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Hydrogeological Investigation

97 Bower Street, Acton, Ontario

Palmer Project #
2402401

Prepared For
759509 Ontario Inc.

October 6, 2025

Executive Summary

Palmer (now a part of SLR) is pleased to submit the attached report describing the results of our Hydrogeological Investigation for 97 Bower Street, Acton, Ontario (the site). The site is located on the northwest side of Bower St at the intersection of Bower St and Frederick St North. The area surrounding the site consists of residential area to the west, south, and east, along with a rail line (GO Transit's Kitchener Line) and a woodland to the north. Additionally, Black Creek traverses the northwest portion of the Site. The proposed development includes a 5-story mid rise apartment building with 1 level of underground parking, 64 surface level parking spots, and a driveway with a roundabout.

This investigation determined the site is underlain by ice-contact stratified deposits largely consisting of sand and gravel. A high-water table is present with groundwater levels on Site ranging from 0.80 mbgs at BH25-5 on the southwest portion of the site to 3.33 mbgs at BH25-6 on the southern most portion of the site by Bower St.

A Source Water Protection screening was conducted and determined that the site is within Wellhead Protection Area E with a score of 8.1, a Highly Vulnerable Aquifer with a score of 6, and the site is in a Significant Groundwater Recharge Area. This Source Water Protection Policies do not pose any development restrictions on the site based on the proposed development, however, certain uses such of the storing of bulk level of fuel or the use of salt applications may be limited or restricted.

A pre-development to post-development water balance was completed for the site. The pre-development infiltration and runoff values were 2,498 m^3/year and 1,071 m^3/year respectively. The proposed development added approximately 0.38 ha of imperviousness to the site. The unmitigated post-development infiltration and runoff values were 1,523 m^3/year and 3,520 m^3/year respectively. This is a decrease in infiltration by 974 m^3/year (-39%) and an increase in runoff by 2,449 m^3/year (+229%). As the site is located within a Significant Groundwater Recharge Area, Low Impact Development (LID) measures such as infiltration trenches and grassed swales should be utilized to increase infiltration to the most practical extent possible. Due to its highly permeable surficial soils, the site is ideal for infiltration.

Short-term and long-term dewatering rates were estimated based on the proposed development plans. Short-term dewatering rates are expected to be approximately 292,000 L/day, accounting for a 1.5x factor of uncertainty and a 25 mm storm event. Long-term dewatering is estimated to be approximately 60,000 L/day. As short-term construction dewatering rates are expected to exceed 50,000 L/day, a registration of an Environmental Activity and Sector Registry with the Ministry of the Environment, Conservation and Parks (MECP) is expected to be required to support construction.

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1. Introduction

Palmer (now a part of SLR) was retained by 759509 Ontario Inc. to conduct a Hydrogeological Investigation to investigate the hydrogeological conditions for the proposed development of a mid-rise building (5 story) with underground parking (1-level) at 97 Bower St in Acton, Ontario ("the site") (**Figure 1**).

The site is located on a vacant lot that covers an area of approximately 0.96 hectares (ha) and is bounded on the north side of the property by a set of railroad tracks (GO transit's Kitchener line), neighbouring properties to the northeast and southwest, a commercial property to the southwest, and by Bower St to the south. This site was previously occupied by a single home along the portion closest to Bower St, a garage and an additional structure on the southwest side of the property. There is a small stretch of the adjacent watercourse (Black Creek) that appears to be within the northwest portion of the property.

This investigation is focused on characterizing the hydrogeological conditions at the stie to estimate dewatering rates and to complete a pre-development and post-development water for the site.

1.1 Scope of Work

The scope of work for the hydrogeological investigation includes:

- The drilling of ten (10) bore holes and installation of eight (8) groundwater monitoring wells with depths ranging from 5 metres below ground surface (mbgs) to 15 mbgs. This portion of the scope of work was completed in concurrence with the geotechnical investigation on site.
- Well development and single well response testing (i.e., slug tests) to measure hydraulic conductivity in selected monitoring wells.
- Collection of one (1) groundwater sample to compare against Halton Region Sanitary Sewer and Halton Hills Storm Sewer Bylaw Limits.
- Groundwater level monitoring to delineate groundwater levels and to determine groundwater flow field and regimes.

1.2 Previous Reports

Palmer reviewed a previous Phase II Environmental Site Assessment report completed for the Site, titled "759509 Ontario Inc. Phase II Environmental Site Assessment, 97 Bower Street, Acton, Ontario", prepared by Inspec-Sol Engineering Solutions and dated July 8, 2009. Borehole Logs from this investigation have been included in **Appendix B**. Information from the report including borehole logs, soil, and groundwater conditions was used as background information to help further our understanding of the Site. Monitoring wells from this investigation were located on site and were monitored during this Hydrogeological Investigation include: BH1, MW4, MW5, MW7, MW8, MW9, and MW10. MW11 could not be located. The findings from this report suggest that subsurface geology include a layer of fill overlying silty sand and sandy silt deposits with traces of clay. Historic groundwater levels at the time of the report ranged from 1.12 mbgs at MW4 on the most eastern corner of the site and 3.37 mbgs at BH1 on the south portion of the site closest to Bower St.



LEGEND

- Subject Site
- Watercourse[1]
- Borehole Location[2]
- Borehole/Monitoring Well Location[2]
- Borehole Location[3]
- Monitoring Well Location[3]

1. LIO/MNRF
2. Palmer, 2024
3. Inspec-Sol, 2008



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METRE SCALE

North American Datum 1983
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TITLE
Site Location

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REF. NO. 2402401-1-2

Figure 1

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2. Hydrogeological Conditions

2.1 Site Setting – Regional Conditions

2.1.1 Site Location and Setting

The site is located at 97 Bower St. in Acton, ON. The portion of the site that extends to Bower St. is at the intersection of Bower St and Frederick St N. The site is located within the central area of Acton. While the site is generally located within a residential area, there is a commercial building directly to the southwest of the subject property (Halton Hills Hydro Inc). Along with this, directly behind the property to the north is a set of railroad tracks (the GO transit's Kitchener line). Across the tracks is a recognized woodland and a watercourse (Black Creek).

2.1.2 Topography and Surface Water

The site is largely flat with a surface elevation of 351 metres above sea level (masl) on the southeast side of the property and 350 masl on the northwest side of the property (**Figure 2**). Black Creek runs along the edge of the northwestern portion of the site and eventually flows into Fairy Lake to the southwest of the site. There is no other surface water features located on or in the immediate vicinity of the site. The site is located within the Credit River West Branch watershed, which is within the jurisdiction of the Credit Valley Conservation Authority (CVC). The Credit River West Branch watershed covers an area of approximately 236.4 km^2 and eventually drains into Lake Ontario.

2.1.3 Physiography and Geology

Available Physiography of Southern Ontario mapping by the Ontario Geological Survey indicates the site is located within the Horseshoe Moraines Physiographic Region and is shown to be within a former glacial spillway area. The Horseshoe Moraines Physiographic Region that the site resides in extends Northeast to Southwest from Caledon, Ontario down to the township of Delhi, Ontario. Ground surface in this region is generally decreasing in elevation as you move Northeast to Southwest, with an elevation difference of ~ 400 masl on the Northwest extent of the region to ~230 masl in the Southwest extent of the region. The soil texture that generally describes the area is that of the Dumfries series which consists of stony loam to clay loam with a history leading back to deposits within the spillways from glacial melt in the area (Chapman and Putnam, 1984).

Available Surficial Geology of Southern Ontario mapping by the Ontario Geological Survey indicates the surficial geology for the site is comprised of ice-contact stratified deposits consisting of sand and gravel with minor amounts of silt, clay, and till (**Figure 3**). Bedrock was not encountered in any of the drilled boreholes suggesting that bedrock is deeper than 15.9 mbgs.

Available Paleozoic Geology of Southern Ontario mapping by the Ontario Geological Survey indicates the bedrock geology for the site is the Amabel Formation bedrock unit (**Figure 4**). The Amabel Formation is lower Silurian in age and is characterized as a range of rock types including sandstone, shale, dolostone, and siltstone.



LEGEND

- Subject Site
- Wetland (Evaluated-Provincial)[1]
- Watercourse[1]
- Surface Elevation Contour (1m)

1. LIO/MNRF

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TITLE
Topography and Surface Water

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REF. NO. 2402401-2-1

Figure 2

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LEGEND

Subject Site

Watercourse[1]

Surficial Geology[2]

Phanerozoic / Cenozoic / Quaternary / Recent

20: Organic deposits *(peat, muck, marl)*

19: Modern alluvial deposits *(clay, silt, sand, gravel, may contain organic remains)*

Phanerozoic / Cenozoic / Quaternary / Pleistocene

7b: Glaciofluvial deposits *(Gravelly deposits)*

6: Ice-contact stratified deposits *(sand and gravel, minor silt, clay and till)*

5b: Tilll *(Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain)*

Phanerozoic / Paleozoic

3: Paleozoic bedrock

1. LIO/MNRF
2. Ontario Geological Survey 2010 (Mapped at 1:50,000). Surficial geology of southern Ontario; Ontario Geological Survey. Miscellaneous Release- Data 128 - Revised

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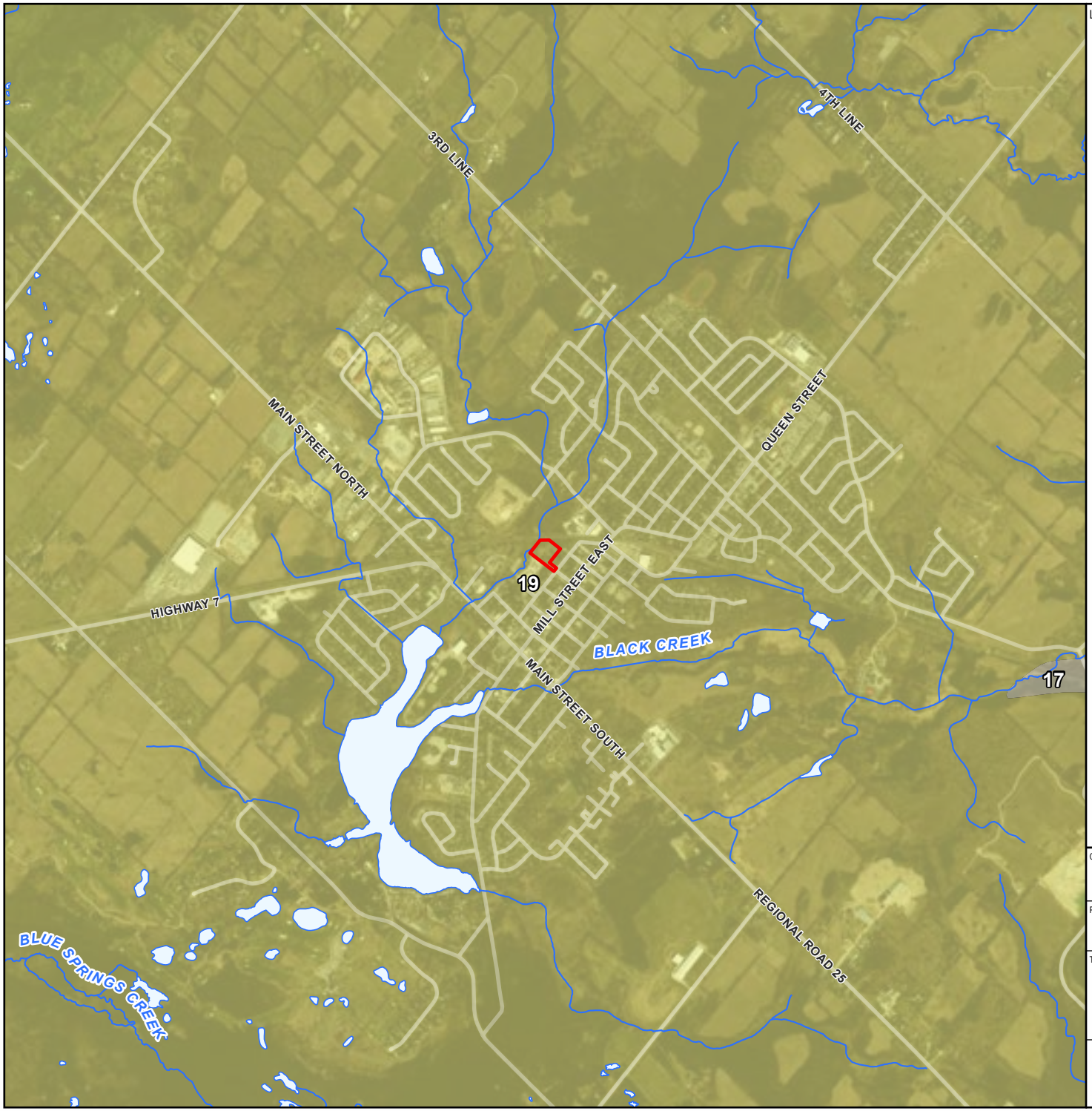
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Surficial Geology

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Figure 3

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LEGEND

Subject Site

Watercourse[1]

Paleozoic Bedrock Geology[2]

Lower Silurian

19: Amabel *(dolostone; thick-bedded, crinoidal, locally biohermal; includes bituminous dolostone)*

17: Clinton-Cataract Group *(shale, sandstone, dolostone, limestone units)*

1. LIO/MNRF
2. Armstrong, D.K. and Dodge, J.E.P. Paleozoic Geology Map of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 219

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Bedrock Geology

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Figure 4

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2.1.4 Hydrogeology

Hydrostratigraphic units can be subdivided into two distinct groups based on their ability to allow groundwater movement: an aquifer and an aquitard. An aquifer is defined as a layer of soil that is permeable enough to permit a usable supply of water to be extracted. An aquitard is a layer of soil that inhibits groundwater movement due to its low permeability. The major regional hydrostratigraphic units that control groundwater at the site are described below:

Oak Ridges Moraine (or equivalent): Based on Oak Ridges Moraine Groundwater Program mapping, the main overburden hydrogeological stratigraphy is the Oak Ridges Moraine or equivalent upper aquifer which occurs throughout the site with a layer thickness of approximately 7m. The Oak Ridges Moraine (ORM) is a significant regional aquifer in Southern Ontario due to its predominantly sandy surface soils and hummocky topography. The hydraulic conductivity of the ORM sediments is generally in the range of $3x10^{-6}$ m/sec to $7x10^{-3}$ m/sec (Sharpe et al., 1999).

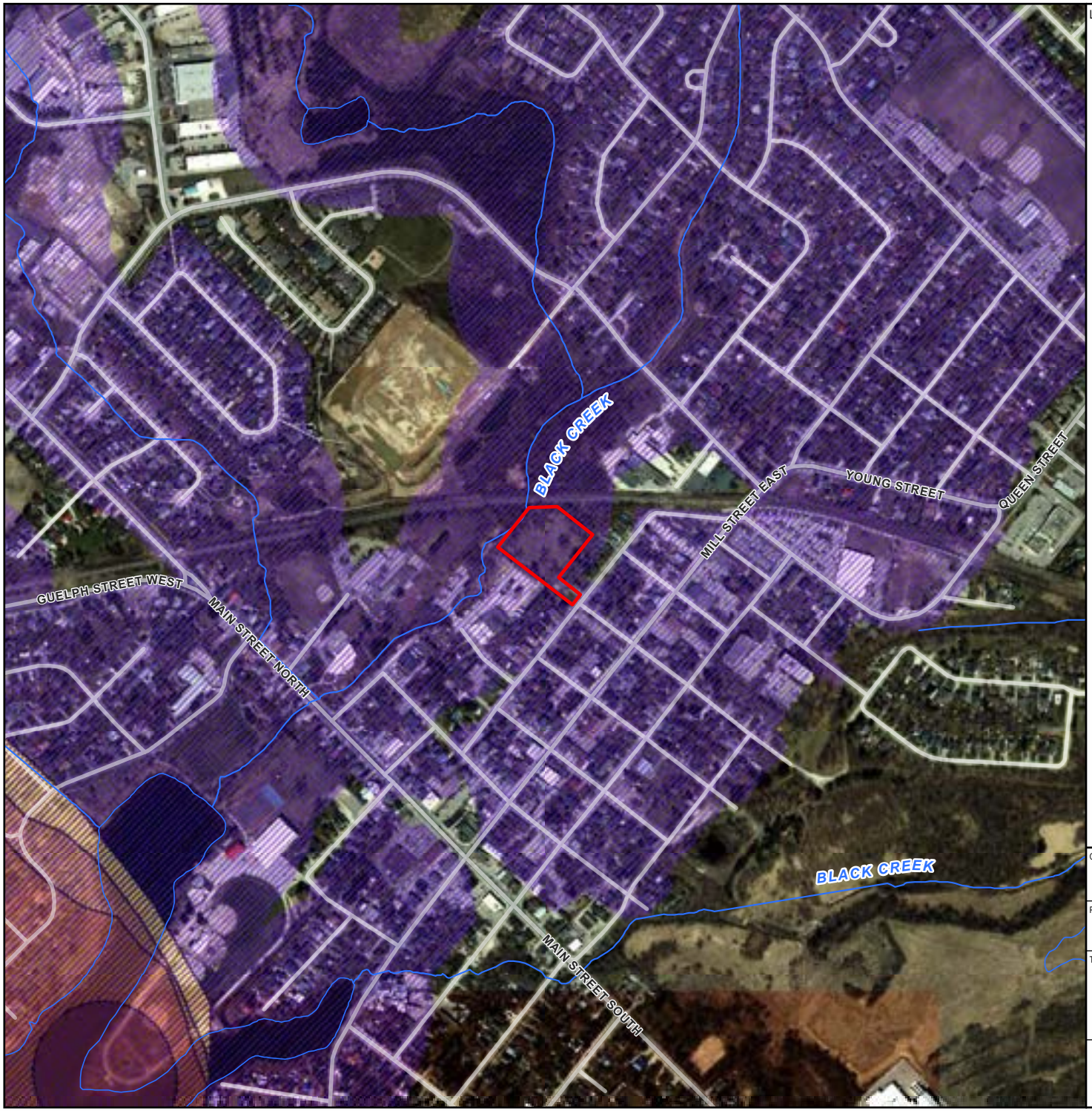
Amabel Formation (Bedrock): The Amabel Formation is a high-capacity aquifer that can be found between Hamilton, ON and Owen Sound, ON. Permeability in this aquifer is highly variable in large part due to fracturing and dissolution within the upper layers of dolomite within the unit (Singer et al., 2003).

2.1.5 Source Water Protection

The site is located in the Credit Valley Source Protection Area under the Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Protection Plan which came into effect on July 22, 2025, with the most recent amendment taking effect on March 6, 2024. The Source Water Protection Plan identifies four main regulatory factors under the *Clean Water Act* (2006) relating to local hydrogeology to consider for site development: Significant Groundwater Recharge Areas (SGRAs), Highly Vulnerable Aquifers (HVA), Wellhead Protection Areas (WHPAs), and Intake Protection Zones (IPZs).

A Wellhead Protection Area (WHPA) is the area around the wellhead where land use activities have the potential to affect the quality or quantity of water that flows into the municipal water supply well. These areas are delineated into zones of vulnerability (A, B, C, and D) based on the time of travel of water into the well, and zones around a surface water body influencing a Groundwater Under Direct Influence (GUDI) (E, F). Other zones (Q1 and Q2) are defined as the areas where new water takings or reduced recharge could impact the quantity of water available to municipal supply wells. IPZs are the area on the water and land surrounding a municipal surface water intake. HVAs are aquifers that are susceptible to contamination as a result of the soil structure/material or due its location near the ground surface. Lastly, SGRAs are areas where recharge is important to maintain the water level in a community drinking water aquifer that have 1.5x the average recharge rate within a watershed.

The Ontario Source Water Protection Information Atlas indicates that this site is within Wellhead Protection Area “E” (WHPA-E) (**Figure 5a**) indicating that the municipal water supply wells in this area are under direct influence from surface water. The WHPA-E score for the subject property is 8.1, indicating the area is significantly vulnerable to impact on the ground water. The Information Atlas also indicated that the site is located within a Highly Vulnerable Aquifer with a vulnerability score of 6, and the site is within a Significant Groundwater Recharge Area (**Figure 5b**).



LEGEND

- Subject Site
- Watercourse[1]

Source Water Protection[2]

- WHPA-A
- WHPA-B
- WHPA-C
- WHPA-D
- WHPA-E

1. LIO/MNRF
2. from *Source Protection Information Atlas*, MECP 2024 © King's Printer for Ontario

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Source Water Protection

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Figure 5a

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LEGEND

Subject Site

Watercourse[1]

Source Water Protection[2]

Highly Vulnerable Aquifer

Significant Groundwater Recharge Area

Score: N/A

1. LIO/MNRF
2. from *Source Protection Information Atlas*, MECP 2024 © King's Printer for Ontario

0 25 50 100 150 200 250

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TITLE

Source Water Protection

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Figure 5b

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2.1.6 MECP Water Well Records

Based on a review of the MECP Water Well Records (WWR) database, 108 records are present within a 500 m radius of the site (**Figure 6**). Of the water wells, 3 are listed as water supply wells, 83 are for monitoring purposes, and 22 wells are unspecified.

The nearest of these domestic wells to the proposed development is approximately 390 m west of the site (#2800001). All three of these wells are deeper than the proposed excavation depths (well depths ranged from 20 m to 41 m) and source water from the bedrock.



LEGEND

- Subject Site
- 500m Site Buffer
- Watercourse[1]

Well Records within 500m[2]

by Well Use

- Water Supply
- Test Well/Monitoring Well
- N/A

1. LIO/MNRF
2. MECP

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METRE SCALE

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97 Bower St, Acton, ON

TITLE
MECP Well Records within 500m of Site

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REF. NO. 2402401-7-1

Figure 6

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2.2 Site Specific Conditions

2.2.1 Borehole Drilling and Monitoring Well Installations

Palmer conducted a drilling program on May 1, 2024. For this drilling program, ten (10) boreholes were drilled at the site using a track mounted drill rig with a combination of hollow stem and solid stem augers.

The depths of the boreholes ranged from 5.3 to 15.9 mbgs. Out of the ten (10) boreholes that were drilled, monitoring wells installed in Eight (8) in accordance with Ontario Regulation 903 (Wells Regulation). Each monitoring well was completed with a 51 mm (2-inch) diameter schedule 40 polyvinyl chloride (PVC) pipe, with either a 1.5 m (5 ft) or 3.1 m (10 ft) screened interval at the bottom of the well. The monitoring wells were sealed using bentonite and completed with stickup monument well casing. Additional details are provided in **Table 1** and the locations are presented in **Figure 1**. The borehole logs can be found in **Appendix B**.

Table 1. Borehole and Monitoring Well Installation Details

Borehole ID	Surface Elevation (masl)	Borehole Depth (mbgs)	Screened Interval* (mbgs)	Screened Interval (masl)	Screened Soils
BH24-01	350.6	5.3	1.5 – 4.6	349.1 – 346.0	Silty Sand
BH24-02	350.4	5.3	1.5 – 4.6	348.9 – 345.8	Fill (silty sand) / Silty Sand
BH24-03	350.6	5.3	1.5 – 4.6	349.1 – 346.0	Fill (silty sand) / Fill (sand and gravel) / Silt
BH24-04	350.1	5.3	1.5 – 4.6	348.6 – 345.5	Sandy Silt
BH24-05	350.5	5.3	1.5 – 4.6	349.0 – 345.9	Fill (silty sand) / Sand and Gravel / Sandy Silt
BH24-06	351.3	5.3	1.5 – 4.6	349.8 – 346.7	Fill (sand) / Sand / Sandy Silt
BH24-07	350.4	15.9	12.2 – 15.3	338.2 – 335.1	Sand and Gravel / Sandy Silt Till
BH24-08	350.2	8.2	4.6 – 6.1	345.6 – 344.1	Silty Sand / Clayey Silt
BH24-09	350.7	8.2	No Monitoring Well		
BH24-10	350.5	15.9	No Monitoring Well		

2.2.2 Geology and Soil Profile

The stratigraphy of the site area encountered during the borehole drilling program is summarized below:

Topsoil: Topsoil was encountered at surface with a unit thickness of approximately 0.1m across the site.

Fill: There was fill encountered in boreholes underlying the topsoil. The fill layers varied across the site with the major composition of the fill being sandy silt, silty sand, sand, sand and gravel, and. The unit thickness for the fill ranged from 1.4 to 4.5 m in BH24-01 and BH24-09 respectively.

Silty Sand: Silty sand was encountered in BH24-01, BH24-02, and BH24-08. In BH24-01 and BH24-02, silty sand extended to the end of the borehole and was encountered as shallow as 1.5 mbgs. Unit thickness for silty sand ranged from 1.5 to 3.8 m in BH24-02 and BH24-01 respectively (although the silty sand extended to the bottom of the borehole in BH24-01 and BH24-02).

Sandy Silt: Sandy silt was encountered BH24-04, BH24-05, BH24-06, BH24-07, BH24-09, and BH24-10 at depths ranging from 1.5 mbgs in BH24-04 to 10.2 mbgs in BH24-10. The unit thickness for the sandy silt layer ranged from 1.0 m in BH24-09 to 3.8 m in BH24-04 (although the sandy silt extended to the bottom of the borehole in BH24-04, BH24-05, and BH24-06).

