date	Water Depth (m)	Elevation (m)
Feb 21, 2022	1.7	264.7
Mar 9, 2022	1.7	264.7

file: 1-21-0516-01 bh logs.gpj

APPENDIX D

TERRAPROBE INC.





MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**4**	SS3	1.8	259.0	2	19	53	26	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
CLAYEY SILT, SOME SAND, TRACE GRAVEL

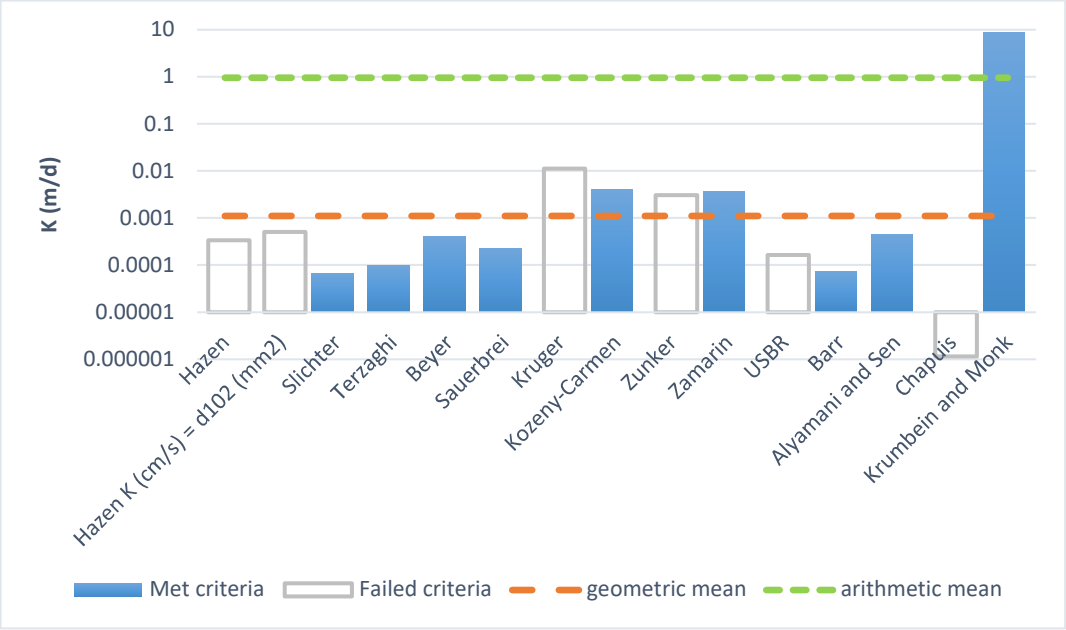
File No.: **1-21-0516-01**

***K* from Grain Size Analysis Report**

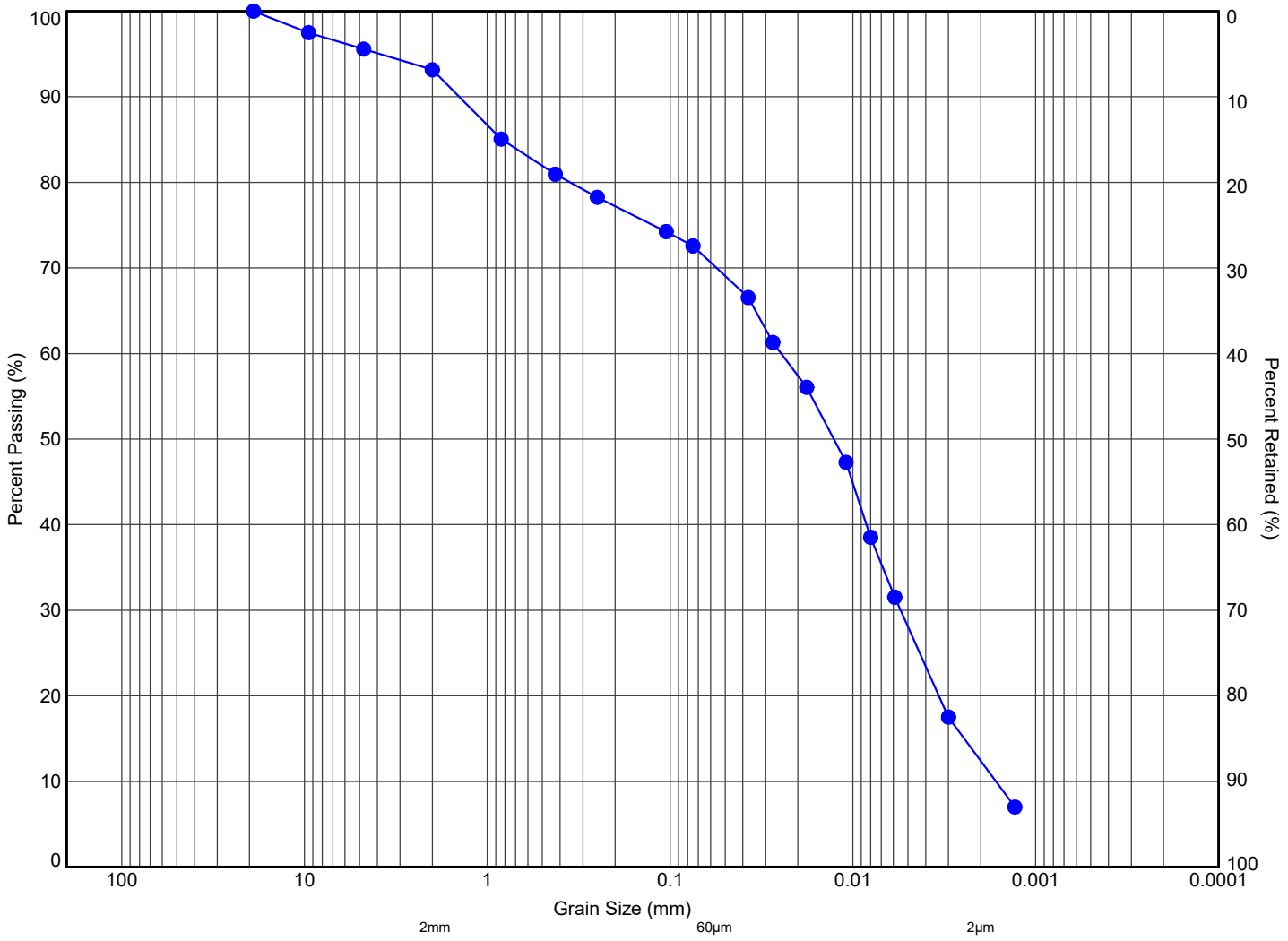
Sample Name: Borehole 4 Sample 3 Elevation (m) 259

