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A REPORT TO
UNITED HOLDINGS INC.

HYDROGEOLOGICAL ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT

NORTHWEST QUADRANT OF MOUNT HOPE ROAD AND COLUMBIA WAY,
TOWN OF CALEDON

REFERENCE NO. 2309-W138
(Rev.2)

February 26, 2026

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Issues and Revisions Registry

Modification	Date	Description of issued and/or revision
1st Draft Report	December 20, 2024	For Review
2nd Draft Report	January 23, 2025	For Comments Response from Client
Final Report	January 24, 2025	For Review and Consideration
Final Report (Rev. 1)	May 28, 2025	Based on the Updated Drawings
Draft Report (Rev. 2)	February 23, 2026	Based on the Updated Drawings and Additional Monitoring.
2nd Draft Report (Rev. 2)	February 25, 2026	Comments Response from Client and updating the report based on a review of the Natural Heritage Figures provided in the LSS
Final Report (Rev.2)	February 26, 2026	For Submission

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1.0 EXECUTIVE SUMMARY

United Holdings Inc. retained Soil Engineers Ltd. (SEL) to conduct a hydrogeological assessment for the property located at the northwest quadrant of the intersection of Mount Hope Road and Columbia Way in the Town of Caledon, Ontario (the Subject Site).

The Subject Site is currently a vacant land utilized as agricultural land, and it is surrounded by agricultural fields and rural residential properties.

Based on the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is understood that the proposed development will include the construction of a single detached, semi-detached, Townhouse, Mid-Rise Residential block in the northeast corner, a commercial block in the southeast corner, a park block, 2 Storm Water Management Ponds (Eastern and Western), and a natural heritage system at the Subject Site. The proposed subdivision will also be provided with roads and municipal services. As the design details for the Commercial Block and Mid-Rise Residential Blocks were not available during the preparation of this report, the associated dewatering requirements will be evaluated once the details become available.

The current investigation revealed that:

- The Subject Site lies within the physiographic region of southern Ontario known as the South Slope and the landform is identified as Till Plain (Drumlinized).
- The Subject Site is located within an area mapped as Clay to silt-textured till (derived from glaciolacustrine deposits or shale) (5d).
- The Subject Site is located within the Humber River Watershed that falls in the Toronto and Region Conservation Authority (TRCA) jurisdiction.
- The ground surface elevation ranges approximately between 257.6 metres above sea level (masl) to 263.0 masl based on ground surface elevations measured at the borehole and monitoring wells' locations.
- The subsoil investigation has revealed that beneath the topsoil veneer, and the Earth fill at the western portion of the site mainly comprises silty clay and silty clay till with interbedded layers of silty fine sand within the northwestern portion of the Subject Site.
- Based on the review of the Hydrographs and manual groundwater levels the highest and lowest stabilized shallow groundwater levels measured at El. 263.1 masl and 255.1 masl at BH/MW 12 and BH/MW 5, respectively.
- Based on the review of the Hydrographs and manual water table data, the highest and lowest stabilized water tables recorded in the installed piezometers interacting with the shallow stratigraphy measured at El. 262.1 masl and 256.3 masl at MP 1 and MP 12, respectively.

- The hydraulic conductivity estimates for the silty clay unit range from 2.0 x 10^{-6} m/sec to 4.9 x 10^{-8} m/sec, and silty clay till unit ranges from 6.2 x 10^{-7} m/sec to 5.0 x 10^{-8} m/sec. The estimated hydraulic conductivity of 1.3 x 10^{-7} m/sec and 6.2 x 10^{-7} m/sec for the silty clay and silty clay till, respectively, were used for the current assessment.
- The preliminary estimated short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed underground services, reaches up to 74,400.0 L/day, considering an open and active excavation trench with dimensions of 2 m width and 50 m length. As such, filing an EASR with the MECP is required for the excavation and construction of the proposed installation of the underground services.
- Based on a preliminary estimates, the anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed residential lots and blocks development that will be constructed below the seasonally high shallow groundwater table, reaches up to 107,600.0 L/day for proposed townhouse blocks, assumed to be comprising of eight (8) units, 16,350.0 L/day for the proposed single-detached residential units, and up to 22,350.0 L/day for the semi-detached units for two (2) attached units. As such, filing an EASR with the MECP is required for the construction of townhouse blocks, but not required for the construction and excavation of the single detached units and the semi-detached units.
- Based on preliminary estimates, the anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed SWM Ponds ranges from 252,300.0 L/day to 681,700.0 L/day. As such, filing an EASR with the MECP is required for the construction of the SWM Ponds.
- Obtaining a discharge permit from the Region of Peel may be required if the potential collected discharge water during construction is proposed to be discharged to the region's sewer system.
- The maximum estimated long-term foundation drainage flow rate of 71,200.0 L/day is below the MECP PTTW threshold limit of 379,000.0 L/day for the proposed development. As such, applying for PTTW with MECP is not required. However, obtaining a discharge agreement from the Region of Peel is required if the foundation drainage is proposed to be conveyed to the Region’s sewer system.
- The preliminary estimated zone of influence for any temporary construction dewatering array or dewatering area could extend up to 18.5, 12.3, 8.2, and 9.9 m from the conceptual dewatering wells or array considered around the proposed underground services, proposed residential units, Western SWM Pond, and Eastern SWM Pond, respectively. Based on the review of the details, Mount Hope Road and Columbia Way are located outside of the Zone of Influence for any temporary construction dewatering array or wells for Street N, Street B, Street C, Eastern SWM Pond and Western SWM Pond. As such, significant risk for ground settlement is not expected

with respect to the proposed development. Record review indicates that there is a total of two (2) tributaries of the Cold Creek that outlet to the Humber River.

- One (1) Tributary is mapped in the Northern portion of the Subject Site, flowing from the west to the southeast direction. Based on the review of the draft plan, it is identified as the Natural Heritage System (NHS), and based on the review of the conceptual zone of influence for dewatering, the provincially significant wetland associated with the NHS is located outside the Zone of influence for the installation of underground services proposed beneath Street A, as well as the proposed nearby residential lots and blocks. As such, significant impacts to the above-noted natural feature are not expected with respect to the proposed development.
- The second tributary is located in the southern portion of the Subject Site, flowing from the east to the southwest direction and eventually south/southeasterly direction towards the Humber River. Based on the review of the proposed plan, the channel realignment is proposed for the tributary. As such, significant impacts to the above noted natural feature are not expected with respect to the proposed development.

- Records of water bodies (ponded waterbody) are mapped within the Subject Site and surrounding lands. Three (3) records are mapped in the north, central and south portions of the Subject Site.
  - Based on the review of Figure 5- Head Water Drainage Feature Assessment Map dated February 18, 2026, Project 2407713, prepared by GEI Consultant, presented in **Appendix A-4** and discussion with the ecologist, the central water body was not observed during the investigation.
  - A review of the Development Concept Plan provided by KLM Planning. dated January 14, 2026 Presented in **Appendix A-4**, indicates that the northern water body is located within the proposed Natural Heritage system area, and it is located outside of the preliminary estimated conceptual zone of influence for dewatering of the street E. Therefore, no Potential impacts are anticipated.
  - Additionally, it is understood that the water body and its associated unevaluated wetland located in the southern portion of the Subject Site located close to the SG 5 and the unevaluated wetland located near BH/MW 101 and MP 1 location is located within the development foot print and proposed to be removed as per the Figure 2 of the project 2407713 dated February 18, 2026 prepared by GEI presented in **Appendix A-4**. As such, significant impacts to the above noted natural features are not expected with respect to the proposed development.
- A review of the MECP well records confirmed that there is a total of twelve (12) water supply wells registered within a 500 m radius of the Subject Site. All twelve (12) water supply wells are for domestic use according to their first use status. Two (2) water supply wells are present within the Subject Site. However, considering the location of the water supply wells and proposed development, it is assumed that both water supply wells will be decommissioned if still existing.

Furthermore, no other water supply wells are present within the zone of influence of the dewatering areas; therefore, no significant impacts to the water supply wells are anticipated with respect to the proposed development if it exists. Additionally, the Private Water Supply Well Survey (Pre-Construction monitoring Study) was completed and provided in the report titled “Private Water Supply Well Survey (Pre-Construction Monitoring Study, Proposed Residential Development, Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon,”, dated April 4, 2025 (SEL. Ref.2309-W138)

2.0 INTRODUCTION

2.1 Site Location and Project Description

United Holdings Inc. retained Soil Engineers Ltd. (SEL) to conduct a hydrogeological assessment for the property located on the Northwest Quadrant of Mount Hope Road and Columbia Way in the Town of Caledon, Ontario (the Subject Site).

The Subject Site is currently a vacant land utilized as agricultural land and it is surrounded by agricultural fields and rural residential properties. The location of the Subject Site is shown on **Drawing 1**.

Based on the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is understood that the proposed development will include the construction of a single detached, semi-detached, Townhouse, Mid-Rise Residential block in the northeast corner, a commercial block in the southeast corner, a park block, 2 Storm Water Management Ponds (Eastern and Western), and a natural heritage system at the Subject Site. The proposed subdivision will also be provided with roads and municipal services.

2.2 Project Objectives

The current hydrogeological assessment report presents the regional and local setting of the Subject Site. The findings of the fieldwork, including subsoil investigation, groundwater level and surface water monitoring, groundwater quality assessment and hydraulic conductivity testing, are presented in the report.

Potential needs for short-term dewatering and long-term foundation drainage control that are considered as preliminary are assessed, and preliminary hydrogeological impacts of the proposed development to the nearby groundwater receptors, including water supply wells, natural heritage features, and structures, are assessed. and presented in the hydrogeological assessment. The hydrogeological assessment report provides mitigation plans on the potential impacts of the proposed development on the groundwater receptors and structures. Comments and recommendations will be provided on any needs for applying for a Permit to Take Water (PTTW) or posting Environmental Activity and Sector Registry (EASR) with the Ministry of the Environment, Conservation and Parks (MECP).

2.3 Scope of Work

The scope of work for the hydrogeological assessment is summarized below:

- *Background Review:* Available background geological and hydrogeological information for the Subject Site including topographic mapping, surface geological, natural heritage features

databases, Town of Caledon official plans, Toronto and Region Conservation Authority (TRCA) regulated area plans, and MECP water well records were reviewed.

- *Fieldwork:* Fieldwork includes inspecting the Subject Site and surrounding properties concerning the natural features, groundwater receptors, and structures, as well as installing and developing the monitoring wells. Additionally, groundwater levels within the installed monitoring wells were monitored over fifteen (15) monitoring events, and in-situ hydraulic conductivity testing was completed within the installed monitoring wells. Additionally, one (1) set of groundwater samples was collected and submitted to a CALA laboratory to characterize groundwater quality in comparison with the Region of Peel Storm and Sanitary Sewer Use By-Law parameters. Furthermore, four (4) sets of surface water samples were collected to assess the background surface water quality after a 45 mm storm event.
- *Wetlands and Watercourses Monitoring Program:* Installation of piezometers and staff gauges and establishment of the surface water flow monitoring stations within the wetland areas and watercourses. The wetland monitoring program consists of the monitoring of the installed piezometers, staff gauges and flow monitoring stations over a 2-year monitoring program. Additionally, the surface water quality monitoring program for the watercourses over 2 years is conducted at the selected locations. The location of the surface water sampling is selected based on the review of the Town of Caledon Terms of Reference for the Local Sub watershed Studies Dated May 2024.
- *Short-Term Dewatering Needs:* Based on a review of the available design drawings, findings of the current subsurface investigation, and recommendations provided in the geotechnical investigation report (if available), a preliminary short-term dewatering flow rate including groundwater seepage, and anticipated water that should be collected over potential storm events, is calculated and presented in the current hydrogeological assessment report. A mitigation plan will be recommended to mitigate potential short-term dewatering impacts to the nearby groundwater receptors (including natural heritage features and water supply wells), and structures, if applicable.
- *Permit Requirements:* Considering the estimated preliminary short-term construction dewatering and long-term foundation drainage flow rates, as a part of the hydrogeological assessment report, recommendations are provided on any need for applying for a PTTW or posting on the EASR with the MECP, and the Town of Caledon/ Region of Peel, if required.

3.0 APPLICABLE REGULATIONS AND OFFICIAL PLANS

The regulations and policies relevant to this hydrogeological assessment and the location of the Subject Site within the official plans are summarized below.

3.1 Toronto Regional Conservation Authority (TRCA) Policies and Regulation (O. Reg. 41/24)

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 TRCA, through its regulatory mandate, is responsible for issuing permits under Ontario Regulation (O. Reg.) 41/24, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses for development proposals or Site alteration work to shorelines and watercourses within the regulated areas.

TRCA Regulated Area online mapping was reviewed on December 16, 2024. It is our understanding that the small area surrounding the two existing creeks or swales, which cross the Subject Site from northwest to southeast in the north portion of the Subject Site, and another originating from the southern portion of the Subject Site to the southeast boundary, falls within a TRCA Regulated Area. Therefore, it is expected that obtaining a permit from the TRCA under O. Reg. 41/24 will be necessary for the proposed development.

3.2 Clean Water Act

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.

Based on a regional-scale source water protection mapping (Source Water Protection Information atlas) provided by the MECP on December 17, 2024, the Subject Site is not located within a WHPA area Q1 and Q2, issue contributing area and intake protection zone, event-based area and HVA.

Additionally, the Subject Site is identified within a Significant Groundwater Recharge Area (SGRA) according to the regional-scale Source Water Protection mapping (Source Water Protection Information Atlas).

Furthermore, a review of the TRCA’s open dataset on the Humber River Watershed Plan (HRWP),

accessed on May 28, 2025, describes SGRAs as areas where groundwater recharge occurs through permeable soils such as sand or gravel. These areas are considered significant under the Clean Water Act, 2006, when they contribute to maintaining aquifer levels that supply drinking water and exhibit higher-than-average recharge rates across the Source Protection Area.

Findings from the current site-specific geotechnical and hydrogeological investigation indicate that the Subject Site is primarily composed of silty clay and silty clay till—soil types known for their low permeability. This is further supported by hydraulic conductivity test results from in-situ hydraulic conductivity tests, which also demonstrated low permeability.

Given the site's soil composition and the results of the current investigation, the Subject Site does not exhibit the characteristics of a Significant Groundwater Recharge Area.

3.3 Future Town of Caledon Official Plan

The Town of Caledon Official Plan establishes the policies to guide the development of the Town. Caledon Council on October 22, 2025, approved the future Caledon Official Plan to shape the future of Caledon for the next 30 years. The Future Caledon Official Plan implements the Region of Peel Official Plan (April 2022) which identifies the Mount Hope West lands as a "2051 Urban Area" on Schedule E-1 (Regional Structure).

Future Caledon Official Plan maps were reviewed for the current study with the results summarized below:

- Schedule B1 (Town Structure) - A review of the map, dated October 2025, delineates the Mount Hope West lands as an "Urban Area".
- Schedule B2 (Growth Management) – A review of the map, dated October 2025, delineates the Mount Hope Land as a “New Urban Area 2051”.
- Schedule B4 (Land Use Designation) - A review of the map, dated October 2025, indicates that the Subject Site is located within the New Community Area.

Based on the information reviewed from the Notice of the Passing of Zoning By-Bylaw 2024-057, it is understood that the purpose and effect of By-law 2024-057 is to amend Comprehensive Zoning By-law No. 2006-50, as amended to rezone lands to provide a range of housing and land uses that aim to advance Caledon’s Housing Pledge and the prescribed provincial priority of building 1.5 million new residential units by December 2031. The town of Caledon Council in November 2024 also approved a Growth Management and Phasing Plan which identified the Mount Hope West lands as being in Phase 1 of the town's future Growth.

4.0 METHODOLOGY

4.1 Borehole Advancement, Monitoring Well and Piezometer Installation

Drilling boreholes and construction of monitoring wells were conducted for geotechnical investigation by SEL Ltd (SEL). Between September 23 and 26, 2023. The program consisted of the drilling of thirteen (13) boreholes (BH) and the installation of twelve (12) monitoring wells for geotechnical and hydrogeological assessment purposes.

Moreover, additional drilling and installation of the monitoring wells and mini piezometers (MP), and piezometers (PZ) were conducted for the hydrogeological assessment and wetland monitoring program by SEL Ltd (SEL) between May 8 and May 9, 2024. The program consisted of the drilling and installation of nine (9) monitoring wells and twelve (12) mini piezometers for wetland monitoring and hydrogeological assessment. An additional three (3) deep monitoring wells were installed within the Subject Site between April 10 and 13, 2025. The locations of the boreholes and monitoring wells are shown on **Drawing 2**.

Borehole drilling and monitoring well construction were completed by a licensed water well contractor, under the full-time supervision of a drilling supervisor from SEL. SEL's geotechnical/hydrogeological supervisor logged the soil strata encountered during borehole advancement and collected representative soil samples for textural classification. The boreholes were drilled using a track-mounted drill rig equipped with continuous flight, solid-stem augers. Detailed descriptions of the encountered subsoil and groundwater conditions are provided by SEL and presented on the borehole and monitoring well logs, on the enclosed **Appendix A-1, Appendix A-2,** and **Appendix A-3**.

The monitoring wells were constructed using 50-mm diameter Trilock pipes and 1.5 to 3.0 m long slotted well screens, which were installed in each of the selected geotechnical boreholes. All of the monitoring wells were equipped with monument protective casings above the ground surface.

The 30 mm diameter Trilock pipes and 0.6 m long slotted well screen, were installed at the selected location. The mini piezometers were installed to observe the surficial water interaction with the shallow stratigraphy at the selected locations close to the wetland and or drainage features.

The UTM coordinates and ground surface elevations at the monitoring wells and piezometer locations, as well as the construction details, are presented in **Table 4-1**. The ground surface elevations and horizontal coordinates at the monitoring wells and piezometers' locations were determined at the time of the investigation, using a TSC 3 SP 60 (Trimble) handheld Global Navigation Satellite System.

Table 4-1 Monitoring Well and Piezometer Installation Details

MW, MP, PZ ID	Installation Date	UTM Coordinates (m)		Ground El. (masl)	Screen Interval (mbgs)	Soil in the Screen Interval	Casing Dia. (mm)	Protective Casing Type
		Easting	Northing					
BH/MW 1	October 24, 2023	601146.9	4861361.0	262.5	13.8 – 16.8	Silty Clay Till	50	Monument
BH/MW 2S	October 26, 2023	601039.9	4861194.0	262.6	4.6 – 6.1	Silty Clay Till	50	Monument
BH/MW 2D	October 26, 2023	601041.9	4861194.6	262.7	15.1 – 16.6	Silty Clay	50	Monument
BH/MW 4	October 25, 2023	600901.5	4861281.0	261.0	13.6 – 16.6	Silty Clay Till	50	Monument
BH/MW 5	October 25, 2023	600762.5	4861114.5	259.2	6.2 – 7.7	Silty Clay	50	Monument
BH/MW 6	October 25, 2023	600742.8	4861271.6	258.9	6.2 – 7.7	Silty Clay	50	Monument
MP 3	May 8, 2024	600777.2	4861281.8	258.7	0.8 – 1.4	Earth Fill	30	NA
MP 4	May 8, 2024	600656.7	4861357.3	259.9	0.8 – 1.4	Silty Clay (interpolated)	30	NA
BH/MW 7	October 23, 2023	600948.6	4861533.2	259.0	3.1 – 6.1	Silty Clay	50	Monument
MP 12	May 8, 2024	600966.5	4861545.8	257.6	0.9 – 1.5	Silty Clay	30	NA
BH/MW 8	May 9, 2024	600741.9	4861547.5	262.0	2.8 – 5.8	Silty Clay and Silty Clay Till	50	Monument
BH/MW 9	October 24, 2023	600753.9	4861727.0	260.6	3.2 – 6.2	Silly Clay and Silty Clay Till	50	Monument
BH/MW 10	October 23, 2023	600530.9	4861721.7	263.1	3.1 – 6.1	Silty Clay	50	Monument
BH/MW 12	October 24, 2023	600343.4	4861928.9	263.0	3.1 – 6.1	Silty Clay and Silty Clay Till	50	Monument
BH/MW 13	October 24, 2023	600326.8	4862131.4	262.0	3.3 – 6.3	Silty Clay	50	Monument
BH/MW 101	May 9, 2024	600993.9	4861264.1	262.2	2.9 – 4.6	Silty Clay	50	Monument
MP 1	May 8, 2024	600992.9	4861249.2	262.0	0.8 – 1.4	Silty Clay	30	NA
BH/MW 102	May 9, 2024	600943.4	4861385.8	259.5	3.0 – 4.5	Silty Clay	50	Monument
MP 2	May 8, 2024	600937.3	4861382.4	259.4	0.9 – 1.5	Silty Clay	30	NA
BH/MW 103	May 8, 2024	600594.0	4861494.2	259.1	3.1 – 4.6	Silty Clay	50	Monument
MP 5	May 8, 2024	600582.3	4861515.7	259.0	0.9 – 1.5	Silty Clay	30	NA
BH/MW 104	May 8, 2024	600456.8	4861666.4	261.6	3.1 – 4.6	Silty Clay and Silty Fine Sand	50	Monument
MP 6	May 8, 2024	600464.0	4861665.3	261.6	0.9 – 1.5	Silty Clay	30	NA
BH/MW 105	May 8, 2024	600375.0	4861775.8	261.8	3.1 – 4.6	Silty Clay and Silty Fine Sand	50	Monument
MP 7	May 8, 2024	600373.9	4861783.0	261.6	0.8 – 1.4	Silty Clay	30	NA
MP 8	May 8, 2024	600342.6	4861753.2	261.5	0.8 – 1.4	Silty Clay	30	NA
BH/MW 106	May 8, 2024	600293.4	4861830.3	261.5	3.1 – 4.6	Silty Clay	50	Monument
MP 9	May 8, 2024	600257.5	4861819.4	261.3	0.7 – 1.3	Silty Clay & Silty Fine Sand	30	NA
BH/MW 107	May 9, 2024	600466.1	4862007.4	259.9	3.1 – 4.6	Silty Clay	50	Monument
MP 10	May 8, 2024	600484.2	4862022.1	259.4	0.9 – 1.5	Silty Clay	30	NA

MW, MP, PZ ID	Installation Date	UTM Coordinates (m)		Ground El. (masl)	Screen Interval (mbgs)	Soil in the Screen Interval	Casing Dia. (mm)	Protective Casing Type
		Easting	Northing					
BH/MW 108	May 9, 2024	600689.0	4861819.8	259.3	3.1 – 4.6	Silty Clay	50	Monument
MP 11	May 8, 2024	600686.3	4861821.9	259.2	0.9 – 1.5	Silty Clay	30	NA
PZ 1S	December 7, 2023	600283.2	4862009.2	260.4	3.0 – 4.5	Silty Clay	20	Monument
PZ 1D	December 7, 2023	600283.4	4862009.8	260.4	4.8 – 6.3	Silty Clay	20	Monument
BH/MW 201	April 10, 2025	600767.1	4861115	262.4	29.2 -30.7	Silty Fine Sand	50	Monument
BH/MW 202	April 11, 2025	601145.7	4861362	259.3	36.6-38.1	Sandy Silt	50	Monument
BH/MW 203	April 13, 2025	600326.8	4862131	262.1	24.1-27.1	Sandy Silt and Silt	50	Monument

Notes:
mbgs metres below ground surface,
masl metres above sea level,
MP- Mini Piezometer,
PZ- Piezometer
S- Shallow nested monitoring well/piezometer
D- deep nested monitoring well/piezometer

4.2 MECP Water Well Records Review

MECP Water Well Records (WWRs) were reviewed for the registered wells located at the Subject Site and within a 500 m radius of the Subject Site boundaries (Study Area). The water well records indicate that twenty-three (23) wells are located within the 500 m zone of influence of the Study Area relative to the Subject Site. The findings of the MECP well records are summarized in **Section 5.6** of the current report.

4.3 Groundwater and Wetland/Surface Water Monitoring

All twenty-three (23) installed monitoring wells were utilized to measure and monitor groundwater and twelve (12) mini piezometers and piezometers were utilized to measure and monitor wetlands and water courses in the Subject Site and adjacent land to the north and west of the Subject Site.

Monitoring wells BH/MW 1 to 7 and BH/MW 9 to 13 were developed on November 15, 2023, and BH/MW 101 to 108 and BH/MW 8 were developed on May 28, 2024. BH/MW 1, 8, 101 to 108, and MP 1 to 12 were instrumented with the automated transducer data logger to continuously monitor the groundwater and water table fluctuation in the wetland features and watercourse/water bodies. The groundwater level and water table monitoring program in the wetland features is currently ongoing and this report will be updated upon completion of the 2-year long-term groundwater and wetland monitoring program.

Additionally, newly installed deep BH/MW 201, 202 and 203 were developed on May 12, 2025 and monitored on August 28, 2025, October 24, 2025, and December 16, 2025 to record the stabilized water levels in the deep aquifer.

The stabilized groundwater levels were also measured manually over fourteen (14) monitoring events from November 15, 2023, to December 16, 2025, with the results presented in **Sections 7.2**, **7.3** and **7.4**.

4.4 In-Situ Hydraulic Conductivity Test

SEL has conducted in-situ hydraulic conductivity tests (falling head) at all the BH/MW locations, with the exception of BH/MWs 201, 202 and 203. The in-situ hydraulic conductivity test (falling head and rising head) provides estimated hydraulic conductivity (K) for subsoil strata at the depths of the well screens. The monitoring wells were developed in advance of the tests. Well development involves the purging and removal of groundwater from each monitoring well 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 in-situ falling head hydraulic conductivity test involves the placement of a slug of known volume into the monitoring well, below the water table, to displace the groundwater level upward. The in-situ rising head hydraulic conductivity test involves removing a volume of water from the monitoring well to displace the groundwater level downward. The rate at which the water level recovers to static conditions (rising head/falling head) is tracked manually using a water level tape and a data logger. The rate at which the water table recovers to static conditions is used to estimate the K value for the water-bearing strata formation at the well screen depth using the Bouwer and Rice method (1976). The findings for the hydraulic conductivity testing are presented in **Section 7.7** of the current report.

4.5 Hydraulic Conductivity Based on Grain Size Distribution Graphs

The Hazen equation estimation method was also used to estimate the hydraulic conductivity (K) for saturated subsoils at selected depths beneath the water table below the subject site. The method provides alternative hydraulic conductivity (K) estimates, which are derived from the grain size diameter, whereby 10% by weight of the soil particles are finer, and 90% are coarser (Freeze and Cherry, 1979). The soils chosen for the Hazen Method estimation were selected primarily from above the well screen depths. Findings are presented in **Section 7.8**.

4.6 Groundwater and Surface Water Quality Assessment

SEL completed a groundwater quality assessment on January 4, 2024. One (1) set of groundwater samples was collected from one (1) selected monitoring well (BH/MW 2D) to characterize its quality for evaluation against the Region of Peel Sanitary and Storm Sewer Use By-Law parameters. This assesses whether any anticipated dewatering effluent can be disposed of into the Region of Peel Storm and Sanitary Sewer system during construction. Based on the results, recommendations for any pre-treatment for any dewatering/drainage effluent can be developed, if required. Furthermore, surface water samples were collected at Flow Stations 1, 2, 3 and 4 on April 3, 2025, following a 45-mm rain event.

SGS Canada Inc. performed the sample analysis and the results of the analysis are discussed in **Section 7.7** of the current report.

4.7 Review of Regional Data and Available Reports for the Subject Site

The maps, data, and documents provided by the MECP, Ontario Geological Survey (OGS), Ministry of Natural Resources (MNR), Oak Ridges Moraine Group (ORMGP), and TRCA were reviewed. Additionally, an issued geotechnical report was reviewed at the time of preparation of the current hydrogeological assessment report, with the findings summarized in **Sections 5 and 6**.

5.0 REGIONAL AND LOCAL SITE SETTING

5.1 Regional Geology

The current understanding of the surface geological setting of the Subject Site is based on scientific work conducted by the OGS (OGS, 2003). The Subject Site is located within an area mapped as Clay to silt-textured till (derived from glaciolacustrine deposits or shale) (5d). **Drawing 3** illustrates the mapped surficial geology for the Subject Site and the surrounding area.

The Oak Ridges Moraine Groundwater Program (ORMGP) produced a cross-sectional geological map to aid in the characterization of the general area. Considering the regional cross-section, it is understood that the overburden units prevalent in this area are as follows, with the youngest unit at the top:

- *Undifferentiated Sediments:* Undifferentiated sediments present in the ground surface, with an approximate thickness of ranging from 0.07 to 1.38 m the Subject Site.
- *Halton Till (Upper Till):* The Halton Till is mainly comprised of sandy silt to clayey silt till interbedded with silt, clay, and a number of discontinuous sand and gravel lenses. It was deposited approximately 12,500 years ago. Based on cross-section, the Halton Till or equivalent can be contacted beneath the undifferentiated sediments with an approximate thickness ranging from 9.6 m to 30.2 m.
- *Oak Ridges Moraine:* The Oak Ridges Aquifer Complex (ORAC) is a regionally significant aquifer in southern Ontario. It is primarily composed of interbedded fine sand and silt deposits with localized coarse sand and gravel deposits. The ORAC is approximately 90 m thick beneath the crest of the moraine but thins out rapidly towards the margins. The approximate thickness of the ORAC ranges from 36 m to 54 m in across the Subject Site.
- *Lower New Newmarket Till:* The Newmarket Till is a regionally extensive till formation that acts as an aquitard separating the Oak Ridges Aquifer Complex (ORAC) from the underlying Thorncliffe Formation. Based on the ORMGP cross-section, Newmarket Till is mapped beneath the ORAC. The thickness of the lower Newmarket Till ranges from 0.2 to 2.3 m beneath the Subject Site.
- *Thorncliffe Formation:* The Thorncliffe Formation consists of glaciofluvial and glaciolacustrine sand and silt deposited approximately 30,000 to 50,000 years ago. The Thorncliffe Formation shows a considerable variation in grain size and thickness, both locally and regionally. It acts as a regional aquifer. Based on the ORMGP cross-section, the approximate thickness of the Thorncliffe at the Subject Site ranges from 5.8 to 16.2 m across the Subject Site.

The underlying bedrock at the Subject Site is the Georgian Bay Formation, which consists of limestone along with shale (OGS, 2007). A review of the ORMGP cross-section indicates that the bedrock could be

contacted at an approximate depth ranging between 52 and 104.0 metres below ground surface (mbgs) beneath the Subject Site.

5.2 Regional Physiography

The Subject Site lies within the physiographic region of southern Ontario known as the South Slope and the landform is identified as Till Plain (Drumlinized). **Drawing 4** shows the location of the Subject Site within the regional physiography map.

5.3 Regional Topography and Drainage

A review of a regional topography map presented on **Drawing 5** indicates that the topography of the Subject Site and the surrounding area is gradually sloping towards the south. The site topography is undulating. The ground surface elevation ranges approximately between 257.6 metres above sea level (masl) to 263.0 masl based on ground surface elevations measured at the borehole and monitoring wells' locations.

5.4 Watershed Setting

The Subject Site is located within the Humber River Watershed that falls in the Toronto and Region Conservation Authority (TRCA) jurisdiction.

5.5 Local Surface Water and Natural Heritage Features

The MNR database was reviewed for any natural heritage features, watercourses, bodies of water, wetland features, Area of Natural and Scientific Interest (ANSI) and wooded areas. **Drawing 6-1** shows the location of the Subject Site within the surrounding Natural Heritage Features.

Record review indicates that there is a total of two (2) tributaries of the Cold Creek that outlet to Humber River. One (1) Tributary is mapped in the Northern portion of the Subject Site, flowing from the west to the southeast direction. The second tributary is located in the southern portion of the Subject Site, flowing from the east to the southwest direction and eventually south/southeasterly direction towards the Humber River.

Records of water bodies (ponded waterbody) are mapped within the Subject Site and surrounding lands. Three (3) records are mapped in the north, central and south portions of the Subject Site.

A review of the Development Concept Plan provided by KLM Planning. dated January 14, 2026 Presented in **Appendix A-4**, indicates that the northern water body is located within the proposed Natural Heritage system (NHS) area.

Based on the review of Figure 5- Head Water Drainage Feature Assessment Map dated February 18, 2026, Project 2407713, prepared by GEI Consultant, presented in **Appendix A-4** and discussion with the ecologist, the central water body was not observed during the investigation.

Additionally, it is understood that the water body and its associated unevaluated wetland located in the southern portion of the Subject Site located close to the SG 5 Identified as A in the **Drawing No 6-2** and the unevaluated wetland located near BH/MW 101 and MP 1 location is located within the development foot print and proposed to be removed as per the Figure 2 of the project 2407713 dated February 18, 2026 prepared by GEI presented in **Appendix A-4**.

Furthermore, as per the reviewed records, records of wetland features are mapped around the Subject Site as follows:

- Three (3) wetlands are mapped as unevaluated wetland features outside of the west boundary of the Subject Site. The records are marked as B, C and D on **Drawing 6-2**.
- Four (4) wetlands are mapped as Provincially Significant Wetland (PSW), including two (2) records in the northwest and two (2) records in the west outside of the Subject Site boundary. The records are marked as E, F, G and H on **Drawing 6-2**.

SEL installed mini piezometers and monitoring wells to monitor the selected existing wetlands mapped within and in close proximity to the Subject Site. The location of the monitoring stations is presented in **Drawing 6-2**. The names, types and nearby monitoring wells and details of the wetlands are provided in **Table 5-1**.

"The Natural Heritage Characterization Report for Mount Hope Lands", prepared by GEI Consultants on December 20, 2024, has been reviewed. A summary of information is presented in **Table 5-1**. In cases where there are discrepancies between the mapping in the Natural Heritage Characterization Report and the MNR datasets, the map prepared by GEI should be considered as it reflects actual site conditions based on ground-truthed surveys. Preliminary Natural Heritage Constraints is provided in **Appendix A-4**.

Table 5-1 List of the Evaluated and unevaluated Wetlands and Nearby Monitoring Wells

Nearby Installed Monitoring Wells, Mini Piezometers and Piezometers by Soil Engineers Ltd.	Wetland Name and Significance Based on the review of the MNRF's Natural Heritage Area Map	Based on the review "Natural Heritage Characterization Report for Mount Hope Lands", prepared by GEI Consultants on December 20, 2024	
		Wetland Type	Details
BH/MW 101 and MP 1	NA	Marsh	Unevaluated Wetlands to be removed and replicated in greenbelt
BH/MW 102 and MP 2	Unevaluated Wetland	Marsh	Unevaluated Wetlands to be removed and replicated in greenbelt
BH/MW 6 and MP 3	NA	Marsh	Provincially Significant Wetland to be removed and replicated along the realigned water course
MP 4	Watercourse	NA	Watercourse

Nearby Installed Monitoring Wells, Mini Piezometers and Piezometers by Soil Engineers Ltd.	Wetland Name and Significance Based on the review of the MNRF's Natural Heritage Area Map	Based on the review "Natural Heritage Characterization Report for Mount Hope Lands", prepared by GEI Consultants on December 20, 2024	
		Wetland Type	Details
BH/MW 103 and MP 5	Unevaluated Wetland	Marsh	Two unevaluated wetlands (requiring evaluation) located close to the monitoring well and mini piezometer
BH/MW 104 and MP 6	Castlederg Wetland Complex – Evaluated Provincial	Marsh	Provincially Significant Wetland (PSW)
BH/MW 105 and MP7	Waterbody	NA	Based on Figure 6 in GEI's report, no wetland was identified at this location
MP 8	Unevaluated Wetland and Waterbody	NA	Based on Figure 6 in GEI's report, no wetland was identified at this location
BH/MW 106 and MP 9	Unevaluated Wetland	Marsh	Unevaluated Wetland
BH/MW 13, PZ 1S and PZ 1D	Castlederg Wetland Complex – Evaluated Provincial	Thicket Swamp	Provincially Significant Wetland (PSW) to be re-evaluated
BH/MW 13, PZ 1S and PZ 1D	Castlederg Wetland Complex – Evaluated Provincial	Marsh	Provincially Significant Wetland (PSW) to be re-evaluated
BH/MW 107 and MP 10	Waterbody associated with a drainage feature	Marsh	Provincially Significant Wetland (PSW) to be re-evaluated
BH/MW 108 and MP 11	NA	NA	Headwater Drainage Feature
BH/MW 7 and MP 12	NA	NA	Headwater Drainage Feature

NA- Not Available

There are records of wooded areas associated with the above-mentioned wetland features. Small bodies of water are also mapped within and close proximity of the Subject Site.

5.6 Ground Water Resources (MECP Well Records)

The MECP well record database was reviewed for records located within a radius of 500 m from the approximate Site boundary (the Study Area). The records indicate that twenty-three (23) well records are located within the Study Area relative to the Subject Site boundaries. A summary of data obtained from the records review is presented in **Table 5-1**.

The locations of the well records, based on the UTM coordinates provided by the records, are shown on **Drawing 7**. Details of the MECP water well records that were reviewed are provided in **Appendix B**.

Table 5-2 MECP Well Record Summary

Water Use (Final Status)	
Status	**Number of Records**
Unknown	2
Abandoned-Other	4
Abandoned-Supply	1
Abandoned-Quality	1
Monitoring and Test Hole	2
Water Supply	12
Test Hole	1
Total	**23**

The above summary indicates that there are two (2) records of water supply wells located within the Subject Site. Additionally, there are records of water supply wells within the close proximity of the Subject Site.

Additionally, the Private Water Supply Well Survey (Pre-Construction monitoring Study) was completed and provided in the report titled “Private Water Supply Well Survey (Pre-Construction Monitoring Study, Proposed Residential Development, Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon.”, dated April 4, 2025 (SEL Ref. No.2309-W138)

5.7 Active Permit to Take Water Application Record Review

The MECP website was reviewed for any active PTTW application records within a 1.0 km radius of the Subject Site on February 24, 2026. Record review indicates there are no records for active PTTW within the Study Area.

5.8 Active EASR Registration Record Review

The MECP Website was reviewed for any active EASR Registration record within a 1.0 Km radius of the Subject Site on December 17, 2024. Record review indicates that there are no records of active EASR registration within the study area.

6.0 SOIL LITHOLOGY AND SUBSURFACE INVESTIGATION

The subsoil investigation has revealed that beneath the topsoil veneer, and the Earth fill the Subject Site mainly comprises silty clay, silty clay till and silty fine sand. Information regarding borehole logs is presented in **Appendix A-1 and A-2**. The approximate locations of boreholes are shown on **Drawing 2**. Additionally, a cross-section Key plan and geological cross-sections are presented on **Drawings 8-1, 8-2A**, **8-2B** and 8-2C respectively. Based on a review of the geotechnical investigation report prepared by SEL and additional hydrogeological and wetland monitoring the stratigraphy beneath the investigated areas of the Subject Site generally consists of the following:

6.1 Topsoil

A surficial topsoil layer was encountered at all borehole locations. The measured topsoil depths ranged from 10 cm to 36 cm.

6.2 Earth Fill

A layer of earth fill, consisting of silty clay with topsoil and organic inclusions, was contacted beneath the topsoil veneer at Boreholes 5 and 6, and BH/MW 202. The fill extends to depths of 4.7 m, 3.7 m, and 4.7 mbgs, respectively. The water content values range from 13% to 26%, with a median of 21%, indicating the fill is in a moist condition.

6.3 Silty Clay Till and Silty Clay

Native silty clay till and silty clay were generally contacted beneath the topsoil veneer and earth fill. Occasional wet sand and silt layers were also identified within the drift. Based on review of BH/MW 201, 202 and 203, an upper silty clay till layer was encountered at depths ranging from ground surface to 17.5 mbgs, 10.0 m to 14.5 mbgs, 7.9 m to 11.5 mbgs. Furthermore, lower silty clay layers were encountered at BH/MWs 201, 202 and 203 at depths ranging from 25.2 m to 27.0 mbgs, 16.3 to 20.5 mbgs, and 11.5 to 20.7 mbgs, respectively.

The natural water content values range from 9% to 37%, with a median of 23%, indicating that silty clay till and silty clay are generally in moist conditions. The colour change from brown to grey was observed at approximately 3.0 to 7.0 mbgs.

The estimated permeability for the silty clay unit encountered at BH/MW 1, 2, 7, 4, 5, 12, 103 and 101 at depths of 10.7, 15.2, 3.1, 10.7, 6.1, 2.3, 4.6, and 3.0 mbgs is about 10-7 cm/sec. Grain size analyses were performed on eight (8) subsoil samples, and the gradation is plotted in Appendix A-1 (Figure 14-15) and Appendix A-2 (10 and 11).

6.4 Silty Fine Sand

A layer of silty fine sand was encountered at the shallower depths in BH/MW 104, 105, 106 within the silty clay unit. The natural water content of the soil samples ranges between 16% and 20%, at a median of 19%, showing a moist to very moist condition. The consistency of the soil ranges from loose to dense. The silty fine sand material was observed brown in colour. The estimated permeability for the silty fine sand unit encountered at BH/MW 105 at a depth of 2.5 mbgs is about 10^{-3} cm/sec. It was also contacted at BH/MW 201 at a depth of 27.0 extending to a termination depth of investigation at 30.6 mbgs. The estimated permeability for the deep unit is about 10^{-4} cm/sec. Grain size analyses were performed on two (2) subsoil samples, and the gradation is plotted in **Appendix A-2** (**Figure 12)** and **Appendix A-3 (Figure 4)**.

6.5 Sandy Silt

A layer of Sandy Silt was encountered in BH/MW 202 and 203 at depths of 31.5 and 20.7 mbgs, respectively. The natural water content of the soil samples ranges between 12% and 26%, showing a moist to very moist condition. The consistency of the soil ranges from compact to very dense. The sandy silt material was observed grey in color. The estimated permeability for the sandy silt samples encountered at BH/MW 202 and 203 at depths of 33.5 and 24.4 mbgs are about 10^{-4} and 10^{-5} cm/sec, respectively. Grain size analyses were performed on two (2) subsoil sample, and the gradation is plotted in **Appendix A-3** (**Figures 5-6).**

6.6 Silt

A layer of Silt was encountered in BH/MWs 201, 202 and 203. The natural water content of the soil samples ranges between 13% and 28%, at a median of 20%, showing a moist to very moist condition. The consistency of the soil ranges from compact to very dense. The silt material was observed grey in color.

7.0 LOCAL HYDROGEOLOGICAL STUDY

7.1 Monitoring Well Development and Groundwater Level Monitoring

All twenty-three (23) installed monitoring wells were utilized to measure and monitor groundwater level fluctuation. Monitoring wells BH/MW 1 to 7 and BH/MW 9 to 13 were developed on November 15, 2023. BH/MW 101 to 108 and BH/MW 8 were developed on May 28, 2024, and BH/MW 201, 202, and 203 were developed on May 12, 2025. BH/MW 1, 8, 101 to 108 were instrumented with the automated transducer data logger to continuously monitor the groundwater level fluctuation. The monitoring program is currently ongoing and this report will be updated upon completion of the 2-year long-term groundwater and wetland monitoring program. BH/MWs 201, 202 and 203 were installed to monitor the stabilized deep groundwater levels within the Subject Site.

The stabilized groundwater levels were also measured manually over fourteen (14) monitoring events from November 15, 2023, to December 16, 2025. SEL measured the groundwater levels using an interface probe (Heron Water Tape Series #1900). A summary of the groundwater level observations and their corresponding elevations are provided in **Appendix C**.

The automated transducer Dataloggers were also installed to record groundwater fluctuation hourly basis. The hydrographs are presented in **Appendix D (Pages 1 to 10)**.

Based on the review of the manual groundwater level monitoring data presented in **Appendix C** and hydrographs presented in **Appendix D**, the highest and lowest stabilized shallow groundwater levels were measured ranging between El. 255.1 masl and 263.1 masl at BH/MW 5 and BH/MW 12, respectively.

Based on the review of the manual groundwater level monitoring data presented in **Appendix C**, the highest and lowest stabilized deep groundwater levels were measured ranging between El. 243.6 masl and 233.3 masl at BH/MW 203 and BH/MW 202, respectively.

A review of the groundwater levels measured in shallow and deep nested monitoring wells BH/MW 2S and BH/MW 2D installed at depths of 6.1 mbgs and 16.6 mbgs, respectively indicates a downward vertical hydraulic gradient.

7.2 Wetland and Surface Water Fluctuation Monitoring

Twelve (12) mini piezometers were utilized to measure and monitor wetlands or surface water including the existing watercourses and water bodies.

MP 1 to 12 were instrumented with the automated transducer data logger to continuously monitor the water table fluctuation in the wetland features. The water table monitoring beneath the Subject Site is currently ongoing and this report will be updated upon completion of a 2-year long-term wetland monitoring program.

Furthermore, water table fluctuations were manually measured over eight (8) monitoring events from May 28, 2024, to December 16, 2025.

Based on the review of the Hydrographs presented in **Appendix D (Pages 11 to 22)** and manual water table monitoring presented in **Appendix C** the highest and lowest surficial water table interacting within the shallow stratigraphy measured at El. 262.1 masl and 256.3 masl at MP 1 and MP 12, respectively.

Based on the review of the groundwater level monitoring programs, all piezometers, with the exception of MP 3, MP 6 and MP 11, remained dry between August 28 and December 16, 2025.

The existing water bodies near the Subject Site were also equipped with staff gauges. The findings are provided in **Appendix C (Page 2)**.

7.3 Surface Water Flow Monitoring

Surface water flow monitoring stations were established at the upstream and downstream of both creeks located on the Subject Site. Creek 1 is located in the southern portion of the Subject Site and Creek 2 is located in the northern portion of the Subject Site.

Creek flow monitoring was completed at the created surface water monitoring stations in upstream and downstream locations for each creek. The OTT MF pro-meter was utilized at the established sections of the creeks using a Cross-Sectional Discharge Measurement Technique. Since direct measurement of stream discharge is not possible; instead, it is calculated using directly measurable variables such as stream depth, width, and flow velocity. Typically, this calculation involves multiplying the stream's cross-sectional area by the water's average velocity within that section.

During the site visits conducted on June 17, 2024, August 29, 2024, and November 5, 2024, both creeks were observed to be dry at the established flow-station locations. During the visits on December 12 and 13, 2024, the Subject Site was covered in snow, and no water flow was encountered or recorded.

A site visit was completed on April 3, 2025, following a rainfall event of approximately 45 mm. During this visit, all four flow-monitoring stations experienced flooding due to heavy rainfall and widespread surface runoff. By the next site visit on May 5, 2025, both creeks were again observed to be dry at the established flow-station locations.

Subsequent site visits on August 28, 2025, and October 24, 2025, also confirmed that both creeks remained dry. Finally, snow cover was observed during the site visit on December 16, 2025. The summary of the observation is presented in **Appendix E,** with the location of the flow stations presented on **Drawings 2** and **6-2**.

7.4 Surface Water and Groundwater Interaction Monitoring

Interaction between surface water and groundwater was monitored in multiple locations at the Subject Site. A summary of findings is presented as follows:

- A review of the groundwater levels and the shallow water table in BH/MW 101 and MP1, installed within the southern portion of the Subject Site, indicates a downward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as May 5, 2025. The piezometer was observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 102 and MP2, installed adjacent to the existing water body, indicated a downward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as May 5, 2025. The piezometer was observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 103 and MP5, which were installed adjacent to a potential wetland, indicates a downward hydraulic gradient during the site visits conducted on May 28 and June 17, 2014. Furthermore, the groundwater levels and the shallow water table remained the same during the groundwater level readings conducted on August 29, November 4–5, 2024, and May 5, 2025. The piezometer was observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 7 and MP12, which were installed adjacent to an intermittent stream, indicated an upward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as May 5, 2025. The piezometer was observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 104 and MP6 were installed adjacent to an existing water body located in adjacent land to the west boundary of the Subject Site, indicated a downward hydraulic gradient during the site visits conducted on May 28, August 29, and November 4–5, 2024, as well as May 5, August 28, and December 16, 2025. An upward hydraulic gradient was observed during the site visit conducted on June 17, 2024. The piezometer was observed to be dry during the site visits conducted on October 24, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 108 and piezometer MP11 indicated a downward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as August 28, and December 16, 2025. An

upward hydraulic gradient was observed during the site visit conducted on May 5, 2025. The piezometer was observed to be dry during the site visits conducted on October 24, 2025.

- A review of the groundwater levels and the shallow water table in BH/MW 105, MP 7 and MP 8 were installed adjacent to an existing water body located in adjacent land to the west boundary of the Subject Site, indicated an upward hydraulic gradient during the site visit conducted on May 28, June 17, August 29, 2024, and May 5, 2025. A downward hydraulic gradient was observed on November 4-5, 2024. The piezometers were observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 106 and MP 9 were installed adjacent to an existing water body located in adjacent land to the west boundary of the Subject Site, indicates a downward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as May 5, 2025. The piezometer was observed to be dry during the site visits conducted on August 28, October 24, and December 16, 2025.
- A review of the groundwater levels and the shallow water table in BH/MW 107 and MP 10 were installed adjacent to an existing water body located in the north portion of the Subject Site, indicates an upward hydraulic gradient during the site visits conducted on May 28, June 17, August 29, and November 4–5, 2024, as well as May 5, 2025. The piezometer was not observed during the site visits conducted on August 28, October 24, and December 16, 2025, as it was covered by vegetation and snow cover.

Across all monitoring wells and piezometer pairs, groundwater assessments generally showed alternating upward or downward vertical hydraulic gradients depending on location and date, with most locations exhibiting downward vertical hydraulic gradients during 2024–2025 site visits, except BH/MW 7–MP12, BH/MW 105–MP7/8, and BH/MW 107–MP10, which showed upward vertical hydraulic gradients during several visits. Groundwater levels in BH/MW 103–MP5 remained stable during the 2024 to 2025 monitoring events. Many piezometers across the Subject Site, including MP1, MP2, MP5, MP7, and MP12, were dry during late-summer and fall monitoring events (August 28, October 24, and December 16, 2025), indicating seasonal low water levels.

7.5 Shallow Groundwater Flow Pattern

Groundwater level elevations measured on May 5, 2025, were considered to interpret the highest shallow groundwater flow pattern beneath the Subject Site. This interpretation suggests that it flows mainly towards the tributaries of the cold creek in an easterly, westerly, and southern direction from the center of the Subject Site. The interpreted seasonal high shallow groundwater flow pattern beneath the Subject Site is illustrated on **Drawing 9-1**.

Groundwater level elevations measured on October 24, 2025, were considered to interpret the lowest shallow groundwater flow pattern beneath the Subject Site. This interpretation suggests that it flows mainly towards the tributaries of the cold creek towards the west and south within the northern portion of the Subject Site and flows towards the north within the southern portion of the Subject Site. The interpreted seasonal low shallow groundwater flow pattern beneath the Subject Site is illustrated on **Drawing 9-2**.

7.6 Deep Groundwater Flow Pattern

Groundwater level elevations measured on October 24, 2025, were considered to interpret the groundwater flow pattern at the deep BH/MW 201, 202 and 203 installed within the deep aquifer beneath the Subject Site. This interpretation suggests that it flows mainly in a southwesterly direction within the Subject Site. The interpreted shallow groundwater flow pattern beneath the Subject Site is illustrated on **Drawing 9-3**.

7.7 Single Well Response Test

Selected BH/MWs underwent single well response testing (SWRTs) to assess the hydraulic conductivity (K) for saturated shallow aquifer or water-bearing units at the depths of the well screens. Each monitoring well was equipped with a digital transducer to record the fluctuation made to complete the SWRT. The results of the SWRT tests are presented in **Appendix F**, with a summary of the findings provided in **Table 7-1**.

Table 7-1 A Summary of Falling Head Hydraulic Conductivity Testing

Well ID	Ground El. (masl)	Monitoring Well Depth (mbgs)	Screen Interval (mbgs)	Screened Soil Strata	Hydraulic Conductivity (K in m/s)	Test Method
BH/MW 2D	262.6	16.6	15.1 – 16.6	Silty Clay	2.0×10^{-6}	Falling Head Test
BH/MW 2S	262.6	6.2	4.7 – 6.2	Silty Clay Till	6.2×10^{-7}	Falling Head Test
BH/MW 4	261.0	16.6	13.6 – 16.6	Silty Clay Till	3.1×10^{-7}	Falling Head Test
BH/MW 5	259.2	7.7	6.2 – 7.7	Silty Clay	4.9×10^{-8}	Falling Head Test
BH/MW 7	259.0	6.1	3.1 – 6.1	Silty Clay	1.3×10^{-7}	Falling Head Test
BH/MW 9	260.6	6.2	3.2 – 6.2	Silty Clay and Silty Clay Till	4.6×10^{-7}	Falling Head Test
BH/MW 12	263.0	5.9	2.9 – 5.9	Silty Clay and Silty Clay Till	5.0×10^{-8}	Falling Head Test
BH/MW 13	262.0	6.3	3.3 – 6.3	Silty Clay	1.1×10^{-7}	Falling Head Test

Notes:
mbgs metres below ground surface
masl metres above sea level

7.8 Hydraulic Conductivity Test Using Grain Size Distribution Graphs

The Hazen Equation method was adopted to estimate the hydraulic conductivity (K) for different soil layers that may contain groundwater during the seasonal high-water table (spring) period, or if they are not encountered within the screen intervals.

The Hazen Equation method relies on the interrelationship between hydraulic conductivity and effective grain size, d_{10}, in the soil media. This empirical relation predicts a power-law relation with K, as follows:

$$K = Ad_{10}^{2}$$

where;

d_{10}: Value of the soil grain size gradation curve as determined by sieve analysis, whereby 10% by weight of the soil particles are finer and 90% by weight of the soil particles are coarser.

A: Coefficient; it is equal to 1 when *K* in cm/sec and d_{10} is in mm

The Hazen Equation estimation provides an indication of the groundwater yield capacity for saturated soil strata at the depths where soil samples were selected for grain size analysis. The grain size distribution graphs prepared for the supplementary geotechnical investigation were used to estimate the hydraulic conductivity, with the details presented in **Appendix A**. The results of the Hazen equation for samples at the Subject Site are provided in **Table 7-2**, respectively.

Table 7-2 A Summary of Hydraulic Conductivity Using the Hazen Equation

Borehole ID	Soil Sample Depth (Sample Number)	Soil Sample Elevation (masl)	Soil Strata	Hydraulic Conductivity (m/s)
BH/MW 105	2.5 (4B)	259.3	Silty Fine Sand	6.25×10^{-6}
BH/MW 201	27.4 (21)	235	Silty Fine Sand	1.44×10^{-6}
BH/MW 202	33.5 (26)	225.8	Sandy Silt	2.50×10^{-7}
BH/MW 203	24.4 (19)	237.7	Sandy Silt	1.96×10^{-6}

Notes:
mbgs metres below ground surface
masl metres above sea level

7.9 Groundwater Quality

One (1) set of groundwater samples was collected for analysis from the monitoring well BH/MW 2D on January 4, 2024, by SEL. The samples were submitted for analysis and evaluation against the Region of Peel Sanitary and Storm Sewer Use By-Law parameters. After sampling, all the bottles were placed in a cooler for shipment to the analytical laboratory. Sample analysis was performed by SGS Canada Inc., which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Results of the analysis are provided in **Appendix G**, with a discussion of the findings provided below. The chain of custody number for the submitted samples that underwent analysis is 038107.