Sand and Gravel: A sand and gravel layer was encountered in BH24-05, BH24-07, and BH24-10. Depth to the sand and gravel unit ranged from 2.3 mbgs in BH24-05 to 14.8 mbgs in BH24-10. Unit thickness ranged from 1.1 m in BH24-10 (although the sand and gravel extended to the bottom of the borehole) to 1.6 m in BH24-07.

Sand: A sand layer was encountered in BH24-06 at a depth of 3.1 mbgs with a unit thickness of 0.7 m.

Silt: A silt layer was encountered in BH24-03 at a depth of 3.8 mbgs and extended to the end of the borehole with a unit thickness of 1.5 m (although the silt extended to the bottom of the borehole).

Silt to Silty Clay: A layer of silt to silty clay was encountered in BH24-10 at a depth of 4.1 mbgs and extended to a depth of 7.2 mbgs (a unit thickness of 3.1 m).

Clayey Silt: Clayey silt was encountered in BH24-07, BH24-08, BH24-09, BH24-10. Depth to the unit ranged from 5.6 mbgs in BH24-07, BH24-08, and BH24-09 to 7.2 mbgs in BH24-10. Unit thickness ranges from 1.6 m in BH24-09 to 4.6 m in BH24-07 (although the clayey silt extended to the bottom of the borehole in BH24-08).

Sandy Silt Till: A sandy silt till was encountered BH24-07, (BH24-09, and BH24-10. In BH24-07, there were 2 separate sandy silt till units separated by a 1.6 m thick sand and gravel layer. Depth to the unit ranged from 7.2 mbgs in BH24-09 to 13.3 mbgs in BH24-10 and the lower sandy silt till unit in BH24-07. Unit thickness ranged from 1.0 m in BH24-09 to 2.6 m in the lower sandy silt till layer in BH24-07 (although the silty sand extended to the bottom of the borehole in BH24-07, BH24-09).

2.2.3 Groundwater Levels

Groundwater levels were manually measured in monitoring wells to capture groundwater levels on March 29th, April 30th, May 1st, May 14th, and May 22nd, of 2024. Groundwater levels were collected using a Solinst probe to measure the depth to groundwater, as shown in **Table 2**. The highest recorded groundwater level was 0.80 mbgs at BH24-5 on May 1st, 2024. It is important to note that groundwater levels can fluctuate daily and seasonally in response to precipitation events and seasonal conditions.

Table 2. Groundwater Levels

Borehole ID	Surface Elevation (masl)	Screened Interval (mbgs)	Groundwater Level Elevations (mbgs)				
			29-Mar-2024	30-Apr-2024	01-May-2024	14-May-2024	22-May-2024
BH/MW1	351.3	1.5 – 3.1	3.23				
MW4	350.0	1.5 – 3.1					0.92
MW5	350.3	2.4 – 4.0	1.00				2.20
MW7	350.2	1.5 – 3.1	0.97				1.18
MW8	350.4	1.5 – 3.1	1.11				1.30
MW9	350.4	3.8 – 5.3	1.18	1.11		1.26	1.41
MW10	350.4	1.5 – 3.1	1.09	0.10			1.29
MW11	350.1	0.9 – 2.4					
BH24-1	350.6	1.5 – 4.6			1.39	1.45	1.56
BH24-2	350.4	1.5 – 4.6			1.05	1.18	1.30
BH24-3	350.6	1.5 – 4.6			1.21	1.40	1.55
BH24-4	350.1	1.5 – 4.6		0.94	1.19	0.99	1.07
BH24-5	350.5	1.5 – 4.6		2.65	0.80	1.36	1.50
BH24-6	351.3	1.5 – 4.6			3.19	3.29	3.33
BH24-7	350.4	12.2 – 15.3					1.27
BH24-8	350.2	4.6 – 6.1					1.04

2.2.4 Groundwater Chemistry

A groundwater quality sample was collected from BH24-2 on May 14th, 2024 for analysis to be compared against the limits for Halton Hills Storm Sewer By-Law (2017-0068) and Halton Region Sanitary Sewer By-Law (02-03). The groundwater sample was collected with dedicated low-flow sampling equipment.

Groundwater was collected in laboratory-prepared sample containers with the appropriate preservatives. The containerized samples were kept in insulated coolers packed with ice and delivered to ALS under a Chain of Custody (CoC). The groundwater analytical results are attached in **Appendix C**.

The following groundwater exceedances were reported for the Halton Hills Storm Sewer Use By-Laws for BH24-2:

- Total Suspended Solids at 17.9 mg/L versus the limit of 15 mg/L
- Total Manganese at 0.123 mg/L versus the limit of 0.05 mg/L

Additionally, as noted in the Chain of Custody in **Appendix C**, the result for 3,3-Dichlorobenzidine was below the control limits of the analyzing laboratory (ALS). 3,3-Dichlorobenzidine is reported at a value of >0.0012 mg/L.

No exceedances were detected for the Halton Region Sanitary Sewer Use By-Law limits

As part of the Phase II Environmental Site Assessment (ESA) completed by Palmer, groundwater samples were collected from BH24-2, BH24-5, and BH24-6 on May 14th, 2024, and compared to MECP table 1 standards (Palmer, 2024). Exceedances are as follows:

BH24-2

- Uranium at 0.023 mg/L versus the limit of 0.089 mg/L

BH24-5

- Vinyl Chloride at 0.00066 mg/L versus the limit of 0.0005 mg/L

BH24-6

- Vinyl Chloride at 0.00058 mg/L versus the limit of 0.0005 mg/L

2.2.5 Hydraulic Conductivity

In-situ hydraulic conductivity testing was conducted in select monitoring wells to provide an estimate of the hydraulic conductivity of the formation which the monitoring wells are screened. Prior to initiating the test, the monitoring wells were instrumented with automated dataloggers to capture the tests results. Conductivity testing was completed by performing falling head tests where a volume of water was added to create a displacement in hydraulic head. Manual water levels were measured prior to initiating the test and following the addition of water. The in-situ hydraulic conductivity test was completed once the water in the well had recovered to static conditions. The in-situ hydraulic conductivity tests were analyzed in AQTESOLV using the Bouwer-Rice (1976) method for unconfined aquifers. The results of the hydraulic conductivity tests are summarized in **Table 4**, and the results of the analyses are provided in **Appendix D**.

Table 3. Hydraulic Conductivity Summary

Borehole ID	Screened Interval (mbgs)	Test Type	Analysis Method	Hydraulic Conductivity, K (m/s)	Screened Materials / Soils
BH24-2	1.5 – 4.6	Falling Head Test	Bouwer-Rice (unconfined)	1.1×10^{-5}	Fill / Silty Sand
BH24-3	1.5 – 4.6	Falling Head Test	Bouwer-Rice (unconfined)	2.1×10^{-6}	Fill / Silty Sand
BH24-4	1.5 – 4.6	Falling Head Test	Bouwer-Rice (unconfined)	1.2×10^{-6}	Sandy Silt
BH24-5	1.5 – 4.6	Falling Head Test	Bouwer Rice (unconfined)	6.2×10^{-7}	Fill / Sand & Gravel / Sandy Silt
BH24-6	1.5 – 4.6	Falling Head Test	Bouwer-Rice (unconfined)	5.0×10^{-6}	Fill / Sand / Sandy Silt

The hydraulic conductivity values ranged from 1.1×10^{-5} to 6.2×10^{-7} m/s, with a geometric mean of 2.5×10^{-6} m/s. These values fall within published values for the screened materials / soils.

3. Water Balance

A pre-development and post-development water balance was completed for the site to determine the existing and expected runoff and groundwater recharge (infiltration) conditions of the site.

The pre-development water budget was calculated over the site area using a monthly soil-moisture balance approach as described in Thornthwaite and Mather (1957) and is presented in **Table 4**. The water balance calculation estimates average annual evapotranspiration (evaporation and plant transpiration) using factors such as monthly precipitation, temperature, and latitude. Long term climate data were obtained from the nearest meteorological station to the study area with a full set of long-term data. Data was obtained over the 30-year duration from 1991 to 2020 from the Kitchener/Waterloo Weather Station (ID#6144239) which is approximately 33 km away from the site. It is noted that the Elora Weather Station (ID#6142286) is slightly closer to site (30 km); however the data provided over the necessary time period is incomplete.

The average available water surplus, which is the water available for infiltration and runoff, was calculated by subtracting the average annual evapotranspiration from the average annual precipitation. A soil moisture retention value of 150 mm was utilized to represent the coarse-textured ice stratified deposits present on site, as described by Thornthwaite and Mather (1957). The resulting annual water surplus for the area was then partitioned using MOEE (1995) infiltration factors.

Table 4. Summary of Annual Water Surplus

Month	Mean Temperature (ºC)	Total Precipitation (mm)	Actual Evapotranspiration (mm)	Water Balance (Surplus) (mm)
January	-6.3	66	0.0	66.3
February	-5.9	46	0.0	46.1
March	-0.8	57	0.0	57.0
April	5.9	81	30.8	50.4
May	12.6	80	78.4	1.8
June	17.8	81	99.5	-19.0
July	20.2	96	106.2	-10.0
August	19.1	67	56.2	11.0
September	15.2	75	59.2	16.0
October	8.8	71	39.6	31.4
November	2.6	75	9.1	65.8
December	-2.8	55	0.0	54.9
YEAR	**-**	**851**	**479**	**372**

Based on OGS surficial geology mapping and drilling results, the site is underlain by ice-contact stratified deposits with sand and gravel, minor silt and clay. Additionally, the site was found to be flat to gently sloped and is primarily covered with agricultural field. The infiltration rate based on these parameters is 0.7 and is presented in **Table 5**.

Table 5. Infiltration Factors

Components of Infiltration Factor	Contribution to Overall Infiltration Factor
Topography – Flat to Gently Sloped	0.2
Soil – ice-contract stratified deposits w/ sand & gravel, minor silt and clay	0.4
Cover – Agriculture	0.1
Infiltration Factor	**0.7**

3.1 Pre-Development Water Balance

The pre-development water balance calculations are provided in **Table 6**. The water surplus on impermeable surfaces has been estimated as 90% of the total precipitation which is within the accepted range for impermeable surfaces. Based on the calculated infiltration factors, water surplus, and the Site Plan statistics (i.e. site area) (**Appendix A),** the pre-development infiltration and runoff for the site is 2,498 m^3/year and 1,071 m^3/year respectively.

Table 6. Pre-Development Water Balance

Land Use	Total (ha)	Impervious Factor	Impervious area (ha)	Water Surplus on Impermeable Surfaces (m/yr)	Estimated Pervious Area (ha)	Water Surplus on Vegetated Pervious Areas (m/yr)	Runoff Coefficient	Infiltration Coefficient	Total Runoff Volume (m^3/yr)	Total Infiltration Volume(m^3/yr)
Undeveloped	0.96	0.00	0.00	0.766	0.96	0.372	0.30	0.70	1,071	2,498
Total	**0.96**	**-**	**0.00**	**-**	**0.96**	**-**	**-**	**-**	**1,071**	**2,498**

3.2 Unmitigated Post-Development Water Balance

The provided Site Plan (**Appendix A)** was used to determine the area of the various land use components. The post-development water balance calculation is provided in **Table 7**. Pre-development to post-development, the area of impermeable surfaces will increase from 0 ha to 0.38 ha. With no mitigation measures, the infiltration and runoff post-development is estimated to be 1,523 m^3/year and 3,520 m^3/year respectively. This is a decrease in infiltration by 974 m^3/year (-39%) and an increase in runoff by 2,449 m^3/year (+229%).

Table 7. Post-Development Water Balance

Land Use	Total (ha)	Impervious Factor	Impervious area (ha)	Water Surplus on Impermeable Surfaces (m/yr)	Estimated Pervious Area (ha)	Water Surplus on Vegetated Pervious Areas (m/yr)	Runoff Coefficient	Infiltration Coefficient	Total Runoff Volume (m^3/yr)	Total Infiltration Volume(m^3/yr)
Paved (Hardscape)	0.25	1.00	0.25	0.766	0.00	0.372	0.30	0.70	1,881	0
Rooftops (Lot Coverage)	0.13	1.00	0.13	0.766	0.00	0.372	0.30	0.70	986	0
Landscaped	0.16	0.00	0.00	0.766	0.16	0.372	0.30	0.70	180	419
Grassed Area	0.42	0.00	0.00	0.766	0.42	0.372	0.30	0.70	473	1,104
Total	**0.96**	**-**	**0.38**	**-**	**0.58**	**-**	**-**	**-**	**3,520**	**1,523**

4. Dewatering Rate Assessment

Palmer understands that the proposed development will involve the construction of an 85 unit, 5 story mid-rise building with 1 level of underground parking with 34 spaces. Additional elements of the proposed development include surface parking for 64 spaces, a driveway including a fire route, a ramp to the underground parking area, a vehicular roundabout, and a waste storage area.

Assuming the 1 level of underground parking will extend 4.5 m below grade (existing ground surface assumed to be 350.4 masl), and allowing an additional 0.5 m for excavation, the estimated depth of excavation will be approximately 345.4 masl. The highest measured groundwater level elevation within the underground parking footprint is 349.7 masl (0.80 mbgs) recorded on May 1st, 2024, from BH24-5. This is expected to be near the seasonal high groundwater level. As the underground parking structure will be constructed below the groundwater table, a dewatering rate assessment is required.

For the dewatering estimations, the highest hydraulic conductivity value was used (1.1 x 10^{-5} m/s, BH24-2). It was assumed that for construction dewatering, the water table would need to be drawn down to 1 m below the excavation base (i.e., 344.4 masl) to maintain a dry excavation base. The proposed underground parking space is approximately 19 m x 67.5 m. Allowing for some over-excavation, the excavation dimensions have been considered as 21 m by 70 m. For preliminary considerations, the dewatering rate (Q) or the steady-state groundwater inflow in m^3/s into a trench shaped excavation can be estimated using a combination of an equation for radial flow to a well with an equation for flow to a trench from a line source for an unconfined aquifer (Powers et al., 2007).

$$Q = \frac{\Pi K(H^2-h^2)}{ln\frac{R_o}{r_e}} + 2\left[\frac{xK(H^2-h^2)}{2L}\right]$$

Where,

Q	=	Steady state inflow rate, m^3/s
K	=	Hydraulic conductivity (m/s)
H	=	Saturated thickness (m)
h	=	Saturated thickness after dewatering (m)
R_0	=	Radius of influence (m) estimated using the Sichardt equation: $R_0 = 3000 * (H-h)*\sqrt{K}$
r_e	=	Half trench width (m)
x	=	Trench length – 21 m
L	=	Trench width – 70 m

Given the above equations and assumptions, the dewatering rate is estimated to be approximately 170,000 L/day. With a 1.5x factor of uncertainty, this rate increases to approximately 255,250 L/day. Adding the volume of water that would need to be removed from the excavation during a 25 mm rain event over 24 hours (36,750 L/day), the dewatering rate is estimated to be approximately 292,000 L/day. The estimated zone of influence extends 68 m from the excavation boundary.

4.1 Long-term Dewatering

As the underground parking structure will be constructed within the groundwater table, long-term groundwater seepage into the structure must be considered. The long-term seepage was estimated using the same methodology as the short-term construction dewatering but utilizes the geomean hydraulic conductivity value and the bottom of the foundation for the total depth. The estimated long-term groundwater seepage rate is approximately 60,000 L/day.

5. Impact Assessment

5.1 Water Balance, Source Water Protection and LIDs

A pre-development to post-development water balance assessment was completed on the site to determine the changes to infiltration and runoff post-development. Based on the proposed development plan and considering no mitigation measures, the infiltration and runoff post development are 1,523 m^3/year and 3,520 m^3/year respectively. This is a decrease in infiltration by 974 m^3/year (-39%) and an increase in runoff by 2,449 m^3/year (+229%).

Based on Source Water Protection mapping, the Site is within Wellhead Protection Zone E with a score of 8.1, an HVA with a score of 6, and an SGRA. These source water protection designations do not limit the proposed development; however, certain uses may be prohibited such as bulk fuel storage. Additionally, any salting on the property may also require a salt management plan and best practices should be followed. It is further recommended that the development prepares and implements a spill management plan.

As the site is located within a Significant Groundwater Recharge Area (SGRA), post-development infiltration should be matched to pre-development infiltration to the most practical extent possible. The use of infiltration based Low Impact Development (LID) measures such as infiltration trenches, or grassed swales may be considered. Directing clean rooftop runoff from the proposed buildings on site towards these LIDs can increase post-development infiltration and reduce runoff. The surficial soils (coarse-textured sand) are ideal at the site for infiltration. While the groundwater level is fairly shallow, allowing for a 1 m separation from the infiltration depth to the groundwater level should be sufficient to support infiltration..

5.2 Natural Environment

The site contains a stretch of Black Creek that flows along the edge of the northwest portion of the site and flows towards Fairy Lake, which is located approximately 550 m southwest of the site at its nearest point. This watercourse would lie within the zone of influence of the proposed dewatering activities. Further assessment of this watercourse would be needed to sufficiently assess impacts to this watercourse. There is a woodland located directly north of the site that is separated from the subject property by railroad tracks. This woodland lies outside of the zone of influence based on the proposed location of the excavation. There are no wetlands or natural heritage features located within the zone of influence.

To ensure that Black Creek maintains its current functions post-development, as well as Fairy Lake in which the creek flows in to, it is recommended that pre-development infiltration rates are maintained. During construction, should the groundwater be confirmed to be uncontaminated, it is recommended that the discharge be directed towards an infiltration area within the northern portion of the site. This would mitigate impacts related to the potential interception of flow within the watercourse that may occur due to the dewatering. This may result in a slight increase in recirculation of water to the dewatering operation

however it would be similar to the existing presence of the watercourse and thus not expected to significantly change the dewatering conditions.

5.3 Existing Groundwater Users

Based on a review of the MECP Water Well Records (WWR) database, 108 wells are present within a 500 m radius of the Site. Of these wells, three (3) are labeled as water supply/domestic wells. The nearest of these domestic wells to the proposed construction is approximately 390 m west of the site (#2800001). All three of these wells are deeper than the proposed excavation depths (well depths ranged from 20 m to 41 m) and source water from the bedrock. Furthermore, as these wells are further than the anticipated radius of influence (54 m), no adverse impact to existing water users are expected.

5.4 Water Taking Permit Recommendations

Water taking in Ontario is governed with Section 34 of the Ontario Water Resources Act and its Regulation 387/04. Amendments to Ontario Regulation 63/16 under the *Environmental Protection Act* permit proponents to self-register eligible construction dewatering activities through the Environmental Activity and Sector Registry (EASR). For construction dewatering, a water taking rate exceeding 50,000 L/day requires the registration of an EASR. For permanent long-term drainage of the foundation, a water taking rate exceeding 379,000 L/day requires a Permit to Take Water (PTTW).

For the construction of the proposed development, a dewatering rate of approximately 292,000 L/day is estimated which includes a factor of uncertainty and accounts for precipitation inputs from storm events. As such, a registration to the Environmental Activity and Sector Registry is expected to be required to support the proposed construction.

For the permanent long-term drainage of the foundation, a water taking rate of approximately 60,000 L/day was estimated. As such, permitting is not expected to be required for the long-term drainage.

5.5 Groundwater Treatment and Discharge Recommendations

As part of the proposed construction, short-term construction dewatering is expected to be required. The analytical results for the groundwater sample collected from the sampled monitoring well (BH24-2) exceeded the guideline criteria for the Halton Hills Storm Sewer By-Law (2017-0068) for Total Suspended Solids (TSS) and Total Manganese.

TSS can be managed using erosion and sediment control measures to reduce the TSS levels within the criteria for discharge. With TSS control, manganese may also be reduced however it is not known if they could be reduced enough to meet the criteria for discharge into storm sewer.

As there were no exceedances with respect to the Halton Region Sanitary Sewer By-Law (02-03), discharge to the sanitary sewer would be an option as it would be expected that the discharge would meet the required criteria.

As recommended above, discharge onsite to an infiltration trench may also be an option if the discharge water is determined to be uncontaminated.

As some level of contamination was determined in the Palmer Phase II investigation, further assessment of the groundwater chemistry is recommended to assess the expected discharge water quality for any discharge to the natural environment (storm sewer or discharge on-site).

It is recommended that stormwater and dewatering effluent be maintained on site and tested to ensure that it meets the receivers' requirements prior to being discharged / removed from site. A discharge treatment contractor should be consulted as needed during construction and prior to discharge of stormwater or dewatering effluent to confirm the appropriate treatment / measures.

6. Summary and Conclusions

Based on the results of the Hydrogeological Investigation, the following summary and conclusions are presented:

- The surficial geology at the site as encountered through borehole drilling consisted of fill material which were underlain mainly by sandy silt / silty sand soils.
- Review of the Source Water Protection Mapping determined that the site is within areas mapped as Wellhead Protection Area E (WHPA-E), Highly Vulnerable Aquifer (HVA), and a Significant Groundwater Recharge Area (SGRA). This does not limit the proposed development, however, may restrict specific site uses and impose restrictions on changes in infiltration rates.
- Review of the MECP WWRs data base revealed 108 well records within 500 m of the Site area, with three (3) being for domestic / water supply use. The wells designated as being of water supply use are drilled deeper and source water from the bedrock.
- Ten (10) boreholes were advanced as part of the Geotechnical Investigation and eight (8) were completed as monitoring wells. An additional seven (7) monitoring wells were found on site from the previous Phase II investigation..
- Groundwater levels ranged from 0.80 to 3.33 mbgs and elevations that ranged from approximately 350 to 351 m sloping from southeast to northwest.
- Single well response tests were conducted on select monitoring wells to determine hydraulic conductivity values. Hydraulic conductivity values ranged from 1.1×10^{-5} to 6.2×10^{-7} m/s, with a geometric mean of 2.5×10^{-6} m/s.
- A groundwater sample was collected from BH24-2 on May 14th, 2024. The sample was compared to Halton Hills Storm Sewer By-Law (2017-0068) and Halton Region Sanitary Sewer By-Law (02-03). No exceedances were found for Halton Region Sanitary Sewer criteria. Exceedances for Total Suspended Solids (TSS) and Total Manganese were found when compared to Halton Hills Storm Sewer criteria.
- A pre-development and post-development water balance assessment was completed for the site. The pre-development infiltration and runoff values were 2,498 m^3/year and 1,071 m^3/year respectively. The proposed development increased the imperviousness of the Site by approximately 0.38 ha. The post-development infiltration and runoff values were 1,523 m^3/year and 3,520 m^3/year respectively. This is a decrease in infiltration by 974 m^3/year (-39%) and an increase in runoff by 2,449 m^3/year (+229%).
- As the site is located within an SGRA, Low Impact Development (LID) methods should be utilized to maintain infiltration rates as close to pre-development rates as possible. Such methods include shallow infiltration trenches or grassed swales as well as directing rooftop runoff towards these LID measures. The Site is ideal for infiltration with permeable surficial soils.
- Should any water be discharged as a part of construction, groundwater should be sampled prior to discharge to confirm the chemistry.
- With short-term construction dewatering rates exceeding 50,000 L/day, a registration of an Environmental Activity and Sector Registry is expected be required.
- As the Phase II ESA found low level contamination on site, further groundwater chemistry testing is recommended to confirm discharge recommendations.
- If discharge water is found to be uncontaminated an meets appropriate water quality guidelines, discharge is recommended to be directed to the an infiltration trench north of the proposed development.

7. Limitations of Report

This report has been prepared by Palmer (now a part of SLR Consulting (Canada) Ltd. (SLR)) for 759509 Ontario Inc (Client) in accordance with the scope of work and all other terms and conditions of the agreement between such parties. Palmer acknowledges and agrees that the Client may provide this report to government agencies, interest holders, and/or Indigenous communities as part of project planning or regulatory approval processes. Copying or distribution of this report, in whole or in part, for any other purpose other than as aforementioned is not permitted without the prior written consent of Palmer.