Mass Sample (g): 334.4 **T (oC)** 23.7

Poorly sorted clay low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	3.9E-07	3.9E-09	0.000339	
Hazen K (cm/s) = d_{10} (mm)	5.8E-07	5.8E-09	0.000504	
Slichter	7.9E-08	7.9E-10	0.000068	
Terzaghi	1.2E-07	1.2E-09	0.000100	
Beyer	4.7E-07	4.7E-09	0.000408	
Sauerbrei	2.7E-07	2.7E-09	0.000230	
Kruger	1.3E-05	1.3E-07	0.011105	
Kozeny-Carmen	4.7E-06	4.7E-08	0.004102	
Zunker	3.5E-06	3.5E-08	0.003061	
Zamarin	4.2E-06	4.2E-08	0.003661	
USBR	1.9E-07	1.9E-09	0.000163	
Barr	8.5E-08	8.5E-10	0.000074	
Alyamani and Sen	5.2E-07	5.2E-09	0.000452	
Chapuis	1.3E-09	1.3E-11	0.000001	
Krumbein and Monk	1.0E-02	1.0E-04	8.686670	
geometric mean	1.3E-06	1.3E-08	0.001119	
arithmetic mean	1.1E-03	1.1E-05	0.966196	



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**6**	SS5	3.3	259.4	7	23	58	12	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SANDY SILT, SOME CLAY, TRACE GRAVEL

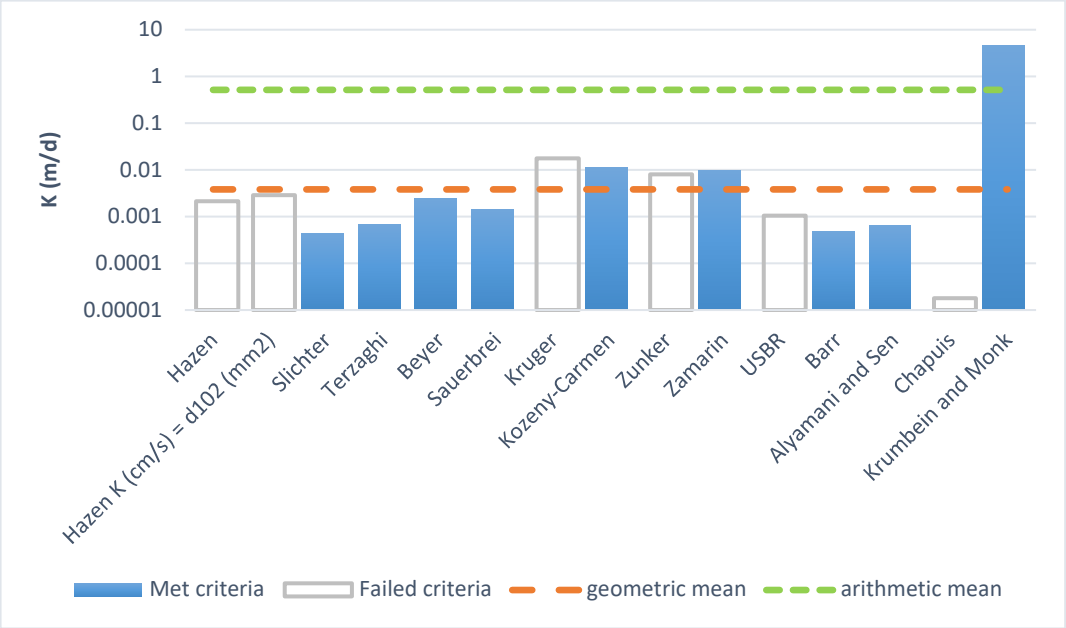
File No.: **1-21-0516-01**

K from Grain Size Analysis Report

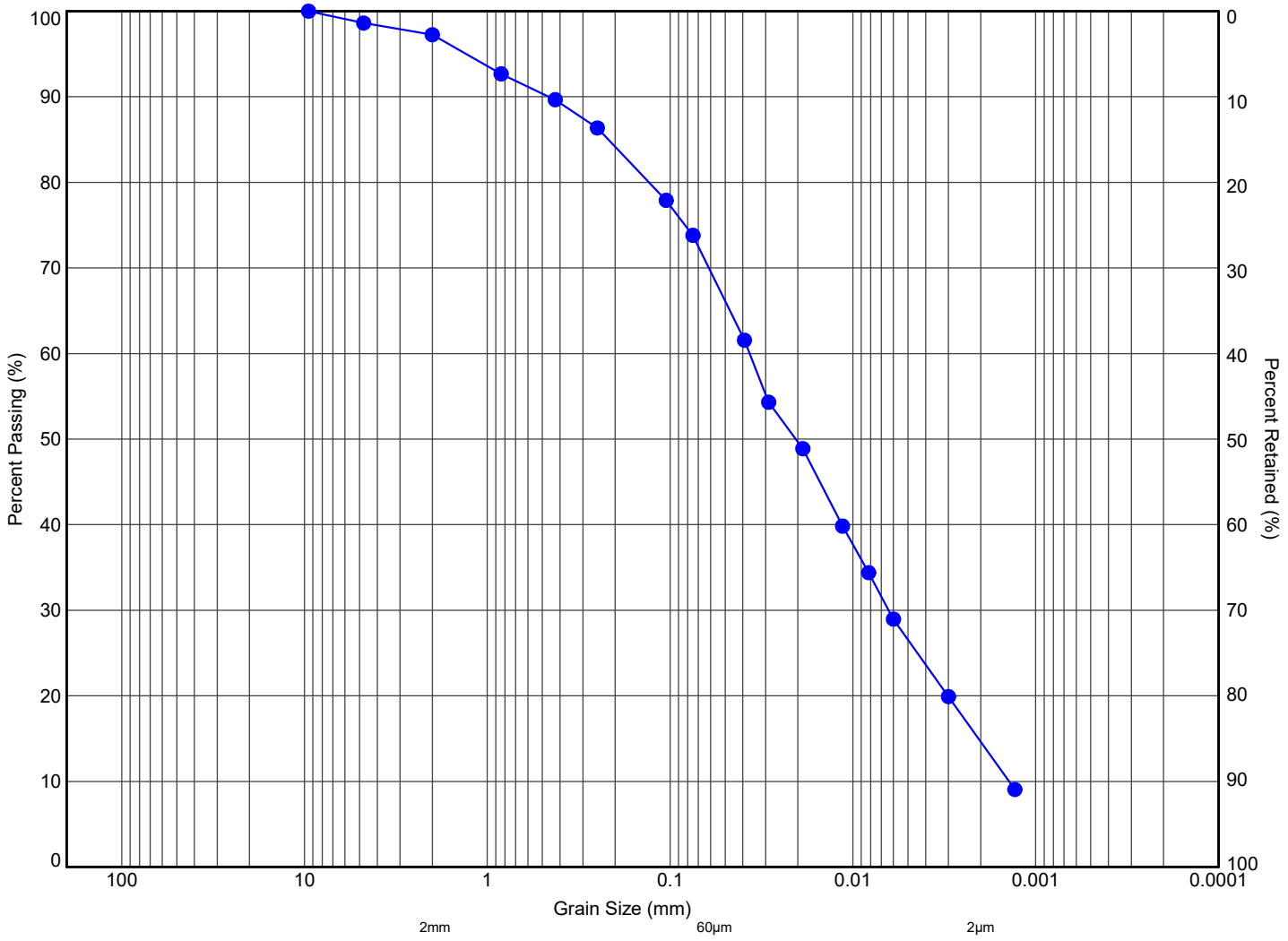
Sample Name: Borehole 6 Sample 5 Elevation (m) 259.4

