Terra-Dynamics inc.
432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

September 2, 2025

1959025 Ontario Inc.
Attn: Peter Horn
366 King Street West
Hamilton, ON L8P 1B3

Re: Dewatering Hydrogeological Study – 2076 Old Lakeshore Road, Burlington, Region of Halton, ON

Dear Mr. Horn,

1.0 Introduction, Background Information and Purpose

Terra-Dynamics Inc. (Terra-Dynamics) respectfully submits this Dewatering Hydrogeological Study for re-development of 2076 Old Lakeshore Road, Burlington (Site, Figure 1). This study is required by the City of Burlington (2024) "*based on the findings of the Geotechnical Report*" as a hydrogeological dewatering study was recommended by Soil-Mat Engineers & Consultants Ltd. (Soil-Mat) (2023).

It is our understanding a 23-storey mixed-use building is to be constructed which will include four basement parking levels. The construction of the basement parking levels will be below the groundwater level in the underlying shale bedrock and consequently construction dewatering requirements require consideration.

This study was completed to evaluate dewatering condition requirements for construction, post-construction and to conform with the City of Burlington requirements (2024).

2.0 Methodology

The following methodologies were used to investigate the Site:

A. Assessment of regional information including topography, overburden soils, bedrock and Ministry of the Environment, Conservation and Parks (MECP) water well records.

B. Review of geotechnical and environmental reporting for the Site (Soil-Mat Engineers & Consultants Ltd., 2014, 2023a and 2023b and Terraprobe, 2021).

C. Investigation of Site conditions through (i) groundwater level monitoring from October 2023 to October 2024, (ii) groundwater sampling to conform with the City of Burlington Stormsewer By-law criteria (2022) and (iii) in-situ bedrock hydraulic conductivity testing of on-site monitoring wells to characterize the bedrock system.

D. Preparation of a description of the hydrogeological setting using the geotechnical/geological information, water levels and *in-situ* hydraulic conductivity testing.

E. Completion of a Groundwater Dewatering Assessment.

3.0 Physical Setting

The Site is municipally serviced and within the City of Burlington and Halton Region. The ground surface elevation is between 82.0 and 75.5 metres above sea level (m ASL) (Figure 2, City of Burlington, 2021). The Site is within the Lower Rambo Creek Watershed of the Burlington Urban Creeks Watershed (Conservation Halton, 2019) with Rambo Creek located approximately 230 m to the north-east, and Lake Ontario located adjacent to the south. The Site is within the Credit Valley Source Protection Area (CVSPA) but no CVSPA-mapped or Credit Valley Conservation (CVC) regulated vulnerable areas are on-site.

3.1 Geology

The Site is located within the South Slope Physiographic Region (Chapman and Putnam, 1984). The regional surficial geology is mapped as a combination of Halton Till (silt to silty clay) and bedrock at surface (i.e. less than 1 m of overburden), in the northern and southern portions of the Site (OGS, 2003).

The underlying bedrock is the Queenston Formation, comprised of shales with minor interbeds of siltstones and limestones averaging 100 m in thickness (Singer et al, 2003) extending further than 200 metres radially from the Site (Armstrong and Dodge, 2007). The bedrock regionally dips towards Lake Ontario (SNC-Lavalin, 2006).

On September 5 to 13, 2023, twelve boreholes were completed by Soil-Mat Engineers & Consultants Ltd. (Soil-Mat) to between 2 and 26 metres below ground surface (m BGS), and seven monitoring wells were constructed (Figure 2, Appendix A, Soil-Mat, 2023). Summarizing the drilling program:

1. Boreholes were advanced in the overburden by hollow-stem augers and split-spoon sampling. Beneath pavement and/or topsoil, soils were generally silty sand/sandy silt underlain by '*more till-like material*' (Soil-Mat, 2023a). Earlier investigations classified these materials as "fine sand" over "silty clay" (Soil-Mat, 2014) and the silty clay was also classified as "*clayey silt (glacial till)*" (Terraprobe, 2021). Shale bedrock was encountered between 3.0 to 4.3 metres below ground surface (m BGS) and the top of bedrock locally dips to the west from 79 to 78 m ASL.

2. Bedrock boreholes were advanced in the shale using HQ coring (96 mm/2.5 inches, diameter). The bedrock is red shale "*with more resistant grey layers, highly weathered in the upper levels... becomes sounder with depth*" (Soil-Mat, 2023a). The rock quality designation (RQD) was good (75-90%) to excellent (90-100%) at BH1, BH4 and BH5, while only at BH7 was it poor (<25%) and fair (50-75%).

Hydrogeologic cross-sections were prepared using the above referenced borehole information to visualize the subsurface conditions (Figures 3 and 4).

3.1.1 Geologic Units to be Excavated

Excavation for four basement levels is calculated to proceed to approximately 66.7 m ASL, (NEUF Architects Inc., 2025) or a depth of about 11.8 metres into the shale (Figures 3 and 4).

3.2 Groundwater Levels

Seven groundwater monitoring wells were constructed to monitor three depth intervals in the shale bedrock (Figure 2, Table 1), in increasing depth they are:

a) Shallow Shale (6 to 9 m BGS): MW-10, MW-11 and MW-12;
b) Intermediate Shale (17 to 20 m BGS): MW-2 and MW-6; and
c) Deeper Shale (23 to 26 m BGS): MW-1 and MW-4.

Groundwater levels were measured using a combination of manual measurements and water level datalogging pressure transducers.

Water level datalogger pressure transducers were continuously deployed from October 2023 to October 2024, at three, of the seven, shale groundwater monitoring wells (i.e. MW-10 Shallow, MW-2 Intermediate and MW-4 Deep). The groundwater level hydrographs for these three locations are presented in Appendix B (Charts B-1, B-2, B-3 and B-4) which included barometric compensation.

Manual groundwater level measurements were also collected at the other four monitoring wells in Fall 2023, Winter, Spring, Summer and Fall 2024 (Table 1). However, some fall 2023 manual groundwater level measurements reflect water level recovery and are not static water level background conditions (Table 1). Water level datalogger pressure transducers were also deployed for a two-week period from October 30 to November 15 2023 at the other four shale monitoring wells continuing water level monitoring following in-situ hydraulic conductivity testing (Charts B-5, B-6, B-7 and B-8, Appendix B).

3.2.1 Groundwater Level Discussion

The shale groundwater table was monitored at three groundwater monitoring wells: MW-10, MW-11 and MW-12 (Figure 2, Appendix A). The depth to the water table was observed to be no shallower than 6 metres during the one-year of monitoring (Table 1). Shallow groundwater levels were generally 6.7 to 6.9 m BGS at MW-10, 6.4 to 6.6 m BGS at MW-11 and 6.3 to 6.6 m BGS at MW-12 (Table 1). During the one-year of monitoring, the water table groundwater levels were shallowest in June 2024 as shown by the water level datalogger plot for MW-10 (Chart B-1, Appendix B). The seasonal water table variation from the Fall 2023 low to the Spring 2024 high was less than 1 metre as recorded by the water level datalogger at MW-10 (Chart B-1, Appendix B).

Although monitoring well MW-11 showed evidence of a quick groundwater level rise (1.2 m) in response to a 5.9 mm/day precipitation event November 6, 2023, similar quick responses were not noted at MW-10 or MW-12 (Chart B-1 and B-6, Appendix B) and may have resulted from surface water entering the flushmount well. Groundwater levels were higher, although similar in elevation, at the Site (as measured at MW-10) than as reported at Lake Ontario as reported by the Department of Fisheries and Oceans at Burlington Station 02HB017 (Chart B-4, Appendix B), i.e. Lake Ontario is downgradient of the water table at the Site.

Intermediate shale groundwater levels were monitored at MW-2 and MW-6, with monitoring well screens below the planned base of the fourth underground level. The intermediate shale groundwater levels ranged from about 8 to 9 m BGS (Table 1). During the one-year of monitoring, the intermediate

shale groundwater levels were shallowest in July 2024 as shown by the water level datalogger plot for MW-2 (Chart B-2, Appendix B). The intermediate groundwater levels appear to mimic, understandably, the Lake Ontario surface water levels, however are deeper on average by about 2 metres (Chart B-4, Appendix B). The vertical groundwater gradient was downwards from the water table to the intermediate groundwater system as noted in comparing MW-10 to MW-2 and MW-12 to MW-6 in 2024. However, these intermediate groundwater levels are higher than the planned base of a fourth underground level, indicating a possible upwards groundwater gradient into the future open excavation.

Deep groundwater levels within the shale were monitored at MW-1 and MW-4. Seasonal groundwater level fluctuation was limited at continuously monitored MW-4 (Chart B-3, Appendix B), after recovering following hydraulic conductivity testing in October 2023 and April 2024 (Section 3.3). The vertical gradient was downwards from the intermediate to deep groundwater systems.

3.3 Hydraulic Conductivity Analyses

Hydraulic conductivity testing of the bedrock monitoring wells was completed using a rising-head or a falling-head approach. The analyses were completed in Aqtesolv™ and the bedrock hydraulic conductivity results are summarized in Table 2 and analyses are presented in Appendix C. The calculated bulk representative hydraulic conductivity for the shale on-site is $7x10^{-9}$ m/s. Monitoring wells were developed prior to hydraulic conductivity testing.

Table 2 – Shale Hydraulic Conductivity

Individual Hydraulic Conductivity Results (m/s)	Geometric Mean (m/s)	Unit
$1x10^{-7}$ (MW-10), $1x10^{-9}$ (MW-11) $2x10^{-10}$ (MW-12)	$3x10^{-9}$	Shallow Shale
$6x10^{-9}$ (MW-2), $1x10^{-8}$ (MW-6)	$8x10^{-9}$	Intermediate Shale
$2x10^{-6}$ (MW-1), $3x10^{-10}$ (MW-4)	$2x10^{-8}$	Deep Shale
Geometric Mean	$7x10^{-9}$	Shale

There was considerable variation in the hydraulic conductivity results, ranging from 10^{-6} to 10^{-10} m/s. We have previously noted considerable variation in hydraulic conductivity on other investigations completed in the Queenston Shale within the City of Burlington (Terra-Dynamics, 2021). However, the bedrock is of sufficiently low permeability that groundwater control pumping methods may not be necessary or feasible (Figure 5, Preene, 2020).

3.4 Geologic Units to be Dewatered – Maximum Estimate

The construction excavation into the shale will be below the water table to a proposed maximum excavation depth of between 66.7 m ASL (NEUF Architects Inc., 2025), and a maximum groundwater level elevation of 75.6 m ASL (Table 1), therefore 8.9 metres of shale could horizontally contribute groundwater to the excavation. Long-term dewatering considerations are also discussed in Section 4.0.

3.5 Groundwater Quality Analyses

Unfiltered groundwater quality samples were collected November 15 or 21, 2023 from four monitoring wells: (i) MW-10 (shallow shale), (ii) MW-11 (shallow shale), (iii) MW-1 (deep shale) and (iv) MW-6

(intermediate shale). These groundwater samples were submitted to SGS Canada Inc. (an accredited Ontario laboratory) for laboratory analyses and comparison to the City of Burlington Sewer Use By-Law for Storm Sewer Discharge (Appendix D).

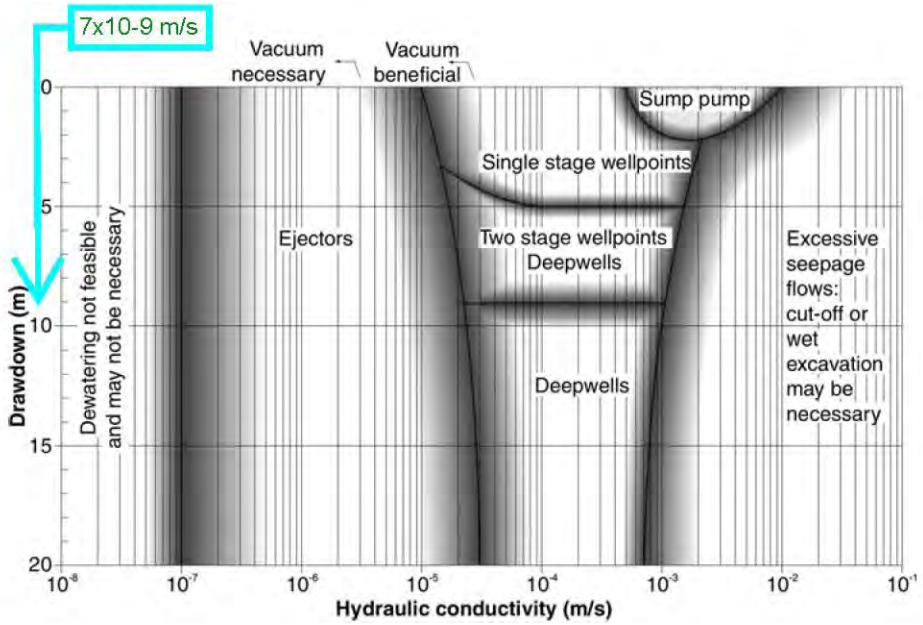


Figure 5 – Range of application of groundwater control pumping methods in granular soils (Preene,2020)

Dewatering groundwater from the shale will require treatment to meet the City of Burlington Storm Sewer Discharge criteria for total suspended solids (TSS), manganese, phosphorus and zinc (Table 3, Appendix D). However, sediment settlement tanks and/or filtering through silt-sacks for TSS would be expected to also reduce manganese, phosphorus and zinc. For example, other 'filtered' groundwater samples collected on-site by others were analyzed for zinc at the Site were non-detect at <0.005 mg/L at MW-10 and MW-11 (Soil-Mat, 2023b), however additional treatment may also be required.

Table 3 - Groundwater Quality Parameters Exceeding Storm Sewer Discharge Criteria

Parameter	Criterion (mg/L)	MW-10 Shallow	MW-11 Shallow	MW-6 Inter	MW-1 Deep
Total Suspended Solids	15	**563**	**442**	**228**	**70**
Manganese	0.05	**0.359**	**0.969**	**0.518**	**0.578**
Total Phosphorus	0.4	**0.441**	**1.02**	0.295	0.070
Zinc	0.04	0.035	**0.147**	**0.124**	**0.046**
PAHs (Total)	0.002	<0.001	<0.001	0.002	**0.004**
Chloroform	0.002	0.0020	0.0008	**0.0040**	<0.0005

Notes: **Bolded values exceeded criterion**, Inter=Intermediate

The isolated detections of PAHs and Chloroform are not considered representative of overall groundwater conditions. However, during construction dewatering, confirmatory water quality testing should be completed to ensure additional treatment is not required.

3.5.1 Long-Term Groundwater Quality Treatment for Discharge

For long-term dewatering, if required, elevated TSS may be sufficiently lowered by 60% (TRCA, 2004) via an oil and grit separator. The oil and grit separator may also reduce other parameters if still elevated above City of Burlington Stormsewer discharge criteria or additional treatment may be required.

3.6 Hydrogeologic Setting

Given the water table observed as about 3 metres below the top of the shale bedrock, it can be considered unconfined. Excavation within the bedrock will involve some collection of groundwater, but 'active' construction dewatering is not anticipated but rather limited excavation sump collection of seeping groundwater due to the low hydraulic conductivity (Figure 5, Preene, 2020).

4.0 Groundwater Dewatering Assessment

Dewatering flow rates were estimated for construction excavation dewatering and post-construction conditions. The horizontal dewatering rates were estimated using an analytical equation for radial flow to a water table from Powers et al (2007).

The maximum groundwater level elevation for the assessment was 75.6 m ASL. The depth of excavation may extend to an elevation of 66.7 m ASL. This requires a potential horizontal dewatering value of 9.4 m (i) 8.9 metres construction depth, plus (ii) an additional 0.5 m of dewatering depth was added as a reasonable assumption for keeping an excavation dry (Preene, 2023). An excavation of 47 by 38 metres was used for the analyses approximating the dimensions of the Site. An additional factor of safety was introduced by modelling using a hydraulic conductivity of $1x10^{-7}$ m/s for the shale.

The calculated maximum construction horizontal dewatering rate is modelled to be less than 10,000 Litres/day (Table E-1, Appendix E).

As the calculated maximum dewatering rate is less than 50,000 L/day, a Ministry of the Environment, Conservation & Parks (MECP) Environmental Activity and Sector Registry (EASR) temporary 'Construction Site Dewatering' application should not be required, however a dewatering plan should be prepared for discharge to the City of Burlington storm sewer.

With respect to long term dewatering, the dewatering flow rate is modelled to decrease over time, to less than 500 Litres/day after 5 years (Figure E-1, Appendix E). Long-term post-construction dewatering rates incorporated a Cooper-Jacob influence calculation from Cashman and Preene (2021), and a saturated thickness of 6.9 m reflecting the maximum groundwater level (75.6 m ASL) and the fourth underground level floor at 68.7 m ASL. Example calculations are shown in Table E-2(Appendix E) at 5 years, where the daily discharge rate is modelled to be less than 500 L/day. Consequently, it is our understanding that this small amount of water would not require 'bath-tubbing" waterproofing, but could be captured by perimeter foundation drainage. However, conditions during excavation should be observed to inform perimeter drainage design.

4.1 Dewatering Zone of Influence

A construction dewatering zone of influence in the shale bedrock was conservatively calculated as between a radial distance of 33 metres (Table E-1, Appendix E). This is a conservative calculation as it does not include consideration of groundwater recharge, or the time to reach this distance. However, it is our understanding that there should be no settlement concerns with dewatering occurring in the shale (Soil-Mat, 2023).

4.2 Other Dewatering Considerations

Ministry of the Environment, Conservation and Parks (MECP, 2024) water well records within 200 m were reviewed and no private groundwater supplies are suggested to exist within this municipally serviced area.

Within 200 m of the Site, only construction dewatering Permits to Take Water (PTTW) and Environmental Activity and Sector Registries (EASRs) were listed by the MECP under Access Environment, i.e. no PTTW were listed within 200 m for groundwater supplies that would be negatively affected by on-site construction dewatering.

5.0 Conclusions and Recommendations

5.1 Conclusions

The following conclusions are provided:

1. Construction of a 23-story mixed-use building at 2076 Old Lakeshore Road, Burlington is proposed to include 4 basement parking levels;

2. Construction of the 4 basement parking levels will require excavation to an elevation of 66.7 metres above sea level. This excavation will be primarily of shale bedrock;

3. The water table at the Site is within the shale bedrock, observed to be as high as 6.3 metres below ground surface. The shale bedrock exhibits a low average bulk hydraulic conductivity of $7x10^{-9}$ m/s;

4. Total suspended solids in dewatering waters will require treatment to meet the City of Burlington stormsewer discharge criterion which may also address potentially naturally elevated manganese, phosphorus and zinc concentrations;

5. Construction dewatering for the underground levels is modelled to not require a Construction Dewatering EASR from the MECP with maximum in-flows calculated as less than 10,000 Litres/day to dewater the shale bedrock;

6. No negative effects are predicted to occur from dewatering takings during construction; and

7. Post-construction dewatering is calculated to be very low at less than 500 L/day after 5 years.

5.2 Recommendations

The following recommendations are provided for your consideration:

1. Total suspended solids (TSS) should be reduced in dewatering waters through sediment control and filtration where needed and laboratory analyses should be completed to confirm reduction in TSS, manganese, phosphorus and zinc;

2. A Dewatering plan should be designed for discharge to the City of Burlington stormsewer;

3. A Permit should be obtained from the City of Burlington for discharging groundwaters from the Site to the stormsewer; and

4. Monitoring wells should be decommissioned once Site Plan approval is received.

6.0 Limitations

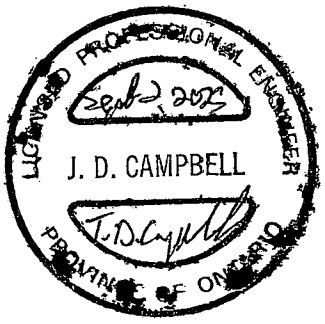
Subsurface dewatering assessments, by their nature, have inherent limitations and uncertainties primarily due to the heterogeneities in geologic conditions causing differences in hydraulic conductivity, hydraulic gradients and pressures in areas of a site not investigated by boreholes and/or monitoring wells. It is believed that these uncertainties have been addressed through conservative interpretation of other existing regional-based geologic conditions and site-specific data at the places investigated. Conditions may vary in the subsurface at places not investigated. The assessment of dewatering potential, including the evaluation of risk and/or impact, is valid only for the assumptions and conditions outlined in this report and the conditions as they were observed at the time of the investigation. Should knowledge of the site conditions change, the assessments of risks posed by the site may differ from that presented in this report.