The groundwater samples collected, comprised unfiltered groundwater. As per the Region of Peel Sanitary and Combined and Storm Sewer Use By-Law parameters, sewer use analysis, a complete set of unfiltered groundwater samples was submitted to the laboratory with the results being presented as totals for various analyzed parameters.

The results of the analysis for the unfiltered groundwater indicate no exceedance when compared and evaluated against the Region of Peel Sanitary and Storm Sewer Use By-Law parameters.

The final design for any dewatering effluent pre-treatment system is the responsibility of the contractors responsible for construction, or of the water treatment system design specialist, or mechanical engineer, if required, for any long-term foundation drainage system for the completed underground structure.

7.10 Surface Water Quality

A total of four (4) surface water sample was taken at Flow Stations 1, 2, 3 and 4 on April 3, 2025, following a 45-mm rain event. The sampling was conducted to provide the background information for the preliminary understanding of the baseline water quality information as per Section 2.2.6 of the Terms of Reference for the Local Sub-Watershed Study, Dated May 2024. The background surface water quality Results are presented in **Appendix G**.

8.0 DISCHARGE WATER CONTROL

8.1 A Review of Proposed Development Plans

Based on the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is understood that the proposed development will include the construction of a single detached, semi-detached, Townhouse, Mid-Rise Residential block in the northeast corner, a commercial block in the southeast corner, a park block, 2 Storm Water Management Ponds (Eastern and Western), and a natural heritage system at the Subject Site. The proposed subdivision will also be provided with roads and municipal services.

Additionally, the preliminary road grading plan, prepared by Scheffers Consulting Engineer, dated December 2025, was reviewed for the current assessment.

The reviewed plan is presented in **Appendix H**.

8.2 A Review of Geotechnical Investigation Report

A review of the Geotechnical Investigation report prepared by SEL Ltd., dated May 2025, indicates that:

- The investigation revealed that beneath a veneer of topsoil and a layer of earth fill in places, the site is generally underlain by strata of silty clay and silty clay till.
- The topsoil must be stripped before site grading and construction. It can only be reused for landscaping purposes. Any surplus should be disposed of off-site.
- The existing earth fill and any badly weathered/ploughed soils should be sub excavated, inspected, and sorted free of organics and/or deleterious material, before reusing for structural backfill or engineered fill.
- Where site grading with additional fill is required, the earth fill should be constructed in an engineered manner for building foundation, underground services and road construction.
- The low-rise residential dwellings with basements can be supported with conventional spread and strip footings founded on engineered fill or sound native soils. In conventional design, the foundation wall must be damp-proofed and provided with a perimeter sub drain at the wall base, connected to a positive outlet.
- Bulk excavation for the mid-rise buildings with 2 levels of underground parking will likely extend to at least 6 to 7 m below grade, in which native silty clay till or silty clay is anticipated, and it is suitable to support the proposed structure on conventional spread and strip footing.

- Excavation should be carried out in accordance with O. Reg. 213/91. Where safe sloped excavation is not feasible, temporary braced shoring walls will be required for the excavation and construction of the underground parking and foundation.

8.3 Preliminary Dewatering Requirements

Based on the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is understood that the proposed development will include the construction of a single detached, semi-detached, Townhouse, Mid-Rise Residential block in the northeast corner, a commercial block in the southeast corner, a park block, 2 Storm Water Management Ponds (Eastern and Western), and a natural heritage system at the Subject Site. The proposed subdivision will also be provided with roads and municipal services.

The current assessment provides preliminary dewatering requirements for the single detached, semi-detached, Townhouse, 2 Storm Water Management Ponds (Eastern and Western) and installation of the underground services.

As the design details for the Commercial Block and Mid-Rise Residential Blocks were not available during the preparation of this report, the associated dewatering requirements will be evaluated once the details become available.

8.3.1 Runoff Accumulation in Excavation

The amount of runoff that could accumulate in the construction excavation was also considered for any construction dewatering needs assessment. Additional dewatering may be required to maintain the dry condition of the excavation during and following significant precipitation events. Therefore, the dewatering flow rates at the Subject Site should also include removing stormwater from the excavation.

A review of the intensity duration frequency curve (IDF curve) for the year 2010 for the coordinates 43° 53' 45" N, 79° 44' 45" W, which are within the Subject Site the rainfall depth considering 2-year storm event over a 3-hour period per day is approximately 32.2 mm and a 100-year storm event over a 12-hour period per day is 102 mm. The data was taken from the Ministry of Transportation's (MTO) website. The accumulated runoff associated with rainfall events within the anticipated excavations for the proposed underground basement structure was calculated using the estimated rainfall depth multiplied by the estimated area of the proposed excavation footprint area for the building.

8.3.2 Short-term Construction Dewatering Needs

Based on the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is understood that the proposed development will include the construction of single detached, semi-

detached, Townhouse, other residential, park block, 2 Storm Water Management Pond, and a natural heritage system at the Subject Site. The proposed subdivision will also be provided with roads and municipal services.

The following sections present short-term dewatering flow rates estimated for the excavation and construction of the proposed dwellings and Installation of the Underground Services.

8.3.3 Dewatering Calculation Methodology

The pumping rate calculation for the construction of the proposed development was performed based on the assumption that each excavation will act as a trench (considering the proposed dimensions). The calculation was based on the equations provided by Powers et al. (2007). For the purposes of this analysis, steady-state flow into an open excavation is assumed. Additionally, the equations of radial flow have the following assumptions:

- Ideal aquifer conditions (homogeneous, isotropic, uniform thickness and has infinite areal extent)
- Fully penetrating pumping well
- Only lateral flow to the pumping well

The following equations were used for open trenches and is based on unconfined aquifer conditions (Powers et. al., 2007):

$$Q = \frac{\pi K(H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q	=	Anticipated pumping Rate (m3/day)
K	=	Hydraulic Conductivity (m/day)
H	=	Distance from the static water level to the bottom of the saturated aquifer (m)
h	=	Depth of water in the well while pumping (m)
R_0	=	Distance from a point of greatest drawdown to a point where there is zero drawdown (radius of influence) (m)
r_s	=	Distance to the points from the centre of the trench, assumed to be half of the trench width (m)
X	=	Trench Length (m)
L	=	Distance from a line source to the trench, Ro (m)/2

The calculated pumping rate was multiplied by a factor of safety of 1.5 to account for uncertainties and natural variability in the range of hydraulic conductivity.

8.3.4 Zone of Influence (ZOI)

An estimate of the Zone of Influence (ZOI) for dewatering in unconfined aquifers can be calculated using the following equation (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

where,

R0	=	Zone of Influence (m), beyond which there is negligible drawdown
H	=	Distance from initial static water level to bottom of saturated aquifer (m)
Sy	=	Specific yield of the aquifer formation
t	=	Time, in seconds, required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 days)
K	=	Hydraulic Conductivity (m/s)

8.3.5 Construction Dewatering Flow Rate Calculation

The proposed development comprises the construction of residential dwellings, underground services, SWM Ponds, parkland block and municipal roads.

The geotechnical investigation report suggests that the proposed residential dwellings can be supported by a conventional foundation.

The following short-term dewatering and long-term foundation drainage flow rates are based on the groundwater tables measured in the installed monitoring wells at the Subject Site. The following sections present the estimated dewatering flow rate for the construction of the houses and underground services separately.

8.3.6 Short-Term Dewatering for Residential Units

Groundwater Seepage (Residential Lots): The following are the assumptions and proposed development details for the short-term construction dewatering:

The comparison of the groundwater contour map against the preliminary grading plan, the assumed base of the excavation, and the need for dewatering is presented in **Appendix I, Page 1**.

Based on the review of **Appendix I, page 1**, the Lots and Blocks that required dewatering and the anticipated dewatering flow rates are provided in **Tables 8-1**. The summary of the calculation is presented in **Appendix I (Pages 2-5)**.

The following assumptions were used for the dewatering assessment for the Residential lots and blocks,

- The proposed residential development will include one type of single detached houses, one type of semi-detached houses and one type of townhouse blocks, as indicated in the development plan.
- The shallow groundwater flow pattern map, prepared based on the stabilized groundwater levels measured on May 5, 2025, was utilized for the assessment.
- The highest estimated hydraulic conductivity of 1.3×10^{-7} m/sec and 6.2×10^{-7} m/sec for the silty clay and silty clay till, respectively, were used for the current assessment.
- The preliminary grading and services plan, dated December 2025, prepared by Schaeffers, was utilized for the dewatering assessment for the proposed underground service.
- It is assumed that the residential units will be provided with one-level basement structures. The base of excavation for the construction of the proposed basements was considered at a depth of 3.0 metres below the proposed grading level.
- For the assessment of the short-term dewatering flow rate, the highest recorded shallow groundwater elevation from the interpreted groundwater contour map located in the vicinity of the proposed blocks or the residential structure was utilized.
- Considering the number of the proposed lots and their frontage, it is assumed that 60% of each lot will be excavated for the construction of the single detached houses.
- Based on 60% of the townhouse block and maintaining the proposed frontage, the dewatering assessments were conducted for a single townhouse block, including the unit count based on the draft plan.
- Based on 60% of the semi-detached units and maintaining the proposed frontage, the dewatering assessments were conducted for two (2) semi-detached residential units.
- It was assumed that 60% of the area would be utilized for the building footprint of each residential unit, and this was taken into consideration for the dewatering assessment.
- The storm event of 2 years -3 months was also considered for the short-term construction dewatering.
- The dewatering target for the proposed excavation was considered 1.0 m below the deepest excavation to facilitate excavation and construction in dry and stable subsoil conditions.

A review of **Appendix I, Page 1,** indicates that the proposed units within the Subject Site will be constructed below the seasonally high shallow groundwater table, with the exception of the residential units within the vicinity of MW 107. As such, short-term dewatering from the groundwater source is expected for all the proposed residential units with the exception of the units in the vicinity of MW 107. Furthermore, the estimated flow rates are based on the highest recorded shallow groundwater table. As such, if excavation and construction of the proposed lots and blocks are completed during summer and fall, lower or no groundwater seepage is expected. The summary of construction dewatering flow rates for the residential Lots that require dewatering is summarized in Table 8-1, with a summary of the calculation presented in Appendix I (Pages 2-5).

Table 8-1 Estimated Construction Dewatering Flow Rates for the Residential Lots and Townhouse Blocks

Dewatering Flow Rates				
Parameters	**Units**	**Proposed Townhouse Blocks**	**Proposed Single Detached**	**Proposed Semi-Detached**
Estimated Short-Term Dewatering Flow Rate (without safety factor and storm event)	L/day	5,600.0 (MW 108) – 55,200.0 (MW 8)	900.0 (MW 6) – 7,700.0 (MW 9)	1,900.0 (MW 6) – 10,300.0 (MW 8)
Estimated Short-Term Dewatering Flow Rate (with safety factor of 1.5)	L/day	8,400.0 (MW 108) – 82,800.0 (MW 8)	1,350.0 (MW 6) – 11,550.0 (MW 9)	2,850.0 (MW 6) – 15,450.0 (MW 8)
Estimated Storm Event Flow Rate (2-year 3-Hr)	L/day	24,800.0 (MW 108) – 24,800.0 (MW 8)	4,800.0	6,900.0
Estimated Short-Term Dewatering Flow Rate (including safety factor and storm event)	L/day	33,200.0 (MW 108) – 107,600.0 (MW 8)	6,150.0 (MW 6) – 16,350.0 (MW 9)	9,750.0 (MW 6) – 22,350.0 (MW 8)
Radius of Influence (Ro)	m	6.9 (MW 108) – 12.3 (MW 8)	6,9 (MW 6) – 12.0 (MW 9)	6.9 (MW 6) – 12.3 (MW 8)
Draw Down	m	1.5 (MW 108) – 3.9 (MW 8)	1.5 (MW 6) – 3.6 (MW 9)	1.5 (MW 108) – 3.9 (MW 8)

S.F. Safety Factor

The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed residential lots and blocks development that will be constructed below the seasonally high shallow groundwater table, can range from 33,000.0 L/day to 107,600.0 L/day for proposed townhouse blocks, assumed to be comprising of eight (8) units, from 6,150.0 L/day to 16,350.0 L/day for the proposed fully-detached residential units, and range from 9,750.0 L/day to 22,350.0 L/day for the semi-detached units for two (2) attached units.

Additionally, a potential 100-year storm event with a duration of 12 hours is expected to range from 15,200.0 L/day to 58,800.0 L/day, considering the active excavation area dimensions mentioned in the above table.

Storm Event Calculation for the residential units near BH/MW 107 that will be constructed above the interpreted groundwater contour: As presented in **Appendix I, Page 1**, the majority of the proposed residential units will be excavated and constructed above the shallow ground table, where groundwater seepage is not anticipated. However, potential stormwater during storm events should be managed. As

such, the anticipated discharge water flow rates are calculated. **Table 8-2** and **Appendix (Page 2-5)** summarise the assumptions and potential stormwater flow. Potential stormwater flow rate estimates are based on considering a 2-year storm event with a duration of 3 hours.

Table 8-2 Summary of the Storm Flow Rates During Storm Event- Proposed Lots and Blocks above Groundwater Table

Proposed Development	Townhouse Units in proximity to BH/MW 107 (Total for 8 townhouse units)	Semi-detached Units in proximity to BH/MW 107
Proposed Residential Lots	24,800.0	6,900.0

8.3.7 Short-Term Dewatering - Proposed Underground Services

The following assumptions are considered for the dewatering assessment for the installation of the underground services;

- The shallow groundwater flow pattern map, prepared based on the stabilized groundwater levels measured on May 5, 2025, was utilized for the assessment.
- The highest estimated hydraulic conductivity of 1.3×10^{-7} m/sec and 6.2×10^{-7} m/sec for the silty clay and silty clay till, respectively, were used for the current assessment.
- The preliminary grading and services plan, dated December 2025, prepared by Schaeffers, was utilized for the dewatering assessment for the proposed underground service.
- The length of the active trench for underground services was considered to be 50 meters at a nearby manhole location at a time, and the width of the trench for the underground service installation was considered to be 2 meters.
- The storm event of 2 years was also considered for the short-term construction dewatering flow rate estimates.
- The dewatering target for the proposed excavation was considered 1.0 m below the proposed deepest excavation to facilitate excavation and construction in dry and stable subsoil conditions.

Considering the above assumptions and reviewed plans, groundwater seepage is anticipated for the excavation and installation of the underground service. Furthermore, the estimated flow rates are based on the highest recorded shallow groundwater table. As such, if excavation and construction of the proposed underground services are completed during summer and fall, lower or no groundwater seepage is expected.

The summary of construction dewatering flow rates for the underground services for the remaining portions of the subdivision is presented in **Table 8-3**. Additionally, the detailed summary and the calculation of the dewatering assessment are presented in **Appendix I** (**Pages 11-12**).

Table 8-3 Short-term Construction Dewatering Flow Rates for Proposed Underground Services

Dewatering Flow Rates		
Parameters	**Units**	**Proposed Underground Services**
Estimated Short-Term Dewatering Flow Rate (without safety factor and storm event)	L/day	1,800.0 (Street K) – 47,400.0 (Street C)
Estimated Short-Term Dewatering Flow Rate (with safety factor of 1.5)	L/day	2,700.0 (Street K) – 71,100.0 (Street C)
Estimated Storm Event Flow Rate (2-year 3-Hr)	L/day	3,300.00 (for the trench dimension assuming 50 m x 2 m)
Estimated Short-Term Dewatering Flow Rate (including safety factor and storm event)	L/day	6,000.0 (Street K) – 74,400.0 (Street C)
Radius of Influence (Ro)	m	7.7 (Street K) – 18.5 (Street C)
Draw Down	m	1.9 (Street K) – 8.6 (Street C)

The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events with a duration of 3 hr/day for a 50 m length active excavation trench for the proposed underground service installation, can range from 6,000.0 L/day to 74,400.0 L/day.

Additionally, a potential 100-year storm event with a duration of 12 hours is expected to reach up to 10,200.0 L/day, considering a maximum active trench with dimensions and width as mentioned in the above tables (2.0 m x 50 m).

8.3.8 Short-Term Dewatering for Stormwater Management Ponds

Groundwater Seepage (Stormwater Management Ponds): The following are the assumptions and proposed development details for the short-term construction dewatering:

The comparison of the groundwater contour map against the preliminary grading plan, the assumed base of the excavation, and the need for dewatering is presented in **Appendix I, Page 14**. The summary of the calculation is presented in **Appendix I (Page 14)**.

The following assumptions were used for the dewatering assessment for the Residential lots and blocks,

- The proposed Stormwater Management (SWM) Ponds will include the construction of two (2) SWM Ponds within the Subject Site.
- The shallow groundwater flow pattern map, prepared based on the stabilized groundwater levels measured on May 5, 2025, was utilized for the assessment.
- The highest estimated hydraulic conductivity of 1.3×10^{-7} m/sec for the silty clay was used for the current assessment.
- The preliminary grading and services plan, dated December 2025, prepared by Schaeffers, was utilized for the dewatering assessment for the proposed SWM Ponds.
- The western SWM Pond dimensions that will be constructed below the shallow groundwater table are assumed to be 103.5 m x 73.7 m, and the eastern SWM Pond dimensions are assumed to

be 189.5 m x 108.1 m, based on review of the preliminary grading and services plan, dated December 2025, prepared by Schaeffers.

- For the assessment of the short-term dewatering flow rate, the highest recorded shallow groundwater elevation from the interpreted groundwater contour map located in the vicinity of the proposed blocks or the residential structure was utilized.
- The storm event of 2 years -3 months was also considered for the short-term construction dewatering.
- The dewatering target for the proposed excavation was considered 1.0 m below the deepest excavation to facilitate excavation and construction in dry and stable subsoil conditions.

A review of **Appendix I (Page 11)** indicates that the proposed SWM Ponds within the Subject Site will be constructed below the seasonally high shallow groundwater table. As such, short-term dewatering from the groundwater source is expected for both SWM Ponds. Furthermore, the estimated flow rates are based on the highest recorded shallow groundwater table. As such, if excavation and construction of the SWM Ponds are completed during summer and fall, lower or no groundwater seepage is expected.

The summary of construction dewatering flow rates for the residential Lots that require dewatering is presented in **Table 8-4** below, and **Appendix I, Page 11**.

Table 8-4 Preliminary Short-Term Discharge Flow Rate Estimates for the Proposed SWM Ponds

Parameters	Western SWM Pond	Eastern SWM Pond
Proposed Ground Surface Contour Elevation (masl)*	259.0	260.0
Considered Grade Elevation for dewatering assessment	257.3	259
Base of Excavation (masl)*	255.5	256.0
Highest Interpreted Groundwater Contour Elevation (masl)	257.1	259.0
Estimated Zone of Influence (m)	8.2	9.9
Anticipated Maximum Drawdown (m)	3.1	4.5
Excavation width (m)	73.7	108.6
Excavation length (m)	103.5	189.5
Area (m^2)	7,630.8	20,477.3
Total flow in L/day (Without Safety factor)	4,400.0	14,800.0
Total flow in L/day (With SF of 2.0)	6,600.0	22,200.0
Anticipated Storm Flow (2- year storm 3 hr/day) (L/day)	245,700.0	659,500.0
Total Estimated Short-Term Dewatering Flow Rate for 2-year event	252,300.0	681,700.0

S.F.: Safety Factor
*Based on preliminary grading and service plan, dated December 2025, prepared by Schaeffers

Additionally, a potential 100-year storm event with a duration of 12 hours is expected to range from 1,262,300.0 L/day to 2,482,600.0, considering the active excavation area dimensions mentioned in the above table

8.3.9 Long-Term Foundation Drainage Needs for Residential Units

The same equation used to estimate the groundwater flow rates for short-term dewatering was utilized to estimate the long-term foundation drainage flow rates from groundwater sources for the lots/blocks that will be constructed below the shallow groundwater table.

The following assumptions were used to estimate potential needs for the long-term foundation drainage flow control for the Residential lots and Blocks;

- It was assumed that 60% of the area would be utilized for the building footprint of each residential unit, and this was taken into consideration for the dewatering assessment.
- The shallow groundwater flow pattern map, prepared based on the stabilized groundwater levels measured on May 5, 2025, was utilized for the assessment
- The highest estimated hydraulic conductivity of 1.3×10^{-7} m/sec and 6.2×10^{-7} m/sec for the silty clay and silty clay till, respectively, were used for the current assessment.
- The preliminary grading and services plan, dated December 2025, prepared by Schaeffers, was utilized for the dewatering assessment for the proposed underground service.
- The dewatering target was considered 0.5 m below the assumed top of the basement FFE.

The summary of construction dewatering flow rates for the residential Lots and Blocks that require dewatering is summarized in **Table 8-5**, with a summary of the calculation presented in **Appendix I** (**Page 7-9**).

Table 8-5 Summary of the Long-term Foundation Drainage Flow- Proposed Lots and Blocks

Parameters	Units	Proposed Townhouse Blocks	Proposed Fully Detached	Proposed Semi-Detached
Estimated Foundation Drainage Flow Rate (without safety factor and storm event)	L/day	2,400.0 (MW 108) – 38,400.0 (MW 8)	400.0 (MW 6) – 5,200.0 (MW 4)	800.0 (MW 6) – 7,400.0 (MW 8)
Estimated Foundation Drainage Flow Rate (with safety factor of 1.5)	L/day	3,600.0 (MW 108) – 57,600.0 (MW 8)	600.0 (MW 6) – 7,800.0 (MW 4)	1,200.0 (MW 6) – 11,100.0 (MW 8)
Estimated Infiltration Flow Rate (2-year 3-Hr)	L/day	13,600.0 (MW 108) – 13,600.0 (MW 8)	900.0	1,000.0
Estimated Foundation Drainage Flow Rate (including safety factor and infiltration)	L/day	17,200.0 (MW 108) – 71,200.0 (MW 8)	1,500.0 (MW 6) – 8,700.0 (MW 4)	2,200.0 (MW 6) – 12,100.0 (MW 8)
Radius of Influence (Ro)	m	5.7 (MW 108) – 11.1 (MW 8)	5.7 (MW 6) – 10.7 (MW 4)	6.6 (MW 6) – 11.1 (MW 8)
Drawdown	m	0.5 (MW 108) – 2.9 (MW 8)	0.5 (MW 6) – 2.6 (MW 4)	0.5 (MW 6) – 2.9 (MW 8)

**S.F. Safety Factor*

The anticipated foundation drainage flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the proposed residential buildings that will be present below the seasonally high

shallow groundwater table, can range from 17,200.0 L/day to 71,200.0 L/day for proposed townhouse blocks, assumed to be comprising of eight (8) units, from 1,500.0 L/day to 8,700.0 L/day for the proposed fully-detached residential units, and range from 2,200.0 L/day to 12,100.0 L/day for the semi-detached units for two (2) attached units.

8.4 Permit Requirement

A summary of the anticipated short-term dewatering flow rate for each section of the proposed development is as follows.

- *Short-Term Construction Dewatering:* Based on the recent amendment to O.Reg. 63/16, which came into effect on July 1, 2025, an EASR registration will be required if water takings of more than 50,000 L/day are required. If it is identified that an EASR is required for the Subject Site, a hydrogeological assessment report will need to be submitted in support of the application.

  The estimated short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed installation of the underground services, reaches up to 74,400.0 L/day, considering an open and active excavation trench with dimensions of 2 m width and 50 m length. As such, filing an EASR with the MECP is required for the excavation and construction of the proposed underground services. Furthermore, the estimated flow rates consider the seasonally high shallow groundwater table. As such, if excavation and construction are completed during dry seasons of a year, the lower construction dewatering flow rates are expected. Obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system.
- The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed residential lots and blocks development that will be constructed below the seasonally high shallow groundwater table, reaches up to 107,600.0 L/day for proposed townhouse blocks, assumed to be comprising of eight (8) units, 16,350.0 L/day for the proposed single-detached residential units, and up to 22,350.0 L/day for the semi-detached units for two (2) attached units. As such, filing an EASR with the MECP is required for the construction of townhouse blocks, but not required for the construction and excavation of the single detached units and the semi-detached units. However, the estimated flow rates are considering the seasonally high shallow groundwater table. As such, if excavation and construction is completed during dry seasons of a year, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system.
- The anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5

during storm events for the active excavation area for the proposed SWM Ponds ranges from 252,300.0 L/day to 681,700.0 L/day. As such, filing an EASR with the MECP is required for the construction of the SWM Ponds. However, the estimated flow rates are considering the seasonally high shallow groundwater table. As such, if excavation and construction is completed during dry seasons of a year, the lower construction dewatering flow rates are expected. Additionally, obtaining a discharge agreement from the region of Peel is required if short-term dewatering effluent is proposed to be conveyed to the region's sewer system.

- *Long-Term Foundation Drainage:* As per the recent amendment to O.Reg. 387/04 that came into effect on July 1, 2025, PTTW registration will be required if the water taking exceeds 379,000.0 L/day. The maximum estimated long-term foundation drainage flow rate of 71,200.0 L/day is below the MECP PTTW threshold limit of 379,000.0 L/day for the proposed development. As such, applying for PTTW with MECP is not required. However, obtaining a discharge agreement from the Region of Peel is required if the foundation drainage is proposed to be conveyed to the Region’s sewer system.

8.5 Potential Dewatering Impact and Mitigation Plan - Preliminary

8.5.1 Short-Term Discharge of Construction Dewatering

One (1) set of groundwater samples was collected for analysis from the monitoring well BH/MW 2D on January 4, 2024, by SEL. The results indicate that no exceedances are present when compared against the Region of Peel Sanitary and Storm Sewer Use By-law standards. However, the concentration of TSS from the unfiltered sample meets the applicable standards when compared against the Region of Durham Sewer Use By-Law.

8.5.2 Ground Settlement

The preliminary estimated conceptual zone of influence for any temporary construction dewatering array or dewatering area could extend up to 18.5, 12.3, 8.2, and 9.9 m from the conceptual dewatering wells or array considered around the proposed underground services, proposed residential units, Western SWM Pond, and Eastern SWM Pond, respectively. Based on the review of the details, Mount Hope Road and Columbia Way are located outside of the Zone of Influence for any temporary construction dewatering array or wells for Street N, Street B, Street C, Eastern SWM Pond and Western SWM Pond. Therefore, the impacts related to ground settlement are not expected. However, the estimated preliminary Zone of Influence for the proposed residential lots and blocks and underground services is based on the preliminary road grading. Once the detailed design becomes available for the Subject Site, the recommendation related to ground settlement should be updated.

8.5.3 Surface Water, Wetlands and Areas of Natural Significance

Record review indicates that there is a total of two (2) tributaries of the Cold Creek that outlet to Humber River. One (1) Tributary is mapped in the Northern portion of the Subject Site, flowing from the west to the southeast direction. Based on the review of the Development Concept Plan provided by KLM Planning. dated January 14, 2026, it is identified as the Natural Heritage System (NHS), and based on the review of the preliminary zone of influence for the provincially significant wetland associated with the system is located outside the preliminary zone of influence from the proposed underground services beneath Street A as well as nearby proposed residential lots and blocks. The second tributary is located in the southern portion of the Subject Site, flowing from the east to the southwest direction and eventually south/southeasterly direction towards the Humber River. Based on the review of the preliminary road grading plan, prepared by Scheffers Consulting Engineer, dated December 2025, the channel realignment is proposed for the tributary. As such, potential impacts are not anticipated on the watercourses with respect to the proposed development at the Subject Site.

Records of water bodies (ponded waterbody) are mapped within the Subject Site and surrounding lands. Three (3) records are mapped in the north, central and south portions of the Subject Site. Based on the review of Figure 5- Head Water Drainage Feature Assessment Map dated February 18, 2026, Project 2407713, prepared by GEI Consultant, presented in **Appendix A-4** and discussion with the ecologist, the central water body was not observed during the investigation. Additionally, a review of the Development Concept Plan was provided by KLM Planning. dated January 14, 2026 Presented in **Appendix A-4**, indicates that the northern water body is located within the proposed Natural Heritage system (NHS) area, and it is located outside of the conceptual zone of influence of the street E. Therefore, no Potential impacts are anticipated to the above noted wate bodies with respect to the proposed development at the Subject Site.

Based on the review of the preliminary estimated dewatering flow rates compared to the information provided by the Ecologist for the water balance risk evaluation for the Subject Site, the anticipated maximum dewatering flow rate for the residential lots/blocks and underground services is 107,600 L/day and 74,400 L/day, which falls within the 50,000 to 400,000 L/day range. The anticipated dewatering duration is greater than 6 months. Therefore, this component is classified as having a medium magnitude. Furthermore, for the proposed western stormwater management (SWM) pond, the anticipated maximum dewatering flow rate is 252,300 L/day, which is also within the 50,000 to 400,000 L/day range. Assuming the anticipated dewatering duration is less than 6 months, this component is classified as having a low magnitude. Additionally, for the proposed eastern stormwater management (SWM) pond, the anticipated maximum dewatering flow rate is 681,700 L/day, which is greater than 400,000 L/day. Although the anticipated dewatering duration is less than 6 months, the flow rate exceeds the upper range and is therefore classified as having a medium magnitude. Considering the above, overall, the anticipated magnitude of dewatering for the Subject Site falls within the range from low to medium Magnitude.

8.5.4 Water Supply Wells

A review of the MECP well records confirmed that there is a total of twelve (12) water supply wells registered within a 500 m radius of the Subject Site. All twelve (12) water supply wells are for domestic use according to their first use status. Two (2) water supply wells are present within the Subject Site. However, considering the location of the water supply wells and proposed development, it is assumed that both water supply wells will be decommissioned, if still existing. Furthermore, no other water supply wells are present within the zone of influence of the dewatering areas; therefore, no significant impacts to the water supply wells are anticipated with respect to the proposed development if it exists. However, it is recommended that the status of the water supply wells be assessed a couple of months in advance of the construction.

Additionally, the Private Water Supply Well Survey (Pre-Construction monitoring Study) was completed and provided in the report titled “Private Water Supply Well Survey (Pre-Construction Monitoring Study, Proposed Residential Development, Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon,”, dated April 4, 2025 (SEL Ref. No, 2309-W138)

9.0 CONCLUSIONS AND RECOMMENDATIONS

- The Subject Site lies within the physiographic region of southern Ontario known as the South Slope and the landform is identified as Till Plain (Drumlinized).
- The Subject Site is located within an area mapped as Clay to silt-textured till (derived from glaciolacustrine deposits or shale) (5d).
- The Subject Site is located within the Humber River Watershed that falls in the Toronto and Region Conservation Authority (TRCA) jurisdiction.
- The ground surface elevation ranges approximately between 257.6 metres above sea level (masl) to 263.0 masl based on ground surface elevations measured at the borehole and monitoring wells' locations.
- The subsoil investigation has revealed that beneath the topsoil veneer, and the Earth fill at the western portion of the site mainly comprises silty clay and silty clay till with interbedded layers of silty fine sand within the northwestern portion of the Subject Site.
- Based on the review of the Hydrographs and manual groundwater levels the highest and lowest stabilized shallow groundwater levels measured at El. 263.1 masl and 255.1 masl at BH/MW 12 and BH/MW 5, respectively.
- Based on the review of the Hydrographs and manual water table data, the highest and lowest stabilized water tables recorded in the installed piezometers interacting with the shallow stratigraphy measured at El. 262.1 masl and 256.3 masl at MP 1 and MP 12, respectively.
- The hydraulic conductivity estimates for the silty clay unit range from 2.0×10^{-6} m/sec to 4.9×10^{-8} m/sec, and silty clay till unit range from 6.2×10^{-7} m/sec to 5.0×10^{-8} m/sec. The estimated hydraulic conductivity of 1.3×10^{-7} m/sec and 6.2×10^{-7} m/sec for the silty clay and silty clay till, respectively, were used for the current assessment.
- The preliminary estimated short-term construction dewatering flow rate from the groundwater source, with a safety factor of 1.5 and a 2-year storm event for construction of the proposed underground services, reaches up to 74,400.0 L/day, considering an open and active excavation trench with dimensions of 2 m width and 50 m length. As such, filing an EASR with the MECP is required for the excavation and construction of the proposed installation of the underground services.
- Based on a preliminary estimates the anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed residential lots and blocks development that will be constructed below the seasonally high shallow groundwater table, reaches up to 107,600.0 L/day for proposed townhouse blocks, assumed to be comprising of eight (8) units, 16,350.0 L/day for the proposed single-detached residential units, and up to 22,350.0 L/day for the semi-detached units for two (2) attached units. As such, filing an EASR with the MECP is required for the construction of townhouse blocks, but

not required for the construction and excavation of the single detached units and the semi-detached units.

- Based on preliminary estimates, the anticipated dewatering flow rates, including groundwater seepage with a safety factor of 1.5 during storm events for the active excavation area for the proposed SWM Ponds ranges from 252,300.0 L/day to 681,700.0 L/day. As such, filing an EASR with the MECP is required for the construction of the SWM Ponds.
- Obtaining a discharge permit from the Region of Peel may be required if the potential collected discharge water during construction is proposed to be discharged to the region's sewer system.
- The preliminary maximum estimated long-term foundation drainage flow rate of 71,200.0 L/day is below the MECP PTTW threshold limit of 379,000.0 L/day for the proposed development. As such, applying for PTTW with MECP is not required. However, obtaining a discharge agreement from the Region of Peel is required if the foundation drainage is proposed to be conveyed to the Region's sewer system.The preliminary estimated zone of influence for any temporary construction dewatering array or dewatering area could extend up to 18.5, 12.3, 8.2, and 9.9 m from the conceptual dewatering wells or array considered around the proposed underground services, proposed residential units, Western SWM Pond, and Eastern SWM Pond, respectively. Based on the review of the details, Mount Hope Road and Columbia Way are located outside of the Zone of Influence for any temporary construction dewatering array or wells for Street N, Street B, Street C, Eastern SWM Pond and Western SWM Pond. As such, significant risk for ground settlement is not expected with respect to the proposed development.
- Record review indicates that there is a total of two (2) tributaries of the Cold Creek that outlet to Humber River.
    - One (1) Tributary is mapped in the Northern portion of the Subject Site, flowing from the west to the southeast direction. Based on the review of the draft plan, it is identified as the Natural Heritage System (NHS), and based on the review of the conceptual zone of influence for dewatering, the provincially significant wetland associated with the NHS is located outside the Zone of influence for the installation of underground services proposed beneath Street A, as well as the proposed nearby residential lots and blocks. As such, significant impacts to the above noted natural feature are not expected with respect to the proposed development.
    - The second tributary is located in the southern portion of the Subject Site, flowing from the east to the southwest direction and eventually south/southeasterly direction towards the Humber River. Based on the review of the proposed plan, the channel realignment is proposed for the tributary. As such, significant impacts to the above noted natural feature are not expected with respect to the proposed development.
- Records of water bodies (ponded waterbody) are mapped within the Subject Site and surrounding lands. Three (3) records are mapped in the north, central and south portions of the Subject Site.

- Based on the review of Figure 5- Head Water Drainage Feature Assessment Map dated February 18, 2026, Project 2407713, prepared by GEI Consultant, presented in **Appendix A-4** and discussion with the ecologist, the central water body was not observed during the investigation.
- A review of the Development Concept Plan provided by KLM Planning. dated January 14, 2026 Presented in **Appendix A-4**, indicates that the northern water body is located within the proposed Natural Heritage system area, and it is located outside of the preliminary estimated conceptual zone of influence for dewatering of the street E. Therefore, no Potential impacts are anticipated.
- Additionally, it is understood that the water body and its associated unevaluated wetland located in the southern portion of the Subject Site located close to the SG 5 and the unevaluated wetland located near BH/MW 101 and MP 1 location is located within the development foot print and proposed to be removed as per the Figure 2 of the project 2407713 dated February 18, 2026 prepared by GEI presented in **Appendix A-4**. As such, significant impacts to the above-noted natural features are not expected with respect to the proposed development.

- A review of the MECP well records confirmed that there is a total of twelve (12) water supply wells registered within a 500 m radius of the Subject Site. All twelve (12) water supply wells are for domestic use according to their first use status. Two (2) water supply wells are present within the Subject Site. However, considering the location of the water supply wells and proposed development, it is assumed that both water supply wells will be decommissioned if still existing. Furthermore, no other water supply wells are present within the zone of influence of the dewatering areas; therefore, no significant impacts to the water supply wells are anticipated with respect to the proposed development if it exists. Additionally, the Private Water Supply Well Survey (Pre-Construction monitoring Study) was completed and provided in the report titled “Private Water Supply Well Survey (Pre-Construction Monitoring Study, Proposed Residential Development, Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon,”, dated April 4, 2025 (SEL. Ref. 2309-W138).

10.0 CLOSURE

We trust that the above-noted information is suitable for your review. If you have any questions regarding this information, please do not hesitate to contact the undersigned.

Yours truly,
SOIL ENGINEERS LTD.

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Project Manager-Hydrogeological Services

Yogirajsinh Rana, B.Sc., C.Tech.
Project Manager-Hydrogeological Services

Narjes Alijani, M.Sc., P.Geo.
Department Manager-Hydrogeological Services



NA
Feb. 26, 2026

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8. Ministry of Natural Recourses and Forestry, 2023. Natural Heritage Interactive Map.
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10. Toronto and Region Conservation Authority, 2023, Online Regulated Area Map.

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Drawings

REFERENCE NO. 2309-W139

600000

601500

4862500

4861000

MOUNT HOPE ROAD

MOUNT PLEASANT ROAD

CALEDON/KING TOWNLINE SOUTH

Cold Creek

HIGHWAY 50

COLUMBIA WAY

SENATOR WAY

FOREST GATE AVENUE

CASTELLI COURT

GRESTRIDGE DRIVE

EWART STREET

GODFELLOW CRESCENT

MCCABE CRESCENT

WESTCHESTER BOULEVARD

GUARDHOUSE DRIVE

EGAN CRESCENT

HIGHBURY STREET

ST. MICHAELS CRESCENT

FOX CHASE DRIVE

TAYLORWOOD AVENUE

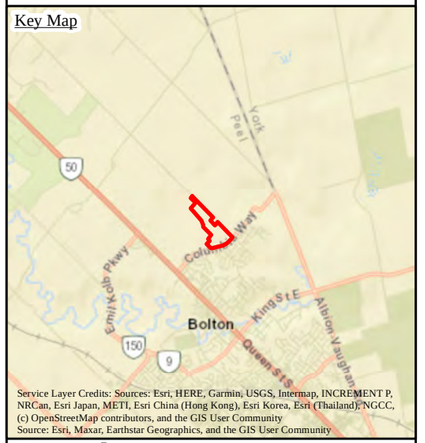
KINGS VIEW DRIVE

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References: Ontario Ministry of Natural Resources and Forestry
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Key Map



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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Waterbody
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Watercourse

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Site Location Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:

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Metres

Drawing No. 1

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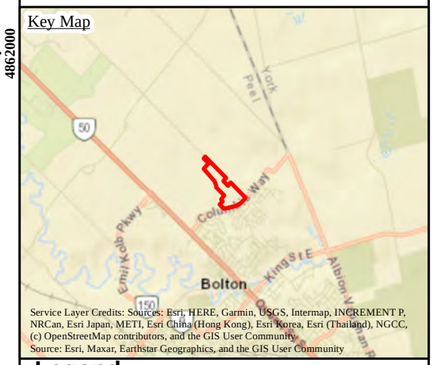
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BH/MW 203
Old Unknown SG
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PZ1S
PZ1D
MP 10
Station 4 Flow
BH/MW 107
BH/MW 12
BH 11
Cold Creek
MP 9
BH/MW 106
SG 1
MP 11
BH/MW 108
BH/MW 105
MP 7
SG 2
MP 8
BH/MW 10
BH/MW 9
MP 6
BH/MW 104
SG 3
BHMW 8
MP 12
BH/MW 7
MP 5
BH/MW 103
SG 4
SG 6
MP 4
SG 5
MP 2
BH 3
BH/MW 102
BH/MW 201
BH/MW 1
MP 3
Cold Creek
BH/MW 6
Flow Station 1
BH/MW 4
BH/MW 101
MP 1
BH/MW 2S
BH/MW 2D
BH/MW 202
Flow Station 2
BH/MW 5
COLUMBIA WAY
MOUNT HOPE ROAD
SENATOR WAY
FOREST GATE AVENUE
KNOLL HAVEN CIRCLE
EWART STREET
BEEHIVE DRIVE
GOODFELLOW CRESCENT
MCCABE CRESCENT
PARK
SWM
COMMERCIAL
RESID.

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References: Ontario Ministry of Natural Resources and Forestry
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Key Map



Legend

- Approximate Boundary of Subject Site
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Local Road
- Flow Station (4)
- Piezometer (2)
- 2025 Borehole with Monitoring Well (3)
- 2024 Borehole with Monitoring Well (9)
- 2024 Mini Piezometers (12)
- 2023 Borehole (2)
- 2023 Borehole with Monitoring Well (10)
- Staff Gauges (7)

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Borehole and Monitoring Well Location Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
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Drawing No. 2

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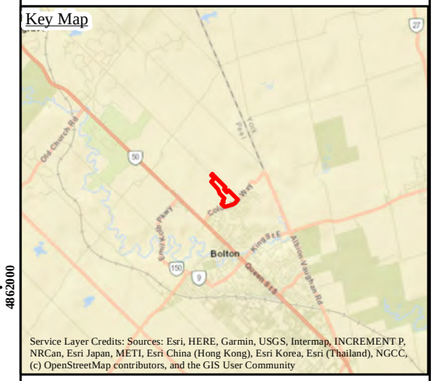
MOUNT HOPE ROAD
MOUNT PLEASANT ROAD
GALEDON KING TOWNLINE SOUTH
HIGHWAY 50
COLUMBIA WAY
FOX CHASE DRIVE
TAYLORWOOD AVENUE
KINGS VIEW DRIVE
GOODFELLOW CRESCENT
EWART STREET
MCCABE CRESCENT
WESTCHESTER BOULEVARD
HIGHBURY STREET
ST MICHAELS CRESCENT
GUARDHOUSE DRIVE
EGAN CRESCENT
SENATOR WAY
FOREST GATE AVENUE
CASTELLI COURT
CRESTRIDGE DRIVE

6
19
12
5d

N

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Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- 5d: Halton Till; consisting of diamicton
- 6: Ice-contact stratified drift; consisting of sand clay, silt, gravel, diamicton:ice-contact
- 12: Older Alluvium; consisting of silt, sand, gravel
- 19: Modern Alluvium; consisting of silt, sand, gravel

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Surface Geology Map

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
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Metres

Drawing No. 3

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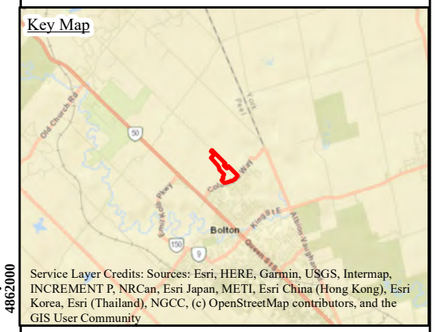
600000
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MOUNT HOPE ROAD
MOUNT PLEASANT ROAD
CALEDON KING TOWNLINE SOUTH
South Slope
Till Plains
(Drumlinized)
HIGHWAY 50
COLUMBIA WAY
SCHAEFER PLACE
GOODFELLOW CRESCENT
FOXCHASE DRIVE
TAYLORWOOD AVENUE
ALDERBROOK PLACE
KINGSVIEW DRIVE
HIGHBURY STREET
ST MICHAELS CRESCENT
WESTCHESTER BOULEVARD
HATHAWAY COURT
MCCABE CRESCENT
GUARDHOUSE DRIVE
EGAN CRESCENT
EWART STREET
BEHAVE DRIVE
FOREST GATE AVENUE
HAVEN CIRCLE
SENATOR WAY
MANORWOOD COURT
CASTELLI COURT
CRESTRIDGE DRIVE
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Source: Chapman, L.J. and Putnam, D.F. 2007. Physiography of Southern Ontario;
Ontario Geological Survey, Miscellaneous Release--Data 228 ISBN 978-1-4249-5158-1

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Key Map



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Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Region Boundary
- Till Plains (Drumlinized)

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Physiographic Map

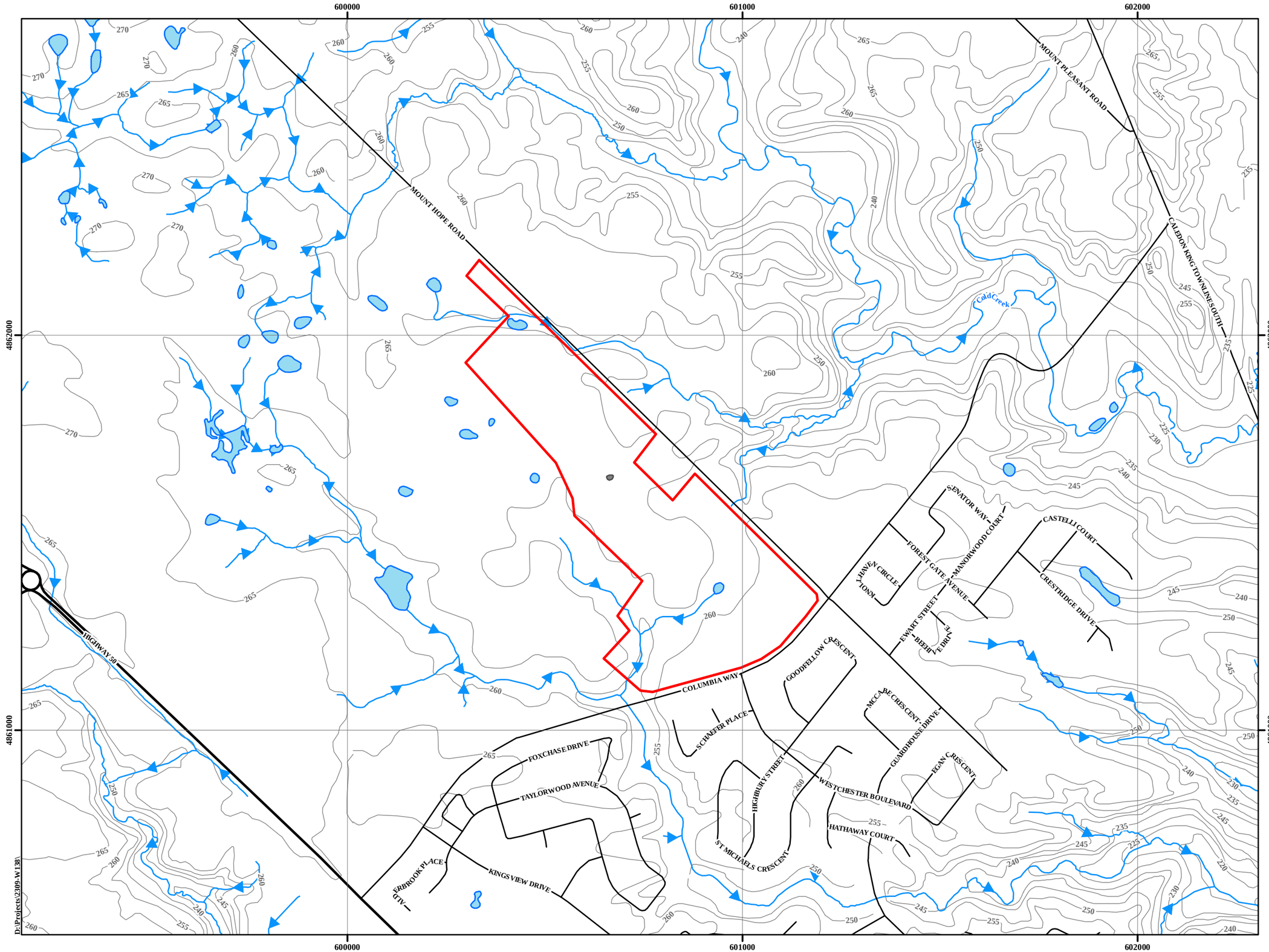
Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
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Metres

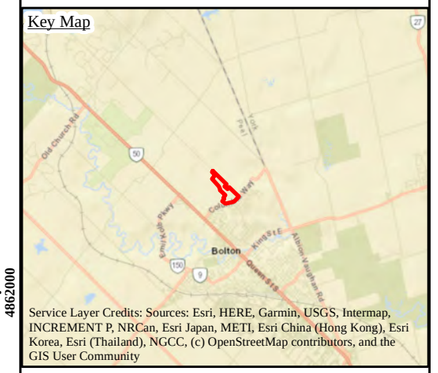
Drawing No. 4



N

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Legend

- Approximately Boundary of Subject Site
- Major Road
- Local Road
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Ontario - 5 m

Soil Engineers Ltd.

Topographic Map

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:

0 55 110 220 330 440 550
Metres

Drawing No. 5

600000
600500
601000
601500
4862000
4861500

Cold Creek
SENATOR WAY
FOREST GATE AVENUE
KNOLL HAVEN CIRCLE
MOUNT HOPE ROAD
EWART STREET
BEEHIVE DRIVE
COLUMBIA WAY
GOODFELLOW CRESCENT
MCCABE CRESCENT

D:\Projects\2309-W138\

N

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Legend

- Approximate Boundary of Subject Site
- Local Road
- Wooded Area *Wooded Area*
- Wetland (classified as Provincial)
- Wetland (Not evaluated per OWES)
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse

Soil Engineers Ltd.

Natural Features and Protection Area Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
0 50 100 150 200 250
Metres

Drawing No. 6-1

600000
600500
601000
601500
4862000
4861500

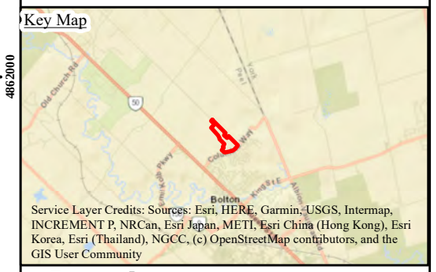
H
BH/MW 13
BH/MW 203
Old Unknown SG
Flow Station 3
PZ1S
PZ1D
G
MP 10
Flow Station 4
BH/MW 107
BH/MW 12
BH 11
Cold Creek
D
MP 9
SG 1
BH/MW 106
MP 7
BH/MW 105
SG 2
MP 8
C
BH/MW 10
MP 11
BH/MW 108
BH/MW 9
BH/MW 104
MP 6
SG 3
F
BHMW 8
MP 12
BH/MW 7
SENATOR WAY
E
MP 5
BH/MW 103
B
SG 4
SG 6
MP 4
SG 5
MP 2
BH/MW 102
A
BH 3
BH/MW 1
BH/MW 201
KNOLLHAVEN CIRCLE
FOREST GATE AVENUE
BH/MW 6
MP 3
Flow Station 1
BH/MW 4
BH/MW 101
MP 1
MOUNT HOPE ROAD
EWART STREET
BEEHIVE DRIVE
BH/MW 2S
BH/MW 2D
GOODFELLOW CRESCENT
BH/MW 202
BH/MW 5
COLUMBIA WAY
Flow Station 2
MCCABE CRESCENT

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Legend

- Approximate Boundary of Subject Site
- Marked Wetland Location
- Local Road
- Wooded Area *Wooded Area*
- Wetland (classified as Provincial)
- Wetland (Not evaluated per OWES)
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Piezometer
- Flow Station
- 2025 Borehole with Monitoring Well
- 2024 Borehole With Monitoring Well
- 2024 Mini Piezometers
- 2023 Borehole
- 2023 Borehole with Monitoring Well
- Staff Gauges

Soil Engineers Ltd.

Natural Features and Protection Area Plan
with BH/MW, PZ, MP, and SG Locations

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 24, 2026

Scale:
0 50 100 150 200 250
Metres

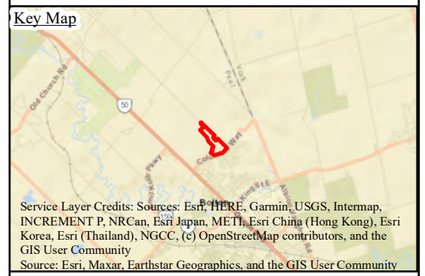
Drawing No. 6-2

600000
601000
602000
4862000
4861000
MOUNT PLEASANT ROAD
CALEDON KING TOWNLINE SOUTH
MOUNT HOPE ROAD
Gold Creek
HIGHWAY 50
COLUMBIA WAY
GOODFELLOW CRESCENT
SCHAEFER PLACE
FOXCHASE DRIVE
FOXBURY PLACE
TAYLORWOOD AVENUE
THORNBURY ROAD
COLEMAN COURT
KINGSVIEW DRIVE
HIGHBURY STREET
ST. MICHAELS CRESCENT
WESTCHESTER BOULEVARD
GUARDHOUSE DRIVE
EGAN CRESCENT
HATHAWAY COURT
SENATOR WAY
FOREST GATE AVENUE
EWART STREET
CASTELLI COURT
KNOLLRIDGE STREET
CRESTRIDGE DRIVE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
D:\Projects\2309-W138\

N

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- Major Road
- Local Road
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Unknown (2)
- Abandoned-Quality (1)
- Abandoned-Supply (1)
- Monitoring and Test Hole (2)
- Test Hole (1)
- Water Supply (12)

Soil Engineers Ltd.

MECP Well Location Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
0 50 100 200 300 400 500
Metres

Drawing No. 7

600000
600500
601000
601500
4862000
4861500

A'
A
B'
B
C'
C

BH/MW 13
BH/MW 107
BH 11 (Projected)
BH/MW 12
BH/MW 106
BH/MW 105
BH/MW 108 (Projected)
BH/MW 10
BH/MW 9
BH/MW 104
BH/MW 7 (Projected)
BH/MW 103
BH/MW 102
BH 3
BH/MW 1
BH/MW 6 (Projected)
BH/MW 4 (Projected)
BH/MW 101 (Projected)
BH/MW 2S
BH/MW 2D
BH/MW 5

Cold Creek
Cold Creek

SENATOR WAY
FOREST GATE AVENUE
KNOLL HAVEN CIRCLE
MOUNT HOPE ROAD
EWART STREET
BEEHIVE DRIVE
GOODFELLOW CRESCENT
COLUMBIA WAY
MCCABE CRESCENT

D:\Projects\2309-W138\

N

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Approximate Boundary of Subject Site
- Waterbody not observed per Hedwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Cross Section
- Local Road
- 2023 Borehole
- 2023 Borehole with Monitoring Well
- 2024 Borehole with Monitoring Well

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Cross-Section Plan

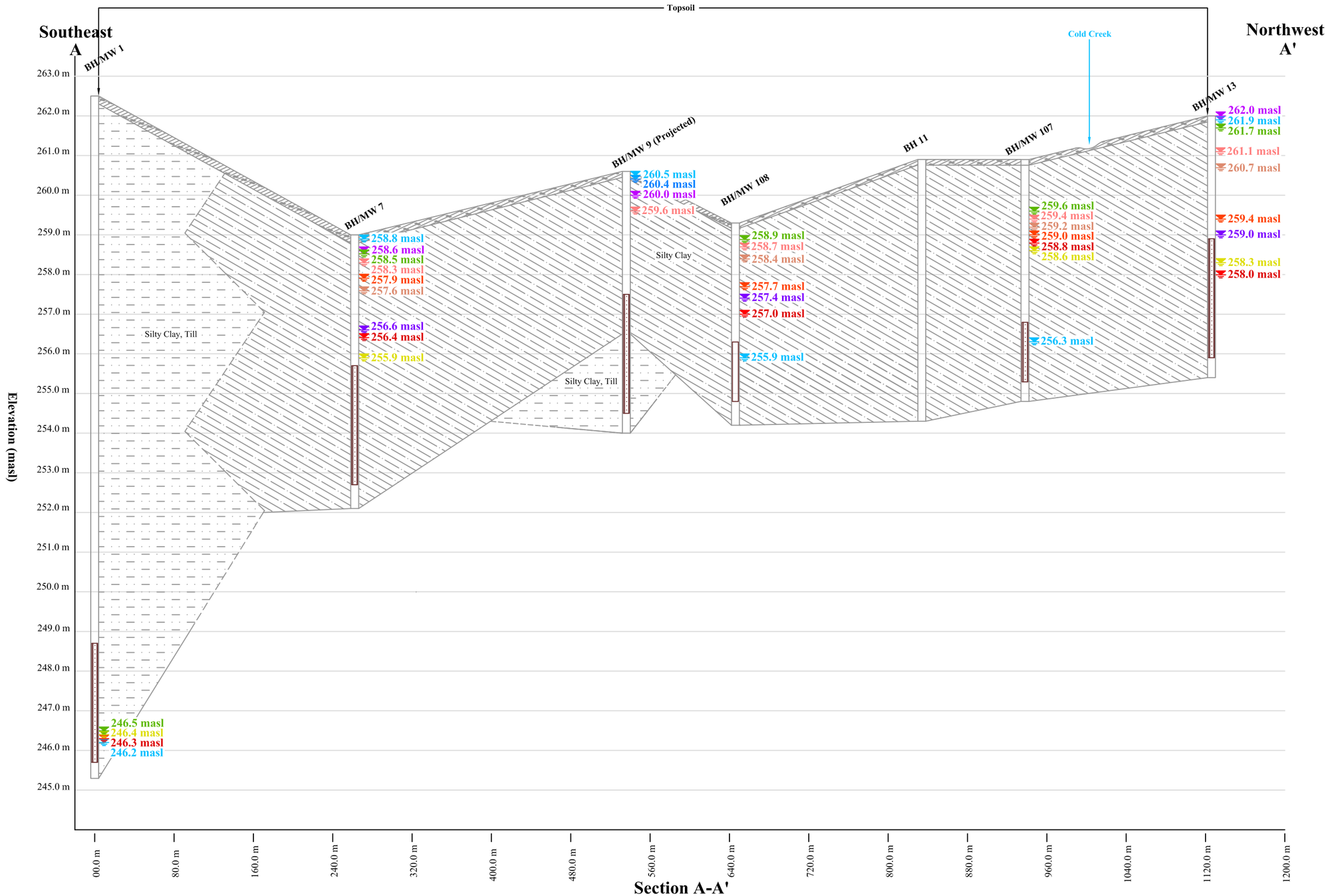
Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:
0 25 50 100 150 200 250
Metres

Drawing No. 8-1



Section A-A'

Topsoil

Silty Clay Till

Silty Clay

Watercourse

Screen

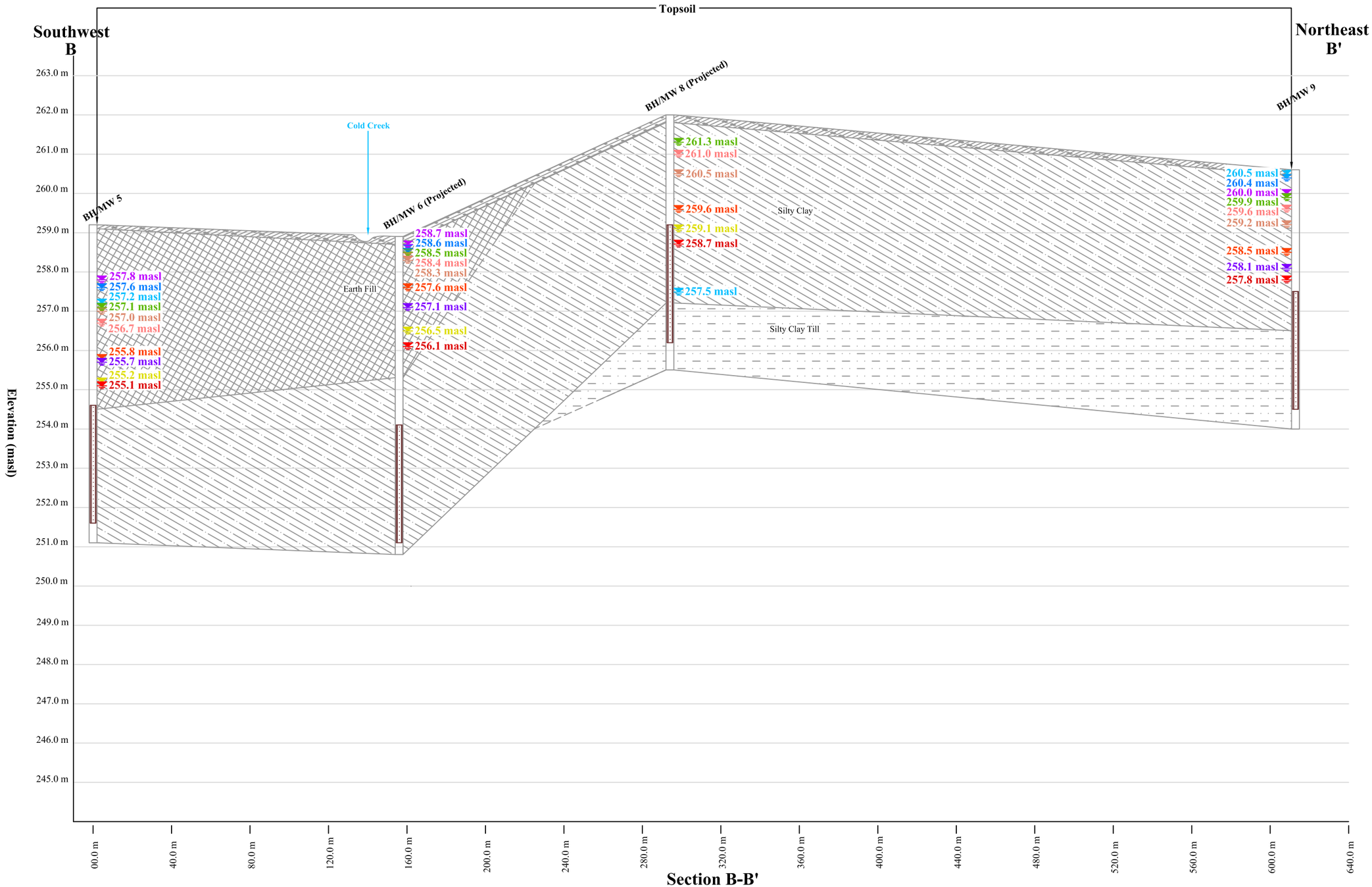
- Water Table on March 27, 2024
- Water Table on April 24, 2024
- Water Table on May 28, 2024
- Water Table on June 17, 2024
- Water Table on August 29, 2024
- Water Table on November 4-5, 2024
- Water Table on May 5, 2025
- Water Table on August 28, 2025
- Water Table on October 24, 2025
- Water Table on December 16, 2025

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Title: Geological Cross-Section (A-A')

Project: Hydrogeological Assessment
Proposed Residential Development
Northwest of Mount Hope Road and Columbia Way, Town of Caledon

Reference No:	Date:	Scale: V	Scale: H	Drawing No.
2309-W138	February, 2026	1:100	1:4000	8-2A



Section B-B'

Topsoil
Silty Clay
Earth Fill
Silty Clay Till

Watercourse
Screen

Water Table on March 27, 2024
Water Table on April 24, 2024
Water Table on May 28, 2024
Water Table on June 17, 2024
Water Table on August 29, 2024
Water Table on November 4-5, 2024
Water Table on May 5, 2025
Water Table on August 28, 2025
Water Table on October 24, 2025
Water Table on December 16, 2025

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Title: Geological Cross-Section (B-B')

Project: Hydrogeological Assessment
Proposed Residential Development
Northwest of Mount Hope Road and Columbia Way, Town of Caledon

Reference No:	Date:	Scale: V	Scale: H	Drawing No.
2309-W138	February, 2026	1:100	1:2000	8-2B

Northwest **C**

Southeast **C'**

Topsoil

Cold Creek

BH/MW 12 — 263.1 masl, 263.0 masl, 262.8 masl, 262.6 masl, 262.5 masl, 261.0 masl, 260.7 masl, 260.0 masl, 259.8 masl

BH/MW 10 — 262.5 masl, 262.4 masl, 262.0 masl, 261.6 masl, 260.3 masl, 260.0 masl, 259.2 masl, 258.7 masl

BH/MW 8 (Projected) — 261.3 masl, 261.0 masl, 260.5 masl, 259.6 masl, 259.1 masl, 258.7 masl, 257.5 masl

BH/MW 4

BH/MW 101 (Projected) — 261.7 masl, 261.4 masl, 260.9 masl, 259.8 masl, 257.8 masl

BH/MW 2D — 252.2 masl, 251.7 masl, 251.6 masl, 251.5 masl, 251.3 masl

Silty Clay

Silty Clay Till

Silty Clay

Silty Clay Till

Silty Clay

Silty Clay Till — 248.9 masl, 248.8 masl, 248.7 masl, 248.6 masl, 248.3 masl

Elevation (masl)

263.00 m
262.00 m
261.00 m
260.00 m
259.00 m
258.00 m
257.00 m
256.00 m
255.00 m
254.00 m
253.00 m
252.00 m
251.00 m
250.00 m
249.00 m
248.00 m
247.00 m
246.00 m
245.00 m
244.00 m

0.00 m
150.00 m
300.00 m
450.00 m
600.00 m
750.00 m
900.00 m
1050.00 m

Section C-C'

Topsoil

Silty Clay

Silty Clay Till

Watercourse

Screen

Water Table on March 27, 2024
Water Table on April 24, 2024
Water Table on May 28, 2024
Water Table on June 17, 2024
Water Table on August 29, 2024
Water Table on November 4-5, 2024
Water Table on May 5, 2025
Water Table on August 28, 2025
Water Table on October 24, 2025
Water Table on December 16, 2025

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Title: Geological Cross-Section (C-C')

Project: Hydrogeological Assessment
Proposed Residential Development
Northwest of Mount Hope Road and Columbia Way, Town of Caledon

Reference No:	Date:	Scale: V	Scale: H	Drawing No.
2309-W138	February, 2026	1:100	1:3750	8-2C

600000 600500 601000 601500

4862000 4861500

BH/MW 13 (261.7)
BH/MW 107 (259.6)
BH/MW 12 (262.8)
BH/MW 106 (261.3)
BH/MW 105 (261.4)
BH/MW 10 (262.0)
BH/MW 104 (261.2)
BH/MW 108 (258.9)
BH/MW 9 (259.9)
BHMW 8 (261.3)
BH/MW 103 (258.7)
BH/MW 7 (258.5)
BH/MW 102 (258.9)
BH/MW 6 (258.5)
BH/MW 101 (261.7)
BH/MW 2S (261.5)
BH/MW 5 (257.1)

Cold Creek

SENATOR WAY
FOREST GATE AVENUE
KNOLLHAVEN CIRCLE
MOUNT HOPE ROAD
EWART STREET
BEEHIVE DRIVE
GOODFELLOW CRESCENT
COLUMBIA WAY
MCCABE CRESCENT

D:\Projects\2309-W138\

N

References: Ontario Ministry of Natural Resources and Forestry
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Key Map



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Legend

- Approximate Boundary of Subject Site
- Borehole With Monitoring Well
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Contour - 0.25m
- Local Road
- Interpreted Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Interpreted Groundwater Flow Direction
- (262.8) Groundwater Level Measured on May 05, 2025

Soil Engineers Ltd.

Seasonally High Groundwater Flow Pattern Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

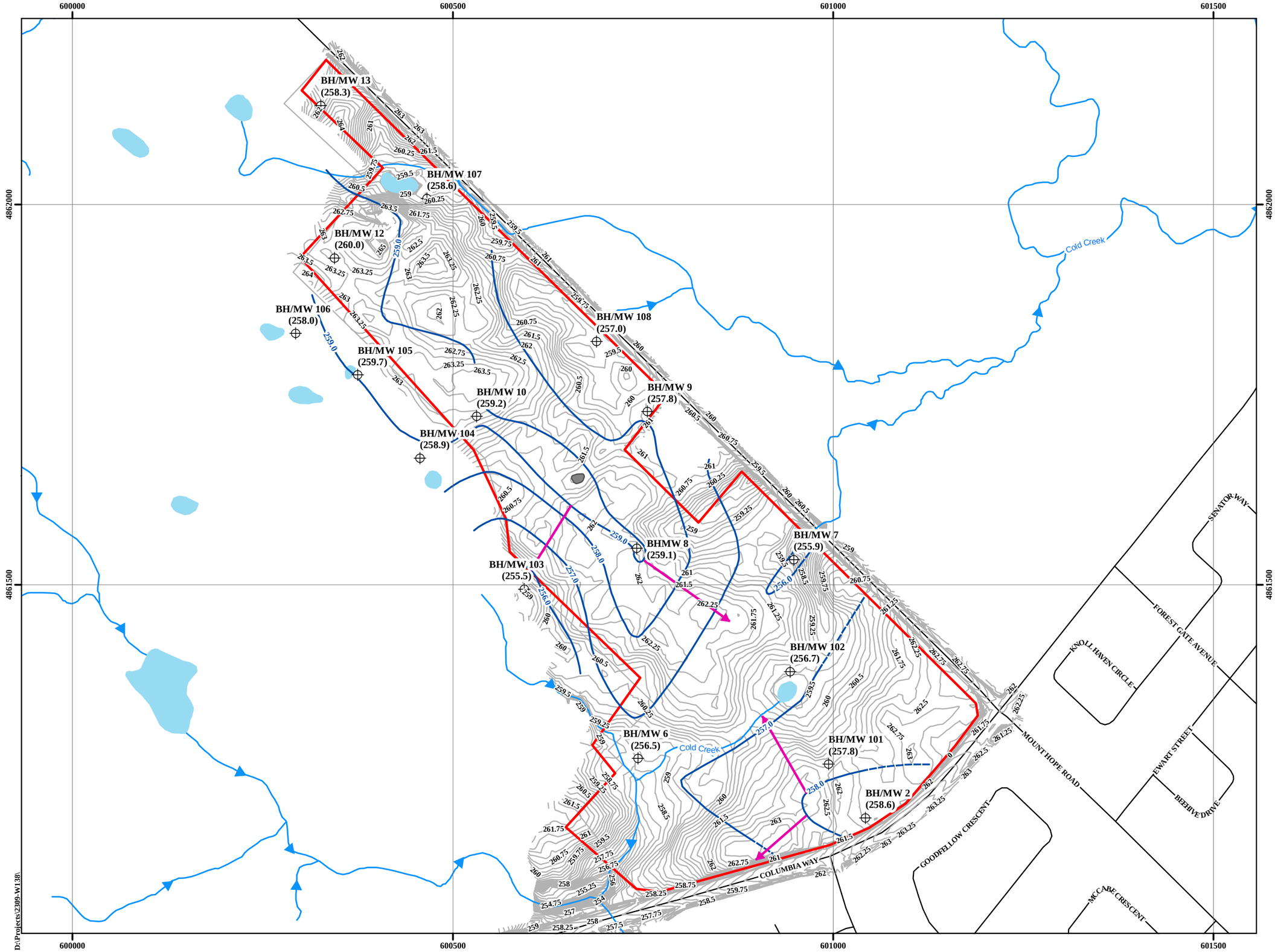
Reference No. 2309-W138

Date: February 25, 2026

Scale:

0 25 50 100 150 200 250
Metres

Drawing No. 9-1



N

References: Ontario Ministry of Natural Resources and Forestry
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Key Map



Legend

- Approximate Boundary of Subject Site
- Borehole With Monitoring Well
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Contour - 0.25m
- Local Road
- Interpreted Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Interpreted Groundwater Flow Direction
- (261.9) Groundwater Level Measured on October 24, 2025

Soil Engineers Ltd.

Seasonally Low
Groundwater Flow Pattern Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

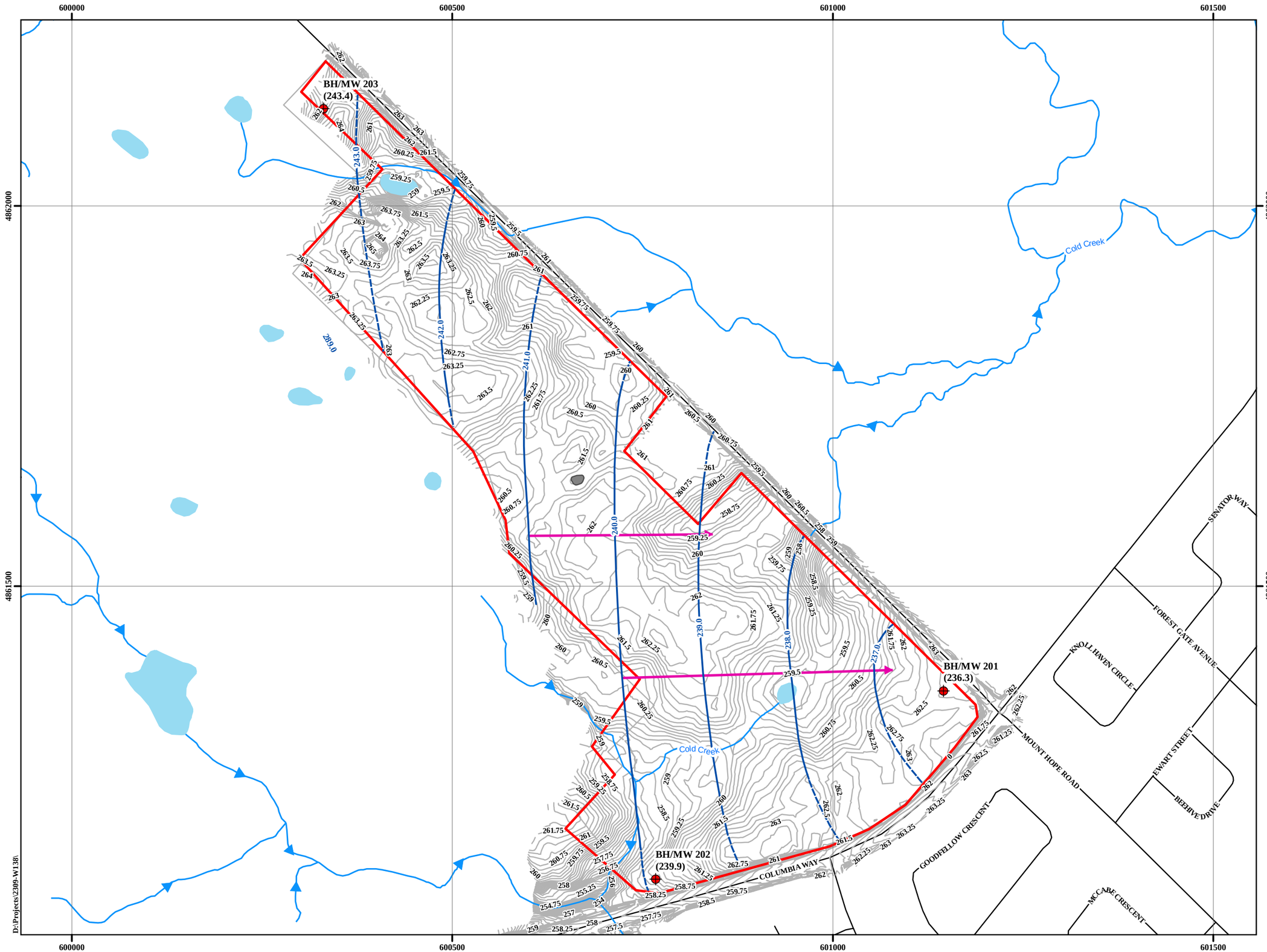
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Date: February 10, 2025

Scale:

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Metres

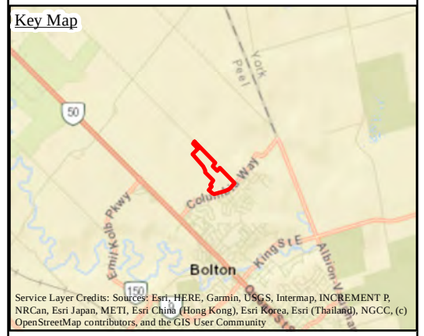
Drawing No. 9-2



N

References: Ontario Ministry of Natural Resources and Forestry
Ⓒ King's Printer for Ontario, 2026

Key Map



Legend

- Approximate Boundary of Subject Site
- 2025 Borehole with Monitoring Well
- Waterbody not observed per Headwater Drainage Assessment by GEI
- Waterbody
- Watercourse
- Contour - 0.25m
- Local Road
- Interpreted Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Interpreted Groundwater Flow Direction
- (242.6) Groundwater Level Measured on October 24, 2025

Soil Engineers Ltd.

Deep Groundwater Flow Pattern Plan

Hydrogeological Assessment
Proposed Residential Development
Northwest Quadrant of
Mount Hope Road and Columbia Way
Town of Caledon

Reference No. 2309-W138

Date: February 25, 2026

Scale:

0 25 50 100 150 200 250
Metres

Drawing No. 9-3

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BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'A-1'

Borehole Logs and Grain size Distribution Graphs
Drilling Program of 2023

REFERENCE NO. 2309-W138

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS Auger sample
CS Chunk sample
DO Drive open (split spoon)
DS Denison type sample
FS Foil sample
RC Rock core (with size and percentage recovery)
ST Slotted tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash sample

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH Sampler advanced by static weight
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
NP No penetration

SOIL DESCRIPTION

Cohesionless Soils:

'N' (blows/ft)	Relative Density
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

Undrained Shear Strength (ksf)	'N' (blows/ft)	Consistency
less than 0.25	0 to 2	very soft
0.25 to 0.50	2 to 4	soft
0.50 to 1.0	4 to 8	firm
1.0 to 2.0	8 to 16	stiff
2.0 to 4.0	16 to 32	very stiff
over 4.0	over 32	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

□ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg
1 inch = 25.4 mm
1ksf = 47.88 kPa

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Hollow Stem Augers with Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 24, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
262.5	Ground Surface							
0.0	**23 cm TOPSOIL**	1	DO	13	0		20	
	Stiff to hard **SILTY CLAY TILL** traces of sand and gravel	2	DO	22	1		17	
		3	DO	26	2		16	
		4	DO	34			17	
	brown / grey	5A 5B	DO	25	3		18	
		6	DO	24	4		18	
	clay layer	7	DO	12	5		25	
		8	DO	19	6		14	
		9	DO	17	7		17	
	clay layer	10	DO	24	8		20	
		11	DO	43	9		14	
		12	DO	92/28	10		11	
	sand layer	13A 13B	DO	86/28	11		13 18	
245.3		14	DO	78	12		15	
17.2	**END OF BOREHOLE**				13			
	Installed 50 mm Ø PVC monitoring well to 16.8 m with 3.0 m screen Sand backfill from 13.1 to 16.8 m Bentonite seal from 0.0 m to 13.1 m Provided with monument casing				14			
					15			
					16			
					17			
					18			
					19			
					20			
					21			
					22			
					23			
					24			

Water Level Reading:
W.L. @ El. 246.4 masl on Nov 15, 2023
Dry on Dec 04, 2023
Dry on Jan 04, 2024
Dry on Jan 26, 2024
W.L. @ El. 246.2 masl on Mar 27, 2024
W.L. @ El. 246.2 masl on Apr 24, 2024
W.L. @ El. 246.2 masl on May 28, 2024
W.L. @ El. 246.3 masl on Jun 17, 2024
W.L. @ El. 246.5 masl on Aug 29, 2024
W.L. @ El. 246.3 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 2D

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Hollow Stem Augers with Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 26, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
262.6	Ground Surface							
0.0	**23 cm TOPSOIL**	1A 1B	DO	10	0		14 17	
	Brown, stiff to hard **SILTY CLAY** a trace of sand	2	DO	25	1		17	
		3	DO	37	2		18	
		4	DO	39			19	
		5	DO	30	3			
	wet silt layer	6	DO	32	4		19	
257.0					5			
5.6	Grey, very stiff to hard **SILTY CLAY TILL** traces of sand and gravel	7	DO	24	6		11	
		8	DO	16	7		20	
		9	DO	24	8		17	
	wet silt layer	10A 10B	DO	52	9		11 23	
		11	DO	63	10		18	
		12	DO	56	11		9	
247.9					12			
14.7	Grey, hard **SILTY CLAY** a trace of sand	13	DO	50/13	13		15	
245.6		14	DO	50/13	14		14	
17.0	**END OF BOREHOLE**				15			
	Installed 50 mm Ø PVC monitoring well to 16.8 m with 1.5 m screen Sand backfill from 14.6 to 16.8 m Bentonite seal from 0.0 m to 14.6 m Provided with monument casing				16			
	Water Level Reading: W.L. @ El. 251.2 masl on Nov 15, 2023 W.L. @ El. 251.4 masl on Dec 04, 2023 W.L. @ El. 251.4 masl on Jan 04, 2024 W.L. @ El. 251.6 masl on Jan 26, 2024 W.L. @ El. 251.7 masl on Mar 27, 2024 W.L. @ El. 251.7 masl on Apr 24, 2024 W.L. @ El. 251.7 masl on May 28, 2024 W.L. @ El. 252.2 masl on Jun 17, 2024 W.L. @ El. 251.5 masl on Aug 29, 2024 W.L. @ El. 251.6 masl on Nov 4 - 5, 2024				17		14	
					18			
					19			
					20			
					21			
					22			
					23			
					24			

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 2S

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 26, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
262.6	Ground Surface							
0.0	**23 cm TOPSOIL**				0			
	Brown, stiff to hard **SILTY CLAY** a trace of sand				1			
	Grey, very stiff to hard **SILTY CLAY TILL** traces of sand and gravel				2			
					3			
					4			
					5			
256.5								
5.6	Grey, very stiff to hard **SILTY CLAY TILL** traces of sand and gravel				6			
6.1	**END OF BOREHOLE** Installed 50 mm Ø PVC monitoring well to 6.1 m with 1.5 m screen Sand backfill from 4 to 6.1 m Bentonite seal from 0.0 m to 4 m Provided with monument casing				7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			

Water Level Reading:
W.L. @ El. 259.2 masl on Nov 15, 2023
W.L. @ El. 259.4 masl on Dec 04, 2023
W.L. @ El. 261.7 masl on Jan 04, 2024
W.L. @ El. 261.4 masl on Jan 26, 2024
W.L. @ El. 261.8 masl on Mar 27, 2024
W.L. @ El. 261.8 masl on Apr 24, 2024
W.L. @ El. 261.9 masl on May 28, 2024
W.L. @ El. 261.1 masl on Jun 17, 2024
W.L. @ El. 260.4 masl on Aug 29, 2024
W.L. @ El. 259.5 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH 3

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 23, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
260.3	Ground Surface							
0.0	**18 cm TOPSOIL**	1A 1B	DO	12	0		17	
	Stiff to hard **SILTY CLAY** a trace of sand	2	DO	20	1		23	
		3	DO	27	2		15	
		4	DO	38			16	
	brown / grey	5	DO	27	3		17	
		6	DO	22	4 5		13	
253.7		7	DO	28	6		17	
6.5	**END OF BOREHOLE**				7 8 9 10 11 12 13 14			

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 4

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Hollow Stem Augers with Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 25, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
261.0	Ground Surface							
0.0	**36 cm TOPSOIL**	1	DO	10	0		20	
	Brown, stiff to hard **SILTY CLAY TILL** traces of sand and gravel occ. sand seams	2	DO	15	1		18	
		3	DO	28	2		14	
		4	DO	28			12	
		5	DO	37	3			
257.0					4			
4.0	Grey, very stiff **SILTY CLAY** a trace of sand	6	DO	21	5		19	
		7	DO	24	6		18	
		8	DO	22	7		24	
		9	DO	19	8		21	
		10	DO	18	9		21	
249.4					10			
11.7	Grey, very stiff to hard **SILTY CLAY TILL** traces of sand and gravel occ. sand layers	11	DO	19	11		13	
		12	DO	20	12		16	
		13	DO	66	13		10	
243.8		14	DO	65	14		12	
17.2	**END OF BOREHOLE**				15			
	Installed 50 mm Ø PVC monitoring well to 16.8 m with 3.0 m screen Sand backfill from 13.1 to 16.8 m Bentonite seal from 0.0 m to 13.1 m Provided with monument casing				16			
	Water Level Reading: W.L. @ El. 248.8 masl on Nov 15, 2023 W.L. @ El. 248.6 masl on Dec 04, 2023 W.L. @ El. 248.5 masl on Jan 04, 2024 W.L. @ El. 248.6 masl on Jan 26, 2024 W.L. @ El. 248.8 masl on Mar 27, 2024 W.L. @ El. 248.8 masl on Apr 24, 2024 W.L. @ El. 248.9 masl on May 28, 2024 W.L. @ El. 248.8 masl on Jun 17, 2024 W.L. @ El. 248.7 masl on Aug 29, 2024 W.L. @ El. 248.7 masl on Nov 4 - 5, 2024				17			
					18			
					19			
					20			
					21			
					22			
					23			
					24			



Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 5

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 25, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.2	Ground Surface				
0.0	**10 cm TOPSOIL**	1A			0
	EARTH FILL Dark brown, silty clay occ. organics inclusion	1B	DO	16	
		2	DO	9	1
		3	DO	8	2
		4	DO	7	
		5	DO	9	3
		6	DO	8	4
254.5		7A			
4.7	Very stiff to hard **SILTY CLAY** a trace of sand	7B	DO	22	5
		8	DO	38	6
	brown / grey				7
251.1		9	DO	21	8
8.1	**END OF BOREHOLE**				9
	Installed 50 mm Ø PVC monitoring well to 7.6 m with 1.5 m screen Sand backfill from 5.5 to 7.6 m Bentonite seal from 0.0 m to 5.5 m Provided with monument casing				10
					11
					12
					13
					14

Dynamic Cone (blows/30 cm) 10 30 50 70 90

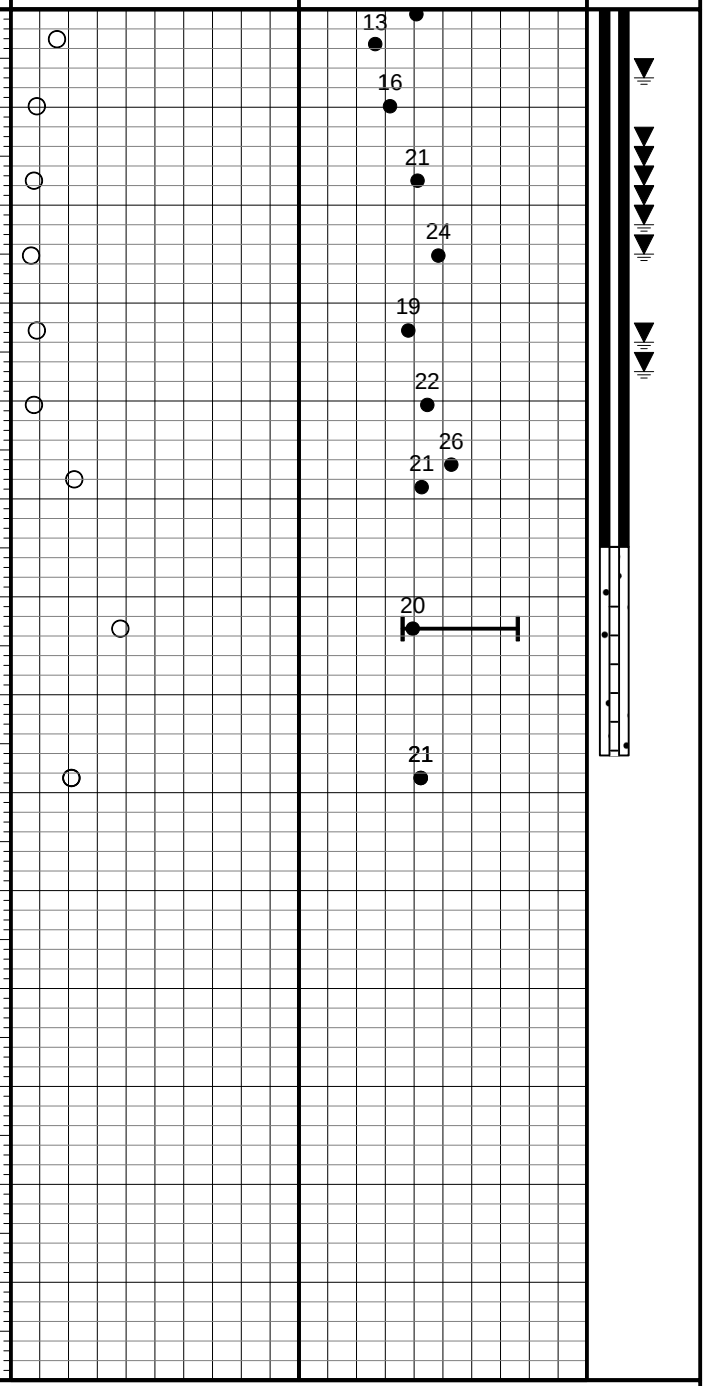
Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL



Water Level Reading:
W.L. @ El. 255.5 masl on Nov 15, 2023
W.L. @ El. 255.8 masl on Dec 04, 2023
W.L. @ El. 258.5 masl on Jan 04, 2024
W.L. @ El. 257.4 masl on Jan 26, 2024
W.L. @ El. 257.6 masl on Mar 27, 2024
W.L. @ El. 257.8 masl on Apr 24, 2024
W.L. @ El. 257.2 masl on May 28, 2024
W.L. @ El. 256.7 masl on Jun 17, 2024
W.L. @ El. 257.0 masl on Aug 29, 2024
W.L. @ El. 255.8 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 6

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 25, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
258.9	Ground Surface							
0.0	**18 cm TOPSOIL**	1A 1B	DO	11	0		15	
	EARTH FILL Dark brown, silty clay occ. organics inclusion and asphalt debris	2	DO	7	1		24	
		3	DO	8	2		23	
		4	DO	9			25	
255.3		5	DO	10	3		19	
3.7	Very stiff to hard **SILTY CLAY** a trace of sand	6	DO	27	4		24	
		7	DO	35	5		15	
	brown / grey	8	DO	30	6		18	
250.8		9	DO	23	7		17	
8.1	**END OF BOREHOLE** Installed 50 mm Ø PVC monitoring well to 7.6 m with 1.5 m screen Sand backfill from 5.5 to 7.6 m Bentonite seal from 0.0 m to 5.5 m Provided with monument casing				8			
					9			
					10			
					11			
					12			
					13			
					14			

Water Level Reading:
W.L. @ El. 257.6 masl on Nov 15, 2023
W.L. @ El. 257.9 masl on Dec 04, 2023
W.L. @ El. 258.4 masl on Jan 04, 2024
W.L. @ El. 258.5 masl on Jan 26, 2024
W.L. @ El. 258.6 masl on Mar 27, 2024
W.L. @ El. 258.7 masl on Apr 24, 2024
W.L. @ El. 258.5 masl on May 28, 2024
W.L. @ El. 258.4 masl on Jun 17, 2024
W.L. @ El. 258.3 masl on Aug 29, 2024
W.L. @ El. 257.6 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 7

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 23, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
259.0	Ground Surface							
0.0	**18 cm TOPSOIL**	1A			0			
	Stiff to hard **SILTY CLAY** a trace of sand	1B	DO	15			15	
		2	DO	29	1		16	
		3	DO	36	2		16	
		4	DO	35			15	
	brown / grey	5	DO	32	3		16	
	wet sandy silt layer	6A 6B	DO	49	4 5		15 17	
252.5		7	DO	25	6		19	
6.5	**END OF BOREHOLE**				7			

Installed 50 mm Ø PVC monitoring well
to 6.1 m with 3.0 m screen
Sand backfill from 2.4 to 6.1 m
Bentonite seal from 0.0 m to 2.4 m
Provided with monument casing

8 9 10 11 12 13 14

Water Level Reading:
W.L. @ El. 257.3 masl on Nov 15, 2023
W.L. @ El. 258.1 masl on Dec 04, 2023
W.L. @ El. 258.6 masl on Jan 04, 2024
W.L. @ El. 258.5 masl on Jan 26, 2024
W.L. @ El. 258.8 masl on Mar 27, 2024
W.L. @ El. 258.6 masl on Apr 24, 2024
W.L. @ El. 258.8 masl on May 28, 2024
W.L. @ El. 258.3 masl on Jun 17, 2024
W.L. @ El. 257.6 masl on Aug 29, 2024
W.L. @ El. 256.9 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 8

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 23, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
262.0	Ground Surface				
0.0	**20 cm TOPSOIL**	1A / 1B	DO	17	0
	Brown, very stiff to hard **SILTY CLAY** a trace of sand	2	DO	32	1
		3	DO	29	2
		4A / 4B	DO	40	
	wet sandy silt layer	5A / 5B	DO	20	3
257.2					4
4.8	Grey, very stiff **SILTY CLAY TILL** traces of sand and gravel	6	DO	18	5
					6
255.5		7	DO	21	
6.5	**END OF BOREHOLE**				7
	Installed 50 mm Ø PVC monitoring well to 5.8 m with 3.0 m screen Sand backfill from 2.5 to 5.8 m Bentonite seal from 0.0 m to 2.5 m Provided with monument casing				8
					9
					10
					11
					12
					13
					14

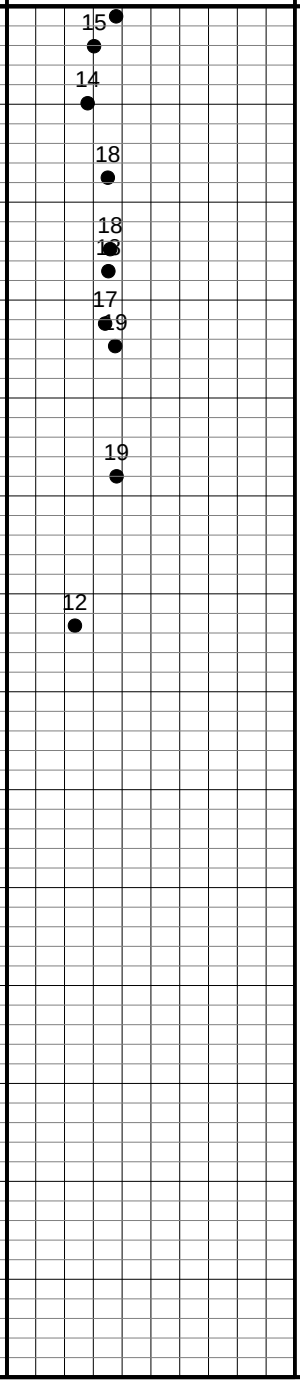
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

Water Level Reading:
W.L. @ El. 257.5 masl on May 28, 2024
W.L. @ El. 261.0 masl on Jun 17, 2024
W.L. @ El. 260.5 masl on Aug 29, 2024
W.L. @ El. 259.6 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 24, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
260.6 / 0.0	Ground Surface				
	15 cm TOPSOIL	1A			0
		1B	DO	12	
	Brown, stiff to very stiff **SILTY CLAY** a trace of sand	2	DO	25	1
		3	DO	25	2
	wet sandy silt layer	4A 4B	DO	11	
		5	DO	11	3
256.5 / 4.0	Grey, very stiff **SILTY CLAY TILL** traces of sand and gravel	6	DO	19	4
		7	DO	28	5
254.0 / 6.5	**END OF BOREHOLE**				6
	Installed 50 mm Ø PVC monitoring well to 6.1 m with 3.0 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with monument casing				7
					8
					9
					10
					11
					12
					13
					14

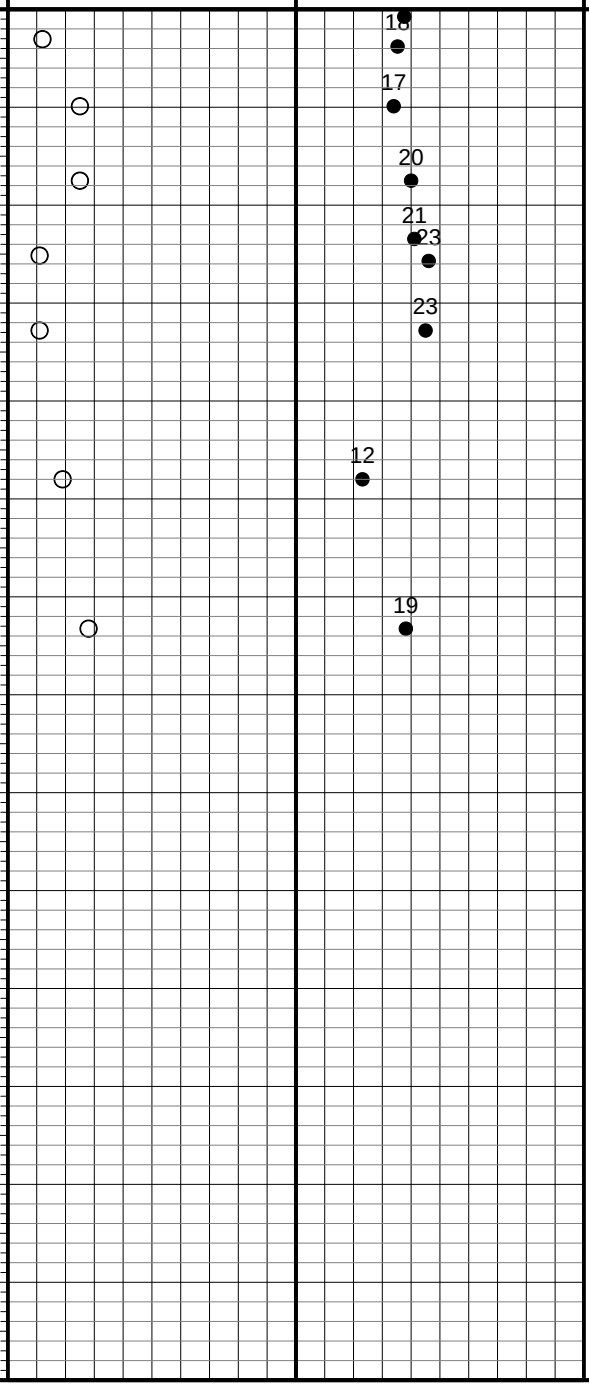
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

Water Level Reading:
W.L. @ El. 259.4 masl on Nov 15, 2023
W.L. @ El. 260.2 masl on Dec 04, 2023
W.L. @ El. 260.1 masl on Jan 04, 2024
W.L. @ El. 260.3 masl on Jan 26, 2024
W.L. @ El. 260.4 masl on Mar 27, 2024
W.L. @ El. 260.0 masl on Apr 24, 2024
W.L. @ El. 260.5 masl on May 28, 2024
W.L. @ El. 259.6 masl on Jun 17, 2024
W.L. @ El. 259.2 masl on Aug 29, 2024
W.L. @ El. 258.5 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 23, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
263.1	Ground Surface							
0.0	**25 cm TOPSOIL**	1A	DO	13	0		21	
	Stiff to hard **SILTY CLAY** a trace of sand	1B						
		2	DO	23	1		17	
		3	DO	19	2		19	
		4	DO	36			17	
		5	DO	48	3		16	
	brown / grey				4			
		6	DO	34	5		15	
					6			
256.5		7	DO	27			17	
6.5	**END OF BOREHOLE**				7			
	Installed 50 mm Ø PVC monitoring well to 6.1 m with 3.0 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with monument casing				8			
					9			
					10			
					11			
					12			
					13			
					14			

Water Level Reading:
W.L. @ El. 258.0 masl on Nov 15, 2023
W.L. @ El. 258.4 masl on Dec 04, 2023
W.L. @ El. 262.2 masl on Jan 04, 2024
W.L. @ El. 262.2 masl on Jan 26, 2024
W.L. @ El. 262.5 masl on Mar 27, 2024
W.L. @ El. 262.5 masl on Apr 24, 2024
W.L. @ El. 262.4 masl on May 28, 2024
W.L. @ El. 262.0 masl on Jun 17, 2024
W.L. @ El. 261.6 masl on Aug 29, 2024
W.L. @ El. 260.0 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH 11

FIGURE NO.: 11

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 24, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
260.9	Ground Surface							
0.0	**13 cm TOPSOIL**	1A			0		18	
	Stiff to hard **SILTY CLAY** a trace of sand	1B	DO	12				
		2	DO	18	1		18	
		3	DO	25	2		19	
		4	DO	26			19	
		5	DO	32	3		20	
	brown / grey				4			
		6	DO	17	5		18	
		7	DO	23	6		17	
254.3								
6.5	**END OF BOREHOLE**				7			
					8			
					9			
					10			
					11			
					12			
					13			
					14			

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 12

FIGURE NO.: 12

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Augers

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 24, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
263.0	Ground Surface							
0.0	**30 cm TOPSOIL**	1A	DO	8	0		19	
	Firm to hard **SILTY CLAY** a trace of sand	1B						
		2	DO	11	1		19	
		3	DO	12	2		21	
		4	DO	29			18	
		5	DO	48	3		18	
	brown grey				4			
	wet sandy silt layer	6A 6B	DO	44	5		19 21	
257.4 5.6	Hard **SILTY CLAY TILL** traces of sand and gravel	7	DO	37	6		10	
256.4 6.5	**END OF BOREHOLE**				7			
	Installed 50 mm Ø PVC monitoring well to 6.1 m with 3.0 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with monument casing				8			
					9			
					10			
					11			
					12			
					13			
					14			

Water Level Reading:
W.L. @ El. 260.3 masl on Nov 15, 2023
W.L. @ El. 260.1 masl on Dec 04, 2023
W.L. @ El. 262.3 masl on Jan 04, 2024
W.L. @ El. 263.0 masl on Jan 26, 2024
W.L. @ El. 263.0 masl on Mar 27, 2024
W.L. @ El. 263.1 masl on Apr 24, 2024
W.L. @ El. 263.0 masl on May 28, 2024
W.L. @ El. 262.6 masl on Jun 17, 2024
W.L. @ El. 262.5 masl on Aug 29, 2024
W.L. @ El. 261.0 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 13

FIGURE NO.: 13

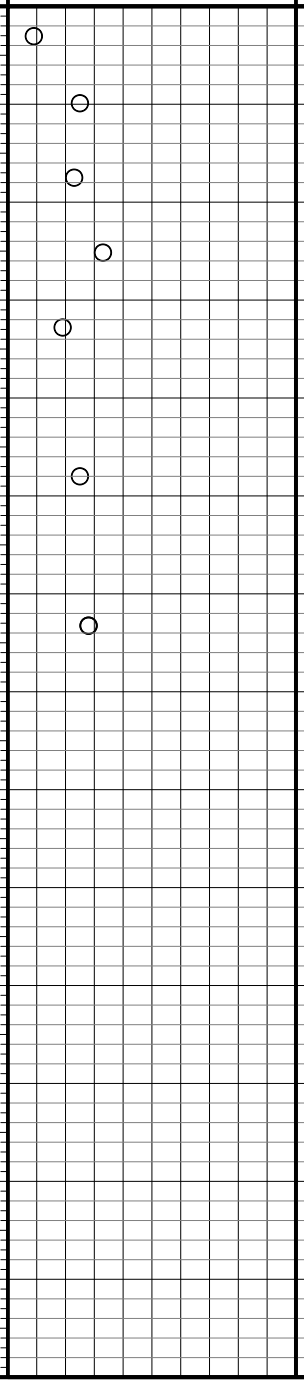
PROJECT DESCRIPTION: Proposed Residential Development

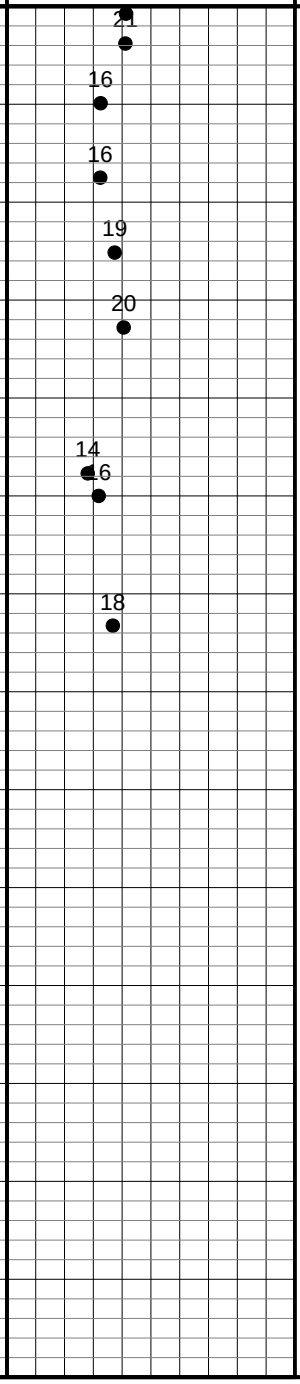
METHOD OF BORING: Solid Stem Augers

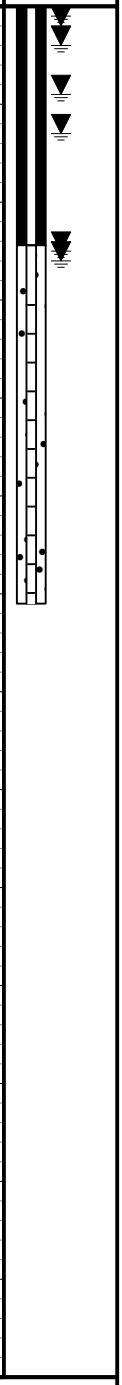
PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way
Town of Caledon

DRILLING DATE: October 24, 2023

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
262.0 / 0.0	Ground Surface				
	15 cm TOPSOIL	1A			0
	Stiff to hard **SILTY CLAY** a trace of sand	1B	DO	9	
		2	DO	25	1
		3	DO	23	
		4	DO	33	2
	brown / grey				
		5	DO	19	3
	wet sandy silt layer	6A 6B	DO	25	4
					5
					6
255.4 / 6.5		7	DO	28	
	END OF BOREHOLE				7
	Installed 50 mm Ø PVC monitoring well to 6.1 m with 3.0 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with monument casing				8
					9
					10
					11
					12
					13
					14







Water Level Reading:
W.L. @ El. 259.4 masl on Nov 15, 2023
W.L. @ El. 259.5 masl on Dec 04, 2023
W.L. @ El. 261.6 masl on Jan 04, 2024
W.L. @ El. 261.8 masl on Jan 26, 2024
W.L. @ El. 261.9 masl on Mar 27, 2024
W.L. @ El. 262.0 masl on Apr 24, 2024
W.L. @ El. 261.9 masl on May 28, 2024
W.L. @ El. 261.1 masl on Jun 17, 2024
W.L. @ El. 260.7 masl on Aug 29, 2024
W.L. @ El. 259.4 masl on Nov 4 - 5, 2024

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GRAIN SIZE DISTRIBUTION

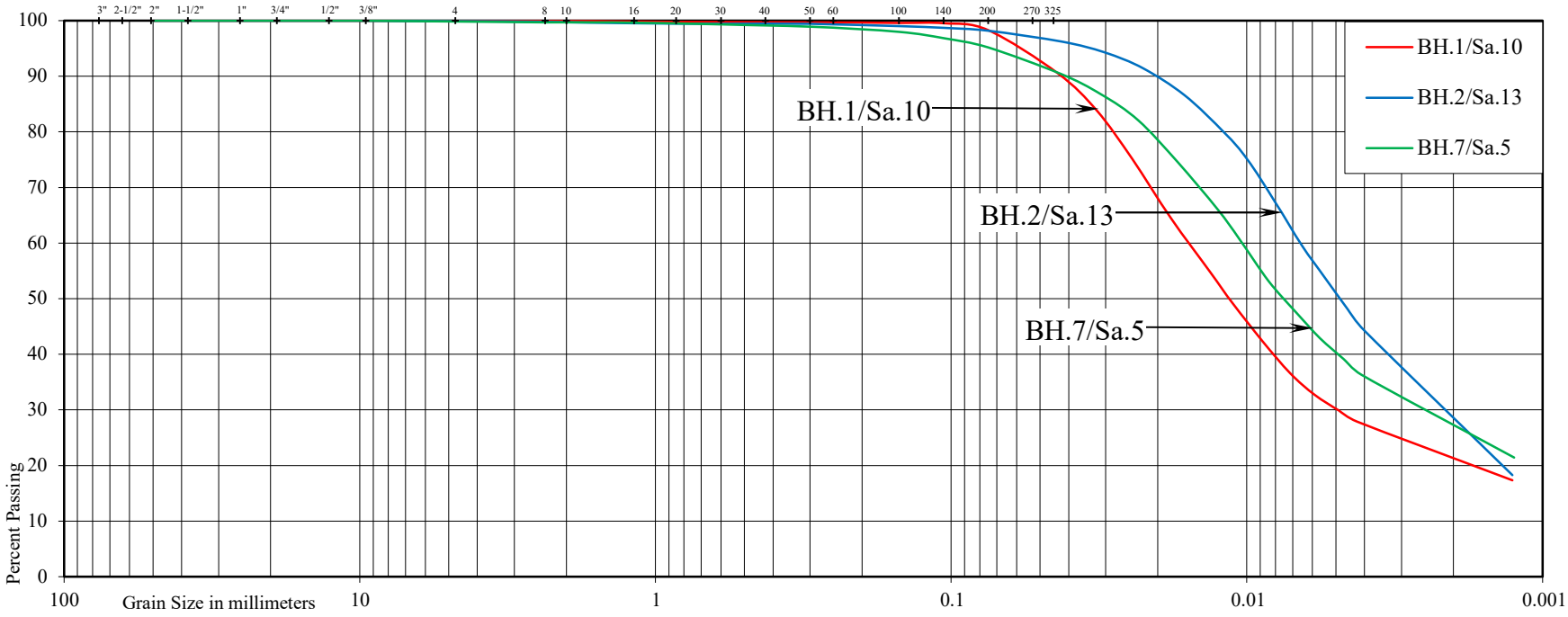
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No:	1	2	7
Sample No:	10	13	5
Depth (m):	10.7	15.2	3.1
Elevation (m):	251.8	247.4	256.0