Mass Sample (g): 259.8 **T (oC)** 23.7

Poorly sorted clay low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	2.5E-06	2.5E-08	0.002134	
Hazen K (cm/s) = d_{10} (mm)	3.3E-06	3.3E-08	0.002855	
Slichter	5.1E-07	5.1E-09	0.000443	
Terzaghi	7.8E-07	7.8E-09	0.000675	
Beyer	2.9E-06	2.9E-08	0.002518	
Sauerbrei	1.6E-06	1.6E-08	0.001393	
Kruger	2.0E-05	2.0E-07	0.017437	
Kozeny-Carmen	1.3E-05	1.3E-07	0.011121	
Zunker	9.3E-06	9.3E-08	0.008007	
Zamarin	1.1E-05	1.1E-07	0.009680	
USBR	1.2E-06	1.2E-08	0.001043	
Barr	5.7E-07	5.7E-09	0.000491	
Alyamani and Sen	7.4E-07	7.4E-09	0.000640	
Chapuis	2.0E-08	2.0E-10	0.000018	
Krumbein and Monk	5.3E-03	5.3E-05	4.612840	
geometric mean	4.4E-06	4.4E-08	0.003796	
arithmetic mean	6.0E-04	6.0E-06	0.515533	



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**14**	SS4	2.7	261.8	3	27	55	15	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SANDY SILT, SOME CLAY, TRACE GRAVEL

File No.: **1-21-0516-01**

***K* from Grain Size Analysis Report**

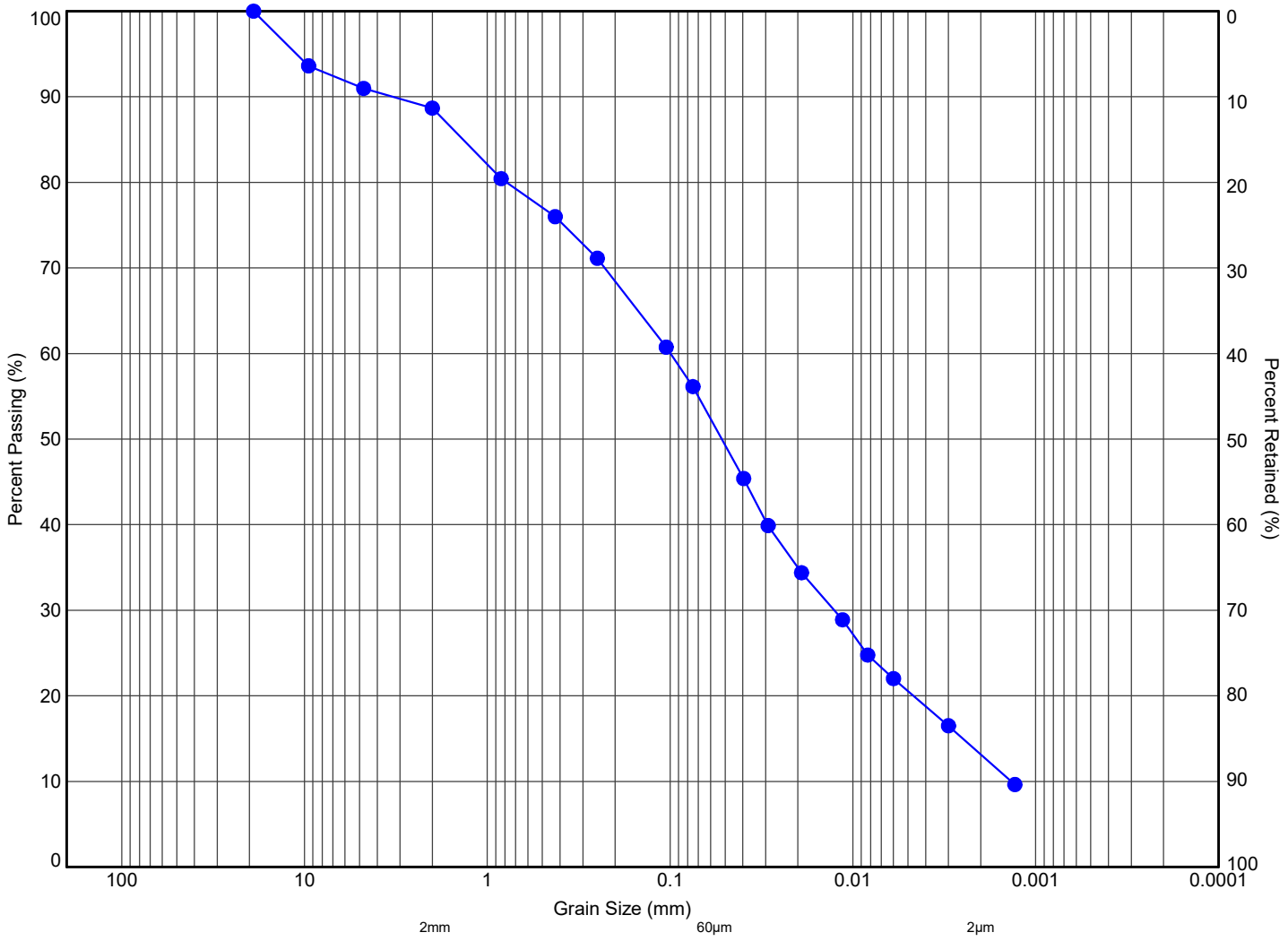
Sample Name: Borehole 14 Sample 4 Elevation (m) 262

Mass Sample (g): 360.5 **T (oC)** 23.7

Poorly sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.4E-06	1.4E-08	0.001185	
Hazen K (cm/s) = d_{10} (mm)	2.2E-06	2.2E-08	0.001865	
Slichter	2.7E-07	2.7E-09	0.000234	
Terzaghi	3.9E-07	3.9E-09	0.000337	
Beyer	1.6E-06	1.6E-08	0.001369	
Sauerbrei	9.5E-07	9.5E-09	0.000822	
Kruger	2.3E-05	2.3E-07	0.020244	
Kozeny-Carmen	1.0E-05	1.0E-07	0.008949	
Zunker	7.9E-06	7.9E-08	0.006858	
Zamarin	9.5E-06	9.5E-08	0.008223	
USBR	8.5E-07	8.5E-09	0.000737	
Barr	2.9E-07	2.9E-09	0.000252	
Alyamani and Sen	1.2E-06	1.2E-08	0.001067	
Chapuis	7.0E-09	7.0E-11	0.000006	
Krumbein and Monk	1.1E-02	1.1E-04	9.737067	
geometric mean	3.4E-06	3.4E-08	0.002954	
arithmetic mean	1.3E-03	1.3E-05	1.084258	



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**15**	SS7	6.3	260.1	11	37	39	13	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT AND SAND, SOME CLAY, SOME GRAVEL