This report was prepared by Terra-Dynamics Inc. for 1959025 Ontario Inc.. The material in it reflects Terra-Dynamics' best judgment in light of the information available to Terra-Dynamics at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibility of such third parties. Terra-Dynamics accepts no responsibility for damages, if any, suffered by any third parties as a result of decisions made, or actions taken, based on this report. However that being said, a reliance letter is provided with the final report that authorizes the City of Burlington to make reliance on the findings and recommendation outlined in this report (Appendix F).

We trust this information is sufficient. Please do not hesitate to contact us if you have any questions or require additional information for your review.

Yours truly,

TERRA-DYNAMICS INC.



Jayme D. Campbell, P.Eng.
Senior Water Resource Engineer

Attachments
Figure 1 – Site Location
Figure 2 – Site Details
Figure 3 – Hydrogeologic Cross Section A-A'
Figure 4 – Hydrogeologic Cross Section B-B'
Table 1 – Manual Groundwater Levels
Appendix A – Borehole/Monitoring Well Logs
Appendix B – Hydrographs
Appendix C – Hydraulic Conductivity Analyses
Appendix D – Water Quality Analyses
Appendix E – Dewatering Calculations
Appendix F – Reliance Letter

7.0 References

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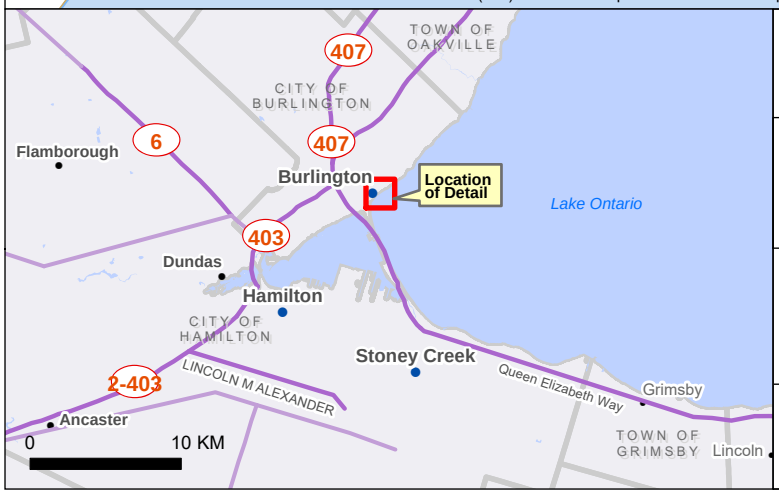
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Site Location

Dewatering Hydrogeological Study
2670 Old Lakeshore Road, Burlington, ON

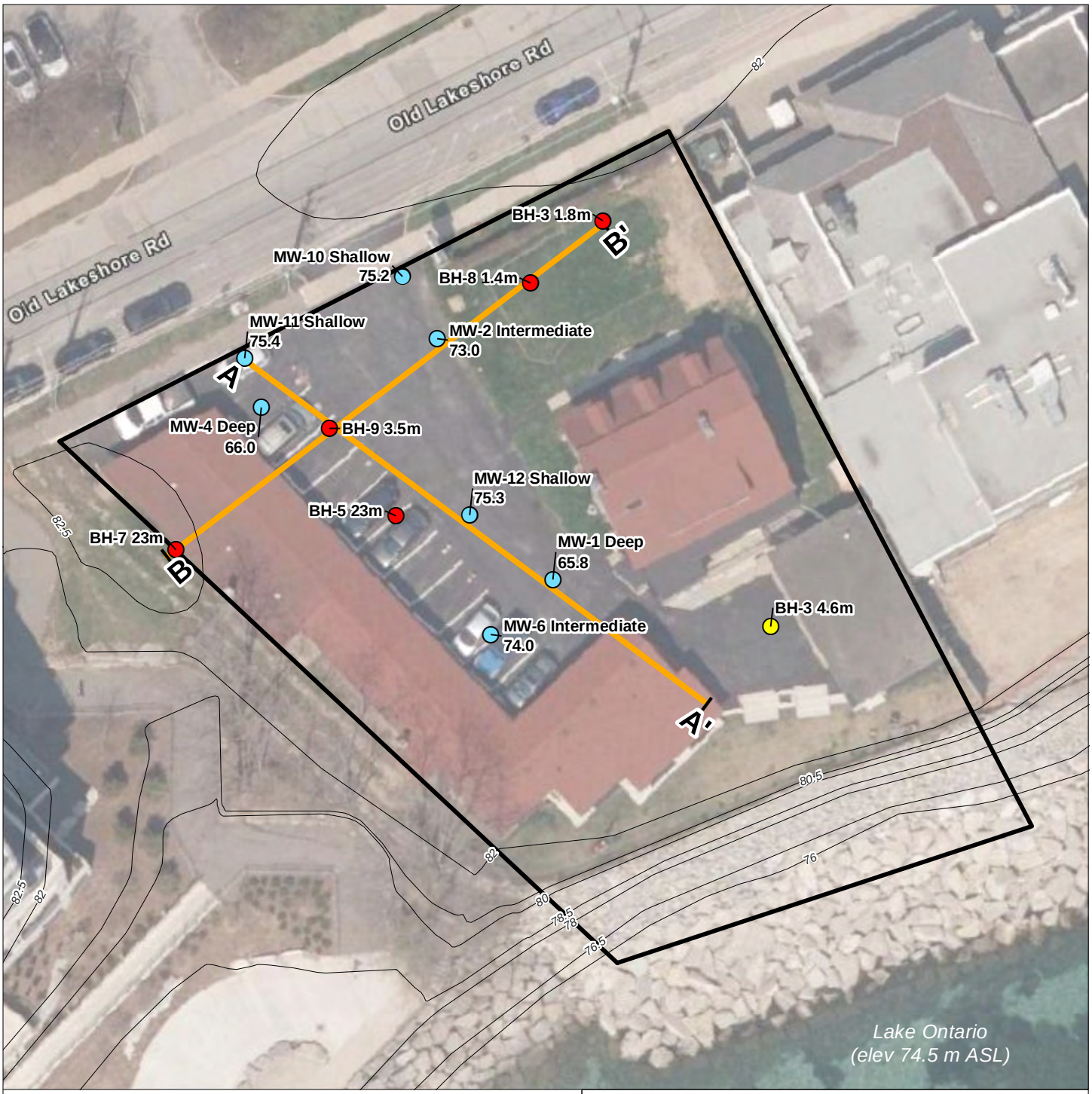
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Figure 1

Path: H:\TERRA_DYNAMICS\9767 - TD 2670 Old Lakeshore Rd\gis\mxd\Figure 1 Location of Subject Lands.mxd Revised: August 14, 2025



Legend

- Subject Lands
- Surface Contours, m ASL (City of
- Geologic Cross-section
- Borehole (Soil-Mat 2023)
- Borehole (TerraProbe)
- Monitoring Well (Soil-Mat 2023)

Depth (m) / *Identifier* — **BH-5 23m**

BH-3 4.6m

Identifier — **MW-1 Deep**

Water Level (mASL) — **65.8**

Manual groundwater levels April 9, 2024.

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Air photo: City of Burlington 2023.
Coordinate system : NAD 1983, UTM Zone 17T

Site Details

Dewatering Hydrogeological Study
2670 Old Lakeshore Road, Burlington, ON

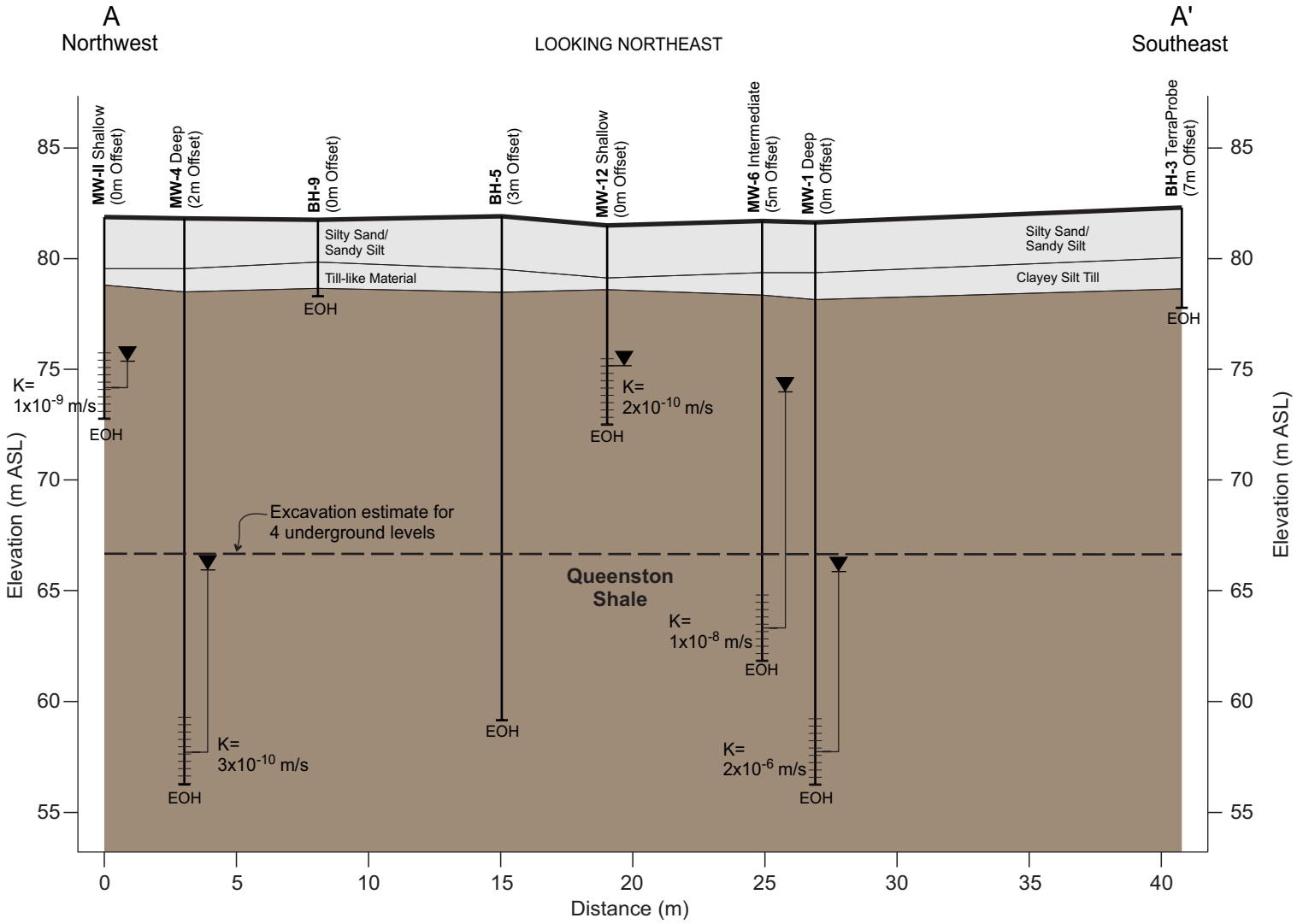
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Figure 2

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Groundwater Level April 9, 2024 mASL

Well Screen

EOH End of Hole

$K= 3x10^{-10}$ Hydraulic Conductivity (m/s)

Overburden

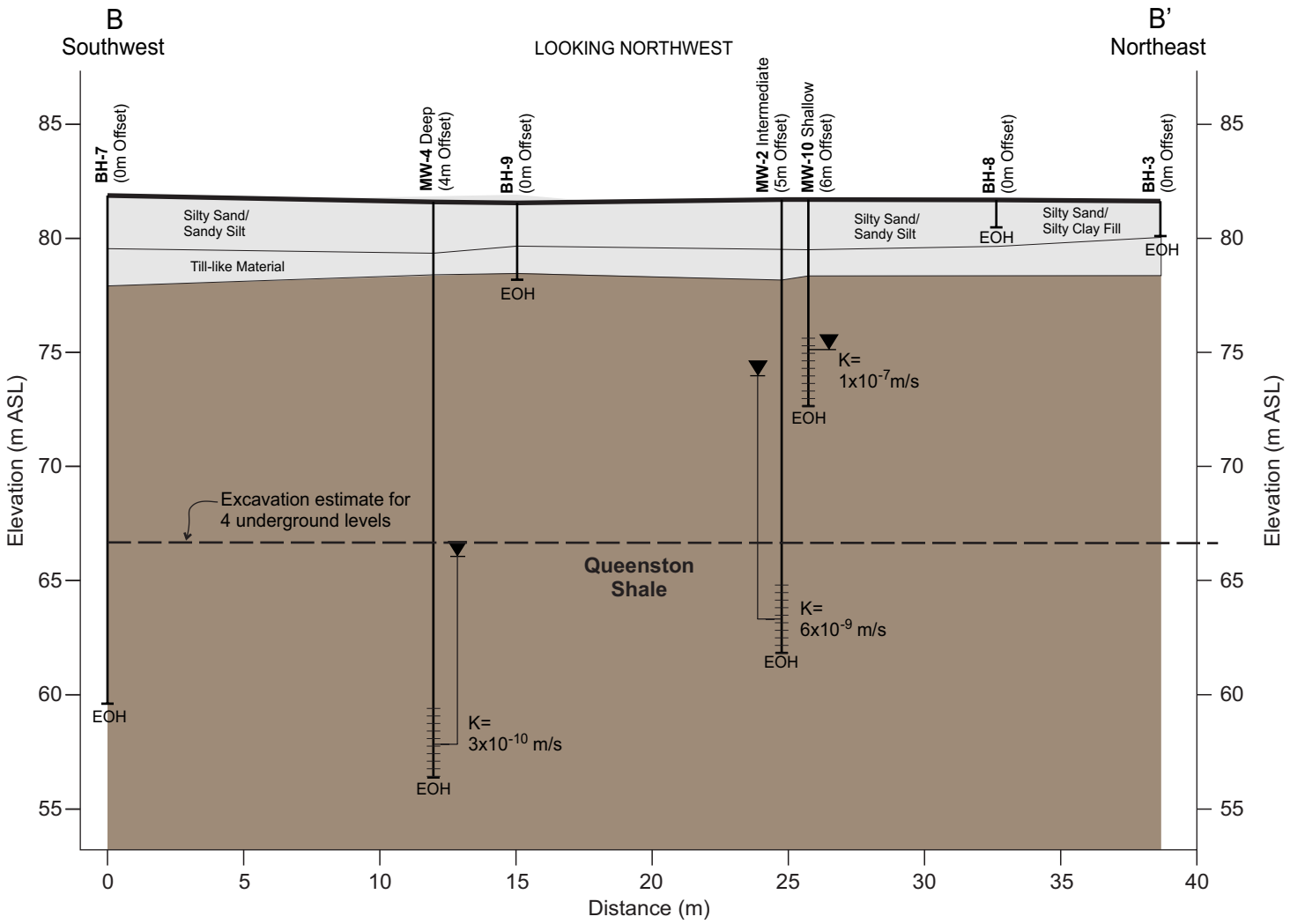
Queenston Shale Bedrock

Hydrogeologic Cross-section A-A'

Dewatering Hydrogeological Study
2670 Old Lakeshore Road, Burlington, ON

Terra-Dynamics inc.

Figure 3



Groundwater Level April 9, 2024 mASL

Well Screen

EOH End of Hole

K= $3x10^{-10}$ Hydraulic Conductivity (m/s)

Overburden

Queenston Shale Bedrock

Hydrogeologic Cross-section B-B'

Dewatering Hydrogeological Study
2670 Old Lakeshore Road, Burlington, ON

Terra-Dynamics inc.

Figure 4

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Table 1
Monitoring Well Details and Manual Water Levels

Well I.D.	Ground Elevation (m ASL)	Stick-Up (m)	TOC Elevation (m ASL)	Well Depth Below TOC (m)	Well Depth below ground (m)	Date	Water level (m below TOC)	Water Level below ground (m)	Water Level Elevation (m ASL)
MW1 - Deep	81.90	-0.06	81.84	25.85	25.91	4-Oct-23	15.60	15.66	66.24
						30-Oct-23	15.03	15.09	66.81
						31-Oct-23	15.07	15.13	66.77
						7-Nov-23	15.01	15.07	66.84
						15-Nov-23	15.27	15.33	66.57
						22-Feb-24	15.89	15.95	65.95
						9-Apr-24	16.07	16.13	65.78
						2-Oct-24	16.15	16.21	65.69
MW2 - Intermediate	81.90	-0.14	81.77	20.14	20.27	4-Oct-23	8.95	9.09	72.82
						30-Oct-23	9.09	9.23	72.68
						31-Oct-23	8.96	9.09	72.81
						7-Nov-23	10.12	10.26	71.65
						15-Nov-23	9.71	9.85	72.06
						22-Feb-24	8.94	9.08	72.83
						9-Apr-24	8.76	8.90	73.01
						3-Sep-24	8.57	8.71	73.20
						2-Oct-24	8.63	8.77	73.14
MW4 - Deep	81.96	-0.17	81.79	25.74	25.91	31-Oct-23	23.01	23.18	58.78
						7-Nov-23	20.02	20.19	61.77
						15-Nov-23	18.24	18.41	63.55
						22-Feb-24	15.93	16.10	65.86
						9-Apr-24	15.83	16.00	65.96
						2-Oct-24	15.64	15.81	66.15
MW6 - Intermediate	81.97	-0.10	81.87	20.17	20.27	30-Oct-23	7.55	7.65	74.32
						7-Nov-23	8.24	8.34	73.63
						15-Nov-23	8.25	8.35	73.62
						22-Feb-24	7.99	8.09	73.88
						9-Apr-24	7.88	7.98	73.99
						3-Sep-24	7.92	8.02	73.95
						2-Oct-24	7.96	8.06	73.91
MW10 - Shallow	81.9	-0.04	81.89	9.10	9.14	4-Oct-23	7.20	7.24	74.69
						17-Oct-23	7.22	7.26	74.67
						30-Oct-23	7.18	7.22	74.71
						31-Oct-23	7.28	7.32	74.61
						7-Nov-23	7.19	7.23	74.70
						15-Nov-23	7.18	7.22	74.71
						21-Nov-23	7.17	7.21	74.72
						22-Feb-24	6.86	6.90	75.04
						9-Apr-24	6.68	6.72	75.21
						3-Sep-24	6.72	6.76	75.17
						2-Oct-24	6.66	6.70	75.23

Table 1
Monitoring Well Details and Manual Water Levels

Well I.D.	Ground Elevation (m ASL)	Stick-Up (m)	TOC Elevation (m ASL)	Well Depth Below TOC (m)	Well Depth below ground (m)	Date	Water level (m below TOC)	Water Level below ground (m)	Water Level Elevation (m ASL)
BH/MW11 - Shallow	82.0	-0.06	81.9	9.08	9.14	17-Oct-23	8.08	8.14	73.82
						30-Oct-23	7.84	7.90	74.06
						31-Oct-23	8.46	8.52	73.44
						7-Nov-23	6.96	7.02	74.94
						15-Nov-23	7.51	7.57	74.39
						21-Nov-23	7.86	7.92	74.04
						22-Feb-24	7.16	7.22	74.74
						9-Apr-24	6.53	6.59	75.37
						3-Sep-24	6.35	6.41	75.56
						2-Oct-24	6.35	6.41	75.55
BH/MW12 - Shallow	81.8	-0.10	81.71	9.04	9.14	4-Oct-23	3.10	3.20	78.61
						17-Oct-23	8.54	8.64	73.17
						30-Oct-23	8.39	8.49	73.32
						31-Oct-23	8.43	8.53	73.28
						7-Nov-23	8.70	8.80	73.02
						15-Nov-23	8.63	8.73	73.08
						21-Nov-23	8.57	8.67	73.14
						22-Feb-24	7.45	7.55	74.26
						9-Apr-24	6.45	6.55	75.26
						3-Sep-24	6.16	6.26	75.55
						2-Oct-24	6.49	6.59	75.22

Note:
MW=Monitoring well; TOC= Top of Casing; mASL=metres above sea level
Grey shading indicates recovering groundwater levels

Appendix A

Soil-Mat and Terraprobe

Borehole/ Monitoring Well Logs

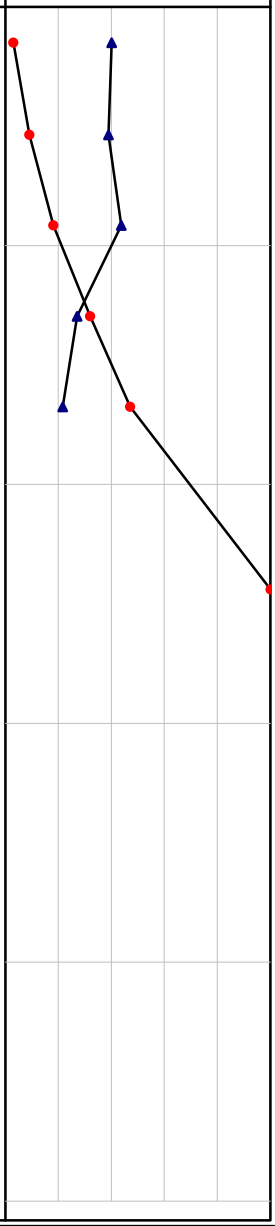
Log of Borehole No. 1

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597892

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
ft / m	81.90	Ground Surface								
0 / 0	81.70	**Pavement Structure** Approximately 50 millimetres of asphaltic concrete over 100 millimetres of compact granular base.		SS	1	4,2,1,2	3			
		Silty Sand/Sandy Silt Brown, trace gravel, some clay, reworked in appearances in the upper levels, very loose to dense.		SS	2	2,3,6,8	9			
				SS	3	6,8,10,50/4" Wet Spoon	18			
2 / 1	79.60	Transition to more till-like material.		SS	4	8,16,16,17	32			
				SS	5	5,21,26,50/5"	47			
4 / 2	78.30	**Queenston shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	6	50/2"	100			
				HQ	7	RQD=81.7%				

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 5, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 1

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597892

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34												
35												
36	11											
37												
38												
39												
40	12											
41												
42												
43	13											
44												
45												
46	14											
47												
48												
49	15											
50												
51												
52	16											
53												
54												
55												
56	17											
57					HQ	8	RQD=98.3%					
58												
59	18											
60												
61												
62	19				HQ	9	RQD=86.7%					
63												
64												
65												

Drill Method: HS/HQ
Drill Date: September 5, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 1

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597892

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
66–98	56.00		End of Borehole		HQ	10	RQD=94.4%					Core C2: 23.31 metres Unconfined Compressive Strength = 26.5 MPa
					HQ	11	RQD=100%					Core C3: 24.63 metres Unconfined Compressive Strength = 12.4 MPa

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 5, 2023 to termination at a depth of 25.9 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 15.66 metres bgs.