BH./Sa.	1/10	2/13	7/5
Liquid Limit (%) =	25	-	-
Plastic Limit (%) =	16	-	-
Plasticity Index (%) =	9	-	-
Moisture Content (%) =	20	15	16
Estimated Permeability (cm./sec.) =	10^{-7}	10^{-7}	10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY

a trace of sand

Figure: 14

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

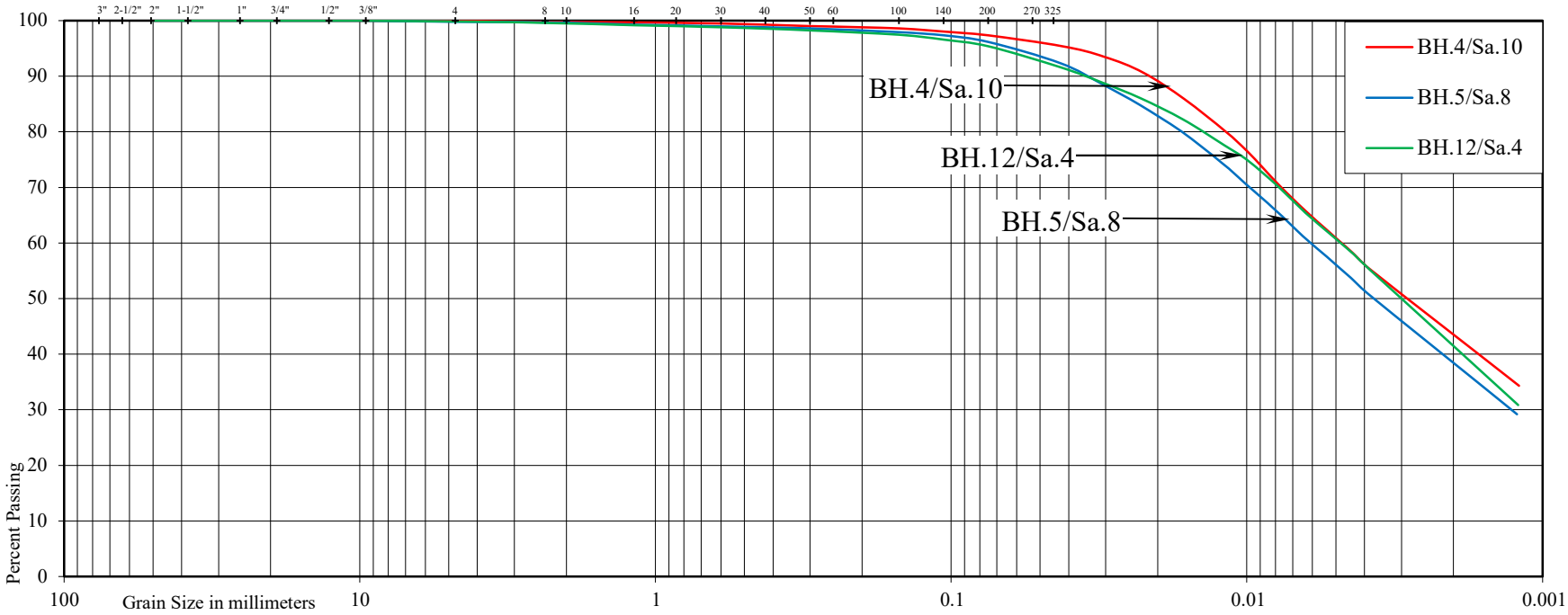
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No:	4	5	12
Sample No:	10	8	4
Depth (m):	10.7	6.1	2.3
Elevation (m):	250.4	253.1	260.7

BH./Sa.	4/10	5/8	12/4
Liquid Limit (%) =	-	38	40
Plastic Limit (%) =	-	18	19
Plasticity Index (%) =	-	20	21
Moisture Content (%) =	21	20	18
Estimated Permeability (cm./sec.) =	10^{-7}	10^{-7}	10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY

a trace of sand

Figure: 15

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'A-2'

Borehole Logs and Grain size Distribution Graphs
Drilling Program Conducted during 2024

REFERENCE NO. 2309-W138

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 101

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 9, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
262.2	Ground Surface							
0.0	**10 cm Topsoil**	1	DO	7	0		22	
	Firm to hard **SILTY CLAY** a trace of fine sand occ. fine gravel	2A	DO	15	1		26	
	weathered	2B					16	
		3	DO	34	2		19	
		4	DO	32	3		20	
	brown grey	5	DO	40	4		19	
		6	DO	19	5		19	
257.1								
5.1	**END OF BOREHOLE**				6			
	Installed 50 mm Ø monitoring well to 4.6 m completed with 1.5 m screen Sand backfill from 2.4 m to 4.6 m Bentonite seal from 0.0 m to 2.4 m Provided with a momument steel casing				7			
					8			

Water Level Reading:
W.L. @ El. 257.8 masl on May 28, 2024
W.L. @ El. 261.4 masl on Jun 17, 2024
W.L. @ El. 261.4 masl on Aug 29, 2024
W.L. @ El. 260.9 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 102

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 9, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.5 / 0.0	Ground Surface				
	15 cm Topsoil	1	DO	5	0
	Firm to to hard **SILTY CLAY** a trace of fine sand occ. fine gravel — weathered	2	DO	12	1
		3	DO	24	2
	— — brown / grey	4	DO	34	3
		5	DO	30	4
254.4 / 5.1		6	DO	10	5
	END OF BOREHOLE				6
	Installed 50 mm Ø monitoring well to 4.6 m completed with 1.5 m screen Sand backfill from 2.4 m to 4.6 m Bentonite seal from 0.0 m to 2.4 m Provided with a momument steel casing				7
					8

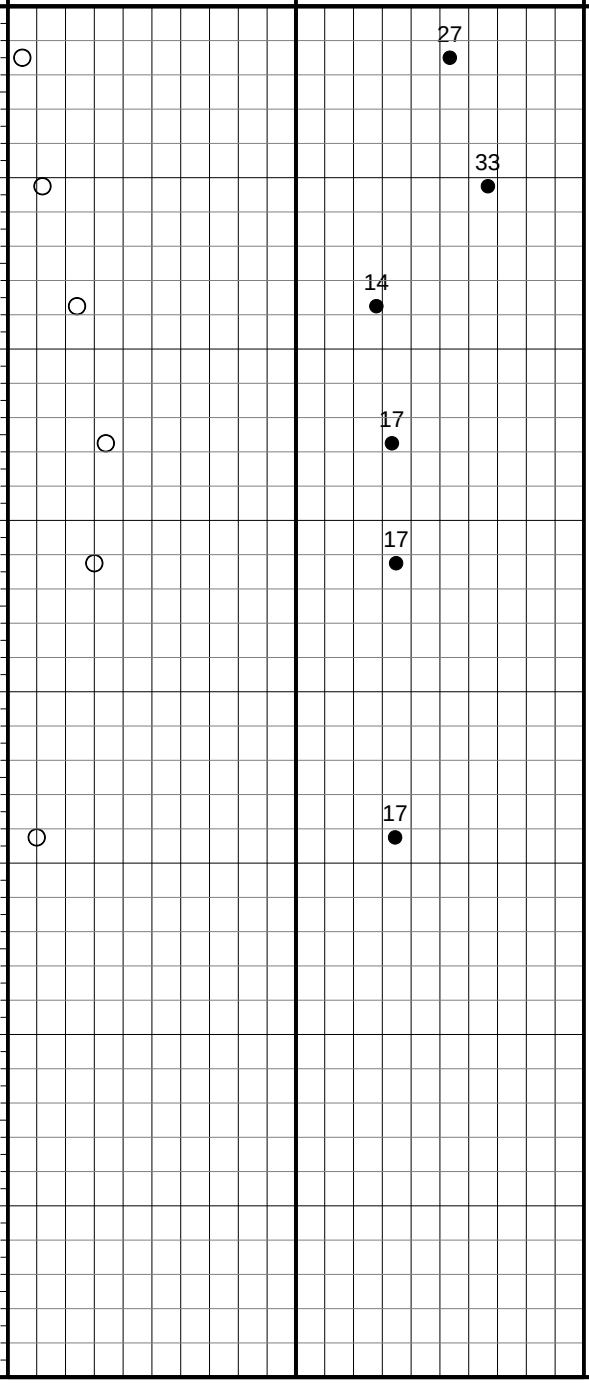
Dynamic Cone (blows/30 cm): 10 30 50 70 90

Shear Strength (kN/m²): 50 100 150 200

Penetration Resistance (blows/30 cm): 10 30 50 70 90

Atterberg Limits: PL — LL

Moisture Content (%): 10 20 30 40



WATER LEVEL



Water Level Reading:
W.L. @ El. 255.0 masl on May 28, 2024
W.L. @ El. 257.4 masl on Jun 17, 2024
W.L. @ El. 258.8 masl on Aug 29, 2024
W.L. @ El. 257.9 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 103

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 8, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
259.1	Ground Surface							
0.0	**20 cm Topsoil**	1	DO	10	0		27	
	Stiff to to hard **SILTY CLAY** a trace of sand occ. fine gravel — weathered	2	DO	12	1		25	
		3	DO	15	2		23	
		4	DO	23			16	
		5	DO	30	3		20	
	— — brown grey	6	DO	22	4		19	
254.0					5			
5.1	**END OF BOREHOLE**				6			
	Installed 50 mm Ø monitoring well to 4.6 m completed with 1.5 m screen Sand backfill from 2.4 m to 4.6 m Bentonite seal from 0.0 m to 2.4 m Provided with a momument steel casing				7			
					8			

Water Level Reading:
W.L. @ El. 255.4 masl on May 28, 2024
W.L. @ El. 258.4 masl on Jun 17, 2024
W.L. @ El. 258.4 masl on Aug 29, 2024
W.L. @ El. 258.2 masl on Nov 4 - 5, 2024

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 104

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

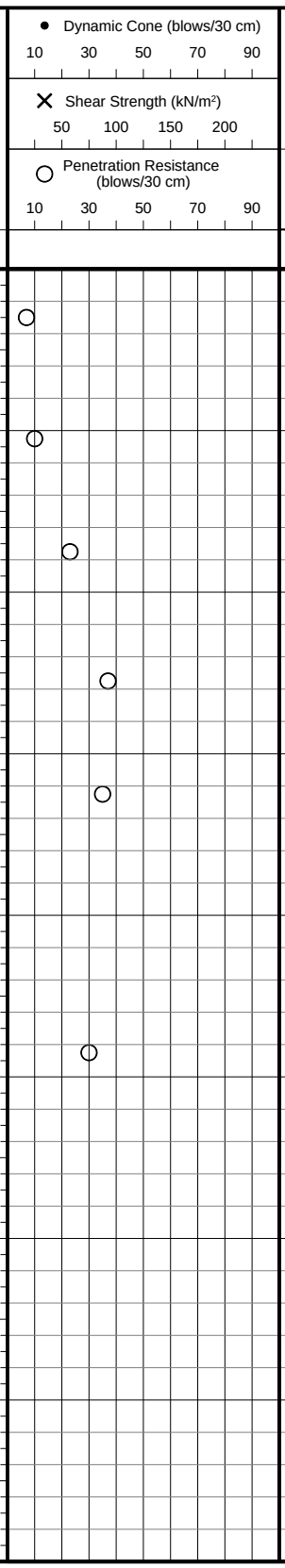
PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

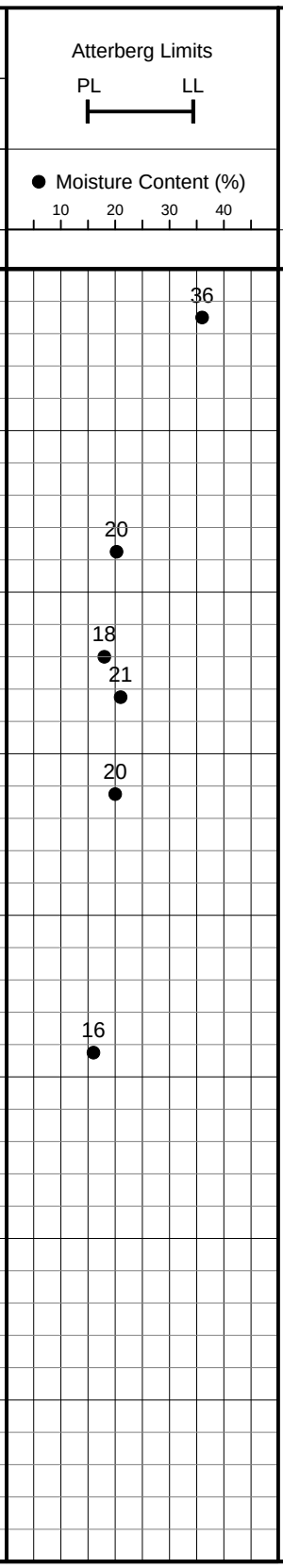
DRILLING DATE: May 8, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
261.6 / 0.0	Ground Surface			
	15 cm Topsoil	1	DO	7
	Brown firm to very stiff **SILTY CLAY** a trace of fine sand occ. fine gravel — weathered	2	DO	10
		3	DO	23
259.1 / 2.5		4A / 4B	DO	37
	Brown, dense, wet **SILTY FINE SAND** a trace of clay	5	DO	35
257.7 / 3.9	Grey, very stiff **SILTY CLAY** a trace of fine sand occ. fine gravel	6	DO	30
256.5 / 5.1	**END OF BOREHOLE**			

Installed 50 mm Ø monitoring well to 4.6 m
completed with 1.5 m screen
Sand backfill from 2.4 m to 4.6 m
Bentonite seal from 0.0 m to 2.4 m
Provided with a momument steel casing

Water Level Reading:
W.L. @ El. 258.3 masl on May 28, 2024
W.L. @ El. 261.1 masl on Jun 17, 2024
W.L. @ El. 260.6 masl on Aug 29, 2024
W.L. @ El. 259.8 masl on Nov 4 - 5, 2024







Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 105

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

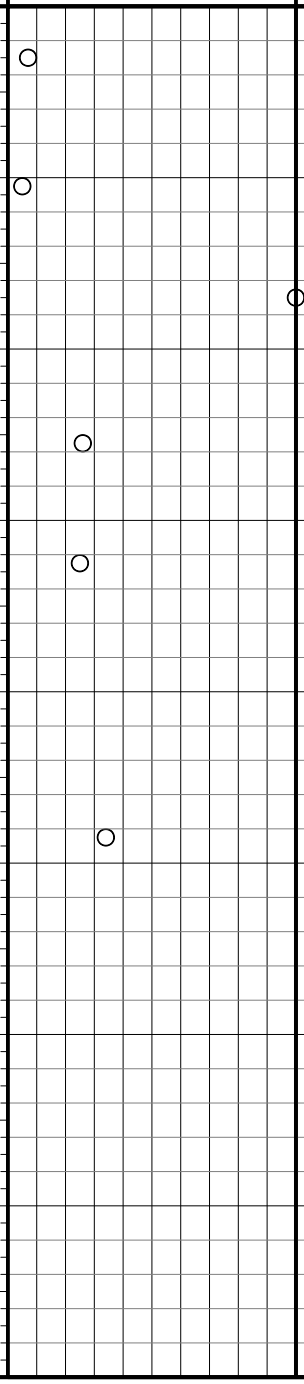
PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

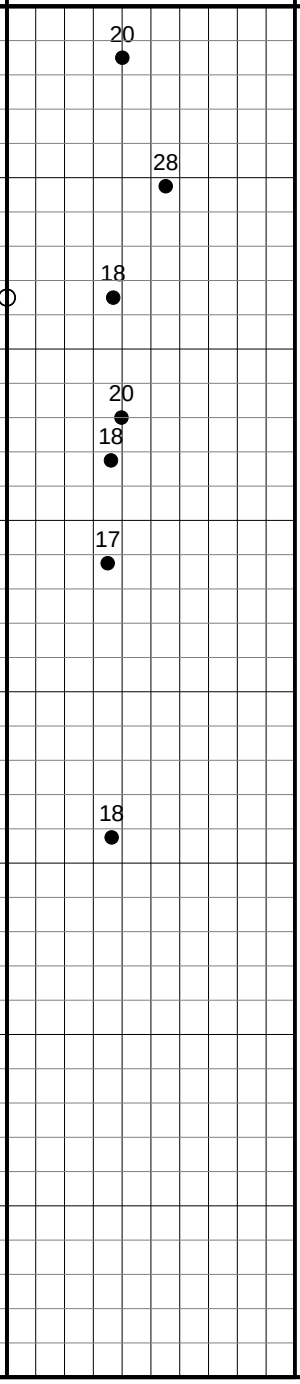
DRILLING DATE: May 8, 2024

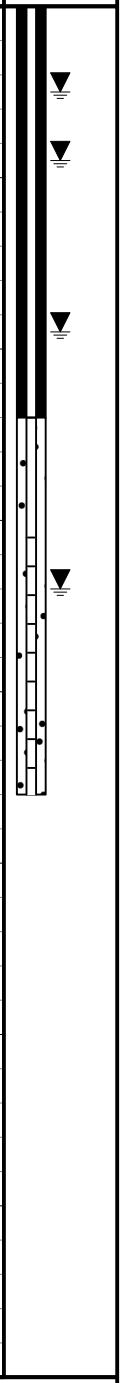
El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
261.8 / 0.0	Ground Surface			
	15 cm Topsoil	1	DO	7
	Brown, firm to hard **SILTY CLAY** a trace of sand occ. gravel — weathered	2	DO	5
		3	DO	63/28
259.3 / 2.5	Brown, compact, wet **SILTY FINE SAND** a trace of clay	4A 4B	DO	26
258.8 / 3.0	Grey, very stiff to hard **SILTY CLAY** a trace of sand occ. gravel	5	DO	25
		6	DO	34
256.7 / 5.1	**END OF BOREHOLE**			

Installed 50 mm Ø monitoring well to 4.6 m
completed with 1.5 m screen
Sand backfill from 2.4 m to 4.6 m
Bentonite seal from 0.0 m to 2.4 m
Provided with a momument steel casing

Water Level Reading:
W.L. @ El. 258.4 masl on May 28, 2024
W.L. @ El. 261.3 masl on Jun 17, 2024
W.L. @ El. 260.9 masl on Aug 29, 2024
W.L. @ El. 259.9 masl on Nov 4 - 5, 2024







Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 106

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 8, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
261.5	Ground Surface							
0.0	**15 cm Topsoil**	1	DO	7	0		37	
	Dark brown, firm **SILTY CLAY** — weathered a trace of sand and occ. topsoil inclusion							
260.8 0.7		2	DO	8	1		18	
	Brown, loose, very moist **SILTY FINE SAND** occ. fine gravel							
260.1 1.4		3	DO	8			18	
	Stiff to very stiff **SILTY CLAY** occ. fine gravel				2			
	— sand layers	4	DO	12			21	
	— — brown / grey	5	DO	11	3		27	
		6	DO	27	4		15	
256.4 5.1	**END OF BOREHOLE**				5			
	Installed 50 mm Ø monitoring well to 4.6 m completed with 1.5 m screen Sand backfill from 2.4 m to 4.6 m Bentonite seal from 0.0 m to 2.4 m Provided with a momument steel casing				6			
					7			
					8			

Water Level Reading:
W.L. @ El. 257.1 masl on May 28, 2024
W.L. @ El. 260.9 masl on Jun 17, 2024
W.L. @ El. 260.6 masl on Aug 29, 2024
W.L. @ El. 260.0 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 107

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 9, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.9 / 0.0	Ground Surface				
	13 cm Topsoil	1	DO	5	0
	weathered				
	Firm to very stiff **SILTY CLAY** a trace of sand occ. sand seams	2	DO	14	1
		3	DO	19	2
	brown grey	4	DO	16	
		5	DO	25	3
					4
254.8		6	DO	14	5
5.1	**END OF BOREHOLE**				6
					7
					8

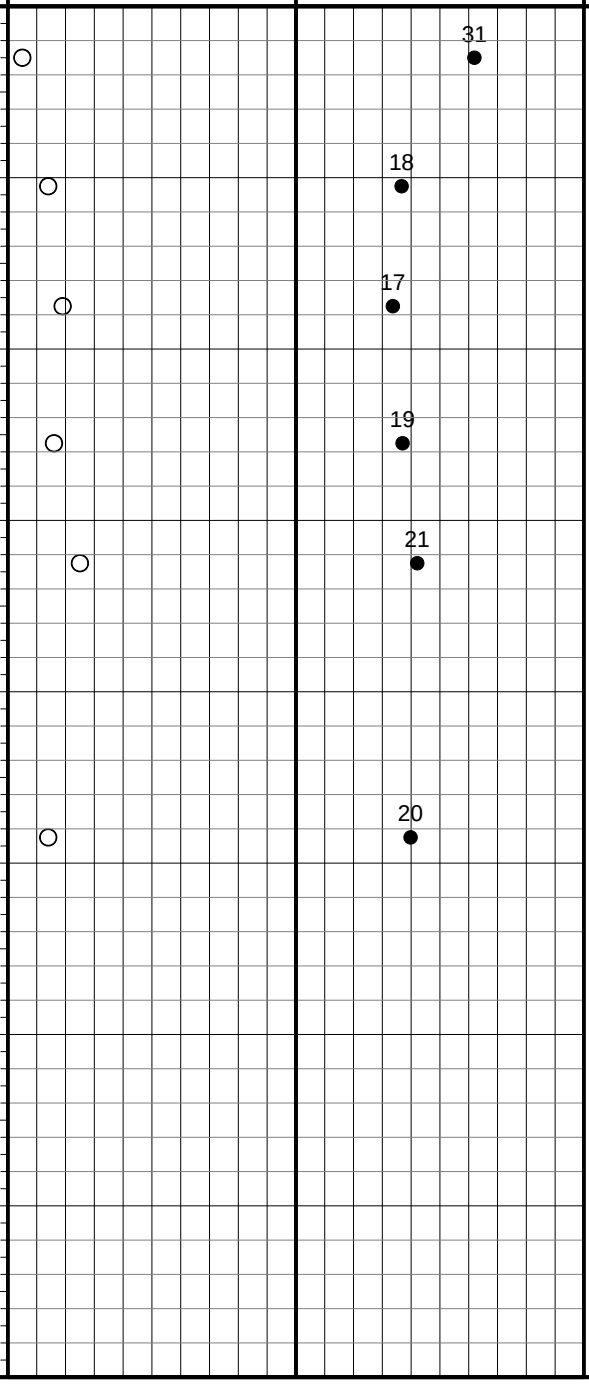
Dynamic Cone (blows/30 cm): 10 30 50 70 90

Shear Strength (kN/m²): 50 100 150 200

Penetration Resistance (blows/30 cm): 10 30 50 70 90

Atterberg Limits: PL — LL

Moisture Content (%): 10 20 30 40



WATER LEVEL

Installed 50 mm Ø monitoring well to 4.6 m
completed with 1.5 m screen
Sand backfill from 2.4 m to 4.6 m
Bentonite seal from 0.0 m to 2.4 m
Provided with a momument steel casing

Water Level Reading:
W.L. @ El. 256.3 masl on May 28, 2024
W.L. @ El. 259.4 masl on Jun 17, 2024
W.L. @ El. 259.2 masl on Aug 29, 2024
W.L. @ El. 259.0 masl on Nov 4 - 5, 2024

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 108

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Solid Stem Auger

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: May 9, 2024

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.3 / 0.0	Ground Surface				
	13 cm Topsoil	1	DO	7	0
	weathered				
	Firm to very stiff **SILTY CLAY** a trace of fine sand occ. fine gravel	2	DO	16	1
		3	DO	27	2
		4	DO	30	
	brown grey	5	DO	12	3
	wet	6	DO	9	4
254.2 / 5.1	**END OF BOREHOLE**				5
					6
					7
					8

Dynamic Cone (blows/30 cm) 10 30 50 70 90

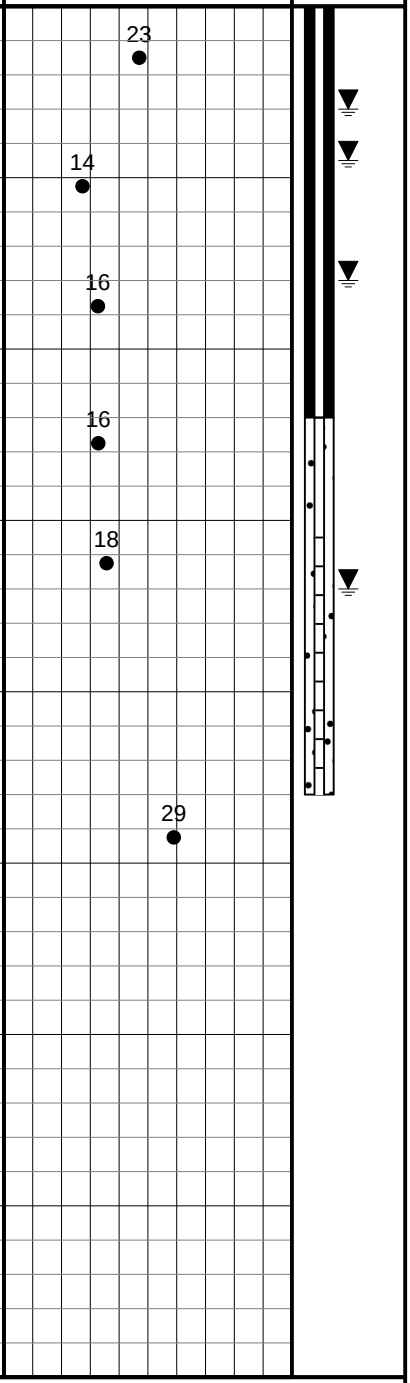
Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL



Installed 50 mm Ø monitoring well to 4.6 m
completed with 1.5 m screen
Sand backfill from 2.4 m to 4.6 m
Bentonite seal from 0.0 m to 2.4 m
Provided with a momument steel casing

Water Level Reading:
W.L. @ El. 255.9 masl on May 28, 2024
W.L. @ El. 258.7 masl on Jun 17, 2024
W.L. @ El. 258.4 masl on Aug 29, 2024

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Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

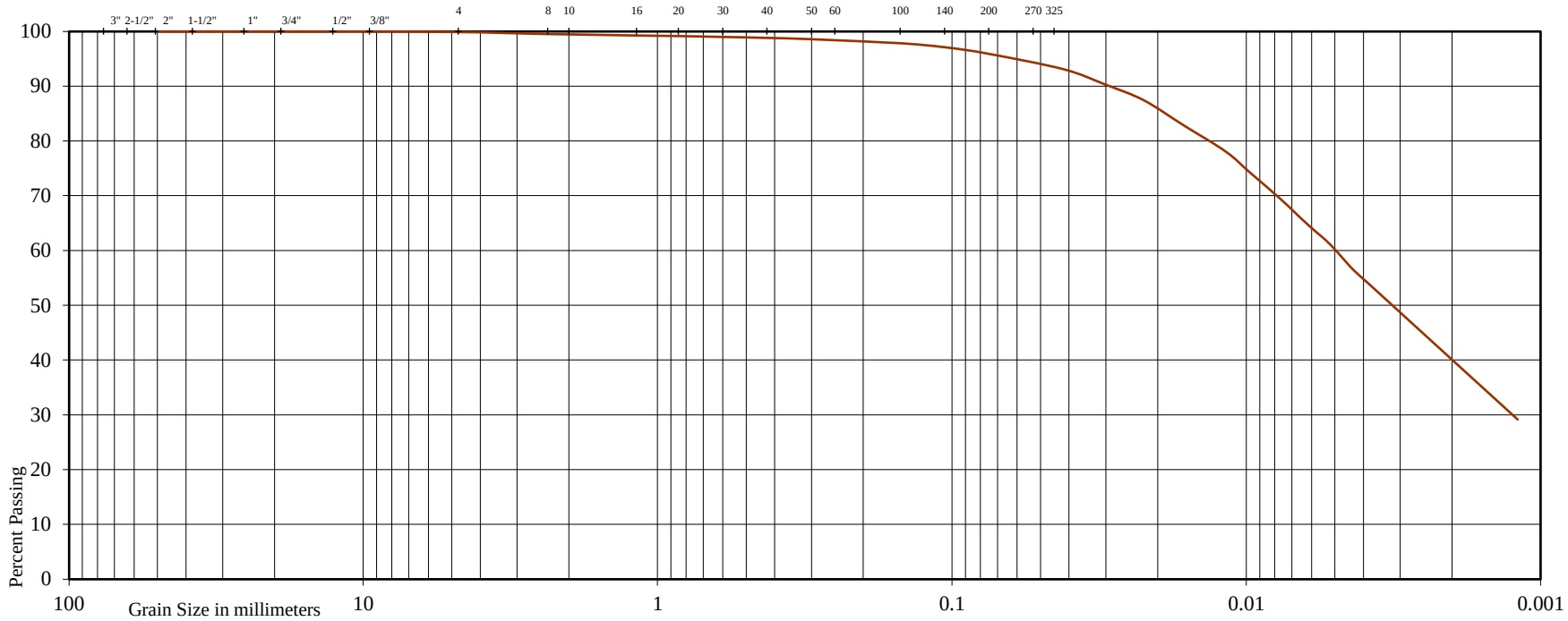
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 103

Sample No: 6

Depth (m): 4.6

Elevation (m): 254.5

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY
a trace of sand

Figure: 10

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

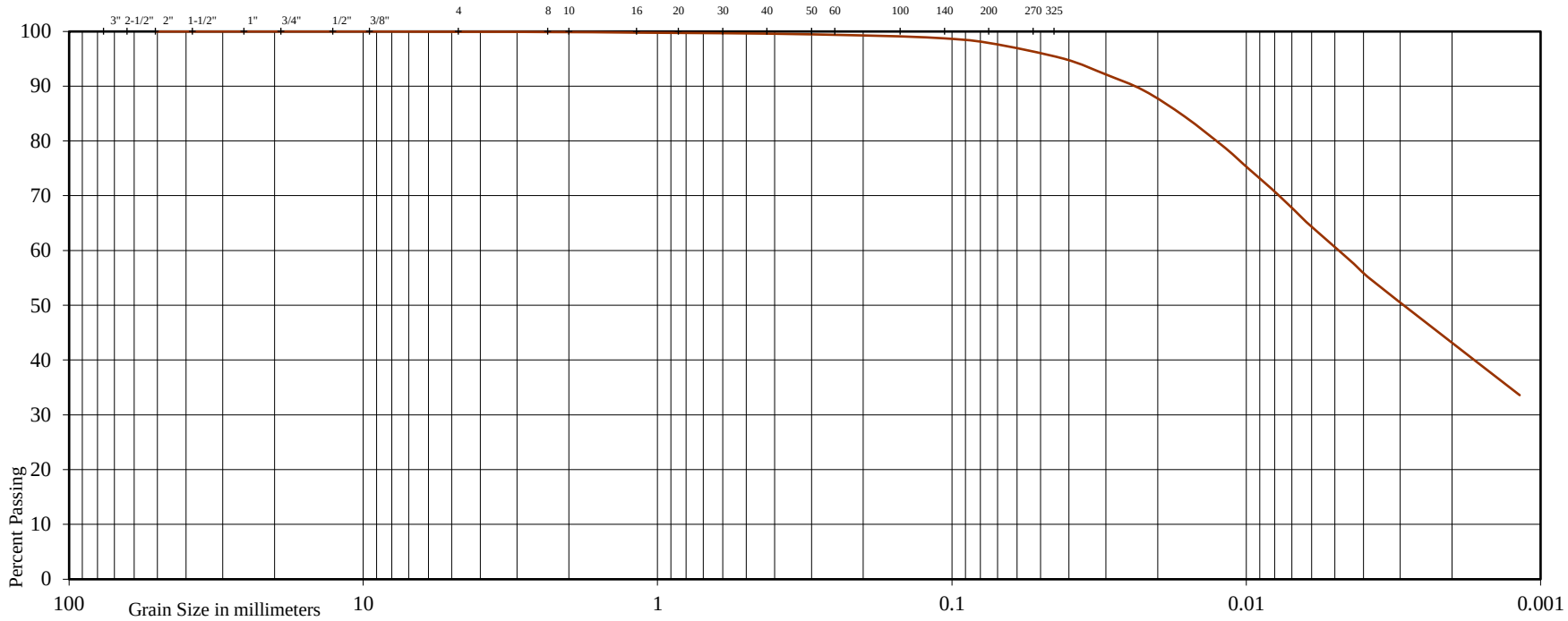
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 101

Sample No: 5

Depth (m): 3.0

Elevation (m): 259.2

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY
a trace of fine sand

Figure: 11

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

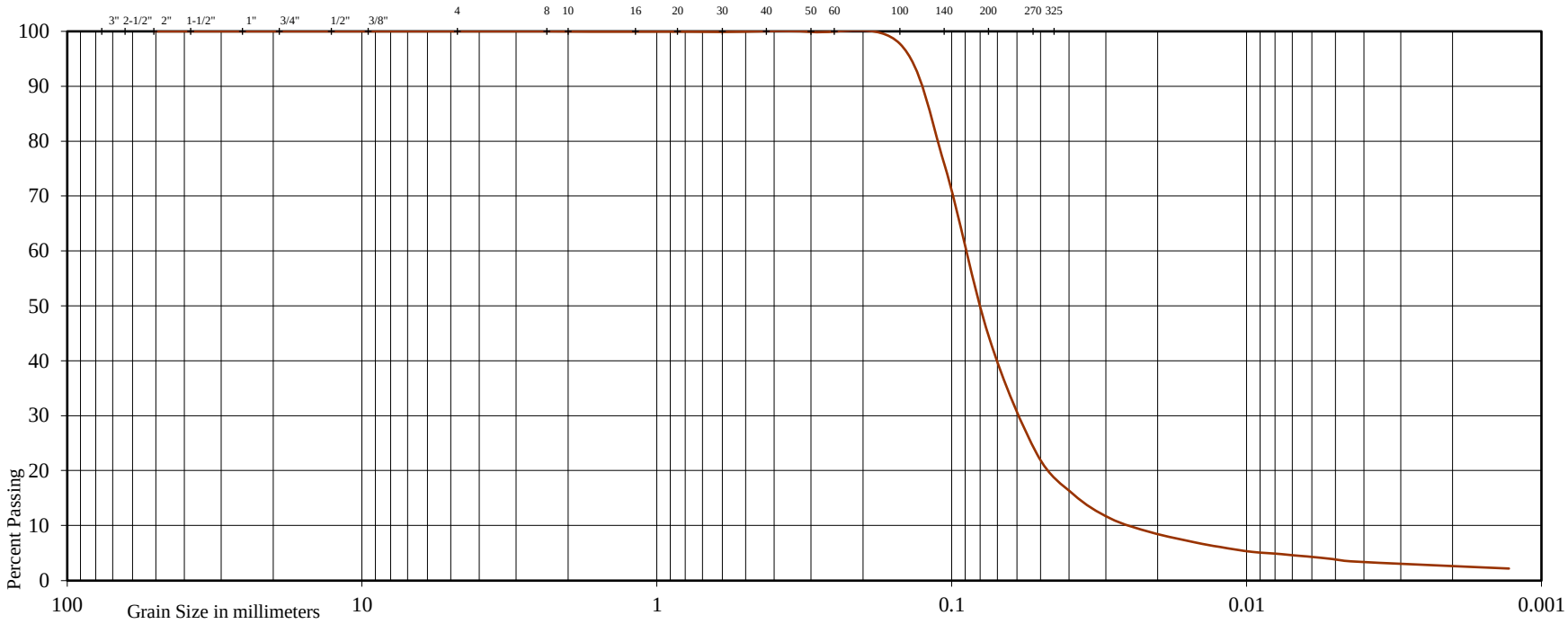
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 105

Sample No: 4B

Depth (m): 2.5

Elevation (m): 259.3

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-3}

Classification of Sample [& Group Symbol]: SILTY FINE SAND
a trace of clay

Figure: 12

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90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'A-3'

Borehole Logs and Grain size Distribution Graphs
Drilling Program Conducted during 2025

REFERENCE NO. 2309-W138

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 201

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: April 10, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
262.4	Ground Surface				
0.0	Stiff to hard **23 cm Topsoil** **SILTY CLAY TILL** traces of sand and gravel	1	DO	13	0
		2	DO	22	1
		3	DO	26	2
		4	DO	34	3
	brown / grey	5A 5B	DO	25	3
		6	DO	24	4
	clay layer	7	DO	12	5
		8	DO	19	6
		9	DO	17	7
	clay layer	10	DO	24	8
		11	DO	43	9
		12	DO	92/28	10
	sand layer	13A 13B	DO	86/28	11
244.9		14	DO	78	12
17.5	Grey, very dense **SILT** some clay, a trace of sand occ. clay layers	15	DO	50/15	13
		16	DO	50/28	14
	seepage	17	DO	94/25	15
	clay layer	18	DO	64	16
		19	DO	50/15	17
237.2					18
25.2	Grey, stiff **SILTY CLAY** a trace of sand, occ. fine gravel	20	DO	14	19
235.4					20
27.0	Grey, very dense, wet **SILTY FINE SAND** a trace of silt a trace of clay occ. fine gravel	21	DO	50/25	21
	some silt	22	DO	50/15	22
231.7		23	DO	50/15	23
30.6					24
					25
					26
					27
					28
					29
					30
					31
					32
					33
					34
					35
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					48

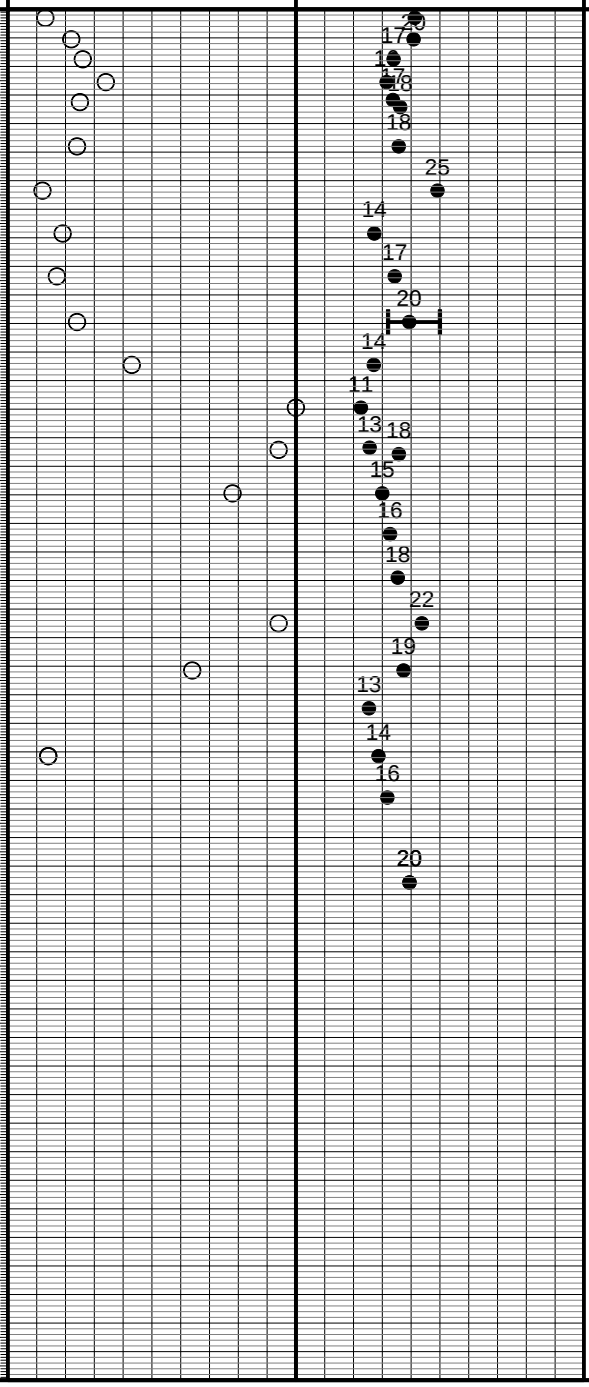
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

END OF BOREHOLE

Installed 50 mm Ø PVC monitoring well
to 30.7 m with 1.5 m screen
Sand backfill from 28.5 m to 30.7 m
Bentonite seal from 0 m to 28.5 m
Provided with Flushmount cover

Water level reading:
W.L. @ El. 236.5 masl on May 12, 2025
W.L. @ El. 236.5 masl on Aug 28, 2025
W.L. @ El. 236.3 masl on Oct 24, 2025
W.L. @ El. 236.3 masl on Dec 16, 2025

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 202

FIGURE NO.: 2

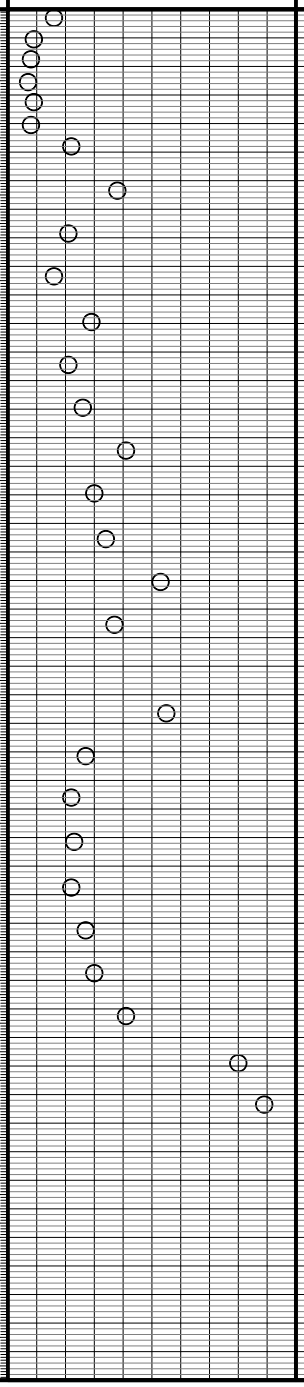
PROJECT DESCRIPTION: Proposed Residential Development

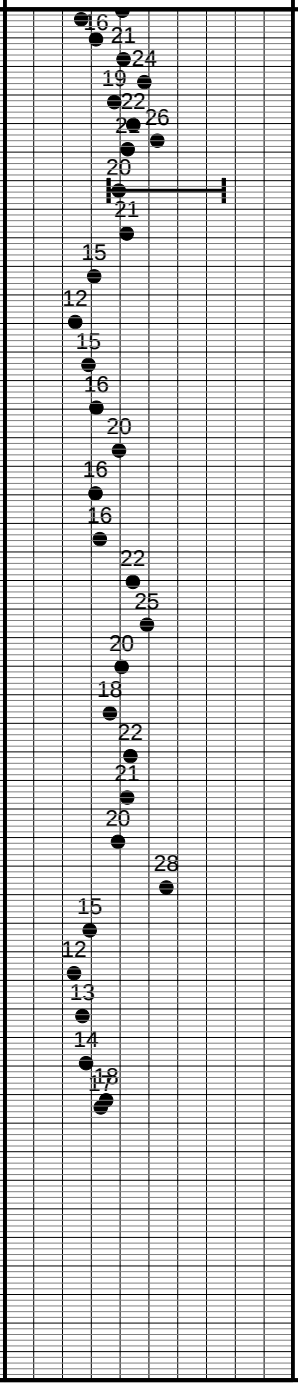
METHOD OF BORING: Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: April 11, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
259.3 / 0.0	Ground Surface				
	EARTH FILL 10 cm Topsoil Dark brown, silty clay occ. organics inclusion	1B	DO	16	0
		2	DO	9	1
		3	DO	8	2
		4	DO	7	3
		5	DO	9	4
254.6 / 4.7		6	DO	8	
	Very stiff to hard **SILTY CLAY** a trace of sand, occ. fine gravel — brown / grey	7A/7B	DO	22	5
		8	DO	38	6
		9	DO	21	7
249.3		10	DO	16	8
10.0	Grey, very stiff **SILTY CLAY TILL** traces of sand and gravel	11	DO	29	9
		12	DO	21	10
244.8		13	DO	26	11
14.5 / 243.0	Grey, dense, wet **SANDY SILT** occ. clay layers	14	DO	41	12
16.3	Grey, very stiff to hard **SILTY CLAY** a trace of fine sand occ. fine gravel	15	DO	30	13
		16	DO	34	14
238.8		17	DO	53	15
20.5	Grey, compact to very dense **SILT** some clay, a trace of gravel — seepage occ. silty clay layers seepage below 23.15 m	18	DO	37	16
		19	DO	93/25	17
		20	DO	55	18
		21	DO	27	19
		22	DO	22	20
		23	DO	23	21
	— clay layers	24	DO	22	22
227.8 / 31.5	Grey, compact to very dense, wet — some clay **SANDY SILT** traces of clay and gravel	25	DO	27	23
		26	DO	30	24
		27	DO	41	25
		28	DO	80	26
220.7 / 38.6		29A/29B	DO	89	27
	END OF BOREHOLE Installed 50 mm Ø PVC monitoring well to 38.1 m with 1.5 m screen Sand backfill from 35.9 m to 38.1 m Bentonite seal from 0 m to 35.9 m Provided with Flushmount cover				28
	Water level reading: W.L. @ El. 239.8 masl on May 12, 2025 W.L. @ El. 240.1 masl on Aug 28, 2025 W.L. @ El. 239.9 masl on Oct 24, 2025 W.L. @ El. 239.8 masl on Dec 16, 2025				29
					30
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					48





WATER LEVEL

Soil Engineers Ltd.

JOB NO.: 2309-W138

LOG OF BOREHOLE:BH/MW 203

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Residential Development

METHOD OF BORING: Tricone

PROJECT LOCATION: Northwest of Mount Hope Road and Columbia Way, Town of Caledon

DRILLING DATE: April 13, 2025

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
262.1 / 0.0	Ground Surface				
	Stiff to hard **15 cm Topsoil** **SILTY CLAY** a trace of sand — — brown grey	1B	DO	9	0
		2	DO	25	1
		3	DO	23	2
		4	DO	33	3
		5	DO	19	4
257.2 / 4.9	Grey, compact, wet **SANDY SILT** a trace of clay occ. fine gravel	6A 6B	DO	25	5
		7	DO	15	6
255.1 / 7.0	Grey, very stiff **SILTY CLAY** a trace of sand, occ.fine gravel	8	DO	28	7
		9	DO	33	8
254.2 / 7.9	Grey, very stiff **SILTY CLAY TILL** traces of sand and gravel	10	DO	26	9
		11	DO	85	10
250.6 / 11.5	Grey, very hard **SILTY CLAY** a trace of sand, occ. fine gravel occ.silt seams and layers	12	DO	60	11
		13	DO	66	12
		14	DO	36	13
		15	DO	42	14
		16	DO	36	15
241.4 / 20.7	Grey, very dense, wet **SANDY SILT** a trace of clay, occ. fine gravel occ. silty clay layers	17	DO	57	16
		18	DO	79	17
		19	DO	50	18
235.6 / 26.5		20	DO	50/10	19
234.6 / 27.6	Grey, very dense, wet **SILT** a trace of clay	21	DO	50/13	20
					21
					22
					23
					24
					25
					26
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Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL

END OF BOREHOLE

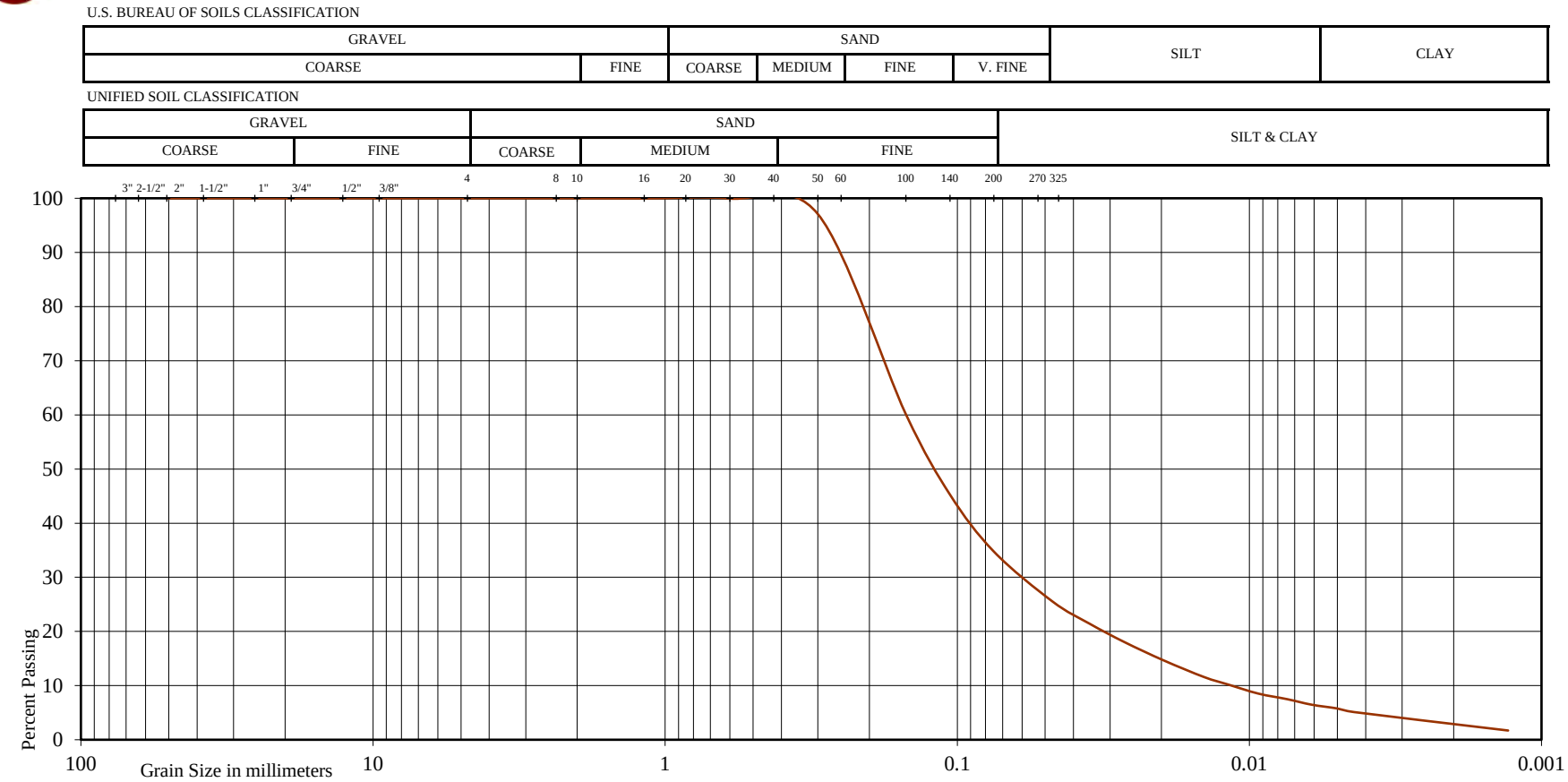
Installed 50 mm Ø PVC monitoring well
to 27.1 m with 3.0 m screen
Sand backfill from 23.4 m to 27.1 m
Bentonite seal from 0 m to 23.4 m
Provided with Flushmount cover

Water level reading:
W.L. @ El. 242.5 masl on May 12, 2025
W.L. @ El. 243.6 masl on Aug 28, 2025
W.L. @ El. 243.4 masl on Oct 24, 2025
W.L. @ El. 243.4 masl on Dec 16, 2025

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 2309-W138



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 201

Sample No: 21

Depth (m): 27.4

Elevation (m): 235.0

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-4}

Classification of Sample [& Group Symbol]: SILTY FINE SAND
a trace of clay

Figure: 4

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

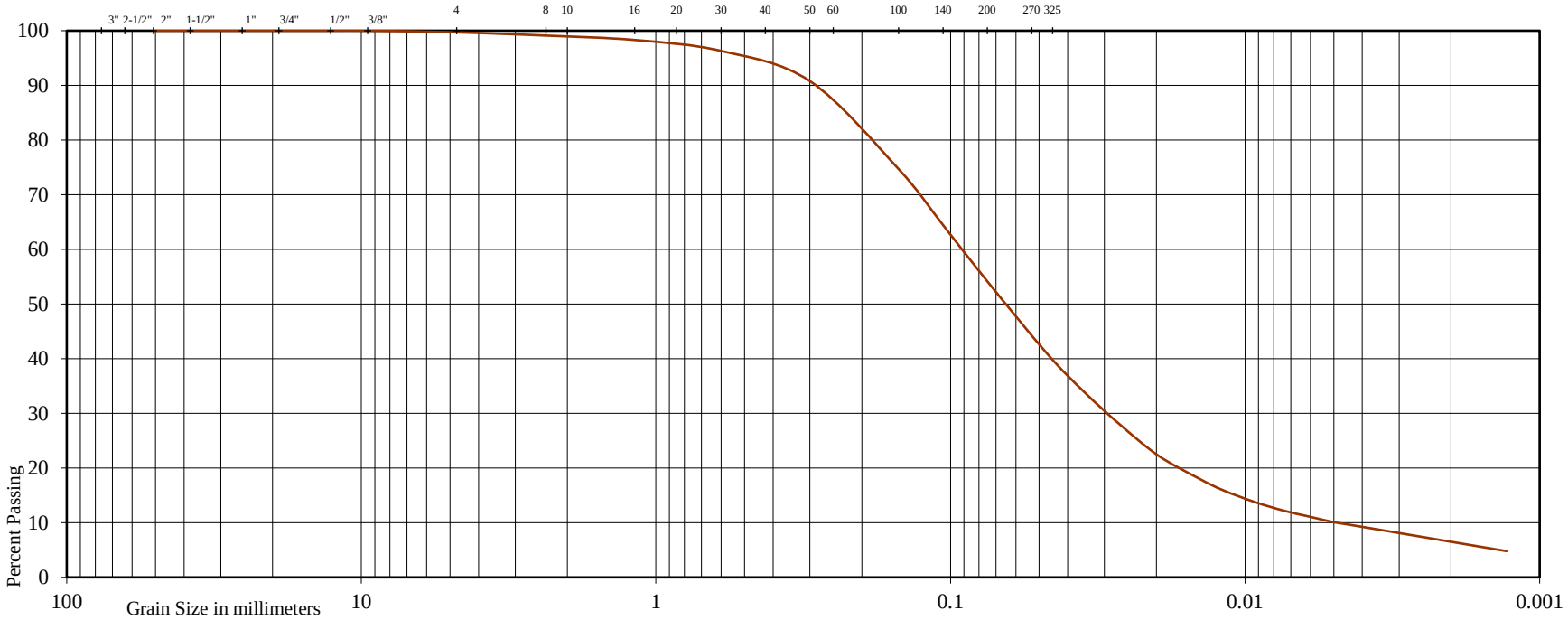
Reference No: 2309-W138

U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL		SAND				SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 202

Sample No: 26

Depth (m): 33.5

Elevation (m): 225.8

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-5}

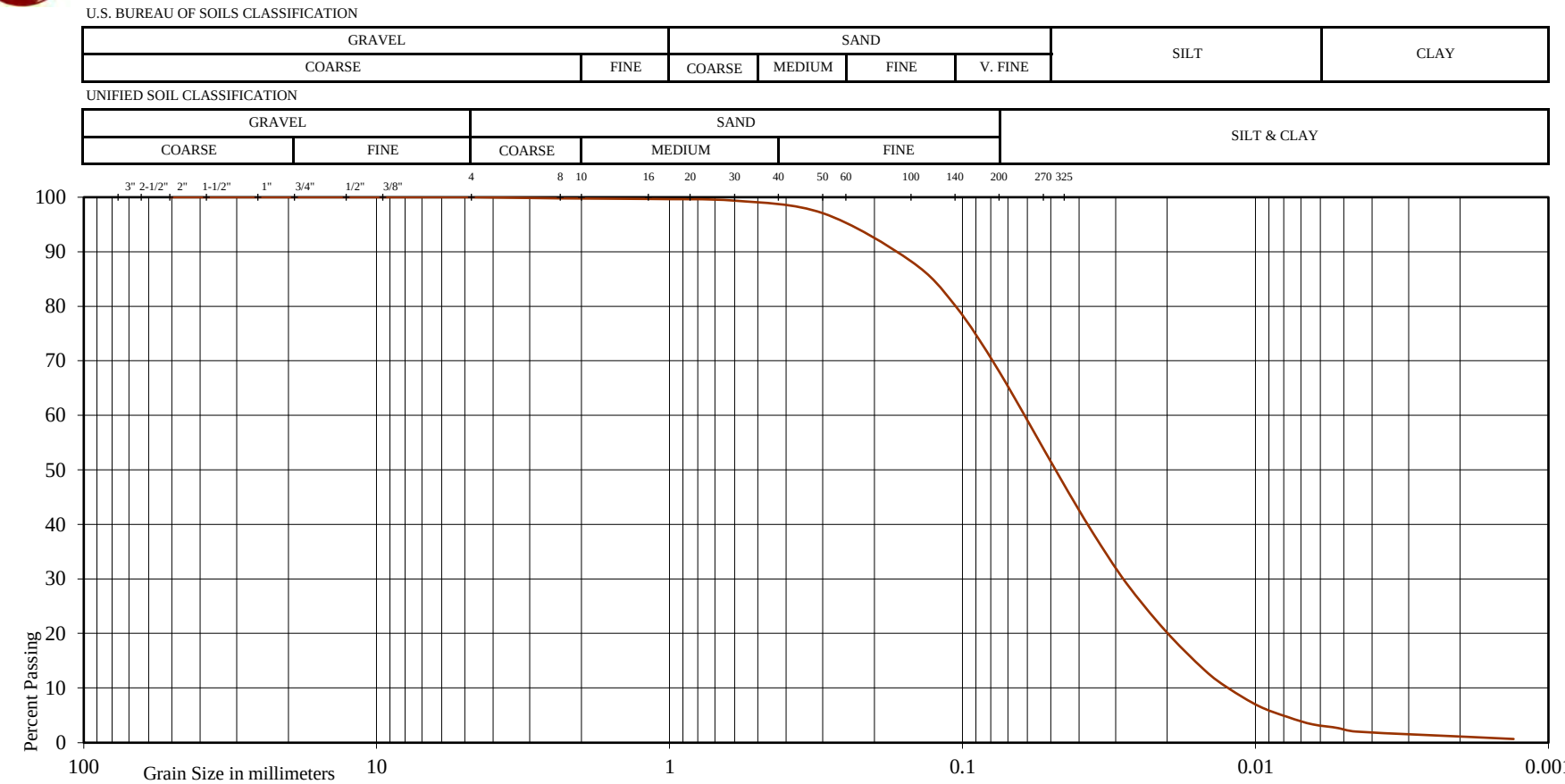
Classification of Sample [& Group Symbol]: SANDY SILT
a trace of clay

Figure: 5

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 2309-W138



Project: Proposed Residential Development

Location: Northwest Quadrant of Mount Hope Road and Columbia Way, Town of Caledon

Borehole No: 203

Sample No: 19

Depth (m): 24.4

Elevation (m): 237.7

Liquid Limit (%) = -

Plastic Limit (%) = -

Plasticity Index (%) = -

Moisture Content (%) = -

Estimated Permeability (cm./sec.) = 10^{-4}

Classification of Sample [& Group Symbol]: SANDY SILT
a trace of clay

Figure: 6

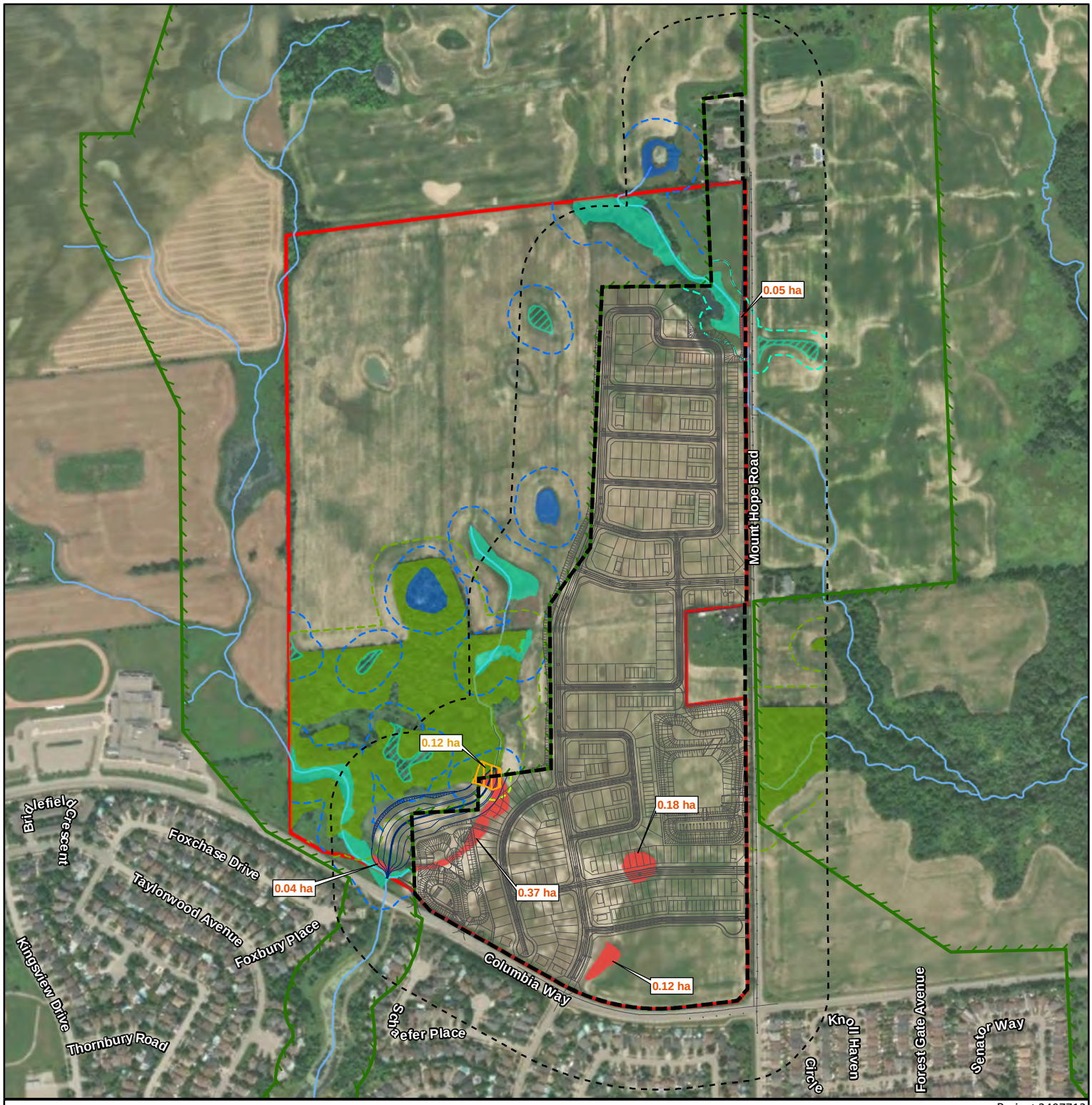
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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'A-4'

Preliminary Natural Heritage Constraints Map
Prepared by GEI Dated December 20, 2024

REFERENCE NO. 2309-W138



Project 2407713

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2026.
3. Orthoimagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Imagery taken in July 2024.

Legend

- Land Holdings
- Secondary Plan Area
- Secondary Plan Area + 120 m
- Greenbelt Plan Boundary
- Watercourse (LIO)
- Provincially Significant Wetland (PSW)
- Evaluated Non-PSW
- Unevaluated Wetland
- Evaluated Non-PSW (Secondary Plan Area) +15 m
- PSW (Secondary Plan Area and Greenbelt) & Non-PSW (Greenbelt) +30 m
- Significant Woodland
- Significant Woodland (Greenbelt) + 30 m
- Significant Woodland (Secondary Plan Area) + 15 m
- Channel Realignment
- Draft Plan and Grading Plan
- Proposed Wetland Removal (0.76 ha)
- Proposed Woodland Removal (0.12 ha)

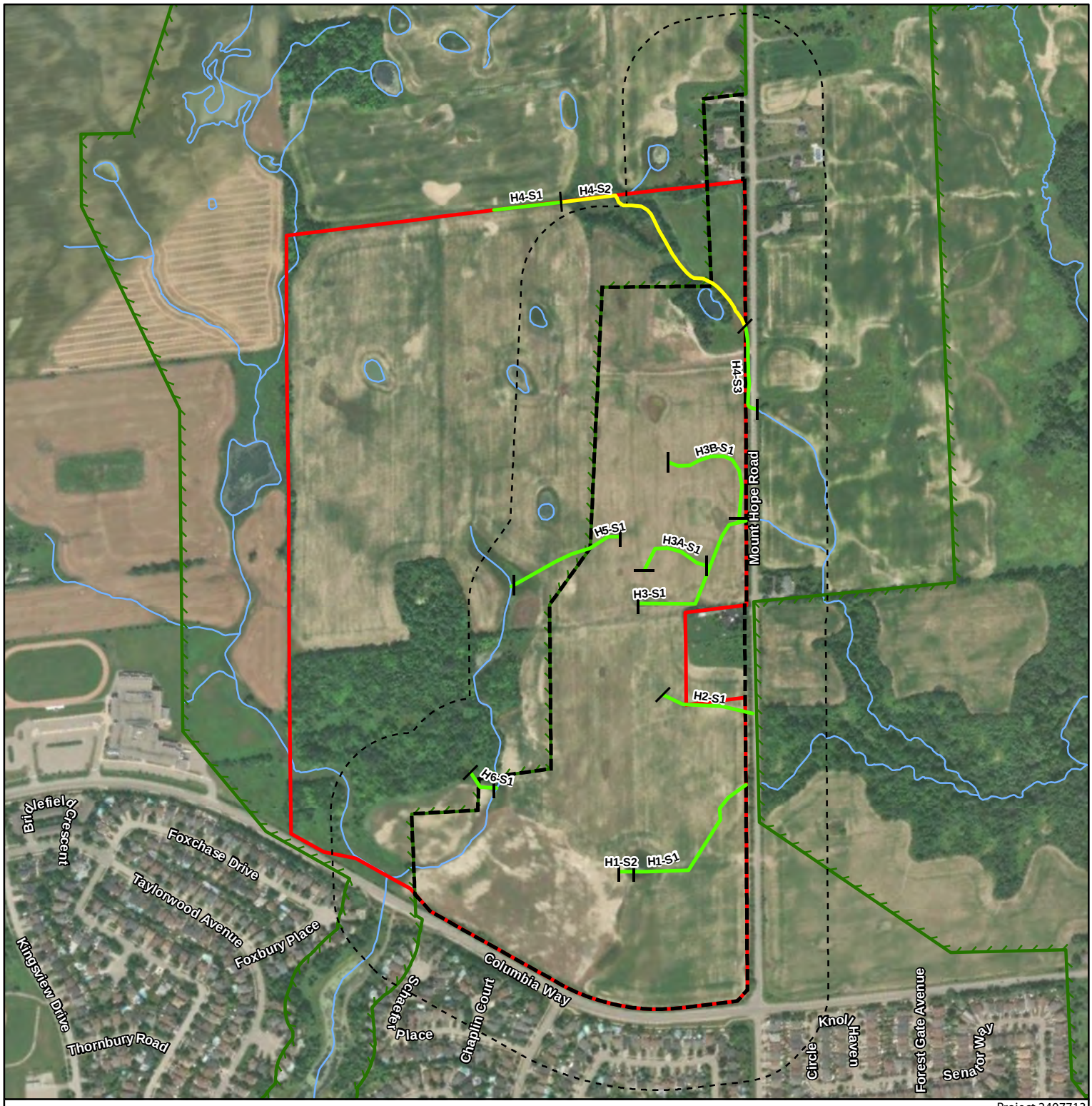
Local Subwatershed Study: Phase 2
Mount Hope West Lands
United Holdings Inc.

Figure 2
Natural Heritage Feature Removals

0 100 m
1:8,000

GEI Consultants

Path: \\bos-pzcc-1\Data_Storage\Working\UNITED HOLDINGS INC\2407713 Mount Hope West Lands Bolton\05_GIS\MXD\2026-02_LSS_phase_2\2407713_rpt_fig02_NHF_removals.mxd Date Saved: Wednesday, February 18, 2026 Last Modified by: PatWor3101



Project 2407713

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3. Orthoimagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Imagery taken in July 2024.

Legend

- Land Holdings
- Secondary Plan Area
- Secondary Plan Area + 120 m
- Greenbelt Plan Boundary
- Watercourse (LIO)
- Waterbody (LIO)

Headwater Drainage Feature Management Recommendations

- Conservation
- Mitigation
- Reach Breaks

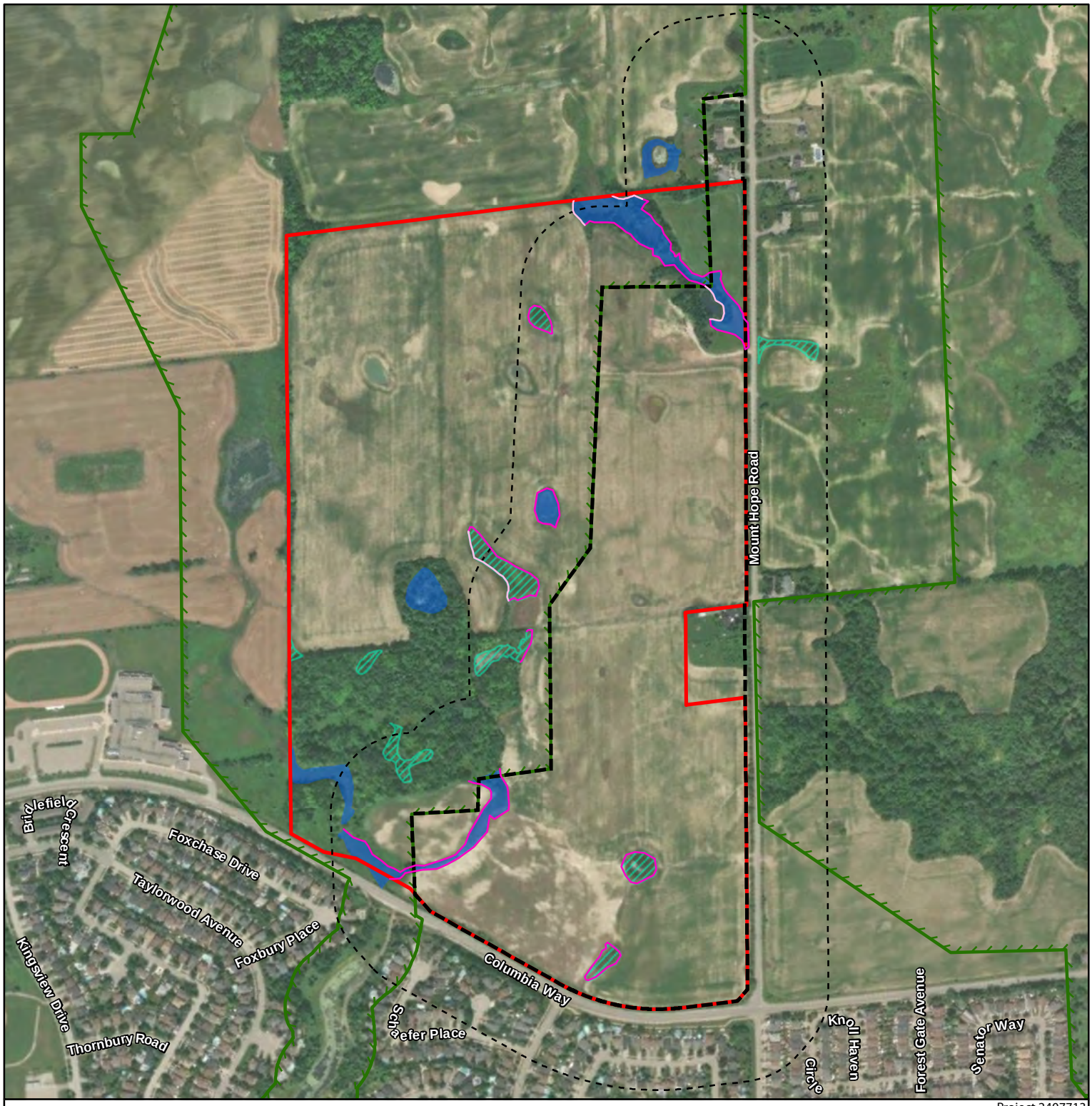
Local Subwatershed Study: Phase 1
Mount Hope West Lands
United Holdings Inc.

Figure 5
Headwater Drainage Feature Assessment

0 100 m
1:8,000

GEI Consultants

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Project 2407713

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3. Orthoimagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Imagery taken in July 2024.

Legend

- Land Holdings
- Secondary Plan Area
- Secondary Plan Area + 120 m
- Greenbelt Plan Boundary
- Staked Wetland (R-PE Surveying, August 16, 2024)
- Wetland (GEI Air Photo Interpretation)
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland

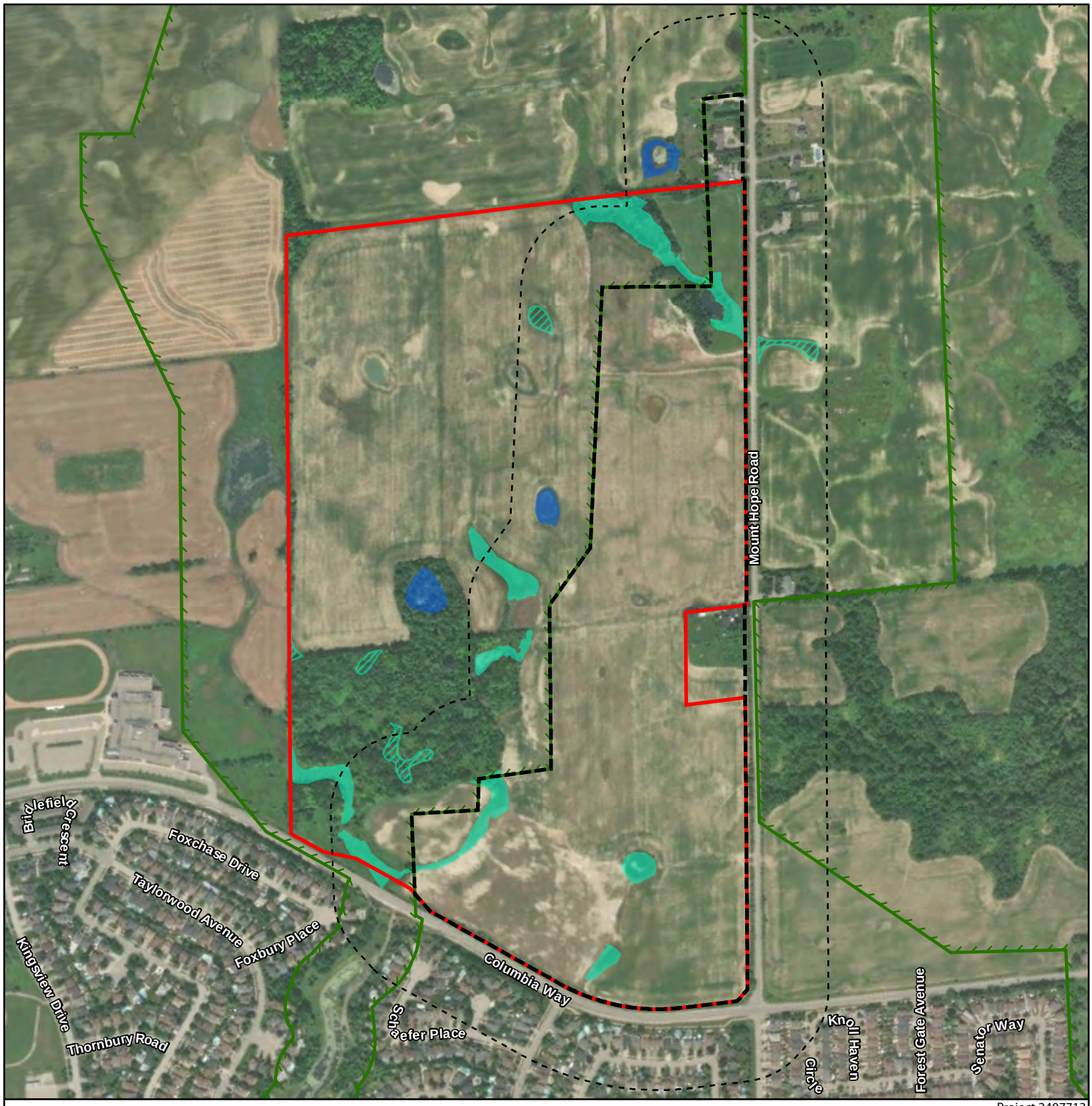
Local Subwatershed Study: Phase 1
Mount Hope West Lands
United Holdings Inc.

Figure 6A
Wetlands
Before OWES

0 100 m
1:8,000

GEI Consultants

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Project 2407713

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3. Orthoimagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Imagery taken in July 2024.

Legend

- Land Holdings
- Secondary Plan Area
- Secondary Plan Area + 120 m
- Greenbelt Plan Boundary
- Provincially Significant Wetland (PSW)
- Evaluated Non-PSW
- Unevaluated Wetland

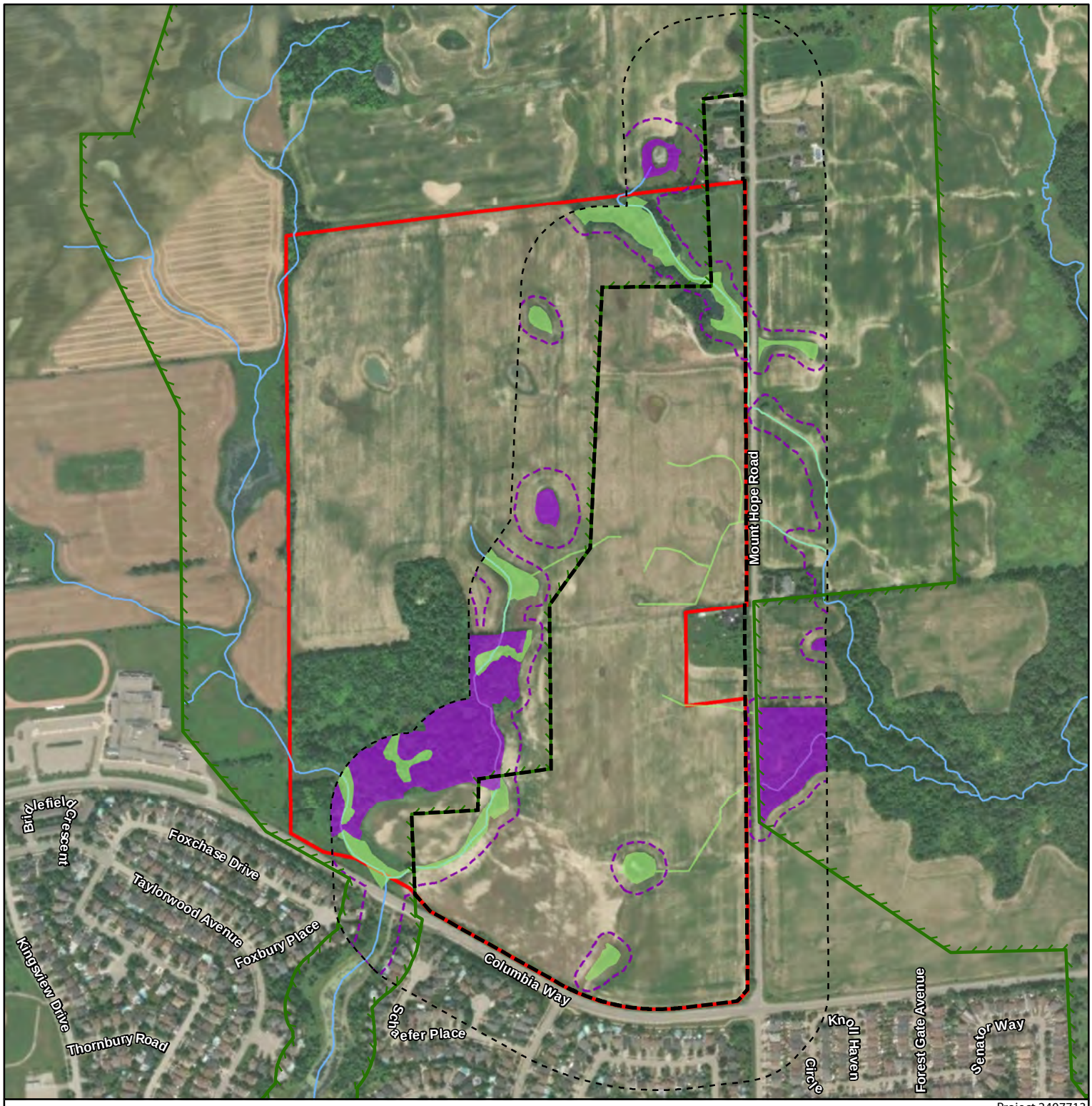
Local Subwatershed Study: Phase 1
Mount Hope West Lands
United Holdings Inc.

Figure 6B
Wetlands
After OWES

0 100 m
1:8,000

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Path: \\bos-pzcc-1\Data_Storage\Working\UNITED HOLDINGS INC\2407713 Mount Hope West Lands Bolton\05_GIS\MXD\2026-02_LSS_phase_1\2407713_rpt_fig06B_wetlands_after_OWES.mxd Date Saved: Thursday, February 5, 2026 Last Modified by: PatWor3101



Project 2407713

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Legend

- Land Holdings
- Secondary Plan Area
- Secondary Plan Area + 120 m
- Greenbelt Plan Boundary
- Watercourse (LIO)
- Existing NHS (Natural Features and Areas)
- Existing NHS (Supporting Features and Areas)
- Existing NHS Setback

Local Subwatershed Study: Phase 1
Mount Hope West Lands
United Holdings Inc.

Figure 11
Existing Natural Heritage System

0 100 m
1:8,000

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APPENDIX 'B'

MECP Water Well Records

REFERENCE NO. 2309-W138

MECP Well Records Summary

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				Final Status	First Use				
1	4900449	Cable Tool	64	Water Supply	Domestic	27.4	-	-	1966-06-18
2	4900450	Cable Tool	60	Water Supply	Domestic	28.3	58.8	60	1967-10-21
3	4900452	Rotary (Convent.)	89	Test Hole	Not Used	0.0	-	-	1959-12-03
4	4900384	Boring	24.1	Water Supply	Domestic	19.5	-	-	1956-06-16
5	4900388	Cable Tool	64	Water Supply	Livestock	24.4	62.2	64	1959-08-03
6	4900448	Boring	19.8	Abandoned-Supply	-	-	-	-	1966-05-17
7	4904451	Rotary (Convent.)	24.7	Water Supply	Domestic	17.7	23.8	24.7	1974-08-12
8	4905297	Cable Tool	33.5	Water Supply	Domestic	22.6	-	-	1977-08-02
9	4905630	Rotary (Convent.)	56.4	Water Supply	Domestic	20.7	40.8	41.8	1979-09-19
10	4905852	Rotary (Convent.)	68.6	Water Supply	Domestic	21.0	67.4	68.6	1981-07-18
11	4906046	Cable Tool	70.1	Water Supply	Domestic	17.1	62.5	64.3	1983-03-04
12	4906158	Rotary (Convent.)	93	Water Supply	Domestic	24.7	-	-	1984-03-05
13	4906769	Rotary (Convent.)	33.5	Water Supply	Domestic	1.8	24.4	25.3	1987-10-13
14	4908423	Other Method	54.9	Abandoned-Quality	Not Used	28.0	-	-	1998-11-03
15	4908424	Not Known	-	Abandoned-Other	Not Used	-	-	-	1998-11-03
16	4908593	Digging	-	Abandoned-Other	Not Used	-	-	-	2000-04-19
17	4908660	Cable Tool	52.7	Water Supply	Domestic	21.3	50.9	52.1	2000-06-25
18	7040135	-	15.2	Abandoned-Other	-	-	-	-	2006-08-30
19	7040137	-	-	Abandoned-Other	-	-	-	-	2006-11-06
20	7297324	Boring	3	Monitoring and Test Hole	-	-	3	1.5	2017-07-31
21	7297325	Boring	3	Monitoring and Test Hole	Test Hole	-	-	3	2017-07-31
22	7355088	-	-	-	-	-	-	-	
23	7370378	-	-	-	-	-	-	-	2020-09-02

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APPENDIX 'C'

Groundwater Monitoring and Surface water Monitoring Summary

REFERENCE NO. 2309-W138

MW* ID	Units	15-Nov-23	4-Dec-23	4-Jan-24	26-Jan-24	27-Mar-24	24-Apr-24	28-May-24	17-Jun-24	29-Aug-24	Nov 4 - 5, 2024	05-May-25	12-May-25	28-Aug-25	24-Oct-25	16-Dec-25
BH/MW 1	mbgs	16.1	Dry	Dry	Dry	16.3	16.3	16.3	16.2	16.0	16.2	16.0	NM	16.1	16.1	16.2
	masl	246.4				246.2	246.2	246.2	246.3	246.5	246.3	246.5		246.4	246.4	246.3
BH/MW 2S	mbgs	3.4	3.2	0.9	1.2	0.8	0.8	0.7	1.5	2.2	3.1	1.1	NM	3.1	4.0	4.4
	masl	259.2	259.4	261.7	261.4	261.8	261.8	261.9	261.1	260.4	259.5	261.5		259.5	258.6	258.2
BH/MW 2D	mbgs	11.4	11.2	11.2	11.0	10.9	10.9	10.9	10.4	11.1	11.0	11.0	NM	11.1	11.3	11.3
	masl	251.2	251.4	251.4	251.6	251.7	251.7	251.7	252.2	251.5	251.6	251.6		251.5	251.3	251.3
BH/MW 4	mbgs	12.2	12.4	12.5	12.4	12.2	12.2	12.1	12.2	12.3	12.3	12.2	NM	12.3	12.4	12.7
	masl	248.8	248.6	248.5	248.6	248.8	248.8	248.9	248.8	248.7	248.7	248.8		248.7	248.6	248.3
BH/MW 5	mbgs	3.7	3.4	0.7	1.8	1.6	1.4	2.0	2.5	2.2	3.4	2.1	NM	3.5	4.0	4.1
	masl	255.5	255.8	258.5	257.4	257.6	257.8	257.2	256.7	257.0	255.8	257.1		255.7	255.2	255.1
BH/MW 6	mbgs	1.3	1.0	0.5	0.4	0.3	0.2	0.4	0.5	0.6	1.3	0.4	NM	1.8	2.4	2.8
	masl	257.6	257.9	258.4	258.5	258.6	258.7	258.5	258.4	258.3	257.6	258.5		257.1	256.5	256.1
MP 3	mbgs	NI	NI	NI	NI	NI	NI	0.3	0.6	0.5	0.7	0.3	NM	0.9	Dry	Dry
	masl							258.4	258.1	258.2	258.0	258.4		257.8		
MP 4	mbgs	NI	NI	NI	NI	NI	NI	1.1	1.2	1.2	1.4	1.1	NM	Dry	Dry	Dry
	masl							258.8	258.7	258.7	258.5	258.8				
BH/MW 7	mbgs	1.7	0.9	0.4	0.5	0.2	0.4	0.2	0.7	1.4	2.1	0.5	NM	2.4	3.1	2.6
	masl	257.3	258.1	258.6	258.5	258.8	258.6	258.8	258.3	257.6	256.9	258.5		256.6	255.9	256.4
MP 12	mbgs	NA	NA	NA	NA	NA	NA	0.0	0.5	1.0	1.3	0.3	NM	Dry	Dry	Dry
	masl	NA	NA	NA	NA	NA	NA	257.6	257.1	256.6	256.3	257.3				
BH/MW 8	mbgs	NA	NA	NA	NA	NA	NA	4.5	1.0	1.5	2.4	0.7	NM	2.9	2.9	3.3
	masl	NA	NA	NA	NA	NA	NA	257.5	261.0	260.5	259.6	261.3		259.1	259.1	258.7
BH/MW 9	mbgs	1.2	0.4	0.5	0.3	0.2	0.6	0.1	1.0	1.4	2.1	0.7	NM	2.5	2.8	2.8
	masl	259.4	260.2	260.1	260.3	260.4	260.0	260.5	259.6	259.2	258.5	259.9		258.1	257.8	257.8
BH/MW 10	mbgs	5.1	4.7	0.9	0.9	0.6	0.6	0.7	1.1	1.5	3.1	1.1	NM	2.8	3.9	4.4
	masl	258.0	258.4	262.2	262.2	262.5	262.5	262.4	262.0	261.6	260.0	262.0		260.3	259.2	258.7
BH/MW 12	mbgs	2.7	2.9	0.7	0.0	0.0	-0.1	0.0	0.4	0.5	2.0	0.2	NM	2.3	3.0	3.2
	masl	260.3	260.1	262.3	263.0	263.0	263.1	263.0	262.6	262.5	261.0	262.8		260.7	260.0	259.8
BH/MW 13	mbgs	2.6	2.5	0.4	0.2	0.1	0.0	0.1	0.9	1.3	2.6	0.3	NM	3.0	3.7	4.0
	masl	259.4	259.5	261.6	261.8	261.9	262.0	261.9	261.1	260.7	259.4	261.7		259.0	258.3	258.0
BH/MW 101	mbgs	NI	NI	NI	NI	NI	NI	4.4	0.8	0.8	1.3	0.5	NM	2.4	4.4	1.3
	masl							257.8	261.4	261.4	260.9	261.7		259.8	257.8	260.9
MP 1	mbgs	NI	NI	NI	NI	NI	NI	0.1	0.1	0.1	0.3	0.1	NM	Dry	Dry	Dry
	masl							261.9	261.9	261.9	261.7	261.9				
BH/MW 102	mbgs	NI	NI	NI	NI	NI	NI	4.5	2.1	0.7	1.6	0.6	NM	NA	2.8	3.4
	masl							255.0	257.4	258.8	257.9	258.9			256.7	256.1
MP 2	mbgs	NI	NI	NI	NI	NI	NI	0.1	0.3	0.5	0.4	0.1	NM	Dry	Dry	Dry
	masl							259.3	259.1	258.9	259.0	259.3				
BH/MW 103	mbgs	NI	NI	NI	NI	NI	NI	3.8	0.8	0.8	1.0	0.4	NM	1.8	3.6	3.9
	masl							255.3	258.3	258.3	258.1	258.7		257.3	255.5	255.2
MP 5	mbgs	NI	NI	NI	NI	NI	NI	0.1	0.6	0.7	0.9	0.3	NM	Dry	Dry	Dry
	masl							258.9	258.4	258.3	258.1	258.7				
BH/MW 104	mbgs	NI	NI	NI	NI	NI	NI	3.3	0.5	1.0	1.8	0.4	NM	1.9	2.7	2.6
	masl							258.3	261.1	260.6	259.8	261.2		259.7	258.9	259.0
MP 6	mbgs	NI	NI	NI	NI	NI	NI	0.6	0.8	0.4	0.5	0.1	NM	1.0	Dry	0.4
	masl							261.0	260.8	261.2	261.1	261.5		260.6		261.2
BH/MW 105	mbgs	NI	NI	NI	NI	NI	NI	3.4	0.5	0.9	1.9	0.4	NM	2.0	2.6	2.7
	masl							258.4	261.3	260.9	259.9	261.4		259.8	259.2	259.1
MP 7	mbgs	NI	NI	NI	NI	NI	NI	0.0	0.6	0.7	1.0	0.2	NM	Dry	Dry	Dry
	masl							261.6	261.0	260.9	260.6	261.4				
MP 8	mbgs	NI	NI	NI	NI	NI	NI	0.4	0.5	0.7	1.1	0.4	NM	Dry	Dry	Dry
	masl							261.1	261.0	260.8	260.4	261.1				
BH/MW 106	mbgs	NI	NI	NI	NI	NI	NI	4.4	0.6	0.9	1.5	0.2	NM	2.8	3.5	3.5
	masl							257.1	260.9	260.6	260.0	261.3		258.7	258.0	258.0
MP 9	mbgs	NI	NI	NI	NI	NI	NI	-0.1	0.3	0.4	0.9	-0.2	NM	Dry	Dry	Dry
	masl							261.4	261.0	260.9	260.4	261.5				
BH/MW 107	mbgs	NI	NI	NI	NI	NI	NI	3.6	0.5	0.7	0.9	0.3	NM	1.3	1.3	1.1
	masl							256.3	259.4	259.2	259.0	259.6		258.6	258.6	258.8
MP 10	mbgs	NI	NI	NI	NI	NI	NI	0.1	0.2	0.4	0.7	0.1	NM	NA	NA	NA
	masl							259.3	259.2	259.0	258.7	259.3				
BH/MW 108	mbgs	NI	NI	NI	NI	NI	NI	3.4	0.6	0.9	1.6	0.4	NM	1.9	2.3	2.3
	masl							255.9	258.7	258.4	257.7	258.9		257.4	257.0	257.0
MP 11	mbgs	NI	NI	NI	NI	NI	NI	0.2	0.3	0.5	0.7	0.4	NM	1.3	Dry	1.2
	masl							259.0	258.9	258.7	258.5	258.8		257.9		258.0
PZ-1S	mbgs	NI	NI	NI	0.3	0.4	0.8	0.5	1.0	1.0	1.3	0.7	NM	1.7	2.8	2.5
	masl				260.1	260.0	259.6	259.9	259.4	259.4	259.1	259.7		258.7	257.6	257.9
PZ-1D	mbgs	NI	NI	NI	0.6	0.2	0.5	0.2	0.8	0.8	1.1	0.8	NM	1.9	2.7	2.3
	masl				259.8	260.2	259.9	260.2	259.6	259.6	259.3	259.6		258.5	257.7	258.1
BH/MW 201	mbgs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	25.9	25.9	26.1	26.1
	masl												236.5	236.5	236.3	236.3
BH/MW 202	mbgs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	19.5	19.2	19.4	19.5
	masl												239.8	240.1	239.9	239.8
BH/MW 203	mbgs	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	19.6	18.5	18.7	18.7
	masl												242.5	243.6	243.4	243.4

NI - Not Installed
NM - Not Measured
NA- Not Accessible

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Staff Gauge	Easting	Northing	Ground Level Elevation (masl)	Units	19-Jul-24	29-Aug-24	5-May-25	28-Aug-25	16-Dec-25	20-Jan-26
OLD Unknown SG	4862020.2	600279.4	258.3	mags	NA	NA	0.1	Dry	Snow Cover	Snow Cover
				masl			258.40			
SG 1	4861828.5	600274.6	261.2	mags	0.05	Dry	0.3	Dry	Snow Cover	Snow Cover
				masl	261.25		261.50			
SG 2	4861756.0	600313.7	261.2	mags	0.26	Dry	0.4	Dry	Snow Cover	Snow Cover
				masl	261.46		261.60			
SG 3	4861626.3	600471.8	261.0	mags	0.34	0.22	0.3	Dry	Snow Cover	Snow Cover
				masl	261.34	261.22	261.31			
SG 4	4861464.0	600555.0	NA	mags	0.18	0.12	0.20	NA	Snow Cover	Snow Cover
				masl						
SG 5	4861382.4	600937.3	259.4	mags	0.04	Dry	0.1	Dry	Snow Cover	Snow Cover
				masl	259.44		259.50			
SG 6	4861457.0	600582.0	259.0	mags	0.18	0.12	0.2	NA	Snow Cover	Snow Cover
				masl	259.18	259.12	259.20			

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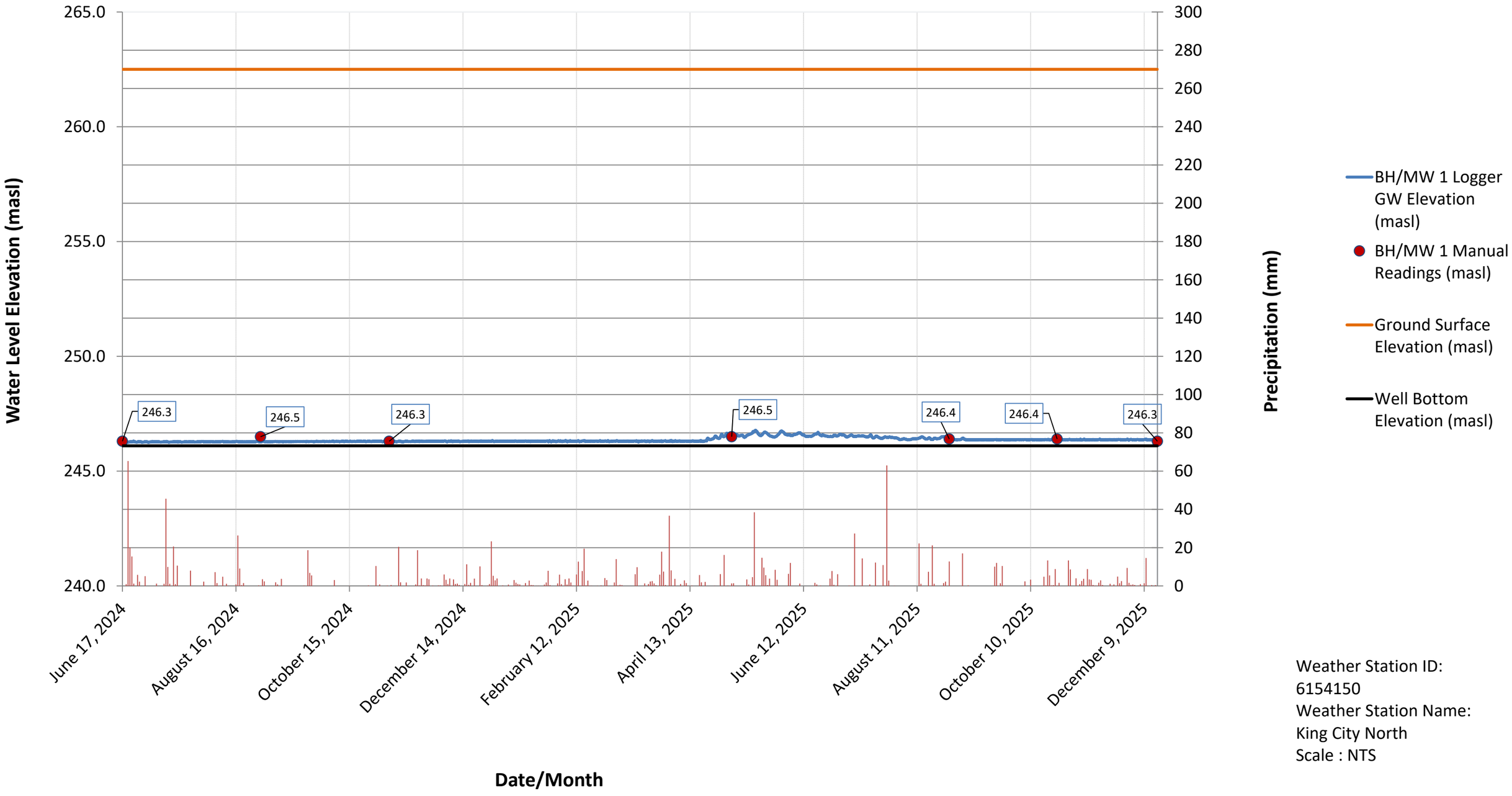
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APPENDIX 'D'

Hydrographs

REFERENCE NO. 2309-W139

Hydrograph : BH/MW 1



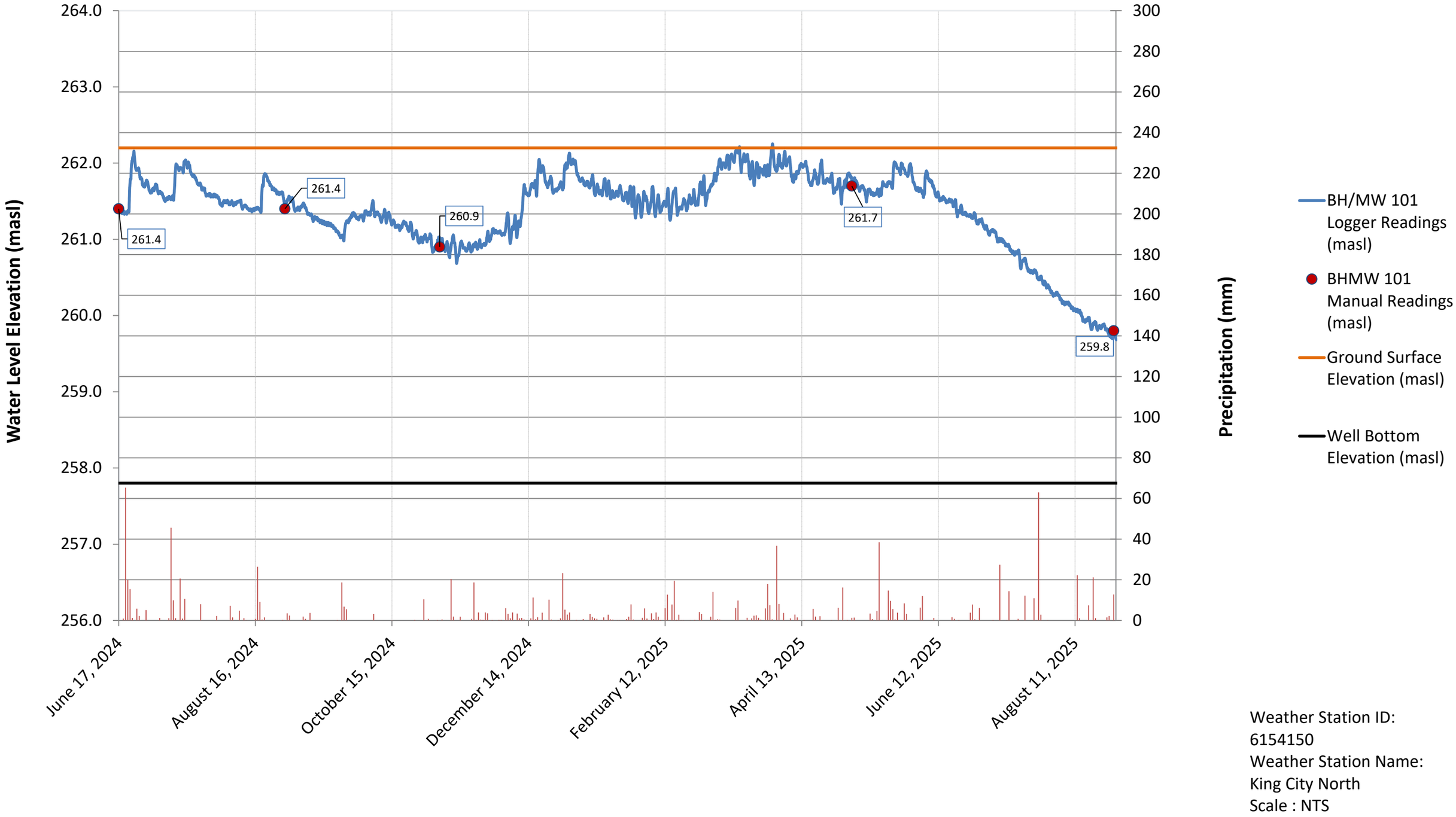
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 8



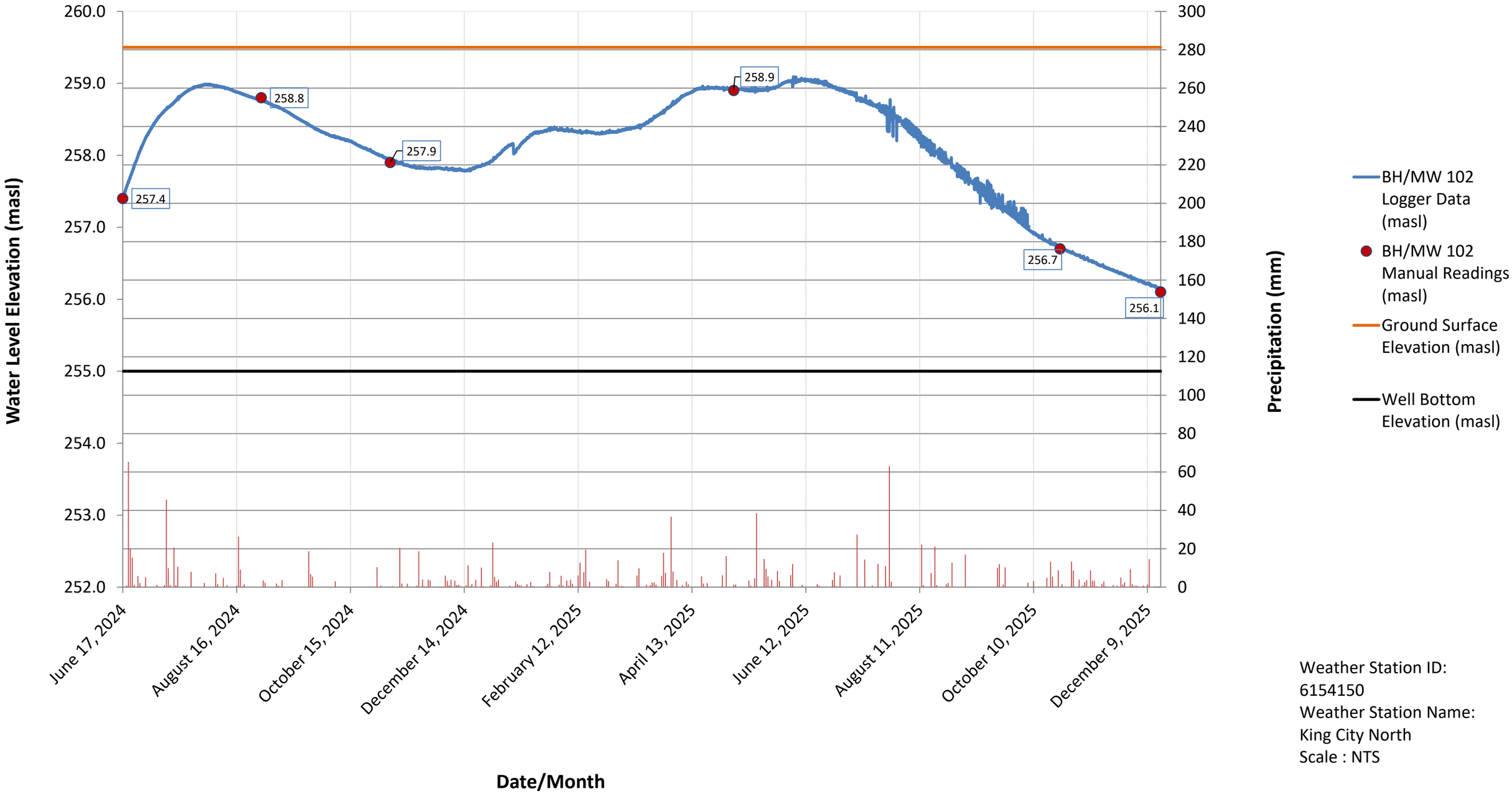
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BHMW 101



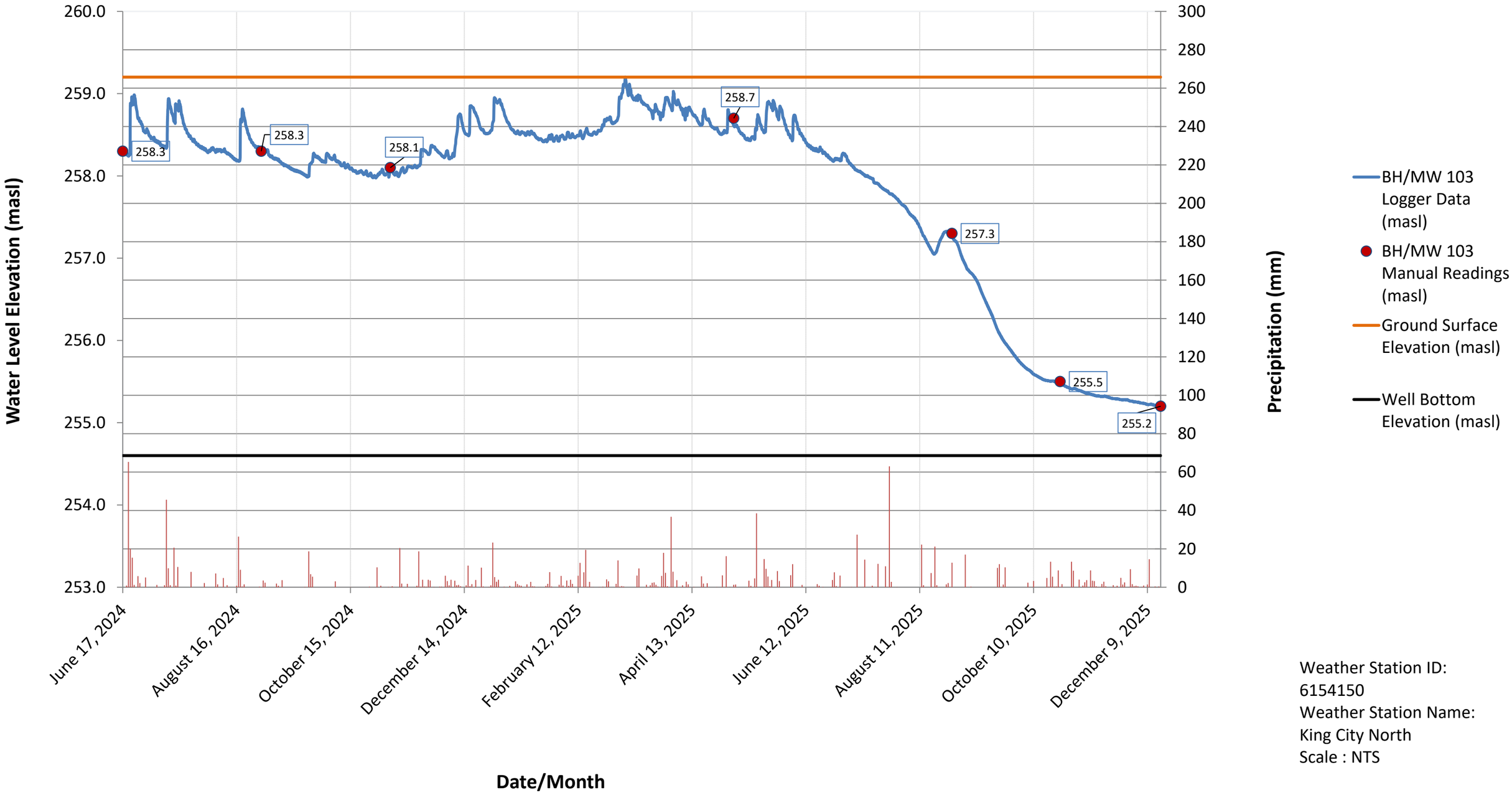
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 102