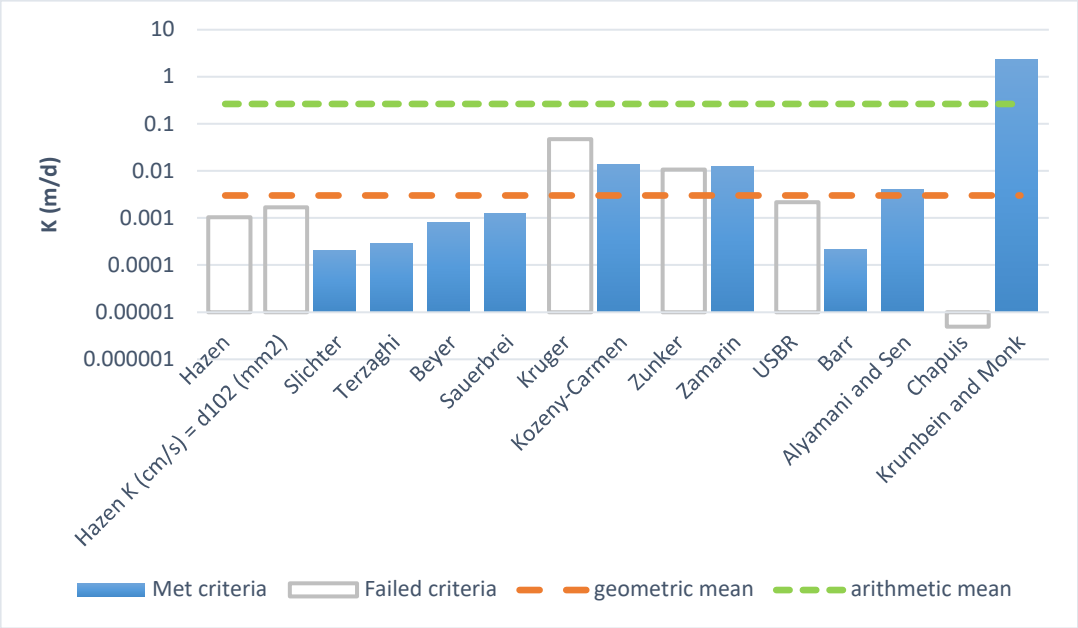
File No.: **1-21-0516-01**

K from Grain Size Analysis Report

Sample Name: Borehole 15 Sample 7 Elevation (m) 260.1

Mass Sample (g): 337.8 **T (oC)** 23.7

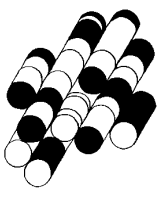
Poorly sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.2E-06	1.2E-08	0.001042	
Hazen K (cm/s) = d_{10} (mm)	1.9E-06	1.9E-08	0.001681	
Slichter	2.4E-07	2.4E-09	0.000205	
Terzaghi	3.4E-07	3.4E-09	0.000292	
Beyer	9.3E-07	9.3E-09	0.000801	
Sauerbrei	1.5E-06	1.5E-08	0.001289	
Kruger	5.5E-05	5.5E-07	0.047279	
Kozeny-Carmen	1.6E-05	1.6E-07	0.013971	
Zunker	1.2E-05	1.2E-07	0.010706	
Zamarin	1.5E-05	1.5E-07	0.012700	
USBR	2.5E-06	2.5E-08	0.002180	
Barr	2.5E-07	2.5E-09	0.000220	
Alyamani and Sen	4.6E-06	4.6E-08	0.004008	
Chapuis	5.7E-09	5.7E-11	0.000005	
Krumbein and Monk	2.7E-03	2.7E-05	2.369885	
geometric mean	3.5E-06	3.5E-08	0.003050	
arithmetic mean	3.1E-04	3.1E-06	0.267041	

APPENDIX E

TERRAPROBE INC.



Terraprobe
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

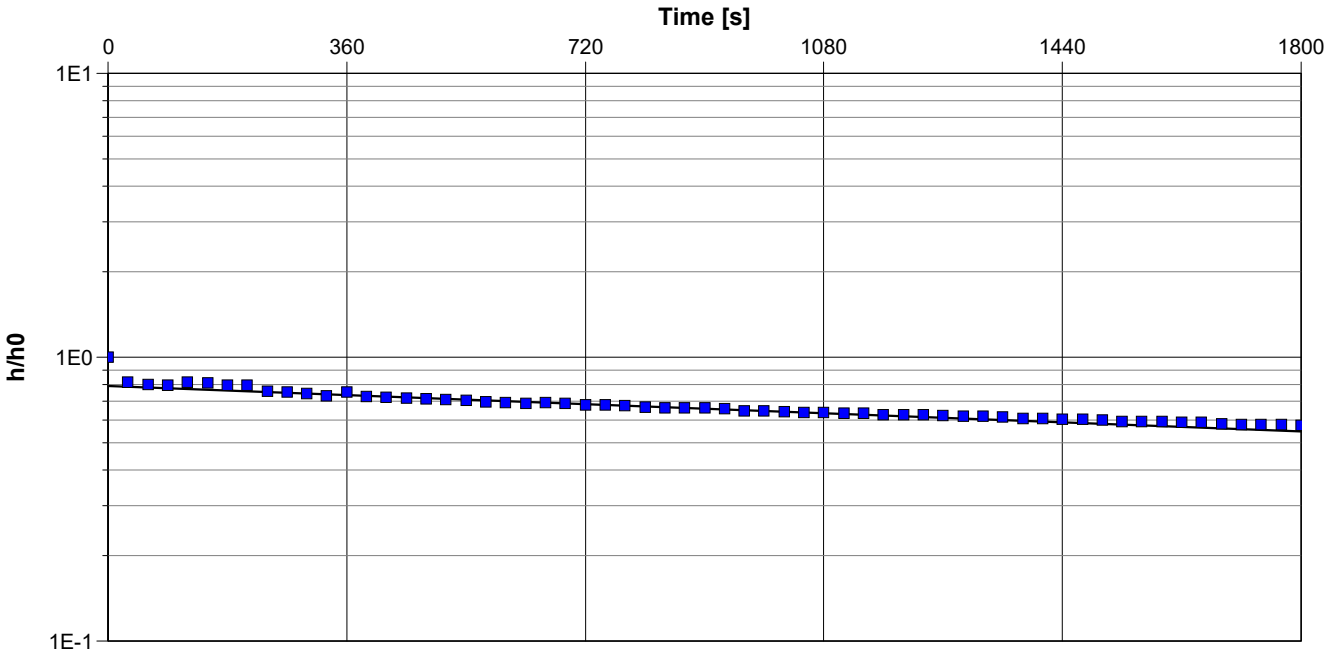
Slug Test Analysis Report

Project: 12100 Creditview Road

Number: 1-21-0516-46

Client: 12100 Creditview Developments Limited

Location: Caledon, Ontario	Slug Test: BH 6	Test Well: BH 6
Test Conducted by: AA		Test Date: 2022-02-23
Analysis Performed by: UA	BH 6	Analysis Date: 2022-04-20
Aquifer Thickness: 6.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 6	6.89×10^{-8}	