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8. Certification

This report was prepared, reviewed and approved by the undersigned:

Prepared By: G. Colibaba

Griffin Colibaba, B.Sc.
Environmental Scientist

Reviewed and Approved By: Nick Schmidt

Nick Schmidt, B.Sc., P.Geo.
Senior Hydrogeologist



9. References

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Appendix A: Concept Study Plan

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PROPOSED MID-RISE RESIDENTIAL DEVELOPMENT

97 BOWER STREET, ACTON, ON
MAY 2025

4 ARCHITECTURE INC.
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COVER PAGE

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CONTEXT MAP



STREET VIEW 1 FROM BOWER STREET



STREET VIEW 2 FROM BOWER STREET



AERIAL VIEW FROM EAST



AERIAL VIEW FROM SOUTH



STREET VIEW FROM FREDERICK STREET

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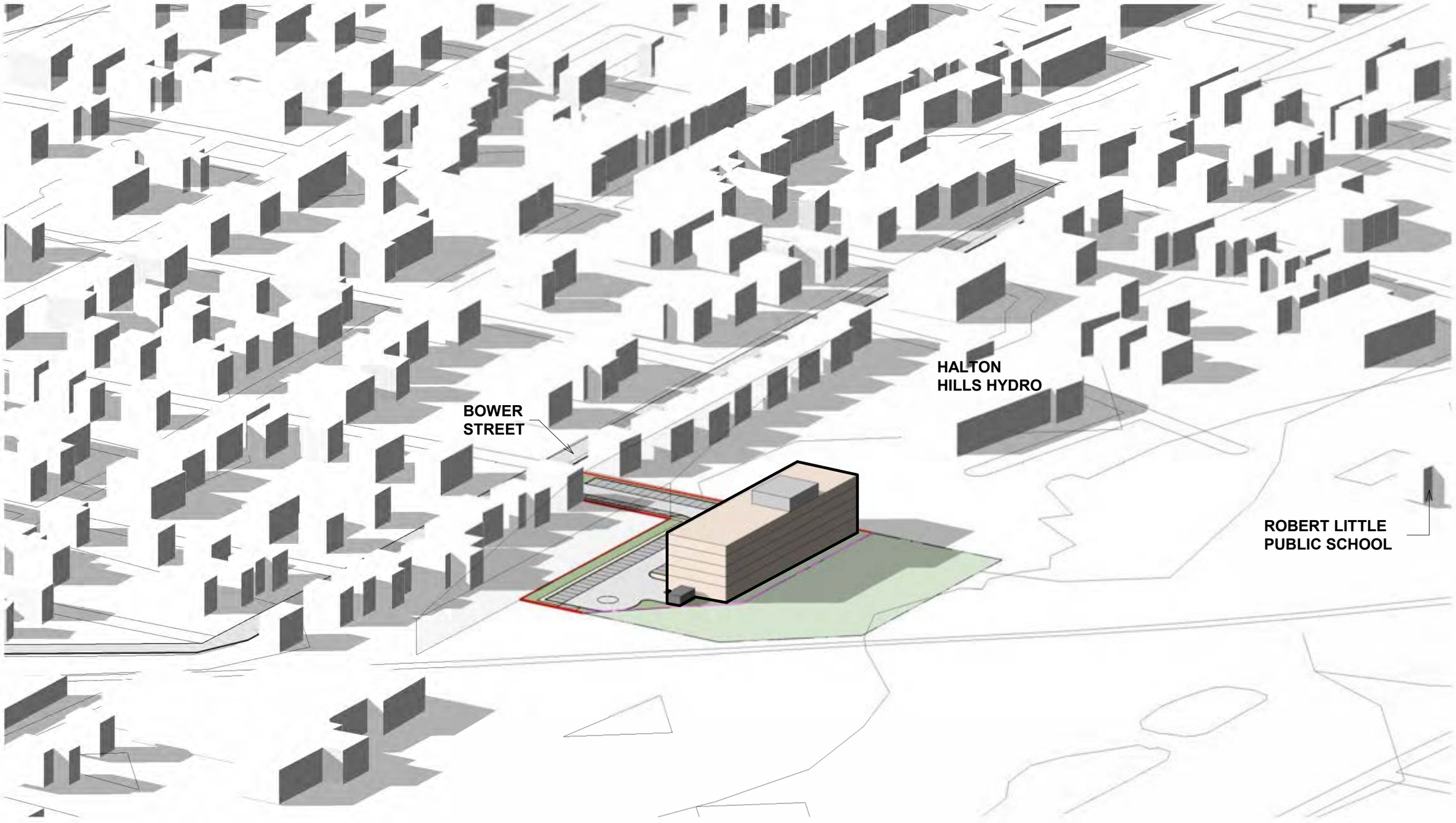
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LOCATION PLAN & CONTEXT STUDY

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CONTEXT VIEW

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PROJECT NORTH

TRUE NORTH

LINE OF REGULATION LIMIT

LINE OF DEVELOPMENT LIMIT

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

PROPERTY LINE

LINE OF DEVELOPMENT LIMIT

LINE OF REGULATION LIMIT

LEGEND

COMPENSATION AREA AREA	ENCROACHMENT AREA	POTENTIAL ENHANCEMENT AREA
180.10 m²	344.40 m²	592.45 m²
< 1 : 2 RATIO PROPOSED COMPENSATION TO ENCROACHMENT AREA		

BOWER STREET

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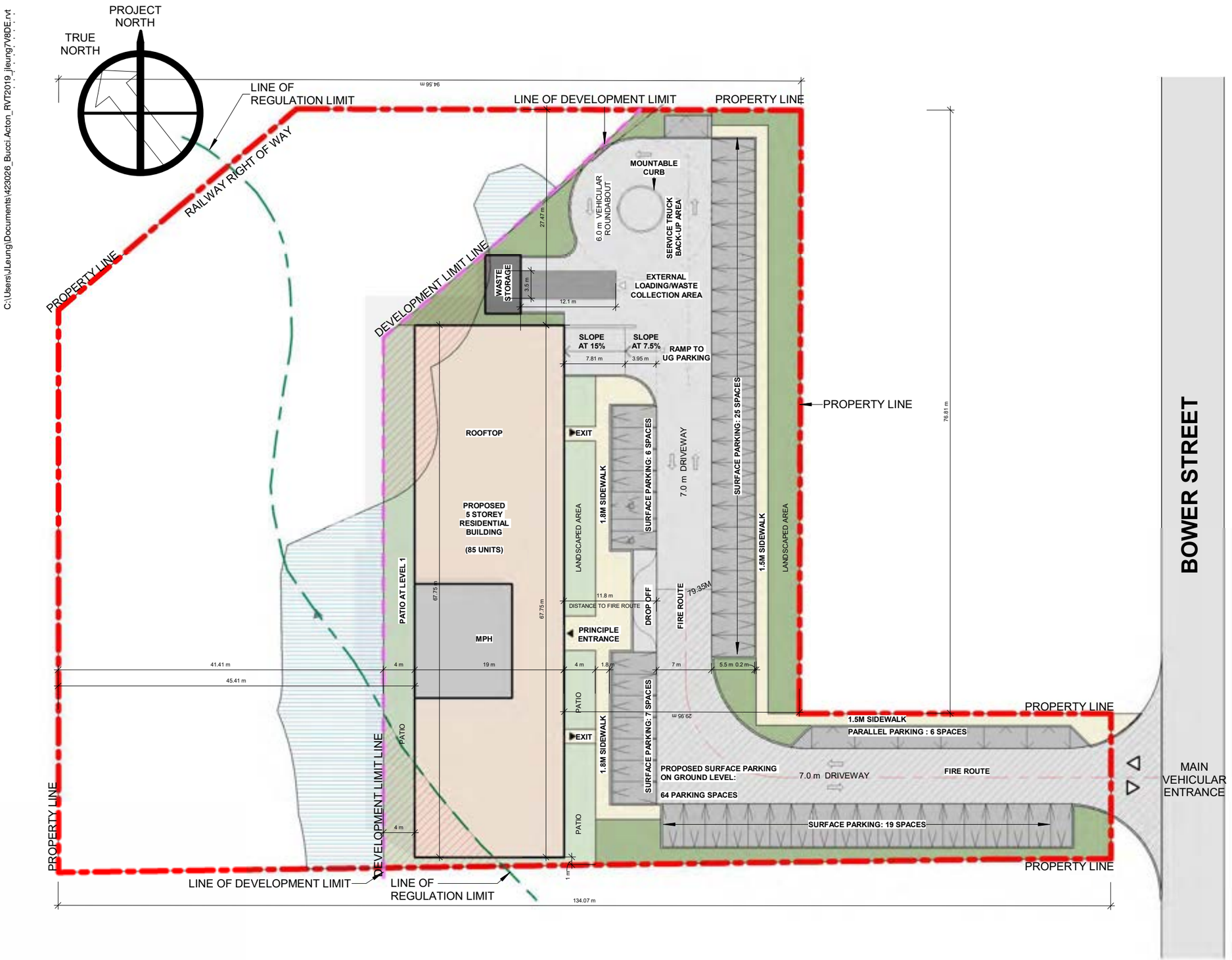
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97 BOWER STREET, ACTON, ON

SITE PLAN DEVELOPMENT AREA CALCULATION

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SITE STATISTICS

SITE INFORMATION	97 BOWER STREET, ACTON
MUNICIPALITY :	HALTON
PARENT ZONING BY-LAW :	2010-0050
REGION :	HALTON HILLS
ZONING DESIGNATION :	URBAN RESIDENTIAL ZONE LDR1-4
SITE SPECIFIC BY-LAW :	-
LOT AREA :	9,610.58 m² (.96 ha)(2.37 a)
LOT AREA (WITH ECOLOGY CONSTRAINTS):	5,191.16 m² (.52 ha)(1.28 a)
LOT AREA (AFTER REVISED DEV LIMIT LINE):	5,355.89 m² (.54 ha)(1.32 a)
LOT FRONTAGE :	97.1 m
LOT DEPTH :	94.2 m
DENSITY :	64 UNIT/ACRE
FLOOR SPACE INDEX:	1.20 FSI

SETBACKS	REQUIRED	PROVIDED
MIN. FRONT YARD	4.5 m	4.5 m
MIN. REAR YARD	7.5 m	45 m
MIN. INTERIOR SIDE YARD	0.6 m	6 m
MIN. INTERIOR SIDE YARD 2	1.0 m	27.4 m

COVERAGE	REQUIRED	PROVIDED
LOT COVERAGE :	-	1,287.25 m²
PAVING (HARDSCAPE) :	-	2,457.29 m²
LANDSCAPE :	-	1,611.00 m²

UNIT COUNT	
LEVEL 1	9 UNITS
LEVEL 2	20 UNITS
LEVEL 3	20 UNITS
LEVEL 4	20 UNITS
LEVEL 5	16 UNITS
TOTAL UNITS	85 UNITS

BUILDING INFORMATION	REQUIRED	PROVIDED
BUILDING HEIGHT :	11.0 m	16.7 m
STOREY (ABOVE GRADE)	-	5 STOREY
STOREY (BELOW GRADE)	-	1 STOREY

FLOOR AREA	
APARTMENT	6,436.25 m²
TOTAL SELLABLE GFA	(85%) 5,470.81 m²

PARKING GARAGE AREA	REQUIRED	PROVIDED
PARKING DIMENSION (SURFACE)	2.75 m x 5.5 m	2.75 m x 5.5 m
(GARAGE)	2.6 m x 5.5 m	2.6 m x 5.5 m
DRIVE AISLE	6.7 m @ 90°	6.7 m @ 90°
RESIDENT	*1.5 SP / UNIT* *1.5 x 85 = 128*	*1.15 SP / UNIT* *1.15 x 85 = 98*
VISITOR	*0.25 SP / UNIT* *0.25 x 85 = 22*	*(1.15 RATE PROPOSED INCLUSIVE OF RESIDENT AND VISITOR)*
TOTAL	*150 SPACES*	*34 SPACES U.G.* *64 SURFACE* *TOTAL: 98 SPACES* *(AT 1.15 RATE PROPOSED*

BICYCLE	REQUIRED	PROVIDED
RESIDENT	-	
VISITOR	-	

LOADING	REQUIRED	PROVIDED
LOADING SPACE DIMENSION	3.5 m x 12 m x 4.2 m	3.5 m x 12 m x 4.2 m
RESIDENT		1

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BUCCI - 423026
97 BOWER STREET, ACTON, ON

SITE PLAN

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BUCCI - ACTON

97 BOWER STREET, ACTON, ON

Project Statistics

May 13, 2025 — Project No. 423026

1.0 Site Area

	Hectare	acres	sq.m.	sq.ft.
SITE AREA	**0.96**	**2.37**	**9,610.58**	**103,447**
SITE AREA WITH ECOLOGY CONSTRAINTS	**0.52**	**1.28**	**5,191.16**	**55,877**
SITE AREA AFTER REVISED DEVELOPMENT LIMIT LINE	**0.54**	**1.32**	**5,355.89**	**57,650**

2.0 GFA — Zoning By Law 2010-0050

The aggregate of the areas of each floor of a buiding or structure above or below established grade, measured between the exterior faces of the exterior walls of the building or structure excluding the sum of the areas of each floor used, or designed or intended for use for the parking of motor vehicles, unless the parking of motor vehicles is the principle use of the building or structure.

2.1 **GROSS FLOOR AREA**

			floors		sq.m.	sq.m.	sq.ft.
Level	1		1	x	1,287.25	1,287.25	13,856
Levels	2	to 4	3	x	1,287.25	3,861.75	41,568
Level	5		1	x	1,287.25	1,287.25	13,856
Total GFA						**6,436.25**	**69,280**

2.2 **GROSS CONSTRUCTION AREA**

			floors		sq.m.	sq.m.	sq.ft.
Level	P1		1	x	1,287.25	1,287.25	13,856
Level	1		1	x	1,287.25	1,287.25	13,856
Levels	2	to 4	3	x	1,287.25	3,861.75	41,568
Level	5		1	x	1,287.25	1,287.25	13,856
Total GFA						**7,723.50**	**83,136**

Total GFA	÷	Site Area	FSI
6,436.25 sq.m.		5,355.89 sq.m.	**1.20**

3.0 Unit Count

*(*15% of suites to be fully accessible)*

3.1

Building 1 units			floors		STUDIO	1BR	1BR+D	2 BR	2BR+D	3BR	Units
Level	1		1	x	0	4	0	1	2	2	9
Levels	2	to 4	3	x	0	10	6	0	4	0	60
Level	5		1	x	0	2	5	0	5	4	16
Total Units					0	36	23	1	19	6	**85**
					0.0%	*42.4%*	*27.1%*	*1.2%*	*22.4%*	*7.1%*	*100%*

3.2 **Approximate Area Range**

1 BR	37.16-44.59 SQ.M	**400-535 SQ.FT**
1 BR_D	37.16-44.59 SQ.M	**600-665 SQ.FT**
2 BR	55.74-68.75 SQ.M	**650-750 SQ.FT**
2BR_D	78.97-91.04 SQ.M	**780-850 SQ.FT**
3 BR	78.97-96.62 SQ.M	**850-950 SQ.FT**

4.0 Amenity Area

4.1

Required Indoor Amenity Area	Min req	units	sq.m.	sq.f.
0.0	0.00	*85*	0.00	0

4.2

Required Outdoor Amenity Area		units	sq.m.	sq.f.
0.0	0.00	*85*	0.00	0
Total Required Amenity			**0.00**	**0**

4.3

Proposed Indoor Amenity	Location	sq.m.	sq.f.
Level 1	*Level 1*	123.48	1,329

4.4

Proposed Outdoor Amenity	Location	sq.m.	sq.f.
Level 1	*Outdoor*	89.45	963
Total Proposed Amenity		**212.93**	**2,292**

5.0 Vehicular Parking — Zoning By Law 2010-0050

5.3 RESIDENTIAL PARKING REQUIREMENTS (TABLE 5.2 - Residential Parking Requirements):
Apartment Dwelling Units - 1.5 spaces per unit plus 0.25 parking spaces per unit for visitors where more than 4 apartment dwelling units are located.

5.1 **Required Parking Spaces**

	ratio	units	Parking Spaces
Required Residential	1.50	x 85	128
Required Visitor	0.25	x 85	22
Total Parking Spaces			**150**

5.2 **Proposed Parking Spaces**

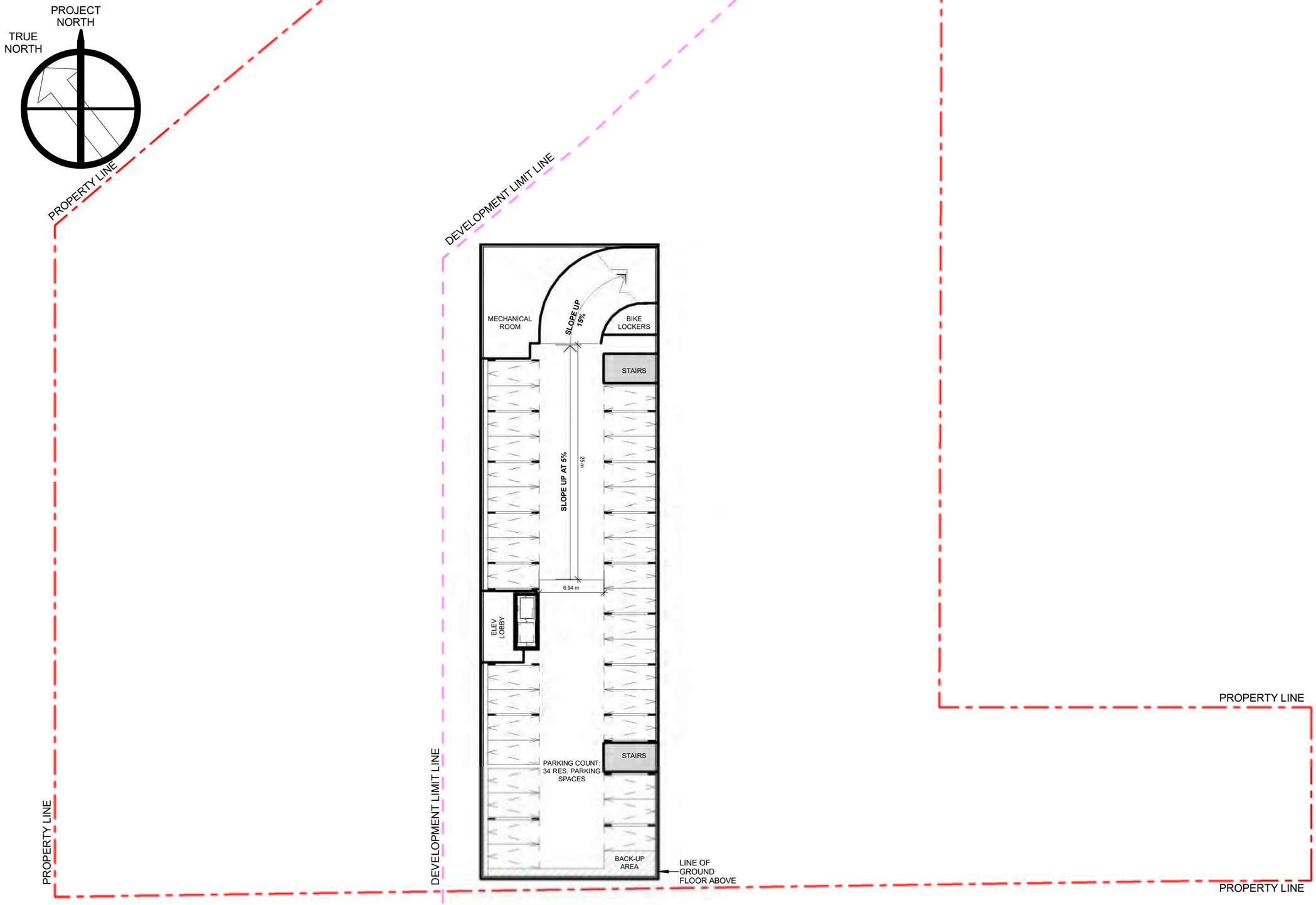
	ratio	units	Parking Spaces
Proposed Residential	1.00	x 85	85
Proposed Visitor	0.15	x 85	13
Total Parking Spaces			**98**

5.3 **Number of Proposed Parking Spaces**

Level	P1	34
Level	1	64
Total Parking Area		**98**

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PARKING FLOOR PLAN

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PROJECT NORTH

TRUE NORTH

PROPERTY LINE

DEVELOPMENT LIMIT LINE

PROPERTY LINE

MOUNTABLE CURB

6.0 m VEHICULAR ROUNDABOUT

SERVICE TRUCK BACK-UP AREA

WASTE STORAGE

3.5 m

EXTERNAL LOADING/WASTE COLLECTION AREA

RAMP DOWN TO UG PARKING

SLOPE AT 15%

SLOPE AT 7.5%

3.95 m

RAMP TO UG PARKING

4 m

19 m

MECH / ELEC ROOM

BIKE STORAGE

STAIRS

EXIT

PATIO

1B
49.64 m²
534 ft²

1B
49.64 m²
534 ft²

1B
49.64 m²
534 ft²

AMENITY
123.48 m²
1329 ft²

4 m

1.8 m

LANDSCAPED AREA

6.74 m

SURFACE PARKING: 6 SPACES

7.0 m DRIVEWAY

7 m

SURFACE PARKING: 25 SPACES

1.5 m

4 m

1.5M SIDEWALK

LANDSCAPED AREA

PARCEL

MAIL RM

LOUNGE

11.8 m

DISTANCE TO FIRE ROUTE

DROP OFF

FIRE ROUTE

79.35M

LOBBY

VEST

CACF

PRINCIPLE ENTRANCE

ELEV LOBBY

2B+D
77.60 m²
835 ft²

2B
69.73 m²
751 ft²

3 m

3.3 m

5.5 m

7 m

5.5 m

0.2 m

2B+D
74.46 m²
801 ft²

1.8 m

EXIT

STAIRS

1B
44.70 m²
481 ft²

3B
91.03 m²
980 ft²

3B
90.95 m²
979 ft²

1 m

3 m

19 m

3 m

1.8M SIDEWALK

SURFACE PARKING: 7 SPACES

PROPERTY LINE

1.5M SIDEWALK

1.5 m

2.75 m

PARALLEL PARKING : 6 SPACES

PROPOSED SURFACE PARKING ON GROUND LEVEL:

64 PARKING SPACES

7 m

7.0 m DRIVEWAY

FIRE ROUTE

MAIN VEHICULAR ENTRANCE

5.5 m

SURFACE PARKING: 19 SPACES

PROPERTY LINE

DEVELOPMENT LIMIT LINE

PROPERTY LINE

LEVEL 1 FLOOR PLAN

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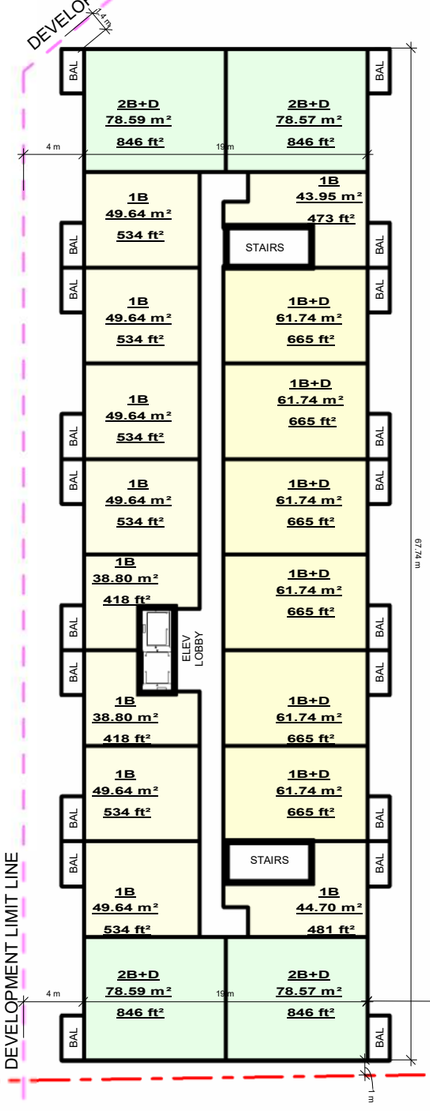
PROJECT NORTH

TRUE NORTH

PROPERTY LINE

PROPERTY LINE

DEVELOPMENT LIMIT LINE



PROPERTY LINE

PROPERTY LINE

DEVELOPMENT LIMIT LINE

PROPERTY LINE

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LEVEL 2-4 FLOOR PLAN

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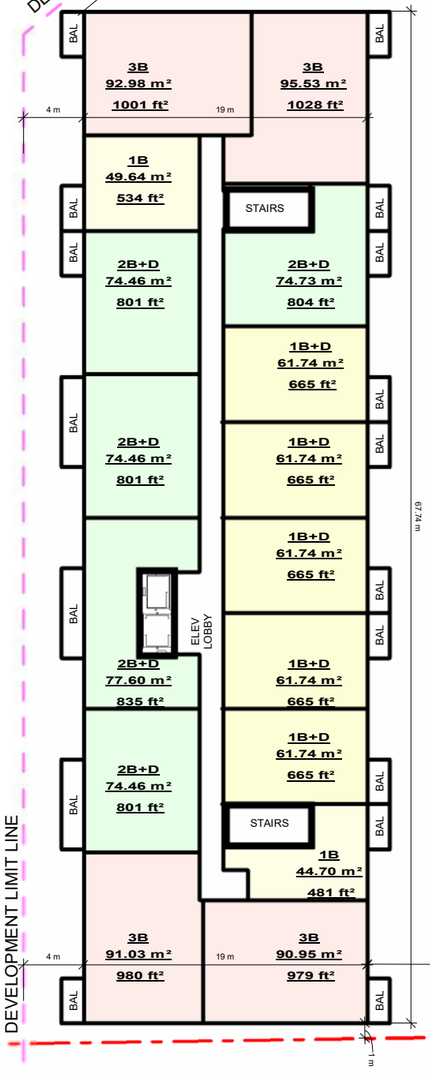
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PROJECT NORTH

TRUE NORTH

PROPERTY LINE

DEVELOPMENT LIMIT LINE



PROPERTY LINE

PROPERTY LINE

DEVELOPMENT LIMIT LINE

PROPERTY LINE

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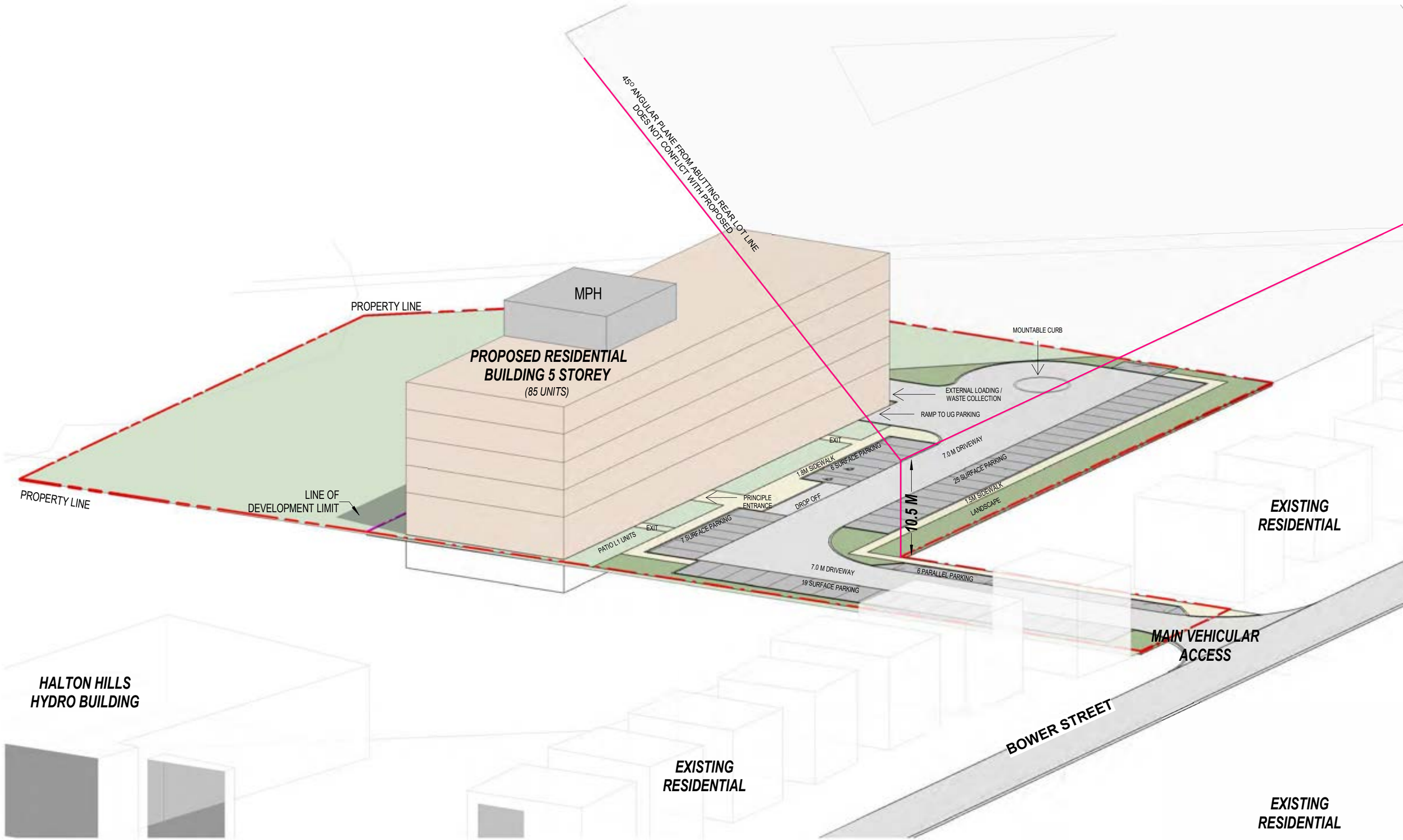
LEVEL 5 FLOOR PLAN

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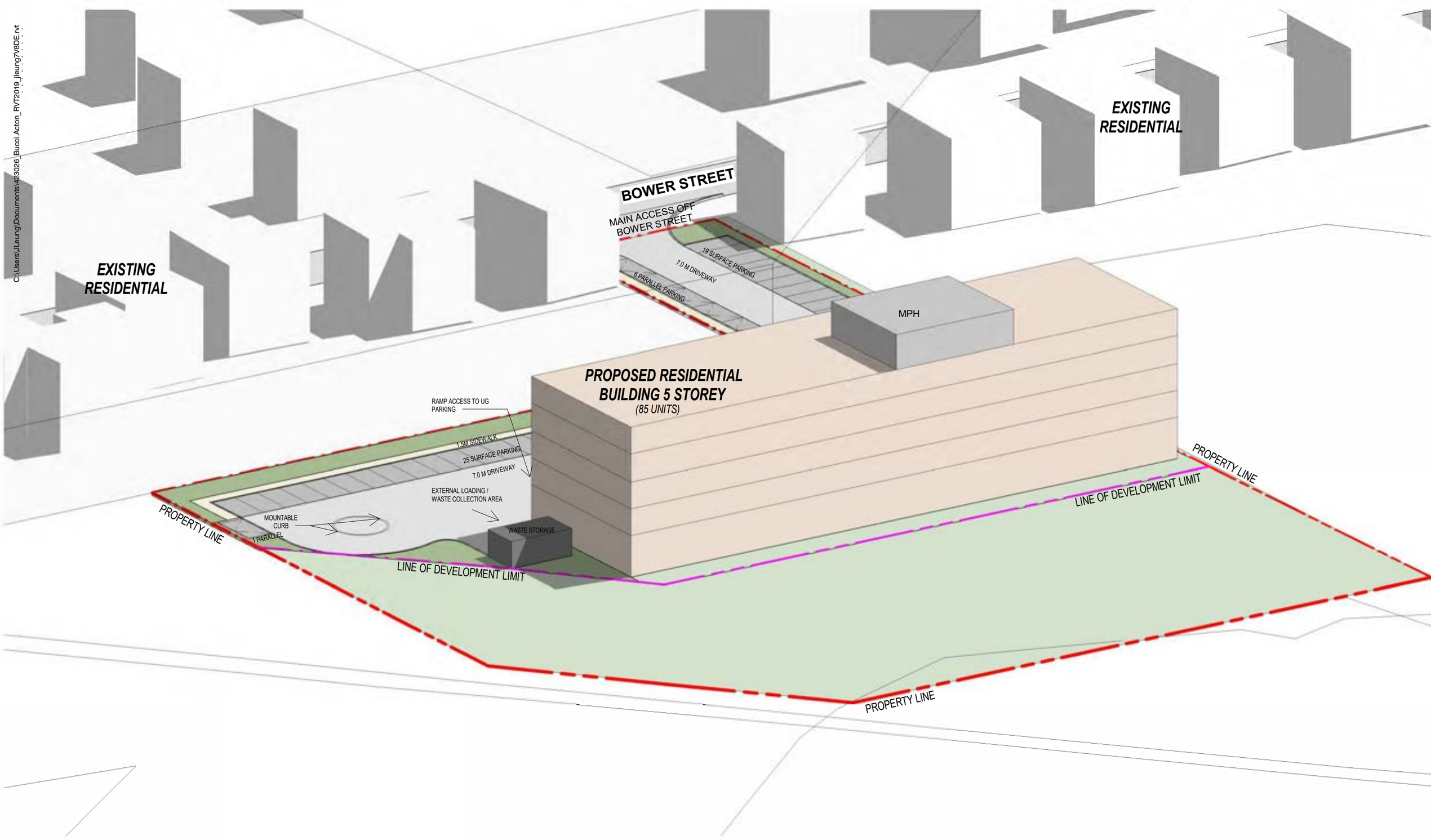
BUCCI - 423026
97 BOWER STREET, ACTON, ON

MASSING VIEW

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MASSING VIEW

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Appendix B: Borehole Logs

Palmer

LOG OF BOREHOLE BH24-01

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Soild Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 1, 2024

ENCL NO.: 1

BH LOCATION: See Borehole Location Plan N 4831665.53 E 577416.54

(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.6	Ground Surface											
350.0	**TOPSOIL:** 80mm						Concrete					
0.1	**FILL:** silty sand, trace clay, trace gravel, trace organics, brown, moist, very loose to compact.		1	SS	4		Sand		○			
							350					
							Bentonite					
1	contains sandy silt pockets		2	SS	15				○			
							Sand					
						▽	W. L. 349.2 m May 9, 2024					
2	wet		3	SS	11				○			
348.3												
2.3	**SANDY SILT:** trace clay, trace gravel, dilatant, brown, wet to saturated, very loose to loose.		4	SS	5		348		○			
							Screen					
3	contains sand and silt layers		5	SS	3				○			4 45 48 3
							347					
4			6	SS	4				○			
							346					
5			7	SS	9		Bentonite		○			
345.3												
5.3	**END OF BOREHOLE**											

1) 50mm diameter monitoring well was installed upon completion in the borehole.

Water Level Readings:

Date	W. L. Depth (mBGS)
2024-05-09	1.42

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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Palmer

LOG OF BOREHOLE BH24-02

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Solid Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 1, 2024

ENCL NO.: 2

BH LOCATION: See Borehole Location Plan N 4831636.74 E 577437.7

(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.4	Ground Surface											
350.3 0.1	**TOPSOIL:** 70mm						Concrete					
	FILL: sand, trace clay, trace silt, trace organics, brown, moist to wet, loose.		1	SS	7		Sand		○			
							350					
							Bentonite					
1	wet below 0.9m		2	SS	6	▽			○			
348.9							W. L. 349.3 m May 9, 2024					
1.5	**FILL:** silty sand, trace clay, trace gravel, brown, wet to saturated, loose to very loose.		3	SS	5				○			4 77 15 4
2												
			4	SS	3		348		○			
347.4												
3.1	**SANDY SILT:** trace clay, trace gravel, dilatant, brown, wet to saturated, loose.		5	SS	7		Screen		○			
							347					
4			6	SS	8				○			
							346					
5			7	SS	7		Bentonite		○			
345.1												
5.3	**END OF BOREHOLE**											

1) 50mm diameter monitoring well was installed upon completion in the borehole.

Water Level Readings:

Date	W. L. Depth (mBGS)
2024-05-09	1.15

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

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Palmer

LOG OF BOREHOLE BH24-03

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Solid Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 1, 2024

ENCL NO.: 3

BH LOCATION: See Borehole Location Plan N 4831613.98 E 577420.37

ELEV / DEPTH (m)	CLASSIFICATION	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.6	Ground Surface						
350.5 0.1	**TOPSOIL:** Top soil					Concrete	
	FILL: silty sand, trace clay, trace gravel, trace organics, brown, moist, very loose.	1	SS	4		Sand	
349.8						350	
0.8	**FILL:** sand, trace to some silt, trace clay, brown, moist to wet, very loose.	2	SS	3		Bentonite	
348.9						Sand	
1.7	**FILL:** sandy silt, trace gravel, trace clay, dilatant, brown, wet, loose to compact.	3	SS	9		W. L. 349.2 m May 9, 2024	
		4	SS	14		348	
347.5						Screen	
3.1	**FILL:** sandy gravel, trace clay, trace silt, trace cobbles, brown, wet, loose.	5	SS	10		347	
	contains sandy silt layers	6	SS	10			15 25 55 5
345.7						346	
4.9	**SANDY SILT:** trace clay, brown, wet to saturated, loose.	7	SS	7		Bentonite	
345.2							
5.3	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 1.37						

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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Palmer

LOG OF BOREHOLE BH24-04

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Solid Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: Apr 30, 2024

ENCL NO.: 4

BH LOCATION: See Borehole Location Plan N 4831626.36 E 577391.17

(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.1	Ground Surface											
350.0 / 0.1	**TOPSOIL:** 90mm						Concrete					
	FILL: silty sand, trace clay, trace gravel, trace organics, brown, moist, loose to compact.		1	SS	3		Sand					
	wet below 0.8m		2	SS	11		Bentonite W. L. 349.2 m May 9, 2024					
	contains sandy silt layers below 1.5m		3	SS	9		Sand					
							348					
	contains sandy silt layers		4	SS	9							0 35 60 5
347.0 / 3.1	**SANDY SILT:** trace clay, dilatant, contains silt seams, brown, wet, loose.		5	SS	9		Screen					
			6	SS	6		346					
			7	SS	6		Bentonite					
344.8 / 5.3	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 0.9											

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

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Palmer

LOG OF BOREHOLE BH24-05

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Solid Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: Apr 30, 2024

ENCL NO.: 5

BH LOCATION: See Borehole Location Plan N 4831596.48 E 577429.53

ELEV / DEPTH (m)	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.5	Ground Surface							
350.4 / 0.1	**TOPSOIL:** 70mm					Concrete		
	FILL : sandy silt, trace clay, trace gravel, trace organics, brown, moist, loose.		1	SS	5	Sand	350	
349.7						Bentonite		
0.8	**FILL :** silty sand, trace clay, trace gravel, trace organics, greyish brown, wet, loose to compact.		2	SS	8			
						Sand		
						W. L. 349.1 m May 9, 2024		
	contains rock debris below 1.8m		3	SS	15			
	---------- brown, wet to saturated		4	SS	22		348	
347.4						Screen		
3.1	**FILL:** sandy gravel, trace clay, trace silt, brown, moist to wet, compact.		5	SS	21		347	
			6	SS	13			23 37 31 9
345.9	contains gravelly sand and gravelly silt layers						346	
4.6	**FILL:** sandy silt, trace clay, trace gravel, contains plastic pieces, dilatant, brown, moist to wet, loose.		7	SS	9	Bentonite		
345.1								
5.3	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 1.36							

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

0 SOIL JOCAVATES 0101 CONTRACT DATE FORMAT HIGH LOGO AUS PALMER ACAD 83NA LOG 2402401 GPJ BH LOGS 2024 0809 GPJ 4 23 25

Palmer

LOG OF BOREHOLE BH24-06

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Solid Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 150 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 1, 2024

ENCL NO.: 6

BH LOCATION: See Borehole Location Plan N 4831564.67 E 577473.61

ELEV / DEPTH (m)	CLASSIFICATION	NUMBER	TYPE	BLOWS / 0.3 m "N"	ELEVATION
351.3	Ground Surface				
350.9 / 0.1	**TOPSOIL:** 80mm				Concrete
	FILL: silty sand mixed with clayey silt pockets, some gravel, contains asphalt debris, brown, moist, compact.	1	SS	13	Sand
350.5 / 0.8	**FILL:** silty sand, trace to some gravel, trace clay, trace organics, contains rock debris, greyish brown, moist, compact to loose.	2	SS	25	Bentonite
	contains concrete pieces	3	SS	10	Sand
349.0 / 2.3	**FILL:** sand, trace to some gravel, trace clay, trace silt, brown, moist to wet, compact.	4	SS	11	349
348.3 / 3.1	**FILL:** silty sand, trace clay, trace gravel, brown, wet to saturated, loose.	5	SS	10	Screen W. L. 348.1 m May 9, 2024
347.0 / 4.3	**SANDY SILT:** trace clay, contains sand seams, dilatant, brown, wet to saturated, compact to loose.	6	SS	14	347
		7	SS	6	Bentonite
346.0 / 5.3	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 3.24				346

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL
	9	72	15	4

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH24-07

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 2, 2024

ENCL NO.: 7

BH LOCATION: See Borehole Location Plan N 4831650.26 E 577417.51

(m) ELEV / DEPTH	CLASSIFICATION	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.4	Ground Surface										
350.0 / 0.0	**TOPSOIL:** 60mm					Concrete					
349.9 / 0.1	**FILL:** silty sand, trace gravel, trace organics, brown, moist, moist to wet, loose to compact.	1	SS	7		Sand					
	wet below 0.8m	2	SS	9	▽	350					
	containis sandy silt layers	3	SS	10		W. L. 349.2 m May 9, 2024					
	contains coarse sand layers	4	SS	14		348					
347.3											
3.1	**SANDY SILT:** trace clay, brown, wet to saturated, loose to very loose.	5	SS	7		347					
		6	SS	2		346					
344.7						345					
5.7	**SILT:** trace clay, trace sand, dilatant, brown, wet, very loose.					Bentonite					
		7	SS	2		344					
	saturated	8	SS	55		343					Spoon boucing
						342					
		9	SS	15		341					

Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

D:\SKI JACK\FEB 2013 CORRECT DATE FORMAT HIGH LOGS.GLB
PALMER.PCN - 8/8/24 - LOG: 2402401 - I:\E POWER BI\ - BH LOGS 2024\2803.GPJ - 4.3.24.3

LOG OF BOREHOLE BH24-07

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 2, 2024

ENCL NO.: 7

BH LOCATION: See Borehole Location Plan N 4831650.26 E 577417.51

(m) ELEV / DEPTH	CLASSIFICATION (Continued)	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
340.2												
10.2	**SANDY SILT TILL:** trace to some clay, trace gravel, contains dilatant silt layers, brown, wet, compact to very dense.						340					
11			10	SS	22				○			
							339					
12							Sand					
			11	SS	50/ initial 100mm		338					Spoon boucing
13							337					
							Screen					
14	contains sand and silt layers		12	SS	50/ 75mm				○			6 43 44 7
335.8							336					
14.6	**CLAYEY SILT TILL:** sandy, trace gravel, trace rock fragments, grey, moist to wet, hard.											
15												
335.0			13	SS	50/ initial 100mm		Bentonite		○			
15.3	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 1.2											Spoon boucing

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

I:\SOIL JOCs\JOCs\2024\2402401 - 97 BOWER ST, ACTON\4 - REPORT\1 - LOGS\2402401 - 97 BOWER ST - BH LOGS - 2024-06-03.GPJ - 4.328.25 - PALMER JOCs - 8.8.0.6 - LOG - 2402401 - 97 BOWER ST - BH LOGS - 2024-06-03.GPJ - 4.328.25

Palmer

LOG OF BOREHOLE BH24-08

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 1, 2024

ENCL NO.: 8

BH LOCATION: See Borehole Location Plan N 4831644.63 E 577455.82

(m) ELEV / DEPTH	CLASSIFICATION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
350.2	Ground Surface									
350.0 / 0.1	**TOPSOIL:** 80mm				Concrete					
	FILL: silty sand, clayey, trace gravel, trace organics, greyish brown, moist, very loose to loose.	1	SS	1	Sand					
	moist to wet	2	SS	5	W. L. 349.2 m May 9, 2024					
348.7 / 1.5	**FILL:** silty sand, trace clay, trace gravel, trace organics, brown, wet, loose.	3	SS	7	348					
		4	SS	10	Bentonite					
		5	SS	8	347					
					346					
345.6 / 4.6	**SILT:** trace sand, trace to some clay, dilatant, brown, wet to saturated, loose to compact.	6	SS	6	Sand					0 5 91 4
					345					
					Screen					
	wet below 6.1m	7	SS	15	344					
343.5 / 6.7	**END OF BOREHOLE** 1) 50mm diameter monitoring well was installed upon completion in the borehole. Water Level Readings: Date W. L. Depth (mBGS) 2024-05-09 0.96				Bentonite					
		8	SS	11	342					

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ε=3% Strain at Failure

I:\SOIL JOCs\JOCs FY23 - CONTRACT DATE\PROJECT HIGH\ LOGS.GLB
PALMER.PCN - 6.8.8.8 - LOG: 2402401 - LIB: PALMER.GLB - BH LOGS: 2024-09-03.GPJ - 4.3.2.2

Palmer

LOG OF BOREHOLE BH24-09

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: May 2, 2024

ENCL NO.: 9

BH LOCATION: See Borehole Location Plan N 4831634.73 E 577402.62

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"							GR SA SI CL
350.6	Ground Surface											
350.5 / 0.1	**TOPSOIL:** 90mm											
	FILL: sand, trace clay, trace silt, trace gravel, trace organics, brown, moist, loose to compact.		1	SS	6		350					
1	moist to wet		2	SS	10							
	wet below1.5m		3	SS	8		349					
2			4	SS	14		348					Wet spoon below
3			5	SS	22		347					
4												
346.0												
4.6	**SANDY SILT:** trace clay, dilatant, brown, wet to saturated, very loose.		6	SS	4		346					
5												
344.9												
5.6	**SILT:** trace to some sand, trace clay, dilatant, brown, wet, very loose.						345					
6			7	SS	2							
7							344					
343.4												
7.2	**SANDY SILT TILL:** trace to some clay, trace gravel, contains dilatant silt seams, brown, moist, dense.						343					
8			8	SS	32							
342.3												
8.2	**END OF BOREHOLE**											

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

0:\DOC_DOCUMENTS (101)_CONTRACT DATE_FORMAT_HIGH LOGO.GLB
PALMER_BOH_BRGR_LOGO_2402401_V8_BOWER.GLB - BH LOGS 2024.08.03.GPJ 4.3.2.2

LOG OF BOREHOLE BH24-10

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: Apr 30, 2024

ENCL NO.: 10

BH LOCATION: See Borehole Location Plan N 4831603.9 E 577435.27

(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
350.5	Ground Surface						
350.4	**TOPSOIL:** 100mm						
0.1	**FILL:** sandy silt, trace clay, trace gravel, trace organics, brown, moist to wet, very loose.		1	SS	4		
349.8							
0.7	**FILL:** silty sand, trace clay, trace gravel, brown, wet, very loose.		2	SS	2		
349.1							
1.5	**FILL:** sandy silt, trace clay, trace gravel, brown, moist to wet, very loose.		3	SS	3		
348.3							
2.2	**FILL:** sand and gravel, trace clay, trace silt, trace organics, brown, wet, compact.		4	SS	23		
			5	SS	19		
345.9							
4.6	**SANDY SILT:** trace clay, trace gravel, dilatant, brown, wet, loose		6	SS	7		
344.9							
5.6	**SILT:** trace to some clay, trace sand, dilatant, brown, wet, very loose to dense.		7	SS	4		
			8	SS	31		
			9	SS	11		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
- ○ UNCONFINED
- ● QUICK TRIAXIAL
- + FIELD VANE & Sensitivity
- × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

0:\SOIL JOCS\JOCS 2013 CONTRACT DATE FORMAT YEAR\JOCS 4.3.8-23 PALMER.PCN - 8/8/24 - LOG - 2402401 - I:\E POWER BI\ - BH LOGS - 2024\2024-08-08 GPJ - 4.3.8-23

LOG OF BOREHOLE BH24-10

PROJECT: Geotechnical Investigation - 97 Bower Street

CLIENT: 759509 Ontario Inc.