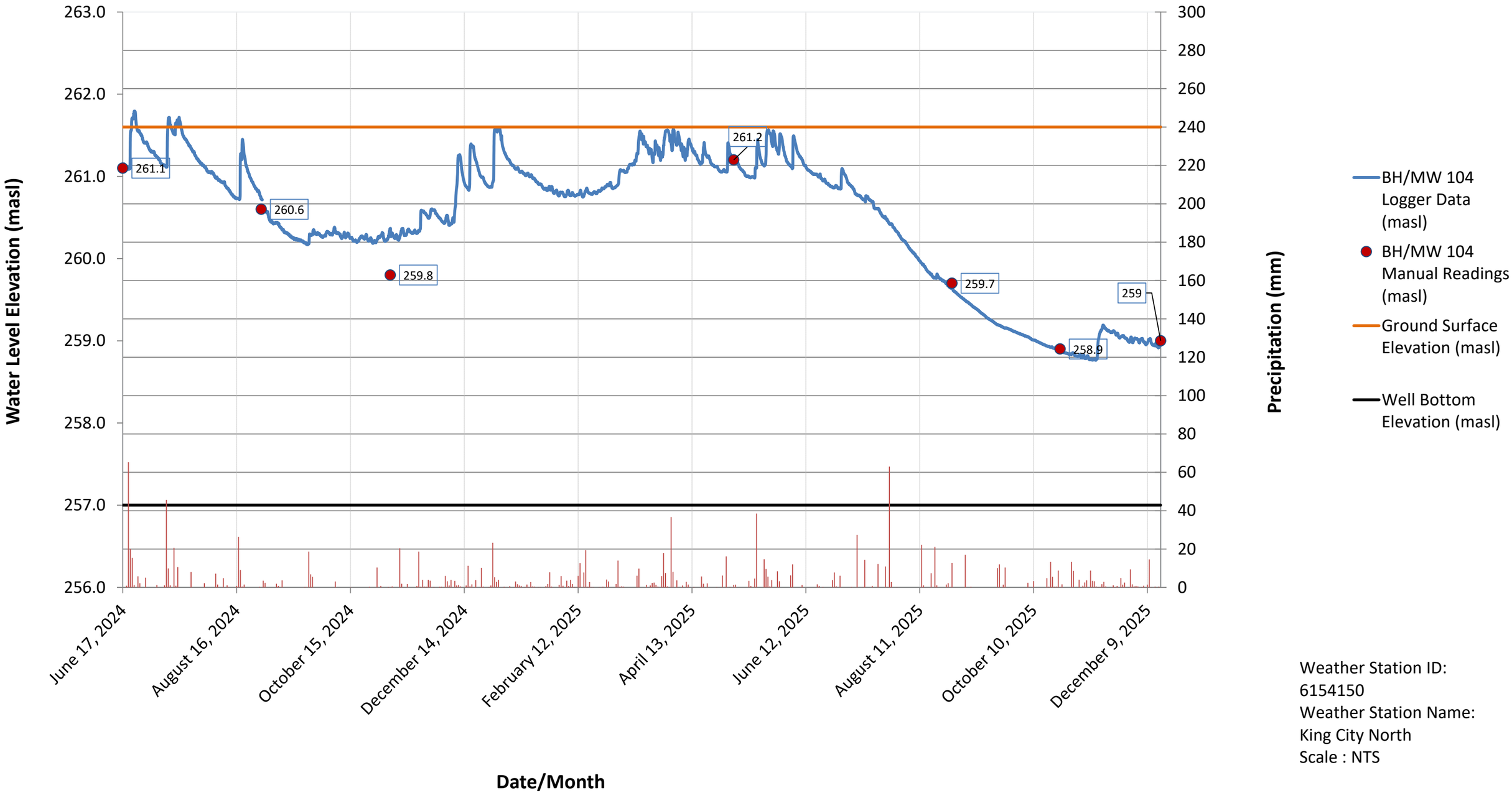
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 103



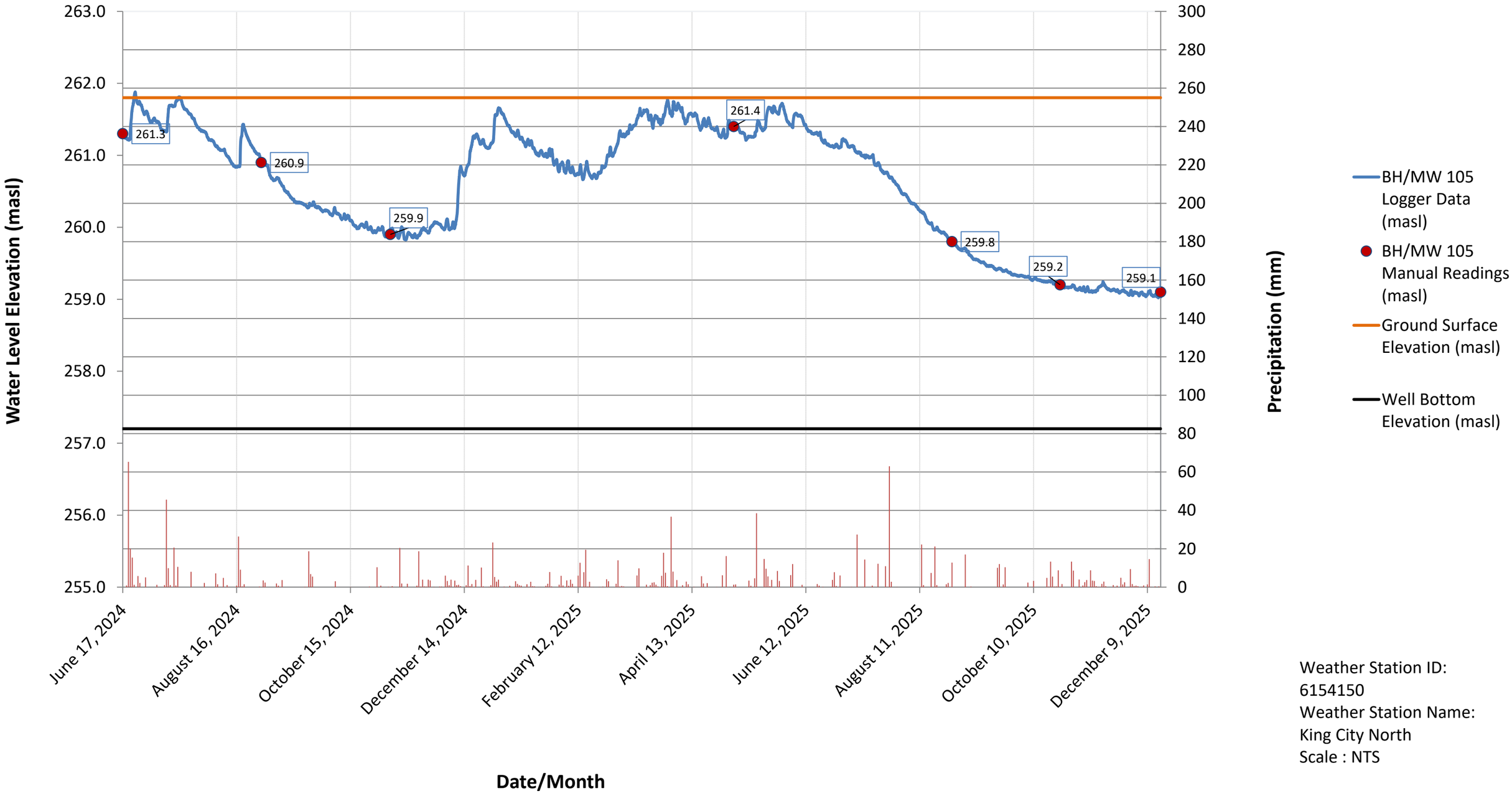
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 104



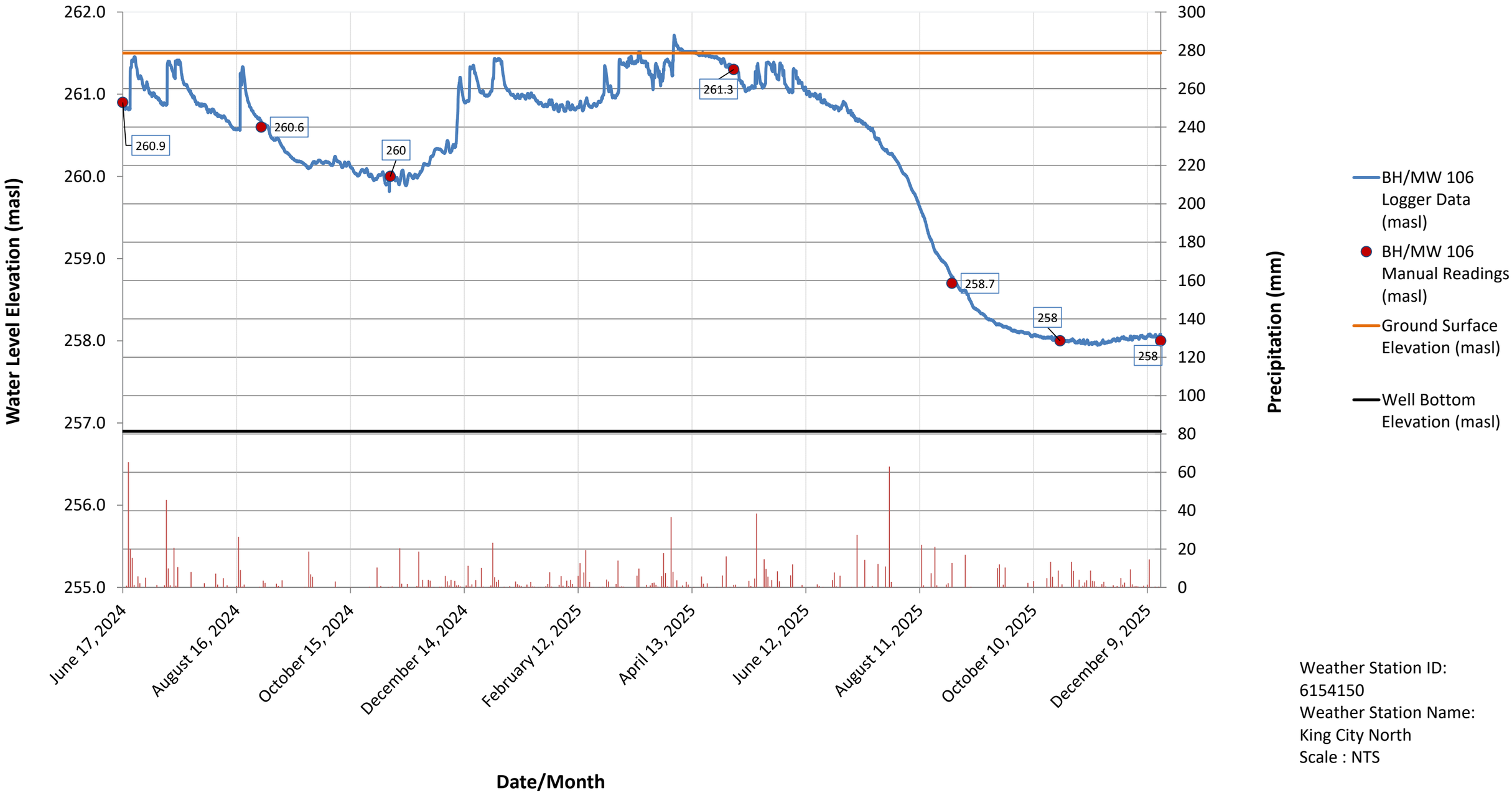
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 105



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 106



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 107



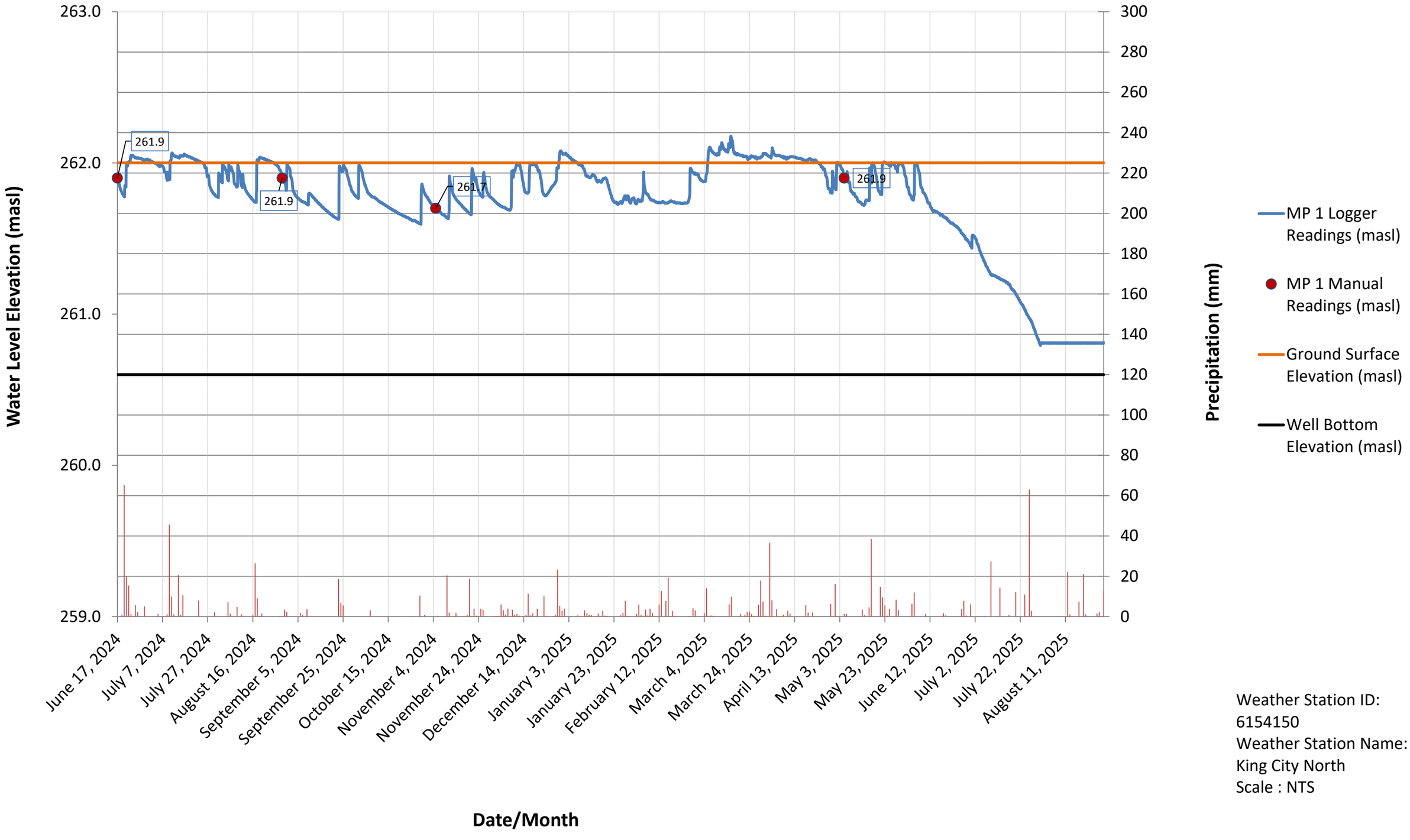
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Weather Station Name: King City North
Scale : NTS

Hydrograph : BH/MW 108



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 1



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP2



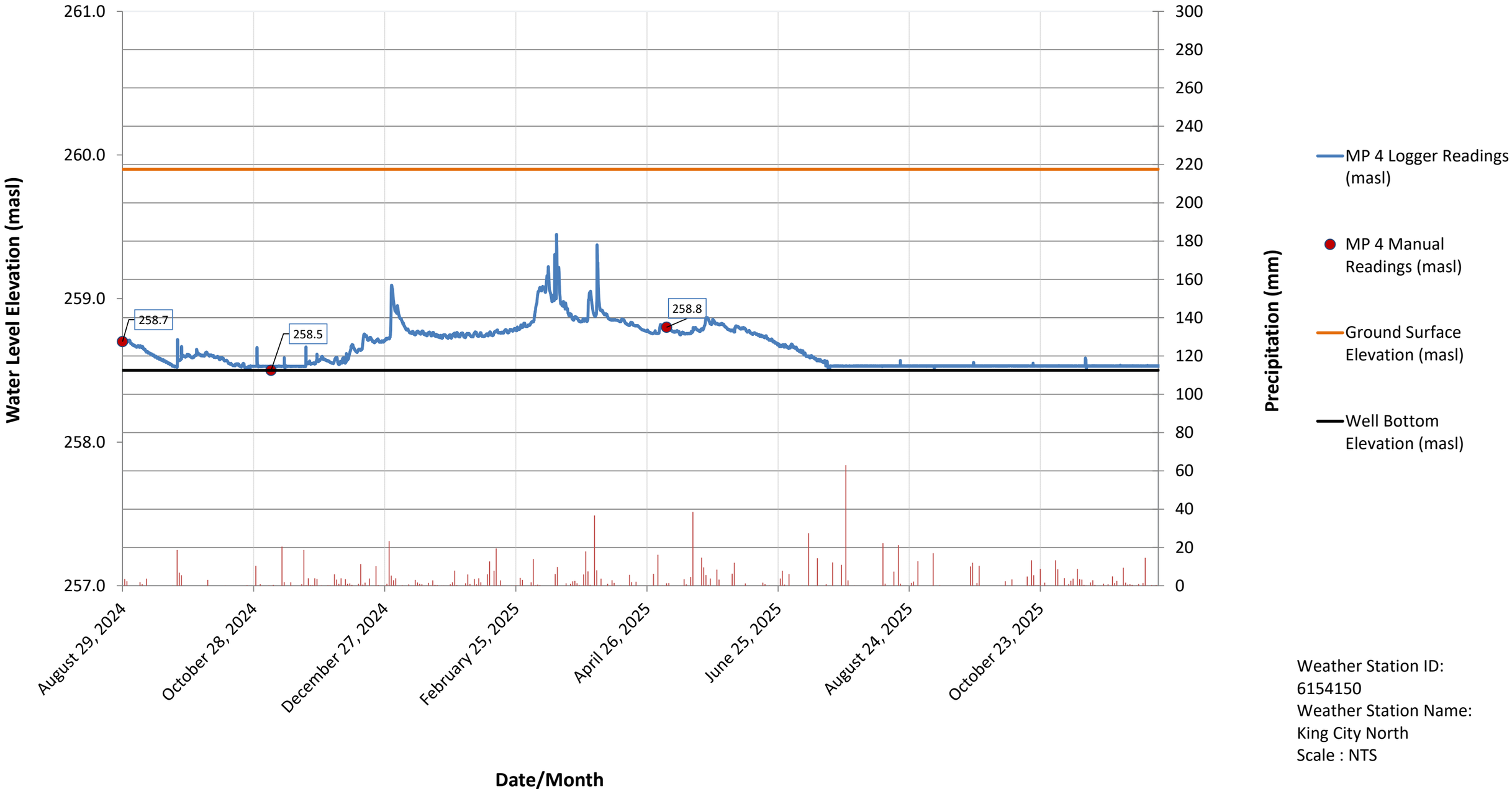
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 3



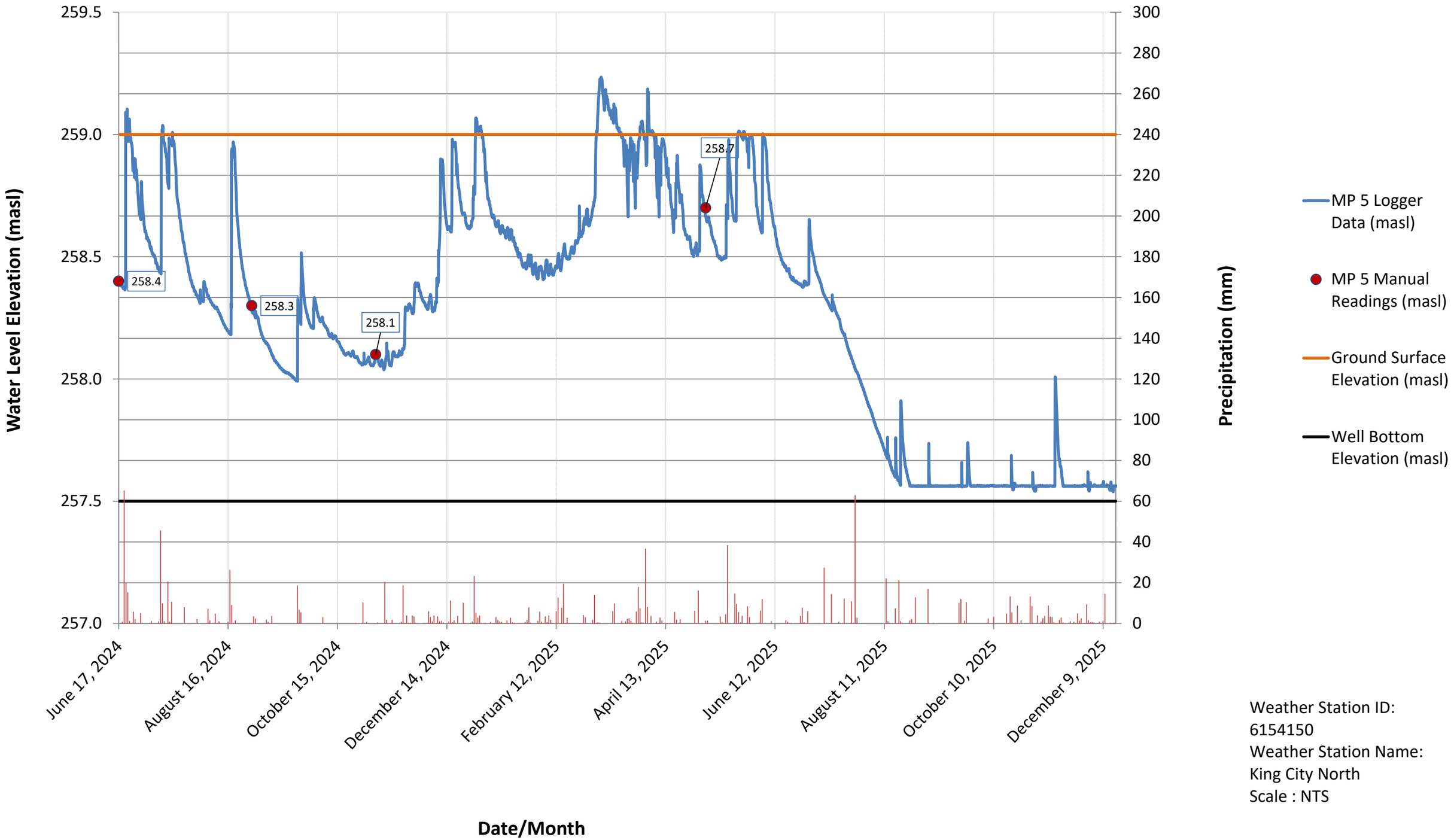
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 4



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 5



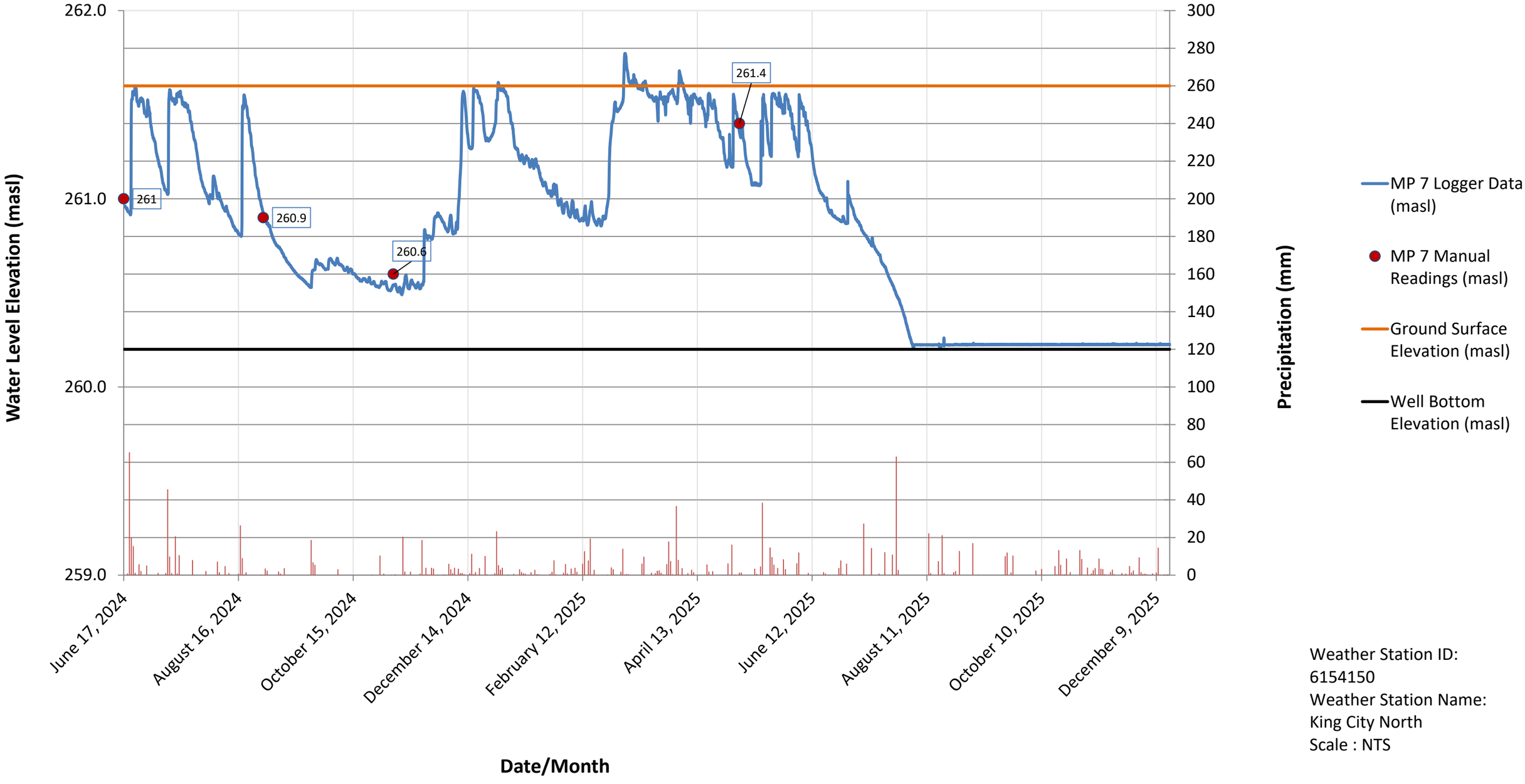
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Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 6



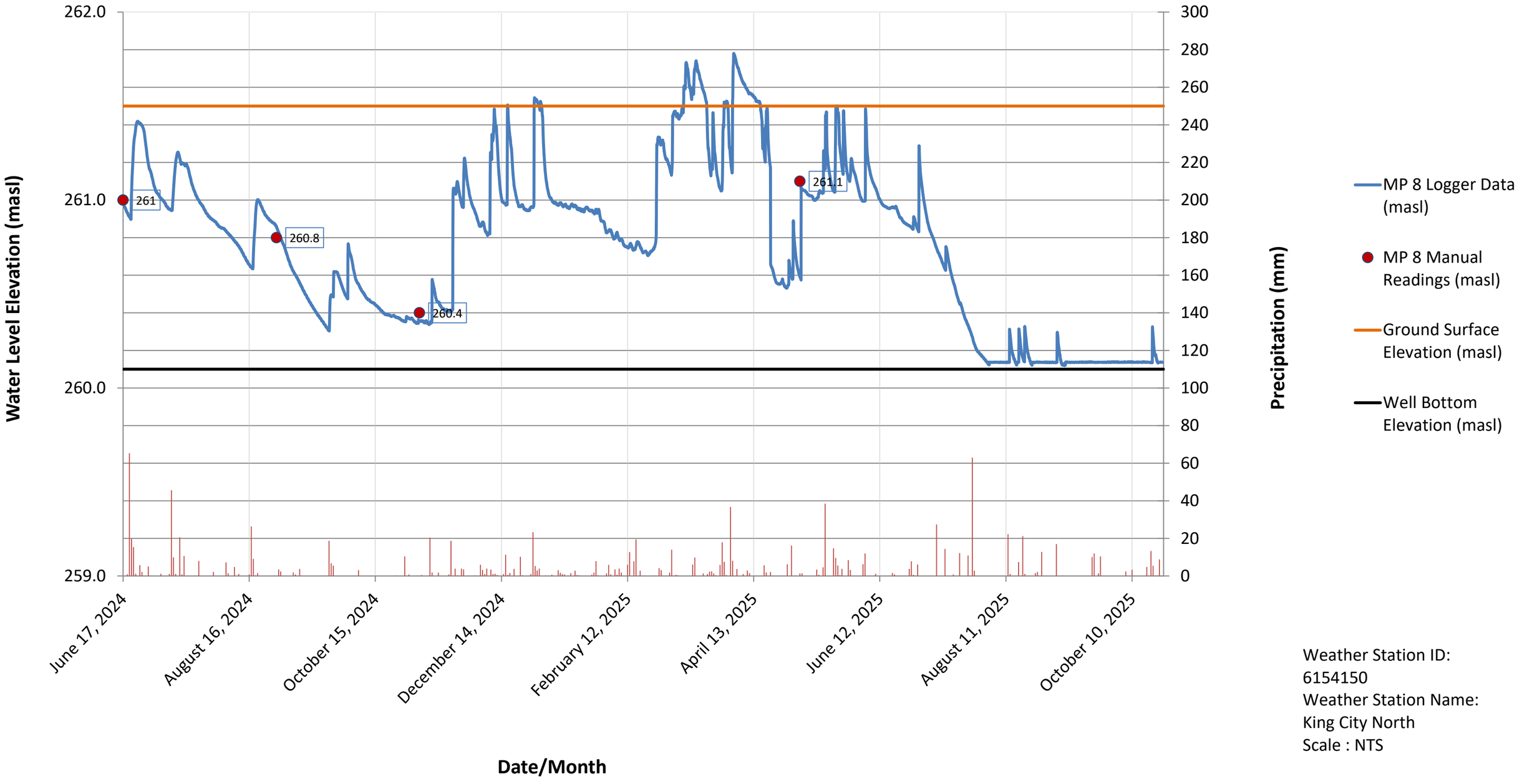
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 7



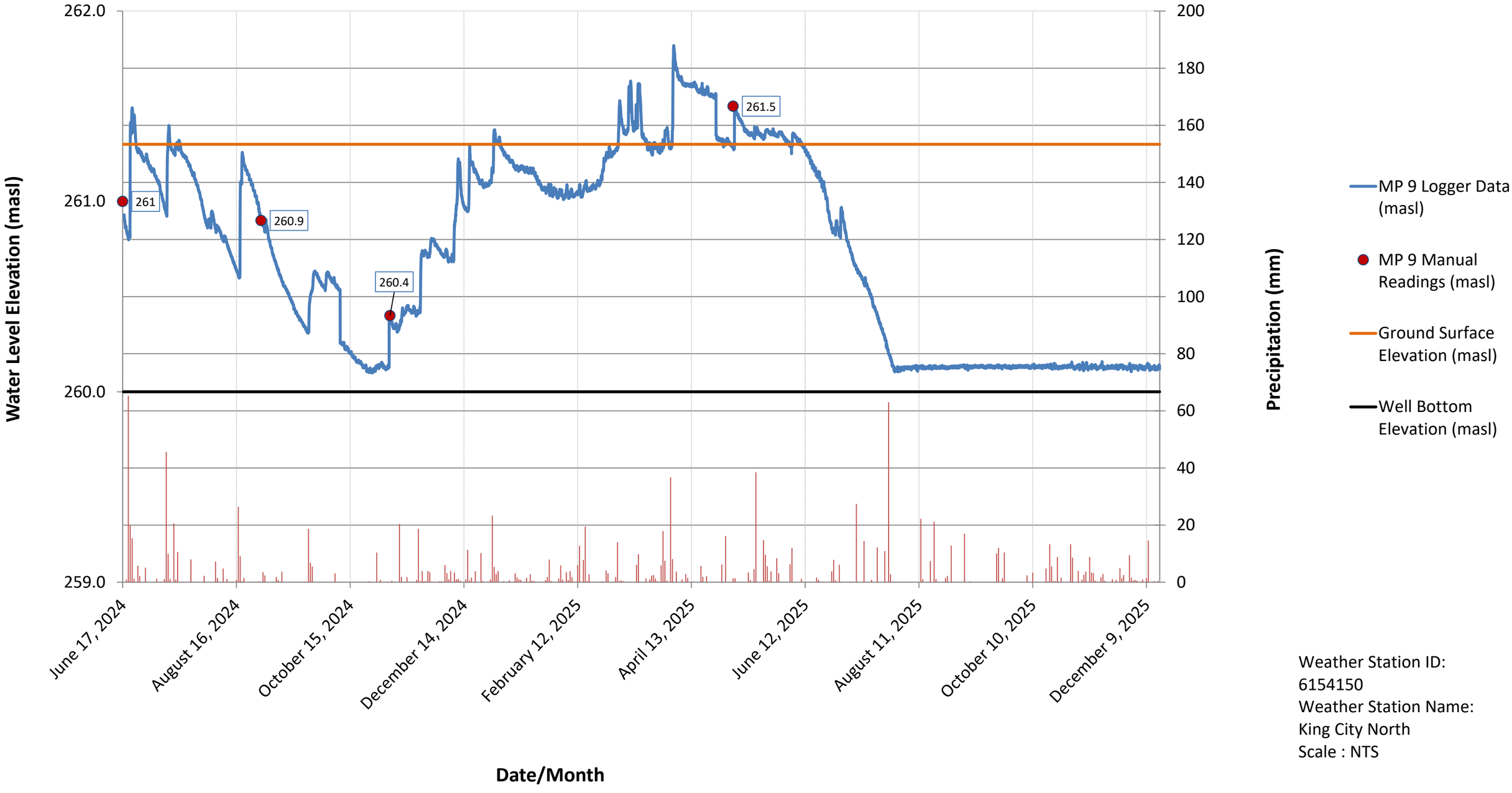
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 8



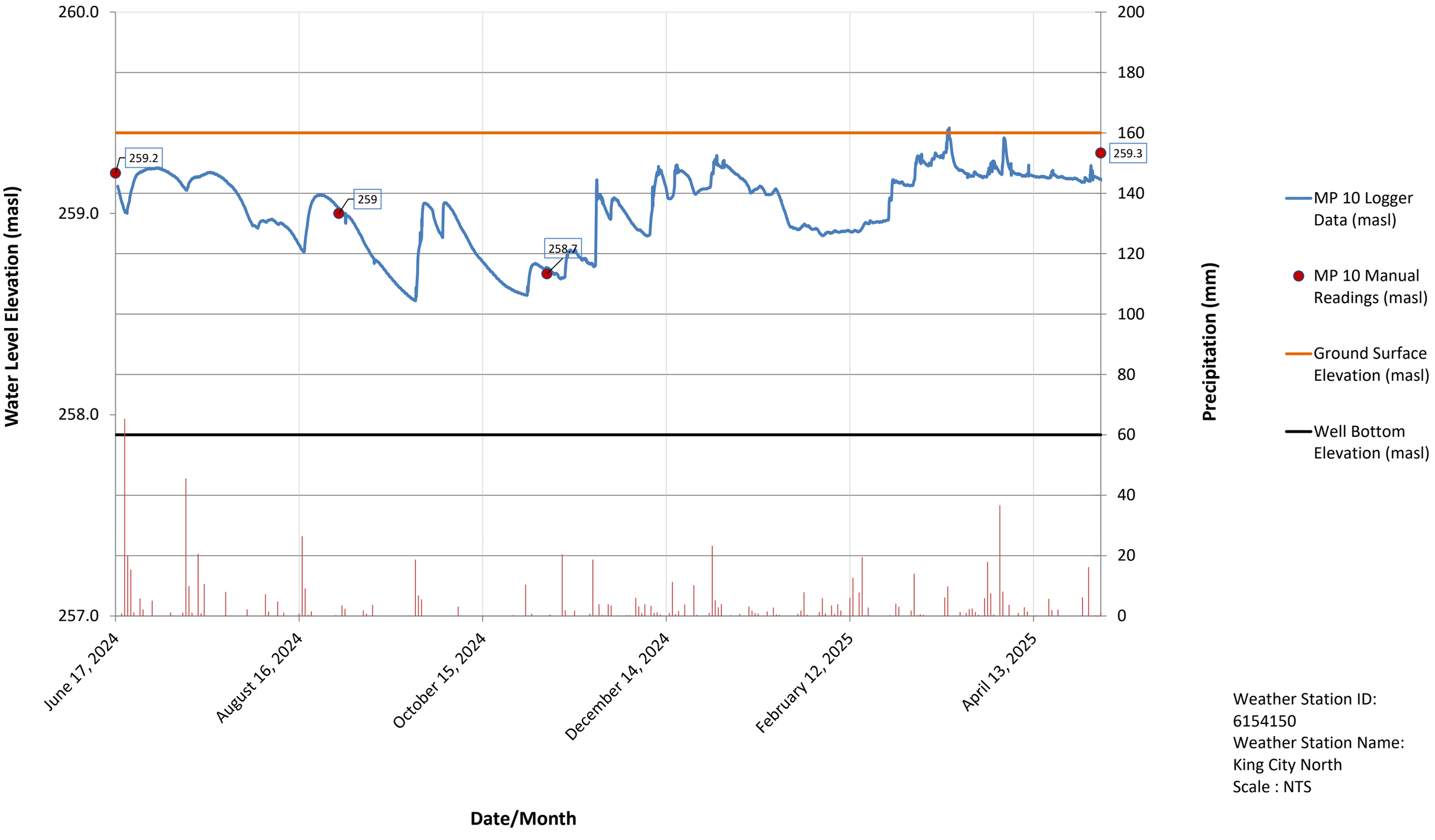
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 9



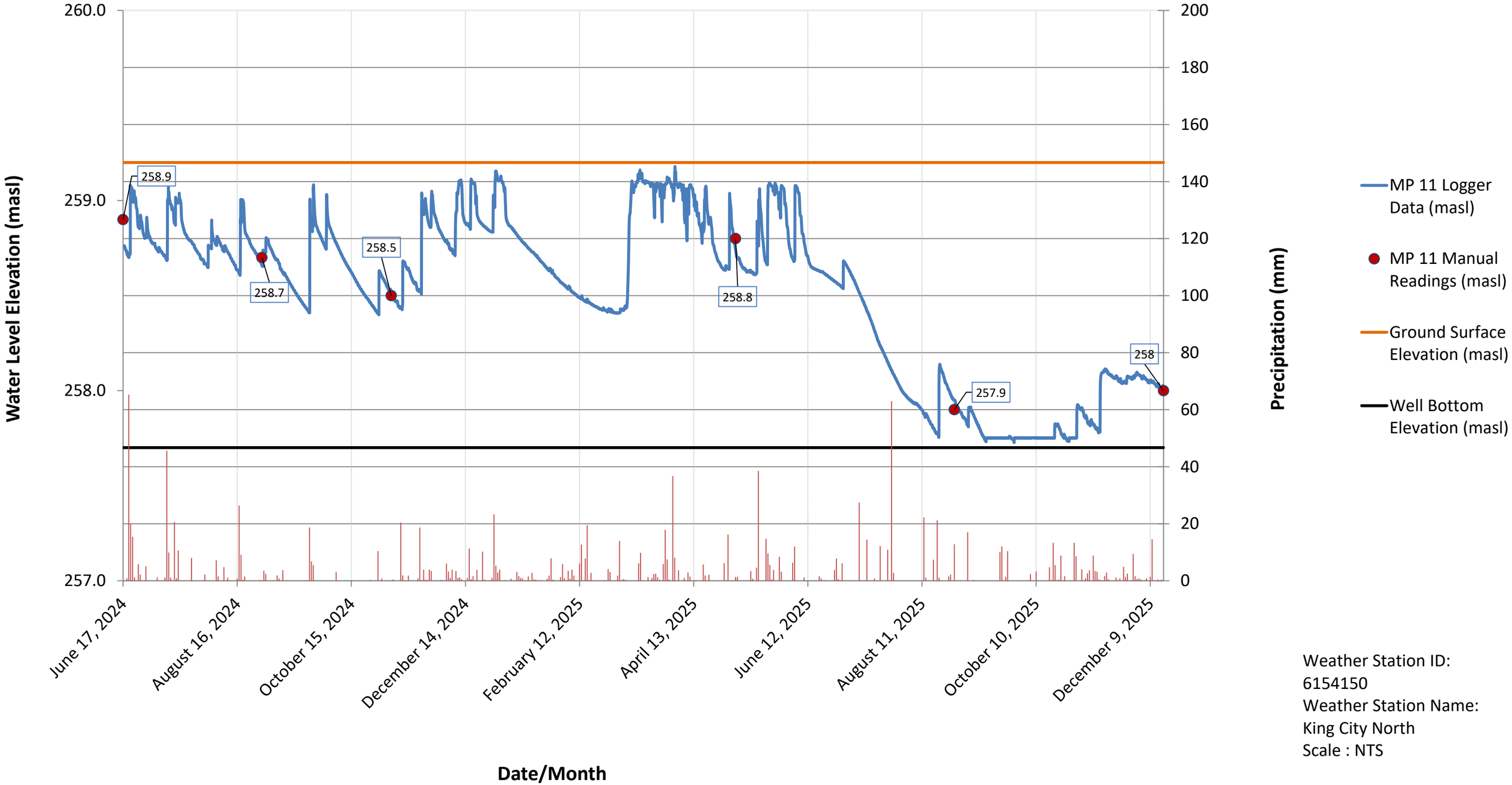
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 10



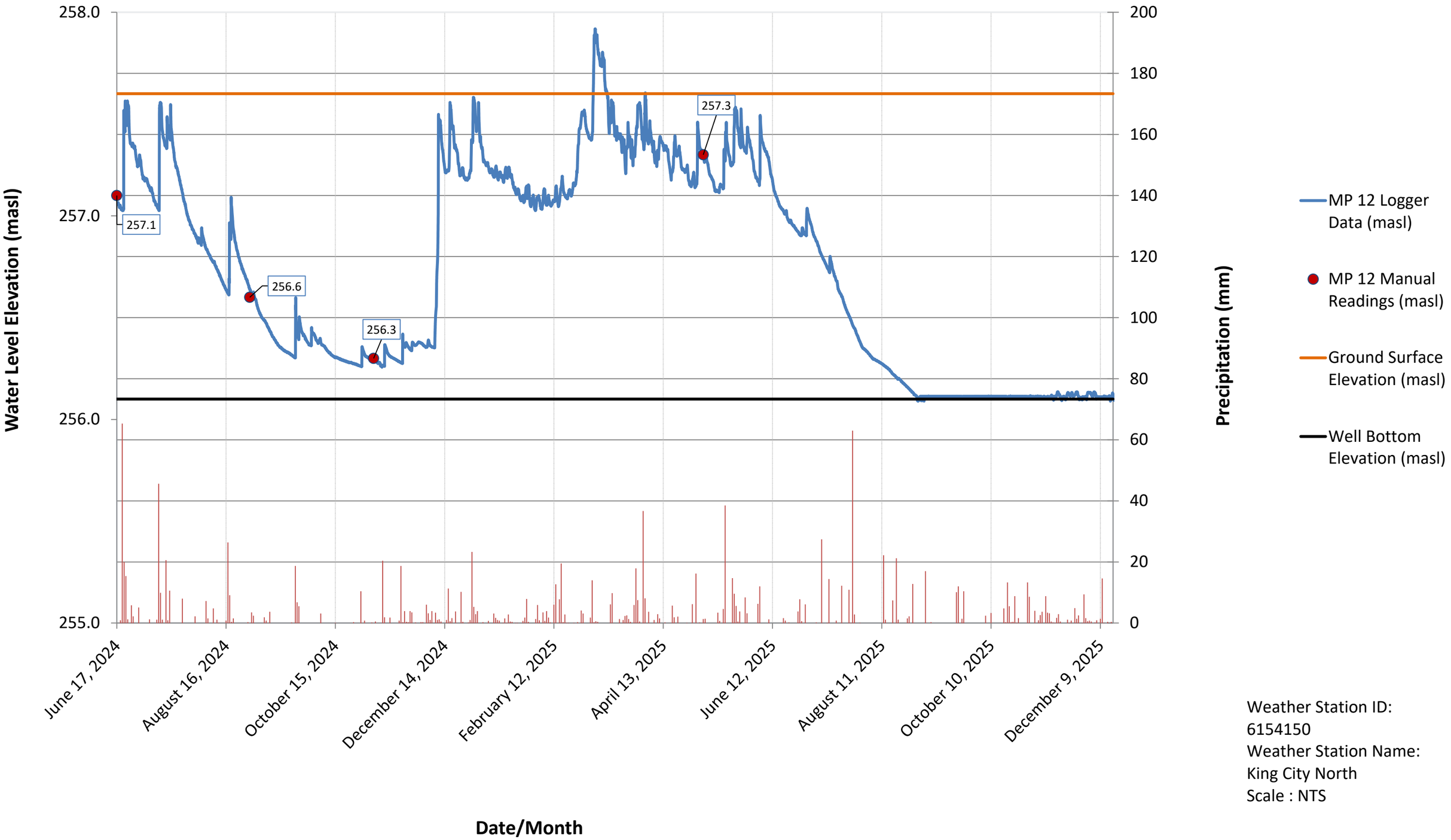
Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 11



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

Hydrograph : MP 12



Weather Station ID: 6154150
Weather Station Name: King City North
Scale : NTS

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TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'E'

Surface Water Flow Monitoring Summary

REFERENCE NO. 2309-W138

Creek	Monitoring Station ID	Section length (m)	Measurments	17-Jun-24	29-Aug-24	05-Nov-24	12-Dec-24	13-Dec-24	03-Apr-25	05-May-25	28-Aug-25	24-Oct-25	16-Dec-25
							(Rain Event ~ 5 mm)	(Rain Event ~ 5 mm)	(Rain Event ~ 45 mm)				
Creek 1	Flow Station 1 (Upstream of South Creek)	5.35	Total Discharge (m3/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
			Total Flow (L/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
	Flow Station 2 (Down Stream of South Creek)	1.50	Total Discharge (m3/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
			Total Flow (L/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
Creek 2	Flow Station 3 (Upstream of North Creek)	2.35	Total Discharge (m3/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
			Total Flow (L/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
	Flow Station 4 (Down Stream of North Creek)	3.35	Total Discharge (m3/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover
			Total Flow (L/sec)	Dry	Dry	Dry	Snow Cover No water Flow	Snow Cover No water Flow	The station experienced flooding due to heavy rainfall and widespread surface runoff across the area	Dry	Dry	Dry	Snow Cover

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BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

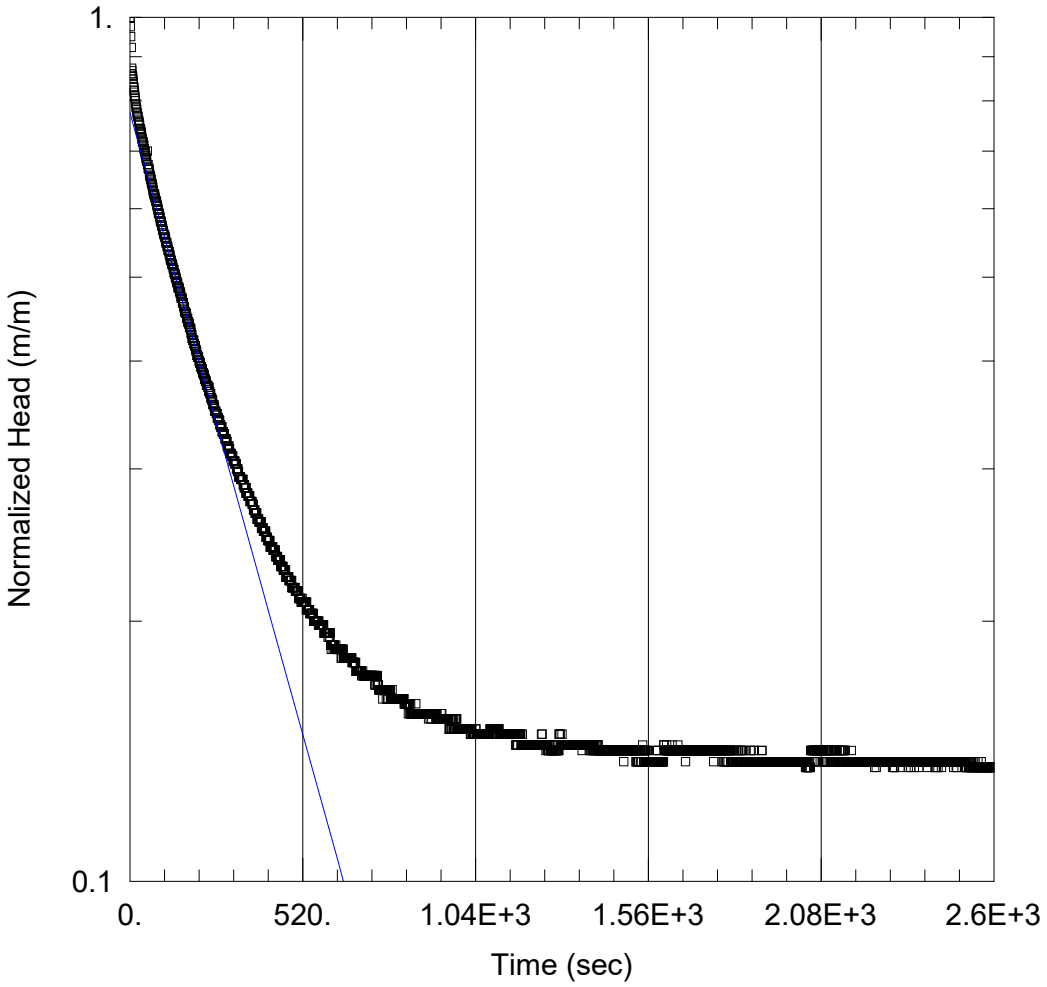
APPENDIX 'F'

In-Situ Hydraulic Conductivity Testing Details

REFERENCE NO. 2309-W138

Falling Head SWRT of BH/MW 2D

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	**Location:**
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.002E-6 m/sec y0 = 0.3719 m

AQUIFER DATA

Saturated Thickness: 5.39 m Anisotropy Ratio (Kz/Kr): 1.

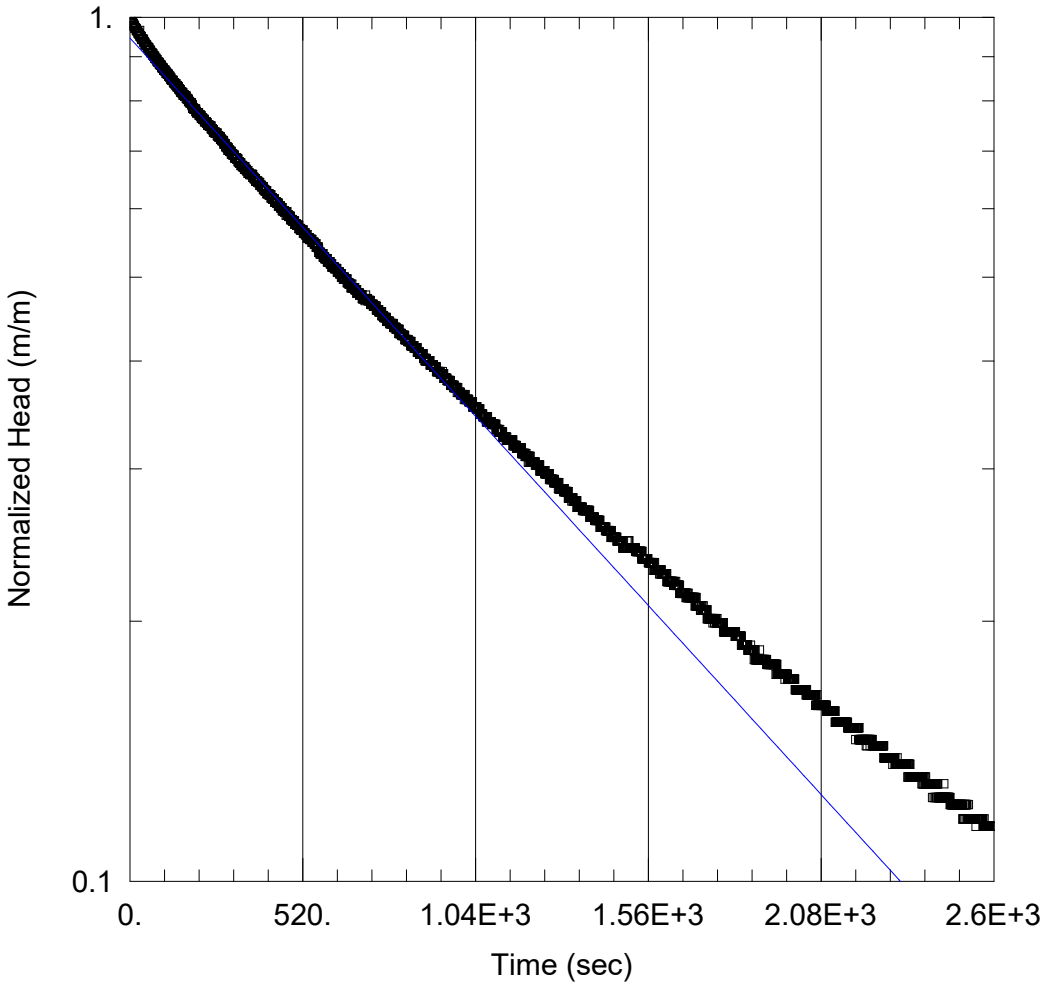
WELL DATA (BH/MW 2D)

Initial Displacement: 0.48 m
Static Water Column Height: 5.39 m
Total Well Penetration Depth: 5.39 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 2S

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	**Location:**
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 6.186E-7 m/sec y0 = 0.4086 m

AQUIFER DATA

Saturated Thickness: 2.95 m Anisotropy Ratio (Kz/Kr): 1.

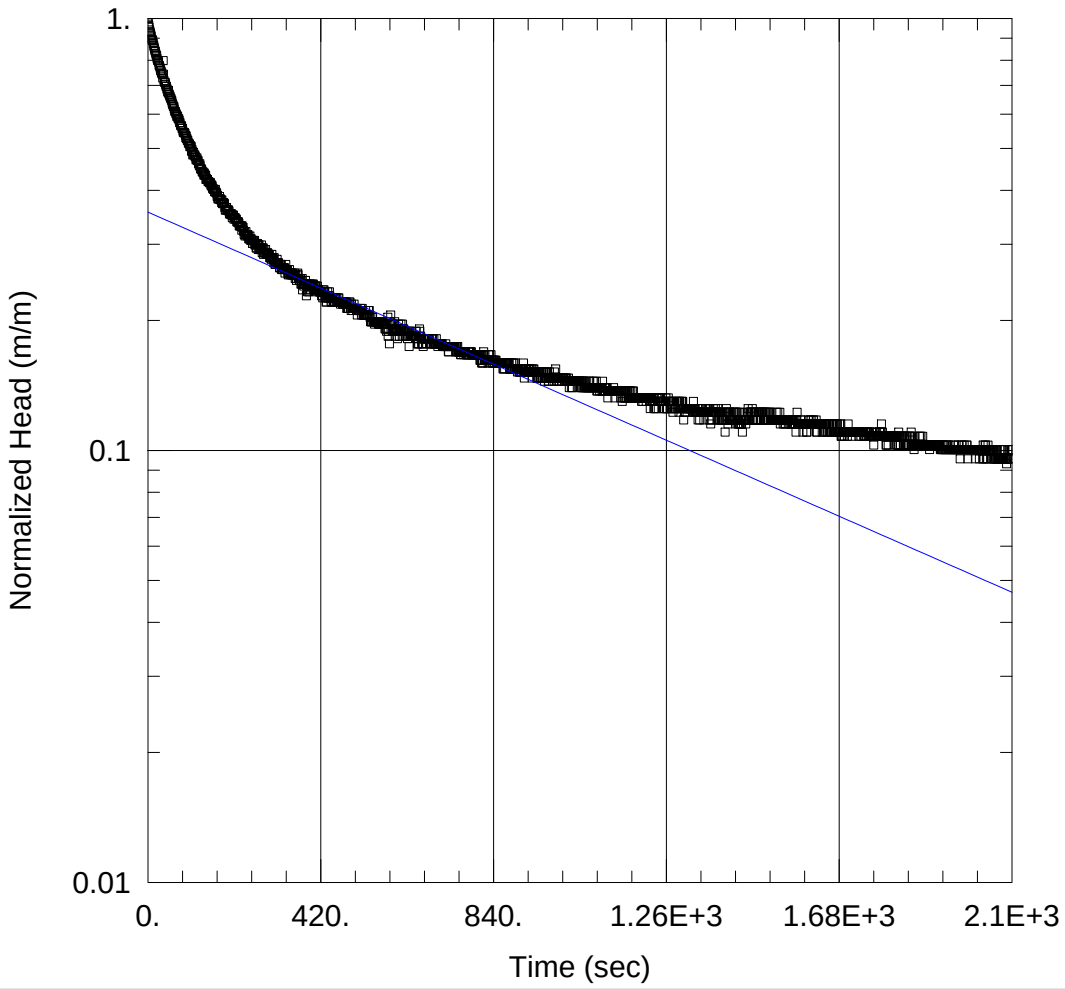
WELL DATA (BH/MW 2S)

Initial Displacement: 0.432 m
Static Water Column Height: 2.95 m
Total Well Penetration Depth: 2.95 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 4

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	**Location:**
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 3.128E-7 m/sec y0 = 0.1453 m

AQUIFER DATA

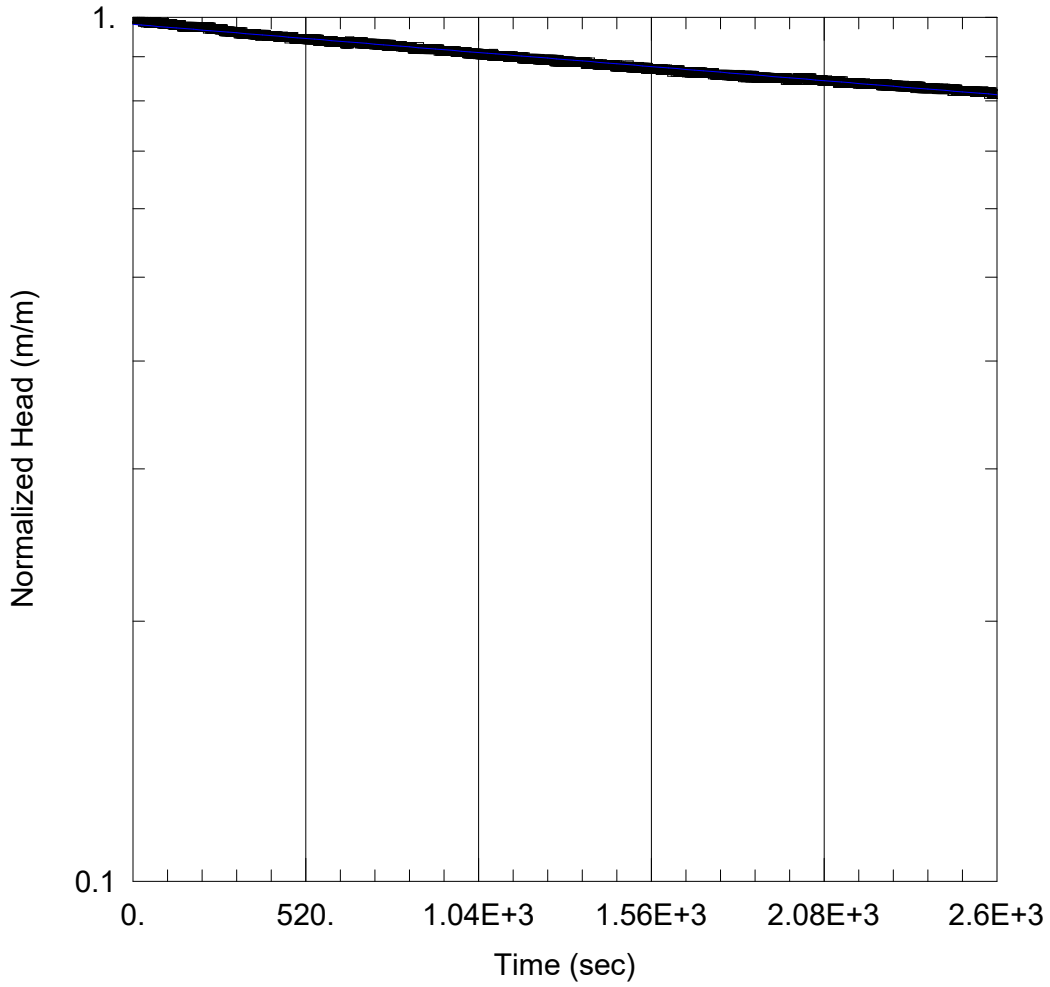
Saturated Thickness: 4.23 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH/MW 4)

Initial Displacement: 0.408 m
Static Water Column Height: 4.23 m
Total Well Penetration Depth: 4.23 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Falling Head SWRT of BH/MW 5

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	Location:
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 4.939E-8 m/sec y0 = 0.4767 m

AQUIFER DATA

Saturated Thickness: 4.33 m Anisotropy Ratio (Kz/Kr): 1.

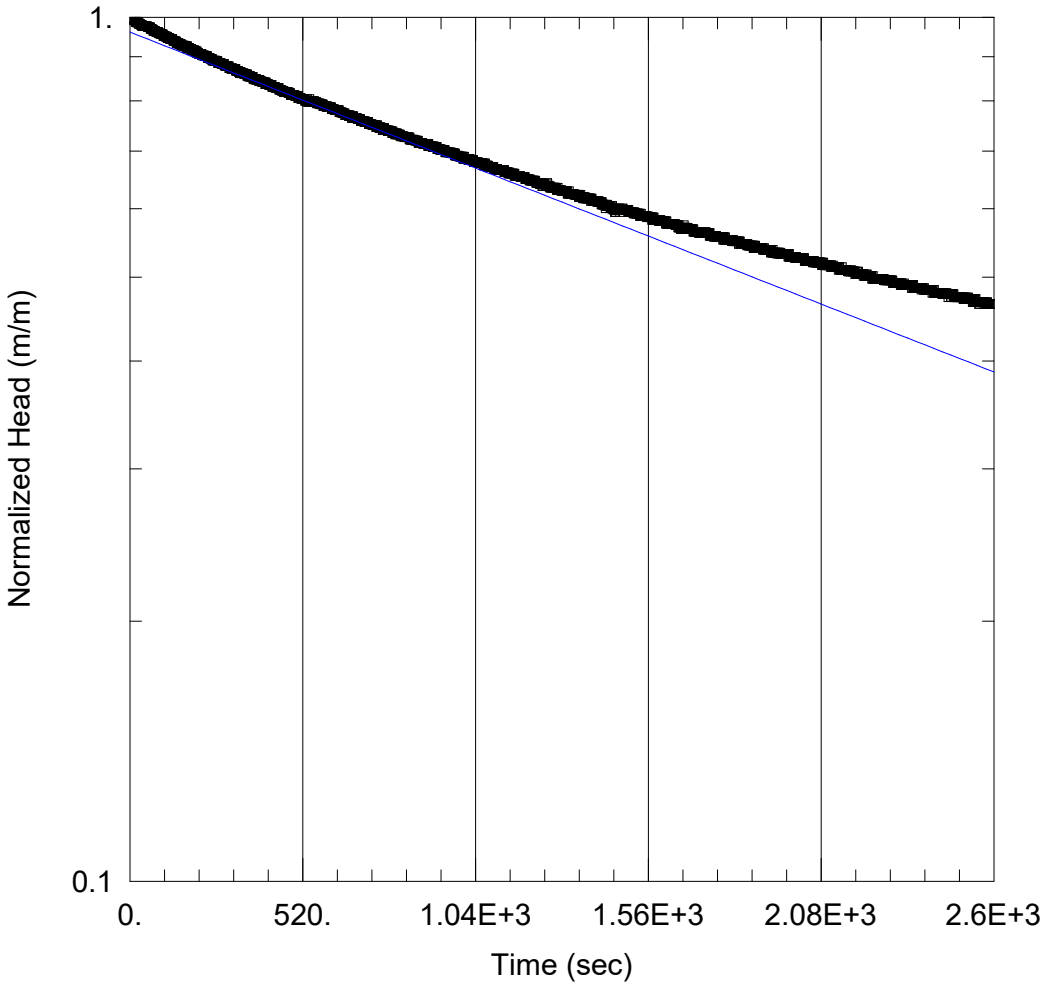
WELL DATA (BH/MW 5)

Initial Displacement: 0.486 m
Static Water Column Height: 4.33 m
Total Well Penetration Depth: 4.33 m
Screen Length: 1.5 m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 7

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	Location:
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.301E-7 m/sec y0 = 0.4766 m

AQUIFER DATA

Saturated Thickness: 5.18 m Anisotropy Ratio (Kz/Kr): 1.

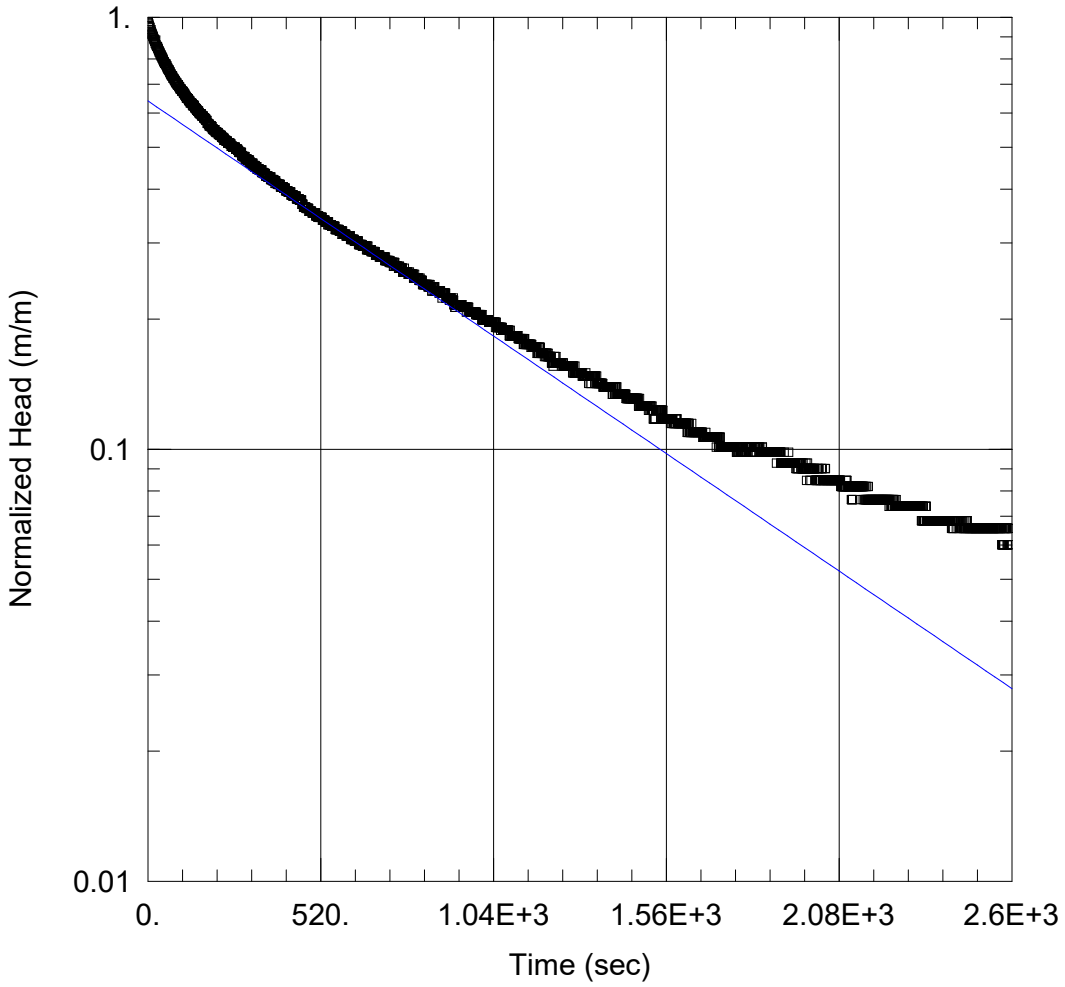
WELL DATA (BH/MW 7)

Initial Displacement: 0.496 m
Static Water Column Height: 5.18 m
Total Well Penetration Depth: 5.18 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 9

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	**Location:**
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 4.588E-7 m/sec y0 = 0.2342 m

AQUIFER DATA

Saturated Thickness: 5.79 m Anisotropy Ratio (Kz/Kr): 1.

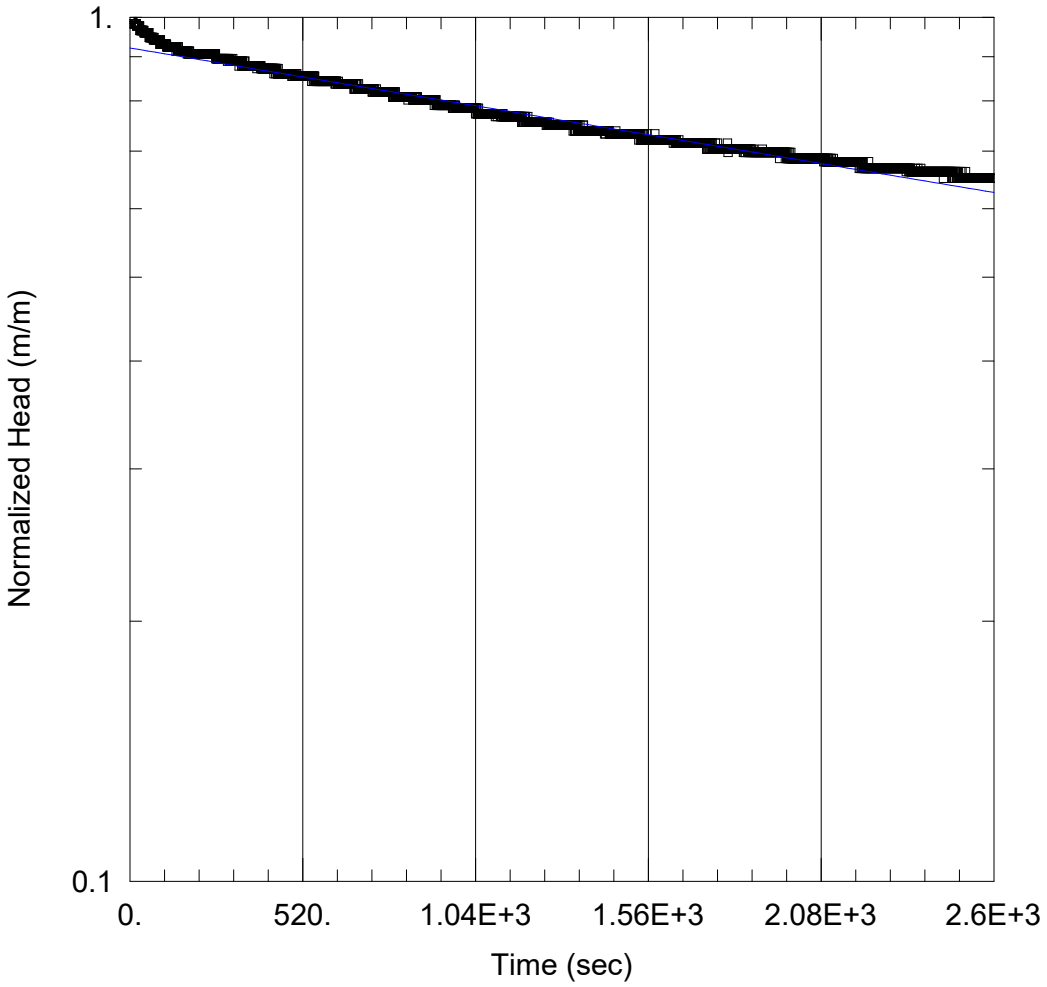
WELL DATA (BH/MW 9)

Initial Displacement: 0.366 m
Static Water Column Height: 5.79 m
Total Well Penetration Depth: 5.79 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 12

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	Location:
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.01E-8 m/sec y0 = 0.1584 m

AQUIFER DATA

Saturated Thickness: 2.98 m Anisotropy Ratio (Kz/Kr): 1.

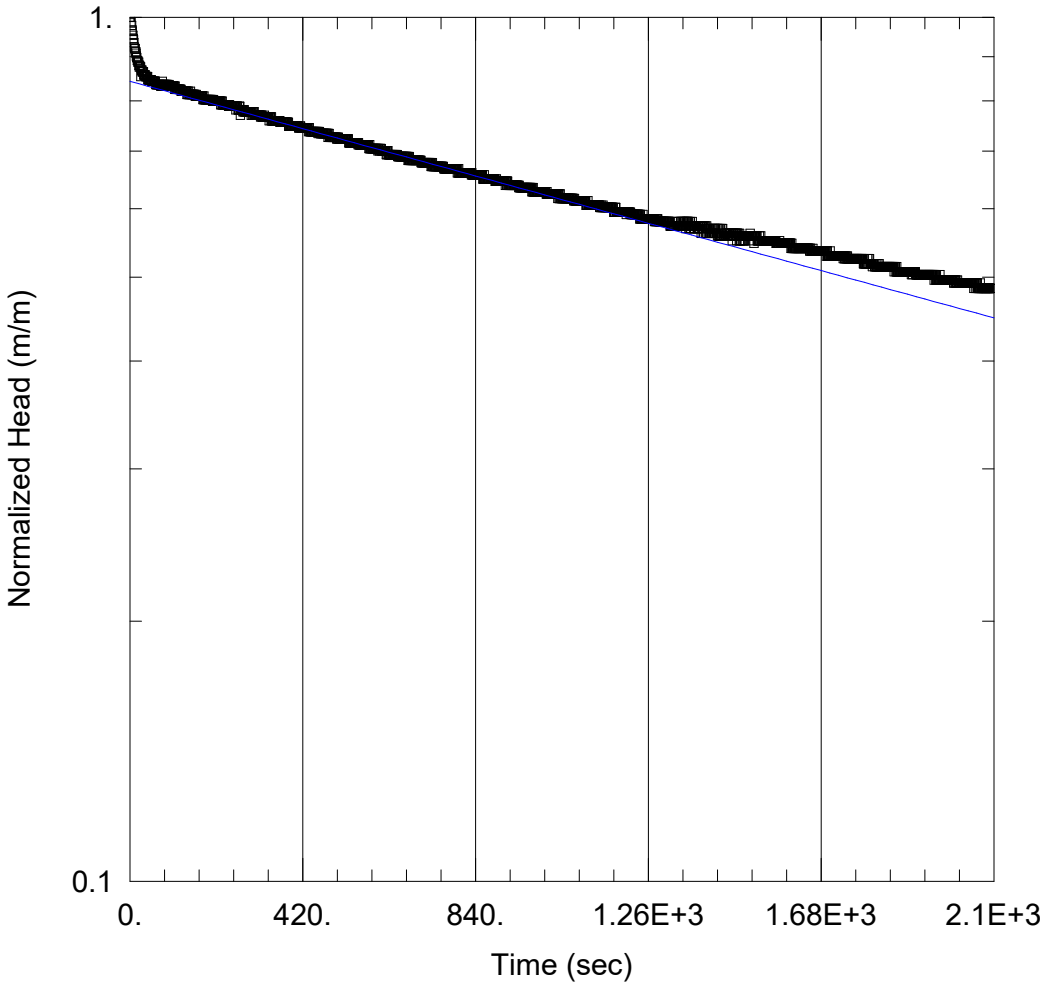
WELL DATA (BH/MW 12)

Initial Displacement: 0.172 m
Static Water Column Height: 2.98 m
Total Well Penetration Depth: 3. m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

Soil Engineers Ltd.

Falling Head SWRT of BH/MW 13

Prepared By:	Prepared For:
Soil Engineers Ltd.	United Holdings Inc.
Project:	**Location:**
2309-W138	Town of Caledon



SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.057E-7 m/sec y0 = 0.231 m

AQUIFER DATA

Saturated Thickness: 3.77 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH/MW 13)

Initial Displacement: 0.274 m
Static Water Column Height: 3.77 m
Total Well Penetration Depth: 3.77 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.0508 m

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'G'

Groundwater Quality Test Results

REFERENCE NO. 2309-W138





FINAL REPORT

CA40009-JAN24 R1

2309-W138, Mount Hope Rd & Columbia Way, C aledon

Prepared for

Soil Engineers Ltd.

FINAL REPORT

First Page

CLIENT DETAILS

Client	Soil Engineers Ltd.
Address	90 West Beaver Creek Rd Richmond, ON M1S 3A7. Canada
Contact	Gurkaranbir Singh
Telephone	519-731-6442
Facsimile	
Email	gurkaranbir.singh@soilengineersltd.com
Project	2309-W138, Mount Hope Rd & Columbia Way, C aledon
Order Number	
Samples	Ground Water (1)

LABORATORY DETAILS

Project Specialist	Maarit Wolfe, Hon.B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2000
Facsimile	705-652-6365
Email	Maarit.Wolfe@sgs.com
SGS Reference	CA40009-JAN24
Received	01/05/2024
Approved	01/12/2024
Report Number	CA40009-JAN24 R1
Date Reported	01/12/2024

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 6 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 038107

CNT spike low due to sample matrix

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

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Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd & Columbia Way, C aledon
Project Manager: Gurkaranbir Singh
Samplers: Gurkaranbir Singh

MATRIX: WATER

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Sample Number	8
Sample Name	BH/MW-2D
Sample Matrix	Ground Water
Sample Date	04/01/2024

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	300	15	< 4 ↑
Total Suspended Solids	mg/L	2	350	15	2
Total Kjeldahl Nitrogen	as N mg/L	0.5	100	1	0.9
Metals and Inorganics					
Fluoride	mg/L	0.06	10		0.25
Cyanide (total)	mg/L	0.01	2	0.02	< 0.01
Sulphate	mg/L	2	1500		21
Aluminum (total)	mg/L	0.001	50		0.253
Antimony (total)	mg/L	0.0009	5		< 0.0009
Arsenic (total)	mg/L	0.0002	1	0.02	0.0018
Cadmium (total)	mg/L	0.000003	0.7	0.008	0.000019
Chromium (total)	mg/L	0.00008	5	0.08	0.00064
Copper (total)	mg/L	0.0002	3	0.05	0.0020
Cobalt (total)	mg/L	0.000004	5		0.000251
Lead (total)	mg/L	0.00009	3	0.12	0.00054
Manganese (total)	mg/L	0.00001	5	0.05	0.0334
Molybdenum (total)	mg/L	0.00004	5		0.00219
Nickel (total)	mg/L	0.0001	3	0.08	0.0016
Phosphorus (total)	mg/L	0.003	10	0.4	0.036
Selenium (total)	mg/L	0.00004	1	0.02	0.00004
Silver (total)	mg/L	0.00005	5	0.12	< 0.00005
Tin (total)	mg/L	0.00006	5		0.00010

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd & Columbia Way, C aledon
Project Manager: Gurkaranbir Singh
Samplers: Gurkaranbir Singh

MATRIX: WATER

Sample Number	8
Sample Name	BH/MW-2D
Sample Matrix	Ground Water
Sample Date	04/01/2024

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Titanium (total)	mg/L	0.00007	5		0.00827
Zinc (total)	mg/L	0.002	3	0.04	0.014
Microbiology					
E. Coli	cfu/100mL	0		200	< 2↑
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.02		< 0.001
Nonylphenol Ethoxylates	mg/L	0.01	0.2		< 0.01
Nonylphenol diethoxylate	mg/L	0.01			< 0.01
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd & Columbia Way, C aledon
Project Manager: Gurkaranbir Singh
Samplers: Gurkaranbir Singh

MATRIX: WATER

Sample Number	8
Sample Name	BH/MW-2D
Sample Matrix	Ground Water
Sample Date	04/01/2024

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	10	9	7.83
Mercury (total)	mg/L	0.00001	0.01	0.0004	< 0.00001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.001	0.0004	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.002	1	0.008	< 0.002
SVOCs					
di-n-Butyl Phthalate	mg/L	0.002	0.08	0.015	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.012	0.0088	< 0.002
VOCs					
Chloroform	mg/L	0.0005	0.04	0.002	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.05	0.0056	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.08	0.0068	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005	4	0.0056	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.14	0.0056	< 0.0005
Methylene Chloride	mg/L	0.0005	2	0.0052	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	1.4	0.017	< 0.0005
Methyl ethyl ketone	mg/L	0.02	8		< 0.02
Styrene	mg/L	0.0005	0.2		< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1	0.0044	< 0.0005
Trichloroethylene	mg/L	0.0005	0.4	0.008	< 0.0005

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd & Columbia Way, C aledon
Project Manager: Gurkaranbir Singh
Samplers: Gurkaranbir Singh

MATRIX: WATER

Sample Number	8
Sample Name	BH/MW-2D
Sample Matrix	Ground Water
Sample Date	04/01/2024

L1 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Storm Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
VOCs - BTEX					
Benzene	mg/L	0.0005	0.01	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.16	0.002	< 0.0005
Toluene	mg/L	0.0005	0.27	0.002	< 0.0005
Xylene (total)	mg/L	0.0005	1.4	0.0044	< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005			< 0.0005

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO5015-JAN24	mg/L	2	<2	6	20	108	80	120	113	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0010-JAN24	mg/L	2	< 2	5	30	106	70	130	NV	70	130

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0055-JAN24	mg/L	0.01	<0.01	ND	10	95	90	110	71	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0095-JAN24	mg/L	0.06	<0.06	ND	10	100	90	110	102	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENV]SPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0013-JAN24	mg/L	0.00001	< 0.00001	ND	20	88	80	120	82	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0052-JAN24	mg/L	0.00005	<0.00005	ND	20	100	90	110	86	70	130
Aluminum (total)	EMS0052-JAN24	mg/L	0.001	<0.001	8	20	99	90	110	97	70	130
Arsenic (total)	EMS0052-JAN24	mg/L	0.0002	<0.0002	13	20	104	90	110	107	70	130
Cadmium (total)	EMS0052-JAN24	mg/L	0.000003	<0.000003	19	20	99	90	110	107	70	130
Cobalt (total)	EMS0052-JAN24	mg/L	0.000004	<0.000004	9	20	101	90	110	104	70	130
Chromium (total)	EMS0052-JAN24	mg/L	0.00008	<0.00008	15	20	101	90	110	106	70	130
Copper (total)	EMS0052-JAN24	mg/L	0.0002	<0.0002	3	20	98	90	110	119	70	130
Manganese (total)	EMS0052-JAN24	mg/L	0.00001	<0.00001	5	20	101	90	110	97	70	130
Molybdenum (total)	EMS0052-JAN24	mg/L	0.00004	<0.00004	3	20	99	90	110	108	70	130
Nickel (total)	EMS0052-JAN24	mg/L	0.0001	<0.0001	17	20	101	90	110	105	70	130
Phosphorus (total)	EMS0052-JAN24	mg/L	0.003	<0.003	ND	20	97	90	110	NV	70	130
Selenium (total)	EMS0052-JAN24	mg/L	0.00004	<0.00004	ND	20	92	90	110	114	70	130
Titanium (total)	EMS0052-JAN24	mg/L	0.00007	<0.00005	7	20	98	90	110	NV	70	130
Zinc (total)	EMS0052-JAN24	mg/L	0.002	<0.002	4	20	101	90	110	97	70	130
Lead (total)	EMS0056-JAN24	mg/L	0.00009	<0.00009	19	20	108	90	110	120	70	130
Antimony (total)	EMS0056-JAN24	mg/L	0.0009	<0.0009	ND	20	99	90	110	108	70	130
Tin (total)	EMS0056-JAN24	mg/L	0.00006	<0.00006	ND	20	102	90	110	NV	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9095-JAN24	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0076-JAN24	mg/L	0.01	<0.01			81	55	120			
Nonylphenol Ethoxylates	GCM0076-JAN24	mg/L	0.01	< 0.01								
Nonylphenol monoethoxylate	GCM0076-JAN24	mg/L	0.01	<0.01			84	55	120			
Nonylphenol	GCM0076-JAN24	mg/L	0.001	<0.001			76	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0090-JAN24	mg/L	2	<2	NSS	20	106	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0090-JAN24	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0090-JAN24	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0104-JAN24	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0072-JAN24	mg/L	0.002	<0.002	ND	10	99	80	120	93	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0083-JAN24	mg/L	0.0001	<0.0001	NSS	30	123	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bis(2-ethylhexyl)phthalate	GCM0081-JAN24	mg/L	0.002	< 0.002	NSS	30	99	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0081-JAN24	mg/L	0.002	< 0.002	NSS	30	101	50	140	NSS	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0148-JAN24	mg/L	2	< 2	1	10	97	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0061-JAN24	as N mg/L	0.5	<0.5	7	10	103	90	110	106	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	117	60	130	119	50	140
1,2-Dichlorobenzene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	109	60	130	98	50	140
1,4-Dichlorobenzene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	114	60	130	101	50	140
Benzene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	110	60	130	102	50	140
Chloroform	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	109	60	130	101	50	140
cis-1,2-Dichloroethene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	109	60	130	101	50	140
Ethylbenzene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	109	60	130	100	50	140
m-p-xylene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	111	60	130	100	50	140
Methyl ethyl ketone	GCM0086-JAN24	mg/L	0.02	<0.02	ND	30	102	50	140	97	50	140
Methylene Chloride	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	106	60	130	100	50	140
o-xylene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	114	60	130	103	50	140
Styrene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	111	60	130	99	50	140
Tetrachloroethylene (perchloroethylene)	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	106	60	130	96	50	140
Toluene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	109	60	130	100	50	140
trans-1,3-Dichloropropene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	108	60	130	97	50	140
Trichloroethylene	GCM0086-JAN24	mg/L	0.0005	<0.0005	ND	30	104	60	130	86	50	140

QC SUMMARY

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

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

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 038107

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

Page ____ of ____

Laboratory Information Section - Lab use only

Received By: ED
Received Date: 1/5/24 (mm/dd/yy)
Received Time: 13:30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Temperature Upon Receipt (°C): 6.8 3
LAB LIMS #: CA-40009-Jan24

REPORT INFORMATION	INVOICE INFORMATION
Company: SOIL ENG LTD	☑ (same as Report Information)
Contact: GURKARANBIR SINGH	Company:
Address: 90 Westbeaver Creek Rd, Richmond Hill	Contact:
Phone: 519-731-6442	Address:
Fax:	Phone:
Email: gurkaranbir.singh@soilengineers.ca	Email:

Quotation #:
P.O. #: 2309-W138
Project #:
Site Location/ID: Mount Hope Rd & Columbia Way, Caledon

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)

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

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

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

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

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA _____
☐ ODWS Not Reportable *See note

Sewer By-Law:
☑ Sanitary
☑ Storm
Municipality: Region of Peel

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (Incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all Incl PAHs, ABNs, CPs)	PCB: PCBs (Aroclor ☐ Total ☐)	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other (please specify)						SPLP: Specify tests	TCLP: Specify tests	COMMENTS:
																					Sewer Use: Storm / Sanitary	Specify pkg: Region / Peel	Water Characterization Pkg: General ☐ Extended ☐			
1	BH/MW-2D	Jan 04, 2024	1:30pm	17	GW	N																		☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): Gurkaranbir Singh Signature:
Date: Jan 04, 24 (mm/dd/yy)
Relinquished by (NAME): Gurkaranbir Singh Signature:
Date: Jan 04, 24 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.





FINAL REPORT

CA40038-APR25 R

2309-W138, Mount Hope Rd, C.aledon

Prepared for

Soil Engineers Ltd.

FINAL REPORT

CA40038-APR25 R

First Page

CLIENT DETAILS

Client	Soil Engineers Ltd.
Address	90 West Beaver Creek Rd, Richmond Hill Canada, M1S 3A7 Phone: 705-341-1987. Fax:416-754-8516
Contact	Yogiraj Rana
Telephone	705-341-1987
Facsimile	416-754-8516
Email	yogiraj.rana@soilengineersltd.com
Project	2309-W138, Mount Hope Rd, C.aledon
Order Number	
Samples	Surface Water (1)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA40038-APR25
Received	04/03/2025
Approved	04/10/2025
Report Number	CA40038-APR25 R
Date Reported	04/10/2025

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 034797

Phos TR spk low due to sample matrix

SIGNATORIES

Brad Moore Hon. B.Sc



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Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd, C.aledon
Project Manager: Yogiraj Rana
Samplers: Amar Deep Regmi

MATRIX: WATER

Sample Number	15
Sample Name	FS1
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
General Chemistry				
Alkalinity	mg/L as CaCO3	2		123
Conductivity	uS/cm	2		194
Total Solids	mg/L	30		755
Total Suspended Solids	mg/L	2		484
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 ↑
Dissolved Oxygen	mg/L	1		11
Salinity	none			0.1
Turbidity	NTU	0.10		750
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5
Total Reactive Phosphorous (o-phosphate as P)	mg/L	0.03		0.04
Metals and Inorganics				
Nitrate (as N)	as N mg/L	0.06		2.12
Nitrite (as N)	as N mg/L	0.03		< 0.03
Nitrate + Nitrite (as N)	as N mg/L	0.06		2.12
Hardness	mg/L as CaCO3	0.05		216
Aluminum (total)	mg/L	0.001		12.6
Barium (total)	mg/L	0.00008		0.110
Beryllium (total)	mg/L	0.000007		0.000534
Bismuth (total)	mg/L	0.00001		0.00012
Boron (total)	mg/L	0.002		0.014

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd, C.aledon
Project Manager: Yogiraj Rana
Samplers: Amar Deep Regmi

MATRIX: WATER

Sample Number	15
Sample Name	FS1
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Metals and Inorganics (continued)				
Cadmium (total)	mg/L	0.000003		0.000108
Calcium (total)	mg/L	0.01		71.5
Chromium (total)	mg/L	0.00008		0.0187
Cobalt (total)	mg/L	0.000004		0.00735
Copper (total)	mg/L	0.001		0.017
Iron (total)	mg/L	0.007		18.3
Lead (total)	mg/L	0.00009		0.0101
Lithium (total)	mg/L	0.0001		0.0143
Magnesium (total)	mg/L	0.001		9.15
Manganese (total)	mg/L	0.00001		0.392
Molybdenum (total)	mg/L	0.0004		< 0.0004
Nickel (total)	mg/L	0.0001		0.0181
Phosphorus (total)	mg/L	0.003		0.470
Potassium (total)	mg/L	0.009		4.62
Silicon (total)	mg/L	0.02		20.8
Silver (total)	mg/L	0.00005		< 0.00005
Strontium (total)	mg/L	0.00008		0.137
Thallium (total)	mg/L	0.000005		0.000159
Tin (total)	mg/L	0.00006		0.00009
Titanium (total)	mg/L	0.0001		0.226
Uranium (total)	mg/L	0.000002		0.000758
Vanadium (total)	mg/L	0.00001		0.0237

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd, C.aledon
Project Manager: Yogiraj Rana
Samplers: Amar Deep Regmi

MATRIX: WATER

Sample Number	15
Sample Name	FS1
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Metals and Inorganics (continued)				
Zinc (total)	mg/L	0.002		0.050
Zirconium (total)	mg/L	0.002		< 0.002
Antimony (total)	mg/L	0.0009		< 0.0009
Arsenic (total)	mg/L	0.0002		0.0026
Selenium (total)	mg/L	0.00004		0.00019
Microbiology				
Total Coliform	MPN/100mL	0		10980
E. Coli	mpn/100mL	0		5
Fecal Coliform	mpn/100mL	0		37
Na				
Sodium	µg/L	10		1680
Oil and Grease				
Oil & Grease (total)	mg/L	2		< 2
Oil & Grease (animal/vegetable)	mg/L	4		< 4
Oil & Grease (mineral/synthetic)	mg/L	4		< 4

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd, C.aledon
Project Manager: Yogiraj Rana
Samplers: Amar Deep Regmi

MATRIX: WATER

Sample Number	15
Sample Name	FS1
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Other (ORP)				
pH	No unit	0.05		7.81
Chloride	µg/L	1000		6600
PAHs				
Acenaphthene	µg/L	0.1		< 0.1
Acenaphthylene	µg/L	0.1		< 0.1
Anthracene	µg/L	0.1		< 0.1
Benzo(a)anthracene	µg/L	0.1		< 0.1
Benzo(a)pyrene	µg/L	0.01		< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1
Benzo(ghi)perylene	µg/L	0.2		< 0.2
Benzo(k)fluoranthene	µg/L	0.1		< 0.1
Chrysene	µg/L	0.1		< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1		< 0.1
Fluoranthene	µg/L	0.1		< 0.1
Fluorene	µg/L	0.1		< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2
1-Methylnaphthalene	µg/L	0.5		< 0.5
2-Methylnaphthalene	µg/L	0.5		< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5
Naphthalene	µg/L	0.5		< 0.5
Phenanthrene	µg/L	0.1		< 0.1
Pyrene	µg/L	0.1		< 0.1

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0110-APR25	mg/L as CaCO3	2	< 2	1	20	111	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0061-APR25	as N mg/L	0.1	<0.1	ND	10	97	90	110	92	75	125

Anions by discrete analyzer

Method: US EPA 325.2 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO8011-APR25	ug/L	1000	<1000	ND	20	97	80	120	100	75	125

QC SUMMARY

Anions by IC

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0132-APR25	mg/L	0.06	<0.06	NA		NA			NA		
Nitrite (as N)	DIO0132-APR25	mg/L	0.03	<0.03	ND	20	101	90	110	82	75	125
Nitrate (as N)	DIO0132-APR25	mg/L	0.06	<0.06	0	20	102	90	110	78	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0006-APR25	mg/L	2	< 2	5	30	115	70	130	97	70	130

QC SUMMARY

Conductivity

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0110-APR25	uS/cm	2	3	0	20	106	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0052-APR25	mg/L	0.00005	<0.00005	ND	20	102	90	110	91	70	130
Aluminum (total)	EMS0052-APR25	mg/L	0.001	<0.001	4	20	100	90	110	105	70	130
Arsenic (total)	EMS0052-APR25	mg/L	0.0002	<0.0002	12	20	100	90	110	107	70	130
Barium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	0	20	98	90	110	112	70	130
Beryllium (total)	EMS0052-APR25	mg/L	0.000007	<0.000007	7	20	104	90	110	99	70	130
Boron (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	104	90	110	101	70	130
Bismuth (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	15	20	96	90	110	109	70	130
Calcium (total)	EMS0052-APR25	mg/L	0.01	<0.01	2	20	97	90	110	96	70	130
Cadmium (total)	EMS0052-APR25	mg/L	0.000003	<0.000003	ND	20	103	90	110	105	70	130
Cobalt (total)	EMS0052-APR25	mg/L	0.000004	<0.000004	9	20	100	90	110	106	70	130
Chromium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	ND	20	100	90	110	109	70	130
Copper (total)	EMS0052-APR25	mg/L	0.001	<0.001	5	20	101	90	110	100	70	130
Iron (total)	EMS0052-APR25	mg/L	0.007	<0.007	12	20	97	90	110	100	70	130
Potassium (total)	EMS0052-APR25	mg/L	0.009	<0.009	1	20	98	90	110	84	70	130
Lithium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	102	90	110	85	70	130
Magnesium (total)	EMS0052-APR25	mg/L	0.001	<0.001	2	20	96	90	110	102	70	130
Manganese (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	3	20	102	90	110	99	70	130
Molybdenum (total)	EMS0052-APR25	mg/L	0.0004	<0.0004	ND	20	101	90	110	105	70	130
Sodium	EMS0052-APR25	ug/L	10	<10	1	20	96	90	110	98	70	130
Nickel (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	8	20	100	90	110	100	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead (total)	EMS0052-APR25	mg/L	0.00009	<0.00009	2	20	98	90	110	109	70	130
Phosphorus (total)	EMS0052-APR25	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Antimony (total)	EMS0052-APR25	mg/L	0.0009	<0.0009	ND	20	110	90	110	120	70	130
Selenium (total)	EMS0052-APR25	mg/L	0.00004	<0.00004	13	20	99	90	110	109	70	130
Silicon (total)	EMS0052-APR25	mg/L	0.02	<0.02	2	20	105	90	110	NV	70	130
Tin (total)	EMS0052-APR25	mg/L	0.00006	<0.00006	2	20	102	90	110	NV	70	130
Strontium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	2	20	96	90	110	100	70	130
Titanium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	101	90	110	NV	70	130
Thallium (total)	EMS0052-APR25	mg/L	0.000005	<0.000005	ND	20	98	90	110	100	70	130
Uranium (total)	EMS0052-APR25	mg/L	0.000002	<0.000002	6	20	98	90	110	106	70	130
Vanadium (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	0	20	100	90	110	102	70	130
Zinc (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	96	90	110	101	70	130
Zirconium (total)	EMS0052-APR25	mg/L	0.002	<0.002	ND	20	98	90	110	NV	70	130

QC SUMMARY

Microbiology

Method: SM 9223B | Internal ref.: ME-CA-[ENV]MIC-LAK-AN-021

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Fecal Coliform	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9104-APR25	MPN/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0103-APR25	mg/L	2	<2	NSS	20	105	75	125			

QC SUMMARY

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0103-APR25	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0103-APR25	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0110-APR25	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Reactive Phosphorus by SFA

Method: SM 4500-P F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Reactive Phosphorous (o-phosphate as P)	SKA0092-APR25	mg/L	0.03	<0.03	2	10	98	90	110	55	75	125

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
2-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
Acenaphthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140
Acenaphthylene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	98	50	140	103	50	140
Anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	100	50	140	103	50	140
Benzo(a)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Benzo(a)pyrene	GCM0101-APR25	ug/L	0.01	< 0.01	ND	30	106	50	140	102	50	140
Benzo(b+j)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	107	50	140	101	50	140
Benzo(ghi)perylene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	101	50	140
Benzo(k)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	109	50	140	105	50	140
Chrysene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	104	50	140
Dibenzo(a,h)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	101	50	140	102	50	140
Fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Fluorene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	106	50	140
Indeno(1,2,3-cd)pyrene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	102	50	140
Naphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	105	50	140	105	50	140
Phenanthrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	103	50	140	103	50	140
Pyrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140

QC SUMMARY

Solids Analysis

Method: SM 2540 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Solids	EWL0153-APR25	mg/L	30	<30	ND	20	101	80	120	NA		

Suspended Solids

Method: SM 2540D I Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0109-APR25	mg/L	2	< 2	4	10	94	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F I Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0055-APR25	as N mg/L	0.5	<0.5	2	10	101	90	110	99	75	125

QC SUMMARY

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0082-APR25	NTU	0.10	< 0.10	0	10	99	90	110	NA		

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

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

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 034797

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

Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Soft Rana
Received Date: 04/03/2025 (mm/dd/yy)
Received Time: 16 : 30 (hr : min)
Received By (signature): S
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Temperature Upon Receipt (°C): 9 C
CA 40038 APR25 K.A
LAB LIMS #: ____

REPORT INFORMATION

Company: Soil Engineers Ltd.
Contact: Yogijaj Rana
Address: 90 West Beaver Creek Rd. Richmond Hill, ON
Phone: 416-779-2825
Fax: Yogiraj.rana@soilengineersltd.com
Email:

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #: 2024 1115
Project #: 2309-W138
P.O. #:
Site Location/ID: Mount Hope Rd. Caledon

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)

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

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

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: ____

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

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19

☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other: ____
☐ MISA ____
☐ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality: ____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na–water)	M&I: Full Metals Suite (ICP metals plus B(HWS–soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify)				Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg Extended ☐ General	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
																		SEE ATTACHED QUOTE							
1	FS 1	04/03/25	10:10	12	SW	N												X							Please do
2																									analysis for
3																									all mentio
4																									-ned in the
5																									attached
6																									letter.
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Amar Deep Regmi Signature: Date: 04/03/25 (mm/dd/yy)
Relinquished by (NAME): Amar Deep Regmi Signature: Date: 04/03/25 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.





FINAL REPORT

CA40039-APR25 R

2309-W138, Mount Hope Rd., C.aledon

Prepared for

Soil Engineers Ltd.

FINAL REPORT

CA40039-APR25 R

First Page

CLIENT DETAILS

Client	Soil Engineers Ltd.
Address	90 West Beaver Creek Rd, Richmond Hill Canada, M1S 3A7 Phone: 705-341-1987. Fax:416-754-8516
Contact	Yogiraj Rana
Telephone	705-341-1987
Facsimile	416-754-8516
Email	yogiraj.rana@soilengineersltd.com
Project	2309-W138, Mount Hope Rd., C.aledon
Order Number	
Samples	Surface Water (1)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA40039-APR25
Received	04/03/2025
Approved	04/10/2025
Report Number	CA40039-APR25 R
Date Reported	04/10/2025

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 034798

phos TR spk low due to sample matrix

SIGNATORIES

Brad Moore Hon. B.Sc

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Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd., C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15
Sample Name	FS2
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
General Chemistry				
Alkalinity	mg/L as CaCO3	2		75
Conductivity	uS/cm	2		172
Total Solids	mg/L	30		183
Total Suspended Solids	mg/L	2		38
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 ↑
Dissolved Oxygen	mg/L	1		10
Salinity	none			0.1
Turbidity	NTU	0.10		70
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5
Total Reactive Phosphorous (o-phosphate as P)	mg/L	0.03		< 0.03
Metals and Inorganics				
Nitrate (as N)	as N mg/L	0.06		1.82
Nitrite (as N)	as N mg/L	0.03		< 0.03
Nitrate + Nitrite (as N)	as N mg/L	0.06		1.82
Hardness	mg/L as CaCO3	0.05		74.9
Aluminum (total)	mg/L	0.001		2.06
Barium (total)	mg/L	0.00008		0.0212
Beryllium (total)	mg/L	0.000007		0.000075
Bismuth (total)	mg/L	0.00001		0.00002
Boron (total)	mg/L	0.002		0.008

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd., C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15
Sample Name	FS2
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Metals and Inorganics (continued)				
Cadmium (total)	mg/L	0.000003		0.000018
Calcium (total)	mg/L	0.01		25.5
Chromium (total)	mg/L	0.00008		0.00254
Cobalt (total)	mg/L	0.000004		0.000752
Copper (total)	mg/L	0.001		0.003
Iron (total)	mg/L	0.007		2.27
Lead (total)	mg/L	0.00009		0.00111
Lithium (total)	mg/L	0.0001		0.0018
Magnesium (total)	mg/L	0.001		2.76
Manganese (total)	mg/L	0.00001		0.0439
Molybdenum (total)	mg/L	0.0004		< 0.0004
Nickel (total)	mg/L	0.0001		0.0022
Phosphorus (total)	mg/L	0.003		0.068
Potassium (total)	mg/L	0.009		2.37
Silicon (total)	mg/L	0.02		4.69
Silver (total)	mg/L	0.00005		< 0.00005
Strontium (total)	mg/L	0.00008		0.0514
Thallium (total)	mg/L	0.000005		0.000030
Tin (total)	mg/L	0.00006		0.00009
Titanium (total)	mg/L	0.0001		0.0539
Uranium (total)	mg/L	0.000002		0.000272
Vanadium (total)	mg/L	0.00001		0.00383

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd., C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15
Sample Name	FS2
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Metals and Inorganics (continued)				
Zinc (total)	mg/L	0.002		0.006
Zirconium (total)	mg/L	0.002		< 0.002
Antimony (total)	mg/L	0.0009		< 0.0009
Arsenic (total)	mg/L	0.0002		0.0006
Selenium (total)	mg/L	0.00004		0.00011
Microbiology				
Total Coliform	MPN/100mL	0		>2420
E. Coli	mpn/100mL	0		4
Fecal Coliform	mpn/100mL	0		12
Na				
Sodium	µg/L	10		1200
Oil and Grease				
Oil & Grease (total)	mg/L	2		< 2
Oil & Grease (animal/vegetable)	mg/L	4		< 4
Oil & Grease (mineral/synthetic)	mg/L	4		< 4

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Rd., C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15
Sample Name	FS2
Sample Matrix	Surface Water
Sample Date	03/04/2025

Parameter	Units	RL		Result
Other (ORP)				
pH	No unit	0.05		7.69
Chloride	µg/L	1000		4500
PAHs				
Acenaphthene	µg/L	0.1		< 0.1
Acenaphthylene	µg/L	0.1		< 0.1
Anthracene	µg/L	0.1		< 0.1
Benzo(a)anthracene	µg/L	0.1		< 0.1
Benzo(a)pyrene	µg/L	0.01		< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1
Benzo(ghi)perylene	µg/L	0.2		< 0.2
Benzo(k)fluoranthene	µg/L	0.1		< 0.1
Chrysene	µg/L	0.1		< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1		< 0.1
Fluoranthene	µg/L	0.1		< 0.1
Fluorene	µg/L	0.1		< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2
1-Methylnaphthalene	µg/L	0.5		< 0.5
2-Methylnaphthalene	µg/L	0.5		< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5
Naphthalene	µg/L	0.5		< 0.5
Phenanthrene	µg/L	0.1		< 0.1
Pyrene	µg/L	0.1		< 0.1

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0110-APR25	mg/L as CaCO3	2	< 2	1	20	111	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0061-APR25	as N mg/L	0.1	<0.1	ND	10	97	90	110	92	75	125

Anions by discrete analyzer

Method: US EPA 325.2 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO8011-APR25	ug/L	1000	<1000	ND	20	97	80	120	100	75	125

QC SUMMARY

Anions by IC

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0133-APR25	mg/L	0.06	<0.06	NA		NA			NA		
Nitrite (as N)	DIO0133-APR25	mg/L	0.03	<0.03	9	20	101	90	110	100	75	125
Nitrate (as N)	DIO0133-APR25	mg/L	0.06	<0.06	0	20	102	90	110	93	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0006-APR25	mg/L	2	< 2	5	30	115	70	130	97	70	130

QC SUMMARY

Conductivity

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0110-APR25	uS/cm	2	3	0	20	106	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Molybdenum (total)	EMS0052-APR25	mg/L	0.0004	<0.0004	ND	20	101	90	110	105	70	130
Sodium	EMS0052-APR25	ug/L	10	<10	1	20	96	90	110	98	70	130
Nickel (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	8	20	100	90	110	100	70	130
Lead (total)	EMS0052-APR25	mg/L	0.00009	<0.00009	2	20	98	90	110	109	70	130
Phosphorus (total)	EMS0052-APR25	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Antimony (total)	EMS0052-APR25	mg/L	0.0009	<0.0009	ND	20	110	90	110	120	70	130
Selenium (total)	EMS0052-APR25	mg/L	0.00004	<0.00004	13	20	99	90	110	109	70	130
Silicon (total)	EMS0052-APR25	mg/L	0.02	<0.02	2	20	105	90	110	NV	70	130
Tin (total)	EMS0052-APR25	mg/L	0.00006	<0.00006	2	20	102	90	110	NV	70	130
Strontium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	2	20	96	90	110	100	70	130
Titanium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	101	90	110	NV	70	130
Thallium (total)	EMS0052-APR25	mg/L	0.000005	<0.000005	ND	20	98	90	110	100	70	130
Uranium (total)	EMS0052-APR25	mg/L	0.000002	<0.000002	6	20	98	90	110	106	70	130
Vanadium (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	0	20	100	90	110	102	70	130
Zinc (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	96	90	110	101	70	130
Zirconium (total)	EMS0052-APR25	mg/L	0.002	<0.002	ND	20	98	90	110	NV	70	130
Silver (total)	EMS0052-APR25	mg/L	0.00005	<0.00005	ND	20	102	90	110	91	70	130
Aluminum (total)	EMS0052-APR25	mg/L	0.001	<0.001	4	20	100	90	110	105	70	130
Arsenic (total)	EMS0052-APR25	mg/L	0.0002	<0.0002	12	20	100	90	110	107	70	130
Barium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	0	20	98	90	110	112	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Beryllium (total)	EMS0052-APR25	mg/L	0.000007	<0.000007	7	20	104	90	110	99	70	130
Boron (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	104	90	110	101	70	130
Bismuth (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	15	20	96	90	110	109	70	130
Calcium (total)	EMS0052-APR25	mg/L	0.01	<0.01	2	20	97	90	110	96	70	130
Cadmium (total)	EMS0052-APR25	mg/L	0.000003	<0.000003	ND	20	103	90	110	105	70	130
Cobalt (total)	EMS0052-APR25	mg/L	0.000004	<0.000004	9	20	100	90	110	106	70	130
Chromium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	ND	20	100	90	110	109	70	130
Copper (total)	EMS0052-APR25	mg/L	0.001	<0.001	5	20	101	90	110	100	70	130
Iron (total)	EMS0052-APR25	mg/L	0.007	<0.007	12	20	97	90	110	100	70	130
Potassium (total)	EMS0052-APR25	mg/L	0.009	<0.009	1	20	98	90	110	84	70	130
Lithium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	102	90	110	85	70	130
Magnesium (total)	EMS0052-APR25	mg/L	0.001	<0.001	2	20	96	90	110	102	70	130
Manganese (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	3	20	102	90	110	99	70	130

QC SUMMARY

Microbiology

Method: SM 9223B | Internal ref.: ME-CA-[ENV]MIC-LAK-AN-021

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Fecal Coliform	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9104-APR25	MPN/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0112-APR25	mg/L	2	<2	NSS	20	102	75	125			

QC SUMMARY

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0112-APR25	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0112-APR25	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0110-APR25	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Reactive Phosphorus by SFA

Method: SM 4500-P F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Reactive Phosphorous (o-phosphate as P)	SKA0092-APR25	mg/L	0.03	<0.03	2	10	98	90	110	55	75	125

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
2-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
Acenaphthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140
Acenaphthylene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	98	50	140	103	50	140
Anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	100	50	140	103	50	140
Benzo(a)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Benzo(a)pyrene	GCM0101-APR25	ug/L	0.01	< 0.01	ND	30	106	50	140	102	50	140
Benzo(b+j)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	107	50	140	101	50	140
Benzo(ghi)perylene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	101	50	140
Benzo(k)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	109	50	140	105	50	140
Chrysene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	104	50	140
Dibenzo(a,h)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	101	50	140	102	50	140
Fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Fluorene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	106	50	140
Indeno(1,2,3-cd)pyrene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	102	50	140
Naphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	105	50	140	105	50	140
Phenanthrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	103	50	140	103	50	140
Pyrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140

QC SUMMARY

Solids Analysis

Method: SM 2540 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Solids	EWL0153-APR25	mg/L	30	<30	ND	20	101	80	120	NA		

Suspended Solids

Method: SM 2540D I Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0109-APR25	mg/L	2	< 2	4	10	94	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F I Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0055-APR25	as N mg/L	0.5	<0.5	2	10	101	90	110	99	75	125

QC SUMMARY

Turbidity

Method: SM 2130 I Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0082-APR25	NTU	0.10	< 0.10	0	10	99	90	110	NA		

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.
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The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Reproduction of this analytical report in full or in part is prohibited.

This report supersedes all previous versions.