Terraprobe
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

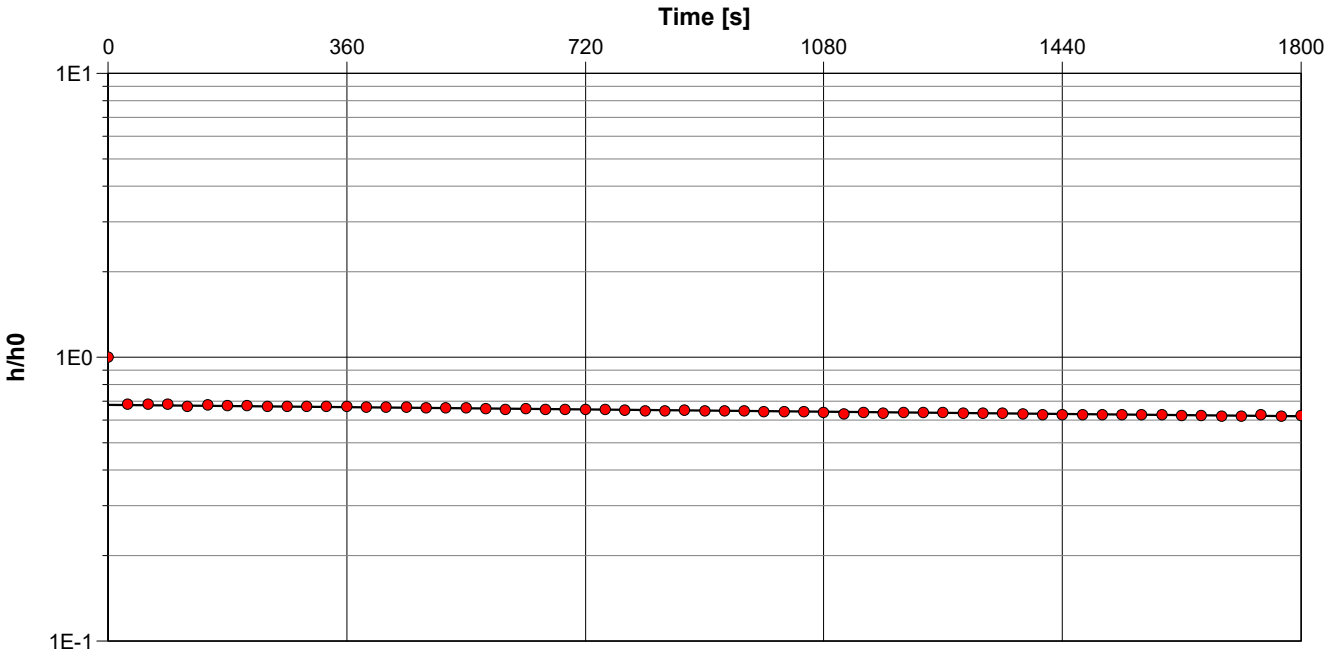
Slug Test Analysis Report

Project: 12100 Creditview Road

Number: 1-21-0516-46

Client: 12100 Creditview Developments Limited

Location: Caledon, Ontario	Slug Test: BH 14	Test Well: BH 14
Test Conducted by: AA		Test Date: 2022-02-23
Analysis Performed by: UA	BH 6	Analysis Date: 2022-04-20
Aquifer Thickness: 6.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 14	1.91×10^{-8}	

Terraprobe
Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing

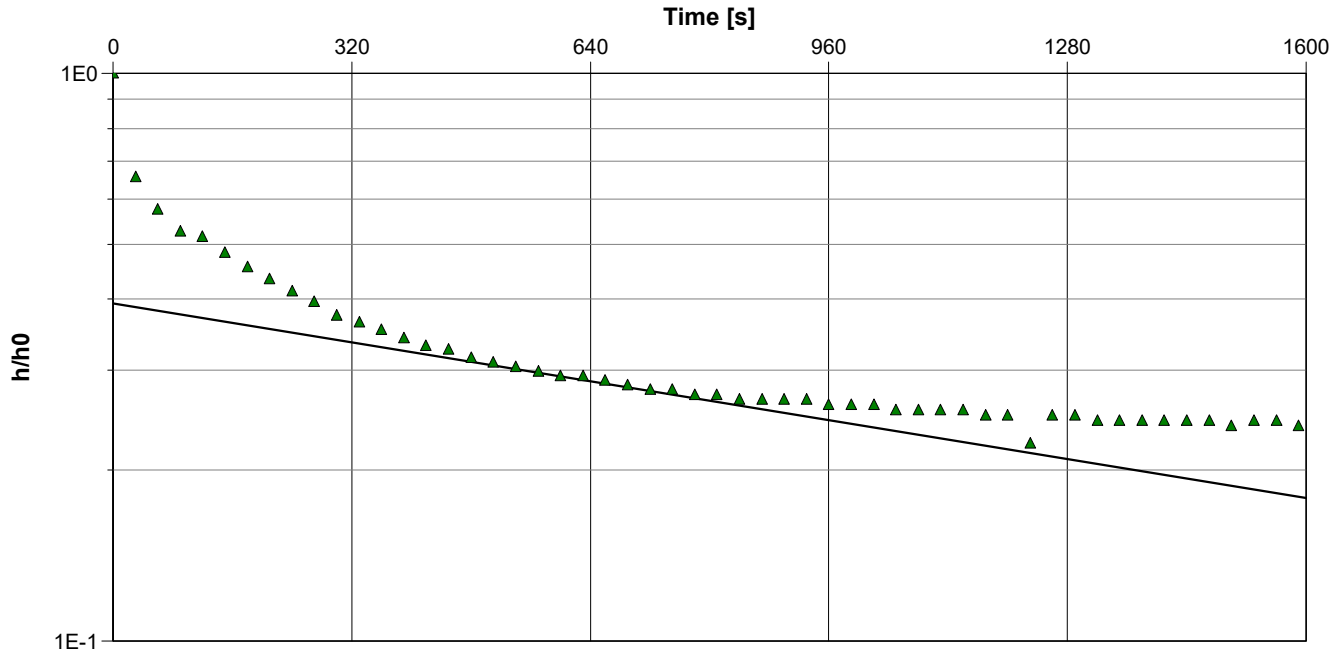
Slug Test Analysis Report

Project: 12100 Creditview Road

Number: 1-21-0516-46

Client: 12100 Creditview Developments Limited

Location: Caledon, Ontario	Slug Test: BH 15	Test Well: BH 15
Test Conducted by: AA		Test Date: 2022-02-26
Analysis Performed by: UA	BH 15	Analysis Date: 2022-04-20
Aquifer Thickness: 6.00 m		

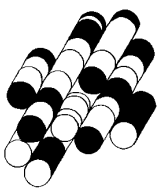


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 15	1.73×10^{-7}	

APPENDIX F

TERRAPROBE INC.



5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: TERRAPROBE INC.
11 INDELL LANE
BRAMPTON, ON L6T3Y3
(905) 796-2650
ATTENTION TO: Usman Arshad
PROJECT: 1-21-0516-46
AGAT WORK ORDER: 22T867275
WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer
DATE REPORTED: Mar 03, 2022
PAGES (INCLUDING COVER): 10
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

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- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
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Environmental Services Association of Alberta (ESAA)

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AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

CLIENT NAME: TERRAPROBE INC.