Method: Hollow Stem Augers

PROJECT LOCATION: Acton, Ontario

Diameter: 200 mm

REF. NO.: 2402401

DATUM: Geodetic

Date: Apr 30, 2024

ENCL NO.: 10

BH LOCATION: See Borehole Location Plan N 4831603.9 E 577435.27

(m) ELEV / DEPTH	CLASSIFICATION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued											
	SILT: trace to some clay, trace sand, dilatant, brown, wet, very loose to dense.(Continued)						340					
11			10	SS	24				○			
338.8							339					
11.7	**CLAYEY SILT TILL:** sandy, trace gravel, contains rock fragments, grey, wet, hard.											
12			11	SS	93/ 125mm		338		○			Spoon bouncing
337.4												
13.1	**CLAYEY SILT TILL/SHALE COMPLEX:** sandy, trace gravel, contains rock/shale fragments, grey, wet, hard.											Auger grinding
			12	SS	50/ initial 125mm		337		○			Spoon bouncing
14												
							336					
15												
335.1			13	SS	50/ intial 125mm							Spoon bouncing
15.4	**END OF BOREHOLE**											

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

I:\SOIL JOCs\JOCs\2024\2402401 - 97 BOWER ST, ACTON\4 - REPORT\1 - LOGS\2402401 - 97 BOWER ST - BH LOGS - 2024-05-03.GPJ - 4.328.23

REFERENCE No.: T040153e2 ENCLOSURE No.: 1

iNSPEC·SOL

BOREHOLE No.: BH1/MW1
ELEVATION: 351.29 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

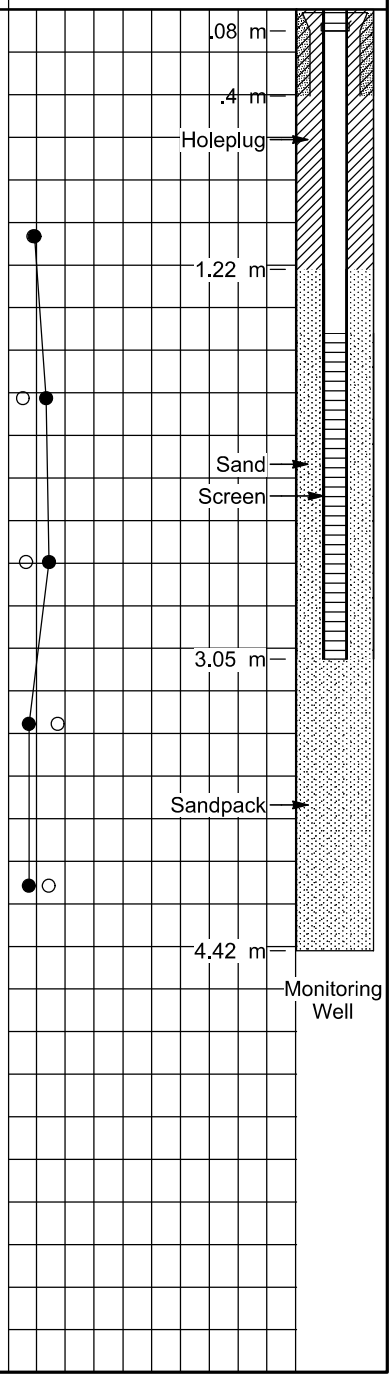
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 351.29	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
	0.08	351.21		ASPHALT : 75 mm						
	0.23	351.06		GRANULAR MATERIAL : 150 mm						
1				FILL : SAND AND GRAVEL, brown, moist, loose						
2										
3	1.0					SS-1	1.0	9	2-4-5-6	9
4										
5	1.52	349.77		NATIVE : SAND, some gravel, brown, moist to dry, compact						
6						SS-2	0.9	5	5-6-7-7	13
7	2.0									
8						SS-3	1.0	6	7-6-8-7	14
9										
10	3.0									
	3.05	348.24		trace silt and gravel, saturated, loose						
11						SS-4	0.8	17	3-3-4-5	7
12										
	3.81	347.48		SILT, trace sand, brown, wet, loose						
13	4.0					SS-5	0.9	14	3-3-4-6	7
14										
	4.42	346.87		**END OF BOREHOLE**						
15				End of Borehole at 4.42 m depth bgs Borehole caved at 3.05 m depth bgs Monitoring well installed bgs denotes 'below ground surface'						
16										
17	5.0									
18										
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
Atterberg limits (%) W_p W_l
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 2

iNSPEC·SOL

BOREHOLE No.: BH2
ELEVATION: 350.80 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 350.80	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N	Shear test (Cu) △ Field, Sensitivity (S) □ Lab, ○ Water content (%), Atterberg limits (%) W_p W_l, ● "N" Value (blows / 12 in.-30 cm) 10 20 30 40 50 60 70 80 90
	0.08	350.72		ASPHALT : 75 mm							
	0.23	350.57		GRANULAR MATERIAL : 150 mm							
1				FILL : SAND AND GRAVEL, brown, moist, very loose							
2											
3	1.0					SS-1	1.4	9	2-2-1-2	3	●○
4											
5	1.52	349.28		moist to wet							
	1.72	349.08		black staining at top 1.72 m , wet, compact		SS-2	1.9	5	4-10-5-6	15	○●
6											
7	2.0										
	2.29	348.51		wet							
8						SS-3	1.3	9	3-2-7-9	9	●
9											
10	3.0										
	3.05	347.75		trace gravel							
11						SS-4	0.9	21	3-5-6-11	11	●○
12	3.66	347.14									
13	4.0			**END OF BOREHOLE**							
14				End of Borehole at 3.66 m depth bgs							
15				Borehole remained open and dry upon completion							
16				Borehole backfilled with holeplug and auger cuttings							
17	5.0			bgs denotes 'below ground surface'							
18											
19											
20	6.0										

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 3

INSPEC·SOL

BOREHOLE No.: BH3
ELEVATION: 350.52 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 5, 2008 DATE (FINISH): August 5, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.52		GROUND SURFACE			ppm			N
	0.08	350.44		TOPSOIL : 75 mm						
1				FILL : SANDY SILT, rootlets, brown, moist, loose		SS-1	0.7	11	7-4-5	9
2										
	0.76	349.76								
3	1.0			SILTY SAND, some gravel, trace clay, red/brown, moist, compact		SS-2	0.6	11	7-10-5	15
4										
5	1.52	349.00		NATIVE : CLAYEY SILT, red/brown, saturated, loose		SS-3	0.5	19	5-5-4	9
6										
	2.0									
7										
8						SS-4	0.8	19	5-5-6-7	11
9										
10	3.0									
11						SS-5	0.9	16	3-2-3-6	5
12										
13	4.0					SS-6	0.7	20	5-6-6-9	12
14										
15	4.57	345.95		SILTY SAND, red/brown, saturated, compact						
16	5.0					SS-7	0.6	16	6-6-6-7	12
17	5.18	345.34		**END OF BOREHOLE**						
18				End of Borehole at 5.18 m depth bgs						
19				Water level at 3.66 m depth bgs upon completion						
20	6.0			Borehole caved at 4.42 m depth bgs						
				Borehole backfilled with holeplug and auger cuttings						
				bgs denotes 'below ground surface'						

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

WL 3.66 m ▼ 8/5/2008

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 4

iNSPEC·SOL

BOREHOLE No.: BH4
ELEVATION: 350.33 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.33		GROUND SURFACE			ppm			N
	0.08	350.25		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, moist, loose		SS-1	0.5	17	2-2-2-4	4
2	0.76	349.57		NATIVE : SANDY SILT, brown, wet, loose to compact						
3	1.0					SS-2	0.4	21	4-4-5-7	9
4										
5										
6						SS-3	0.7	19	5-5-6-12	11
7	2.0									
8										
9						SS-4	0.8	21	3-5-7-8	12
10	3.0									
11	3.35	346.98		hard layer		SS-5	0.7	--	5-50/50mm	R
12	3.81	346.52								
13	4.0			**END OF BOREHOLE**						
14				End of Borehole at 3.81 m depth bgs upon spoon refusal						
15				Borehole remained dry upon completion						
16				Borehole caved at 2.80 m depth bgs						
17	5.0			Borehole backfilled with holeplug and auger cuttings						
18				bgs denotes 'below ground surface'						
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

REFERENCE No.: T040153e2 ENCLOSURE No.: 5

INSPEC·SOL

BOREHOLE No.: BH5
ELEVATION: 350.37 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 5, 2008 DATE (FINISH): August 5, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.37		GROUND SURFACE			ppm			N
	0.08	350.29		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, dry, very loose		SS-1	5.9	5	2-1-1-2	2
2	0.76	349.61		NATIVE : SAND, trace gravel, brown, dry, loose to compact						
3	1.0					SS-2	1.6	9	4-5-6-8	11
4										
5	1.52	348.85		SILT, trace clay, brown, dilated, saturated, compact						
6						SS-3	0.5	14	5-5-10-14	15
7	2.0									
	2.29	348.08		trace clay, loose						
8						SS-4	0.9	25	4-4-3-5	7
9										
10	3.0									
11						SS-5	3.7	17	5-3-3-3	6
12										
	3.81	346.56		CLAYEY SILT, grey/brown, wet to saturated, loose						
13	4.0					SS-6	4.8	22	4-4-3-2	7
14										
	4.42	345.95		**END OF BOREHOLE**						
15				End of Borehole at 4.42 m depth bgs						
16				Water level at 2.90 m depth bgs						
17	5.0			Borehole caved at 2.90 m depth bgs						
18				Borehole backfilled with auger cuttings and holeplug						
19				bgs denotes 'below ground surface'						
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

WL 2.90 m ▼
8/5/2008

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 6

INSPEC·SOL

BOREHOLE No.: BH6
ELEVATION: 350.47 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 5, 2008 DATE (FINISH): August 5, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
		350.47		GROUND SURFACE						
	0.08	350.39		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, dry, loose to compact		SS-1	0.7	10	4-5-5-5	10
2										
	0.76	349.71		trace gravel, dry to moist						
3	1.0					SS-2	0.7	15	5-3-4-5	7
4										
5	1.52	348.95		NATIVE : SAND, trace to some gravel, medium sand, brown/red, wet, compact		SS-3	0.6	18	4-5-6-7	11
6	2.0									
7										
8						SS-4	0.8	13	4-6-7-9	13
9										
10	3.0									
11						SS-5	0.8	13	7-7-9-9	16
12										
13	4.0									
14	4.32	346.15		cobbles		SS-6	0.6	11	6-6-10-14	16
15						SS-7A	0.6	19	9-12-9-11	21
16										
	5.0					SS-7B	0.4	20	--	--
	5.08	345.39								
17	5.18	345.29		SILT, red/brown, dilated, saturated						
18				**END OF BOREHOLE**						
19				End of Borehole at 5.18 m depth bgs Water level at 3.66 m depth bgs Borehole caved at 4.27 m depth bgs Borehole backfilled with auger cuttings and holeplug bgs denotes 'below ground surface'						
	6.0									
20										

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

WL 3.66 m — 8/5/2008 ▼

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 2

INSPEC·SOL

BOREHOLE No.: MW2
ELEVATION: 350.56 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

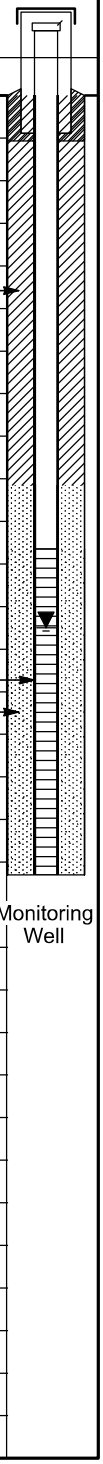
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
		350.56		GROUND SURFACE						
	0.08	350.48		TOPSOIL : 75 mm FILL : SILTY SAND, rootlets, brown, moist, loose		SS-1	0.4	17	2-1-3-2	4
	0.76	349.80		NATIVE : SILTY CLAYEY SAND, trace gravel, brown, moist, loose to very loose		SS-2	0.5	10	2-2-2-2	4
	1.0					SS-3	0.8	21	3-3-3-3	6
	2.0									
	2.29	348.27		SILTY SAND, trace gravel, light brown, wet		SS-4	0.6	18	5-9-9-8	18
	3.0									
	3.05	347.51		SILT, trace sand, light brown, wet, compact		SS-5	0.4	19	4-8-9-7	17
	3.66	346.90		**END OF BOREHOLE** End of Borehole at 3.66 m depth bgs Borehole remained open upon completion Water level at 2.50 m depth bgs Monitoring well installed bgs denotes 'below ground surface'						
	4.0									
	5.0									
	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
Atterberg limits (%) W_p W_l
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 3

INSPEC·SOL

BOREHOLE No.: MW3
ELEVATION: 350.12 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

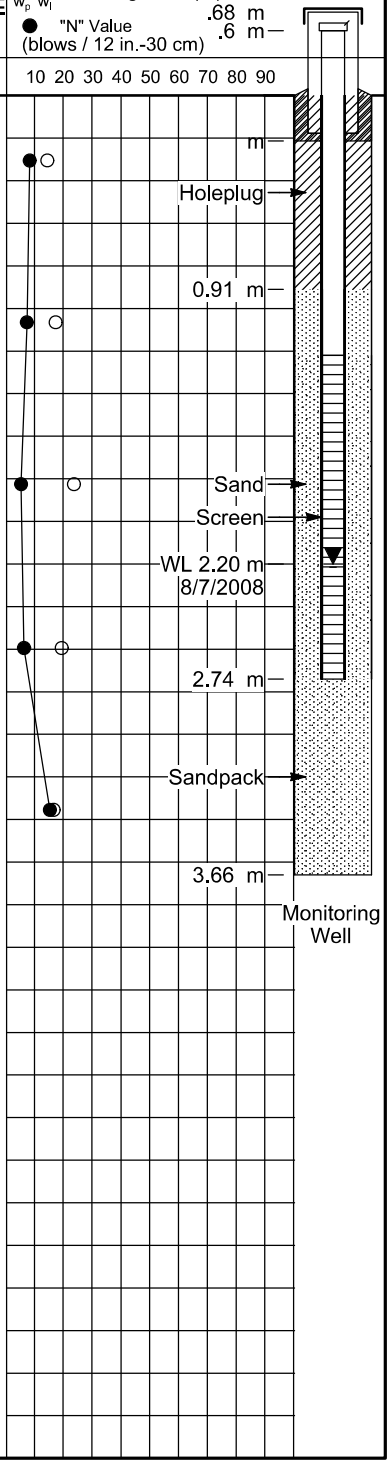
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 350.12	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
	0.08	350.04		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, brown/grey, moist to wet, loose, gravel on tip		SS-1	0.7	14	2-4-4-9	8
2										
	0.76	349.36		trace to some gravel, grey, wet						
3	1.0					SS-2	0.9	17	4-4-3-1	7
4										
5	1.52	348.60		SILTY COARSE SAND, trace wood, grey, wet						
6						SS-3	1.3	23	1-3-2-2	5
7	2.0									
	2.29	347.83		NATIVE : CLAYEY SILT, trace sand, brown/red, saturated, loose						
8						SS-4	0.8	19	2-2-4-5	6
9										
10	3.0									
	3.20	346.92		compact						
11						SS-5	0.7	16	7-8-7-13	15
12	3.66	346.46								
13	4.0			**END OF BOREHOLE**						
14				End of Borehole at 3.66 m depth bgs						
15				Water level at 2.20 m depth bgs						
16				Borehole caved at 2.60 m depth bgs						
17	5.0			Monitoring well installed						
18				bgs denotes 'below ground surface'						
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 4

iNSPEC·SOL

BOREHOLE No.: MW4
ELEVATION: 350.03 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

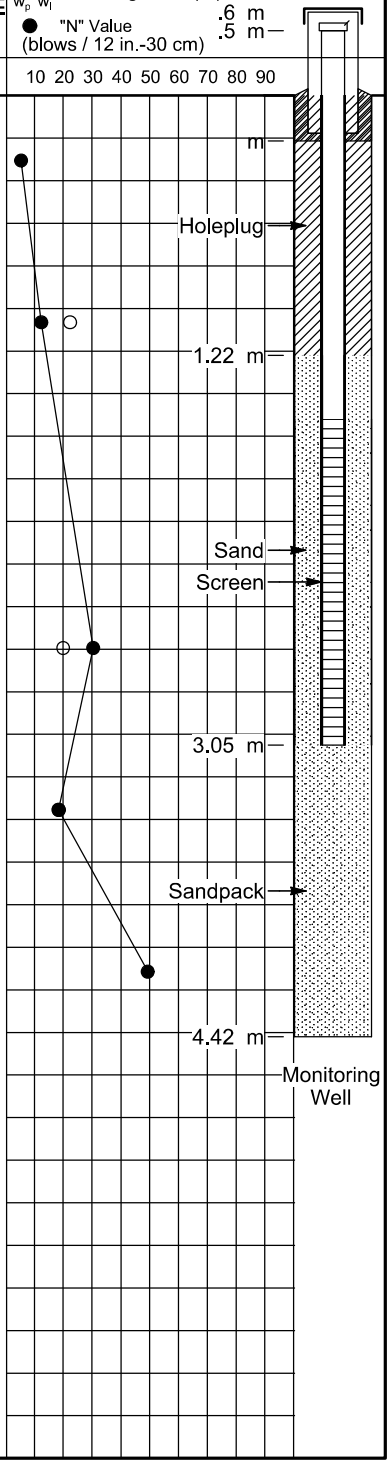
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 350.03	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
	0.08	349.95		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, moist to wet, loose		SS-1	1.1	--	3-3-2-1	5
2										
	0.76	349.27		SILT, trace sand, saturated, red/brown, compact						
3	1.0					SS-2	0.6	22	3-5-7-8	12
4										
5	1.52	348.51		no recovery						
6						SS-3	--	--	2-1-4-8	R
7	2.0									
	2.29	347.74		NATIVE : SANDY SILT, brown, saturated, compact to dense						
8						SS-4	0.6	20	1-4-26-26	30
9										
10	3.0 3.05	346.98		SILT, trace sand/clay, brown, saturated, compact						
11						SS-5	0.9	18	6-8-10-12	18
12										
	3.81	346.22		dense, trace gravel						
13	4.0									
14						SS-6	0.6	--	26-31-18-11	49
	4.42	345.61								
15				**END OF BOREHOLE**						
16				End of Borehole at 4.42 m depth bgs Borehole remained dry upon completion Borehole caved at 3.05 m depth bgs Monitoring well installed bgs denotes 'below ground surface'						
17	5.0									
18										
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
Atterberg limits (%) W_p W_l
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 5

iNSPEC·SOL

BOREHOLE No.: MW5
ELEVATION: 350.26 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 6, 2008 DATE (FINISH): August 6, 2008

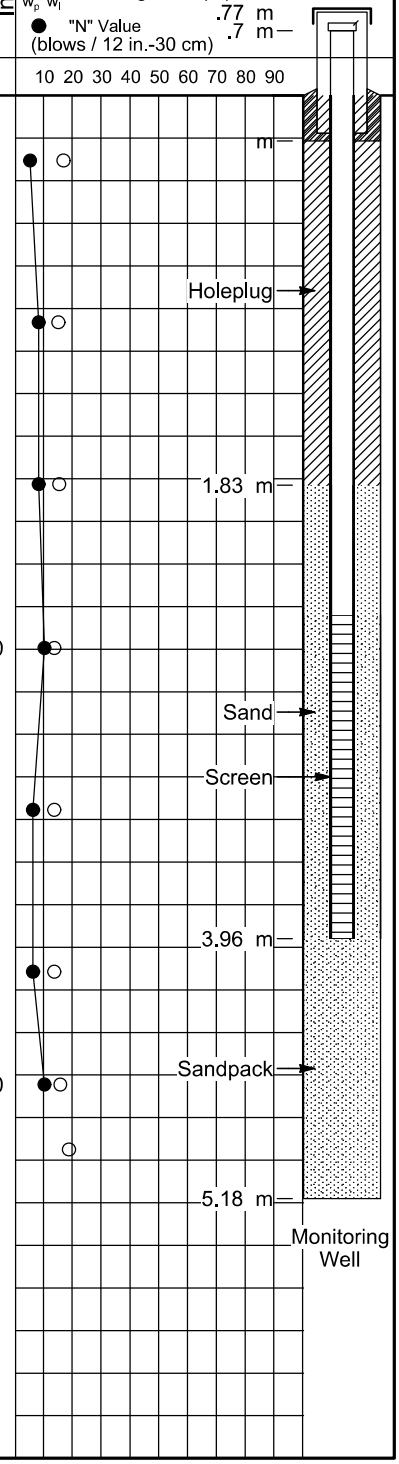
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.26		GROUND SURFACE			ppm			N
	0.08	350.18		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, moist, loose		SS-1	0.9	17	3-3-2-4	5
2										
	0.76	349.50		trace gravel, wet						
3	1.0					SS-2	0.6	15	4-4-4-6	8
4										
5	1.52	348.74		SAND, trace gravel, teace silt, red/brown, wet						
6						SS-3	0.8	15	3-4-4-5	8
7	2.0									
	2.29	347.97		no recovery						
8						SS-4	--	13	18-5-5-3	10
9										
10	3.0									
	3.05	347.21		NATIVE : SAND AND SILT, red/brown, saturated, medium sand, loose						
11						SS-5	0.6	13	8-3-3-2	6
12										
13	4.0					SS-6	0.8	13	3-3-3-5	6
14										
15	4.57	345.69		compact to loose		SS-7A	0.8	16	9-5-5-7	10
	4.73	345.53		CLAYEY SILT, grey to brown/red, wet to moist, loose to compact						
16	5.0					SS-7B	0.7	19	--	--
17	5.18	345.08		**END OF BOREHOLE**						
18				End of Borehole at 5.18 m depth bgs						
19				Borehole open and dry upon completion						
20	6.0			Monitoring well installed						
				bgs denotes 'below ground surface'						

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 6

iNSPEC·SOL

BOREHOLE No.: MW6

ELEVATION: 350.33 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.

PROJECT: Phase II Environmental Site Assessment

LOCATION: 97 Bower Street, Acton, Ontario

DESCRIBED BY: A. Loong CHECKED BY: K. Roechner

DATE (START): August 5, 2008 DATE (FINISH): August 5, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.33		GROUND SURFACE			ppm			N
	0.08	350.25		TOPSOIL : 75 mm						
1				FILL : SANDY SILT, rootlets, brown, moist, loose to very loose		SS-1	0.6	15	2-2-2-3	4
2										
	0.76	349.57		SAND, trace silt, red/brown, wet						
3	1.0					SS-2	0.6	12	3-4-3-4	7
4										
5	1.52	348.81		NATIVE : SILTY SAND, red/brown, saturated, loose		SS-3	0.6	17	6-4-3-3	7
6	2.0									
7										
	2.29	348.04		SILT, trace to some sand, red/brown, dilated, saturated, very loose		SS-4	0.7	18	0-1-2-4	3
8										
9										
10	3.0									
	3.05	347.28		trace gravel, compact		SS-5	0.7	17	4-10-6-7	16
11										
12										
	3.81	346.52		wet cobbles		SS-6	0.7	9	9-14-50/75*	R
13	4.0									
	4.20	346.13								
14				**END OF BOREHOLE**						
15				End of Borehole at 4.20 m depth bgs						
16				Water level at 2.68 m depth bgs						
	5.0			Borehole caved at 3.29 m depth bgs						
17				Borehole backfilled with holeplug and auger cuttings						
18				bgs denotes 'below ground surface'						
19				* denotes 'mm'						
	6.0									
20										

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
Atterberg limits (%) W_p W_l
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

WL 2.68 m — 8/5/2008 ▼

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 7

INSPEC·SOL

BOREHOLE No.: MW7
ELEVATION: 350.17 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 6, 2008 DATE (FINISH): August 6, 2008

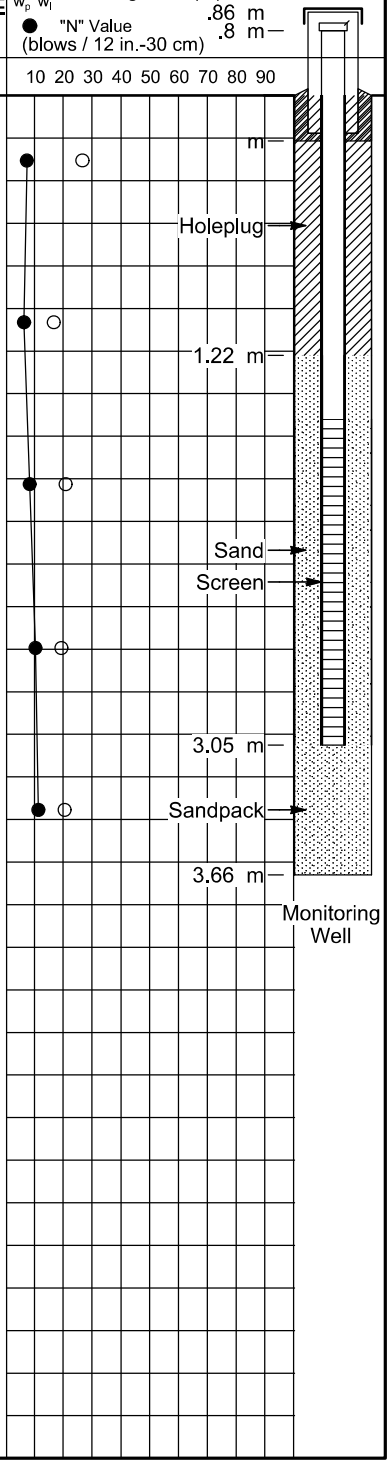
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.17		GROUND SURFACE			ppm			N
	0.08	350.09		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, moist, loose		SS-1	0.8	26	4-3-4-4	7
2										
	0.76	349.41		trace clay, wet, dark staining at bottom 0.15 mm						
3	1.0					SS-2	1.4	16	2-2-4-4	6
4										
5	1.52	348.65		NATIVE : SILTY SAND, brown, moist, loose						
6						SS-3	1.0	21	3-4-4-6	8
7	2.0									
	2.29	347.88		loose to compact						
8										
9						SS-4	0.8	19	3-4-6-8	10
10	3.0									
11						SS-5	1.1	20	6-6-5-8	11
12	3.66	346.51		**END OF BOREHOLE**						
13	4.0			End of Borehole at 3.66 m depth bgs Borehole remained wet and muddy upon completion Borehole caved at 2.13 m depth bgs Monitoring well installed bgs denotes ' below ground surface'						
14										
15										
16										
17	5.0									
18										
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 8

iNSPEC·SOL

BOREHOLE No.: MW8
ELEVATION: 350.40 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 6, 2008 DATE (FINISH): August 6, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.40		GROUND SURFACE			ppm			N
	0.08	350.32		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, trace gravel, rootlets, brown, moist, very loose to loose		SS-1	0.9	17	2-1-3-2	4
2										
	0.76	349.64		wet						
3	1.0					SS-2	0.7	15	2-1-3-5	4
4										
5	1.52	348.88		compact						
6						SS-3	1.0	15	3-8-8-9	16
7	2.0									
	2.29	348.11		NATIVE : SANDY SILT, brown, wet, loose						
8						SS-4	0.9	19	2-3-4-12	7
9										
10	3.0									
	3.05	347.35		trace to some gravel, compact						
11						SS-5	0.9	14	8-7-9-8	16
12	3.66	346.74								
13	4.0			**END OF BOREHOLE**						
14				End of Borehole at 3.66 m depth bgs						
15				Borehole remained open upon completion						
16	5.0			Water level at 2.00 m depth bgs						
17				Monitoring well installed						
18				bgs denotes 'below ground surface'						
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

.75 m
.7 m
m
Holeplug
1.83 m
WL 2.00 m 8/6/2008
Screen
Sand
3.05 m
Sandpack
3.66 m
Monitoring Well

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 9

INSPEC·SOL

BOREHOLE No.: MW9
ELEVATION: 350.38 m

BOREHOLE REPORT

Page: 1 of 2

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 6, 2008 DATE (FINISH): August 6, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 350.38	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
				GROUND SURFACE						
				TOPSOIL, rootlets, brown, moist : 610 mm		SS-1	0.8	11	2-2-3-5	5
	0.61	349.77		FILL : SILTY SAND, trace gravel, brown, moist, compact		SS-2	0.9	14	6-4-9-10	13
	1.52	348.86		NATIVE : medium to coarse SAND, brown, wet, loose to compact		SS-3	1.1	14	5-4-7-9	11
	2.29	348.09		trace gravel		SS-4	1.5	17	5-6-7-11	13
						SS-5	1.1	21	4-12-8-15	20
						SS-6	1.4	15	5-6-13-13	19
						SS-7A	1.5	14	6-10-5-5	15
	4.82	345.56		SILT, brown, saturated, compact		SS-7B	0.9	19	--	--
						SS-8	1.0	20	8-7-4-3	11
	5.95	344.43								

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90

.97 m
.9 m

m
Holeplug
3.35 m
Sand
Screen
WL 4.77 m 8/6/2008
5.34 m
Sandpack
5.95 m

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 9

iNSPEC·SOL

BOREHOLE No.: MW9
ELEVATION: 350.38 m

BOREHOLE REPORT

Page: 2 of 2

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 6, 2008 DATE (FINISH): August 6, 2008

LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index	Shear test (Cu) △ Field, Sensitivity (S) □ Lab, ○ Water content (%), W_p W_l Atterberg limits (%), ● "N" Value (blows / 12 in.-30 cm)
		350.38		GROUND SURFACE			ppm			N	10 20 30 40 50 60 70 80 90
				END OF BOREHOLE End of Borehole at 5.95 m depth bgs Water level at 4.77 m depth bgs Borehole caved at 5.30 m depth bgs Monitoring well installed bgs denotes 'below ground surface'							Monitoring Well
21											
22											
23	7.0										
24											
25											
26	8.0										
27											
28											
29											
30	9.0										
31											
32											
33	10.0										
34											
35											
36	11.0										
37											
38											
39	12.0										

SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 10

INSPEC·SOL

BOREHOLE No.: MW10
ELEVATION: 350.42 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 5, 2008 DATE (FINISH): August 5, 2008

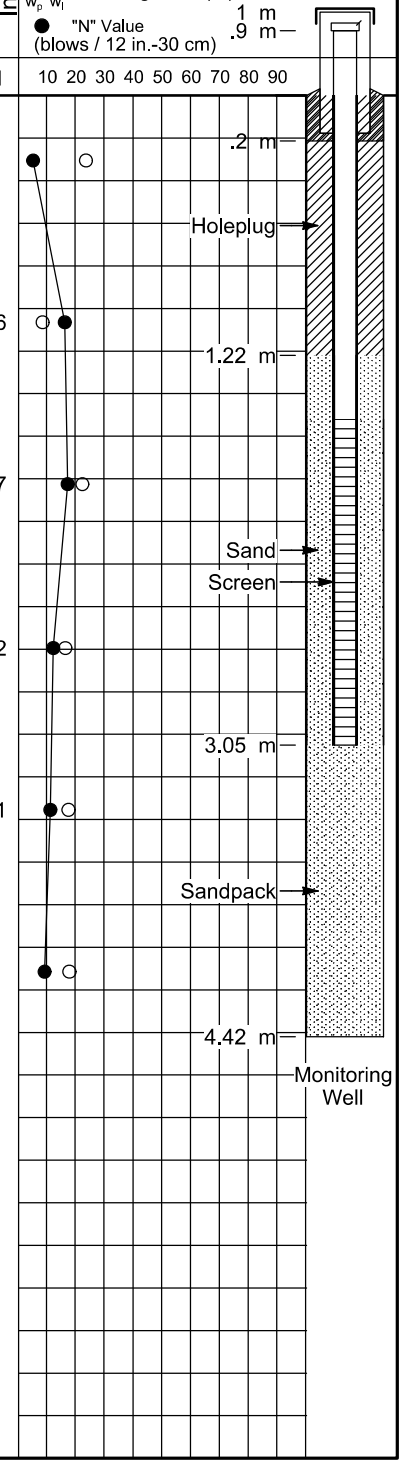
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- ▼ - WATER LEVEL

Depth Feet	Depth Metres	Elevation (m) 350.42	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID ppm	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index N
	0.08	350.34		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, brown, moist to wet, loose to very loose		SS-1	0.5	23	2-2-3-4	5
2	0.76	349.66								
3	1.0			NATIVE : SAND, trace silt, brown, wet, compact, gravel on tip		SS-2	0.8	8	8-7-9-18	16
4										
5	1.52	348.90		SANDY SILT, red/brown, wet to saturated, compact						
6						SS-3	0.7	22	7-7-8-9	17
7	2.0									
8										
9						SS-4	0.7	16	6-7-5-7	12
10	3.0									
11						SS-5	0.9	17	7-5-6-6	11
12										
13	4.0					SS-6	0.7	18	6-4-5-4	9
14										
	4.42	346.00								
15				**END OF BOREHOLE**						
16	5.0			End of Borehole at 4.42 m depth bgs Borehole remained dry upon completion Borehole caved at 3.05 m depth bgs Monitoring well installed bgs denotes 'below ground surface'						
17										
18										
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
Atterberg limits (%) W_p W_l
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

REFERENCE No.: T040153e2 ENCLOSURE No.: 11

iNSPEC·SOL

BOREHOLE No.: MW11
ELEVATION: 350.11 m

BOREHOLE REPORT

Page: 1 of 1

CLIENT: 759509 Ontario Inc.
PROJECT: Phase II Environmental Site Assessment
LOCATION: 97 Bower Street, Acton, Ontario
DESCRIBED BY: A. Loong CHECKED BY: K. Roechner
DATE (START): August 7, 2008 DATE (FINISH): August 7, 2008

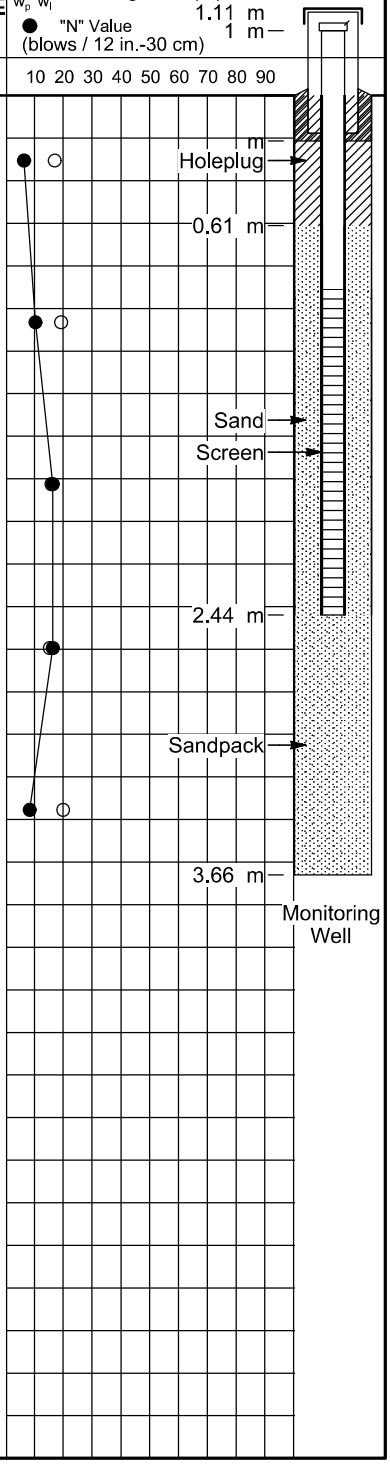
LEGEND

- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RC - ROCK CORE
- WATER LEVEL

Depth Feet	Depth Metres	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	State	Type and Number	PID	Moisture Content	Blows per 6 in. / 15 cm	Penetraion Index
		350.11		GROUND SURFACE			ppm			N
	0.08	350.03		TOPSOIL : 75 mm						
1				FILL : SILTY SAND, rootlets, brown, saturated, loose		SS-1	0.8	17	3-3-3-3	6
2	0.76	349.35		trace gravel, saturated						
3	1.0					SS-2	0.7	19	2-5-5-9	10
4										
5	1.52	348.59		compact						
6						SS-3	0.6	16	7-8-8-12	16
7	2.0									
8	2.29	347.82		trace gravel						
9						SS-4	0.9	15	5-9-7-6	16
10	3.0									
11	3.05	347.06		NATIVE : SANDY SILT, brown, saturated, loose		SS-5	0.8	20	5-4-4-5	8
12	3.66	346.45								
13	4.0			**END OF BOREHOLE**						
14				End of Borehole at 3.66 m depth bgs						
15				Borehole remained dry upon completion						
16	5.0			Borehole caved at 3.00 m depth bgs						
17				Monitoring well installed						
18				bgs denotes 'below ground surface'						
19										
20	6.0									

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
W_p W_l Atterberg limits (%)
● "N" Value (blows / 12 in.-30 cm)

10 20 30 40 50 60 70 80 90



SOIL LOG WITH GRAPH+WELL T040153E2 - BH 1 TO 6, MW 1 TO 10 08-07-08.GPJ INSPEC_SOL.GDT 8/29/08

Appendix C: Groundwater Chemistry Results

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2412099**	Page	: 1 of 13
Client	: **Palmer Environmental Consulting Group Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Nick Schmidt	Account Manager	: Andrew Martin
Address	: 871 Equestrian Court Unit #1 Oakville ON Canada L6L 6L7	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 2402401	Date Samples Received	: 14-May-2024 15:52
PO	: ----	Date Analysis Commenced	: 15-May-2024
C-O-C number	: ----	Issue Date	: 23-May-2024 07:15
Sampler	: BF		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Kaitlyn Lammers	Lab Assistant	Microbiology, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Inorganics, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Metals, Waterloo, Ontario
Niki Goebel	Inorganics Analyst	Metals, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
24- 2	Water	Solids, total suspended [TSS]		HHSUB	STM	17.9 mg/L	15 mg/L
	Water	Manganese, total		HHSUB	STM	0.123 mg/L	0.05 mg/L
	Water	Dichlorobenzidine, 3,3'-		HHSUB	STM	<1.20	

General Comments

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

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

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

Unit	*Description*
µg/L	micrograms per litre
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

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

Sample Comments

Sample	Client Id	Comment
WT2412099-001	24- 2	RRQC/RRR: Recovery for 3,3-Dichlorobenzidine is below ALS control limits. Reporting limits have been raised accordingly.

Qualifiers

Qualifier	Description
BODL	*Limit of Reporting for BOD was increased to account for the largest volume of sample tested.*
RRR	*Refer to report comments for issues regarding this analysis.*

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	----	----	----	----	----	----
				24- 2	----	----	----	----	----	----
			Sampling date/time	14-May-2024 09:30	----	----	----	----	----	----
			Sub-Matrix	Groundwater	----	----	----	----	----	----
				WT2412099-001	--------	--------	--------	--------	--------	--------
Physical Tests										
pH	----	E108/WT	pH units	7.77	----	----	----	----	----	----
Solids, total suspended [TSS]	----	E160/WT	mg/L	17.9	----	----	----	----	----	----
Anions and Nutrients										
Fluoride	16984-48-8	E235.F/WT	mg/L	0.031	----	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/WT	mg/L	0.389	----	----	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/WT	mg/L	0.128	----	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	mg/L	11.3	----	----	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	mg/L	<0.0020	----	----	----	----	----	----
Microbiological Tests										
Coliforms, Escherichia coli [E. coli]	----	E012A.EC/WT	CFU/100 mL	Not Detected	----	----	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/WT	mg/L	0.185	----	----	----	----	----	----
Antimony, total	7440-36-0	E420/WT	mg/L	0.00015	----	----	----	----	----	----
Arsenic, total	7440-38-2	E420/WT	mg/L	0.00343	----	----	----	----	----	----
Beryllium, total	7440-41-7	E420/WT	mg/L	<0.000020	----	----	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	mg/L	0.0000125	----	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	mg/L	0.00050	----	----	----	----	----	----
Cobalt, total	7440-48-4	E420/WT	mg/L	0.00037	----	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	mg/L	0.00466	----	----	----	----	----	----
Iron, total	7439-89-6	E420/WT	mg/L	0.284	----	----	----	----	----	----
Lead, total	7439-92-1	E420/WT	mg/L	0.000377	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	mg/L	0.123	----	----	----	----	----	----
Mercury, total	7439-97-6	E508/WT	mg/L	<0.0000050	----	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/WT	mg/L	0.00994	----	----	----	----	----	----
Nickel, total	7440-02-0	E420/WT	mg/L	0.00150	----	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	mg/L	0.000960	----	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	24- 2	----	----	----	----	----	----
				Sampling date/time	14-May-2024 09:30	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
					WT2412099-001	--------	--------	--------	--------	--------	--------
Total Metals											
Silver, total	7440-22-4	E420/WT	mg/L		<0.000010	----	----	----	----	----	----
Tin, total	7440-31-5	E420/WT	mg/L		0.00019	----	----	----	----	----	----
Titanium, total	7440-32-6	E420/WT	mg/L		0.00519	----	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	mg/L		0.0120	----	----	----	----	----	----
Speciated Metals											
Chromium, hexavalent [Cr VI], total	18540-29-9	E532/WT	mg/L		<0.00050	----	----	----	----	----	----
Aggregate Organics											
Biochemical oxygen demand [BOD]	----	E550/WT	mg/L		<3.0 BODL	----	----	----	----	----	----
Oil & grease (gravimetric)	----	E567/WT	mg/L		<5.0	----	----	----	----	----	----
Oil & grease, animal/vegetable (gravimetric)	----	EC567A.SG/WT	mg/L		<5.0	----	----	----	----	----	----
Oil & grease, mineral (gravimetric)	----	E567SG/WT	mg/L		<5.0	----	----	----	----	----	----
Phenols, total (4AAP)	----	E562/WT	mg/L		0.0018	----	----	----	----	----	----
Volatile Organic Compounds											
Dichlorobenzene, 1,2-	95-50-1	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Dichlorobenzene, 1,4-	106-46-7	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Volatile Organic Compounds [Drycleaning]											
Dichloroethylene, cis-1,2-	156-59-2	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Dichloromethane	75-09-2	E611F/WT	µg/L		<1.0	----	----	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Tetrachloroethylene	127-18-4	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Trichloroethylene	79-01-6	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Volatile Organic Compounds [Fuels]											
Benzene	71-43-2	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Ethylbenzene	100-41-4	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Toluene	108-88-3	E611F/WT	µg/L		<0.50	----	----	----	----	----	----
Xylene, m+p-	179601-23-1	E611F/WT	µg/L		<0.40	----	----	----	----	----	----
Xylene, o-	95-47-6	E611F/WT	µg/L		<0.30	----	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: 24- 2	----	----	----	----	----	----
Sampling date/time				14-May-2024 09:30	----	----	----	----	----	----
Sub-Matrix				Groundwater	----	----	----	----	----	----
				WT2412099-001	--------	--------	--------	--------	--------	--------
Volatile Organic Compounds [Fuels]										
Xylenes, total	1330-20-7	E611F/WT	µg/L	<0.50	----	----	----	----	----	----
Volatile Organic Compounds [THMs]										
Chloroform	67-66-3	E611F/WT	µg/L	<0.50	----	----	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611F/WT	%	100	----	----	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611F/WT	%	96.4	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Acenaphthylene	208-96-8	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Anthracene	120-12-7	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	µg/L	<0.0050	----	----	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Chrysene	218-01-9	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	µg/L	<0.0050	----	----	----	----	----	----
Fluoranthene	206-44-0	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Fluorene	86-73-7	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
Naphthalene	91-20-3	E641A/WT	µg/L	<0.050	----	----	----	----	----	----
Phenanthrene	85-01-8	E641A/WT	µg/L	<0.020	----	----	----	----	----	----
Pyrene	129-00-0	E641A/WT	µg/L	<0.010	----	----	----	----	----	----
PAHs, total (CCME sewer 18)	n/a	E641A/WT	µg/L	<0.070	----	----	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates										
Chrysene-d12	1719-03-5	E641A/WT	%	104	----	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	24- 2	----	----	----	----	----	----
				Sampling date/time	14-May-2024 09:30	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
				WT2412099-001	--------	--------	--------	--------	--------	--------	--------
Polycyclic Aromatic Hydrocarbons Surrogates											
Naphthalene-d8	1146-65-2	E641A/WT	%	102	----	----	----	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	%	109	----	----	----	----	----	----	----
Phthalate Esters											
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E625A/WT	µg/L	<0.60	----	----	----	----	----	----	----
Di-n-butyl phthalate	84-74-2	E625A/WT	µg/L	<1.0	----	----	----	----	----	----	----
Semi-Volatile Organics											
Dichlorobenzidine, 3,3'-	91-94-1	E625A/WT	µg/L	<1.20 RRR	----	----	----	----	----	----	----
Semi-Volatile Organics Surrogates											
Fluorobiphenyl, 2-	321-60-8	E625A/WT	%	71.9	----	----	----	----	----	----	----
Nitrobenzene-d5	4165-60-0	E625A/WT	%	76.8	----	----	----	----	----	----	----
Terphenyl-d14, p-	1718-51-0	E625A/WT	%	97.5	----	----	----	----	----	----	----
Chlorinated Phenolics											
Pentachlorophenol [PCP]	87-86-5	E625A/WT	µg/L	<0.50	----	----	----	----	----	----	----
Phenolics Surrogates											
Tribromophenol, 2,4,6-	118-79-6	E625A/WT	%	77.3	----	----	----	----	----	----	----
Nonylphenols											
Nonylphenol [NP]	84852-15-3	E749A/WT	µg/L	<1.0	----	----	----	----	----	----	----
Nonylphenol diethoxylates [NP2EO]	n/a	E749B/WT	µg/L	<0.10	----	----	----	----	----	----	----
Nonylphenol ethoxylates, mono+di	n/a	E749B/WT	µg/L	<2.0	----	----	----	----	----	----	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B/WT	µg/L	<2.0	----	----	----	----	----	----	----
Polychlorinated Biphenyls											
Aroclor 1016	12674-11-2	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1221	11104-28-2	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1232	11141-16-5	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1242	53469-21-9	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1248	12672-29-6	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1254	11097-69-1	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	24- 2	----	----	----	----	----	----
				Sampling date/time	14-May-2024 09:30	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
				WT2412099-001	--------	--------	--------	--------	--------	--------	--------
Polychlorinated Biphenyls											
Aroclor 1260	11096-82-5	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1262	37324-23-5	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Aroclor 1268	11100-14-4	E687/WT	µg/L	<0.020	----	----	----	----	----	----	----
Polychlorinated biphenyls [PCBs], total	----	E687/WT	µg/L	<0.060	----	----	----	----	----	----	----
Polychlorinated Biphenyls Surrogates											
Decachlorobiphenyl	2051-24-3	E687/WT	%	79.4	----	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	E687/WT	%	81.8	----	----	----	----	----	----	----
Organochlorine Pesticides											
Aldrin	309-00-2	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Chlordane, cis- (alpha)	5103-71-9	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Chlordane, total	57-74-9	E660F/WT	µg/L	<0.011	----	----	----	----	----	----	----
Chlordane, trans- (gamma)	5103-74-2	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
DDD, 2,4'-	53-19-0	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDD, 4,4'-	72-54-8	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDD, total	----	E660F/WT	µg/L	<0.0060	----	----	----	----	----	----	----
DDE, 2,4'-	3424-82-6	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDE, 4,4'-	72-55-9	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDE, total	----	E660F/WT	µg/L	<0.0060	----	----	----	----	----	----	----
DDT, 2,4'-	789-02-6	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDT, 4,4'-	50-29-3	E660F/WT	µg/L	<0.0040	----	----	----	----	----	----	----
DDT, total	----	E660F/WT	µg/L	<0.0060	----	----	----	----	----	----	----
Dieldrin	60-57-1	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Hexachlorobenzene	118-74-1	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Mirex	2385-85-5	E660F/WT	µg/L	<0.0080	----	----	----	----	----	----	----
Aldrin + Dieldrin	----	E660F/WT	µg/L	<0.011	----	----	----	----	----	----	----
DDT + metabolites, total	----	E660F/WT	µg/L	<0.010	----	----	----	----	----	----	----
Organochlorine Pesticides Surrogates											

Analytical Results Evaluation

Matrix: **Groundwater**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	24- 2	----	----	----	----	----	----
				Sampling date/time	14-May-2024 09:30	----	----	----	----	----	----
				Sub-Matrix	Groundwater	----	----	----	----	----	----
					WT2412099-001	--------	--------	--------	--------	--------	--------
Organochlorine Pesticides Surrogates											
Decachlorobiphenyl	2051-24-3	E660F/WT	%		104	----	----	----	----	----	----
Tetrachloro-m-xylene	877-09-8	E660F/WT	%		91.8	----	----	----	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	HALSUB SAN	HHSUB STM
Physical Tests				
pH	----	pH units	**6 - 10 pH units**	**6.5 - 8.5 pH units**
Solids, total suspended [TSS]	----	mg/L	**350 mg/L**	**15 mg/L**
Anions and Nutrients				
Fluoride	16984-48-8	mg/L	**10 mg/L**	**--**
Kjeldahl nitrogen, total [TKN]	----	mg/L	**100 mg/L**	**--**
Phosphorus, total	7723-14-0	mg/L	**10 mg/L**	**0.4 mg/L**
Sulfate (as SO4)	14808-79-8	mg/L	**1500 mg/L**	**--**
Cyanides				
Cyanide, strong acid dissociable (Total)	----	mg/L	**2 mg/L**	**0.02 mg/L**
Microbiological Tests				
Coliforms, Escherichia coli [E. coli]	----	CFU/100mL	**--**	**200 CFU/100mL**
Total Metals				
Aluminum, total	7429-90-5	mg/L	**50 mg/L**	**--**
Antimony, total	7440-36-0	mg/L	**5 mg/L**	**--**
Arsenic, total	7440-38-2	mg/L	**1 mg/L**	**0.02 mg/L**
Beryllium, total	7440-41-7	mg/L	**5 mg/L**	**--**
Cadmium, total	7440-43-9	mg/L	**1 mg/L**	**15 mg/L**
Chromium, total	7440-47-3	mg/L	**3 mg/L**	**0.08 mg/L**
Cobalt, total	7440-48-4	mg/L	**5 mg/L**	**--**
Copper, total	7440-50-8	mg/L	**3 mg/L**	**0.04 mg/L**
Iron, total	7439-89-6	mg/L	**50 mg/L**	**--**
Lead, total	7439-92-1	mg/L	**3 mg/L**	**0.12 mg/L**
Manganese, total	7439-96-5	mg/L	**5 mg/L**	**0.05 mg/L**
Mercury, total	7439-97-6	mg/L	**0.05 mg/L**	**0.0004 mg/L**
Molybdenum, total	7439-98-7	mg/L	**5 mg/L**	**--**
Nickel, total	7440-02-0	mg/L	**3 mg/L**	**0.08 mg/L**
Selenium, total	7782-49-2	mg/L	**5 mg/L**	**0.02 mg/L**
Silver, total	7440-22-4	mg/L	**5 mg/L**	**0.12 mg/L**
Tin, total	7440-31-5	mg/L	**5 mg/L**	**--**
Titanium, total	7440-32-6	mg/L	**5 mg/L**	**--**
Zinc, total	7440-66-6	mg/L	**3 mg/L**	**0.04 mg/L**
Speciated Metals				
Chromium, hexavalent [Cr VI], total	18540-29-9	mg/L	**--**	**--**
Aggregate Organics				
Biochemical oxygen demand [BOD]	----	mg/L	**300 mg/L**	**15 mg/L**

Analyte	CAS Number	Unit	HALSUB SAN	HHSUB STM					
Aggregate Organics - Continued									
Oil & grease (gravimetric)	----	mg/L	--	--					
Oil & grease, animal/vegetable (gravimetric)	----	mg/L	**150 mg/L**	--					
Oil & grease, mineral (gravimetric)	----	mg/L	**15 mg/L**	--					
Phenols, total (4AAP)	----	mg/L	**1 mg/L**	**0.008 mg/L**					
Volatile Organic Compounds									
Dichlorobenzene, 1,2-	95-50-1	µg/L	--	**5.6 µg/L**					
Dichlorobenzene, 1,4-	106-46-7	µg/L	**80 µg/L**	**6.8 µg/L**					
Tetrachloroethane, 1,1,2,2-	79-34-5	µg/L	**1400 µg/L**	**17 µg/L**					
Dichloroethylene, cis-1,2-	156-59-2	µg/L	--	**5.6 µg/L**					
Dichloromethane	75-09-2	µg/L	**2000 µg/L**	**5.2 µg/L**					
Dichloropropylene, trans-1,3-	10061-02-6	µg/L	--	--					
Tetrachloroethylene	127-18-4	µg/L	**1000 µg/L**	**4.4 µg/L**					
Trichloroethylene	79-01-6	µg/L	**400 µg/L**	**7.6 µg/L**					
Benzene	71-43-2	µg/L	**10 µg/L**	**2 µg/L**					
Ethylbenzene	100-41-4	µg/L	**160 µg/L**	**2 µg/L**					
Toluene	108-88-3	µg/L	**16 µg/L**	**2 µg/L**					
Xylene, m+p-	179601-23-1	µg/L	--	--					
Xylene, o-	95-47-6	µg/L	--	--					
Xylenes, total	1330-20-7	µg/L	--	**4.4 µg/L**					
Chloroform	67-66-3	µg/L	**40 µg/L**	**2 µg/L**					
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	%	--	--					
Difluorobenzene, 1,4-	540-36-3	%	--	--					
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	µg/L	--	--					
Acenaphthylene	208-96-8	µg/L	--	--					
Anthracene	120-12-7	µg/L	--	--					
Benz(a)anthracene	56-55-3	µg/L	--	--					
Benzo(a)pyrene	50-32-8	µg/L	--	--					
Benzo(b+j)fluoranthene	n/a	µg/L	--	--					
Benzo(g,h,i)perylene	191-24-2	µg/L	--	--					
Benzo(k)fluoranthene	207-08-9	µg/L	--	--					
Chrysene	218-01-9	µg/L	--	--					
Dibenz(a,h)anthracene	53-70-3	µg/L	--	--					
Fluoranthene	206-44-0	µg/L	--	--					
Fluorene	86-73-7	µg/L	--	--					
Indeno(1,2,3-c,d)pyrene	193-39-5	µg/L	--	--					
Methylnaphthalene, 1-	90-12-0	µg/L	--	--					
Methylnaphthalene, 2-	91-57-6	µg/L	--	--					

Analyte	CAS Number	Unit	HALSUB SAN	HHSUB STM
Polycyclic Aromatic Hydrocarbons - Continued				
Naphthalene	91-20-3	µg/L	**140 µg/L**	--
PAHs, total (CCME sewer 18)	n/a	µg/L	--	--
Phenanthrene	85-01-8	µg/L	--	--
Pyrene	129-00-0	µg/L	--	--
Chrysene-d12	1719-03-5	%	--	--
Naphthalene-d8	1146-65-2	%	--	--
Phenanthrene-d10	1517-22-2	%	--	--
Phthalate Esters				
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	µg/L	**12 µg/L**	**8.8 µg/L**
Di-n-butyl phthalate	84-74-2	µg/L	**80 µg/L**	**15 µg/L**
Semi-Volatile Organics				
Dichlorobenzidine, 3,3'-	91-94-1	µg/L	**2 µg/L**	**0.8 µg/L**
Semi-Volatile Organics Surrogates				
Fluorobiphenyl, 2-	321-60-8	%	--	--
Nitrobenzene-d5	4165-60-0	%	--	--
Terphenyl-d14, p-	1718-51-0	%	--	--
Chlorinated Phenolics				
Pentachlorophenol [PCP]	87-86-5	µg/L	**5 µg/L**	**2 µg/L**
Tribromophenol, 2,4,6-	118-79-6	%	--	--
Nonylphenols				
Nonylphenol [NP]	84852-15-3	µg/L	--	**1 µg/L**
Nonylphenol diethoxylates [NP2EO]	n/a	µg/L	--	--
Nonylphenol ethoxylates, mono+di	n/a	µg/L	--	**10 µg/L**
Nonylphenol monoethoxylates [NP1EO]	n/a	µg/L	--	--
Polychlorinated Biphenyls				
Aroclor 1016	12674-11-2	µg/L	--	--
Aroclor 1221	11104-28-2	µg/L	--	--
Aroclor 1232	11141-16-5	µg/L	--	--
Aroclor 1242	53469-21-9	µg/L	--	--
Aroclor 1248	12672-29-6	µg/L	--	--
Aroclor 1254	11097-69-1	µg/L	--	--
Aroclor 1260	11096-82-5	µg/L	--	--
Aroclor 1262	37324-23-5	µg/L	--	--
Aroclor 1268	11100-14-4	µg/L	--	--
Polychlorinated biphenyls [PCBs], total	----	µg/L	**1 µg/L**	**0.4 µg/L**
Decachlorobiphenyl	2051-24-3	%	--	--
Tetrachloro-m-xylene	877-09-8	%	--	--
Organochlorine Pesticides				
Aldrin + Dieldrin	----	µg/L	**0.2 µg/L**	**0.08 µg/L**

Analyte	CAS Number	Unit	HALSUB SAN	HHSUB STM					
Organochlorine Pesticides - Continued									
Aldrin	309-00-2	µg/L	--	--					
Chlordane, cis- (alpha)	5103-71-9	µg/L	--	--					
Chlordane, total	57-74-9	µg/L	**100 µg/L**	**40 µg/L**					
Chlordane, trans- (gamma)	5103-74-2	µg/L	--	--					
DDD, 2,4'-	53-19-0	µg/L	--	--					
DDD, 4,4'-	72-54-8	µg/L	--	--					
DDD, total	----	µg/L	--	--					
DDE, 2,4'-	3424-82-6	µg/L	--	--					
DDE, 4,4'-	72-55-9	µg/L	--	--					
DDE, total	----	µg/L	--	--					
DDT + metabolites, total	----	µg/L	**0.1 µg/L**	--					
DDT, 2,4'-	789-02-6	µg/L	--	--					
DDT, 4,4'-	50-29-3	µg/L	--	--					
DDT, total	----	µg/L	--	--					
Dieldrin	60-57-1	µg/L	--	--					
Hexachlorobenzene	118-74-1	µg/L	**0.1 µg/L**	**0.04 µg/L**					
Hexachlorocyclohexane, gamma-	58-89-9	µg/L	**100 µg/L**	**40 µg/L**					
Mirex	2385-85-5	µg/L	**100 µg/L**	**40 µg/L**					
Decachlorobiphenyl	2051-24-3	%	--	--					
Tetrachloro-m-xylene	877-09-8	%	--	--					

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

Key:

HALSUB	Ontario Halton Sanitary Sewer By-Law No. 02-03 (Mar, 2003)
SAN	Halton Sanitary By-Law (02-03, March 2003)
HHSUB	Ontario Halton Hills Sewer Use By-Law 2017-0068 (NOV, 2017)
STM	Halton Hills Storm Sewer (2017-0068)

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2412099**	Page	: 1 of 12
Client	: **Palmer Environmental Consulting Group Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Nick Schmidt	Account Manager	: Andrew Martin
Address	: 871 Equestrian Court Unit #1 Oakville ON Canada L6L 6L7	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 2402401	Date Samples Received	: 14-May-2024 15:52
PO	: ----	Issue Date	: 23-May-2024 07:17
C-O-C number	: ----		
Sampler	: BF		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Semi-Volatile Organics	QC-MRG2-1445151 002	----	Dichlorobenzidine, 3,3'-	91-94-1	E625A	13.4 % RRQC	50.0-140%	Recovery less than lower control limit

Result Qualifiers

Qualifier	*Description*
RRQC	*Refer to report comments for information regarding this QC result.*

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] 24- 2	E550	14-May-2024	----	----	----		15-May-2024	4 days	1 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) 24- 2	E567SG	14-May-2024	16-May-2024	28 days	2 days	✓	16-May-2024	28 days	2 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) 24- 2	E567	14-May-2024	16-May-2024	28 days	2 days	✓	16-May-2024	28 days	2 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP] 24- 2	E562	14-May-2024	16-May-2024	28 days	2 days	✓	17-May-2024	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] 24- 2	E235.F	14-May-2024	16-May-2024	28 days	2 days	✓	21-May-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] 24- 2	E235.SO4	14-May-2024	16-May-2024	28 days	2 days	✓	21-May-2024	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] 24- 2	E318	14-May-2024	21-May-2024	28 days	7 days	✓	21-May-2024	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP] 24- 2	E372-U	14-May-2024	20-May-2024	28 days	6 days	✓	21-May-2024	28 days	7 days	✓
Chlorinated Phenolics : BNA (Routine List) by GC-MS/MS										
Amber glass/Teflon lined septa cap - SVOCs (sodium thiosulfate) [ON MECP] 24- 2	E625A	14-May-2024	16-May-2024	14 days	2 days	✓	21-May-2024	40 days	5 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) 24- 2	E333	14-May-2024	15-May-2024	14 days	1 days	✓	15-May-2024	14 days	1 days	✓
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP] 24- 2	E012A.EC	14-May-2024	----	----	----		15-May-2024	48 hrs	28 hrs	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS 24- 2	E749B	14-May-2024	16-May-2024	7 days	2 days	✓	16-May-2024	7 days	0 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS 24- 2	E749A	14-May-2024	16-May-2024	7 days	2 days	✓	16-May-2024	7 days	0 days	✓
Organochlorine Pesticides : OCP Analysis by GC-MS-MS or GC-MS										
Amber glass/Teflon lined cap [ON MECP] 24- 2	E660F	14-May-2024	15-May-2024	14 days	1 days	✓	17-May-2024	40 days	2 days	✓
Phthalate Esters : BNA (Routine List) by GC-MS/MS										
Amber glass/Teflon lined septa cap - SVOCs (sodium thiosulfate) [ON MECP] 24- 2	E625A	14-May-2024	16-May-2024	14 days	2 days	✓	21-May-2024	40 days	5 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] 24- 2	E108	14-May-2024	16-May-2024	14 days	2 days	✓	17-May-2024	14 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
24- 2	E160	14-May-2024	----	----	----		16-May-2024	7 days	2 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
24- 2	E687	14-May-2024	15-May-2024	14 days	1 days	✓	15-May-2024	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Water by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate)										
24- 2	E641A	14-May-2024	16-May-2024	14 days	2 days	✓	17-May-2024	40 days	1 days	✓
Semi-Volatile Organics : BNA (Routine List) by GC-MS/MS										
Amber glass/Teflon lined septa cap - SVOCs (sodium thiosulfate) [ON MECP]										
24- 2	E625A	14-May-2024	16-May-2024	14 days	2 days	✓	21-May-2024	40 days	5 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
HDPE - total (NaOH+Buf) [ON MECP]										
24- 2	E532	14-May-2024	----	----	----		15-May-2024	28 days	1 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
24- 2	E508	14-May-2024	15-May-2024	28 days	1 days	✓	16-May-2024	28 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
24- 2	E420	14-May-2024	15-May-2024	180 days	1 days	✓	15-May-2024	180 days	1 days	✓
Volatile Organic Compounds : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
24- 2	E611F	14-May-2024	21-May-2024	14 days	7 days	✓	21-May-2024	14 days	7 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	1443411	1	19	5.2	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1444016	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	1446424	1	15	6.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1445832	1	14	7.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1445831	1	14	7.1	5.0	✓
pH by Meter	E108	1446421	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1445691	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1446425	1	15	6.6	5.0	✓
Total Cyanide	E333	1443107	1	11	9.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1443433	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1445692	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1443695	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1442765	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1445688	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	1445218	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	1451176	1	8	12.5	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	1443411	1	19	5.2	5.0	✓
BNA (Routine List) by GC-MS/MS	E625A	1445151	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1446424	1	15	6.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1442998	1	19	5.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1445832	1	14	7.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1445831	1	14	7.1	5.0	✓
OCP Analysis by GC-MS-MS or GC-MS	E660F	1442993	1	2	50.0	5.0	✓
Oil & Grease by Gravimetry	E567	1442997	1	20	5.0	5.0	✓
PAHs in Water by Hexane LVI GC-MS	E641A	1445121	1	11	9.0	5.0	✓
PCB Aroclors by GC-MS	E687	1442992	1	9	11.1	4.7	✓
pH by Meter	E108	1446421	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1445691	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1446425	1	15	6.6	5.0	✓
Total Cyanide	E333	1443107	1	11	9.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1443433	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1445692	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1443695	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1442765	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1445688	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TSS by Gravimetry	E160	1445218	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	1451176	1	8	12.5	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	1443411	1	19	5.2	5.0	✓
BNA (Routine List) by GC-MS/MS	E625A	1445151	1	12	8.3	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1444016	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	1446424	1	15	6.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1442998	1	19	5.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1445832	1	14	7.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1445831	1	14	7.1	5.0	✓
OCP Analysis by GC-MS-MS or GC-MS	E660F	1442993	1	2	50.0	5.0	✓
Oil & Grease by Gravimetry	E567	1442997	1	20	5.0	5.0	✓
PAHs in Water by Hexane LVI GC-MS	E641A	1445121	1	11	9.0	5.0	✓
PCB Aroclors by GC-MS	E687	1442992	1	9	11.1	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	1445691	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1446425	1	15	6.6	5.0	✓
Total Cyanide	E333	1443107	1	11	9.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1443433	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1445692	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1443695	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1442765	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1445688	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	1445218	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	1451176	1	8	12.5	5.0	✓
Matrix Spikes (MS)							
Fluoride in Water by IC	E235.F	1446424	1	15	6.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1445832	1	14	7.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1445831	1	14	7.1	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1445691	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1446425	1	15	6.6	5.0	✓
Total Cyanide	E333	1443107	1	11	9.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1443433	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1445692	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1443695	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1442765	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1445688	1	19	5.2	5.0	✓
VOCs (Full List) by Headspace GC-MS	E611F	1451176	1	8	12.5	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
E. coli (MF-mFC-BCIG)	E012A.EC ALS Environmental - Waterloo	Water	ON E3433 (mod)	Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Waterloo	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Cyanide	E333 ALS Environmental - Waterloo	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Total Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. Results are based on an un-filtered, field-preserved sample.
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Waterloo	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Gravimetry	E567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Mineral Oil & Grease by Gravimetry	E567SG ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
VOCs (Full List) by Headspace GC-MS	E611F ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BNA (Routine List) by GC-MS/MS	E625A ALS Environmental - Waterloo	Water	EPA 8270E (mod)	BNA are analyzed by GC-MS/MS.
PAHs in Water by Hexane LVI GC-MS	E641A ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
OCP Analysis by GC-MS-MS or GC-MS	E660F ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Pesticides are analyzed by GC-MS-MS or GC-MS
PCB Aroclors by GC-MS	E687 ALS Environmental - Waterloo	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	Water samples are filtered and analyzed on LCMS/MS by direct injection.
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG ALS Environmental - Waterloo	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 ALS Environmental - Waterloo	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Oil & Grease Extraction for Gravimetry	EP567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
BNA Extraction	EP625 ALS Environmental - Waterloo	Water	EPA 3510C (mod)	SVOCs are extracted from aqueous sample using DCM liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Nonylphenol and Nonylphenol Ethoxylates	EP749 ALS Environmental - Waterloo	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **WT2412099**	Page	: 1 of 14
Client	: Palmer Environmental Consulting Group Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Nick Schmidt	Account Manager	: Andrew Martin
Address	: 871 Equestrian Court Unit #1 Oakville ON Canada L6L 6L7	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 2402401	Date Samples Received	: 14-May-2024 15:52
PO	: ----	Date Analysis Commenced	: 15-May-2024
C-O-C number	: ----	Issue Date	: 23-May-2024 07:15
Sampler	: BF		
Site	: ----		
Quote number	: 2024 SOA - Ontario		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
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Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1445218)											
WT2412033-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	14.7	17.7	3.0	Diff <2x LOR	----
Physical Tests (QC Lot: 1446421)											
WT2412245-002	Anonymous	pH	----	E108	0.10	pH units	8.19	8.14	0.612%	4%	----
Anions and Nutrients (QC Lot: 1445688)											
HA2401008-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0037	0.0034	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1445692)											
HA2401008-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.355	0.355	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1446424)											
WT2412245-002	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.169	0.168	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1446425)											
WT2412245-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	57.2	57.2	0.0158%	20%	----
Cyanides (QC Lot: 1443107)											
WP2411382-002	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 1444016)											
WT2412174-002	Anonymous	Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	30	17	55.3%	65%	----
Total Metals (QC Lot: 1442765)											
HA2401008-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	32.0 µg/L	0.0320	0.0713%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.32 µg/L	0.00032	0.000003	Diff <2x LOR	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0092 µg/L	0.0000069	0.0000023	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.10 µg/L	0.00011	0.000002	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	66 µg/L	0.065	0.0006	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	43.7 µg/L	0.0430	1.49%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	1.03 µg/L	0.00104	0.000006	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1442765) - continued											
HA2401008-001	Anonymous	Silver, total	7440-22-4	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.30 µg/L	<0.00030	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<3.0 µg/L	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 1443695)											
WT2412038-003	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1443433)											
WT2412002-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1443411)											
WT2412121-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	14.7	13.2	11.2%	30%	----
Aggregate Organics (QC Lot: 1445691)											
WT2411956-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0015	0.0012	0.0003	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1451176)											
WT2412240-001	Anonymous	Benzene	71-43-2	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611F	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611F	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611F	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611F	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1445831)											
WT2412196-003	Anonymous	Nonylphenol [NP]	84852-15-3	E749A	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1445832)											
WT2412196-003	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.10	µg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----

Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1445218)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1445688)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1445692)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1446424)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1446425)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Cyanides (QCLot: 1443107)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 1444016)						
Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	----
Total Metals (QCLot: 1442765)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1442765) - continued						
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 1443695)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Speciated Metals (QCLot: 1443433)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 1442997)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1442998)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1443411)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1445691)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1451176)						
Benzene	71-43-2	E611F	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611F	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,2-	95-50-1	E611F	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611F	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611F	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611F	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611F	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611F	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611F	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611F	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611F	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611F	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611F	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611F	0.3	µg/L	<0.30	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1445121)						
Acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1445121) - continued						
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
Pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
Phthalate Esters (QCLot: 1445151)						
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E625A	0.6	µg/L	<0.60	----
Di-n-butyl phthalate	84-74-2	E625A	1	µg/L	<1.0	----
Semi-Volatile Organics (QCLot: 1445151)						
Dichlorobenzidine, 3,3'-	91-94-1	E625A	0.4	µg/L	<0.40	----
Chlorinated Phenolics (QCLot: 1445151)						
Pentachlorophenol [PCP]	87-86-5	E625A	0.5	µg/L	<0.50	----
Nonylphenols (QCLot: 1445831)						
Nonylphenol [NP]	84852-15-3	E749A	1	µg/L	<1.0	----
Nonylphenols (QCLot: 1445832)						
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	<0.10	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	<2.0	----
Polychlorinated Biphenyls (QCLot: 1442992)						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----
Organochlorine Pesticides (QCLot: 1442993)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organochlorine Pesticides (QCLot: 1442993) - continued						
Aldrin	309-00-2	E660F	0.008	µg/L	<0.0080	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.008	µg/L	<0.0080	----
Chlordane, trans- (gamma)	5103-74-2	E660F	0.008	µg/L	<0.0080	----
DDD, 2,4'-	53-19-0	E660F	0.004	µg/L	<0.0040	----
DDD, 4,4'-	72-54-8	E660F	0.004	µg/L	<0.0040	----
DDE, 2,4'-	3424-82-6	E660F	0.004	µg/L	<0.0040	----
DDE, 4,4'-	72-55-9	E660F	0.004	µg/L	<0.0040	----
DDT, 2,4'-	789-02-6	E660F	0.004	µg/L	<0.0040	----
DDT, 4,4'-	50-29-3	E660F	0.004	µg/L	<0.0040	----
Dieldrin	60-57-1	E660F	0.008	µg/L	<0.0080	----
Hexachlorobenzene	118-74-1	E660F	0.008	µg/L	<0.0080	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.008	µg/L	<0.0080	----
Mirex	2385-85-5	E660F	0.008	µg/L	<0.0080	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1445218)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	99.2	85.0	115	----
Physical Tests (QCLot: 1446421)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Anions and Nutrients (QCLot: 1445688)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.434 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 1445692)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 1446424)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1446425)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.9	90.0	110	----
Cyanides (QCLot: 1443107)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	83.6	80.0	120	----
Total Metals (QCLot: 1442765)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	108	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	99.3	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	106	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	95.4	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	100	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	99.8	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	96.6	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	97.0	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	101	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	99.1	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	100	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	97.0	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	90.0	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	93.5	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1442765) - continued									
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	96.5	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	95.5	80.0	120	----
Total Metals (QCLot: 1443695)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	91.6	80.0	120	----
Speciated Metals (QCLot: 1443433)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Aggregate Organics (QCLot: 1442997)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	89.3	70.0	130	----
Aggregate Organics (QCLot: 1442998)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	71.3	70.0	130	----
Aggregate Organics (QCLot: 1443411)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 1445691)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	112	85.0	115	----
Volatile Organic Compounds (QCLot: 1451176)									
Benzene	71-43-2	E611F	0.5	µg/L	100 µg/L	102	70.0	130	----
Chloroform	67-66-3	E611F	0.5	µg/L	100 µg/L	114	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611F	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611F	0.5	µg/L	100 µg/L	101	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611F	0.5	µg/L	100 µg/L	109	70.0	130	----
Dichloromethane	75-09-2	E611F	1	µg/L	100 µg/L	118	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611F	0.5	µg/L	100 µg/L	96.7	70.0	130	----
Ethylbenzene	100-41-4	E611F	0.5	µg/L	100 µg/L	97.2	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611F	0.5	µg/L	100 µg/L	108	70.0	130	----
Tetrachloroethylene	127-18-4	E611F	0.5	µg/L	100 µg/L	99.3	70.0	130	----
Toluene	108-88-3	E611F	0.5	µg/L	100 µg/L	96.6	70.0	130	----
Trichloroethylene	79-01-6	E611F	0.5	µg/L	100 µg/L	109	70.0	130	----
Xylene, m+p-	179601-23-1	E611F	0.4	µg/L	200 µg/L	98.6	70.0	130	----
Xylene, o-	95-47-6	E611F	0.3	µg/L	100 µg/L	97.2	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1445121)									
Acenaphthene	83-32-9	E641A	0.01	µg/L	0.526 µg/L	94.2	50.0	140	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	0.526 µg/L	91.8	50.0	140	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1445121) - continued									
Anthracene	120-12-7	E641A	0.01	µg/L	0.526 µg/L	85.4	50.0	140	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.526 µg/L	106	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.526 µg/L	85.8	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.526 µg/L	96.1	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.526 µg/L	94.0	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.526 µg/L	89.9	50.0	140	----
Chrysene	218-01-9	E641A	0.01	µg/L	0.526 µg/L	94.0	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.526 µg/L	109	50.0	140	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	0.526 µg/L	96.5	50.0	140	----
Fluorene	86-73-7	E641A	0.01	µg/L	0.526 µg/L	95.1	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.526 µg/L	118	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.526 µg/L	91.4	50.0	140	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.526 µg/L	91.3	50.0	140	----
Naphthalene	91-20-3	E641A	0.05	µg/L	0.526 µg/L	90.3	50.0	140	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	0.526 µg/L	100	50.0	140	----
Pyrene	129-00-0	E641A	0.01	µg/L	0.526 µg/L	94.5	50.0	140	----
Phthalate Esters (QCLot: 1445151)									
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E625A	0.6	µg/L	33.7 µg/L	108	50.0	140	----
Di-n-butyl phthalate	84-74-2	E625A	1	µg/L	33.7 µg/L	90.4	50.0	140	----
Semi-Volatile Organics (QCLot: 1445151)									
Dichlorobenzidine, 3,3'-	91-94-1	E625A	0.4	µg/L	8.42 µg/L	# 13.4	50.0	140	RRQC
Chlorinated Phenolics (QCLot: 1445151)									
Pentachlorophenol [PCP]	87-86-5	E625A	0.5	µg/L	25.3 µg/L	65.3	65.0	130	----
Nonylphenols (QCLot: 1445831)									
Nonylphenol [NP]	84852-15-3	E749A	1	µg/L	10 µg/L	88.5	75.0	125	----
Nonylphenols (QCLot: 1445832)									
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	1 µg/L	123	75.0	125	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	20 µg/L	95.4	75.0	125	----
Polychlorinated Biphenyls (QCLot: 1442992)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	113	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	113	60.0	140	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polychlorinated Biphenyls (QCLot: 1442992) - continued									
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	113	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	113	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	94.5	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	97.9	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	91.2	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	91.2	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	91.2	60.0	140	----
Organochlorine Pesticides (QCLot: 1442993)									
Aldrin	309-00-2	E660F	0.008	µg/L	0.2 µg/L	106	50.0	150	----
Chlordane, cis- (alpha)	5103-71-9	E660F	0.008	µg/L	0.2 µg/L	85.0	50.0	150	----
Chlordane, trans- (gamma)	5103-74-2	E660F	0.008	µg/L	0.2 µg/L	108	50.0	150	----
DDD, 2,4'-	53-19-0	E660F	0.004	µg/L	0.2 µg/L	134	50.0	150	----
DDD, 4,4'-	72-54-8	E660F	0.004	µg/L	0.2 µg/L	116	50.0	150	----
DDE, 2,4'-	3424-82-6	E660F	0.004	µg/L	0.2 µg/L	96.6	50.0	150	----
DDE, 4,4'-	72-55-9	E660F	0.004	µg/L	0.2 µg/L	79.0	50.0	150	----
DDT, 2,4'-	789-02-6	E660F	0.004	µg/L	0.2 µg/L	99.4	50.0	150	----
DDT, 4,4'-	50-29-3	E660F	0.004	µg/L	0.2 µg/L	108	50.0	150	----
Dieldrin	60-57-1	E660F	0.008	µg/L	0.2 µg/L	93.4	50.0	150	----
Hexachlorobenzene	118-74-1	E660F	0.008	µg/L	0.2 µg/L	90.4	50.0	150	----
Hexachlorocyclohexane, gamma-	58-89-9	E660F	0.008	µg/L	0.2 µg/L	126	50.0	150	----
Mirex	2385-85-5	E660F	0.008	µg/L	0.2 µg/L	134	50.0	150	----