-- End of Analytical Report --

SGS

Request for Laboratory Services and CHAIN OF CUSTODY

No: 034798

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

Page _____ of _____

CA 40039 APR25 KA

Laboratory Information Section - Lab use only

Received By: Scott Ru
Received Date: 04/03/2025 (mm/dd/yy)
Received Time: 16:30 (hr : min)
Received By (signature): S
Custody Seal Present: Yes ☐ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C): 3.4 3
LAB LIMS #: _____

REPORT INFORMATION

Company: Soil Engineers LTD.
Contact: Yogiraj Rana
Address: 90 west Beaver Creek Rd
Richmond Hill, ON
Phone: 416-779-2825
Fax: _____
Email: yogiraj.rana@soilengineers ltd.com

INVOICE INFORMATION

☑ (same as Report Information)
Company: _____
Contact: _____
Address: _____
Phone: _____
Email: _____

Quotation #: 2024 1115
Project #: 2309-W138
P.O. #: _____
Site Location/ID: Mount Hope Rd. Caledon

TURNAROUND TIME (TAT) REQUIRED

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

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: _____

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

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other: _____
☐ MISA _____
☐ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality: _____

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (Incl CrVI, CN, Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs ☐ Total ☐ Aroclor	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other: SEE ATTACHED QUOTE	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg ☐ Extended ☐ General	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	FS2	04/03/25	10:00	12	SW	N												X					Please do Analysis for all Mentioned in Attached letter.
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Observations/Comments/Special Instructions

Sampled By (NAME): Karim Salib Signature: _____ Date: 04/03/25 (mm/dd/yy) Pink Copy - Client
Relinquished by (NAME): Karim Salib Signature: _____ Date: 04/03/25 (mm/dd/yy) Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.





FINAL REPORT

CA40040-APR25 R

2309-W138, Mount Hope Road, C.aledon

Prepared for

Soil Engineers Ltd.

FINAL REPORT

CA40040-APR25 R

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Soil Engineers Ltd.	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	90 West Beaver Creek Rd, Richmond Hill Canada, M1S 3A7 Phone: 705-341-1987. Fax:416-754-8516	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Yogiraj Rana	Telephone	705-652-2000
Telephone	705-341-1987	Facsimile	705-652-6365
Facsimile	416-754-8516	Email	Maarit.Wolfe@sgs.com
Email	yogiraj.rana@soilengineersltd.com	SGS Reference	CA40040-APR25
Project	2309-W138, Mount Hope Road, C.aledon	Received	04/03/2025
Order Number		Approved	04/10/2025
Samples	Surface Water (2)	Report Number	CA40040-APR25 R
		Date Reported	04/10/2025

COMMENTS

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 034795

Phos TR spike low due to sample matrix

SIGNATORIES

Brad Moore Hon. B.Sc

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Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Road, C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15	16
Sample Name	FS4	FS3
Sample Matrix	Surface Water	Surface Water
Sample Date	03/04/2025	03/04/2025

Parameter	Units	RL		Result	Result
General Chemistry					
Alkalinity	mg/L as CaCO3	2		83	57
Conductivity	uS/cm	2		211	153
Total Solids	mg/L	30		129	97
Total Suspended Solids	mg/L	2		3	14
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 ↑	< 4 ↑
Dissolved Oxygen	mg/L	1		9.8	9.8
Salinity	none			0.1	0.1
Turbidity	NTU	0.10		16	28
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	< 0.5
Total Reactive Phosphorous (o-phosphate as P)	mg/L	0.03		0.04	< 0.03
Metals and Inorganics					
Nitrate (as N)	as N mg/L	0.06		0.78	1.43
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03
Nitrate + Nitrite (as N)	as N mg/L	0.06		0.78	1.43
Hardness	mg/L as CaCO3	0.05		81.8	62.9
Aluminum (total)	mg/L	0.001		0.535	0.968
Barium (total)	mg/L	0.00008		0.0136	0.0142
Beryllium (total)	mg/L	0.000007		0.000022	0.000034
Bismuth (total)	mg/L	0.00001		0.00001	0.00002
Boron (total)	mg/L	0.002		0.010	0.008

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Road, C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15	16
Sample Name	FS4	FS3
Sample Matrix	Surface Water	Surface Water
Sample Date	03/04/2025	03/04/2025

Parameter	Units	RL		Result	Result
Metals and Inorganics (continued)					
Cadmium (total)	mg/L	0.000003		0.000007	0.000014
Calcium (total)	mg/L	0.01		27.0	20.2
Chromium (total)	mg/L	0.00008		0.00077	0.00136
Cobalt (total)	mg/L	0.000004		0.000250	0.000418
Copper (total)	mg/L	0.001		0.002	0.002
Iron (total)	mg/L	0.007		0.667	1.14
Lead (total)	mg/L	0.00009		0.00034	0.00066
Lithium (total)	mg/L	0.0001		0.0006	0.0009
Magnesium (total)	mg/L	0.001		3.46	3.00
Manganese (total)	mg/L	0.00001		0.0295	0.0347
Molybdenum (total)	mg/L	0.0004		< 0.0004	< 0.0004
Nickel (total)	mg/L	0.0001		0.0008	0.0013
Phosphorus (total)	mg/L	0.003		0.083	0.066
Potassium (total)	mg/L	0.009		2.84	2.77
Silicon (total)	mg/L	0.02		3.08	3.65
Silver (total)	mg/L	0.00005		< 0.00005	< 0.00005
Strontium (total)	mg/L	0.00008		0.0559	0.0439
Thallium (total)	mg/L	0.000005		0.000009	0.000014
Tin (total)	mg/L	0.00006		0.00007	0.00007
Titanium (total)	mg/L	0.0001		0.0149	0.0231
Uranium (total)	mg/L	0.000002		0.000179	0.000090
Vanadium (total)	mg/L	0.00001		0.00111	0.00188

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Road, C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15	16
Sample Name	FS4	FS3
Sample Matrix	Surface Water	Surface Water
Sample Date	03/04/2025	03/04/2025

Parameter	Units	RL		Result	Result
Metals and Inorganics (continued)					
Zinc (total)	mg/L	0.002		0.003	0.004
Zirconium (total)	mg/L	0.002		< 0.002	< 0.002
Antimony (total)	mg/L	0.0009		< 0.0009	< 0.0009
Arsenic (total)	mg/L	0.0002		0.0004	0.0004
Selenium (total)	mg/L	0.00004		0.00010	0.00011
Microbiology					
Total Coliform	MPN/100mL	0		>2420	>2420
E. Coli	mpn/100mL	0		102	22
Fecal Coliform	mpn/100mL	0		68	74
Na					
Sodium	µg/L	10		4110	2050
Oil and Grease					
Oil & Grease (total)	mg/L	2		< 2	< 2
Oil & Grease (animal/vegetable)	mg/L	4		< 4	< 4
Oil & Grease (mineral/synthetic)	mg/L	4		< 4	< 4

Client: Soil Engineers Ltd.
Project: 2309-W138, Mount Hope Road, C.aledon
Project Manager: Yogiraj Rana
Samplers: Karim Salib

MATRIX: WATER

Sample Number	15	16
Sample Name	FS4	FS3
Sample Matrix	Surface Water	Surface Water
Sample Date	03/04/2025	03/04/2025

Parameter	Units	RL		Result	Result
Other (ORP)					
pH	No unit	0.05		7.49	7.20
Chloride	µg/L	1000		11000	4600
PAHs					
Acenaphthene	µg/L	0.1		< 0.1	< 0.1
Acenaphthylene	µg/L	0.1		< 0.1	< 0.1
Anthracene	µg/L	0.1		< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1		< 0.1	< 0.1
Benzo(a)pyrene	µg/L	0.01		< 0.01	< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1	< 0.1
Benzo(ghi)perylene	µg/L	0.2		< 0.2	< 0.2
Benzo(k)fluoranthene	µg/L	0.1		< 0.1	< 0.1
Chrysene	µg/L	0.1		< 0.1	< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1		< 0.1	< 0.1
Fluoranthene	µg/L	0.1		< 0.1	< 0.1
Fluorene	µg/L	0.1		< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2	< 0.2
1-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5
2-Methylnaphthalene	µg/L	0.5		< 0.5	< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5	< 0.5
Naphthalene	µg/L	0.5		< 0.5	< 0.5
Phenanthrene	µg/L	0.1		< 0.1	< 0.1
Pyrene	µg/L	0.1		< 0.1	< 0.1

QC SUMMARY

Alkalinity

Method: SM 2320 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0108-APR25	mg/L as CaCO3	2	< 2	1	20	98	80	120	NA		

Ammonia by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0061-APR25	as N mg/L	0.1	<0.1	ND	10	97	90	110	92	75	125

Anions by discrete analyzer

Method: US EPA 325.2 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO8011-APR25	ug/L	1000	<1000	ND	20	97	80	120	100	75	125

QC SUMMARY

Anions by IC

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate + Nitrite (as N)	DIO0133-APR25	mg/L	0.06	<0.06	NA		NA			NA		
Nitrite (as N)	DIO0133-APR25	mg/L	0.03	<0.03	9	20	101	90	110	100	75	125
Nitrate (as N)	DIO0133-APR25	mg/L	0.06	<0.06	0	20	102	90	110	93	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0006-APR25	mg/L	2	< 2	5	30	115	70	130	97	70	130

QC SUMMARY

Conductivity

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0108-APR25	uS/cm	2	< 2	0	20	100	90	110	NA		

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0052-APR25	mg/L	0.00005	<0.00005	ND	20	102	90	110	91	70	130
Aluminum (total)	EMS0052-APR25	mg/L	0.001	<0.001	4	20	100	90	110	105	70	130
Arsenic (total)	EMS0052-APR25	mg/L	0.0002	<0.0002	12	20	100	90	110	107	70	130
Barium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	0	20	98	90	110	112	70	130
Beryllium (total)	EMS0052-APR25	mg/L	0.000007	<0.000007	7	20	104	90	110	99	70	130
Boron (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	104	90	110	101	70	130
Bismuth (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	15	20	96	90	110	109	70	130
Calcium (total)	EMS0052-APR25	mg/L	0.01	<0.01	2	20	97	90	110	96	70	130
Cadmium (total)	EMS0052-APR25	mg/L	0.000003	<0.000003	ND	20	103	90	110	105	70	130
Cobalt (total)	EMS0052-APR25	mg/L	0.000004	<0.000004	9	20	100	90	110	106	70	130
Chromium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	ND	20	100	90	110	109	70	130
Copper (total)	EMS0052-APR25	mg/L	0.001	<0.001	5	20	101	90	110	100	70	130
Iron (total)	EMS0052-APR25	mg/L	0.007	<0.007	12	20	97	90	110	100	70	130
Potassium (total)	EMS0052-APR25	mg/L	0.009	<0.009	1	20	98	90	110	84	70	130
Lithium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	102	90	110	85	70	130
Magnesium (total)	EMS0052-APR25	mg/L	0.001	<0.001	2	20	96	90	110	102	70	130
Manganese (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	3	20	102	90	110	99	70	130
Molybdenum (total)	EMS0052-APR25	mg/L	0.0004	<0.0004	ND	20	101	90	110	105	70	130
Sodium	EMS0052-APR25	ug/L	10	<10	1	20	96	90	110	98	70	130
Nickel (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	8	20	100	90	110	100	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Lead (total)	EMS0052-APR25	mg/L	0.00009	<0.00009	2	20	98	90	110	109	70	130
Phosphorus (total)	EMS0052-APR25	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Antimony (total)	EMS0052-APR25	mg/L	0.0009	<0.0009	ND	20	110	90	110	120	70	130
Selenium (total)	EMS0052-APR25	mg/L	0.00004	<0.00004	13	20	99	90	110	109	70	130
Silicon (total)	EMS0052-APR25	mg/L	0.02	<0.02	2	20	105	90	110	NV	70	130
Tin (total)	EMS0052-APR25	mg/L	0.00006	<0.00006	2	20	102	90	110	NV	70	130
Strontium (total)	EMS0052-APR25	mg/L	0.00008	<0.00008	2	20	96	90	110	100	70	130
Titanium (total)	EMS0052-APR25	mg/L	0.0001	<0.0001	ND	20	101	90	110	NV	70	130
Thallium (total)	EMS0052-APR25	mg/L	0.000005	<0.000005	ND	20	98	90	110	100	70	130
Uranium (total)	EMS0052-APR25	mg/L	0.000002	<0.000002	6	20	98	90	110	106	70	130
Vanadium (total)	EMS0052-APR25	mg/L	0.00001	<0.00001	0	20	100	90	110	102	70	130
Zinc (total)	EMS0052-APR25	mg/L	0.002	<0.002	1	20	96	90	110	101	70	130
Zirconium (total)	EMS0052-APR25	mg/L	0.002	<0.002	ND	20	98	90	110	NV	70	130

QC SUMMARY

Microbiology

Method: SM 9223B | Internal ref.: ME-CA-[ENV]MIC-LAK-AN-021

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Fecal Coliform	BAC9104-APR25	mpn/100mL	-	ACCEPTED	ACCEPTED							
Total Coliform	BAC9104-APR25	MPN/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0103-APR25	mg/L	2	<2	NSS	20	105	75	125			

QC SUMMARY

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0103-APR25	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0103-APR25	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0108-APR25	No unit	0.05	NA	0		101			NA		

QC SUMMARY

Reactive Phosphorus by SFA

Method: SM 4500-P F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Reactive Phosphorous (o-phosphate as P)	SKA0092-APR25	mg/L	0.03	<0.03	2	10	98	90	110	55	75	125

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
2-Methylnaphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	103	50	140	106	50	140
Acenaphthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140
Acenaphthylene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	98	50	140	103	50	140
Anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	100	50	140	103	50	140
Benzo(a)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Benzo(a)pyrene	GCM0101-APR25	ug/L	0.01	< 0.01	ND	30	106	50	140	102	50	140
Benzo(b+j)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	107	50	140	101	50	140
Benzo(ghi)perylene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	101	50	140
Benzo(k)fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	109	50	140	105	50	140
Chrysene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	104	50	140
Dibenzo(a,h)anthracene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	101	50	140	102	50	140
Fluoranthene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	104	50	140
Fluorene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	105	50	140	106	50	140
Indeno(1,2,3-cd)pyrene	GCM0101-APR25	ug/L	0.2	< 0.2	ND	30	102	50	140	102	50	140
Naphthalene	GCM0101-APR25	ug/L	0.5	< 0.5	ND	30	105	50	140	105	50	140
Phenanthrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	103	50	140	103	50	140
Pyrene	GCM0101-APR25	ug/L	0.1	< 0.1	ND	30	104	50	140	105	50	140

QC SUMMARY

Solids Analysis

Method: SM 2540 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Solids	EWL0152-APR25	mg/L	30	<30	0	20	98	80	120	NA		
Total Solids	EWL0153-APR25	mg/L	30	<30	ND	20	101	80	120	NA		

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0109-APR25	mg/L	2	< 2	4	10	94	90	110	NA		
Total Suspended Solids	EWL0143-APR25	mg/L	2	< 2	2	10	100	90	110	NA		

QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0055-APR25	as N mg/L	0.5	<0.5	2	10	101	90	110	99	75	125

Turbidity

Method: SM 2130 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Turbidity	EWL0082-APR25	NTU	0.10	< 0.10	0	10	99	90	110	NA		

QC SUMMARY

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

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

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 034795

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

Page ____ of ____

Laboratory Information Section - Lab use only

Received By: Sudha Ram
Received Date: 04 / 03 / 2025 (mm/dd/yy)
Received Time: 16:30 (hr: min)
Received By (signature): S
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C): 9°C x 3
LAB LIMS #: CA40040-APR25

REPORT INFORMATION

Company: Soilengineers LTD.
Contact: Yogiraj Rana
Address: 90 west Beaver creek Richmond Hill
Phone: 416 779 2825
Fax:
Email: Yogiraj.rana@s.lengineersltd.com

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #: 2024 7115
Project #: 2309-W138
P.O. #:
Site Location/ID: Mount hope Road, caledon

TURNAROUND TIME (TAT) REQUIRED

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

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

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

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na–water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Ti,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other (please specify)						SPLP: Specify tests	TCLP: Specify tests	COMMENTS:
																					Sewer Use: Specify pkg:	Water Characterization Pkg: General ☐ Extended ☐			
1	FS4	04/03/25	11:20	13	SW	N																	☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	Please analyze
2	FS3	04/03/25	11:40	13	SW	N																			for all parameters
3																									Mentioned in
4																									Attached letter
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Yiann-S. Signature:
Date: 04 / 03 / 2025 (mm/dd/yy)

Relinquished by (NAME): Yiann-S. Signature:
Date: 04 / 03 / 2025 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'H'

Reviewed Plans

REFERENCE NO. 2309-W138

DEVELOPMENT CONCEPT

UNITED HOLDINGS INC.

LEGEND

- DRAFT PLAN BOUNDARY
- 9.8m SINGLE DETACHED
- 13.7m SEMI-DETACHED
- 6.1m STREET TOWNHOUSE
- OTHER RESIDENTIAL
- COMMERCIAL
- PARK
- STORM WATER MANAGEMENT
- NATURAL HERITAGE SYSTEM
- ROAD BUFFER
- OPEN SPACE
- SERVICING BLOCK
- FUTURE DEVELOPMENT

UNIT STATISTICS

TYPE	LOTS/BLOCKS	UNITS
9.8m SINGLE DETACHED	100	100
13.7m SEMI-DETACHED	165	330
6.1m STR. TOWNHOUSE	29	171
OTHER RESIDENTIAL	TBD	TBD
TOTAL (NOT INCLUDING TBD OF 'OTHER RESID.')	294	601

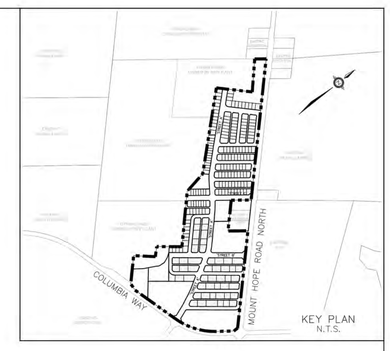
NOTE:

THIS DRAWING IS CONCEPTUAL AND PROVIDED FOR DISCUSSION PURPOSES ONLY.

BOUNDARY INFORMATION, ROAD ALIGNMENT, AND AREA/UNIT COUNT CALCULATIONS ARE SUBJECT TO CHANGE AND NEED TO BE VERIFIED.

PROJECT No. P-3638
SCALE 1:1500
JANUARY 14, 2026
3638DES17

KLM PLANNING
64 JARDIN DRIVE - UNIT 1B,
CONCORD ONT. L4K 3P3
TEL: (905)669-4055



LEGEND

- DENOTES PROPOSED STORM MANHOLE
- DENOTES PROPOSED SANITARY MANHOLE
- DENOTES PROPOSED STORM SEWER
- DENOTES PROPOSED SANITARY SEWER
- DENOTES PROPOSED WATERMAIN
- DENOTES PROPOSED INFILTRATION TRENCH
- 246 DENOTES EXISTING CONTOUR AND ELEVATION
- DENOTES PROPERTY LIMIT
- DENOTES OVERLAND FLOW ROUTE
- × DENOTES EXISTING ELEVATION
- × 278.60 DENOTES PROPOSED ELEVATION
- N 270.80 W 270.30 DENOTES SANITARY SEWER OBVERT
- N 270.80 W 270.30 E 270.70 DENOTES STORM SEWER OBVERT
- E 281.25 DENOTES CLEAN WATER COLLECTOR OBVERT

NOTE:
SANITARY INFORMATION GOING NORTH ON MOUNT HOPE ROAD TO BE CONFIRMED.

FLOODPLAIN TRCA
FLOODLINE +10m
WETLAND
UNEVALUATED WETLAND
DRIPLINE
DRIPLINE +30m
10m BUFFER
PSW
PSW +30m
PSW +15m
WATERCOURSE
10R +10m
RESID.
FUT. DEV.
STR. E
STREET F
STREET G
STREET H
STREET C
STREET I
STREET A
STREET K
STREET J
STREET L
STREET M
STREET B
STREET N
STREET E
PARK
1.42±Ha.
NHS
0.78±Ha.
NHS
0.43±Ha.
COMMERCIAL
2.64±Ha.
WET CELL
SWM
2.76±Ha.
FOREBAY
FILTER BED AREA
SEDIMENT DRYING AREA
MAINTENANCE ACCESS ROAD
8m SERV. BL.
12m SERV. BLOCK
0.3m RESERVE
RD. WIDENING
EXTENT OF MOUNT HOPE ROAD TO BE REGRADED TO PROVIDE COVER ON PROPOSED PROPOSED STORM SEWER AND FDC COLLECTOR.
256.76m (REGIONAL FLOODLINE ELEVATION)
256.87m (REGIONAL FLOODLINE ELEVATION)
256.88m (REGIONAL FLOODLINE ELEVATION)
FUTURE SANITARY ON MOUNT HOPE ROAD
PROPOSED CONNECTION TO WATERMAIN ON MOUNT HOPE ROAD
TEMPORARY SANITARY MH & PIPE TO DIVERT FLOW TO TEMP. P.S.
TEMPORARY SANITARY FORCEMAIN
CONTROL PANEL FOR TEMP. P.S. TO BE ENCLOSED IN PRE-FABRICATED STORAGE SHED
TEMPORARY SANITARY PUMPING STATION
RETAINING WALL REQUIRED
PROPOSED CONNECTION TO 100mmø WATERMAIN ON Ex. COLUMBIA WAY
EXISTING SANITARY SEWER INVERT = 258.60m
TEMPORARY SANITARY FORCEMAIN TO DISCHARGE TO EXISTING SANITARY MH
Ex. COLUMBIA WAY
Ex. WESTCHESTER BLVD
MOUNT HOPE ROAD

NO.	DATE	ISSUED FOR
1.	17/05/26	FIRST SUBMISSION TO THE TOWN OF CALEDON / REGION OF PEEL / TRCA

BENCH MARK:
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE TOWN OF CALEDON BENCH MARK No. 23, HAVING AN ELEVATION OF 308.817 METRES.

RESIDENTIAL SUBDIVISION
UNITED HOLDINGS INC. C/O SOLMAR DEVELOPMENT CORP.

SCHAEFFERS
CONSULTING ENGINEERS
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6 Ronrose Drive, Concord, Ontario L4K 4R3
Tel: (905) 738-6100
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E-mail: design@schaeffers.com

Region of Peel
Working for you

TOWN OF CALEDON

SCALE: 1:1250			PROJECT No. 2023-5476
DESIGNED BY: A.C.	DRAWN BY: V.B.		DRAWING No. GR-SS-1
CHECKED BY: N.L.	DATE: DEC. 2025		

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

APPENDIX 'I'

Short-Term Construction Dewatering and Long-Term Foundation Drainage Calculations

REFERENCE NO. 2309-W138

Residential Units Area Breakdwon

Nearby Well ID	Type of House	Nearby Lowest Proposed Road Grad Elev. (masl)	Assumed excavation elevation (masl)	Highest GW elevation (masl) May 5, 2025	difference between the highest Groundwater contour and Base of the excavation (m)	dewatering Required (Highest GW contour)	Length (m)	Width (m)	Lot Area (m2)	Building Area (m2)	Actual width of the excavation (b')	Actual Trench Length (for Building Excavation/foundations) (a')	Actual Perimeter	a/b
12	Semi detached	263.64	260.64	262.00	-1.4	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
107	Townhouse Block	263.20	260.20	260.00	0.2	No	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
107	Semi detached	263.20	260.20	260.00	0.2	No	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
10	Townhouse Block	262.46	259.46	261.00	-1.5	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
10	Semi detached	262.46	259.46	261.00	-1.5	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
10	Single Detached	262.46	259.46	261.00	-1.5	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
108	Townhouse Block	262.46	259.46	260.00	-0.5	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
108	Semi detached	262.46	259.46	260.00	-0.5	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
108	Single Detached	262.46	259.46	260.00	-0.5	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
8	Townhouse Block	261.14	258.14	261.00	-2.9	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
8	Semi detached	261.14	258.14	261.00	-2.9	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
9	Townhouse Block	261.40	258.40	261.00	-2.6	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
9	Semi detached	261.40	258.40	261.00	-2.6	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
9	Single Detached	261.40	258.40	261.00	-2.6	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
6	Semi detached	261.43	258.43	259.00	-0.6	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
6	Single Detached	261.43	258.43	259.00	-0.6	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
5	Semi detached	261.43	258.43	260.00	-1.6	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
5	Single Detached	261.43	258.43	260.00	-1.6	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
101	Townhouse Block	261.77	258.77	261.00	-2.2	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
101	Semi detached	261.77	258.77	261.00	-2.2	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
101	Single Detached	261.77	258.77	261.00	-2.2	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
2S	Semi detached	261.88	258.88	261.00	-2.1	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
2S	Single Detached	261.88	258.88	261.00	-2.1	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
4	Townhouse Block	261.43	258.43	261.00	-2.6	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
4	Semi detached	261.43	258.43	261.00	-2.6	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
4	Single Detached	261.43	258.43	261.00	-2.6	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6
102	Townhouse Block	261.77	258.77	260.00	-1.2	Yes	26	6.1	158.6	95.2	6.1	15.6	43.4	2.6
102	Semi detached	261.77	258.77	260.00	-1.2	Yes	26	13.7	356.2	213.7	11.7	18.3	59.9	1.6
102	Single Detached	261.77	258.77	260.00	-1.2	Yes	26	9.5	247.0	148.2	7.5	19.8	54.5	2.6

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Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q = Anticipated pumping rate (m^3/day)
K = Hydraulic Conductivity (m/day)
H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
h = Depth of water in the well while pumping (m)
R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m
r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
x = Trench Length (m)
L = Distance from a line source to the trench, R_o (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

R_0 = Radius of Influence (m), beyond which there is negligible drawdown
H = Distance from initial static water level to bottom of saturated aquifer (m)
K = Hydraulic conductivity (m/s)
S_y = Specific yield of the aquifer formation
t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 d

Soil Engineers Ltd.

SHORT-TERM DEWATERING FLOW RATES FOR THE
Residential Lots and BLKs

Nearby BH/MW		12	107	107	10	10	10	108	108	108	8	8
House Type		Semi detached	Townhouse Block	Semi detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit / Town house Block	**L/Day**	**16,050.0**	**24,800.0**	**6,900.0**	**34,300.0**	**10,500.0**	**7,050.0**	**33,200.0**	**9,750.0**	**6,150.0**	**107,600.0**	**22,350.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**6,900.0**	**24,800.0**	**6,900.0**	**21,700.0**	**6,900.0**	**4,800.0**	**24,800.0**	**6,900.0**	**4,800.0**	**24,800.0**	**6,900.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Grading Elevation (masl)	**masl**	263.64	263.20	263.20	262.46	262.46	262.46	262.46	262.46	262.46	261.14	261.14
Existing Ground Surface Elevation	**masl**	263.00	259.90	259.90	263.10	263.10	263.10	259.30	259.30	259.30	262.00	262.00
Highest Interpreted Groundwater Elevation	**masl**	262.00	260.00	260.00	261.00	261.00	261.00	260.00	260.00	260.00	261.00	261.00
Proposed Invert Elevation for the Excavation	**masl**	260.64	260.20	260.20	259.46	259.46	259.46	259.46	259.46	259.46	258.14	258.14
Width	**m**	11.7	6.1	11.7	6.1	11.7	7.5	6.1	11.7	7.5	6.1	11.7
Length	**m**	18.3	15.6	18.3	15.6	18.3	19.8	15.6	18.3	19.8	15.6	18.3
Area	**m2**	213.7	95.2	213.7	95.2	213.7	148.2	95.2	213.7	148.2	95.2	213.7
Perimeter	**m**	59.9	43.4	59.9	43.4	59.9	54.5	43.4	59.9	54.5	43.4	59.9
Q s.f. 1.5	**L/Day**	**9,150.0**	**N.A.**	**N.A.**	**12,600.0**	**3,600.0**	**2,250.0**	**8,400.0**	**2,850.0**	**1,350.0**	**82,800.0**	**15,450.0**
Q	**L/Day**	**6,100.0**	**N.A.**	**N.A.**	**8,400.0**	**2,400.0**	**1,500.0**	**5,600.0**	**1,900.0**	**900.0**	**55,200.0**	**10,300.0**
Q	**m^3/day**	6.1	**N.A.**	**N.A.**	1.1	2.3	1.4	0.7	1.9	0.9	6.8	10.2
K	**m/day**	0.0536	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0536	0.0536
H	**m**	3.9	1.3	1.3	4.0	4.0	4.0	3.0	3.0	3.0	5.4	5.4
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	10.4	4.5	4.5	8.0	8.0	8.0	6.9	6.9	6.9	12.3	12.3
Trench width (b)	**m**	11.7	6.1	11.7	6.1	11.7	7.5	6.1	11.7	7.5	6.1	11.7
r_s	**m**	5.9	3.1	5.9	3.1	5.9	3.8	3.1	5.9	3.8	3.1	5.9
x (a)	**m**	18.3	15.6	18.3	15.6	18.3	19.8	15.6	18.3	19.8	15.6	18.3
L	**m**	5.2	2.3	2.3	4.0	4.0	4.0	3.5	3.5	3.5	6.1	6.1
	a/b	1.6	2.6	1.6	2.6	1.6	2.6	2.6	1.6	2.6	2.6	1.6

Parameter	Units											
R_0	**m**	10.4	4.5	4.5	8.0	8.0	8.0	6.9	6.9	6.9	12.3	12.3
H	**m**	3.9	1.3	1.3	4.0	4.0	4.0	3.0	3.0	3.0	5.4	5.4
K	**m/s**	6.20E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	6.20E-07	6.20E-07
S_y (Johnson,1967)		0.16	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.16	0.16
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

SHORT-TERM DEWATERING FLOW RATES FOR THE
Residential Lots and BLKs

Nearby BH/MW		9	9	9	6	6	5	5	101	101	101	2S
House Type		Townhouse Block	Semi detached	Single Detached	Semi detached	Single Detached	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached	Semi detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit / Town house Block	**L/Day**	**37,650.0**	**21,150.0**	**16,350.0**	**9,750.0**	**6,150.0**	**10,500.0**	**7,050.0**	**33,000.0**	**11,100.0**	**7,650.0**	**19,050.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**9,300.0**	**6,900.0**	**4,800.0**	**6,900.0**	**4,800.0**	**6,900.0**	**4,800.0**	**18,600.0**	**6,900.0**	**4,800.0**	**6,900.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Grading Elevation (masl)	**masl**	261.40	261.40	261.40	261.43	261.43	261.43	261.43	261.77	261.77	261.77	261.88
Existing Ground Surface Elevation	**masl**	260.60	260.60	260.60	258.90	258.90	259.20	259.20	262.20	262.20	262.20	262.60
Highest Interpreted Groundwater Elevation	**masl**	261.00	261.00	261.00	259.00	259.00	260.00	260.00	261.00	261.00	261.00	261.00
Proposed Invert Elevation for the Excavation	**masl**	258.40	258.40	258.40	258.43	258.43	258.43	258.43	258.77	258.77	258.77	258.88
Width	**m**	6.1	11.7	7.5	11.7	7.5	11.7	7.5	6.1	11.7	7.5	11.7
Length	**m**	15.6	18.3	19.8	18.3	19.8	18.3	19.8	15.6	18.3	19.8	18.3
Area	**m2**	95.2	213.7	148.2	213.7	148.2	213.7	148.2	95.2	213.7	148.2	213.7
Perimeter	**m**	43.4	59.9	54.5	59.9	54.5	59.9	54.5	43.4	59.9	54.5	59.9
Q s.f. 1.5	**L/Day**	**28,350.0**	**14,250.0**	**11,550.0**	**2,850.0**	**1,350.0**	**3,600.0**	**2,250.0**	**14,400.0**	**4,200.0**	**2,850.0**	**12,150.0**
Q	**L/Day**	**18,900.0**	**9,500.0**	**7,700.0**	**1,900.0**	**900.0**	**2,400.0**	**1,500.0**	**9,600.0**	**2,800.0**	**1,900.0**	**8,100.0**
Q	**m^3/day**	6.2	9.5	7.6	1.9	0.9	2.3	1.5	1.5	2.8	1.9	8.1
K	**m/day**	0.0536	0.0536	0.0536	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0536
H	**m**	5.1	5.1	5.1	3.1	3.1	4.1	4.1	4.7	4.7	4.7	4.6
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	12.0	12.0	12.0	6.9	6.9	8.0	8.0	8.6	8.6	8.6	11.4
Trench width (b)	**m**	6.1	11.7	7.5	11.7	7.5	11.7	7.5	6.1	11.7	7.5	11.7
r_s	**m**	3.1	5.9	3.8	5.9	3.8	5.9	3.8	3.1	5.9	3.8	5.9
x (a)	**m**	15.6	18.3	19.8	18.3	19.8	18.3	19.8	15.6	18.3	19.8	18.3
L	**m**	6.0	6.0	6.0	3.5	3.5	4.0	4.0	4.3	4.3	4.3	5.7
	a/b	2.6	1.6	2.6	1.6	2.6	1.6	2.6	2.6	1.6	2.6	1.6

Parameter	Units											
R_0	**m**	12.0	12.0	12.0	6.9	6.9	8.0	8.0	8.6	8.6	8.6	11.4
H	**m**	5.1	5.1	5.1	3.1	3.1	4.1	4.1	4.7	4.7	4.7	4.6
K	**m/s**	6.20E-07	6.20E-07	6.20E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	6.20E-07
S_y (Johnson,1967)		0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.16
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

SHORT-TERM DEWATERING FLOW RATES FOR THE
Residential Lots and BLKs

Nearby BH/MW		2S	4	4	4	102	102	102
House Type		Single Detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit / Town house Block	**L/Day**	**14,550.0**	**62,000.0**	**21,000.0**	**16,200.0**	**36,800.0**	**10,200.0**	**6,750.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**4,800.0**	**15,500.0**	**6,900.0**	**4,800.0**	**24,800.0**	**6,900.0**	**4,800.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Grading Elevation (masl)	**masl**	261.88	261.43	261.43	261.43	261.77	261.77	261.77
Existing Ground Surface Elevation	**masl**	262.60	261.00	261.00	261.00	259.50	259.50	259.50
Highest Interpreted Groundwater Elevation	**masl**	261.00	261.00	261.00	261.00	260.00	260.00	260.00
Proposed Invert Elevation for the Excavation	**masl**	258.88	258.43	258.43	258.43	258.77	258.77	258.77
Width	**m**	7.5	6.1	11.7	7.5	6.1	11.7	7.5
Length	**m**	19.8	15.6	18.3	19.8	15.6	18.3	19.8
Area	**m2**	148.2	95.2	213.7	148.2	95.2	213.7	148.2
Perimeter	**m**	54.5	43.4	59.9	54.5	43.4	59.9	54.5
Q s.f. 1.5	**L/Day**	**9,750.0**	**46,500.0**	**14,100.0**	**11,400.0**	**12,000.0**	**3,300.0**	**1,950.0**
Q	**L/Day**	**6,500.0**	**31,000.0**	**9,400.0**	**7,600.0**	**8,000.0**	**2,200.0**	**1,300.0**
Q	**m^3/day**	6.4	6.2	9.4	7.6	1.0	2.2	1.3
K	**m/day**	0.0536	0.0536	0.0536	0.0536	0.0112	0.0112	0.0112
H	**m**	4.6	5.1	5.1	5.1	3.7	3.7	3.7
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	11.4	11.9	11.9	11.9	7.7	7.7	7.7
Trench width (b)	**m**	7.5	6.1	11.7	7.5	6.1	11.7	7.5
r_s	**m**	3.8	3.1	5.9	3.8	3.1	5.9	3.8
x (a)	**m**	19.8	15.6	18.3	19.8	15.6	18.3	19.8
L	**m**	5.7	6.0	6.0	6.0	3.8	3.8	3.8
	a/b	2.6	2.6	1.6	2.6	2.6	1.6	2.6

Parameter	Units							
R_0	**m**	11.4	11.9	11.9	11.9	7.7	7.7	7.7
H	**m**	4.6	5.1	5.1	5.1	3.7	3.7	3.7
K	**m/s**	6.20E-07	6.20E-07	6.20E-07	6.20E-07	1.30E-07	1.30E-07	1.30E-07
S_y (Johnson,1967)		0.16	0.16	0.16	0.16	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

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Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q = Anticipated pumping rate (m^3/day)
K = Hydraulic Conductivity (m/day)
H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
h = Depth of water in the well while pumping (m)
R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m
r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
x = Trench Length (m)
L = Distance from a line source to the trench, R_0 (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

R_0 = Radius of Influence (m), beyond which there is negligible drawdown
H = Distance from initial static water level to bottom of saturated aquifer (m)
K = Hydraulic conductivity (m/s)
S_y = Specific yield of the aquifer formation
t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 d

Soil Engineers Ltd.

LONG-TERM DEWATERING FLOW RATES
FOR THE Residential Lots and BLKs

Nearby BH/MW		12	107	107	10	10	10	108	108	108	8	8
House Type		Semi detached	Townhouse Block	Semi detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit	**L/Day**	**6,550.0**	**13,600.0**	**1,000.0**	**19,250.0**	**3,850.0**	**2,250.0**	**17,200.0**	**2,200.0**	**1,500.0**	**71,200.0**	**12,100.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**1,000.0**	**13,600.0**	**1,000.0**	**11,900.0**	**1,000.0**	**900.0**	**13,600.0**	**1,000.0**	**900.0**	**13,600.0**	**1,000.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	263.64	263.20	263.20	262.46	262.46	262.46	262.46	262.46	262.46	261.14	261.14
Existing Ground Surface Elevation	**masl**	263.00	259.90	259.90	263.10	263.10	263.10	259.30	259.30	259.30	262.00	262.00
Highest Interpreted Groundwater Elevation	**masl**	262.00	260.00	260.00	261.00	261.00	261.00	260.00	260.00	260.00	261.00	261.00
Proposed Invert Elevation for the Excavation	**masl**	260.64	260.20	260.20	259.46	259.46	259.46	259.46	259.46	259.46	258.14	258.14
Width	**m**	11.7	6.1	11.7	6.1	11.7	7.5	6.1	11.7	7.5	6.1	11.7
Length	**m**	18.3	15.6	18.3	15.6	18.3	19.8	15.6	18.3	19.8	15.6	18.3
Area	**m2**	213.7	95.2	213.7	95.2	213.7	148.2	95.2	213.7	148.2	95.2	213.7
Perimeter	**m**	59.9	104.4	59.9	104.4	59.9	54.5	104.4	59.9	54.5	104.4	59.9
Q s.f. 1.5	**L/Day**	**5,550.0**	**N.A.**	**N.A.**	**7,350.0**	**2,850.0**	**1,350.0**	**3,600.0**	**1,200.0**	**600.0**	**57,600.0**	**11,100.0**
Q	**L/Day**	**3,700.0**	**N.A.**	**N.A.**	**4,900.0**	**1,900.0**	**900.0**	**2,400.0**	**800.0**	**400.0**	**38,400.0**	**7,400.0**
Q	**m^3/day**	3.6	**N.A.**	**N.A.**	0.7	1.9	0.9	0.2	0.7	0.3	4.7	7.4
K	**m/day**	0.0536	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0536	0.0536
H	**m**	2.9	1.3	1.3	3.0	3.0	3.0	2.0	3.5	2.0	4.4	4.4
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.0	1.5	1.5	1.5
R_0	**m**	9.0	N.A.	N.A.	6.9	6.9	6.9	5.7	7.5	5.7	11.1	11.1
Trench width (b)	**m**	11.7	6.1	11.7	6.1	11.7	7.5	6.1	11.7	7.5	6.1	11.7
r_s	**m**	5.9	3.1	5.9	3.1	5.9	3.8	3.1	5.9	3.8	3.1	5.9
x (a)	**m**	18.3	15.6	18.3	15.6	18.3	19.8	15.6	18.3	19.8	15.6	18.3
L	**m**	4.5	#VALUE!	#VALUE!	3.5	3.5	3.5	2.8	3.7	2.8	5.5	5.5
	a/b	1.6	2.6	1.6	2.6	1.6	2.6	2.6	1.6	2.6	2.6	1.6

Parameter	Units											
R_0	**m**	9.0	**N.A.**	**N.A.**	6.9	6.9	6.9	5.7	7.5	5.7	11.1	11.1
H	**m**	2.9	1.3	1.3	3.0	3.0	3.0	2.0	3.5	2.0	4.4	4.4
K	**m/s**	6.20E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	6.20E-07	6.20E-07
S_y (Johnson,1967)		0.16	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.16	0.16
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

LONG-TERM DEWATERING FLOW RATES
FOR THE Residential Lots and BLKs

Nearby BH/MW		9	9	9	6	6	5	5	101	101	101	2S
House Type		Townhouse Block	Semi detached	Single Detached	Semi detached	Single Detached	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached	Semi detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit	**L/Day**	**24,450.0**	**11,050.0**	**8,700.0**	**2,200.0**	**1,500.0**	**3,850.0**	**2,250.0**	**19,200.0**	**4,300.0**	**2,850.0**	**9,250.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**5,100.0**	**1,000.0**	**900.0**	**1,000.0**	**900.0**	**1,000.0**	**900.0**	**10,200.0**	**1,000.0**	**900.0**	**1,000.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	261.40	261.40	261.40	261.43	261.43	261.43	261.43	261.77	261.77	261.77	261.88
Existing Ground Surface Elevation	**masl**	260.60	260.60	260.60	258.90	258.90	259.20	259.20	262.20	262.20	262.20	262.60
Highest Interpreted Groundwater Elevation	**masl**	261.00	261.00	261.00	259.00	259.00	260.00	260.00	261.00	261.00	261.00	261.00
Proposed Invert Elevation for the Excavation	**masl**	258.40	258.40	258.40	258.43	258.43	258.43	258.43	258.77	258.77	258.77	258.88
Width	**m**	6.1	11.7	7.5	11.7	7.5	11.7	7.5	6.1	11.7	7.5	11.7
Length	**m**	15.6	18.3	19.8	18.3	19.8	18.3	19.8	15.6	18.3	19.8	18.3
Area	**m2**	95.2	213.7	148.2	213.7	148.2	213.7	148.2	95.2	213.7	148.2	213.7
Perimeter	**m**	104.4	59.9	54.5	59.9	54.5	59.9	54.5	104.4	59.9	54.5	59.9
Q s.f. 1.5	**L/Day**	**19,350.0**	**10,050.0**	**7,800.0**	**1,200.0**	**600.0**	**2,850.0**	**1,350.0**	**9,000.0**	**3,300.0**	**1,950.0**	**8,250.0**
Q	**L/Day**	**12,900.0**	**6,700.0**	**5,200.0**	**800.0**	**400.0**	**1,900.0**	**900.0**	**6,000.0**	**2,200.0**	**1,300.0**	**5,500.0**
Q	**m^3/day**	4.2	6.7	5.2	0.7	0.3	1.9	0.9	1.0	2.2	1.3	5.5
K	**m/day**	0.0536	0.0536	0.0536	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0536
H	**m**	4.1	4.1	4.1	3.6	2.1	3.1	3.1	3.7	3.7	3.7	3.6
h	**m**	1.5	1.5	1.5	3.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	10.7	10.7	10.7	7.5	5.7	6.9	6.9	7.7	7.7	7.7	10.1
Trench width (b)	**m**	6.1	11.7	7.5	11.7	7.5	11.7	7.5	6.1	11.7	7.5	11.7
r_s	**m**	3.1	5.9	3.8	5.9	3.8	5.9	3.8	3.1	5.9	3.8	5.9
x (a)	**m**	15.6	18.3	19.8	18.3	19.8	18.3	19.8	15.6	18.3	19.8	18.3
L	**m**	5.4	5.4	5.4	3.7	2.9	3.5	3.5	3.8	3.8	3.8	5.0
	a/b	2.6	1.6	2.6	1.6	2.6	1.6	2.6	2.6	1.6	2.6	1.6

Parameter	Units											
R_0	**m**	10.7	10.7	10.7	7.5	5.7	6.9	6.9	7.7	7.7	7.7	10.1
H	**m**	4.1	4.1	4.1	3.6	2.1	3.1	3.1	3.7	3.7	3.7	3.6
K	**m/s**	6.20E-07	6.20E-07	6.20E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	6.20E-07
S_y (Johnson,1967)		0.16	0.16	0.16	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.16
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

LONG-TERM DEWATERING FLOW RATES
FOR THE Residential Lots and BLKs

Nearby BH/MW		2S	4	4	4	102	102	102
House Type		Single Detached	Townhouse Block	Semi detached	Single Detached	Townhouse Block	Semi detached	Single Detached
Total Anticipated Short-Term Dewatering Flow, including Storm Event and Safety Factor, Single unit	**L/Day**	**7,200.0**	**40,000.0**	**11,050.0**	**8,700.0**	**20,800.0**	**4,000.0**	**1,950.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/Day**	**900.0**	**8,500.0**	**1,000.0**	**900.0**	**13,600.0**	**1,000.0**	**900.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	261.88	261.43	261.43	261.43	261.77	261.77	261.77
Existing Ground Surface Elevation	**masl**	262.60	261.00	261.00	261.00	259.50	259.50	259.50
Highest Interpreted Groundwater Elevation	**masl**	261.00	261.00	261.00	261.00	260.00	260.00	260.00
Proposed Invert Elevation for the Excavation	**masl**	258.88	258.43	258.43	258.43	258.77	258.77	258.77
Width	**m**	7.5	6.1	11.7	7.5	6.1	11.7	7.5
Length	**m**	19.8	15.6	18.3	19.8	15.6	18.3	19.8
Area	**m2**	148.2	95.2	213.7	148.2	95.2	213.7	148.2
Perimeter	**m**	54.5	104.4	59.9	54.5	104.4	59.9	54.5
Q s.f. 1.5	**L/Day**	**6,300.0**	**31,500.0**	**10,050.0**	**7,800.0**	**7,200.0**	**3,000.0**	**1,050.0**
Q	**L/Day**	**4,200.0**	**21,000.0**	**6,700.0**	**5,200.0**	**4,800.0**	**2,000.0**	**700.0**
Q	**m^3/day**	4.1	4.2	6.6	5.1	0.5	1.9	0.7
K	**m/day**	0.0536	0.0536	0.0536	0.0536	0.0112	0.0112	0.0112
H	**m**	3.6	4.1	4.1	4.1	2.7	2.7	2.7
h	**m**	1.5	1.5	1.5	1.5	1.5	1.5	1.5
R_0	**m**	10.1	10.7	10.7	10.7	6.6	6.6	6.6
Trench width (b)	**m**	7.5	6.1	11.7	7.5	6.1	11.7	7.5
r_s	**m**	3.8	3.1	5.9	3.8	3.1	5.9	3.8
x (a)	**m**	19.8	15.6	18.3	19.8	15.6	18.3	19.8
L	**m**	5.0	5.4	5.4	5.4	3.3	3.3	3.3
	a/b	2.6	2.6	1.6	2.6	2.6	1.6	2.6

Parameter	Units							
R_0	**m**	10.1	10.7	10.7	10.7	6.6	6.6	6.6
H	**m**	3.6	4.1	4.1	4.1	2.7	2.7	2.7
K	**m/s**	6.20E-07	6.20E-07	6.20E-07	6.20E-07	1.30E-07	1.30E-07	1.30E-07
S_y (Johnson,1967)		0.16	0.16	0.16	0.16	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q = Anticipated pumping rate (m^3/day)
K = Hydraulic Conductivity (m/day)
H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
h = Depth of water in the well while pumping (m)
R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m
r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
x = Trench Length (m)
L = Distance from a line source to the trench, R_0 (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

R_0 = Radius of Influence (m), beyond which there is negligible drawdown
H = Distance from initial static water level to bottom of saturated aquifer (m)
K = Hydraulic conductivity (m/s)
S_y = Specific yield of the aquifer formation
t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 d

Soil Engineers Ltd.

SHORT TERM DEWATERING FLOW RATES FOR THE UNDERGROUND SERVICES INSTALLATION

Parameter	Units	Street E (BHMW 12 & 107)	Street E (BHMW 108 & 107)	Street E (BHMW 12 & 10)	Street F	Street G	Street H	Street D	Street C	Street I	Street J
Total Anticipated Short Term Dewatering Flow including Storm Event and Safety Factor	**L/day**	**8,850.0**	**8,700.0**	**13,800.0**	**8,100.0**	**6,450.0**	**8,700.0**	**12,450.0**	**74,400.0**	**42,750.0**	**8,100.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/day**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	263.57	262.68	262.47	263.20	262.81	262.61	261.80	260.52	261.13	262.18
Highest Interpreted Groundwater Elevation	**masl**	262.00	259.00	261.00	260.00	260.00	261.00	260.00	261.00	261.00	260.00
Proposed Invert Elevation for the Excavation	**masl**	259.50	256.95	256.55	258.15	258.89	258.56	256.12	253.36	256.13	257.94
Width	**m**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Length	**m**	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Area	**m2**	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Perimeter	**m**	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0
Q s.f. 1.5	**L/day**	**5,550.0**	**5,400.0**	**10,500.0**	**4,800.0**	**3,150.0**	**5,400.0**	**9,150.0**	**71,100.0**	**39,450.0**	**4,800.0**
Q	**L/day**	**3,700.0**	**3,600.0**	**7,000.0**	**3,200.0**	**2,100.0**	**3,600.0**	**6,100.0**	**47,400.0**	**26,300.0**	**3,200.0**
Q	**m^3/day**	3.6	3.5	6.9	3.1	2.0	3.5	6.0	47.3	26.2	3.1
K	**m/day**	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0536	0.0536	0.0112
H	**m**	5.5	5.9	8.4	5.4	4.1	5.5	7.7	12.2	8.4	5.2
h	**m**	2.0	2.9	3.0	2.5	2.0	2.0	2.8	3.6	2.5	2.1
R_0	**m**	9.3	9.6	11.5	9.2	8.0	9.3	11.0	18.5	15.3	9.0
Trench width (b)	**m**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
r_s	**m**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
x (a)	**m**	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
L	**m**	4.7	4.8	5.8	4.6	4.0	4.6	5.5	9.3	7.7	4.5
	a/b	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0

Parameter	Units										
R_0	**m**	9.3	9.6	11.5	9.2	8.0	9.3	11.0	18.5	15.3	9.0
H	**m**	5.5	5.9	8.4	5.4	4.1	5.5	7.7	12.2	8.4	5.2
K	**m/s**	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	6.20E-07	6.20E-07	1.30E-07
S_y (Johnson,1967)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.16	0.16	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

Soil Engineers Ltd.

SHORT TERM DEWATERING FLOW RATES FOR THE UNDERGROUND SERVICES INSTALLATION

Parameter	Units	Street K	Street B	Street N	Street M	Street L	Street A (BHMW 2 to 4)	Street A (BHMW 4 to 103)	Street A (BHMW 103 to 10)	Street A (BHMW 10 to 12)
Total Anticipated Short Term Dewatering Flow including Storm Event and Safety Factor	**L/day**	**6,000.0**	**8,700.0**	**6,750.0**	**7,500.0**	**10,200.0**	**10,800.0**	**14,850.0**	**21,300.0**	**12,300.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/day**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**	**3,300.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	261.91	261.45	262.14	261.43	261.35	261.88	262.24	262.49	262.89
Highest Interpreted Groundwater Elevation	**masl**	259.00	259.00	259.00	259.00	259.00	260.00	259.00	261.00	262.00
Proposed Invert Elevation for the Excavation	**masl**	258.15	256.72	257.73	257.25	256.08	256.72	254.58	254.23	257.94
Width	**m**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Length	**m**	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Area	**m2**	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Perimeter	**m**	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0
Q s.f. 1.5	**L/day**	**2,700.0**	**5,400.0**	**3,450.0**	**4,200.0**	**6,900.0**	**7,500.0**	**11,550.0**	**18,000.0**	**9,000.0**
Q	**L/day**	**1,800.0**	**3,600.0**	**2,300.0**	**2,800.0**	**4,600.0**	**5,000.0**	**7,700.0**	**12,000.0**	**6,000.0**
Q	**m^3/day**	1.7	3.5	2.3	2.8	4.5	5.0	7.6	11.9	6.0
K	**m/day**	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112	0.0112
H	**m**	3.7	5.6	4.5	4.8	6.6	6.9	9.3	11.9	7.5
h	**m**	1.9	2.4	2.2	2.1	2.6	2.6	3.8	4.1	2.5
R_0	**m**	7.7	9.4	8.4	8.7	10.2	10.4	12.1	13.7	10.9
Trench width (b)	**m**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
r_s	**m**	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
x (a)	**m**	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
L	**m**	3.8	4.7	4.2	4.4	5.1	5.2	6.0	6.8	5.4
	a/b	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0

Parameter	Units									
R_0	**m**	7.7	9.4	8.4	8.7	10.2	10.4	12.1	13.7	10.9
H	**m**	3.7	5.6	4.5	4.8	6.6	6.9	9.3	11.9	7.5
K	**m/s**	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07	1.30E-07
S_y (Johnson,1967)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
t	**s**	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0	1,209,600.0

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Dewatering Rate Formula for an Unconfined Aquifer (Powers et al., 2007):

$$Q = \frac{\pi K (H^2 - h^2)}{\ln(R_0 / r_s)} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right]$$

Where:

Q = Anticipated pumping rate (m^3/day)
K = Hydraulic Conductivity (m/day)
H = Initial Hight of static groundwater level to bottom of the saturated aquifer (m)
h = Depth of water in the well while pumping (m)
R_0 = Distance from a point of greatest drawdown to a point where there is no drawdown (Radius of influence) (m
r_s = Distance to the wellpoints from the centre of the trench (m), assumed to be half of the trench width
x = Trench Length (m)
L = Distance from a line source to the trench, R_0 (m)/2

Radius of Influence Formula (Bear, 1979):

$$R_0 = 2.45\sqrt{\frac{HK}{S_y}}t$$

Where:

R_0 = Radius of Influence (m), beyond which there is negligible drawdown
H = Distance from initial static water level to bottom of saturated aquifer (m)
K = Hydraulic conductivity (m/s)
S_y = Specific yield of the aquifer formation
t =Time (s) required to draw the static groundwater level to the desired level (assumed to be equivalent to 14 d

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SHORT TERM DEWATERING FLOW RATES FOR THE UNDERGROUND SERVICES INSTALLATION

Parameter	Units	Western SWMP (BHMW 5)	Eastern SWMP (BHMW 7)
Total Anticipated Short Term Dewatering Flow including Storm Event and Safety Factor	**L/day**	**252,300.0**	**681,700.0**
Anticipated Storm Flow (2Year-3Hr event)	**L/day**	**245,700.0**	**659,500.0**
Storm Event (2Year-3Hr event)	**m**	0.0322	0.0322
Proposed Heighest Grading Elevation	**masl**	257.30	259.00
Highest Interpreted Groundwater Elevation	**masl**	257.10	259.00
Proposed Invert Elevation for the Excavation	**masl**	255.00	255.50
Width	**m**	73.7	108.1
Length	**m**	103.5	189.5
Area	**m2**	7,630.9	20,485.0
Perimeter	**m**	354.5	595.2
Q s.f. 1.5	**L/day**	**6,600.0**	**22,200.0**
Q	**L/day**	**4,400.0**	**14,800.0**
Q	**m^3/day**	4.4	14.7
K	**m/day**	0.0112	0.0112
H	**m**	4.3	6.3
h	**m**	1.2	1.8
R_0	**m**	8.2	9.9
Trench width (b)	**m**	73.7	108.1
r_s	**m**	36.9	54.1
x (a)	**m**	103.5	189.5
L	**m**	4.1	5.0
	a/b	1.4	1.8

Parameter	Units		
R_0	**m**	8.2	9.9
H	**m**	4.3	6.3
K	**m/s**	1.30E-07	1.30E-07
S_y (Johnson,1967)		0.06	0.06
t	**s**	1,209,600.0	1,209,600.0

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