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2022-02-25

DATE REPORTED: 2022-03-03

		SAMPLE DESCRIPTION:		BH15
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2022-02-24
Parameter	Unit	G / S	RDL	3553663
Electrical Conductivity	µS/cm		2	976
pH	pH Units	6.5-8.5	NA	7.80
Saturation pH (Calculated)				6.72
Langelier Index (Calculated)				1.08
Hardness (as CaCO3) (Calculated)	mg/L		0.5	523
Total Dissolved Solids	mg/L		10	624
Alkalinity (as CaCO3)	mg/L		5	285
Bicarbonate (as CaCO3)	mg/L		5	285
Carbonate (as CaCO3)	mg/L		5	<5
Hydroxide (as CaCO3)	mg/L		5	<5
Fluoride	mg/L		0.05	<0.05
Chloride	mg/L		0.12	84.6
Nitrate as N	mg/L		0.05	12.3
Nitrite as N	mg/L		0.05	<0.05
Bromide	mg/L		0.05	<0.05
Sulphate	mg/L		0.10	98.2
Ortho Phosphate as P	mg/L		0.10	<0.10
Ammonia as N	mg/L		0.02	<0.02
Ammonia-Un-ionized (Calculated)	mg/L	0.02	0.000002	<0.000002
Total Phosphorus	mg/L	*	0.02	0.09
Total Organic Carbon	mg/L		0.5	6.3
True Colour	TCU		5	<5
Turbidity	NTU		0.5	14.5
Total Calcium	mg/L		0.32	136
Total Magnesium	mg/L		0.34	44.5
Total Potassium	mg/L		1.15	3.32
Total Sodium	mg/L		0.45	13.5
Aluminum-dissolved	mg/L	*	0.004	<0.004
Total Antimony	mg/L	0.020	0.001	<0.001
Total Arsenic	mg/L	0.1	0.003	<0.003

Certified By: Iris Verástegui

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

CLIENT NAME: TERRAPROBE INC.

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2022-02-25

DATE REPORTED: 2022-03-03

		SAMPLE DESCRIPTION:		BH15
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2022-02-24
Parameter	Unit	G / S	RDL	3553663
Total Barium	mg/L		0.002	0.153
Total Beryllium	mg/L	*	0.001	<0.001
Total Boron	mg/L	0.2	0.010	0.027
Total Cadmium	mg/L	0.0002	0.0001	<0.0001
Total Chromium	mg/L		0.003	0.004
Total Cobalt	mg/L	0.0009	0.0005	0.0022
Total Copper	mg/L	0.005	0.001	0.013
Total Iron	mg/L	0.3	0.010	5.35
Total Lead	mg/L	*	0.001	0.003
Total Manganese	mg/L		0.002	0.202
Dissolved Mercury	mg/L	0.0002	0.0001	<0.0001
Total Molybdenum	mg/L	0.040	0.002	<0.002
Total Nickel	mg/L	0.025	0.003	0.004
Total Selenium	mg/L	0.1	0.002	<0.002
Total Silver	mg/L	0.0001	0.0001	<0.0001
Total Strontium	mg/L		0.005	0.409
Total Thallium	mg/L	0.0003	0.0003	<0.0003
Total Tin	mg/L		0.002	0.002
Total Titanium	mg/L		0.010	0.048
Total Tungsten	mg/L	0.030	0.010	<0.010
Total Uranium	mg/L	0.005	0.002	0.003
Total Vanadium	mg/L	0.006	0.002	0.006
Total Zinc	mg/L	0.030	0.020	0.212
Total Zirconium	mg/L	0.004	0.004	<0.004
Lab Filtration Aluminum Dissolved				2022/03/1
Lab Filtration mercury				2022/03/1

Certified By: Iris Verástegui

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Certificate of Analysis

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

CLIENT NAME: TERRAPROBE INC.

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2022-02-25

DATE REPORTED: 2022-03-03

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO * Variable - refer to guideline reference document
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

3553663 Diss.Al and Diss.Hg completed on a lab filtered sample.
Dilution required, RDL has been increased accordingly.
Un-ionized Ammonia detection limit is a calculated RDL. The calculation of Un-ionized Ammonia is based on lab measured parameters (ammonia as N, pH and temperature).Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

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Exceedance Summary

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

CLIENT NAME: TERRAPROBE INC.

ATTENTION TO: Usman Arshad

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
3553663	BH15	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0022
3553663	BH15	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.013
3553663	BH15	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	5.35
3553663	BH15	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.212

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Quality Assurance

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

Water Analysis

RPT Date: Mar 03, 2022			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment - PWQO (mg/L)															
Electrical Conductivity	3556622		971	971	0.0%	< 2	104%	90%	110%						
pH	3556622		7.64	7.65	0.1%	NA	102%	90%	110%						
Total Dissolved Solids	3553663	3553663	624	634	1.6%	< 10	98%	80%	120%						
Alkalinity (as CaCO3)	3556622		464	469	1.1%	< 5	96%	80%	120%						
Bicarbonate (as CaCO3)	3556622		464	469	1.1%	< 5	NA								
Carbonate (as CaCO3)	3556622		<5	<5	NA	< 5	NA								
Hydroxide (as CaCO3)	3556622		<5	<5	NA	< 5	NA								
Fluoride	3552721		<0.05	<0.05	NA	< 0.05	104%	70%	130%	104%	80%	120%	101%	70%	130%
Chloride	3552721		34.1	33.9	0.6%	< 0.10	93%	70%	130%	105%	80%	120%	106%	70%	130%
Nitrate as N	3552721		<0.05	<0.05	NA	< 0.05	102%	70%	130%	104%	80%	120%	104%	70%	130%
Nitrite as N	3552721		<0.05	<0.05	NA	< 0.05	95%	70%	130%	103%	80%	120%	102%	70%	130%
Bromide	3552721		<0.05	<0.05	NA	< 0.05	107%	70%	130%	105%	80%	120%	104%	70%	130%
Sulphate	3552721		161	160	0.6%	< 0.10	100%	70%	130%	104%	80%	120%	NA	70%	130%
Ortho Phosphate as P	3552721		<0.10	<0.10	NA	< 0.10	105%	70%	130%	107%	80%	120%	100%	70%	130%
Ammonia as N	3558212		0.20	0.19	5.1%	< 0.02	99%	70%	130%	105%	80%	120%	87%	70%	130%
Total Phosphorus	3553663	3553663	0.09	0.10	NA	< 0.02	101%	70%	130%	94%	80%	120%	93%	70%	130%
Total Organic Carbon	3553663	3553663	6.3	6.4	1.6%	< 0.5	97%	90%	110%	109%	90%	110%	95%	80%	120%
True Colour	3553663	3553663	<5	<5	NA	< 5	99%	90%	110%						
Turbidity	3552718		20.0	20.0	0.0%	< 0.5	98%	80%	120%						
Total Calcium	3544932		10.6	10.8	1.9%	< 0.10	100%	70%	130%	101%	80%	120%	104%	70%	130%
Total Magnesium	3544932		2.38	2.45	2.9%	< 0.10	102%	70%	130%	101%	80%	120%	104%	70%	130%
Total Potassium	3544932		<1.15	<1.15	NA	< 0.50	101%	70%	130%	101%	80%	120%	105%	70%	130%
Total Sodium	3544932		1.39	1.26	9.8%	< 0.10	102%	70%	130%	102%	80%	120%	107%	70%	130%
Aluminum-dissolved	3553663	3553663	<0.004	0.005	NA	< 0.004	111%	70%	130%	109%	80%	120%	101%	70%	130%
Total Antimony	3556391		<0.001	<0.001	NA	< 0.001	110%	70%	130%	106%	80%	120%	111%	70%	130%
Total Arsenic	3556391		0.005	0.005	NA	< 0.003	96%	70%	130%	106%	80%	120%	110%	70%	130%
Total Barium	3556391		<0.002	<0.002	NA	< 0.002	95%	70%	130%	95%	80%	120%	96%	70%	130%
Total Beryllium	3556391		<0.001	<0.001	NA	< 0.001	98%	70%	130%	107%	80%	120%	107%	70%	130%
Total Boron	3556391		0.086	0.091	5.6%	< 0.010	101%	70%	130%	106%	80%	120%	100%	70%	130%
Total Cadmium	3556391		<0.0001	<0.0001	NA	< 0.0001	106%	70%	130%	109%	80%	120%	113%	70%	130%
Total Chromium	3556391		<0.003	<0.003	NA	< 0.003	103%	70%	130%	102%	80%	120%	99%	70%	130%
Total Cobalt	3556391		0.0006	0.0006	NA	< 0.0005	104%	70%	130%	105%	80%	120%	101%	70%	130%
Total Copper	3556391		0.150	0.152	1.3%	< 0.001	100%	70%	130%	103%	80%	120%	92%	70%	130%
Total Iron	3556391		0.266	0.270	1.5%	< 0.010	102%	70%	130%	104%	80%	120%	94%	70%	130%
Total Lead	3556391		0.009	0.009	0.0%	< 0.001	101%	70%	130%	101%	80%	120%	96%	70%	130%
Total Manganese	3556391		0.061	0.062	1.6%	< 0.002	102%	70%	130%	101%	80%	120%	92%	70%	130%
Dissolved Mercury	3553663	3553663	<0.0001	<0.0001	NA	< 0.0001	103%	70%	130%	97%	80%	120%	102%	70%	130%
Total Molybdenum	3556391		<0.002	<0.002	NA	< 0.002	104%	70%	130%	105%	80%	120%	107%	70%	130%
Total Nickel	3556391		<0.003	<0.003	NA	< 0.003	103%	70%	130%	106%	80%	120%	98%	70%	130%