Drill Method: HS/HQ
Drill Date: September 5, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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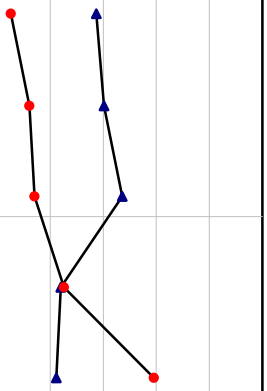
Log of Borehole No. 2

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797682
E: 597890

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	81.90	Ground Surface								
0 / 0		**Topsoil** Approximately 75 millimetres of topsoil.								
1 /		**Silty Sand/Sandy Silt** Brown, some to trace clay, trace gravel and reworked in appearances in the upper levels, loose to very dense.		SS	1	4,3,2,2	5			
2 /				SS	2	3,4,8,6	12			
3 / 1				SS	3	7,9,5,7	14			
7 / 2	79.60	Transition to more till-like material.		SS	4	7,12,13,15	25			
10 / 3				SS	5	4,24,35,50/4"	59			
11 /	78.30	**Queenston shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.								
13 / 4										
16 / 5										
20 / 6										
23 / 7										
26 / 8										
29 / 9										
33 /										

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 6, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 2

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797682
E: 597890

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34												
35												
36	11											
37												
38												
39												
40	12											
41												
42												
43	13											
44												
45												
46	14											
47												
48												
49	15											
50												
51												
52	16											
53												
54												
55	17											
56												
57												
58												
59	18											
60												
61												
62	19											
63												
64												
65												
	61.80											

Drill Method: HS/HQ
Drill Date: September 6, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Sheet: 2 of 3

Log of Borehole No. 2

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797682
E: 597890

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
66			End of Borehole									
67												
68												
69	21											
70												
71												
72	22											
73												
74												
75												
76	23											
77												
78												
79	24											
80												
81												
82	25											
83												
84												
85												
86	26											
87												
88												
89	27											
90												
91												
92	28											
93												
94												
95	29											
96												
97												
98												

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 6, 2023 to termination at a depth of 20.1 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 9.08 metres bgs.

Drill Method: HS/HQ
Drill Date: September 6, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 3

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 479783
E: 597880

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		81.97	Ground Surface								
0	0	81.60	**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	1,4,5,3	9			0 PPM
3	1		**Pavement Structure** Approximately 150 millimetres of compact granular base.		SS	2	1,1,1,2	2			0 PPM
6	2	80.17	**Silty Sand/Silty Clay Fill** Brown, occasional cobbles, organics and concrete inclusions, stiff to soft.		SS	3	28,50/2"	100			0 PPM
			End of Borehole Spoon Refusal on Assumed Concrete								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using solid stem auger equipment on September 12, 2023 to spoon refusal on assumed concrete at a depth of 1.8 metres.

2. Borehole was recorded as open and 'dry' below the ground surface upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Auger
Drill Date: September 12, 2023
Hole Size: 150 millimetres
Drilling Contractor: Davis Drilling Ltd.

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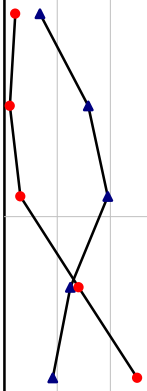
Log of Borehole No. 4

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597876

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 ft / 0 m	81.96	Ground Surface								
0 ft / 0 m	81.70	**Pavement Structure** — Approximately 100 millimetres of asphaltic concrete over 125 millimetres of compact granular base.								
0 ft / 0 m	81.70	**Silty Sand/Sandy Silt** — Brown, trace gravel, some clay, occasional sandy seams, occasional rocks inclusions and reworked in appearances in the upper levels, very loose to dense.		SS	1	2,2,2,3	4			
				SS	2	1,0,2,2	2			
				SS	3	1,2,4,12	6			
8 ft / 2 m	79.60	Transition to more till-like material.		SS	4	7,10,18,15	28			
10 ft / 3 m	78.60	**Queenston shale** — Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	5	4,22,28,50/5"	50			

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 7, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Datum: Geodetic Benchmark
Field Logged by: PTT
Checked by: SRS
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Log of Borehole No. 4

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597876

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34												
35												
36	11											
37												
38												
39												
40	12											
41												
42												
43	13											
44												
45												
46	14											
47												
48												
49	15											
50												
51												
52	16											
53												
54												
55												
56	17				HQ	6	RQD=93.3%					
57												
58												
59	18											
60												
61												
62	19				HQ	7	RQD=95.3%					
63												
64												
65												

Drill Method: HS/HQ
Drill Date: September 7, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 4

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797671
E: 597876

Depth	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
66										
67										
68										
69	21									
70										
71										
72	22									
73										
74										
75										
76	23									
77										
78				HQ	8	RQD=95.8%				
79	24									
80										
81										
82	25			HQ	9	RQD=89.3%				
83										
84										
85	56.06	End of Borehole								
86	26									
87										
88										
89	27									
90										
91										
92	28									
93										
94										
95	29									
96										
97										
98										

Moisture Content w%: 10 20 30 40

Standard Penetration Test blows/300mm: 20 40 60 80

Core D1: 18.69 metres Unconfined Compressive Strength = 17.5 MPa

Core D3: 25.69 metres Unconfined Compressive Strength = 30.9 MPa

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 7, 2023 to termination at a depth of 25.9 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 8.53 metres bgs.

Drill Method: HS/HQ
Drill Date: September 7, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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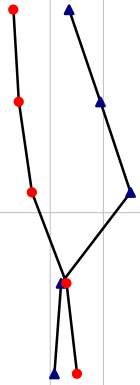
Log of Borehole No. 5

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797697
E: 597894

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	82.01	Ground Surface								
0 / 0	81.70	**Pavement Structure** Approximately 75 millimetres of asphaltic concrete over 175 millimetres of compact granular base.		SS	1	5,4,2,1	6			
3 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel, some to trace clay, occasional sandy seams, reworked in appearances in the upper levels, loose to compact.		SS	2	2,5,3,6	8			
6 / 2				SS	3	4,6,7,8	13			
7 / 2	79.70	Transition to more till-like material.		SS	4	4,15,11,14	26			
10 / 3				SS	5	4,9,21,50/4"	30			
11 / 3	78.60	**Queenston shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		HQ	6	RQD=100%				
33 / 9										

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 8, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 5

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797697
E: 597894

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34												
35												
36	11											
37												
38												
39												
40	12											
41												
42												
43	13											
44												
45												
46	14											
47												
48												
49	15											
50												
51												
52												
53	16											
54												
55												
56	17											
57					HQ	7	RQD=75.0%					
58												
59	18											
60												
61												
62	19											
63												
64												
65												

Drill Method: HS/HQ
Drill Date: September 8, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 5

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797697
E: 597894

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
66–98	59.01		End of Borehole		HQ	8	RQD=91.8%					Core B1: 7.92 metres Unconfined Compressive Strength = 22.3 MPa Core B2: 21.97 metres Unconfined Compressive Strength = 26.3 MPa

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 8, 2023 to termination at a depth of 23.0 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: HS/HQ
Drill Date: September 8, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 6

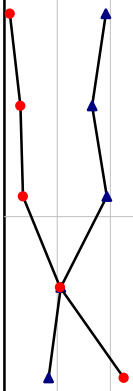
Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797661
E: 597890

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.97	Ground Surface								
0 / 0	81.70	**Pavement Structure** — Approximately 75 millimetres of asphaltic concrete over 150 millimetres of compact granular base.								
1 / 0		**Silty Sand/Sandy Silt** — Brown, trace gravel, some to trace clay, occasional sandy seams, reworked in appearances in the upper levels, very loose to dense.		SS	1	3,1,1,1	2			
2 / 1				SS	2	2,3,3,4	6			
3 / 1				SS	3	2,3,4,5	7			
7 / 2	79.60	Transition to more till-like material, occasional cobbles inclusions.		SS	4	7,9,12,14	21			
10 / 3	78.60	**Queenston shale** — Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	5	6,11,34,34	45			
11 / 3										
13 / 4										
16 / 5										
20 / 6										
23 / 7										
26 / 8										
29 / 9										
33										

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 11, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Sheet: 1 of 3

Log of Borehole No. 6

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797661
E: 597890

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE: Type	SAMPLE: Number	SAMPLE: Blow Counts	SAMPLE: Blows/300mm	SAMPLE: Recovery	SAMPLE: PP (kgf/cm2)	SAMPLE: U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34												
35												
36	11											
37												
38												
39												
40	12											
41												
42												
43	13											
44												
45												
46	14											
47												
48												
49	15											
50												
51												
52	16											
53												
54												
55												
56	17											
57												
58												
59	18											
60												
61												
62	19											
63												
64												
65												

Drill Method: HS/HQ
Drill Date: September 11, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 6

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797661
E: 597890

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
66	61.67											
67			End of Borehole									
68												
69	21											
70												
71												
72	22											
73												
74												
75												
76	23											
77												
78												
79	24											
80												
81												
82	25											
83												
84												
85												
86	26											
87												
88												
89	27											
90												
91												
92	28											
93												
94												
95	29											
96												
97												
98												

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 11, 2023 to termination at a depth of 20.3 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 5.49 metres bgs.

Drill Method: HS/HQ
Drill Date: September 11, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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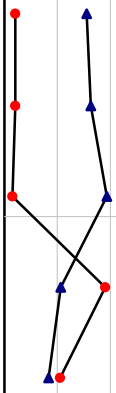
Log of Borehole No. 7

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797662
E: 597856

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	82.29	Ground Surface							
0 / 0	82.10	**Topsoil** Approximately 125 millimetres of topsoil..	SS	1	1,2,2,1	4			
3 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel, trace to some clay, occasional organics inlcusions in the upper levels, very loose to dense.	SS	2	2,2,2,1	4			
6 / 2			SS	3	3,2,1,3	3			
8 / 2	79.70	Transition to more till-like material, occasional cobbles inclusions.	SS	4	6,17,21,16	38			
10 / 3			SS	5	6,9,12,15	21			
13 / 4	78.00	**Queenston shale** Red, high silt content, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.	HQ	6	RQD=48.3%				
23 / 7									
33 / 10									

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: HS/HQ
Drill Date: September 12, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 7

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797662
E: 597856

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65	11 12 13 14 15 16 17 18 19				HQ	7	RQD=70.7%					

Drill Method: HS/HQ
Drill Date: September 12, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 7

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797662
E: 597856

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
66–98	59.39		End of Borehole		HQ	8	RQD=85.0%					Core A1: 17.00 metres Unconfined Compressive Strength = 17.2 MPa Core A2: 21.68 metres Unconfined Compressive Strength = 27.7

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 12, 2023 to termination at a depth of 22.9 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: HS/HQ
Drill Date: September 12, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 8

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797686
E: 597896

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.95	Ground Surface								
0–3 / 0–1		**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	4,7,7,6	14			0 PPM
3–4 / 1	80.55	**Silty Sand/Sandy Silt Fill** Brown, trace gravel, occasional cobbles and construction debris inclusions, compact.		SS	2	1,4,0,0	4			0 PPM
4 / 1		End of Borehole Auger Refusal on Assumed Concrete								

Moisture Content w% — 10 20 30 40

Standard Penetration Test blows/300mm — 20 40 60 80

NOTES:

1. Borehole was advanced using solid stem auger equipment on September 12, 2023 to auger refusal on assumed concrete at a depth of 1.4 metres.

2. Borehole was recorded as open and 'dry' below the ground surface upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Auger
Drill Date: September 12, 2023
Hole Size: 150 millimetres
Drilling Contractor: Davis Drilling Ltd.

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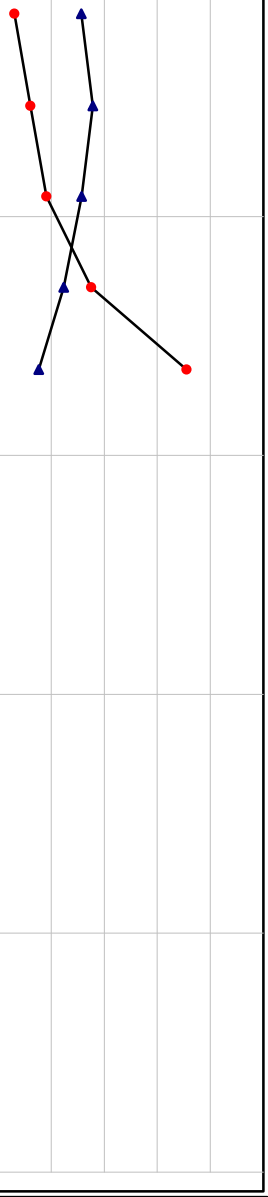
Log of Borehole No. 9

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797676
E: 597886

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.94	Ground Surface								
0 / 0	81.60	**Pavement Structure** Approximately 25 millimetres of asphaltic concrete over 300 millimetres of compact granular base.		SS	1	5,3,3,3	6			0 PPM
3 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel, some to trace clay, reworked in appearances in the upper levels, loose to dense.		SS	2	2,5,7,8	12			75 PPM
6 / 2	79.90	Transition to more till-like material, occasional cobbles inclusions.		SS	3	7,8,10,11	18			0 PPM
10 / 3	78.70			SS	4	9,9,26,22	35			0 PPM
11 / 4	78.44	**Queenston Shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	5	14,21,50/6"	71			0 PPM
		End of Borehole Spoon Refusal on Assumed Bedrock								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using solid stem auger equipment on September 14, 2023 to spoon refusal on assumed bedrock at a depth of 3.5 metres.

2. Borehole was recorded as open and 'dry' below the ground surface upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Auger
Drill Date: September 14, 2023
Hole Size: 150 millimetres
Drilling Contractor: Davis Drilling Ltd.

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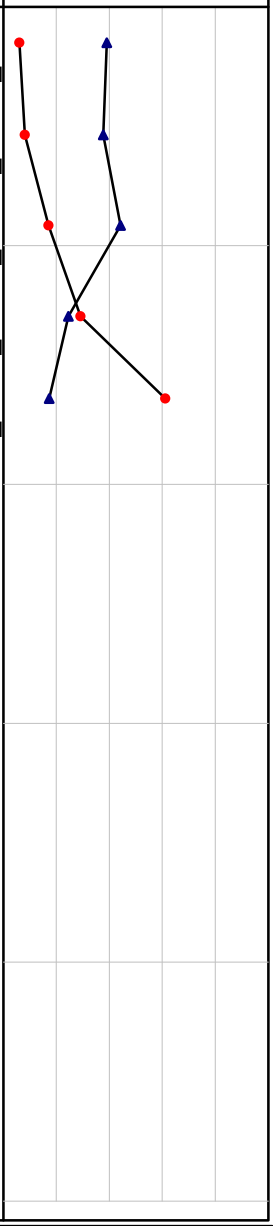
Log of Borehole No. 10

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797684
E: 597890

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.93	Ground Surface								
0 / 0		**Topsoil** Approximately 125 millimetres of topsoil.		SS	1	3,4,2,4	6			80 PPM
3 / 1		**Pavement Structure** Approximately 100 millimetres of compact granular base.		SS	2	3,4,4,4	8			0 PPM
7 / 2	79.60	**Silty Sand/Sandy Silt** Brown, some clay, reworked in appearances in the upper levels, loose to compact.		SS	3	4,8,9,10	17			0 PPM
10 / 3		Transition to more till-like material, occasional cobbles inclusions.		SS	4	3,11,18,17	29			0 PPM
11 / 3	78.50	**Queenston Shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	5	4,11,50/6"	61			0 PPM
30 / 9	72.73	End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 13, 2023 to termination at a depth of 9.2 metres.
2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 7.24 metres bgs.
October 17, 2023 - 7.26 metres bgs.

Drill Method: HS/HQ
Drill Date: September 13, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

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Log of Borehole No. 11

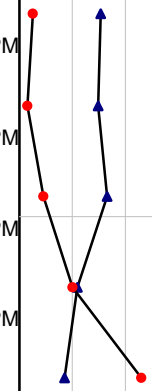
Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

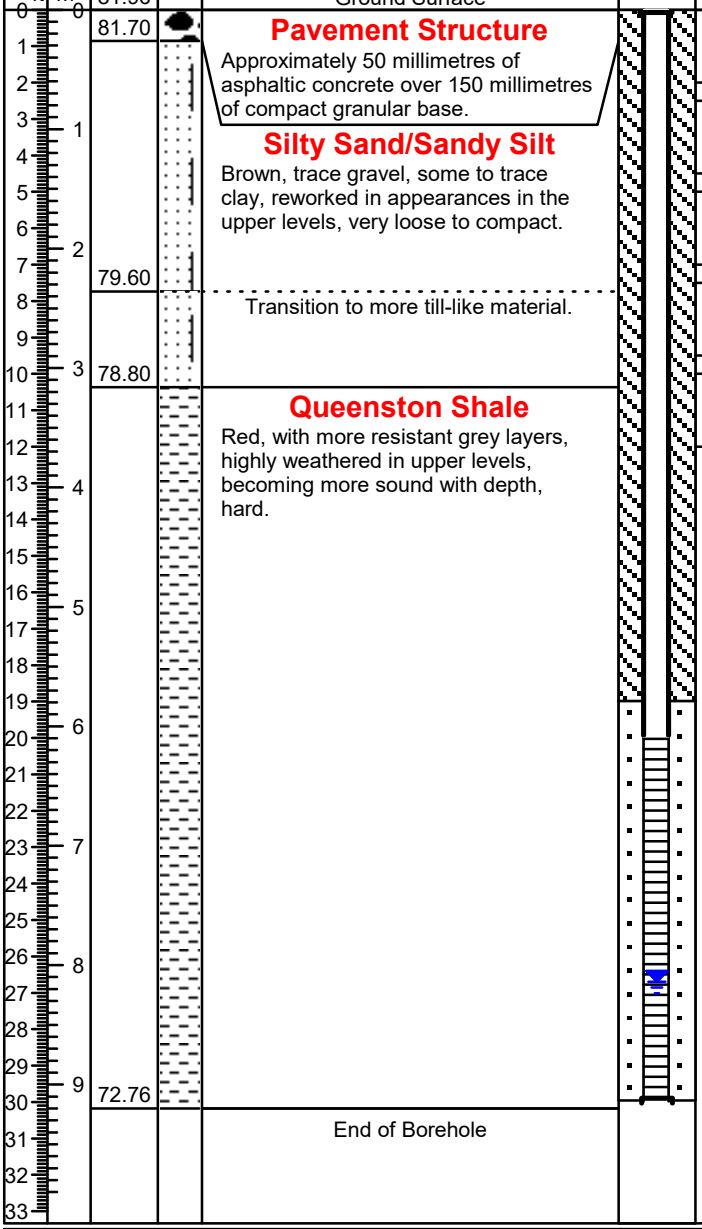
Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797674
E: 597872

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.96	Ground Surface							
0 / 0	81.70	**Pavement Structure** Approximately 50 millimetres of asphaltic concrete over 150 millimetres of compact granular base.							
1 / 0		**Silty Sand/Sandy Silt** Brown, trace gravel, some to trace clay, reworked in appearances in the upper levels, very loose to compact.	SS	1	5,2,3,2	5			0 PPM
2 / 1			SS	2	3,2,1,2	3			0 PPM
3 / 1			SS	3	3,2,7,10	9			0 PPM
7 / 2	79.60	Transition to more till-like material.							
8 / 2			SS	4	5,9,11,14	20			0 PPM
10 / 3	78.80	**Queenston Shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.	SS	5	5,21,25,50/4"	46			0 PPM
30 / 9	72.76	End of Borehole							

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)





NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 14, 2023 to termination at a depth of 9.2 metres.

2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 6.42 metres bgs.
October 17, 2023 - 8.14 metres bgs.

Drill Method: HS/HQ
Drill Date: September 14, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road · Hamilton, Ontario · L8E 2Z3
T: 905.318.7440 · TF: 800.243.1922 · F: 905.318.7455
www.soil-mat.ca · E: info@soil-mat.ca

Datum: Geodetic Benchmark
Field Logged by: PTT
Checked by: SRS
Sheet: 1 of 1

Log of Borehole No. 12

Project No: SM 230469-G
Project: Proposed High-Rise Structure
Location: 2076 Old Lakeshore Road, Burlington
Client: 1959025 Ontario Inc.

Project Manager: Stephen R. Sears, P. Eng., QP ESA
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4797669
E: 597887

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	81.81	Ground Surface							
0 / 0	81.60	**Pavement Structure** Approximately 50 millimetres of asphaltic concrete over 150 millimetres of compact granular base.							
1–7 / 0–2		**Silty Sand/Sandy Silt** Brown, trace gravel, some clay, occasional sandy seams, reworked in appearances in the upper levels, loose to compact.	SS	1	9,4,3,3	7			0 PPM
			SS	2	1,2,4,3	6			35 PPM
			SS	3	2,5,6,6 Wet Spoon	11			0 PPM
7 / 2	79.40	Transition to more till-like material, occasional cobbles inclusions.	SS	4	9,10,12,38	22			0 PPM
9 / 3	78.80	**Queenston Shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.							
30 / 9	72.61	End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger and HQ coring equipment on September 13, 2023 to termination at a depth of 9.2 metres.
2. Borehole was recorded as open upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:
October 4, 2023 - 3.2 metres bgs.
October 17, 2023 - 8.64 metres bgs.

Drill Method: HS/HQ
Drill Date: September 13, 2023
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road · Hamilton, Ontario · L8E 2Z3
T: 905.318.7440 · TF: 800.243.1922 · F: 905.318.7455
www.soil-mat.ca · E: info@soil-mat.ca

Datum: Geodetic Benchmark
Field Logged by: PTT
Checked by: SRS
Sheet: 1 of 1

Terraprobe

LOG OF BOREHOLE 3

Project No. : 7-21-0052-01	Client : Shoreplan Engineering Limited	Originated by : KG
Date started : July 16, 2021	Project : 2076 Old Lakeshore Road	Compiled by : AF
Sheet No. : 1 of 1	Location : Burlington, Ontario	Checked by : AF

Position : E: 597912, N: 4797859 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted | Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Sample Number	Sample Type	SPT 'N' Value	Elevation Scale (m)
	82.5	**GROUND SURFACE**					
0	82.3	100mm **ASPHALTIC CONCRETE**					
	0.2	200mm **FILL**, granular base		1	SS	9	
		FILL, clayey silt, loose, brown					82
	81.6						
1	0.9	**SANDY SILT**, compact, brown		2	SS	21	
							81
	80.6			3	SS	19	
2	1.9	...wet at 1.8m depth					
		CLAYEY SILT, trace gravel, trace sand, hard, reddish brown (GLACIAL TILL)		4	SS	50 / 125mm	80
		...trace shale fragments at 2.3m depth					
3				5	SS	67	
	78.7						79
	3.8	**WEATHERED SHALE**, hard, reddish brown (QUEENSTON FORMATION)		6	SS	50 / 50mm	
4	77.9						
	4.6	**END OF BOREHOLE**		7	SS	50 / 25mm	78

Borehole was dry and open upon completion of drilling.

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

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

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

Headspace Vapour (ppm)

Instrument Details

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

file:7-21-0052-01 2076 old lakeshore road.gpj

Appendix B

Hydrographs

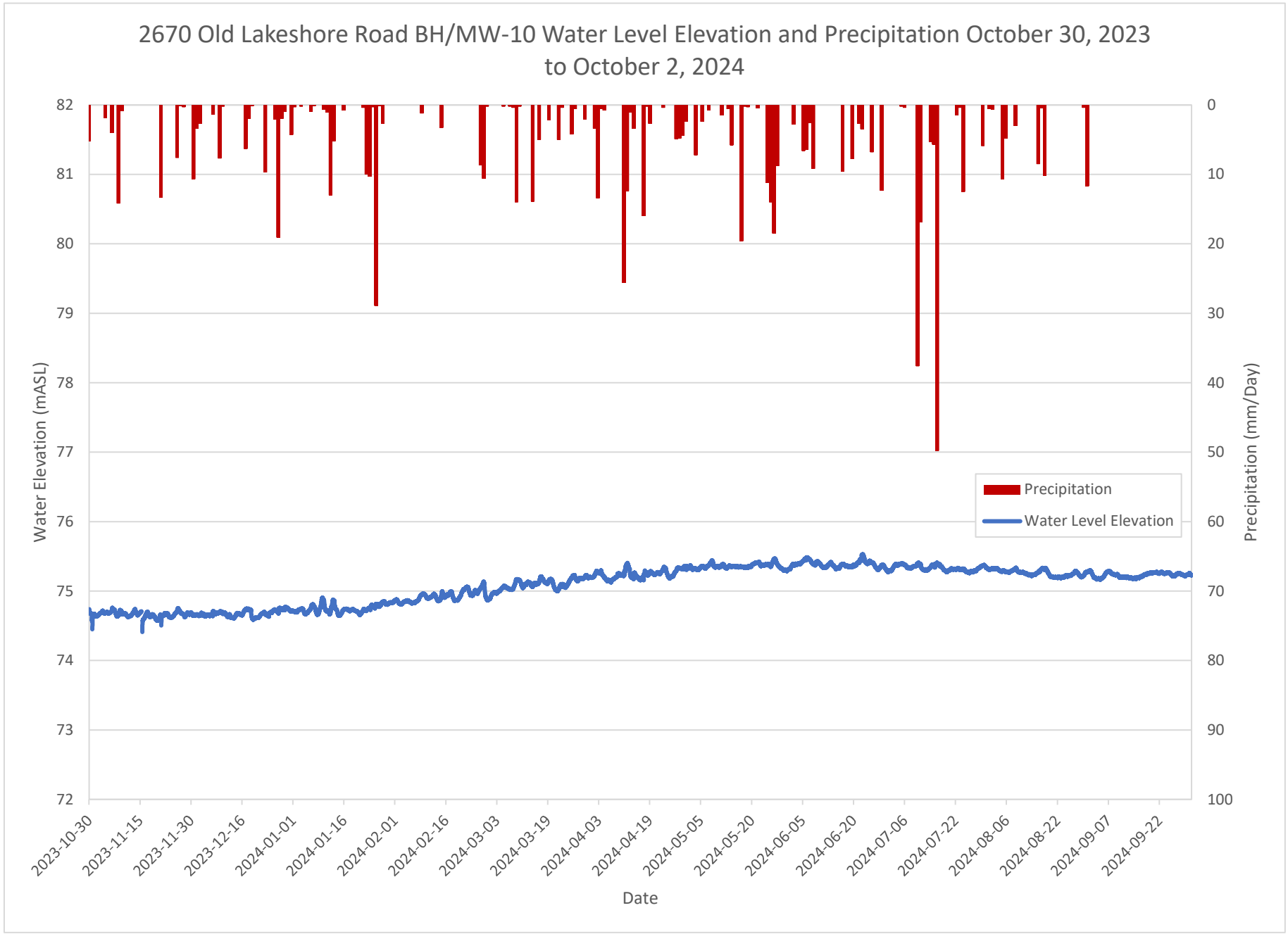

2670 Old Lakeshore Road BH/MW-10 Water Level Elevation and Precipitation October 30, 2023 to October 2, 2024
Water Elevation (mASL)
Precipitation (mm/Day)
Date
Precipitation
Water Level Elevation
82
81
80
79
78
77
76
75
74
73
72
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-11-15
2023-11-30
2023-12-16
2024-01-01
2024-01-16
2024-02-01
2024-02-16
2024-03-03
2024-03-19
2024-04-03
2024-04-19
2024-05-05
2024-05-20
2024-06-05
2024-06-20
2024-07-06
2024-07-22
2024-08-06
2024-08-22
2024-09-07
2024-09-22

Chart B-1

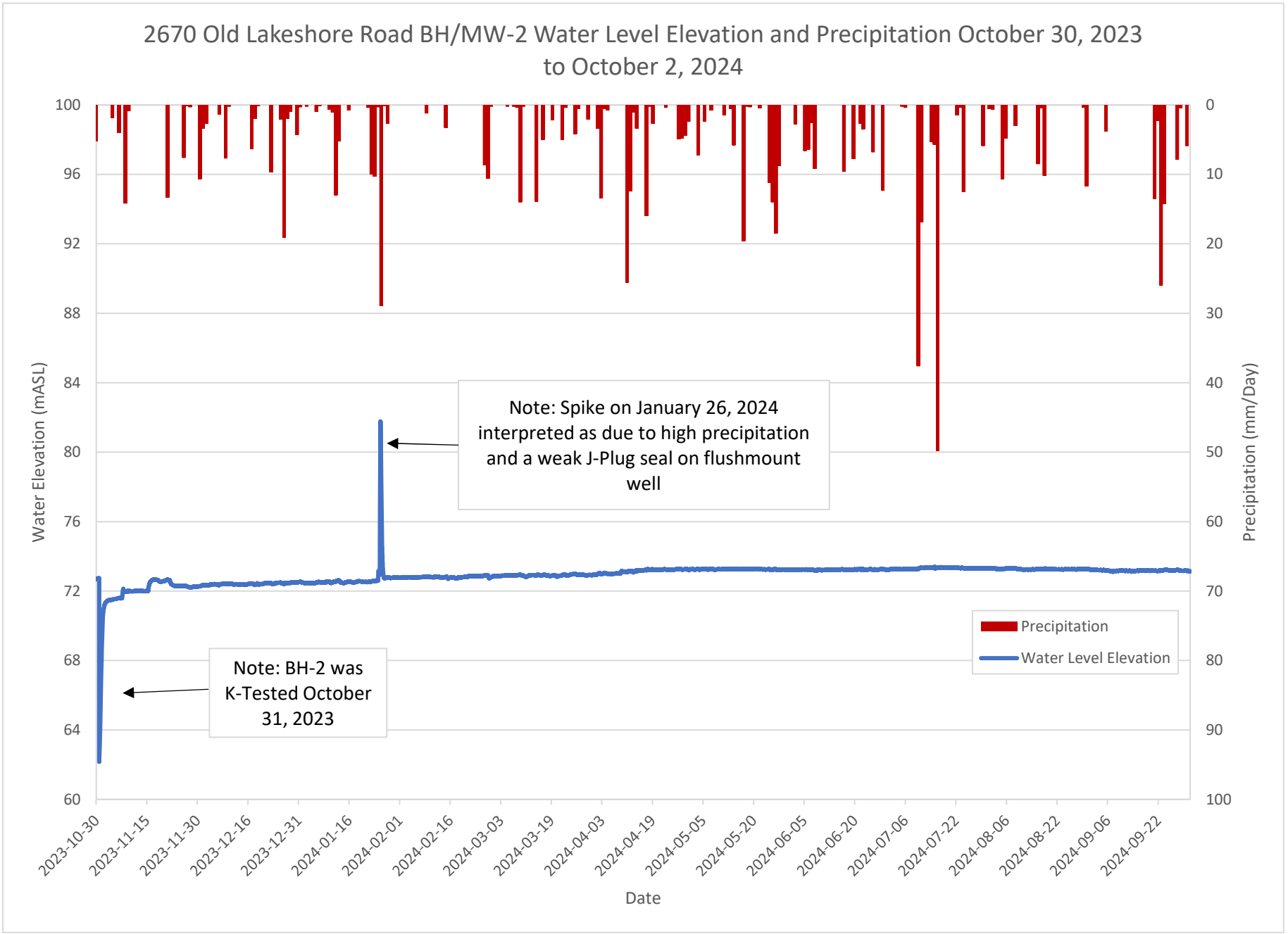

2670 Old Lakeshore Road BH/MW-2 Water Level Elevation and Precipitation October 30, 2023 to October 2, 2024
Water Elevation (mASL)
Precipitation (mm/Day)
Date
Note: Spike on January 26, 2024 interpreted as due to high precipitation and a weak J-Plug seal on flushmount well
Note: BH-2 was K-Tested October 31, 2023
Precipitation
Water Level Elevation

Chart B-2

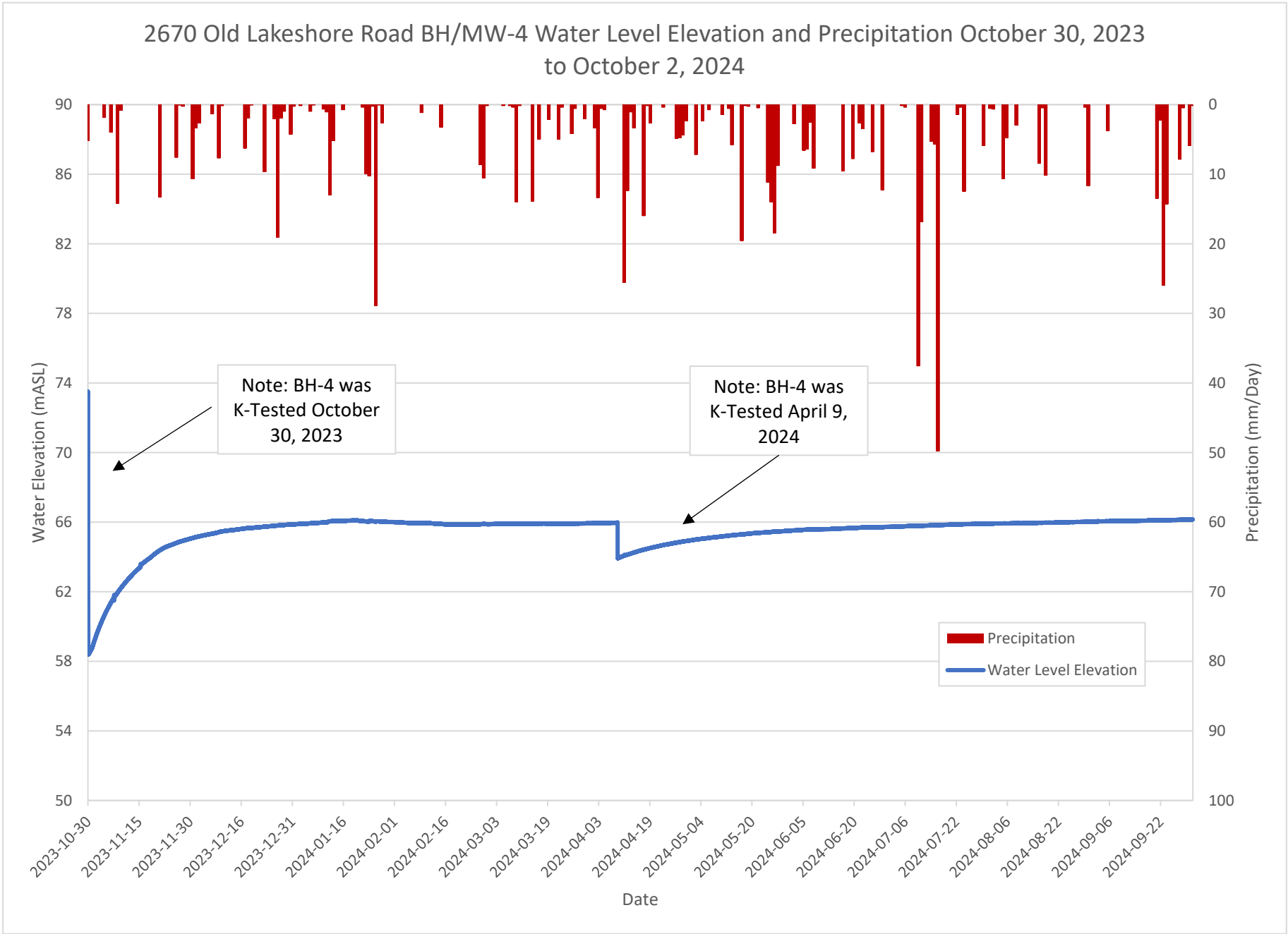

2670 Old Lakeshore Road BH/MW-4 Water Level Elevation and Precipitation October 30, 2023 to October 2, 2024
Water Elevation (mASL)
Precipitation (mm/Day)
Date
Note: BH-4 was K-Tested October 30, 2023
Note: BH-4 was K-Tested April 9, 2024
Precipitation
Water Level Elevation
90
86
82
78
74
70
66
62
58
54
50
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-11-15
2023-11-30
2023-12-16
2023-12-31
2024-01-16
2024-02-01
2024-02-16
2024-03-03
2024-03-19
2024-04-03
2024-04-19
2024-05-04
2024-05-20
2024-06-05
2024-06-20
2024-07-06
2024-07-22
2024-08-06
2024-08-22
2024-09-06
2024-09-22

Chart B-3

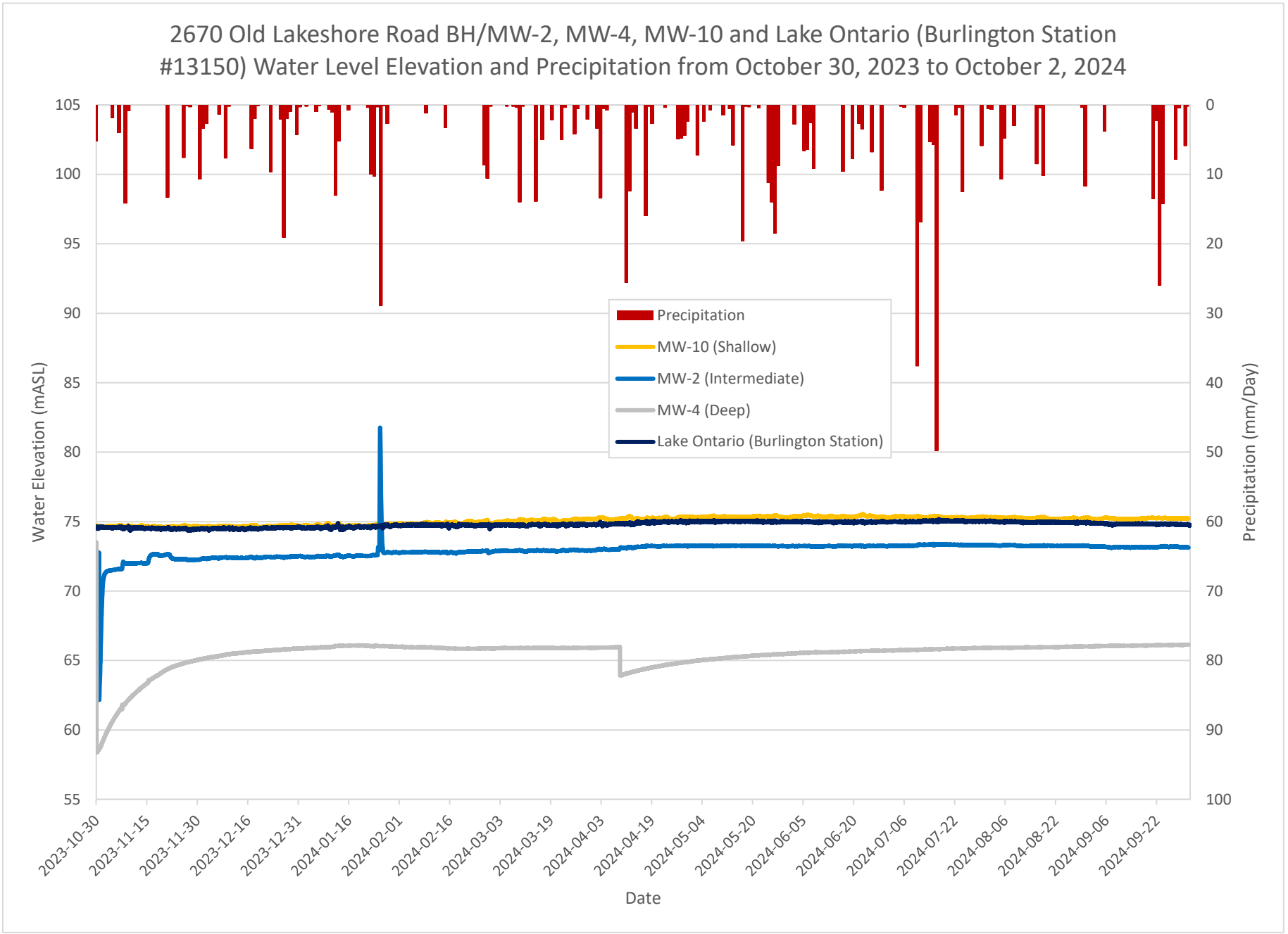

2670 Old Lakeshore Road BH/MW-2, MW-4, MW-10 and Lake Ontario (Burlington Station #13150) Water Level Elevation and Precipitation from October 30, 2023 to October 2, 2024
Water Elevation (mASL)
Precipitation (mm/Day)
Date
Precipitation
MW-10 (Shallow)
MW-2 (Intermediate)
MW-4 (Deep)
Lake Ontario (Burlington Station)
105
100
95
90
85
80
75
70
65
60
55
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-11-15
2023-11-30
2023-12-16
2023-12-31
2024-01-16
2024-02-01
2024-02-16
2024-03-03
2024-03-19
2024-04-03
2024-04-19
2024-05-04
2024-05-20
2024-06-05
2024-06-20
2024-07-06
2024-07-22
2024-08-06
2024-08-22
2024-09-06
2024-09-22

Chart B-4

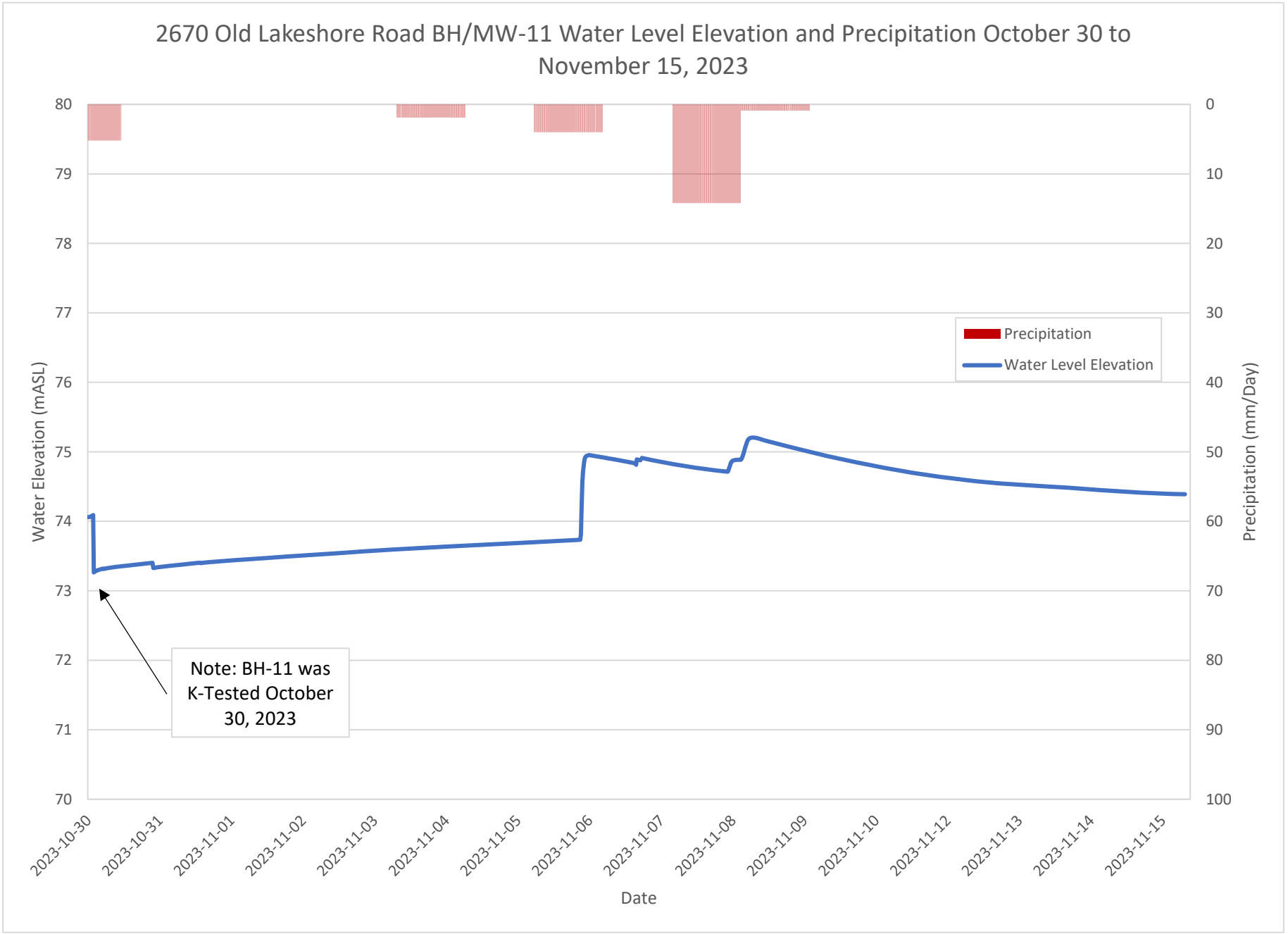

2670 Old Lakeshore Road BH/MW-11 Water Level Elevation and Precipitation October 30 to November 15, 2023
Water Elevation (mASL)
Precipitation (mm/Day)
Precipitation
Water Level Elevation
Note: BH-11 was K-Tested October 30, 2023
Date
80
79
78
77
76
75
74
73
72
71
70
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-10-31
2023-11-01
2023-11-02
2023-11-03
2023-11-04
2023-11-05
2023-11-06
2023-11-07
2023-11-08
2023-11-09
2023-11-10
2023-11-12
2023-11-13
2023-11-14
2023-11-15

Chart B-5

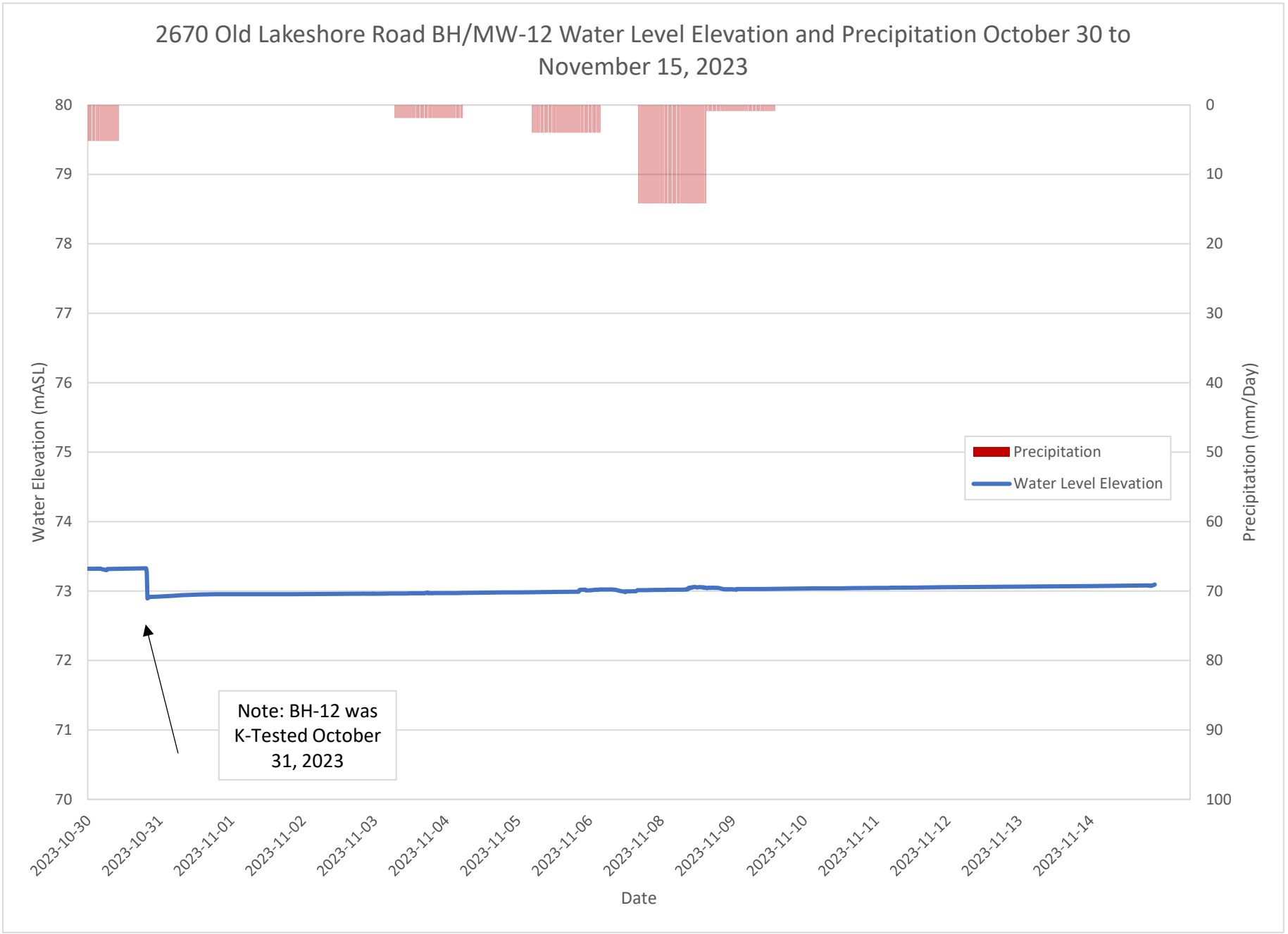

2670 Old Lakeshore Road BH/MW-12 Water Level Elevation and Precipitation October 30 to November 15, 2023
Water Elevation (mASL)
Precipitation (mm/Day)
Date
Precipitation
Water Level Elevation
Note: BH-12 was K-Tested October 31, 2023
80
79
78
77
76
75
74
73
72
71
70
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-10-31
2023-11-01
2023-11-02
2023-11-03
2023-11-04
2023-11-05
2023-11-06
2023-11-08
2023-11-09
2023-11-10
2023-11-11
2023-11-12
2023-11-13
2023-11-14

Chart B-6

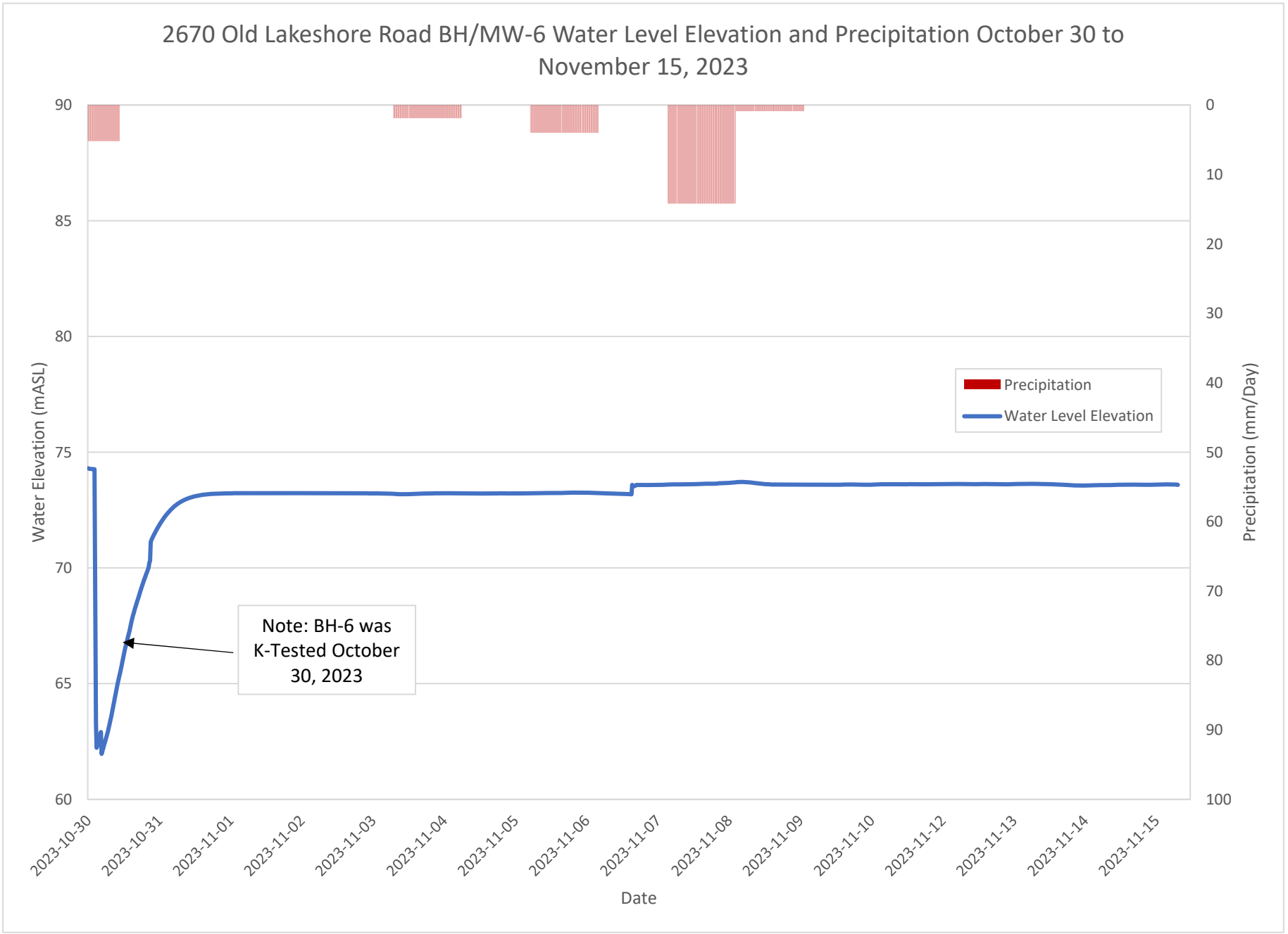

2670 Old Lakeshore Road BH/MW-6 Water Level Elevation and Precipitation October 30 to November 15, 2023
Water Elevation (mASL)
Precipitation (mm/Day)
Precipitation
Water Level Elevation
Note: BH-6 was K-Tested October 30, 2023
Date
90
85
80
75
70
65
60
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-10-31
2023-11-01
2023-11-02
2023-11-03
2023-11-04
2023-11-05
2023-11-06
2023-11-07
2023-11-08
2023-11-09
2023-11-10
2023-11-12
2023-11-13
2023-11-14
2023-11-15

Chart B-7

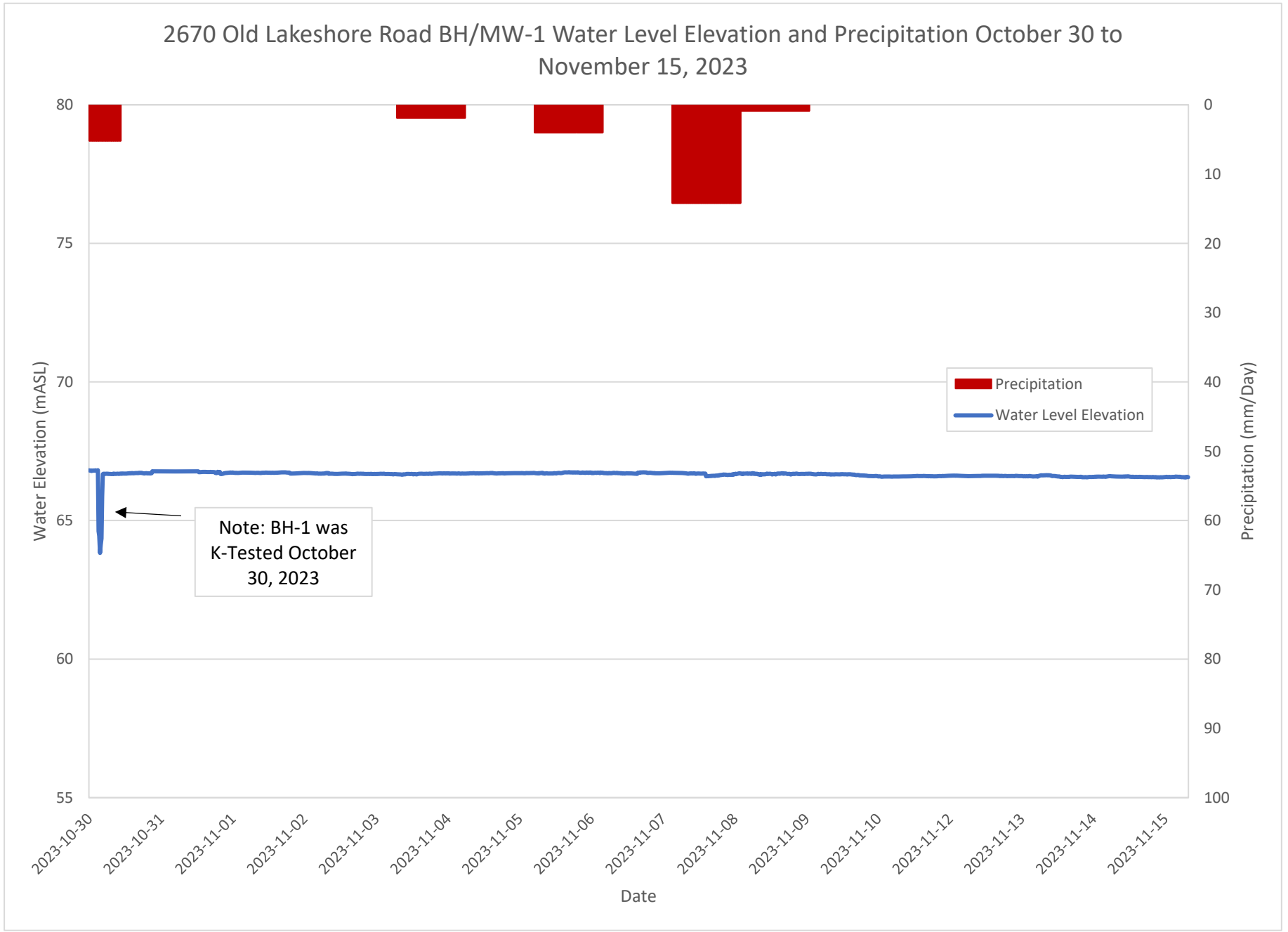
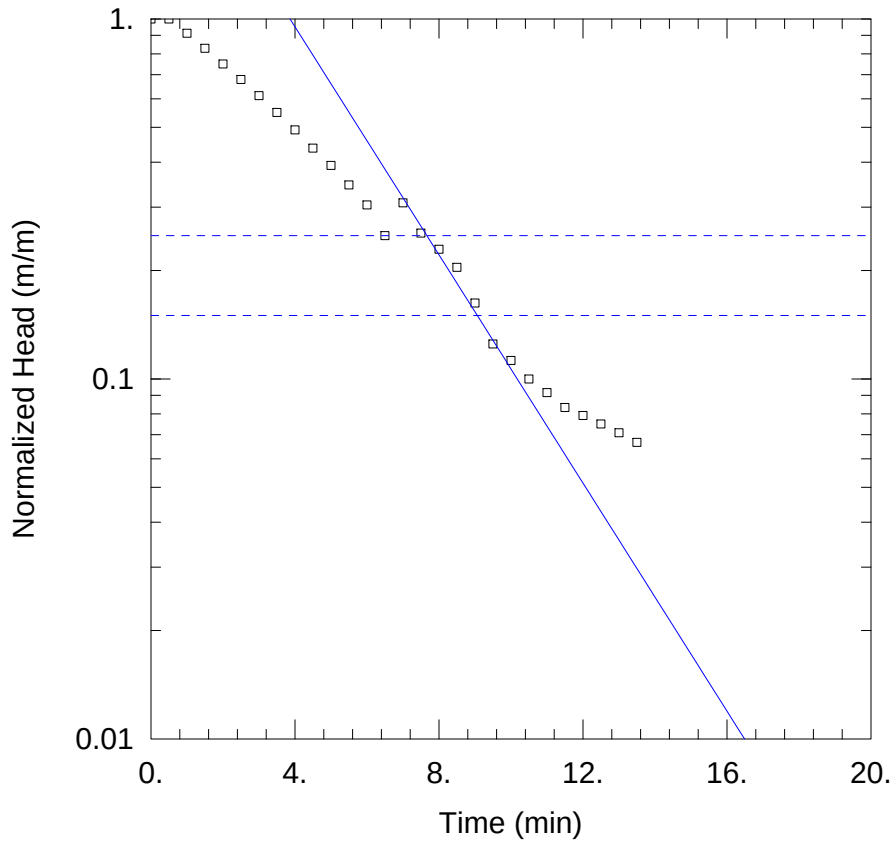

2670 Old Lakeshore Road BH/MW-1 Water Level Elevation and Precipitation October 30 to November 15, 2023
Water Elevation (mASL)
Precipitation (mm/Day)
Precipitation
Water Level Elevation
Note: BH-1 was K-Tested October 30, 2023
Date
80
75
70
65
60
55
0
10
20
30
40
50
60
70
80
90
100
2023-10-30
2023-10-31
2023-11-01
2023-11-02
2023-11-03
2023-11-04
2023-11-05
2023-11-06
2023-11-07
2023-11-08
2023-11-09
2023-11-10
2023-11-12
2023-11-13
2023-11-14
2023-11-15

Chart B-8

Appendix C

Hydraulic Conductivity Analyses



WELL TEST ANALYSIS

Data Set: C:\...\MW1_Hvor.aqt
Date: 02/12/24 Time: 14:43:15

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-1
Test Date: October 30, 2023

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

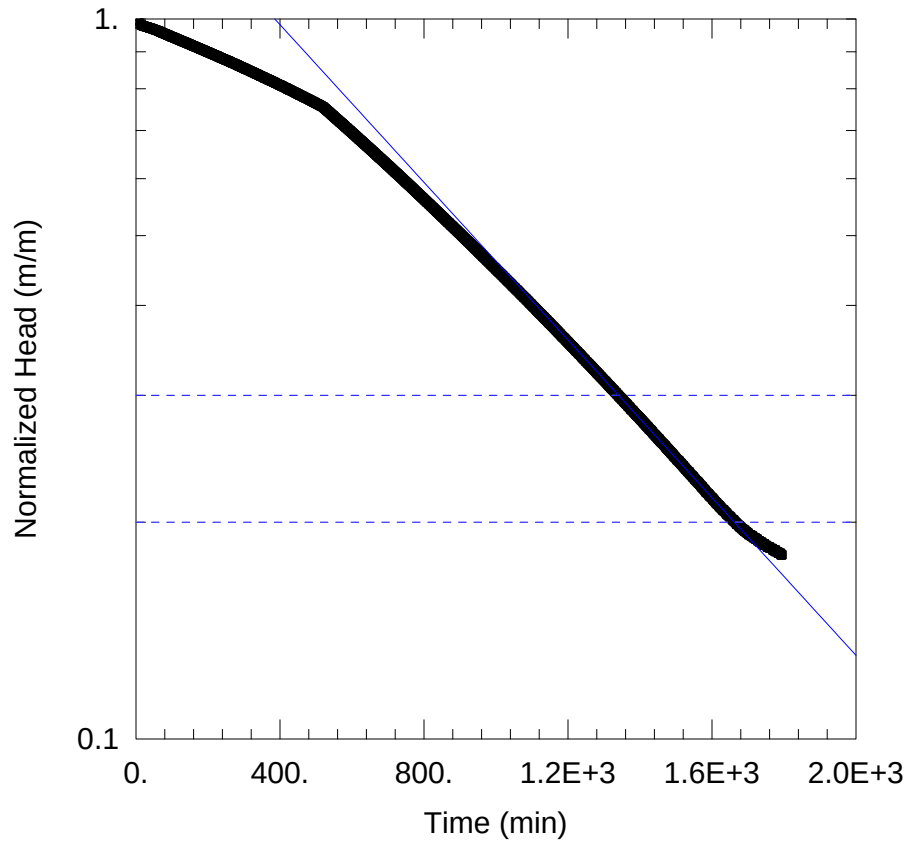
K = 2.223E-6 m/sec
y0 = 9.814 m

AQUIFER DATA

Saturated Thickness: 10.81 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-1)

Initial Displacement: 2.4 m
Total Well Penetration Depth: 10.81 m
Casing Radius: 0.0254 m
Static Water Column Height: 10.81 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2_BR.aqt
Date: 02/13/24 Time: 16:42:26

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-2
Test Date: October 31, 2023

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

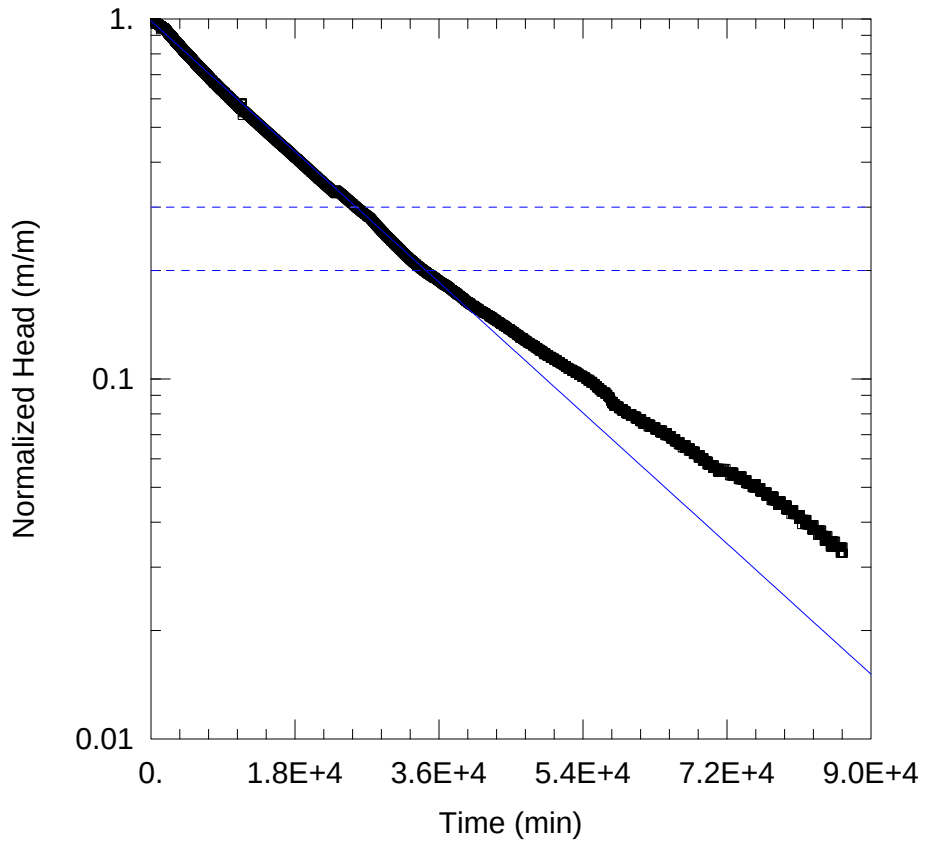
K = 6.449E-9 m/sec
y0 = 17.51 m

AQUIFER DATA

Saturated Thickness: 11.17 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-2)

Initial Displacement: 10.77 m
Total Well Penetration Depth: 10.15 m
Casing Radius: 0.0254 m
Static Water Column Height: 11.17 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW4_BR_Revised.aqt
Date: 04/18/24 Time: 13:41:17

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-4
Test Date: October 30, 2023

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

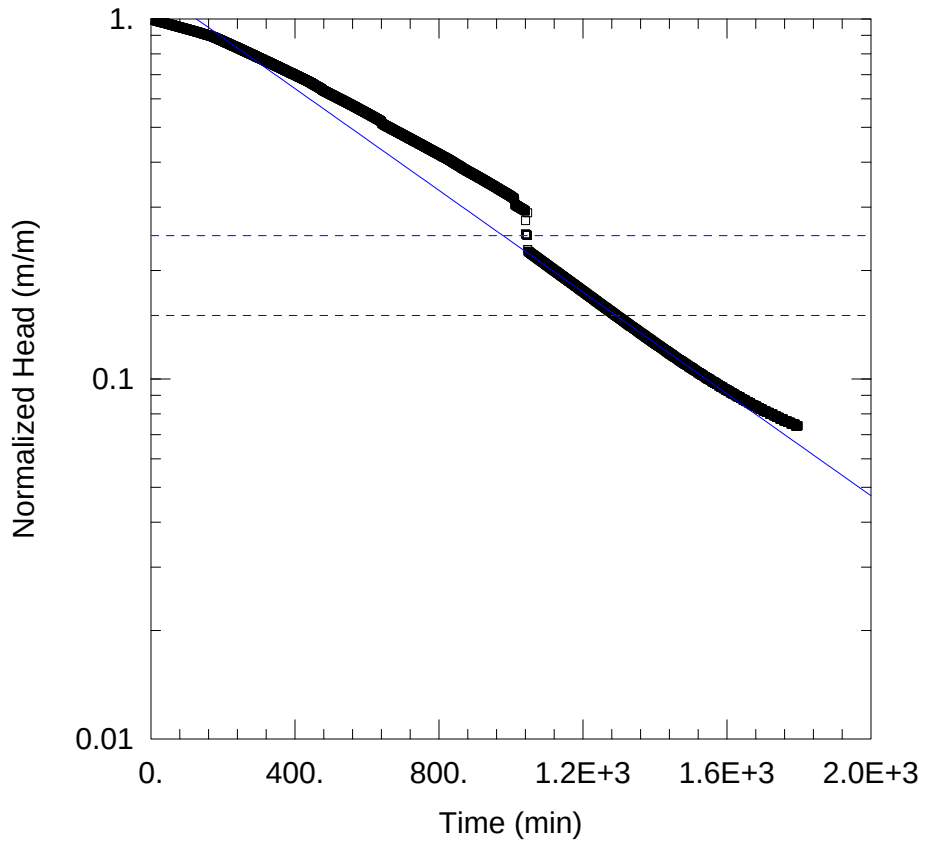
K = 2.586E-10 m/sec
y0 = 7.524 m

AQUIFER DATA

Saturated Thickness: 9.83 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4)

Initial Displacement: 7.62 m
Total Well Penetration Depth: 9.73 m
Casing Radius: 0.0254 m
Static Water Column Height: 9.83 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW6_BR.aqt
Date: 02/13/24 Time: 16:27:27

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-6
Test Date: October 30, 2023

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

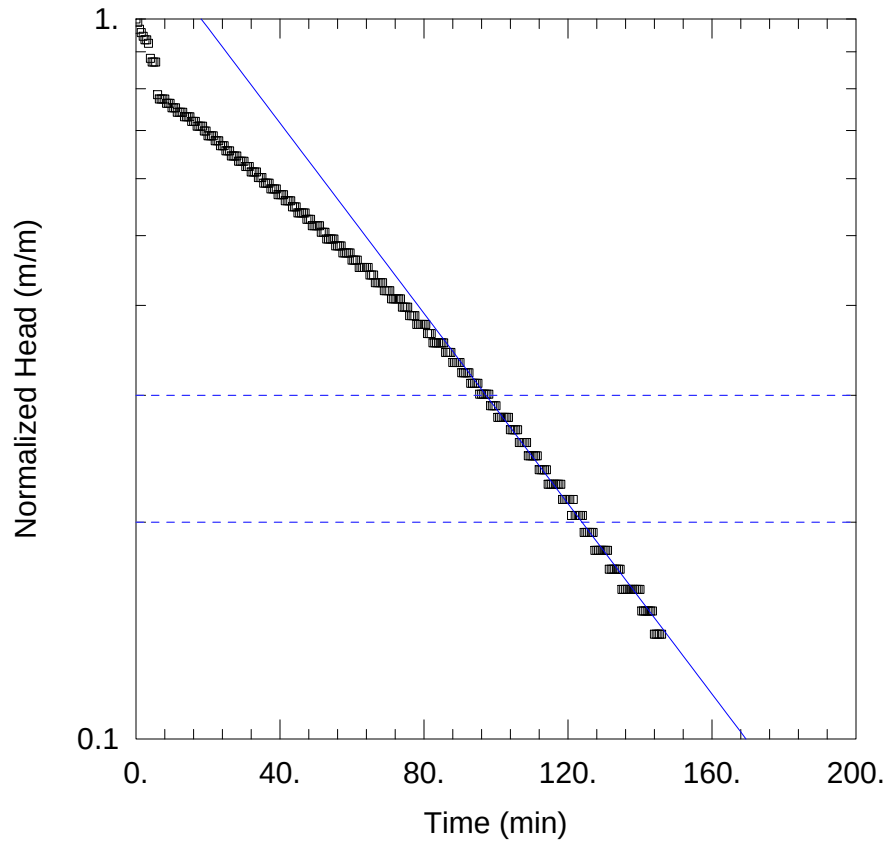
K = 9.923E-9 m/sec
y0 = 14.76 m

AQUIFER DATA

Saturated Thickness: 12.64 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-6)

Initial Displacement: 12.02 m
Total Well Penetration Depth: 11.65 m
Casing Radius: 0.0254 m
Static Water Column Height: 12.64 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW10_BR.aqt
Date: 02/13/24 Time: 16:51:18

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-10
Test Date: October 31, 2023

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

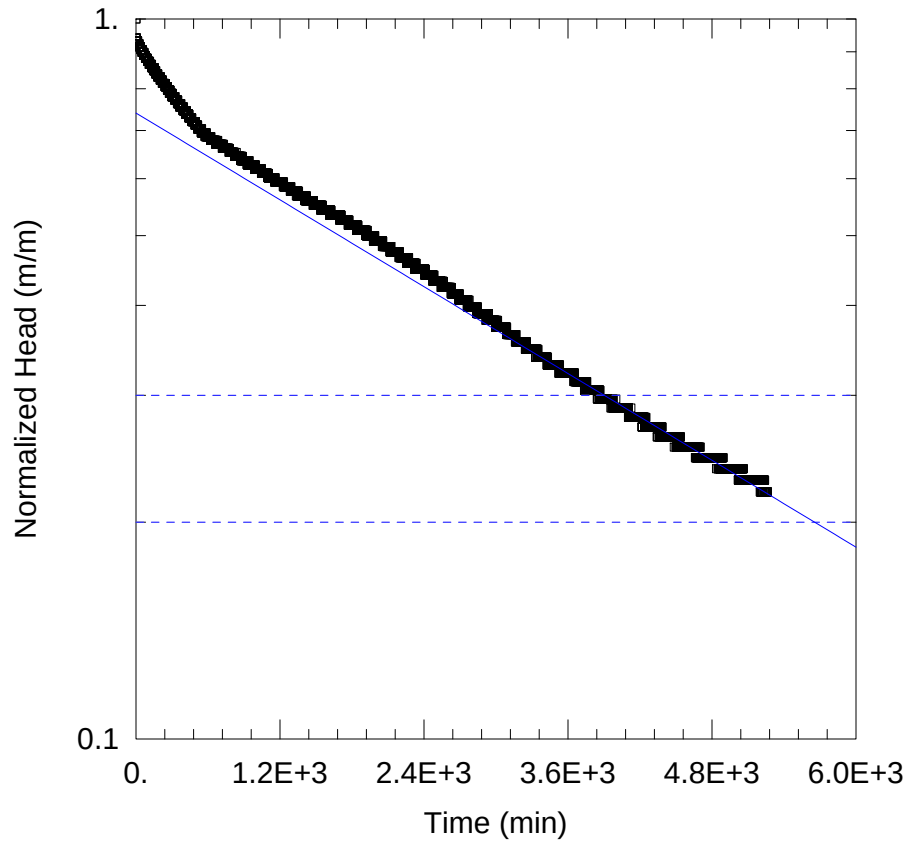
K = 1.038E-7 m/sec
y0 = 1.225 m

AQUIFER DATA

Saturated Thickness: 1.93 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-10)

Initial Displacement: 0.93 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.0254 m
Static Water Column Height: 1.93 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW11.aqt
Date: 04/18/24 Time: 15:08:59

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-11
Test Date: February 22, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

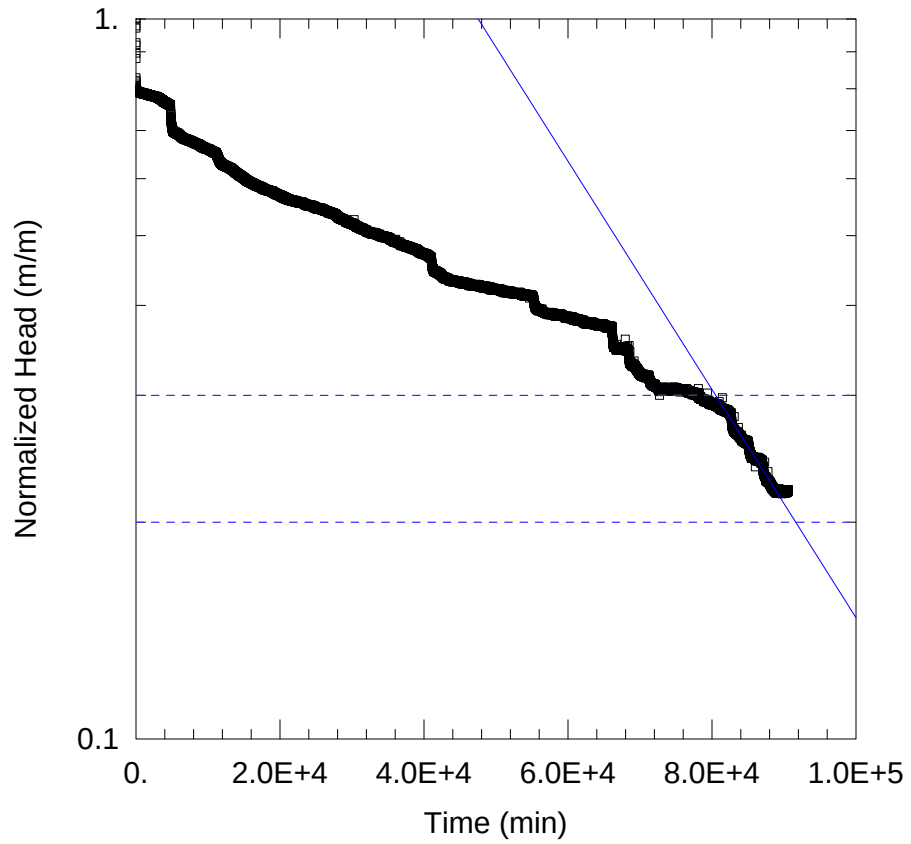
K = 1.495E-9 m/sec
y0 = 0.8734 m

AQUIFER DATA

Saturated Thickness: 2.055 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-11)

Initial Displacement: 1.18 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.0254 m
Static Water Column Height: 2.055 m
Screen Length: 3. m
Well Radius: 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW12.aqt
Date: 10/08/24 Time: 11:02:35

PROJECT INFORMATION

Company: Terra-Dynamics Consulting Inc.
Client: 1959025 Ontario Inc.
Location: 2076 Old Lakeshore Road
Test Well: MW-12
Test Date: April 9, 2024

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.914E-10 m/sec
y0 = 7.762 m

AQUIFER DATA

Saturated Thickness: 2.6 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-12)

Initial Displacement: 1.37 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.0254 m
Static Water Column Height: 2.6 m
Screen Length: 3. m
Well Radius: 0.1 m

Appendix D

Water Quality Analyses





FINAL REPORT

CA15289-NOV23 R2

Prepared for

Terra-Dynamics Consulting Inc.

FINAL REPORT

First Page

CLIENT DETAILS

Client	Terra-Dynamics Consulting Inc.
Address	432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3. Canada
Contact	David Slaine
Telephone	905-646-7931
Facsimile	
Email	dslaine@terra-dynamics.com; kslaine@terra-dynamics.com; br
Project	
Order Number	
Samples	Solution (2)

LABORATORY DETAILS

Project Specialist	Alisha Kelly, B.Sc.,
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2000
Facsimile	705-652-6365
Email	
SGS Reference	CA15289-NOV23
Received	11/22/2023
Approved	11/30/2023
Report Number	CA15289-NOV23 R2
Date Reported	11/30/2023

COMMENTS

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

.

SIGNATORIES

Alisha Kelly, B.Sc.,



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QC Summary..... 8-16

Legend..... 17

Annexes..... 18-19

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Dan Baker

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-10	BH-11
Sample Matrix	Solution	Solution
Sample Date	21/11/2023	21/11/2023

Parameter	Units	RL	L1	Result	Result
General Chemistry					
Temperature @ pH	°C	0		21.2	20.8
Biochemical Oxygen Demand (BOD5)	mg/L	2	15	< 4 ↑	5
Total Suspended Solids	mg/L	2	15	563	442
Metals and Inorganics					
Cyanide (total)	mg/L	0.01	0.02	< 0.01	< 0.01
Arsenic (total)	mg/L	0.0002	0.02	0.0113	0.0116
Cadmium (total)	mg/L	0.000003	0.008	0.000069	0.000187
Chromium (total)	mg/L	0.00008	0.08	0.0105	0.0423
Cobalt (total)	mg/L	0.000004		0.00367	0.0160
Copper (total)	mg/L	0.0002	0.04	0.0076	0.0275
Lead (total)	mg/L	0.00009	0.12	0.00522	0.0183
Manganese (total)	mg/L	0.00001	0.05	0.359	0.969
Nickel (total)	mg/L	0.0001	0.08	0.0092	0.0379
Phosphorus (total)	mg/L	0.003	0.4	0.441	1.02
Selenium (total)	mg/L	0.00004	0.02	0.00071	0.00039
Silver (total)	mg/L	0.00005	0.12	0.00033	0.00126
Zinc (total)	mg/L	0.002	0.04	0.035	0.147

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Dan Baker

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-10	BH-11
Sample Matrix	Solution	Solution
Sample Date	21/11/2023	21/11/2023

Parameter	Units	RL	L1	Result	Result
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.001	< 0.001	< 0.001
Nonylphenol diethoxylate	mg/L	0.01		< 0.01	< 0.01
Nonylphenol Ethoxylates	mg/L	0.01	0.01	< 0.01	< 0.01
Nonylphenol monoethoxylate	mg/L	0.01		< 0.01	< 0.01
Other (ORP)					
pH	No unit	0.05	8.5	7.71	7.93
Mercury (total)	mg/L	0.00001	0.0004	< 0.00001	< 0.00001
Chromium VI	mg/L	0.0002	0.04	< 0.0002	0.0002
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001		< 0.0001	< 0.0001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.0004	< 0.0001	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.001	0.008	< 0.001	< 0.001

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MATRIX: WATER

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Sample Number	8	9
Sample Name	BH-10	BH-11
Sample Matrix	Solution	Solution
Sample Date	21/11/2023	21/11/2023

Parameter	Units	RL	L1	Result	Result
SVOCs					
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.0088	< 0.002	< 0.002
Pentachlorophenol	mg/L	0.0005	0.002	< 0.0005	< 0.0005
di-n-Butyl Phthalate	mg/L	0.002	0.015	< 0.002	< 0.002
3,3-Dichlorobenzidine	mg/L	0.0005	0.0008	< 0.0005	< 0.0005
PAHs (Total)	mg/L		0.002	< 0.001	< 0.001
Perylene	mg/L	0.0005		< 0.0005	< 0.0005
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001		< 0.0001	< 0.0001
Anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(a)anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(a)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(e)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(ghi)perylene	mg/L	0.0002		< 0.0002	< 0.0002
Benzo(k)fluoranthene	mg/L	0.0001		< 0.0001	< 0.0001
Chrysene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,h)anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001		< 0.0002↑	< 0.0002↑
Dibenzo(a,j)acridine	mg/L	0.0001		< 0.0001	< 0.0001
Fluoranthene	mg/L	0.0001		< 0.0001	0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002		< 0.0002	< 0.0002
Phenanthrene	mg/L	0.0001		< 0.0001	< 0.0001
Pyrene	mg/L	0.0001		< 0.0001	< 0.0001

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MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-10	BH-11
Sample Matrix	Solution	Solution
Sample Date	21/11/2023	21/11/2023

Parameter	Units	RL	L1	Result	Result
SVOCs - PAHs (continued)					
VOCs					
Chloroform	mg/L	0.0005	0.002	0.0020	0.0008
1,2-Dichlorobenzene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	< 0.0005	< 0.0005
Methylene Chloride	mg/L	0.0005	0.0052	< 0.0005	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	< 0.0005	< 0.0005
Trichloroethylene	mg/L	0.0005	0.0076	< 0.0005	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005		< 0.0005	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.017	< 0.0005	< 0.0005
VOCs - BTEX					
Benzene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Ethylbenzene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Toluene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Xylene (total)	mg/L	0.0005	0.0044	< 0.0005	< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022 L1
BH-10				
Total Suspended Solids	SM 2540D	mg/L	563	15
Manganese	SM 3030/EPA 200.8	mg/L	0.359	0.05
Phosphorus	SM 3030/EPA 200.8	mg/L	0.441	0.4
BH-11				
Total Suspended Solids	SM 2540D	mg/L	442	15
Manganese	SM 3030/EPA 200.8	mg/L	0.969	0.05
Phosphorus	SM 3030/EPA 200.8	mg/L	1.02	0.4
Zinc	SM 3030/EPA 200.8	mg/L	0.147	0.04

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0043-NOV23	mg/L	2	< 2	8	30	111	70	130	104	70	130

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0238-NOV23	mg/L	0.01	<0.01	ND	10	94	90	110	94	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0244-NOV23	mg/L	0.0002	<0.0002	ND	20	101	80	120	NV	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0049-NOV23	mg/L	0.00001	< 0.00001	ND	20	101	80	120	83	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0238-NOV23	mg/L	0.00005	<0.00005	ND	20	103	90	110	89	70	130
Arsenic (total)	EMS0238-NOV23	mg/L	0.0002	<0.0002	ND	20	104	90	110	106	70	130
Cadmium (total)	EMS0238-NOV23	mg/L	0.000003	<0.000003	16	20	102	90	110	102	70	130
Cobalt (total)	EMS0238-NOV23	mg/L	0.000004	<0.000004	ND	20	105	90	110	110	70	130
Chromium (total)	EMS0238-NOV23	mg/L	0.00008	<0.00008	7	20	106	90	110	100	70	130
Copper (total)	EMS0238-NOV23	mg/L	0.0002	<0.0002	16	20	108	90	110	81	70	130
Manganese (total)	EMS0238-NOV23	mg/L	0.00001	<0.00001	2	20	101	90	110	126	70	130
Nickel (total)	EMS0238-NOV23	mg/L	0.0001	<0.0001	1	20	106	90	110	109	70	130
Lead (total)	EMS0238-NOV23	mg/L	0.00009	<0.00009	3	20	96	90	110	98	70	130
Phosphorus (total)	EMS0238-NOV23	mg/L	0.003	<0.003	6	20	100	90	110	NV	70	130
Selenium (total)	EMS0238-NOV23	mg/L	0.00004	<0.00004	19	20	102	90	110	100	70	130
Zinc (total)	EMS0238-NOV23	mg/L	0.002	<0.002	3	20	104	90	110	104	70	130

QC SUMMARY

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0433-NOV23	mg/L	0.01	<0.01			95	55	120			
Nonylphenol Ethoxylates	GCM0433-NOV23	mg/L	0.01	0								
Nonylphenol monoethoxylate	GCM0433-NOV23	mg/L	0.01	<0.01			95	55	120			
Nonylphenol	GCM0433-NOV23	mg/L	0.001	<0.001			92	55	120			

pH

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0563-NOV23	No unit	0.05	NA	0		98			NA		

QC SUMMARY

Phenols by SFA

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0247-NOV23	mg/L	0.001	<0.001	ND	10	97	80	120	95	75	125

Polychlorinated Biphenyls

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0420-NOV23	mg/L	0.0001	<0.0001	NSS	30	97	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
3,3-Dichlorobenzidine	GCM0412-NOV23	mg/L	0.0005	< 0.0005	NSS	30	91	30	130	NSS	30	130
7Hdibenzo(c,g)carbazole	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	105	50	140	NSS	50	140
Anthracene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	85	50	140	NSS	50	140
Benzo(a)anthracene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	89	50	140	NSS	50	140
Benzo(a)pyrene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	80	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	90	50	140	NSS	50	140
Benzo(e)pyrene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0448-NOV23	mg/L	0.0002	< 0.0002	NSS	30	93	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	101	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0448-NOV23	mg/L	0.002	< 0.002	NSS	30	96	50	140	NSS	50	140
Chrysene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	90	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0448-NOV23	mg/L	0.002	< 0.002	NSS	30	94	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	100	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	86	50	140	NSS	50	140
Fluoranthene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0448-NOV23	mg/L	0.0002	< 0.0002	NSS	30	93	50	140	NSS	50	140
Pentachlorophenol	GCM0448-NOV23	mg/L	0.0005	< 0.0005	NSS	30	109	50	140	NSS	50	140
Perylene	GCM0448-NOV23	mg/L	0.0005	< 0.0005	NSS	30	88	50	140	NSS	50	140
Phenanthrene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	85	50	140	NSS	50	140

QC SUMMARY

Semi-Volatile Organics (continued)

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Pyrene	GCM0448-NOV23	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140

Suspended Solids

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0573-NOV23	mg/L	2	< 2	0	10	105	90	110	NA		

QC SUMMARY

Volatile Organics

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	106	50	140
1,2-Dichlorobenzene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	106	50	140
1,4-Dichlorobenzene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	99	60	130	105	50	140
Benzene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	100	60	130	104	50	140
Chloroform	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	101	50	140
cis-1,2-Dichloroethene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	99	60	130	104	50	140
Ethylbenzene	GCM0389-NOV23	mg/L	0.0005	<0.0005	9	30	100	60	130	NV	50	140
Methylene Chloride	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	99	50	140
Tetrachloroethylene (perchloroethylene)	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	98	60	130	105	50	140
Toluene	GCM0389-NOV23	mg/L	0.0005	<0.0005	11	30	99	60	130	107	50	140
trans-1,3-Dichloropropene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	96	60	130	101	50	140
Trichloroethylene	GCM0389-NOV23	mg/L	0.0005	<0.0005	ND	30	95	60	130	101	50	140

QC SUMMARY

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

-- End of Analytical Report --

SGS

Request for Laboratory Services and CHAIN OF CUSTODY (General)

SGS Environmental Services - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Toll Free: 877-747-7658 Fax: 705-652-6365 Web: www.ca.sgs.com

SGS Environmental Services - London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361 Web: www.ca.sgs.com

Laboratory Information Section

Received Date (mm/dd/yyyy): 11/21/2023 KL | LAB LIMS #: NOV15289

Received Time (After Hours Only): ___ : ___ | Temperature Upon Receipt (°C): 8 & 10

Billing & Reporting Information

Invoice/Receipt to {3}:

Company:	Terra-Dynamics Consulting
Attention:	David Slaine
Address:	432 Niagara St, Unit 2 St. Catharines, ON L2M 4W3
Email:	Dslaine@Terra-Dynamics.Com & Kslaine@Terra-Dynamics.com & Bmacintyre@terra-dynamics.com

Project Name/Number: 2670 Lakeshore - BH-10& BH11 P.O. #:

Quote #:

Attached Parameter List: ☑ YES ☐ NO

Turnaround Time

Is *Rush Turnaround Time Required? ☐ YES ☑ NO

Specify:

* Rush TA Requests Require Lab Approval

Client Information/Report To:

Client Lab #:

Company Name:	Same as above	**Phone Number:**	
Contact Name:	Same as above	**Fax Number:**	
Address:	Same as above	**E-mail:**	
Copy to:	Same as above		

Sample Information

Sample Identifier	Date Sampled (mm/dd/yy)	Time Sampled	# of Bottles	Analysis Requested (please enter the analysis required below and check off which analysis applies to each sample)
				* Please find attached parameter lists *
BH-10	11/21/23	12:50	19	* BH-10 - in cooler #1
BH-11	11/21/23	10:20	19	* BH-11 - in cooler #2
				* This chain of custody has two coolers.

Sampled By {1}:	(Name) Dan Baker	(Signature) Dan Baker	Date:	11/21/23	(mm/dd/yy)
Relinquished by {2}:	(Name) Dan Baker	(Signature) Dan Baker	Date:	11/21/23	(mm/dd/yy)

Note: {1} Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request.

This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

4 AG-IL None

2 AG-IL Sodium thio

6086427 7268

1,250

KL 10.50

KL

Table 1 - Limits for Storm Sewer and Drainage Works Discharge

Parameter	Limit	Unit	Parameter	Limit	Unit
Arsenic (total)	0.02	mg/L	Methylene chloride	0.0052	mg/L
Benzene	0.002	mg/L	Nickel (total)	0.08	mg/L
Biochemical Oxygen Demand	15	mg/L	Nonylphenol ethoxylates	0.01	mg/L
Bis (2-ethylhexyl) phthalate	0.0088	mg/L	Nonylphenols	0.001	mg/L
Cadmium (total)	0.008	mg/L	PCBs	0.0004	mg/L
Chloroform	0.002	mg/L	Pentachlorophenol	0.002	mg/L
Chromium (hexavalent)	0.04	mg/L	pH	6.5 to 8.5	
Chromium (total)	0.08	mg/L	Phenolics (4AAP)	0.008	mg/L
Copper (total)	0.04	mg/L	Phosphorus (total)	0.4	mg/L
Cyanide (total)	0.02	mg/L	Selenium (total)	0.02	mg/L
Dichlorobenzene, 1, 2-	0.0056	mg/L	Silver (total)	0.12	mg/L
Dichlorobenzene, 1, 4-	0.0068	mg/L	Suspended Solids (total)	15	mg/L

Dichlorobenzidine, 3,3'-	0.0008	mg/L	Temperature	< 30	°C
Dichloroethylene, Cis-1,2-	0.0056	mg/L	Tetrachlorethane, 1, 1, 2, 2-	0.017	mg/L
Dichloropropylene, Trans-1,3-	0.0056	mg/L	Tetrachloroethylene	0.0044	mg/L
Di-n-butyl phthalate	0.015	mg/L	Toluene	0.002	mg/L
Ethyl benzene	0.002	mg/L	Total PAHs	0.002	mg/L
Lead (total)	0.12	mg/L	Trichloroethylene	0.0076	mg/L
Manganese (total)	0.05	mg/L	Xylenes (total)	0.0044	mg/L
Mercury (total)	0.0004	mg/L	Zinc (total)	0.04	mg/L





FINAL REPORT

CA15498-NOV23 R3

Prepared for

Terra-Dynamics Consulting Inc.

FINAL REPORT

First Page

CLIENT DETAILS

Client	Terra-Dynamics Consulting Inc.
Address	432 Niagara Street, Unit 2, St. Catharines Canada, L2M 4W3 Phone: 905-646-7931. Fax:
Contact	David Slaine
Telephone	905-646-7931
Facsimile	
Email	dslaine@terra-dynamics.com; kslaine@terra-dynamics.com; br
Project	
Order Number	
Samples	Solution (2)

LABORATORY DETAILS

Project Specialist	Alisha Kelly, B.Sc.,
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2000
Facsimile	705-652-6365
Email	
SGS Reference	CA15498-NOV23
Received	11/16/2023
Approved	11/30/2023
Report Number	CA15498-NOV23 R3
Date Reported	06/05/2024

COMMENTS

Phenol analysis is as low as reasonably achievable due to sample matrix interference

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

Total PAH is the sum of anthracene, benzo(a)pyrene, benzo(a)anthracene, benzo(e)pyrene, benzo(b,j)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, dibenzo(a,i)pyrene, dibenzo(a,j)acridine, 7H-dibenzo(c,g)carbazole, fluoranthene, indeno(1,2,3-c,d)pyrene, perylene, phenanthrene and pyrene..

SIGNATORIES

Alisha Kelly, B.Sc.,



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Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Funk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-6	BH-1
Sample Matrix	Solution	Solution
Sample Date	15/11/2023	15/11/2023

Parameter	Units	RL	L1	Result	Result
General Chemistry					
Temperature @ pH	°C	0		21.6	21.5
Biochemical Oxygen Demand (BOD5)	mg/L	2	15	< 4 ↑	< 4 ↑
Total Suspended Solids	mg/L	2	15	**228**	**70**
Metals and Inorganics					
Cyanide (total)	mg/L	0.01	0.02	< 0.01	< 0.01
Arsenic (total)	mg/L	0.0002	0.02	0.0058	0.0017
Cadmium (total)	mg/L	0.000003	0.008	0.000202	0.000074
Chromium (total)	mg/L	0.00008	0.08	0.0189	0.00318
Cobalt (total)	mg/L	0.000004		0.00635	0.000493
Copper (total)	mg/L	0.0002	0.04	0.0118	0.0082
Lead (total)	mg/L	0.00009	0.12	0.00395	0.00161
Manganese (total)	mg/L	0.00001	0.05	**0.518**	**0.578**
Nickel (total)	mg/L	0.0001	0.08	0.0156	0.0027
Phosphorus (total)	mg/L	0.003	0.4	0.295	0.070
Selenium (total)	mg/L	0.00004	0.02	0.00030	0.00016
Silver (total)	mg/L	0.00005	0.12	0.00057	0.00009
Zinc (total)	mg/L	0.002	0.04	**0.124**	**0.046**

Client: Terra-Dynamics Consulting Inc.
Project:
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MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-6	BH-1
Sample Matrix	Solution	Solution
Sample Date	15/11/2023	15/11/2023

Parameter	Units	RL	L1	Result	Result
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.001	< 0.001	< 0.001
Nonylphenol diethoxylate	mg/L	0.01		< 0.01	< 0.01
Nonylphenol Ethoxylates	mg/L	0.01	0.01	< 0.01	< 0.01
Nonylphenol monoethoxylate	mg/L	0.01		< 0.01	< 0.01
Other (ORP)					
pH	No unit	0.05	8.5	7.67	7.30
Mercury (total)	mg/L	0.00001	0.0004	< 0.00001	< 0.00001
Chromium VI	mg/L	0.0002	0.04	< 0.0002	< 0.0002
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001		0.0003	0.0006
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.0004	< 0.0001	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.01	0.008	< 0.001↓	< 0.01

Client: Terra-Dynamics Consulting Inc.
Project:
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Samplers: Scott Funk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-6	BH-1
Sample Matrix	Solution	Solution
Sample Date	15/11/2023	15/11/2023

Parameter	Units	RL	L1	Result	Result
SVOCs					
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.0088	< 0.002	< 0.002
Pentachlorophenol	mg/L	0.0005	0.002	< 0.0005	< 0.0005
di-n-Butyl Phthalate	mg/L	0.002	0.015	< 0.002	< 0.002
3,3-Dichlorobenzidine	mg/L	0.0005	0.0008	< 0.0005	< 0.0005
PAHs (Total)	mg/L		0.002	0.002	0.004
Perylene	mg/L	0.0005		< 0.0005	< 0.0005
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001		< 0.0001	< 0.0001
Anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Benzo(a)anthracene	mg/L	0.0001		< 0.0001	0.0002
Benzo(a)pyrene	mg/L	0.0001		0.0001	0.0003
Benzo(e)pyrene	mg/L	0.0001		0.0002	0.0003
Benzo(ghi)perylene	mg/L	0.0002		< 0.0002	0.0003
Benzo(k)fluoranthene	mg/L	0.0001		0.0001	0.0002
Chrysene	mg/L	0.0001		0.0002	0.0004
Dibenzo(a,h)anthracene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001		< 0.0001	< 0.0001
Dibenzo(a,j)acridine	mg/L	0.0001		< 0.0001	< 0.0001
Fluoranthene	mg/L	0.0001		0.0004	0.0008
Indeno(1,2,3-cd)pyrene	mg/L	0.0002		< 0.0002	0.0002
Phenanthrene	mg/L	0.0001		< 0.0001	0.0002
Pyrene	mg/L	0.0001		0.0003	0.0006

Client: Terra-Dynamics Consulting Inc.
Project:
Project Manager: David Slaine
Samplers: Scott Funk

MATRIX: WATER

L1 = SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022

Sample Number	8	9
Sample Name	BH-6	BH-1
Sample Matrix	Solution	Solution
Sample Date	15/11/2023	15/11/2023

Parameter	Units	RL	L1	Result	Result
SVOCs - PAHs (continued)					
VOCs					
Chloroform	mg/L	0.0005	0.002	0.0040	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	< 0.0005	< 0.0005
Methylene Chloride	mg/L	0.0005	0.0052	< 0.0005	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	< 0.0005	< 0.0005
Trichloroethylene	mg/L	0.0005	0.0076	< 0.0005	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005		< 0.0005	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.0056	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	ok. tha	0.0005	0.017	< 0.0005	< 0.0005
VOCs - BTEX					
Benzene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Ethylbenzene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Toluene	mg/L	0.0005	0.002	< 0.0005	< 0.0005
Xylene (total)	mg/L	0.0005	0.0044	< 0.0005	< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Burlington Sewer Use ByLaw - Storm Sewer Discharge - BL_59_2022 L1
BH-6				
Chloroform	EPA 5030B/8260C	mg/L	0.0040	0.002
Total Suspended Solids	SM 2540D	mg/L	228	15
Manganese	SM 3030/EPA 200.8	mg/L	0.518	0.05
Zinc	SM 3030/EPA 200.8	mg/L	0.124	0.04
BH-1				
PAHs (Total)	EPA 3510C/8270D	mg/L	0.004	0.002
Total Suspended Solids	SM 2540D	mg/L	70	15
Manganese	SM 3030/EPA 200.8	mg/L	0.578	0.05
Zinc	SM 3030/EPA 200.8	mg/L	0.046	0.04
4AAP-Phenolics	SM 5530B-D	mg/L	< 0.01	0.008

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0034-NOV23	mg/L	2	< 2	1	30	103	70	130	94	70	130

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0185-NOV23	mg/L	0.01	<0.01	ND	10	95	90	110	96	75	125
Cyanide (total)	SKA0209-NOV23	mg/L	0.01	<0.01	ND	10	95	90	110	NV	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0199-NOV23	mg/L	0.0002	<0.0002	ND	20	98	80	120	NV	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0034-NOV23	mg/L	0.00001	< 0.00001	ND	20	89	80	120	96	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0169-NOV23	mg/L	0.00005	<0.00005	ND	20	108	90	110	86	70	130
Arsenic (total)	EMS0169-NOV23	mg/L	0.0002	<0.0002	20	20	101	90	110	106	70	130
Cadmium (total)	EMS0169-NOV23	mg/L	0.000003	<0.000003	0	20	108	90	110	115	70	130
Cobalt (total)	EMS0169-NOV23	mg/L	0.000004	<0.000004	0	20	106	90	110	107	70	130
Chromium (total)	EMS0169-NOV23	mg/L	0.00008	<0.00008	5	20	102	90	110	98	70	130
Copper (total)	EMS0169-NOV23	mg/L	0.0002	<0.0002	0	20	104	90	110	105	70	130
Manganese (total)	EMS0169-NOV23	mg/L	0.00001	<0.00001	3	20	101	90	110	102	70	130
Nickel (total)	EMS0169-NOV23	mg/L	0.0001	<0.0001	5	20	104	90	110	103	70	130
Lead (total)	EMS0169-NOV23	mg/L	0.00009	<0.00009	4	20	107	90	110	99	70	130
Phosphorus (total)	EMS0169-NOV23	mg/L	0.003	<0.003	ND	20	96	90	110	NV	70	130
Selenium (total)	EMS0169-NOV23	mg/L	0.00004	<0.00004	ND	20	104	90	110	115	70	130
Zinc (total)	EMS0169-NOV23	mg/L	0.002	<0.002	4	20	107	90	110	96	70	130

QC SUMMARY

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0305-NOV23	mg/L	0.01	<0.01			86	55	120			
Nonylphenol Ethoxylates	GCM0305-NOV23	mg/L	0.01	0								
Nonylphenol monoethoxylate	GCM0305-NOV23	mg/L	0.01	<0.01			92	55	120			
Nonylphenol	GCM0305-NOV23	mg/L	0.001	<0.001			90	55	120			

pH

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0432-NOV23	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Phenols by SFA

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0189-NOV23	mg/L	0.01	<0.001	ND	10	98	80	120	87	75	125
4AAP-Phenolics	SKA0198-NOV23	mg/L	0.01	<0.001	ND	10	99	80	120	79	75	125

Polychlorinated Biphenyls

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0298-NOV23	mg/L	0.0001	<0.0001	NSS	30	98	60	140	NSS	60	140
Polychlorinated Biphenyls (PCBs) - Total	GCM0311-NOV23	mg/L	0.0001	<0.0001	NSS	30	103	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
7Hdibenzo(c,g)carbazole	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	96	50	140	NSS	50	140
Anthracene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(a)anthracene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	97	50	140	NSS	50	140
Benzo(a)pyrene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	98	50	140	NSS	50	140
Benzo(e)pyrene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0341-NOV23	mg/L	0.0002	< 0.0002	NSS	30	97	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	97	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0341-NOV23	mg/L	0.002	< 0.002	NSS	30	99	50	140	NSS	50	140
Chrysene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	98	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0341-NOV23	mg/L	0.002	< 0.002	NSS	30	101	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	113	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
Fluoranthene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	96	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0341-NOV23	mg/L	0.0002	< 0.0002	NSS	30	92	50	140	NSS	50	140
Pentachlorophenol	GCM0341-NOV23	mg/L	0.0005	< 0.0005	NSS	30	95	50	140	NSS	50	140
Perylene	GCM0341-NOV23	mg/L	0.0005	< 0.0005	NSS	30	91	50	140	NSS	50	140
Phenanthrene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	89	50	140	NSS	50	140
Pyrene	GCM0341-NOV23	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140

QC SUMMARY

Semi-Volatile Organics (continued)

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
3,3-Dichlorobenzidine	GCM0354-NOV23	mg/L	0.0005	< 0.0005	NSS	30	91	30	130	NSS	30	130

Suspended Solids

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0472-NOV23	mg/L	2	< 2	1	10	95	90	110	NA		

QC SUMMARY

Volatile Organics

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

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	98	60	130	129	50	140
1,2-Dichlorobenzene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	94	60	130	99	50	140
1,4-Dichlorobenzene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	101	50	140
Benzene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	96	60	130	102	50	140
Chloroform	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	93	60	130	98	50	140
cis-1,2-Dichloroethene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	95	60	130	103	50	140
Ethylbenzene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	97	60	130	102	50	140
Methylene Chloride	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	93	60	130	98	50	140
Tetrachloroethylene (perchloroethylene)	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	94	60	130	98	50	140
Toluene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	94	60	130	101	50	140
trans-1,3-Dichloropropene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	93	60	130	98	50	140
Trichloroethylene	GCM0306-NOV23	mg/L	0.0005	<0.0005	ND	30	91	60	130	84	50	140

QC SUMMARY

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

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

-- End of Analytical Report --

SGS

Request for Laboratory Services and CHAIN OF CUSTODY (General)

SGS Environmental Services - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Toll Free: 877-747-7658 Fax: 705-652-6365 Web: www.ca.sgs.com

SGS Environmental Services - London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361 Web: www.ca.sgs.com

Laboratory Information Section

Received Date (mm/dd/yyyy): NOV 16 2023 — LAB LIMS #: Nov 15498

Received Time (After Hours Only): ___ : ___ — Temperature Upon Receipt (°C): 11x3

Billing & Reporting Information

Invoice/Receipt to (3):

Company:	Terra-Dynamics Consulting
Attention:	David Slaine
Address:	432 Niagara St, Unit 2 St. Catharines, ON L2M 4W3
Email:	Dslaine@Terra-Dynamics.Com & Kslaine@Terra-Dynamics.com & Bmacintyre@terra-dynamics.com

Project Name/Number: Old Lake 6, 1 — P.O. #:

Quote #:

Attached Parameter List: [X] YES [ ] NO

Turnaround Time

Is *Rush Turnaround Time Required? [ ] YES [X] NO

Specify:

* Rush TA Requests Require Lab Approval

Client Information/Report To:

Client Lab #:

Company Name:	Same as above	**Phone Number:**	
Contact Name:	Same as above	**Fax Number:**	
Address:	Same as above	**E-mail:**	
Copy to:	Same as above		

Sample Information

Sample Identifier	Date Sampled (mm/dd/yy)	Time Sampled	# of Bottles	Analysis Requested (please enter the analysis required below and check off which analysis applies to each sample)
				See attached Analyte list
BH-6	11/15/23	11:05	19	
BH-1	↓	11:45	19	2 coolers
				City of Burlington storm and sanitary Sewer table 1

Sampled By (1):	(Name) Scott Fink	(Signature)		**Date:**	11/15/23	(mm/dd/yy)
Relinquished by (2):	(Name) Scott Fink	(Signature)		**Date:**	11/15/23	(mm/dd/yy)

Note: {1} Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request.

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HCRTN 608642232276

HCRTN 608663731735

Table 1 - Limits for Storm Sewer and Drainage Works Discharge

Parameter	Limit	Unit	Parameter	Limit	Unit
Arsenic (total)	0.02	mg/L	Methylene chloride	0.0052	mg/L
Benzene	0.002	mg/L	Nickel (total)	0.08	mg/L
Biochemical Oxygen Demand	15	mg/L	Nonylphenol ethoxylates	0.01	mg/L
Bis (2-ethylhexyl) phthalate	0.0088	mg/L	Nonylphenols	0.001	mg/L
Cadmium (total)	0.008	mg/L	PCBs	0.0004	mg/L
Chloroform	0.002	mg/L	Pentachlorophenol	0.002	mg/L
Chromium (hexavalent)	0.04	mg/L	pH	6.5 to 8.5	
Chromium (total)	0.08	mg/L	Phenolics (4AAP)	0.008	mg/L
Copper (total)	0.04	mg/L	Phosphorus (total)	0.4	mg/L
Cyanide (total)	0.02	mg/L	Selenium (total)	0.02	mg/L
Dichlorobenzene, 1, 2-	0.0056	mg/L	Silver (total)	0.12	mg/L
Dichlorobenzene, 1, 4-	0.0068	mg/L	Suspended Solids (total)	15	mg/L

Dichlorobenzidine, 3,3'-	0.0008	mg/L	Temperature	< 30	°C
Dichloroethylene, Cis-1,2-	0.0056	mg/L	Tetrachlorethane, 1, 1, 2, 2-	0.017	mg/L
Dichloropropylene, Trans-1,3-	0.0056	mg/L	Tetrachloroethylene	0.0044	mg/L
Di-n-butyl phthalate	0.015	mg/L	Toluene	0.002	mg/L
Ethyl benzene	0.002	mg/L	Total PAHs	0.002	mg/L
Lead (total)	0.12	mg/L	Trichloroethylene	0.0076	mg/L
Manganese (total)	0.05	mg/L	Xylenes (total)	0.0044	mg/L
Mercury (total)	0.0004	mg/L	Zinc (total)	0.04	mg/L

Cooler 1/2

Appendix E

Dewatering Calculations

Table E-1

Horizontal Dewatering Calculation - Peak Flow P4

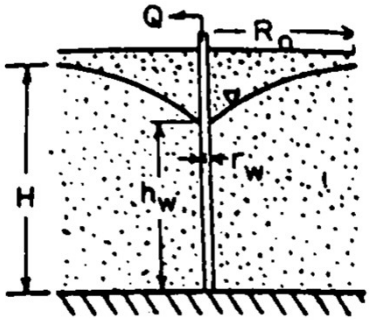
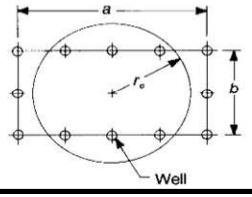
Radial flow, water table aquifer	Inputs	Comments
H=Initial saturated thickness (m)	9.4	
h_w=Remaining saturated thickness (m)	0	
K=Hydraulic Conductivity (m/s)	1.E-07	
a=Rectangular Excavation Length (m)	47	Requirement for a/b < 1.5
b=Rectangular Excavation Width (m)	38	
	Calculations	
R_w=Re=Effective radius Calc (m)	24	$r_e = \sqrt{\frac{ab}{\pi}}$
R_0=Radius of Influence Calc (Sichart & Kryieleis) (m)	33	$R_o = r_e + 3000(H - h_w)\sqrt{k}$
Q_w=Flow Rate (m^3/s)	0.000087	$Q_w = \frac{\pi K(H^2 - h_w^2)}{\ln R_0 / r_w}$
Q_w=Flow Rate (m^3/day)	8	
Q_w=Flow Rate (L/day)	7,550	

Figure E-1
Calculated Daily Dewatering Rate

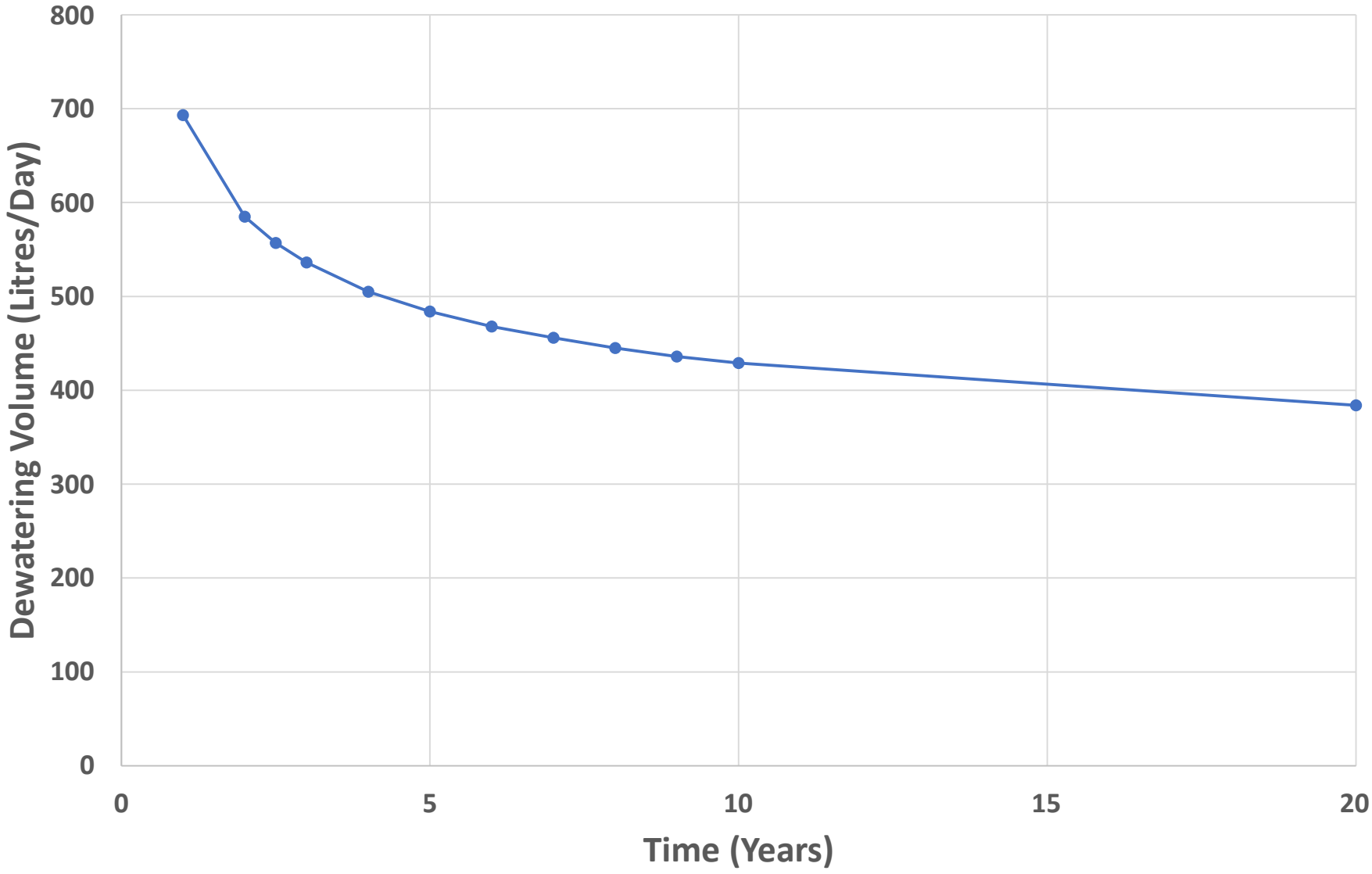
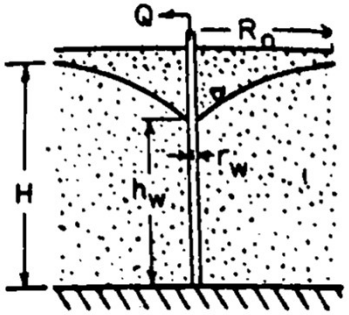
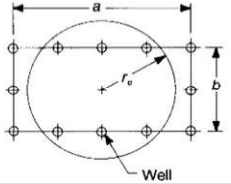


Table E-2

Dewatering Assessment - 5 Years

Radial flow, water table aquifer	Inputs	Comments
H=Initial saturated thickness (m)	6.9	
h_w=Remaining saturated thickness (m)	0	
K=Hydraulic Conductivity (m/s)	1.0E-07	
a=Rectangular Excavation Length (m)	47	Requirement for a/b < 1.5
b=Rectangular Excavation Width (m)	38	
	Calculations	
R_w=Re=Effective radius Calc (m)	24	$r_e = \sqrt{\frac{ab}{\pi}}$
Adjustable Time of dewatering (hours)	43,830	$R_0 = 3000(H - h)\sqrt{K}$
Specific Storage	1.E-04	Sykes et al, 2008 (S_s = 1x10-4)
R_0=Radius of Influence Calc (Cooper&Jacob) (m)	344	$R_o = \sqrt{\frac{2.25kDt}{S}}$
Q_w=Flow Rate (m^3/s)	0.000006	$Q_w = \frac{\pi K(H^2 - h_w^2)}{\ln R_0 / r_w}$
Q_w=Flow Rate (m^3/day)	0	
Q_w=Flow Rate (L/day)	484	

Appendix F

Reliance Letter

Terra-Dynamics inc.
432 Niagara Street, Unit 2 St. Catharines, ON L2M 4W3

September 2, 2025

City of Burlington
Planning, Building and Culture
426 Brant Street
P.O. Box 5013
Burlington, ON L7R 3Z6

Halton Region
1151 Bronte Road
Oakville, Ontario L6M 3L1

Re: 2076 Old Lakeshore Road, City of Burlington, Regional Municipality of Halton,
Letter of Reliance, September 2, 2025 Hydrogeological Dewatering Assessment

Dear Sir or Madam,

Terra-Dynamics Inc. (Terra-Dynamics) has conducted and issued a Hydrogeological Dewatering Study for the property located at 2076 Old Lakeshore Road, Burlington Ontario. The assessment was carried out on behalf of our client, 1959025 Ontario Inc..

Terra-Dynamics has prepared this letter to allow the use of and reliance upon our report dated September 2 2025. Such use and reliance are subject to the terms, conditions and limitations set out in the reports with the inclusion of the following:

Terms, Conditions and Limitations

1. The data and findings presented in Terra-Dynamics' September 2, 2025 titled *Hydrogeological Dewatering Study, 2076 Old Lakeshore Road, Burlington, ON* or other correspondence are valid as of the date or dates when the investigation(s) referred to in the document(s) were performed, and are subject to the same limitations and exceptions described in the documents and within the standard of practice for technical correspondence at the time and place the work was completed. Terra-Dynamics expressly disclaims any liability or responsibility for updating or reviewing the information or conclusions set out in Terra-Dynamics-prepared documents or correspondence, including without limitation reviewing changes in any laws, rules or regulations, or industry standards, in effect since the date of the document or correspondence that might affect the information or conclusions set out in the document. No representation or warranty is made concerning conditions existing subsequent to the date or dates set out in the document or correspondence or any other matter that may have affected the information and conclusions summarized in the document or correspondence after such date or dates.

2. The services provided by Terra-Dynamics that are summarized in the report or correspondence were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession practicing under similar conditions in the locality of the project referred to in the document or correspondence at the time the document or correspondence

was prepared. No other representation or warranty, either expressed or implied, is made or intended by Terra-Dynamics with respect to any and all services, reports, correspondence, memoranda, goods, products, and equipment provided by Terra-Dynamics.

3. Terra-Dynamics shall not be responsible for the interpretation by others of the information developed by Terra-Dynamics. Our September 2, 2025 report titled *Hydrogeological Dewatering Study, 2076 Old Lakeshore Road, Burlington, ON* is exclusively for the use of our client, 1959025 Ontario Inc. and its, solicitors, lenders, engineers and consultants. The document or correspondence and the findings contained therein shall not, in whole or in part, be disseminated or conveyed to any other party or be used or relied upon by any other party, other than our client, 1959025 Ontario Inc.. and its, solicitors, lenders, engineers and consultants, in whole or in part, without the prior written consent of Terra-Dynamics. Our September 2, 2025 report and this Reliance letter are not transferrable and do not grant rights or benefits to any third party unless written agreement is made between Terra-Dynamics and the third party. We accept no responsibility for any loss or damage suffered by a third party as a result of decisions made or actions based on our September 2, 2025 report or this Letter of Reliance.

4. Should a third party have a concern about the Property and seeks a report upon which it may rely, it is obligated to hire an independent consultant at its own cost.

5. The work product completed under our Authorization to Proceed, and Terra-Dynamics' permission to use the information contained therein, in accordance with the terms described above, is offered in consideration of the understanding that our Client has entered into consideration of an Official Plan and Zoning By-law Amendment for the property located at 2076 Old Lakeshore Road, Burlington, Ontario and that our Client has authorized Terra-Dynamics' to provide this reliance to the City of Burlington and Halton Region herein.

6. Subject to these conditions, as well as the qualifications and limitations contained in the Report, you may rely on the Report for the express purpose which they are prepared, with no greater rights that those of our Client.

Please do not hesitate to contact the undersigned with any questions.

Yours truly,

TERRA-DYNAMICS INC.



Jayme D. Campbell, P. Eng.
Senior Water Resource Engineer, and President