Qualifiers

Qualifier	Description
RRQC	*Refer to report comments for information regarding this QC result.*

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1445688)										
HA2401008-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0997 mg/L	0.1 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 1445692)										
HA2401008-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	3.13 mg/L	2.5 mg/L	125	70.0	130	----
Anions and Nutrients (QCLot: 1446424)										
WT2412245-002	Anonymous	Fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1446425)										
WT2412245-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	96.5 mg/L	100 mg/L	96.5	75.0	125	----
Cyanides (QCLot: 1443107)										
WP2411382-002	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.212 mg/L	0.25 mg/L	84.8	75.0	125	----
Total Metals (QCLot: 1442765)										
HA2401008-002	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	----	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0529 mg/L	0.05 mg/L	106	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0546 mg/L	0.05 mg/L	109	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.00542 mg/L	0.005 mg/L	108	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00505 mg/L	0.005 mg/L	101	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0134 mg/L	0.012 mg/L	107	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0133 mg/L	0.012 mg/L	106	70.0	130	----
		Copper, total	7440-50-8	E420	0.0134 mg/L	0.012 mg/L	108	70.0	130	----
		Iron, total	7439-89-6	E420	ND mg/L	----	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.0257 mg/L	0.025 mg/L	103	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	----	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0129 mg/L	0.012 mg/L	103	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0265 mg/L	0.025 mg/L	106	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0514 mg/L	0.05 mg/L	103	70.0	130	----
		Silver, total	7440-22-4	E420	0.00466 mg/L	0.005 mg/L	93.1	70.0	130	----
		Tin, total	7440-31-5	E420	0.0246 mg/L	0.025 mg/L	98.4	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0253 mg/L	0.025 mg/L	101	70.0	130	----
Total Metals (QCLot: 1443695)										
WT2412038-004	Anonymous	Mercury, total	7439-97-6	E508	0.0000946 mg/L	0 mg/L	94.6	70.0	130	----
Speciated Metals (QCLot: 1443433)										
WT2412002-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
Aggregate Organics (QCLot: 1445691)										
WT2411956-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0238 mg/L	0.02 mg/L	119	75.0	125	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1451176)										
WT2412240-001	Anonymous	Benzene	71-43-2	E611F	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		Chloroform	67-66-3	E611F	108 µg/L	100 µg/L	108	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611F	94.6 µg/L	100 µg/L	94.6	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611F	94.2 µg/L	100 µg/L	94.2	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611F	107 µg/L	100 µg/L	107	60.0	140	----
		Dichloromethane	75-09-2	E611F	111 µg/L	100 µg/L	111	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611F	92.8 µg/L	100 µg/L	92.8	60.0	140	----
		Ethylbenzene	100-41-4	E611F	90.0 µg/L	100 µg/L	90.0	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611F	114 µg/L	100 µg/L	114	60.0	140	----
		Tetrachloroethylene	127-18-4	E611F	83.6 µg/L	100 µg/L	83.6	60.0	140	----
		Toluene	108-88-3	E611F	89.2 µg/L	100 µg/L	89.2	60.0	140	----
		Trichloroethylene	79-01-6	E611F	93.7 µg/L	100 µg/L	93.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611F	184 µg/L	200 µg/L	91.8	60.0	140	----
		Xylene, o-	95-47-6	E611F	90.6 µg/L	100 µg/L	90.6	60.0	140	----
Nonylphenols (QCLot: 1445831)										
WT2412196-003	Anonymous	Nonylphenol [NP]	84852-15-3	E749A	9.8 µg/L	10 µg/L	97.9	60.0	140	----
Nonylphenols (QCLot: 1445832)										
WT2412196-003	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	1.14 µg/L	1 µg/L	114	60.0	140	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	14.3 µg/L	20 µg/L	71.5	60.0	140	----

W-187 15-659 IN-812

GC-931 L-367 CN-804

MM-588 SC-734 OGG-471 OR-112

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 -

ALS www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page

Environmental Division Waterloo

Work Order Reference WT2412099

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Palmer Environmental Consulting Group Inc.
Contact:	Nick Schmidt (nick.schmidt@pecg.ca)
Phone:	905-329-1669
	Company address below will appear on the final report
Street:	1-871 Equestrian Court
City/Province:	Oakville, ON
Postal Code:	L6L 6L7
Invoice To	Same as Report To ☐ YES ☒ NO
	Copy of Invoice with Report ☒ YES ☐ NO
Company:	Palmer Environmental Consulting Group Inc.
Contact:	Accounting

Project Information	
ALS Account # / Quote #:	24400
Job #:	2402401
PO / AFE:	[redacted]
LSD:	
ALS Lab Work Order # (ALS use only):	

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

Invoice Recipients	
Select Invoice Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax:	accounting@pecg.ca
Email 2:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Andrew Sampler: BF

Turnaround Time (TAT) Requested

- ☐ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 100% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs:

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

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BOD	CrVI	E. coli	General/TSS	NP/NFE	OCPs	Oil + Grease	PAHs	PCBs	sVOCs	TKN, TP Analysis	Total Cyanide	Total Mercury	Total Metals	[redacted] VOCs	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	24-2	14-05-24	9:30	GW	21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	Compare to the Halton Region Sanitary Sewer Bylaw and Halton Hills Storm Sewer Bylaw
Are samples for human consumption/ use? ☐ YES ☒ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☑ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
16.8			16.4		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Bailey Fleet	Date: 14/05/24	Time: 15:47	Received by: Fahad M	Date: 14 May 2024	Time: 15:52	Received by: TL	Date: 14-May-24	Time: 18:00

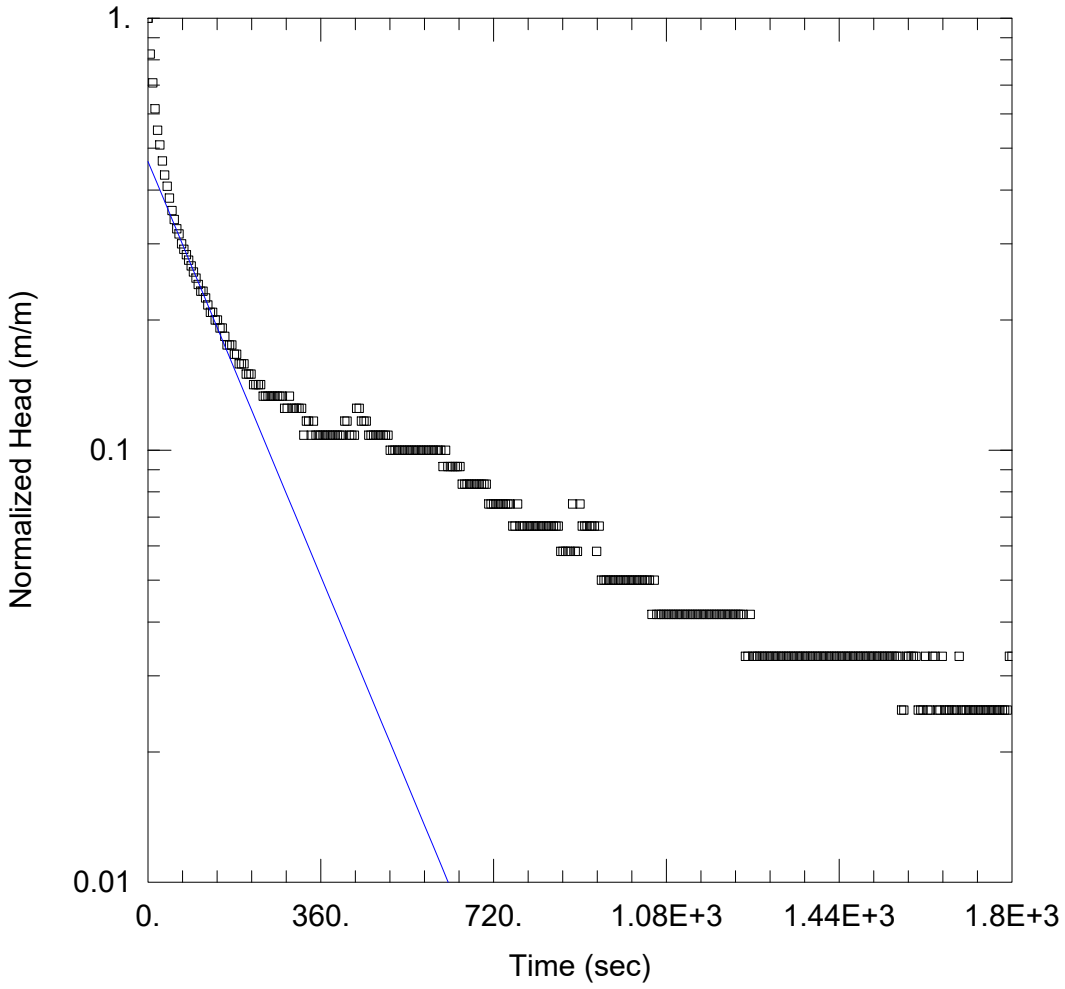
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

Appendix D: Hydraulic Conductivity Results



PROJECT INFORMATION

Company: Palmer
Client: 759509 Ontario Inc
Project: 2402401
Location: 97 Bower St, Acton, ON
Test Well: BH24-2
Test Date: May 22, 2024

AQUIFER DATA

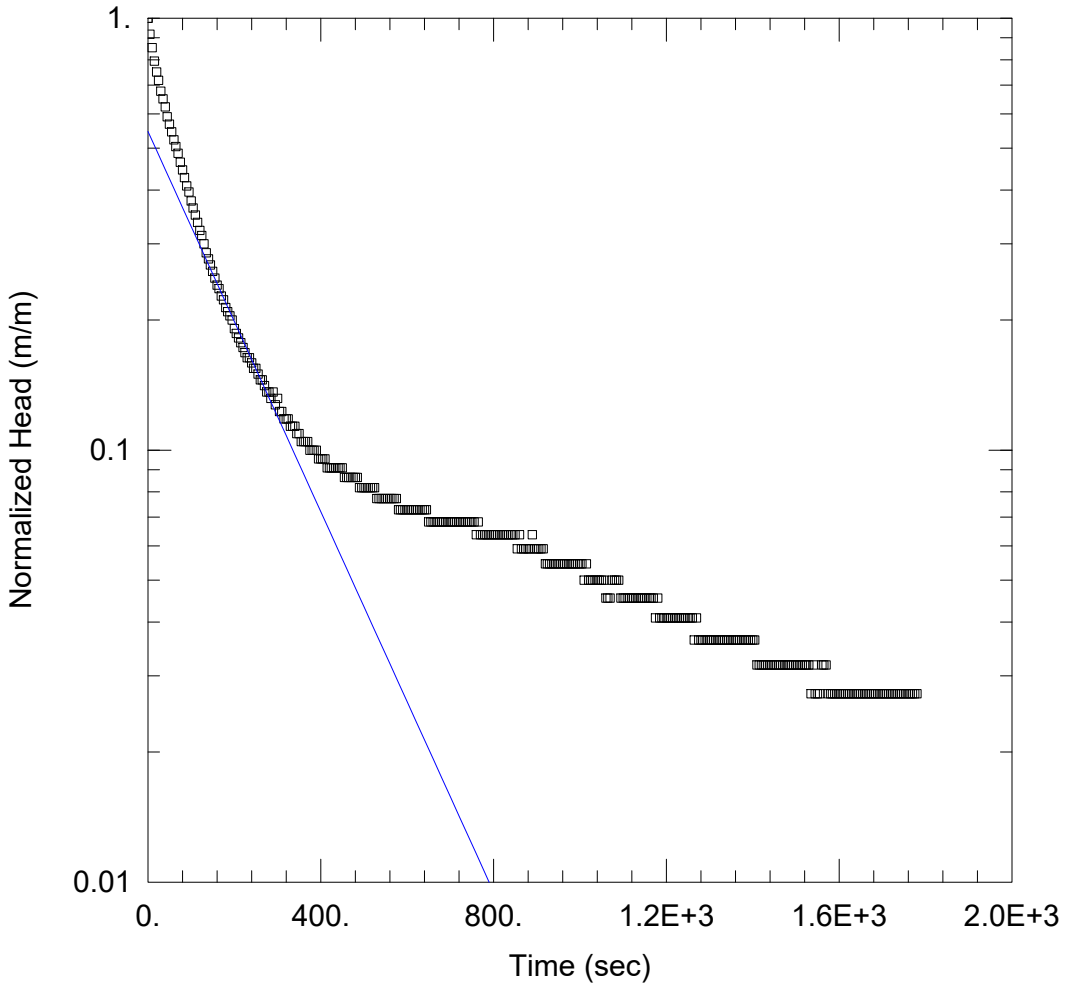
Saturated Thickness: 3.08 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-2)

Initial Displacement: 1.2 m
Total Well Penetration Depth: 3.08 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.08 m
Screen Length: 3.05 m
Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.064E-5 m/sec
y0 = 0.5588 m



PROJECT INFORMATION

Company: Palmer
Client: 759509 Ontario Inc
Project: 2402401
Location: 97 Bower St, Acton, ON
Test Well: BH24-3
Test Date: May 22, 2024

AQUIFER DATA

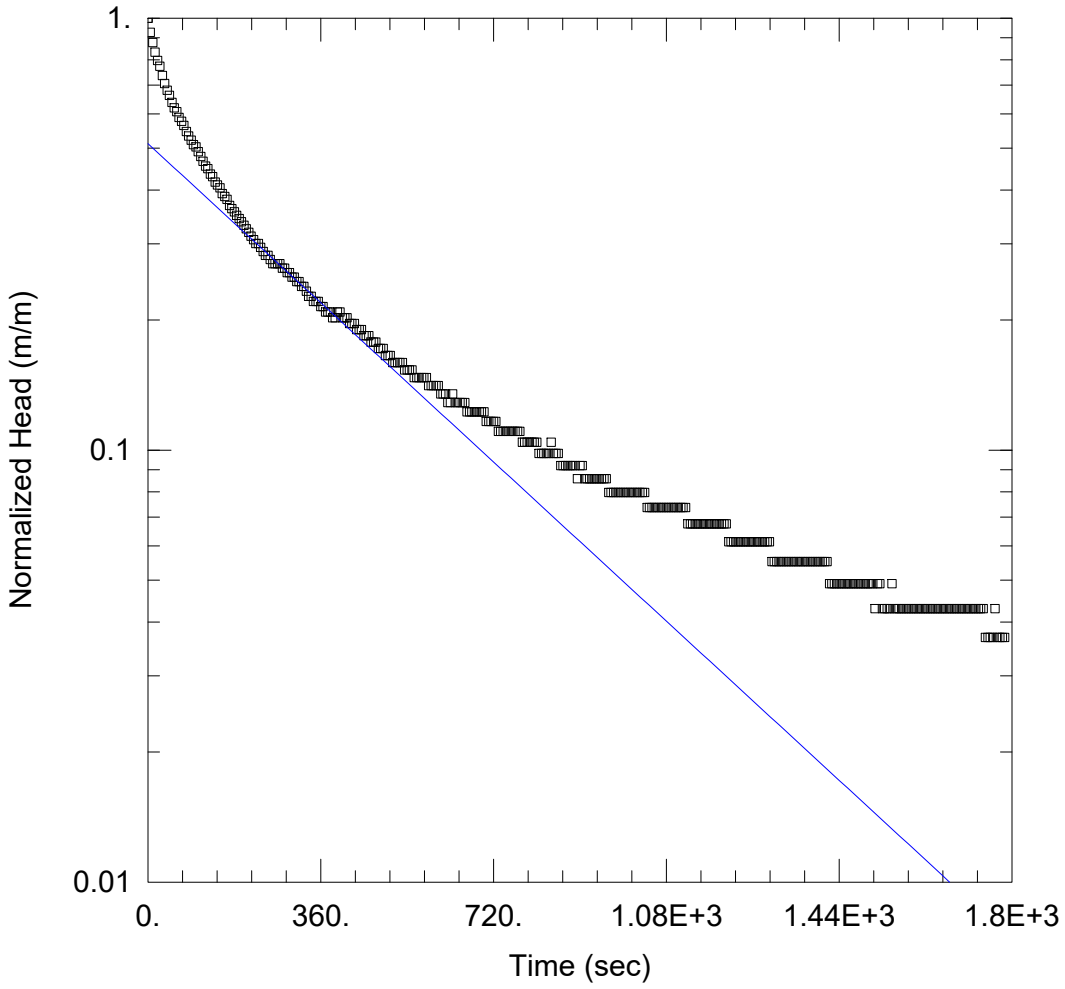
Saturated Thickness: 2.88 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-3)

Initial Displacement: 2.2 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.88 m
Screen Length: 3.05 m
Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.09E-6 m/sec
y0 = 1.202 m



PROJECT INFORMATION

Company: Palmer
Client: 759509 Ontario Inc
Project: 2402401
Location: 97 Bower St, Acton, ON
Test Well: BH24-4
Test Date: May 22, 2024

AQUIFER DATA

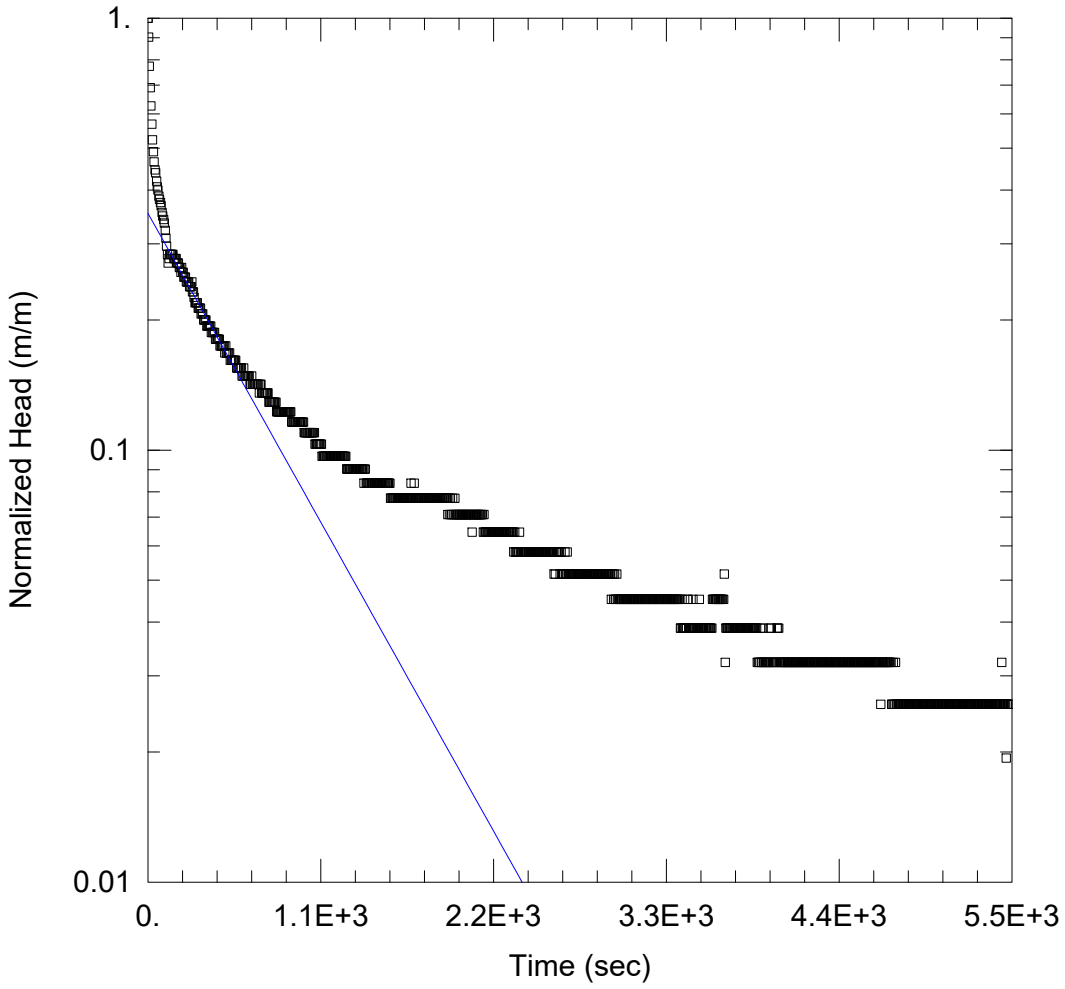
Saturated Thickness: 3.32 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-4)

Initial Displacement: 1.63 m
Total Well Penetration Depth: 3.32 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.32 m
Screen Length: 3.05 m
Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.199E-6 m/sec
y0 = 0.8346 m



PROJECT INFORMATION

Company: Palmer
Client: 759509 Ontario Inc
Project: 2402401
Location: 97 Bower St, Acton, ON
Test Well: BH24-5
Test Date: May 22, 2024

AQUIFER DATA

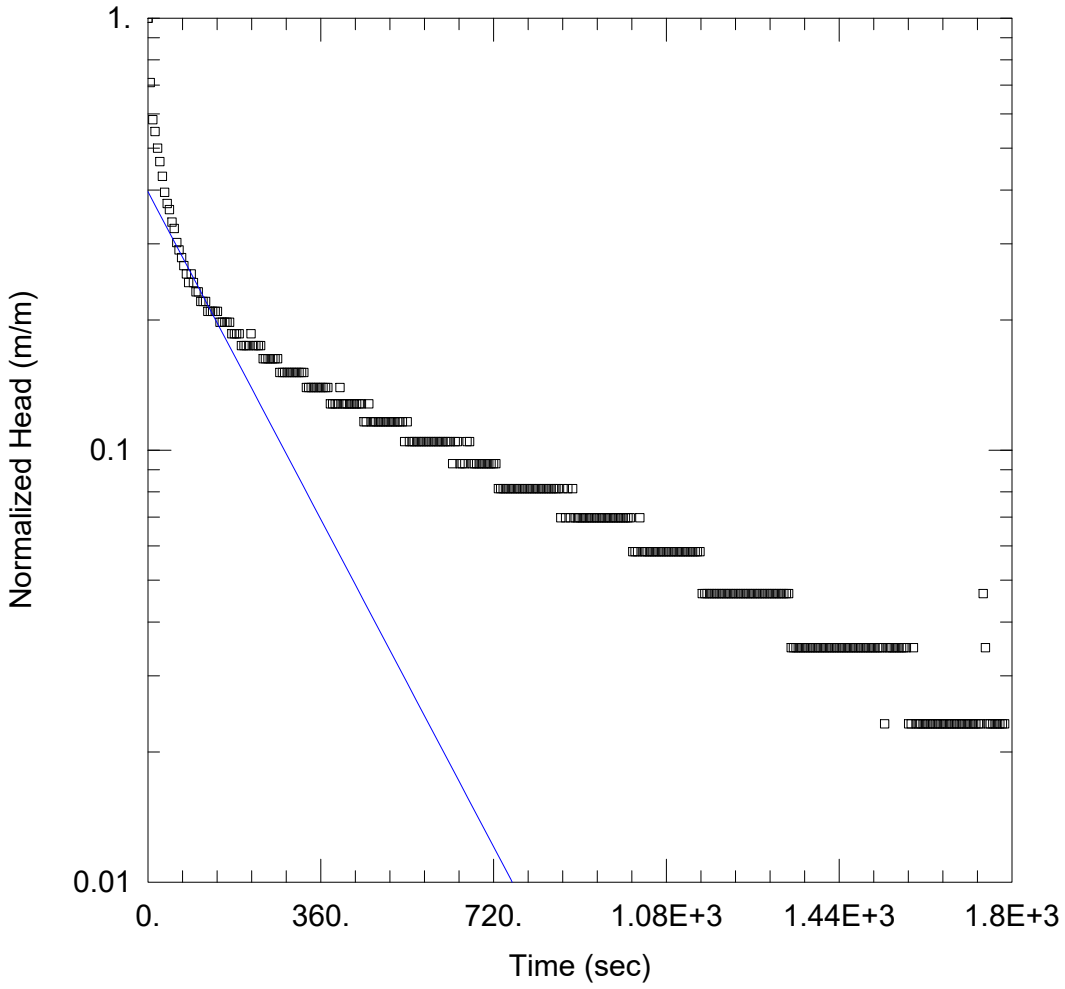
Saturated Thickness: 2.86 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-5)

Initial Displacement: 1.55 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.86 m
Screen Length: 3.05 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 6.216E-7 m/sec
y0 = 0.5476 m



PROJECT INFORMATION

Company: Palmer
Client: 759509 Ontario Inc
Project: 2402401
Location: 97 Bower St, Acton, ON
Test Well: BH24-6
Test Date: May 22, 2024

AQUIFER DATA

Saturated Thickness: 1.09 m
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-6)

Initial Displacement: 0.86 m
Total Well Penetration Depth: 3.05 m
Casing Radius: 0.0254 m
Static Water Column Height: 1.09 m
Screen Length: 3.05 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 5.025E-6 m/sec
y0 = 0.3406 m