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

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Quality Assurance

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

Water Analysis (Continued)

RPT Date: Mar 03, 2022			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Selenium	3556391		0.008	0.008	NA	< 0.002	103%	70%	130%	98%	80%	120%	102%	70%	130%
Total Silver	3556391		<0.0001	<0.0001	NA	< 0.0001	106%	70%	130%	104%	80%	120%	96%	70%	130%
Total Strontium	3556391		0.051	0.053	3.8%	< 0.005	101%	70%	130%	99%	80%	120%	95%	70%	130%
Total Thallium	3556391		<0.0003	<0.0003	NA	< 0.0003	99%	70%	130%	104%	80%	120%	99%	70%	130%
Total Tin	3556391		<0.002	<0.002	NA	< 0.002	102%	70%	130%	102%	80%	120%	107%	70%	130%
Total Titanium	3556391		<0.010	<0.010	NA	< 0.010	102%	70%	130%	104%	80%	120%	106%	70%	130%
Total Tungsten	3556391		<0.010	<0.010	NA	< 0.010	94%	70%	130%	92%	80%	120%	93%	70%	130%
Total Uranium	3556391		0.002	0.002	NA	< 0.002	100%	70%	130%	106%	80%	120%	107%	70%	130%
Total Vanadium	3556391		<0.002	<0.002	NA	< 0.002	101%	70%	130%	102%	80%	120%	103%	70%	130%
Total Zinc	3556391		0.028	0.028	NA	< 0.020	102%	70%	130%	114%	80%	120%	106%	70%	130%
Total Zirconium	3556391		<0.004	<0.004	NA	< 0.004	102%	70%	130%	103%	80%	120%	103%	70%	130%

Comments: NA signifies Not Applicable.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Matrix spike: Spike level < native concentration. Matrix spike acceptance limits do not apply.

Certified By: Iris Verástegui

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Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Saturation pH (Calculated)		SM 2320 B	CALCULATION
Langelier Index (Calculated)		SM 2330B	CALCULATION
Hardness (as CaCO3) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684,ON MOECC E3139,SM 2540C,D	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH3 H	LACHAT FIA
Ammonia-Un-ionized (Calculated)		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Turbidity	INOR-93-6044	modified from SM 2130 B	NEPHELOMETER
Total Calcium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Magnesium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Potassium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Sodium	MET-93-6105	modified from EPA 6010D	ICP/OES
Aluminum-dissolved	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

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Method Summary

CLIENT NAME: TERRAPROBE INC.

AGAT WORK ORDER: 22T867275

PROJECT: 1-21-0516-46

ATTENTION TO: Usman Arshad

SAMPLING SITE:12100 Creditview Rd, Caledon

SAMPLED BY:AA

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Dissolved Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tungsten	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration Aluminum Dissolved	SR-78-9001		FILTRATION
Lab Filtration mercury	SR-78-9001		FILTRATION

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AGAT Laboratories

Med Blue

5835 Coopers Avenue
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webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only 22T867452

Work Order #: 22T867275

Cooler Quantity: 1

Arrival Temperatures: 2.6 | 1.9 | 1.8

Custody Seal Intact: ☐ Yes ☐ No ☒ N/A

Notes: Ice

Report Information:

Company: Terraprobe
Contact: Usman Arshad
Address: 11 Indell Lane, Brampton, ON L6T 3Y3
Phone: 204 962 2466 Fax:
Reports to be sent to:
1. Email: uarshad@terraprobe.ca
2. Email: Nmakrad@terraprobe.ca

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☐ Coarse
☐ Fine

☐ Excess Soils R406
Table ____ (Indicate One)
☐ Regulation 558
☐ CCME

☐ Sewer Use ☐ Sanitary ☐ Storm
____ (Region)
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1-21-0516
Site Location: 12100 Creditview Rd, Caledon
Sampled By: Alaa Alborno
AGAT Quote #: ____ PO: ____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs	O. Reg 153: Analyze F4G if required ☐ Yes ☐ No	O. Reg 153: PAHs	O. Reg 153: PCBs	O. Reg 153: VOC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs	O. Reg 406: Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	VOC	PHC/BTEX	PWQO	Potentially Hazardous or High Concentration (Y/N)
BH14	02/23/22	AM PM	8	GW														✓	✓		
BH6	02/24/22	AM PM	8	GW														✓	✓		
BH15	02/24/22	AM PM	7	GW																✓	
DUP1	02/24/22	AM PM	8	GW														✓	✓		
		AM PM																			
		AM PM																			
		AM PM																			
		AM PM																			
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		AM PM																			
		AM PM																			

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Alaa Alborno	02/24/2022	8:11 PM			
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

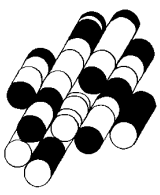
22FEB25 8:31

Page ____ of ____

N°: T 130917

APPENDIX G

TERRAPROBE INC.



APPENDIX G - Water Balance - 12100 Creditview Road, Caledon, ON
File No. 1-21-0516-46

1. Climate Information

Precipitation[1]	877 mm/a	0.88 m/a
Actual Evapotranspiration[2]	539 mm/a	0.54 m/a
Precipitation Surplus	**338 mm/a**	**0.34 m/a**

2. Infiltration Rates

rolling topography (0.2), impervious clay (0.1), cultvated land (0.1).

Table 2 Approach - Infiltration Factors [3]	***(Pre and Post Development)***	
Infiltration	135 mm/a	0.135 m/a
Run-off	203 mm/a	0.203 m/a

3. Property Statistics [4]

				%
Building Area/Coverage		0 m^2	0.00 ha	0
Hardscape/Impervious		0 m^2	0.00 ha	0
Softscape/Landscape (Undeveloped area)		102,800 m^2	10.28 ha	100
	TOTAL	**102,800.00 m^2**	**10.28 ha**	100
Post-Development Coverage				
Building Area/Coverage (Roof Runoff)		19,661 m^2	1.97 ha	19
Hardscape/Impervious (Paved area)		68,000 m^2	6.80 ha	66
Softscape/Landscape		15,139 m^2	1.51 ha	15
	TOTAL:	**102,800.00 m^2**	**10.28 ha**	**100**

Notes/References:

1 - Climate Normals 1981-2010 Station for Georgetown WWTP station (Climate ID: 6152695)
2 - Thornthwaite and Matther approach
3 - MOE, June 2003, Stormwater Management Planning and Design Manual
4 - Preliminary Landscape Concept Plan, prepared by MBTW,dated March 8, 2022;
GSAI email on 2022-04-26

APPENDIX G - Water Balance - 12100 Creditview Road, Caledon, ON
File No. 1-21-0516-46

4. Annual Water Balance (Pre Development)

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Building Area/Coverage	0	0	nil	0	nil	0
Hardscape/Impervious	0	0	nil	0	nil	0
Softscape/Landscape	102,800	90,156	55,409	nil	13,899	20,848
TOTAL	**102,800**	**90,156**	**55,409**	**0**	**13,899**	**20,848**

6. Annual Water Balance (Post Development) without Mitigation

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Building Area/Coverage	19,661	17,243	nil	1,724	nil	15,518
Hardscape/Impervious	68,000	59,636	nil	5,964	nil	53,672
Softscape/Landscape	15,139	13,277	8,160	nil	2,047	3,070
TOTAL	**102,800**	**90,156**	**8,160**	**7,688**	**2,047**	**72,261**

7. Comparison of Pre-Development (before buidling additions) and Post-Development (after building additions)

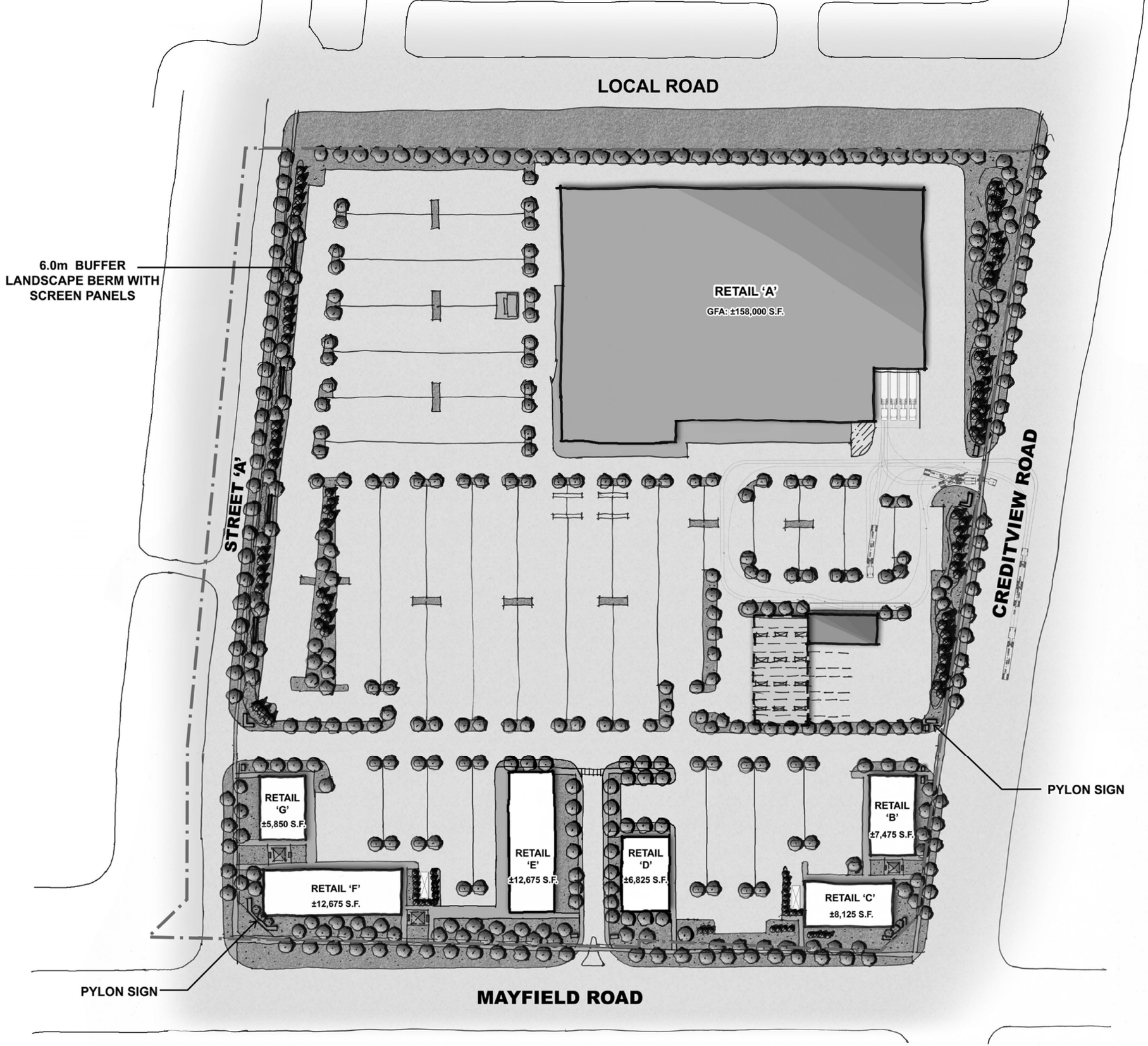
	Precipitation	Evapotranspiration	Evaporation	Infiltration	Run-Off
Pre-Development	**90,156**	55,409	0	13,899	20,848
Post-Development	**90,156**	8,160	7,688	2,047	72,261
Difference	**0**	**-47,249**	**7,688**	**-11,852**	**51,413**

8. Requirement for Infiltration Maintaenance from roof run-off

Volume of roof run-off captured (90%) (roof run-off available in post development) 13,967 m^3

Volume of roof run-off required to match pre-development infiltration rates (Infiltration deficit in post deve 11,852 m^3

Percentage of roof run-off required to match pre-development infiltration **85%**



SITE STATISTICS

SITE AREA 25.30 AC
10.28 HA

GROSS FLOOR AREA (GFA)

RETAIL A:	± 158,000 SF
RETAIL B:	± 7,475 SF
RETAIL C:	± 8,125 SF
RETAIL D:	± 6,825 SF
RETAIL E:	± 12,675 SF
RETAIL F:	± 12,675 SF
RETAIL G:	± 5,850 SF
TOTAL:	± 211,625 SF

PARKING ± 1,261 SPACES

BUILDING HEIGHTS = 1 STOREY

CREDITVIEW & MAYFIELD

PRELIMINARY LANDSCAPE CONCEPT PLAN

MARCH 8, 2022

N

0 15 30 45 60
SCALE 1:750 (m)

mbtw wai

experience • knowledge • integrity

civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité