GEMS®

Groundwater Environmental Management Services

Hydrogeological Report

15 and 17 Elm Street Toronto, Ontario

Project: 22-1422

August 12, 2022

Prepared For:

Fora Developments200 – 2440 Dundas St. W., Toronto, ON, M6P 1W9

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1.0 Introduction

Groundwater Environmental Management Services Inc. (GEMS) was retained by Fora Developments (the Contractor) to evaluate the hydrogeological conditions for a proposed development at 15 and 17 Elm Street, Toronto, Ontario (the Site). The regional location of the Site is illustrated in **Figure 1**.

The Site is currently occupied by two 2-storey buildings, with a lane that runs the length of the east side. The Site property is approximately 750 square metres (m^2) with an excavation area of equal dimensions. The proposed development will have two levels of underground parking structure with a Finished Floor Elevation (FFE) of approximately 88.5 metres above sea level (masl). The highest water table elevation recorded at the Site was 86.1 masl. It is anticipated that the foundation of the proposed building will be located approximately 3.9 m above the water table, and therefore long-term foundation drainage will not be required. Short-term construction dewatering may be required to achieve the estimated groundwater elevation target of 86.5 masl.

GEMS has reviewed the available relevant geological, environmental, and geotechnical information and has prepared this Hydrogeological Report in support of the proposed development.

GEMS' scope of work included:

- Review of hydrogeological conditions and environmental information based on previous reports prepared for the Site
- Review of subsurface soils conditions
- Groundwater level monitoring
- Hydraulic Conductivity Testing
- Water quality analysis
- Calculation of anticipated rainwater to be managed during construction
- Assessment of potential adverse environmental effects
- Assessment of MECP well records within 500 m of the Site

2.0 Site Conditions

2.1 Location and Land Usage

The Site is rectangular shaped and located on the south side of Elm Street, approximately 90 m west of Avenue Road and 150 m north of Dundas Street East (Google Earth, 2021). The Site is currently zoned as commercial residential (City of Toronto, 2022).

Lands located within 500 metres (m) of the Site are urban and predominately consist of residential, commercial residential, institutional, and open space. (City of Toronto, 2022).

North: Commercial, Residential, and some Open Space

East: Commercial Residential and Residential

South: Commercial Residential and some Open Space

West: Commercial Residential and Institutional

2.2 Proposed Development

The proposed building will consist of a thirty-two (32) storey apartment building underlain by two (2) levels of underground parking. The proposed development will occupy an approximate total area of 775 m^2 as shown in the architectural drawings prepared by Partisans (2022). Plans for the underground structure show a lowest FFE of 88.5 masl (drawings included in **Appendix A**). The base of the excavation (excavation invert) has an assumed elevation of 87.5 masl.

3.0 Methodology

The methodologies followed to complete the field investigation are outlined in this section.

3.1 Drilling Program

A drilling program was conducted by Terrapex Environmental Ltd. from 2 March to 10 May 2022 to support the hydrogeologic investigation presented in this report. Four boreholes (MW101, MW102, MW103, and MW104) were drilled by Pontil Drilling under the direction of Terrapex Environmental Ltd. personnel. All boreholes were equipped with 50 mm, schedule-40, PVC monitoring wells with 1.5 m or 3.0 m screened intervals at their base to evaluate static groundwater elevations, conduct hydraulic testing, and obtain water quality samples. Borehole logs are provided in **Appendix B,** and a detailed Site Plan showing the borehole locations is presented in **Figure 2.**

3.2 Hydraulic Testing

On 6 June 2022, GEMS personnel visited the Site to complete Single Well Response Tests (SWRTs) on monitoring wells MW101, MW103, and MW104.

The SWRTs consisted of rising head testing performed by 'instantaneously' removing a pre-determined volume of water (a slug). Water level recovery back to static conditions was monitored using an automated water level logging device and validated with manual measurements. A dedicated barologger was set above the water table to allow the data to be compensated for changes in atmospheric pressure.

3.3 Water Quality Sampling

On 6 June 2022, GEMS personnel were on Site to collect one (1) groundwater sample for water quality analysis. The sample was taken from monitoring well MW103 using a new dedicated bailer and sterile nitrile gloves to preserve sample integrity and ensure that the results are representative of in-situ groundwater conditions. The sample collection was not filtered.

The sample was packed with ice in a cooler to maintain sample temperature, and the cooler was sealed and transported for analysis to Bureau Veritas, a Canadian laboratory accredited and licensed by the Standards Council of Canada and/or the Canadian Association for Laboratory Accreditation (CALA). The sample was tested for all parameters denoted in the City of Toronto Sanitary and Storm Sewer By-law criteria.

4.0 Geology and Hydrogeological Setting

The Site is situated in the physiographic region detailed as the South Slope, characterized by physiographic features of Beveled till plains (Chapman & Putnam, 2007). Overburden materials deposited at the Site are reported to consist mainly of coarse-textured glaciolacustrine deposits, including sands, gravels, minor silts and clay deposited in coastal and basinal environments (OGS, 1991a).

The surficial soils in the area are mapped as Sunnybrook Drift and the Scarborough Formation (OGS, 1991a), characterized as being carbonate-rich and comprised of silt and silty clay. The surficial geology of the Site is displayed in **Figure 3.** Paleozoic bedrock in the area is mapped as Upper Ordovician deposits of shale and limestone belonging to the Georgian Bay Formation (OGS, 1991b).

4.1 Subsurface Investigation

Boreholes MW101 through MW104 were advanced to depths ranging from 10.5 metres below ground surface (mbgs) (84.5 masl) to 15.3 mbgs (80.2 masl). Elevations at the borehole locations were interpolated from the provided architectural drawings (**Appendix A**). As ground surface elevations were determined in this manner, they should be considered approximate.

The details of borehole advancement and the surveyed well elevations are summarized below in **Table 4.1A**.

Table 4.1A Borehole Details

Well ID	Date Installed	Ground Elevation (masl)	Borehole Depth (mbgs)	Borehole Depth (masl)	Well Screen Top – Bottom (masl)
MW101	2022-03-02	95.47	19.70	75.77	86.97 – 83.96
MW102	2022-03-15	95.47	20.40	75.07	83.27 – 80.17
MW103	2022-05-10	95.47	11.50	83.97	85.37 – 83.97
MW104	2022-05-10	95.47	10.48	84.99	87.87 – 84.77

According to the borehole logs completed by Terrapex Environmental Ltd. (2022), the site stratigraphy was characterized in descending order from surface, as shown in **Table 4.1B**.

Table 4.1B Site Stratigraphy	
Concrete	A 75mm layer of concrete overlays the Site
Fill	All boreholes were advanced through approximately 2.0 m of overburden fill material consisting primarily of silty sand with traces of gravel and debris.
Silty Clay	Silty clay, native till material with traces of gravel and sand was encountered in all four boreholes at elevations ranging from of 93.7 masl to 92.9 masl with thicknesses of 6.5 m to 7.5 m. A second silty clay layer was observed in MW101 and MW102 at 84.0 masl and 84.2 masl respectively, with a thickness of approximately 4 m.
Sandy Silt	Sandy silt till was encountered in boreholes MW101 (86.97 masl to 83.9 masl) and MW102 (87.1 masl to 84.2 masl).
Fine Sand	A thin fine sand layer was observed in MW103 from 86.4 masl to 85.9 masl
Sandy Clay	A sandy clay layer with sand seams was observed in MW103 (85.9 masl to 84.0 masl) and MW104 (86.1 masl to 85.0 masl)
Shale Bedrock	Soft, weathered shale was encountered in MW101 (80.1 masl to 75.8 masl) and MW 101 (80.2 mbgs to 75.0 masl)

This characterization is consistent with what was expected from the available published literature and mapping information for the Site location.

4.2 Stratigraphy and Hydrogeological Conditions

GEMS completed a subsurface review based on the provided borehole logs (**Appendix B**).

The site is covered by a layer of concrete underlain by approximately 2 m of non-cohesive fill material consisting primarily of silty sand with traces of gravel, some clay, and debris.

A silty clay till unit with traces of gravel and some sand was identified in all four boreholes. It is encountered at approximately 2 mbgs (93.3 masl) and is relatively flat across the site.

A sandy silt till layer with traces of gravel and some clay was identified in two boreholes (MW101 and MW102) at 87.0 masl.

Native till extends to approximately 80.2 masl across the site.

A thin fine sand layer with evidence of oxidation was observed in MW103 from 86.4 masl to 85.9 masl.

A sandy clay layer with thin sand seams was observed in boreholes MW103 and MW104 at approximately 86 masl.

Bedrock composed of grey shale with limestone interbeds was encountered in boreholes MW101 and MW102 at 15.3 mbgs (80.2 masl). The bedrock was described as very soft, moderately to highly weathered, and moderately to intensely fractured. The unconsolidated materials are considered part of the same unconfined water-bearing unit.

Water level observations at the Site (**Table 4.3**) indicate a variable water level between the shallower sandy silt or sandy clay units (screened over 87.9 masl to 84.0 masl) and the deeper silty clay unit (screened over 83.3 to 80.2 masl). The maximum observed variability between these two units is 5.6

metres.

Only one well (MW102) was screened in the deeper unit, so it cannot be determined with confidence whether the deep-water level reflects site-wide conditions or is related to the conditions immediately surrounding the well screen. Observations from nearby off-site wells are consistent with the shallow water levels. For these reasons, GEMS recommends assuming the shallow water levels (average 85.9 masl) reflect the water table.

Groundwater flows at the Site trend in a south-eastward direction. Regional groundwater flow is expected to be to the south towards Lake Ontario.

The nearest surface water features are the Don River, 2 km east, and Lake Ontario, 2 km south of the Site (**Figure 1**).

4.3 Groundwater Level/Elevation Monitoring

Between 1 June and 15 July 2022, GEMS carried out four (4) site visits to obtain water level measurements from five (5) monitoring wells (MW101, MW102, MW103 and MW104). Two (2) additional site visits will be conducted over the period of 29 July to 12 August 2022 to satisfy City of Toronto requirements. The groundwater monitoring results collected to date are summarized below in **Table 4.3.**

Table 4.3: Monitoring Well Summary and Groundwater Elevations

Well ID	Screened Unit and Screen Depth (masl)	Ground Elevation (masl)	Static Water Levels			
			Date (YYYY-MM-DD)	Water Level (mbgs)	Water Elevation (masl)	Average (masl)
MW101	Sandy Silt 86.97 – 83.96	95.47	2022-06-01	9.57	85.90	85.92
			2022-06-15	9.34	86.13	
			2022-06-27	9.61	85.86	
			2022-07-15	9.68	85.79	
			2022-07-29	9.72	85.75	
			2022-08-10	9.75	85.72	
MW102	Silty Clay 83.27 – 80.17	95.47	2022-06-01	14.93	80.53	80.68
			2022-06-02	14.72	80.75	
			2022-06-15	14.72	80.75	
			2022-06-27	14.76	80.71	
			2022-07-29	14.72	80.75	
			2022-08-10	14.90	80.57	
MW103	Sandy Clay 85.37 – 83.97	95.47	2022-06-01	9.66	85.81	85.77
			2022-06-02	9.59	85.88	
			2022-06-15	9.80	85.67	
			2022-06-27	9.76	85.71	
			2022-07-29	9.77	85.70	
			2022-08-10	9.83	85.64	
MW104	Silty Clay, Sandy Clay 87.87 – 84.77	95.47	2022-06-01	9.66	85.81	85.89
			2022-06-02	9.34	86.13	
			2022-06-15	9.57	85.89	
			2022-06-27	9.72	85.75	
			2022-07-29	9.72	85.75	
			2022-08-10	9.76	85.71	

Groundwater elevations at the Site during the monitoring period ranged from 86.13 masl to 80.53 masl, and the highest level was observed in MW104 on 15 June 2022. The water table is interpreted as being approximately 85.9 masl based on an average of the water levels observed in MW101, MW103, and MW104, for the purpose of this report. It is unclear if the deeper water level observed in MW102 represents the true water table, or if it is a result of the screened interval being in less permeable material. By using the shallowest water levels, a conservative approach is taken with respect to the dewatering

calculations.

Water level fluctuations may vary due to seasonal weather. Twelve measurements presented in this report were taken during a "peak rainfall" month (June) and thus represent the upper limit of anticipated water levels at the site. It is recommended that additional water levels be taken through the peak season (May to June) of 2023 to confirm the maximum water table elevation.

4.4 Single Well Response Tests

On 6 July 2022, GEMS was on-Site to complete nine (9) Single Well Hydraulic Tests (SWHT) in three (3) monitoring wells (MW101, MW103 and MW104) to estimate the saturated hydraulic conductivity (K) of the soils at well screen depths.

For each SWRT, a 'slug' of water was removed from the well for each test, and the water level recovery was monitored and analyzed until they reached static water level conditions. Estimations of hydraulic conductivity were made in AQTESOLV Aquifer Test Analysis Software using the Hvorslev Method (Hvorslev, 1951). Hydraulic Conductivity analysis graphs for each SWRT are provided in **Appendix C**.

The Hvorslev Method was chosen for its versatility and is based on the following assumptions:

- Water-bearing unit has infinite areal extent;
- Water-bearing unit is homogeneous and of uniform thickness;
- Water bearing unit is confined or unconfined;
- Water table is initially horizontal prior to testing;
- The well is fully or partially penetrating the water-bearing unit;
- The slug is instantaneously removed from the well; and,
- Groundwater flow is steady.

The estimated hydraulic conductivity results for all SWHTs are presented in **Table 4.4**.

Table 4.4: Hydraulic Conductivity Results from Single Well Response Tests

Well ID	Screened Unit	Screen Interval (masl)	SWRT	Hydraulic Conductivity (m/s)	Geometric Mean
MW101	Sandy Silt	86.97 – 83.96	1	6.79x10-7	6.7×10^{-7}
			2	6.79x10-7	
			3	6.43x10-7	
MW103	Sandy Clay	85.37 – 83.97	1	1.71x10-6	1.7×10^{-6}
			2	1.61x10-6	
			3	1.67x10-6	
MW104	Silty Clay, Sandy Clay	87.87 – 84.77	1	5.52x10-8	9.5×10^{-8}
			2	1.40x10-7	
			3	1.10x10-7	
Geometric Mean Hydraulic Conductivity (m/s) for all SWRTs					4.7×10^{-7}
Highest Hydraulic Conductivity (m/s) for all SWRTs					1.7×10^{-6}

The hydraulic conductivity results for tests in MW101, MW103, and MW104 ranged from 1.7 x 10^{-6} m/s to 3.2 x 10^{-5} m/s, with an overall geometric mean of 6.1 x 10^{-6} m/s.

The borehole records indicate that MW101 is screened across sandy silt, MW103 within sandy clay, and MW104 within a silty clay and sandy clay unit. All wells are screened across or below the water table.

The geometric mean of the hydraulic conductivity estimates for the sandy silt, sandy clay, and mixture of silty clay and sandy clay materials are 10^{-7}, 10^{-6}, and 10^{-8}, respectively. These all fall within the textbook range for silt, loess, and silty sand materials denoted by Freeze & Cherry (1979). It is believed that the first test in MW104 may have been impacted by a clogged well screen producing an artificially low conductivity estimate. Subsequent tests in that well were not affected by this issue.

4.5 Groundwater Quality

The water quality that will be discharged by the dewatering system during construction is expected to be similar to in-situ groundwater quality. On 6 July 2022, a groundwater sample was collected from borehole MW103 to characterize the in-situ groundwater quality at the Site. The water quality analysis results are included in **Appendix D**.

Water quality results were compared to the following criteria:

- City of Toronto Storm Sewer Discharge Use By-Law
- City of Toronto Sanitary and Combined Sewers Discharge Guidelines.

Water quality did not exceed Toronto Sanitary Sewer Guidelines. Water quality exceeds the City of Toronto Storm Sewer Discharge Guidelines for the following parameters: Total Suspended Solids, Total Manganese (Mn) and Total Phosphorus. Exceedances to these criteria are summarized in **Table 4.5**.

Table 4.5: Water Quality Results Exceeding Discharge Criteria

Water Quality Parameters	Units	MW103 Results	Sanitary Criteria	Storm Criteria
Total Suspended Solids	mg/L	17	350	**15**
Total Manganese (Mn)	ug/L	295	5000	**50**
Total Phosphorus	ug/L	810	2000	**5.2**

*Exceeded criteria identified in bold

Groundwater quality may change over time and during active construction dewatering. Groundwater conditions and quality should be re-assessed by a dewatering contractor prior to commencing any water taking and discharging activities.

5.0 Short and Long-Term Discharge Rates

5.1 Short-Term Construction Dewatering

A construction dewatering system design may include well points, several sump pumps, and a network of gravity drains. Implementing a dewatering system is the responsibility of the property owner. A qualified dewatering contractor with experience in construction dewatering should be retained to design and outline the methodology of the dewatering system. Construction will require that the groundwater level be lowered to a depth at least 1.0 m below the excavation invert.

Table 5.1: Dewatering Estimate Assumptions

Input Parameters	Assumption	Notes
Ground Surface Elevation	95.5 masl	Highest surface elevation based on architectural drawings (**Appendix A**)
Finished Floor Elevation (FFE)	88.5 masl	Lowest finished floor elevation based on provided architectural drawings (**Appendix A**)
Excavation Invert	87.5 masl	Assumed 1.0 metre below FFE
Dewatering Target Elevation	86.5 masl	Assumed to be 1.0 metre below the excavation invert
Excavation Area	23.0 m x 34.0 m	Estimated extent of the proposed development based on architectural drawings (**Appendix A**)
Max Anticipated Groundwater Elevation	86.9 masl	Highest measured groundwater elevation at the site (MW101 06/15/2022) + 0.8 metres for peak season fluctuation allowance
Base of Aquifer	80.2 masl	Assumed at bedrock surface
Hydraulic Conductivity (K)	1.7×10^{-6} m/s	Highest K value estimated from SWRT tests (MW103)

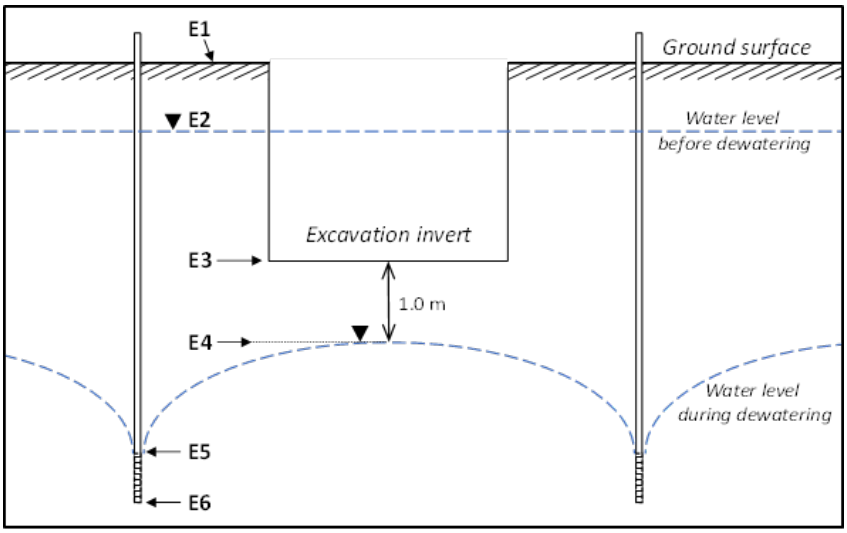
Dewatering estimates have been calculated assuming an excavation invert of 87.5 masl. On-site water level measurements show the water table ranges between approximately 80.5 and 86.1 masl. The maximum anticipated groundwater was estimated to be 86.9 masl after incorporating a 0.8 m fluctuation allowance to the peak static groundwater level as outlined by the City of Toronto Foundation Drainage Guidelines (COT, 2021) for peak season monitoring. The maximum anticipated groundwater elevation is 0.4 metres above the assumed dewatering target elevation (86.5 masl). Therefore, minor short-term construction dewatering is anticipated.

A conceptual well-point dewatering model has been used to forecast the dewatering rates. As such, a greater drawdown would be required at the pumping wells themselves to achieve the target level in the central area of the base of the excavation. For calculations, the bottom tips of dewatering wells have been assumed to be located 3.0 m deeper than the excavation invert, with water levels in those dewatering wells being 2.0 m below the excavation invert.

A schematic diagram of a section of loop dewatering is shown below in **Drawing 1**. The values for Indicated parameters are as follows:

E1 =	Approximate ground level	95.47 masl
E2 =	Maximum hydraulic head	86.93 masl
E3 =	Lowest point of excavation	87.47 masl
E4 =	Target water level below excavation	86.47 masl
E5 =	Target water level in wellpoints	85.47 masl
E6 =	Dewatering wellpoint tips	84.47 masl

Drawing 5.1 Schematic diagram showing a cross-section of loop dewatering at two well points on opposite sides of the property.



5.2 Radius of Influence

Calculations for dewatering effects require estimation of the radius of influence (ROI). Estimates of ROI for a rectangular excavation are calculated using the following formula, adapted from the Jacob equation without recharge (Cooper, 1946).

$$R_o = r_w + \sqrt{\frac{T \cdot t}{C_4 \cdot C_s}}$$

Where:

- t = Duration of Dewatering
- T = Transmissivity in m^2/sec
- C_s = Storage Coefficient (no units)
- C_4 = Constant (4790) (no units)

- r_w = Effective well radius of open excavation in metres.

The effective radius of the open rectangular excavation has dimensions of a and b:

$$r_w = \frac{a + b}{\pi}$$

A rectangle was superimposed over the development area at the Site for use in estimating excavation size and dewatering requirements with an area that was assumed to capture the full dimensions of the underground structure.

- Assumed dimensions: 23.0 m x 34.0 m

Assuming 40 days of pumping for the steady-state drawdown, the ROI extending outward from the perimeter of the rectangular excavation is estimated to be 29 m. This ROI is depicted by the Zone of Influence (ZOI) shown in **Figure 4**. This is the maximum possible ROI, assuming:

I. No recharge;

II. Wells are located around the perimeter of the rectangular excavation; and,

III. The bottom tips of wells are approximately 3.0 m deeper than the assumed foundation invert depth.

ROI estimates are based on simplified standard textbook modelling and are approximations of complex geological conditions that do not account for recharge effects. Based on observations and the documented Site condition, a typical recharge effect is anticipated. Subsurface materials are variable in structure, soil texture, thickness, and other factors, and thus conditions may be present that were not identified by Site boreholes that will affect the extent of the ROI.

A conservative approach to forecasting the maximum pumping rates and associated ROI was taken to account for uncertainties associated with varying subsurface soil conditions and fluctuations in groundwater elevations. The value inputs to the equation were conservatively biased to predict the maximum pumping rates of dewatering required to draw down groundwater to the target levels. This conservative approach reduces the possibility of unforeseen hydrogeological conditions encountered, which may require a higher dewatering rate.

5.3 Pumping Rate Calculations

The calculation for a rectangular excavation is based on a scenario that models radial flow into a well with a calculated equivalent radius reflective of the area to be dewatered. Dewatering was simulated by analyzing radial flow to a well in an unconfined aquifer. Flows toward the well were simulated using the following formula (J.P.Powers, 2007):

$$Q = \frac{\pi \cdot K\left(H^2 - h^2\right)}{\ln\left(\frac{R_o}{r_w}\right)}$$

Where the symbols and input values are as follows:

- Q = Discharge flow (L/min)
- K = Hydraulic conductivity = 1.71 x 10^{-6} m/s
- H = Head of pre-construction static water level
- h = Head of target water level above datum = 1.0 m
- R_o = Radius of influence
- r_w = Effective well radius of open excavation

5.4 Construction Dewatering Rates

Assuming the dewatering wells are installed to elevations of 84.47 masl, the estimated maximum dewatering rate for initial drawdown (7 days) is 10,882 L/day (7.6 L/min), and during steady-state drawdown (40 days) is 5,164 L/day (3.6 L/min).

For the purpose of permitting applications for dewatering, GEMS recommends using the forecasted 7-day pumping rate with a 1.5 safety factor. The resulting pumping rate after applying the safety factor is 16,323 L/day (11.3 L/min). This forecasted dewatering pumping rate will allow for uncertainties and variability in the range of hydraulic conductivity. Additionally, it is necessary to account for contributions from significant precipitation events. Assuming a rectangular excavation with dimensions of 23.0 m x 34.0 m for underground parking, the total surface area of the excavation will be 782 m^2. Anticipating a 15 mm daily rainfall event, the volume of rainwater contributed to this area would be 11,730 L.

Adding the rainfall event contribution to the dewatering rate after applying the safety factor brings the forecast maximum pumping rate to 28,053 L/day (19.5 L/min). The dewatering calculations are provided in **Appendix E.**

A dewatering contractor should be retained to evaluate the dewatering methods. If dewatering wells deeper than 3.0 m below the excavation invert depth are required, the discharge rates should be re-evaluated by GEMS.

Based on the above estimate, a Permit to take Water is not required for water taking during the dewatering and construction of the proposed development, as the forecasted dewatering rate is less than 400,000 L/day. An Environmental Activity and Sector Registry (EASR) is also not required from the MECP as the forecast dewatering rate is less than 50,000 L/day.

5.5 Long-Term Seepage Rates

Post-construction groundwater seepage is not anticipated due to the lowest elevation of the finished underground parking structure being approximately 1.6 metres above the peak water table elevation as described in **Section 4.3**. Further groundwater monitoring is recommended during 'peak season' to confirm the peak water table elevation.

Some discharge of infiltrated stormwater associated with a private water drainage system may occur following significant rainfall events. To account for infiltrated precipitation to the perimeter drains, the Site perimeter is estimated to be approximately 114 m at the lowest underground level. It is assumed that all of the rainfall volume from a 25 mm rain event will be infiltrated.

Using a 1 m slice, GEMS forecasts an infiltrated rainfall volume of 2,850 L/day (2.0 L/min). Employing a 1.5 safety factor brings the discharge forecast to 4,275 L/day (3.0 L/min). Since the long-term forecast is below 50,000 L/day, a Permit to Take Water (PTTW) will not be required for the long-term discharge of water from the foundation drainage system.

6.0 Potential for Adverse Effects

The following section identifies potential adverse environmental effects of the proposed construction dewatering program.

6.1 Regulated and Sensitive Areas

According to the Ministry of Environment, Conservation and Parks' (MECP) Source Protection Information Atlas (MECP, 2021), the Site is not located in an area of development control, as defined by the Niagara Escarpment Planning & Development Act. The Site is also not located on the Oak Ridges Moraine Conservation Area, as defined by the Oak Moraine Conservation Plan, and there are no Toronto and Region Conservation Authority (TRCA) regulated areas within the Zone of Influence of the Site.

6.2 MECP Well Records and Groundwater Resources

The area within 500 m of the Site is serviced by City of Toronto municipal water. The City of Toronto obtains their water supply from Lake Ontario, and thus there is no potential for groundwater interference complaints during construction dewatering activities.

A copy of the Ministry of Environment, Conservation and Parks (MECP) well listings within 500 metres of the Site are provided in **Appendix F**. The wells within 500 metres of the Site are displayed in **Figure 3**.

There are two hundred and twenty (220) wells identified within the 500 m area surrounding the Site. There are eighty-three (83) records that detail monitoring wells, fifty-six (56) records that are monitoring and test hole wells, twenty-three (23) which are just test hole wells, three (3) that detail dewatering wells, two (2) municipal well, and one (1) described as "other". The remaining fifty-two (52) records either have no information or are not used. No significant construction dewatering activities are anticipated, therefore, no water supply wells or domestic wells are expected to be impacted.

Water removal activities related to excavation dewatering following a rain event are not expected to impact any of the wells proximal to the Site, and no monitoring is recommended.

Prior to construction, any inactive monitoring wells at the Site should be properly decommissioned by a

drilling contractor licensed by the MECP, following Ontario Regulation 903.

6.3 Settlement

The potential settlement has been addressed in the Terrapex Environmental Ltd. Geotechincal Report (*report pending*). Settlement of the ground due to dewatering activities is not anticipated.

6.4 Recommended Additional Fieldwork and Monitoring

If water collected on-site during construction will be discharged to a sewer, ongoing monitoring is recommended from the discharge outlet pipe or sampling port of the dewatering system for water quality and quantity.

6.4.1 Groundwater Monitoring and Mitigation Plan, On-Site Water Quantity Monitoring

Monitoring the quantity of the discharged water is required to ensure compliance with the discharge agreement. The recommended monitoring and mitigation plan is outlined below and summarized in **Table 6.4.1**.

Location: A flow meter attached to the discharge pipe of the dewatering system.

Parameter: Total volume of discharge, date, and time of measurement.

Schedule: Minimum daily recording by on-Site personnel.

Trigger: Discharge volume exceeds the maximum rate of dewatering specified in the discharge agreement.

Mitigation: Immediately reduce the pumping rate so that discharge is within the permitted limit and manage any excess water on-site.

Reporting: Any values exceeding the water taking or discharge limits reported to the project supervisor immediately. All values within the limits reported to project supervisor weekly for submission to the City of Toronto.

Table 6.4.1: Groundwater Monitoring and Mitigation Plan, On-Site Water Quantity Monitoring

Period	Monitoring Location	Monitoring Frequency	Method	Triggers for Mitigation	Mitigation Measures / Comments
Pre-Construction	Ensure there is a flow meter attached to the discharge pipe prior to the start of dewatering.	N/A	The flow meter should have a totalizer, show instantaneous flow, and be non- resettable.	Review the Water Taking and Discharge Permits for the limit on water taking and discharge.	N/A
During Construction	The Flow Meter installed on the discharge pipe.	Record the total volume of discharge, date, and time of measurement daily.	Manual readings by on-site personnel.	Discharge volume exceeds the maximum rate of dewatering specified in the discharge agreement.	Immediately reduce the pumping rate so that discharge is within permitted limit.
Post-Construction	No post-construction water taking monitoring is required				

6.4.2 Groundwater Monitoring and Mitigation Plan, On-Site Water Quality Monitoring

If discharge is directed to the City of Toronto sanitary or storm sewer, GEMS recommends the following monitoring and mitigation plan outlined below and summarized in **Table 6.4.2**.

Location: Discharge outlet pipe or sampling port of the dewatering system.

Parameters: City of Toronto sewer use By-Law

Schedule: First sample is recommended to be obtained within first two (2) days of discharge start. Routine samples are recommended to be obtained monthly thereafter.

Trigger: If one or more parameters have a concentration above the By-Law.

Mitigation: Filtration/treatment approaches would be reviewed on a specific basis. Upon installation of a filtration/treatment system, an additional sample should be performed to ensure compliance with the criteria.

Reporting: All results reported to project supervisor for submission to City of Toronto, as required.

Table 6.4.2: Groundwater Monitoring and Mitigation Plan, On-Site Water Quality Monitoring

Period	Monitoring Location	Monitoring Frequency	Method	Triggers for Mitigation	Mitigation Measures/Comments
During Construction	Discharge outlet pipe or sampling port of the dewatering system.	First sample is recommended to be obtained within first two (2) days of discharge start. Routine samples are recommended to be obtained monthly thereafter.	Samples should be sent to a certified laboratory and be analyzed against the City of Toronto sewer use By-Law.	Discharge quality exceeds City of Toronto sewer use By-Law.	Filtration/treatment approaches would be reviewed on a specific basis. Upon installation of a filtration/treatment system, an additional sample should be performed to ensure compliance with the criteria.
Post Construction	No post-construction water quality monitoring is required.				

Note: This Plan does not include Geotechnical Monitoring (settlement monitoring), which is not recommended for this site.

7.0 Conclusion

Based on the above analysis, the following conclusions and recommendations are offered for the proposed construction of 17 Elm Street, Toronto, Ontario:

- The geology within the Site is characterized by Beveled till plains, including coarse textured glaciolacustrine deposits overlaying Paleozoic bedrock.
    - The silty clay, sandy silt, fine sand, sandy clay, and shale/bedrock units at the Site are interpreted to all belong to the same unconfined water-bearing zone or aquifer.
- Hydraulic conductivity for the water-bearing zone (MW101, MW103 and MW104) ranges from 5.52 x 10^{-8} m/s to 1.71 x 10^{-6} m/s, with an overall geometric mean of 4.7 x 10^{-7} m/s.
- Groundwater table at the Site ranges from 80.53 masl to 86.13 masl.
    - The maximum anticipated groundwater is estimated at 86.9 masl, incorporating a 0.8 m fluctuation allowance to the peak static water level as outlined by the City of Toronto Foundation Drainage Guidelines (COT, 2021) for peak season monitoring.
- Groundwater quality at the Site currently meets the City of Toronto Sanitary and Combined Sewers Discharge Guidelines
    - Groundwater quality exceeds the City of Toronto Storm Sewer Discharge Use By-Law for Total Suspended Solids, Total Manganese (Mn), and Total Phosphorus
    - It is recommended that an additional sample is obtained from the accumulated

stormwater on-site prior to discharge to determine if the water quality meets the City of Toronto Sewer Use By-law.

- To drawdown groundwater to a target elevation of 86.47 masl, a dewatering rate of 7.6 L/min or 10,882 L/day will be required.
    - Applying a safety factor of 1.5 for permitting applications and accounting for precipitation during dewatering, GEMS forecasts a total dewatering rate of 19.5 L/min or 28,053 L/day.
- The zone of influence for steady-state construction dewatering (40 days) is expected to extend 29 m beyond the excavation area.
- Long-term dewatering rates are expected to be minimal due to deep water level conditions and low hydraulic conductivity of site material. Long-term infiltrated stormwater is estimated at 4,275 L/day with a safety factor of 1.5
- Well decommissioning will be required prior to construction. Any inactive wells within the Site should be decommissioned by a licensed well contractor under Ontario Regulation 903.

8.0 Limitations

Groundwater Environmental Management Services Inc. (GEMS) has prepared this report for our client and its agents exclusively. GEMS accepts no responsibility for any damages that may be suffered by third parties as a result of decisions or actions based on this report.

The findings and conclusions are site-specific and were developed in a manner consistent with that level of care and skill normally exercised by environmental professionals currently practicing under similar conditions in the area. Changing assessment techniques, regulations, and site conditions mean that environmental investigations and their conclusions can quickly become dated, so this report is current up to two years from the published date. The report should not be used after that without GEMS review/approval.

The project has been conducted according to our instructions and work program. Additional conditions, and limitations on our liability are set forth in our work program/contract. No warranty, expressed or implied, is made.

9.0 References

Chapman, L. J., & Putnam, D. F. (2007). The Physiography of Southern Ontario: Ontario Geological Survey, 3rd edition. Ontario Geological Survey.

City of Toronto (2022). City of Toronto Zoning By-law 569-2013 zoning map. https://map.toronto.ca/maps/map.jsp?app=ZBL_CONSULT

Cooper, H.H. and C.E. Jacob, 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, Am. Geophys. Union Trans., vol. 27, pp. 526-534.

Freeze, R. A., & Cherry, J. A. (1979). Groundwater. Englewood Cliffs, New Jersey: Prentice Hall. ISBN 0-13-365312-9.

Google Earth (2021) Ariel Image of 17 Elm Street earth.google.com/web/.

Hvorslev, M.J. (1951). Time Lag and Soil Permeability in Ground-Water Observations, Bull. No. 36, Waterways Exper. Sta. Corps of Engrs, U.S. Army, Vicksburg, Mississippi, pp. 1-50. [pdf]

J.P.Powers, A. C. (2007). Construction Dewatering and Groundwater Control, New Methods and Applications.

MECP. (2021). Source Protection Information Atlas. Retrieved from https://www.lioapplications.lrc.gov.on.ca/SourceWaterProtection/index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-CA

OGS. (1991a). Quaternary Geology of Southern Ontario Map 2556. Southern sheet. Queens Printer for Ontario

OGS. (1991b). Bedrock Geology of Southern Ontario Map 2556. Southern sheet. Queens Printer for Ontario

Partisans Architects (2022). Architectural Drawings: 15 – 17 Elm Street. Drawings submitted to Fora Developments.

Terrapex Environmental Ltd. (2022). Record of Borehole Logs: 17 Elm Street. Submitted to 17 Elm Limited Partnership.

10.0 Closing

We trust this information will meet your current requirements. Please do not hesitate to contact the undersigned should you have any questions or require additional information.

Yours truly,

Groundwater Environmental Management Services Inc.

Prepared By:

Kenley Bairos

Kenley Bairos, M.Sc., GIT,

Hydrogeologist

Reviewed By:

Mike Francis, B.Sc., P.Geo

Hydrogeologist

Figure 1

Regional Location Plan

Legend

Site: 17 Elm Street, Toronto, ON

Watercourses

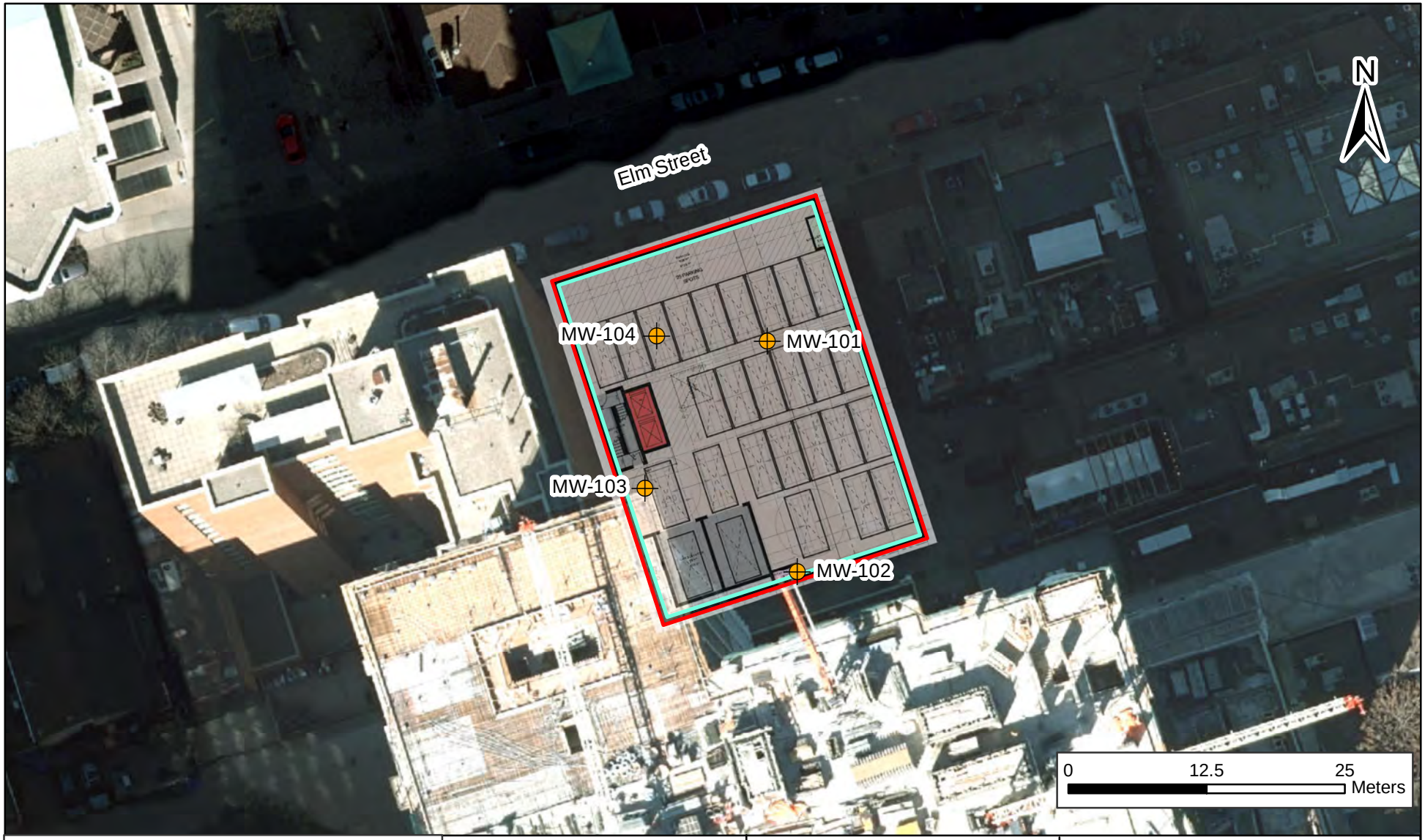
GEMS
Groundwater Environmental Management Services

Client:	Fora Developments
Date:	July 2022
Scale:	1:20,000
Source:	ESRI Basemap WGS1984 UTM Zone 17N

Title:	Figure No.	Project No.	Drawn By:
Regional Location Plan	1	22-1422	JP

Figure 2

Detailed Site Plan



Legend

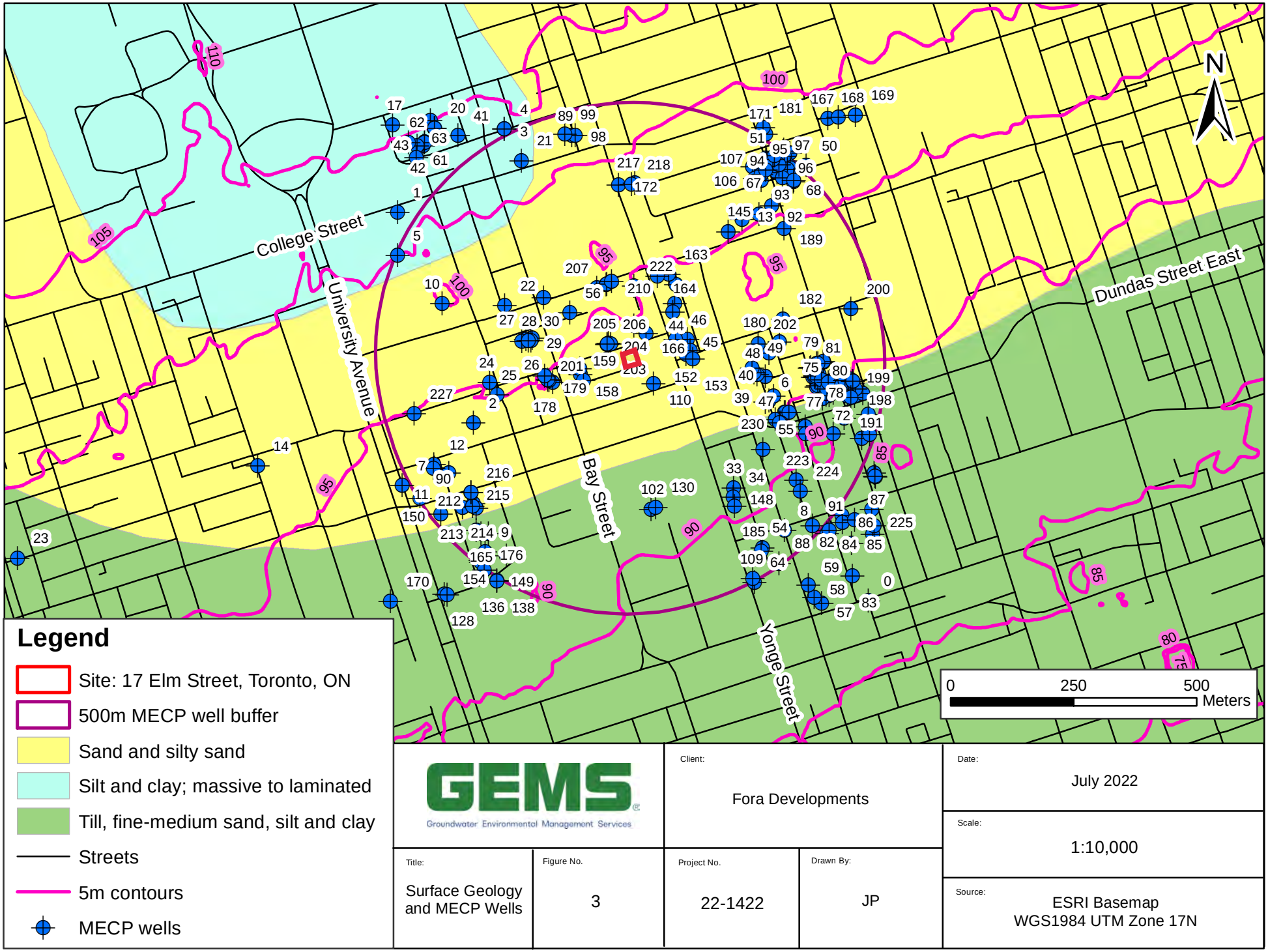
- Site: 17 Elm Street, Toronto, ON
- Dewatering area
- Monitoring wells (Installed May 2022)

GEMS
Groundwater Environmental Management Services

Client: Fora Developments			Date: July 2022
			Scale: 1:500
Title: Detailed Site Plan	Figure No. 2	Project No. 22-1422	Drawn By: JP
			Source: ESRI Basemap WGS1984 UTM Zone 17N

Figure 3

Surface Geology and MECP Wells

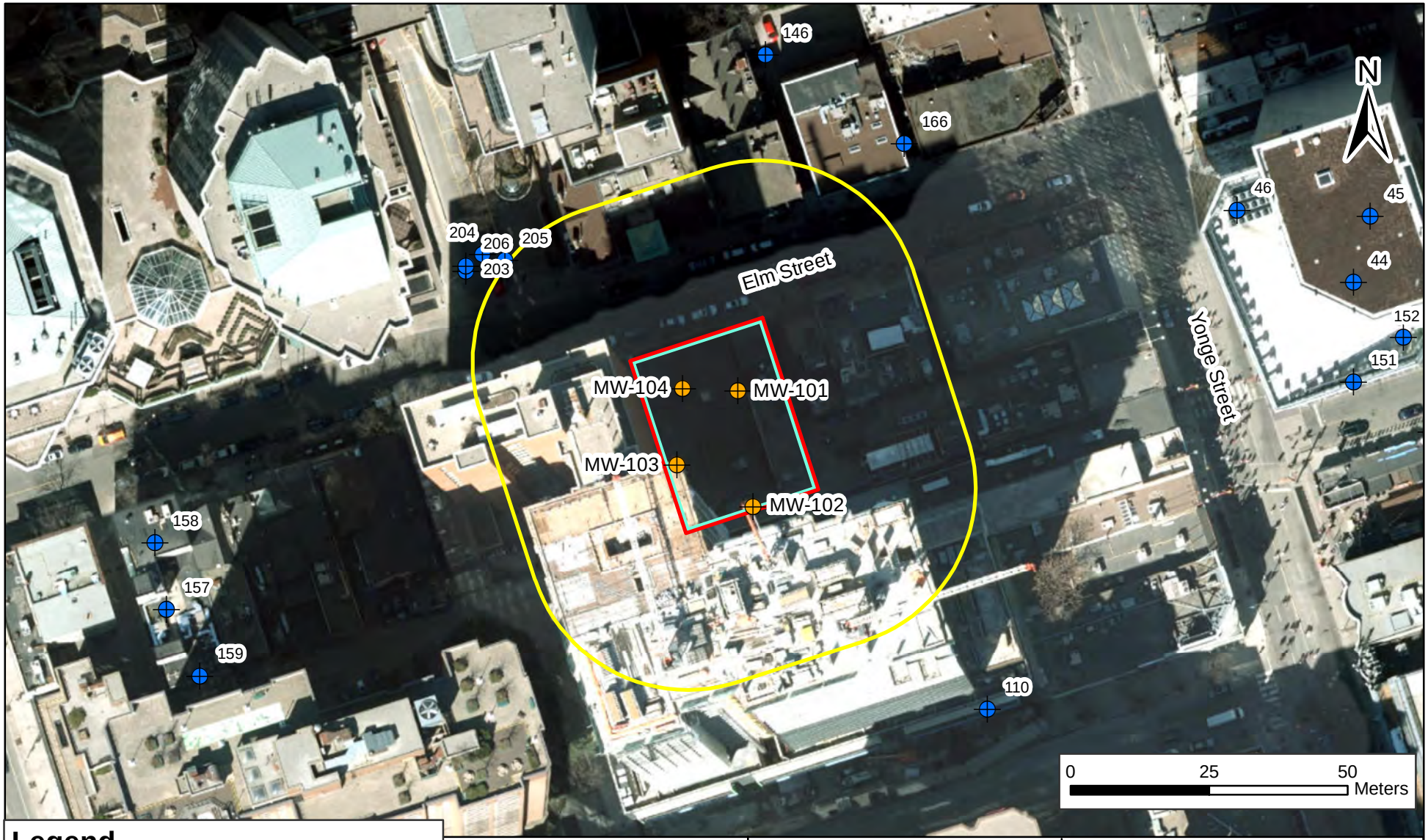


GEMS
Groundwater Environmental Management Services

Client: Fora Developments			Date: July 2022
			Scale: 1:10,000
Title: Surface Geology and MECP Wells	Figure No. 3	Project No. 22-1422	Drawn By: JP
			Source: ESRI Basemap WGS1984 UTM Zone 17N

Figure 4

Excavation Area



Legend

- Site: 17 Elm Street, Toronto, ON
- Radius of influence (29m)
- Dewatering area
- Monitoring wells (Installed May 2022)
- MECP wells

GEMS
Groundwater Environmental Management Services

Client: Fora Developments			Date: July 2022
			Scale: 1:1,000
Title: Dewatering Area	Figure No. 4	Project No. 22-1422	Drawn By: JP
			Source: ESRI Basemap WGS1984 UTM Zone 17N

Appendix A

Architectural Drawings

SPA	[redacted]
Permit	[redacted]
Tender	[redacted]
Contract	
Construction	

No.	DESCRIPTION	Date

NOT FOR CONSTRUCTION

PARTISANS
116 Geary Ave Unit 204, Toronto, ON, Canada, M6H 4H1
www.partisansarchs.com

ONTARIO ASSOCIATION OF ARCHITECTS
JONATHAN FRIEDMAN
LICENCE
7211

Certificate of Practice No.: ????

Architect's BCIN.: 7211

Scale: 1 : 100
Drawn: Author
Checked: Checker
Approved: Approver

North Arrow

Client: Fora Developments

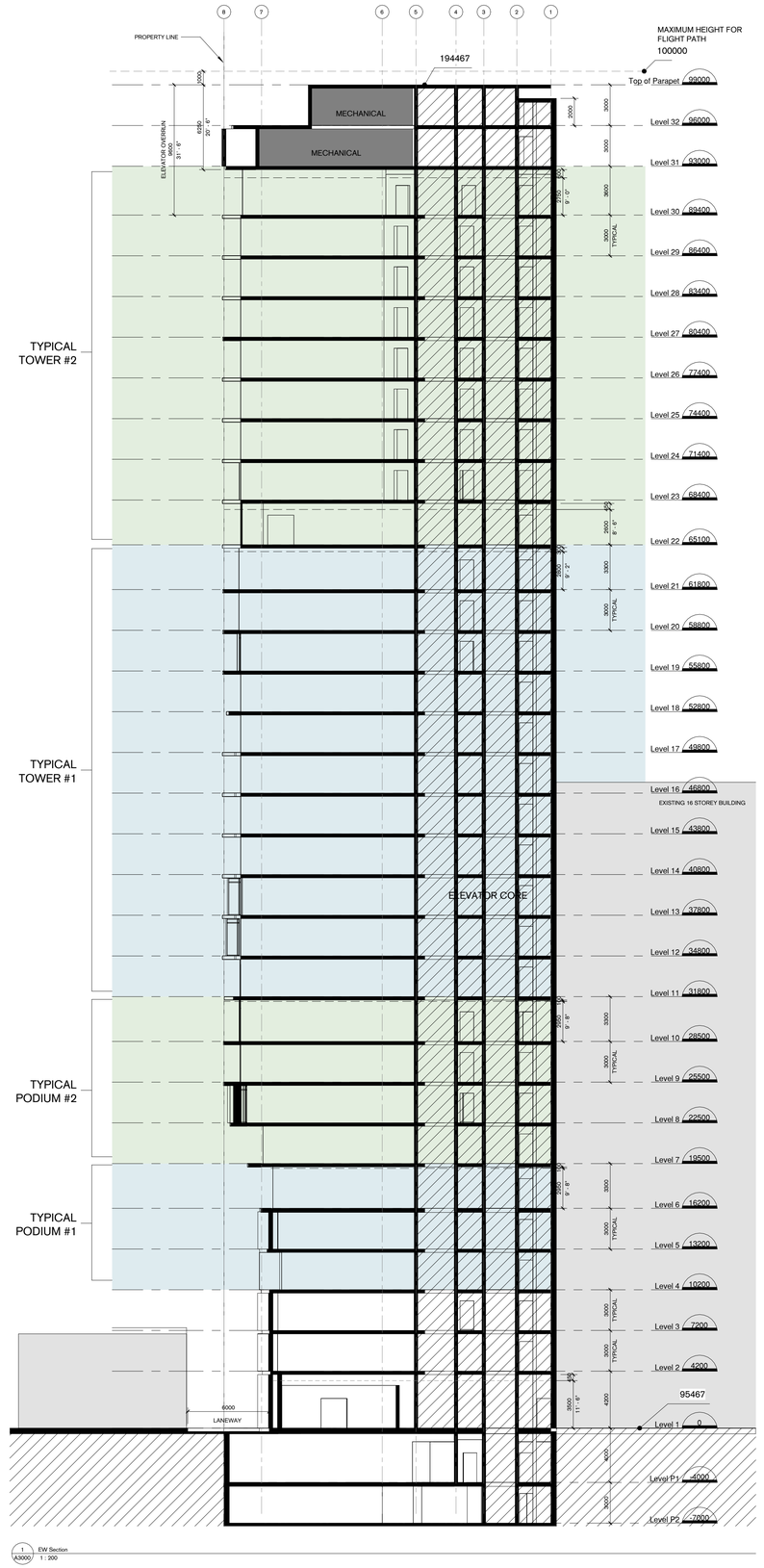
Project: 15-17 ELM STREET

Project Address: 17 Elm Street
Toronto, Ontario
M5G 1H1

Drawing Title: Level P2

Project Number: 88

Drawing Number: A1000.2



1 / A3000 EW Section
1 : 200

SPA	[redacted]
Permit	[redacted]
Tender	[redacted]
Contract	
Construction	

No.	DESCRIPTION	Date

NOT FOR CONSTRUCTION

PARTISANS
116 Geary Ave Unit 204, Toronto, ON, Canada, M6H 4H1
www.partisansprojects.com

ONTARIO ASSOCIATION OF ARCHITECTS
JONATHAN FRIEDMAN
LICENCE
7211

Certificate of Practice No.:	????
Architect's BCIN:	7211
Scale	1 : 200
Drawn	Author
Checked	Checker
Approved	Approver

North Arrow

Client
Fora Developments

Project
15-17 ELM STREET

Project Address
17 Elm Street
Toronto, Ontario
M5G 1H1

Drawing Title
Building Sections

Project Number	Drawing Number
88	A3000

Appendix B

Borehole Logs

CLIENT: 17 Elm Limited Partnership	PROJECT NO.: CT3453.00	**RECORD OF: MW101**
ADDRESS: 17 Elm Street		
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m): ELEV. (m) 95.63
CONTRACTOR: Pontil Drilling	METHOD: Hilti and Mud Rotary	
BOREHOLE DIAMETER (cm): 10	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 2 SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		Concrete (75mm)	0	95.5	2	19	1		12	10p/0p		Bentonite	
		very loose to loose, moist, brown silty sand trace gravel, some clay (FILL)	0.5	95	3	29	2		37	10p/0p			50mm monitoring well was insalled. water level measured on June 1, 2022: 9.57mbgs
			1	94.5									
			1.5	94	6	29	3		50	<5p/0p			
		SILTY CLAY trace gravel, some sand (TILL)	2	93.5	18	21	4		83	15p/1p			
		very stiff moist brown	2.5	93	18	16	5		100	<5p/0p			
		----------	3	92.5	15	20	6		75	<5p/0p			
		stiff ---------- grey	3.5	92									
			4	91.5	9	19	7		95	<5p/0p			
		----------	4.5	91	6	22	8		16	<5p/0p			
			5	90.5	4	20	9		79	<5p/0p			
		firm	5.5	90	5	15	10		45	<5p/0p			
		----------	6	89.5	11	11	11		62	5p/0p			
			6.5	89									
		stiff	7	88.5	11	16	12		79	<5p/0p			
			7.5	88	11	17	13		79	<5p/0p			
		----------	8	87.5	18	14	14		33	15p/0p		Sand	
		very stiff	8.5	87								Screen + Sand	
		compact, moist, grey SANDY SILT trace gravel, trace to some clay (TILL)	9	86.5	18	16	15		91	<5p/0p			

TERRAPEX	LOGGED BY: AMD	DRILLING DATE: 02 March 2022
	INPUT BY: RA/EM	MONITORING DATE: 01-Jun-2022
	REVIEWED BY: VN	PAGE 1 OF 3

CLIENT: 17 Elm Limited Partnership | PROJECT NO.: CT3453.00 | **RECORD OF: MW101**

ADDRESS: 17 Elm Street

CITY/PROVINCE: Toronto, Ontario | NORTHING (m): | EASTING (m): | ELEV. (m) 95.63

CONTRACTOR: Pontil Drilling | METHOD: Hilti and Mud Rotary

BOREHOLE DIAMETER (cm): 10 | WELL DIAMETER (cm): 5 | SCREEN SLOT #: 10 | SAND TYPE: 2 | SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● / N-VALUE (Blows/300mm) ▲	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
compact, moist, grey SANDY SILT trace gravel, trace to some clay (TILL)	9.5	86	▲17	●22	16		95	<5p/0p			
	10	85.5	▲14	●17	17		91	<5p/0p			
	10.5	85	▲15	●23	18		95	<5p/0p			
	11	84.5	▲16	●24	19		95	<5p/0p			
	11.5	84									
very stiff to hard, moist, grey SILTY CLAY trace gravel, some sand (TILL)	12	83.5	▲18	●22	20		91	<5p/0p			
	12.5	83	▲17	●22	21		95	<5p/0p			
	13	82.5									
	13.5	82									
---------- trace shale fragments	14	81.5	▲31	●21	22		100	<5p/0p			
	14.5	81									
	15	80.5	▲50/125	●12	23		64	<5p/0p			
Georgian Bay Formation Grey Medium Strong SHALE Moderately fractured With limestone/siltstone beddings Hard Layers (%): RC1: 25% RC2: 45% RC3: 38% RC4: 13% RC5: 25%	15.5	80			RC1						TCR= 100% RQD= 67%
	16	79.5									
	16.5	79			RC2						TCR= 100% RQD= 58%
	17	78.5									
	17.5	78			RC3						TCR= 97% RQD= 72%
	18	77.5									
	18.5				RC4						TCR= 97% RQD= 89%

TERRAPEX

LOGGED BY: AMD | DRILLING DATE: 02 March 2022

INPUT BY: RA/EM | MONITORING DATE: 01-Jun-2022

REVIEWED BY: VN

CLIENT: 17 Elm Limited Partnership	PROJECT NO.: CT3453.00	**RECORD OF: MW101**
ADDRESS: 17 Elm Street		
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m): ELEV. (m) 95.63
CONTRACTOR: Pontil Drilling	METHOD: Hilti and Mud Rotary	
BOREHOLE DIAMETER (cm): 10	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 2 SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	(SV/TOV) SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
			19	77									
				76.5			RC5						TCR= 97% RQD= 87%
			19.5	76									
		END OF BOREHOLE											

TERRAPEX	LOGGED BY: AMD	DRILLING DATE: 02 March 2022
	INPUT BY: RA/EM	MONITORING DATE: 01-Jun-2022
	REVIEWED BY: VN	PAGE 3 OF 3

CLIENT: 17 Elm Limited Partnership | PROJECT NO.: CT3453.00 | **RECORD OF: MW102**

ADDRESS: 17 Elm Street

CITY/PROVINCE: Toronto, Ontario | NORTHING (m): | EASTING (m): | ELEV. (m) 95.56

CONTRACTOR: Pontil Drilling | METHOD: CME 55, Hollow Stem

BOREHOLE DIAMETER (cm): 10 | WELL DIAMETER (cm): 5 | SCREEN SLOT #: 10 | SAND TYPE: 2 | SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● / N-VALUE (Blows/300mm) ▲	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		Concrete (150mm)	0	95.5									Bentonite
		very loose, wet, borwn silty sand trace gravel (FILL)	0.5	95	2	24	1		37	<5p/0p			50mm monitoring well was insalled. water level measured on June 1, 2022: 14.93mbgs
			1	94.5	3	22	2		75	<5p/0p			
			1.5	94	12	24	3A		62				
						11	3B			<5/0p			
		moist SILTY CLAY trace gravel, trace sand (TILL) stiff brown	2	93.5									
			2.5	93	25	12	4		66	<5p/0p			
		grey	3	92.5									
		very stiff	3.5	92	19	15	5		75	<5p/0p			
			4	91.5	-	176 14	6		75	<5p/0p			
			4.5	91									
			5	90.5	10	16	7		79	<5p/0p			
			5.5	90	- 82	18	8		50	<5p/0p			
		stiff	6	89.5									
			6.5	89	7	21	9		58	<5p/0p			
			7	88.5	-	176 16	10		100	<5p/0p			
			7.5	88									
		very stiff	8	87.5	24	21	11		91	5p/0p			
		compact, moist, grey SANDY SILT trace gravel, trace to some clay (TILL)	8.5	87	23	15	12		95	<5p/0p			
			9	86.5									

TERRAPEX

LOGGED BY: AMD | DRILLING DATE: 15 March 2022

INPUT BY: RA/EM | MONITORING DATE: 01-Jun-2022

REVIEWED BY: VN |

CLIENT: 17 Elm Limited Partnership | PROJECT NO.: CT3453.00 | **RECORD OF: MW102**

ADDRESS: 17 Elm Street

CITY/PROVINCE: Toronto, Ontario | NORTHING (m): | EASTING (m): | ELEV. (m) 95.56

CONTRACTOR: Pontil Drilling | METHOD: CME 55, Hollow Stem

BOREHOLE DIAMETER (cm): 10 | WELL DIAMETER (cm): 5 | SCREEN SLOT #: 10 | SAND TYPE: 2 | SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (SV/TOV)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		compact, moist, grey SANDY SILT trace gravel, trace to some clay (TILL)	9.5	86	▲14	■22	13		100	<5p/0p			
			10	85.5	▲14	■25	14		91	15p/0p			
			10.5	85									
			11	84.5	▲15	■22	15		-	<5p/0p			
		very stiff, moist, grey SILTY CLAY trace gravel, trace sand (TILL)	11.5	84		■19							
			12	83.5	▲29		16		-	<5p/0p			Sand
			12.5	83									Screen + Sand
			13	82.5									
			13.5	82									
			14	81.5	▲27	■24	17		100	<5p/0p			
			14.5	81									
			15	80.5									
		Georgian Bay Formation Grey Weak to Medium Strong SHALE Intense to Moderately fractured With limestone/siltstone beddings Hard Layers (%): RC1: 19% RC2: 36% RC3: 13% RC4: 15%	15.5	80			RC1						TCR= 95% RQD= 52%
			16	79.5									
			16.5	79			RC2						TCR= 100% RQD= 21%
			17	78.5									
			17.5	78									
			18	77.5			RC3						TCR= 100% RQD= 55%
			18.5										

TERRAPEX

LOGGED BY: AMD | DRILLING DATE: 15 March 2022

INPUT BY: RA/EM | MONITORING DATE: 01-Jun-2022

REVIEWED BY: VN

CLIENT: 17 Elm Limited Partnership		PROJECT NO.: CT3453.00	**RECORD OF: MW102**
ADDRESS: 17 Elm Street			
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m):	ELEV. (m) 95.56
CONTRACTOR: Pontil Drilling	METHOD: CME 55, Hollow Stem		
BOREHOLE DIAMETER (cm): 10	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10	SAND TYPE: 2	SEALANT TYPE: Holeplug 3/8

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (SV/TOV)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
			19	77									
			19.5	76.5			RC4						TCR=100% RQD=72%
			20	76									
		END OF BOREHOLE		75.5									

TERRAPEX	LOGGED BY: AMD	DRILLING DATE: 15 March 2022
	INPUT BY: RA/EM	MONITORING DATE: 01-Jun-2022
	REVIEWED BY: VN	PAGE 3 OF 3

CLIENT: 17 Elm Limited Partnership	PROJECT NO.: CT3453.00	**RECORD OF: MW103**
ADDRESS: 17 Elm Street		
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m): ELEV. (m) 95.60
CONTRACTOR: PONTIL DRILLING	METHOD: MUD ROTARY	
BOREHOLE DIAMETER (cm): 20	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: #2 SEALANT TYPE: BENTONITE

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (SV/TOV)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		CONCRETE Topsoil	0	95.5			1		95	<5/0			50mm monitoring well was insalled. water level measured on June 1, 2022: 9.66mbgs
			0.5	95									
			1	94.5			2		75	<5/0			
		brown to black, moist SILTY SAND (FILL) trace oxidation, gravel, debris	1.5	94									
			2	93.5			3		80	<5/0			
			2.5	93			4A		92	25/0			
							4B			25/0			
		light brown to grey, moist SILTY CLAY trace gravel, oxidation, sand (TILL)	3	92.5			5		90	25/0			
		grey	3.5	92									
			4	91.5			6		100	35/0			
		moist to wet	4.5	91			7		100	25/0			
			5	90.5									
			5.5	90			8		98	25/0			
			6	89.5			9		100	<5/0			
			6.5	89									
			7	88.5			10		100	5/0			
			7.5	88									
			8	87.5			11		100	35/0			
			8.5	87			12						
			9	86.5									

TERRAPEX

LOGGED BY: AMD | DRILLING DATE: 9,10 MAY 2022

INPUT BY: JS | MONITORING DATE: 01-Jun-2022

REVIEWED BY: CB |

CLIENT: 17 Elm Limited Partnership | PROJECT NO.: CT3453.00 | **RECORD OF: MW103**

ADDRESS: 17 Elm Street

CITY/PROVINCE: Toronto, Ontario | NORTHING (m): | EASTING (m): | ELEV. (m) 95.60

CONTRACTOR: PONTIL DRILLING | METHOD: MUD ROTARY

BOREHOLE DIAMETER (cm): 20 | WELL DIAMETER (cm): 5 | SCREEN SLOT #: 10 | SAND TYPE: #2 | SEALANT TYPE: BENTONITE

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	(SV/TOV) SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		brown, moist FINE SAND trace oxidation	9.5	86			13A			30/0			
							13B		100	30/0			
		grey, moist to wet SANDY SILT sand seams, trace clay trace shale fragments (TILL)	10	85.5			14		100	45/0			
			10.5	85									
			11	84.5			15			30/0			
			11.5										
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: AMD | DRILLING DATE: 9,10 MAY 2022

INPUT BY: JS | MONITORING DATE: 01-Jun-2022

REVIEWED BY: CB |

CLIENT: 17 Elm Limited Partnership	PROJECT NO.: CT3453.00	**RECORD OF: MW104**
ADDRESS: 17 Elm Street		
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m): ELEV. (m) 95.44
CONTRACTOR: PONTIL DRILLING	METHOD: MUD ROTARY	
BOREHOLE DIAMETER (cm): 20	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: #2 SEALANT TYPE: BENTONITE

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		CONCRETE Topsoil	0										
		brown to black, moist SILTY SAND to CLAYEY SILT (FILL) trace oxidation, gravel, debris	0.5	95			1		98	15/0			50mm monitoring well was insalled. water level measured on June 1, 2022: 9.66mbgs
		trace brick, wood asphalt fragments	1	94.5			2		88	35/0			
		trace clay	1.5	94									
			2	93.5			3		98	5/0			
		brown to grey, moist SILTY CLAY trace gravel, sand, oxidation (TILL)	2.5	93			4		100	<5/0			
			3	92.5			5		100	<5/0			
		moist to wet	3.5	92									
			4	91.5			6		100	25/0			
			4.5	91									
			5	90.5			7		98	20/0			
			5.5	90			8		100	15/0			
			6	89.5									
			6.5	89			9		25	<5/0			
		moist	7	88.5			10		88	15/0			
			7.5	88									
			8	87.5			11		100	15/0			
		sand seams(0.5-3")	8.5	87			12		100	35/0			
			9	86.5									

TERRAPEX

LOGGED BY: AMD	DRILLING DATE: 10 MAY 2022
INPUT BY: JS	MONITORING DATE: 01-Jun-2022
REVIEWED BY: CB	PAGE 1 OF 2

CLIENT: 17 Elm Limited Partnership	PROJECT NO.: CT3453.00	**RECORD OF:**	
ADDRESS: 17 Elm Street		**MW104**	
CITY/PROVINCE: Toronto, Ontario	NORTHING (m):	EASTING (m):	ELEV. (m) 95.44
CONTRACTOR: PONTIL DRILLING	METHOD: MUD ROTARY		
BOREHOLE DIAMETER (cm): 20	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10	SAND TYPE: #2	SEALANT TYPE: BENTONITE

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

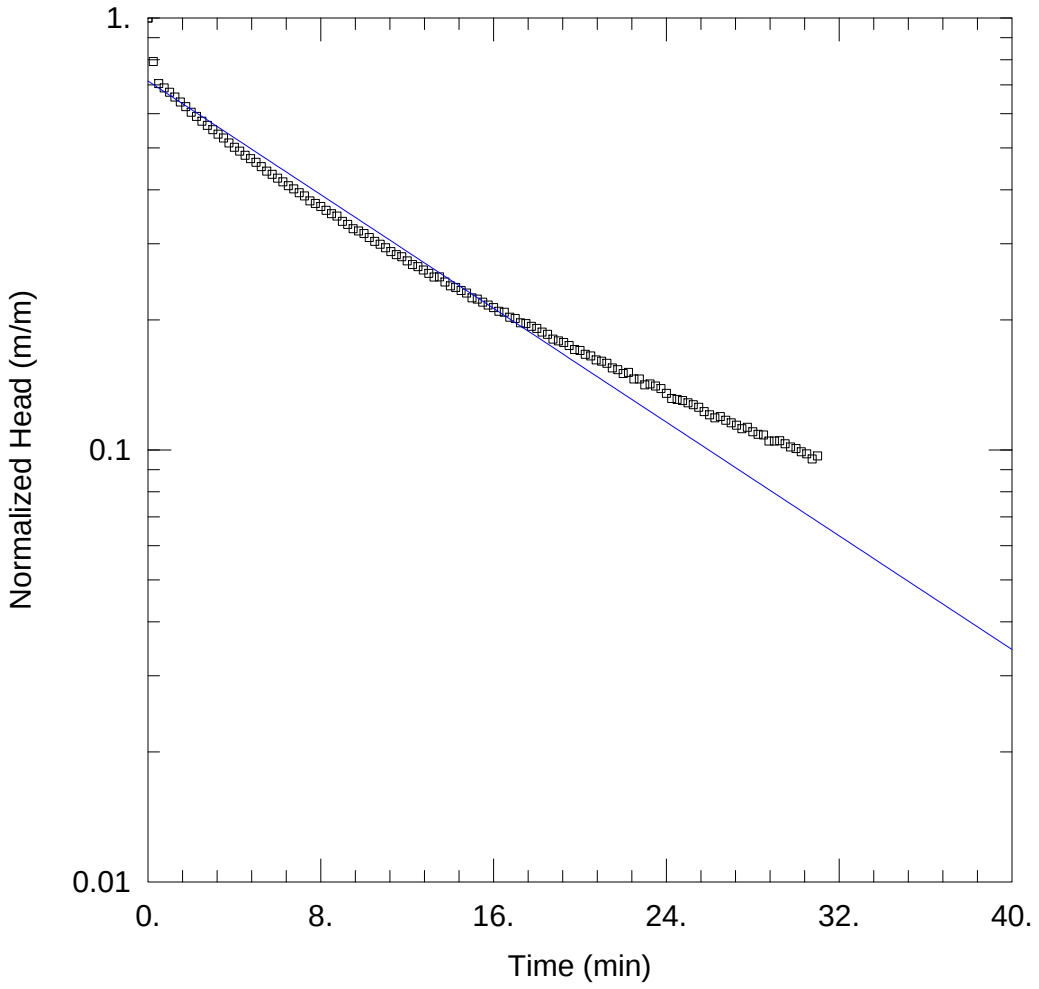
GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (SV/TOV)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		grey, moist to wet SANDY SILT trace clay sand seams (0.1-3 cm) present (TILL)	9.5 10 10.5	86 85.5 85			13 14		98 100	30/0 30/0			
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: AMD	DRILLING DATE: 10 MAY 2022
INPUT BY: JS	MONITORING DATE: 01-Jun-2022
REVIEWED BY: CB	PAGE 2 OF 2

Appendix C

Hydraulic Conductivity



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW101 Test 1.aqt
Date: 07/15/22 Time: 13:41:14

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-101
Test Date: 22/07/06

AQUIFER DATA

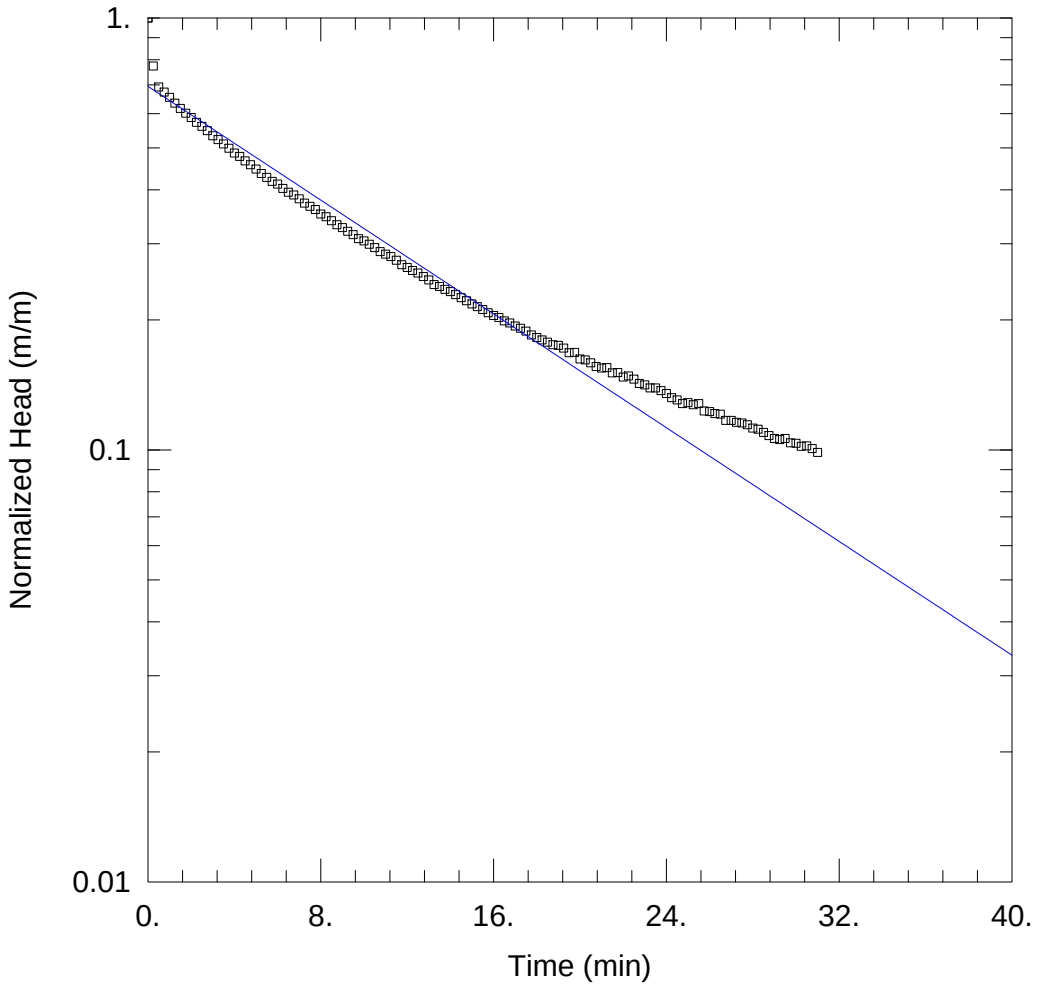
Saturated Thickness: 5.864 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW101)

Initial Displacement: 0.4637 m Static Water Column Height: 1.964 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 6.787E-7 m/sec y0 = 0.3313 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW101 Test 2.aqt
Date: 07/15/22 Time: 13:40:52

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-101
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.864 m Anisotropy Ratio (Kz/Kr): 1.

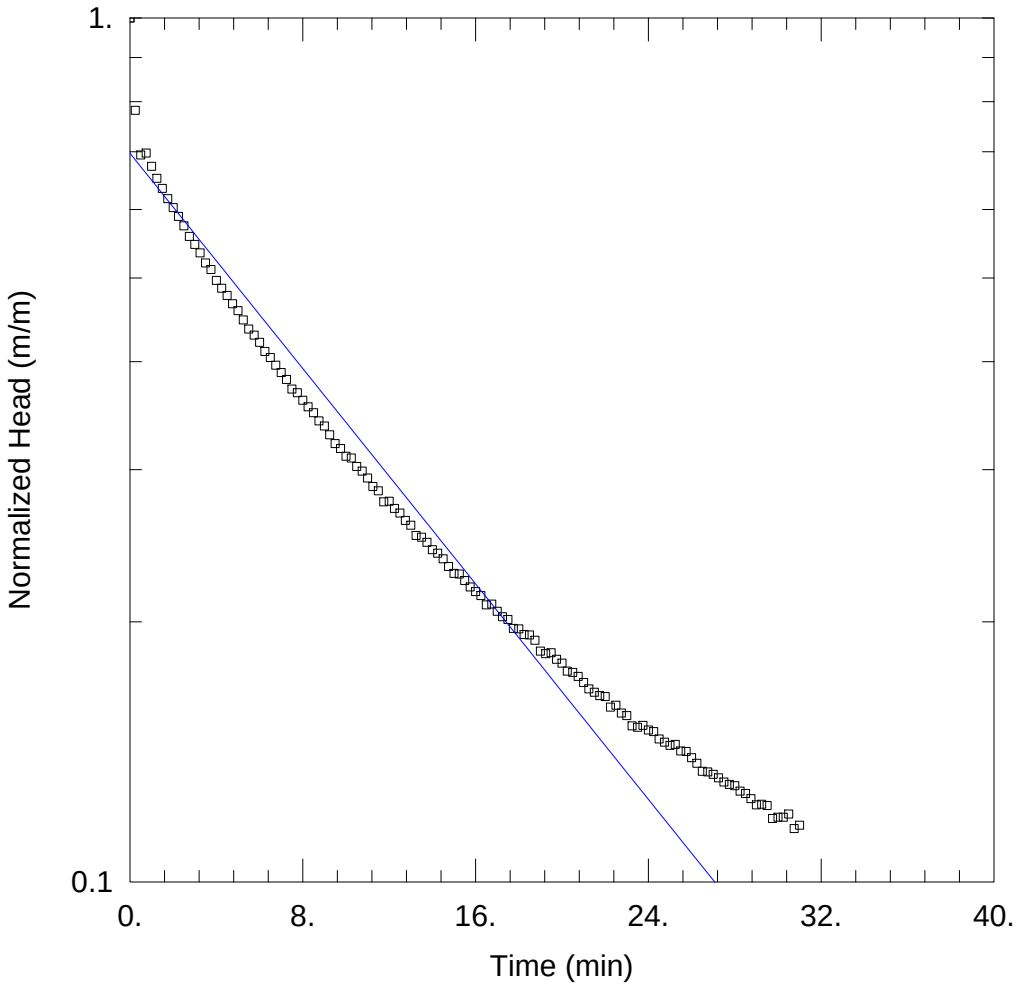
WELL DATA (MW101)

Initial Displacement: 0.4835 m Static Water Column Height: 1.964 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 6.791E-7 m/sec y0 = 0.3357 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW101 Test 3.aqt
Date: 07/15/22 Time: 13:42:27

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-101
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.864 m Anisotropy Ratio (Kz/Kr): 1.

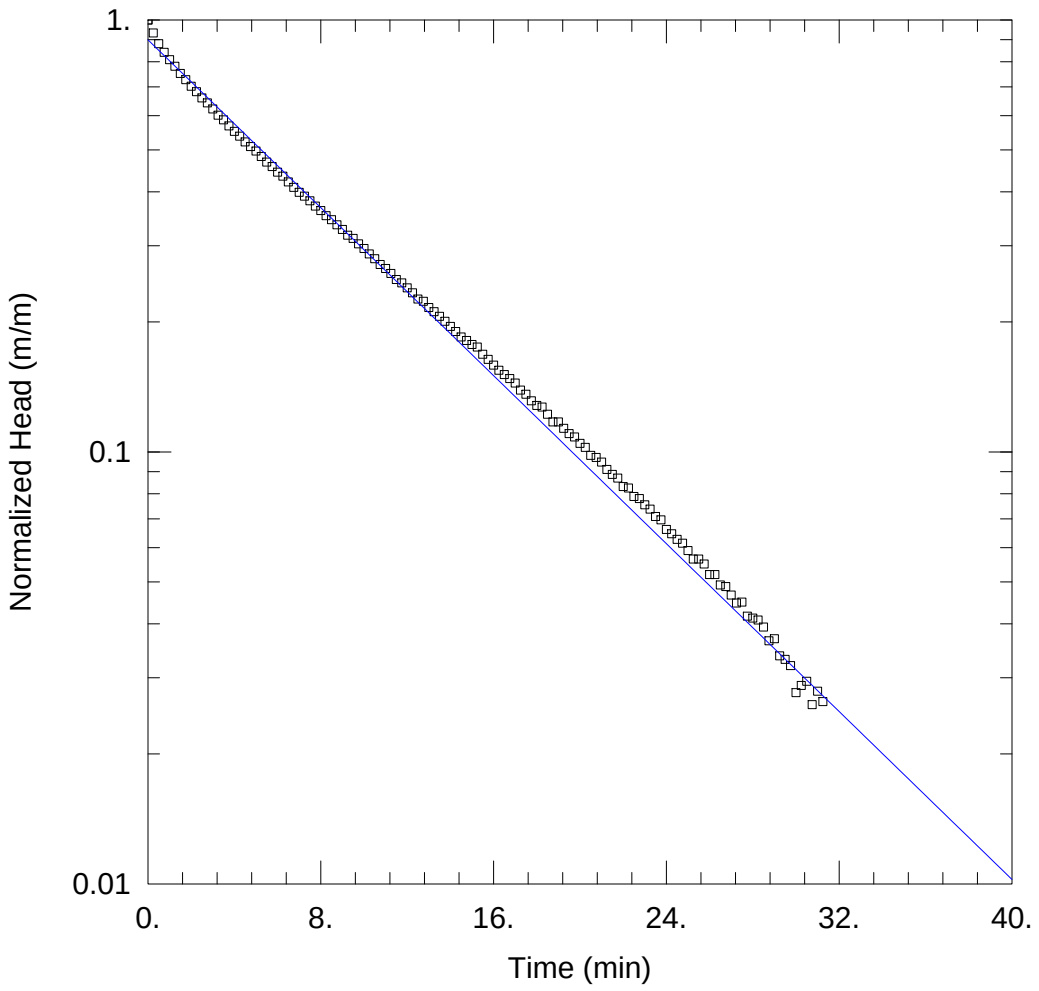
WELL DATA (MW101)

Initial Displacement: 0.4789 m Static Water Column Height: 1.964 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 6.427E-7 m/sec y0 = 0.3339 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW103 Test 1.aqt
Date: 07/15/22 Time: 14:05:45

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-103
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.705 m Anisotropy Ratio (Kz/Kr): 1.

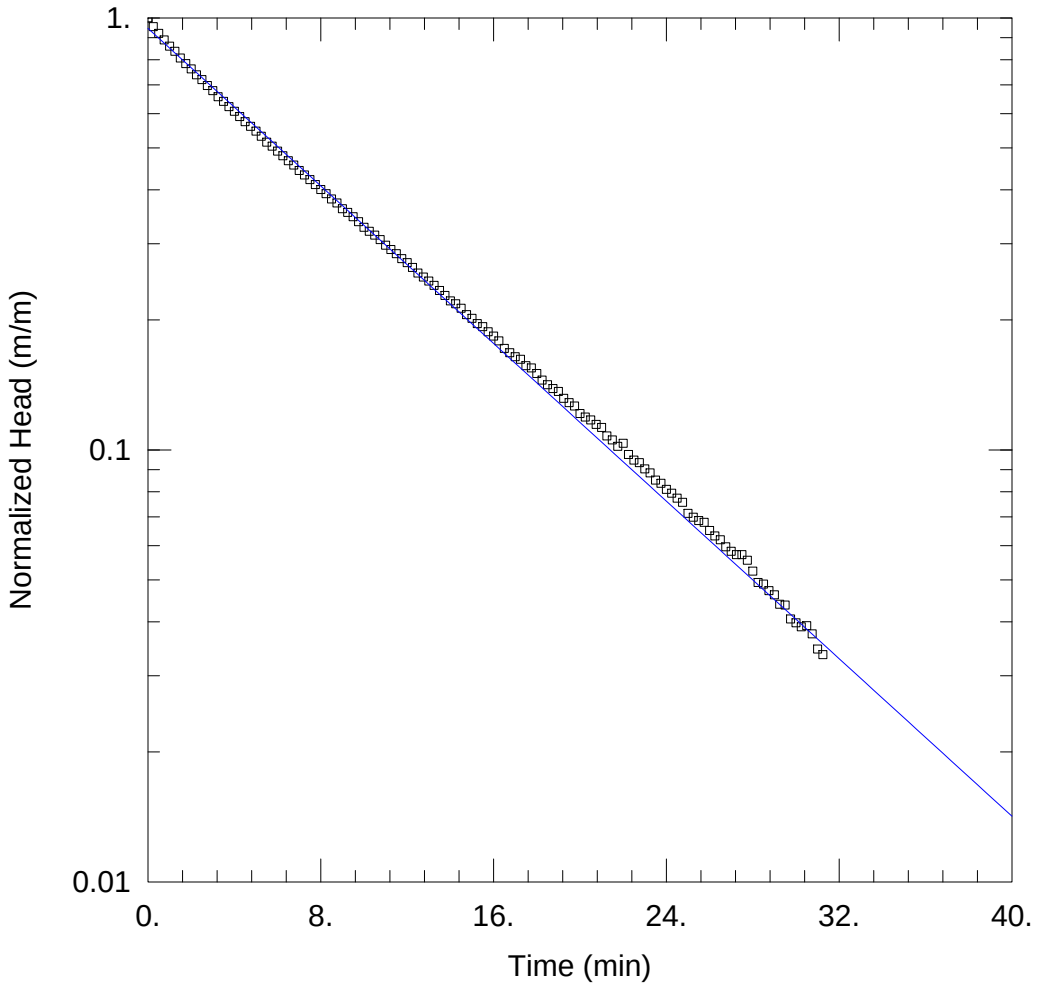
WELL DATA (MW103)

Initial Displacement: 0.4654 m Static Water Column Height: 1.805 m
Total Well Penetration Depth: 1.805 m Screen Length: 1.5 m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.713E-6 m/sec y0 = 0.4185 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW103 Test 2.aqt
Date: 07/15/22 Time: 14:12:16

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-103
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.705 m Anisotropy Ratio (Kz/Kr): 1.

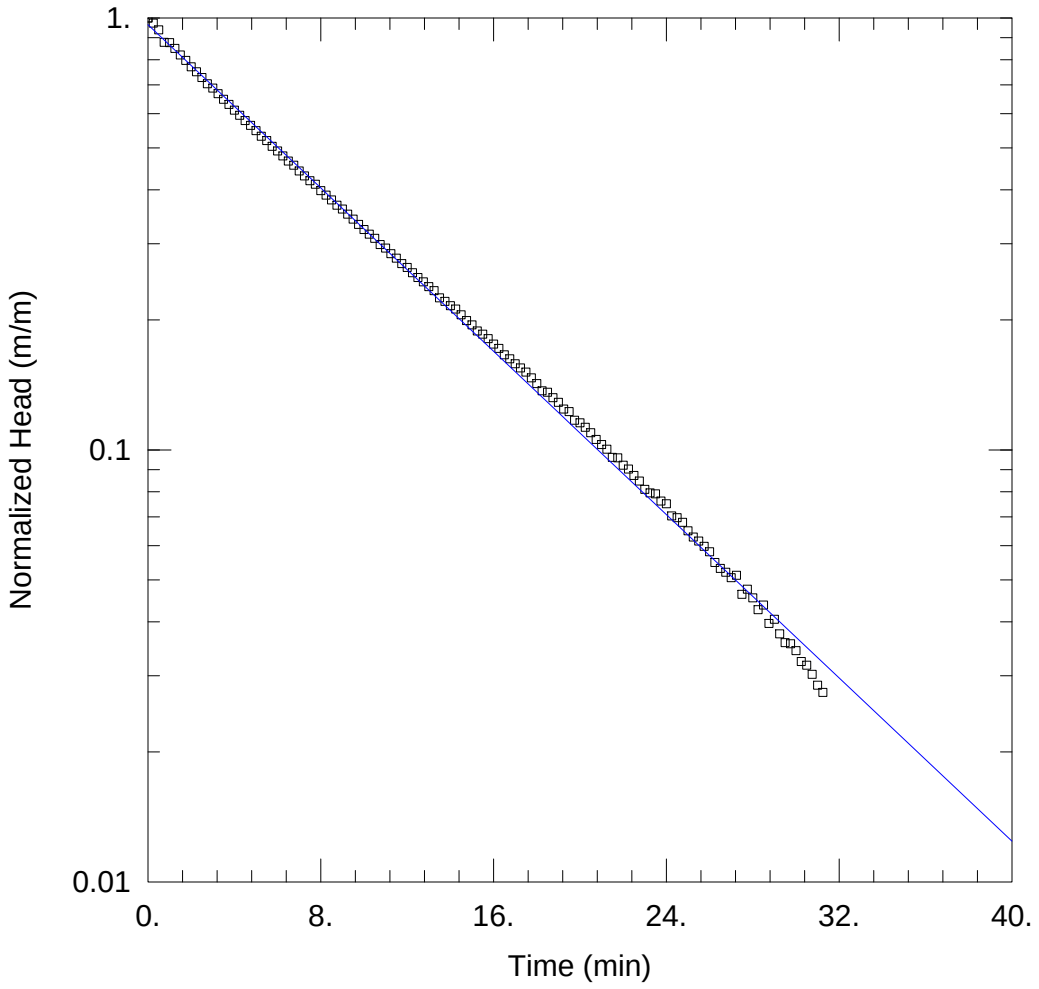
WELL DATA (MW103)

Initial Displacement: 0.4825 m Static Water Column Height: 1.805 m
Total Well Penetration Depth: 1.805 m Screen Length: 1.5 m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.608E-6 m/sec y0 = 0.4563 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW103 Test 3.aqt
Date: 07/15/22 Time: 14:14:49

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-103
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.705 m Anisotropy Ratio (Kz/Kr): 1.

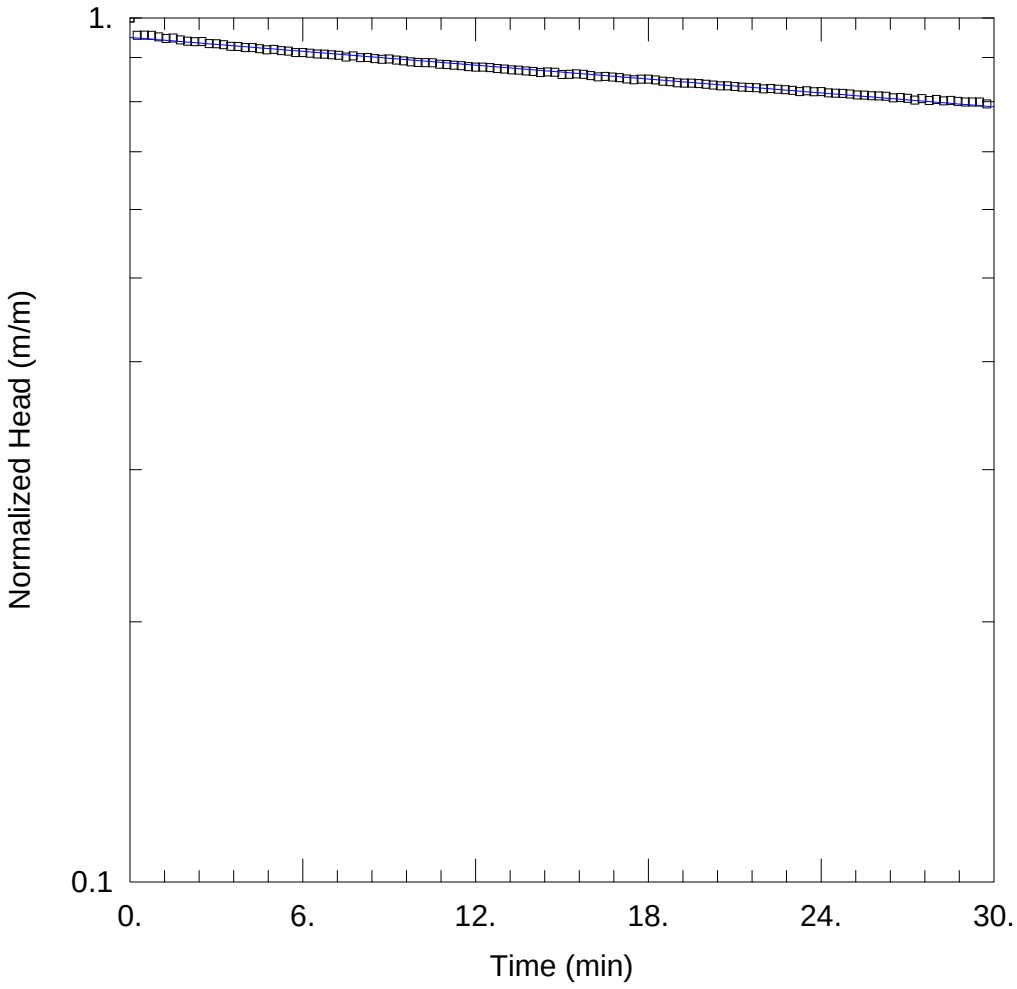
WELL DATA (MW103)

Initial Displacement: 0.4663 m Static Water Column Height: 1.805 m
Total Well Penetration Depth: 1.805 m Screen Length: 1.5 m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.666E-6 m/sec y0 = 0.4497 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW104 Test 1.aqt
Date: 07/15/22 Time: 14:48:42

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-104
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.845 m Anisotropy Ratio (Kz/Kr): 1.

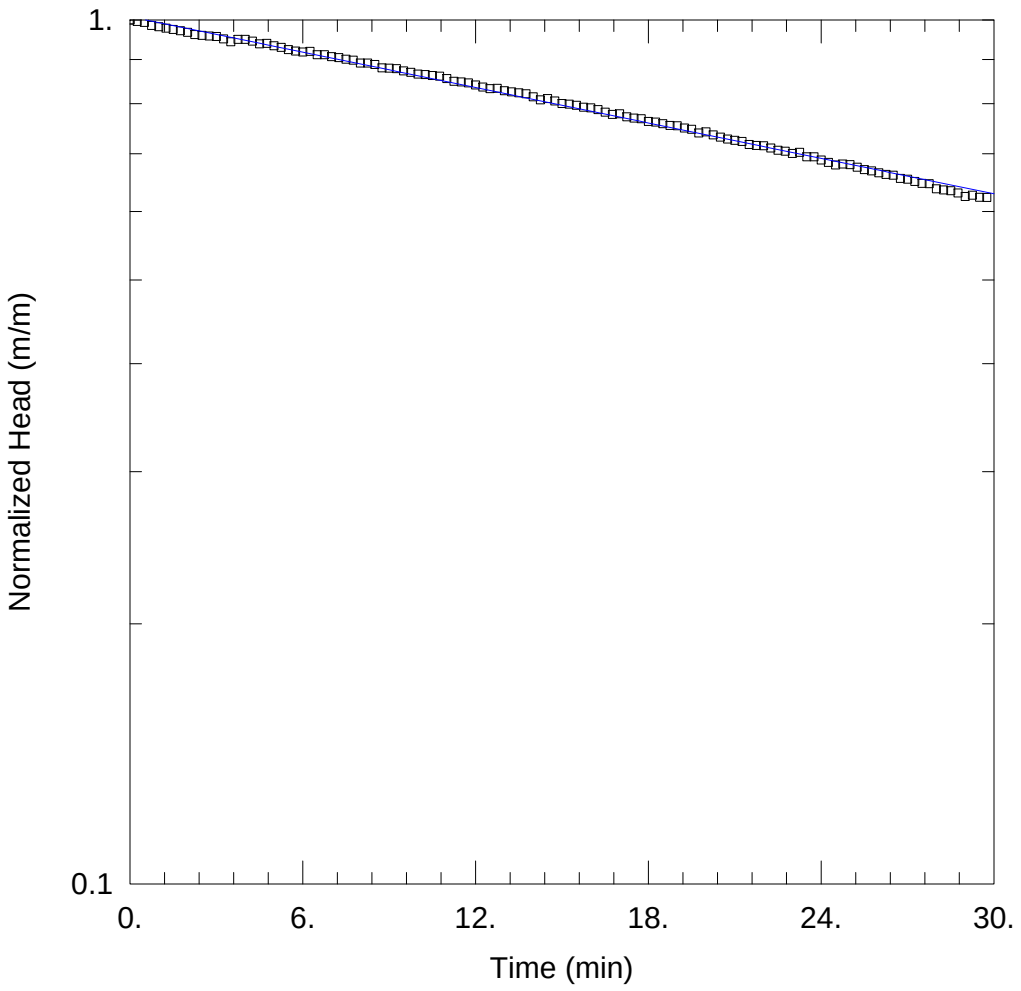
WELL DATA (MW104)

Initial Displacement: 0.5272 m Static Water Column Height: 0.945 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 5.519E-8 m/sec y0 = 0.5005 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW104 Test 2.aqt
Date: 07/15/22 Time: 14:50:47

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-104
Test Date: 22/07/06

AQUIFER DATA

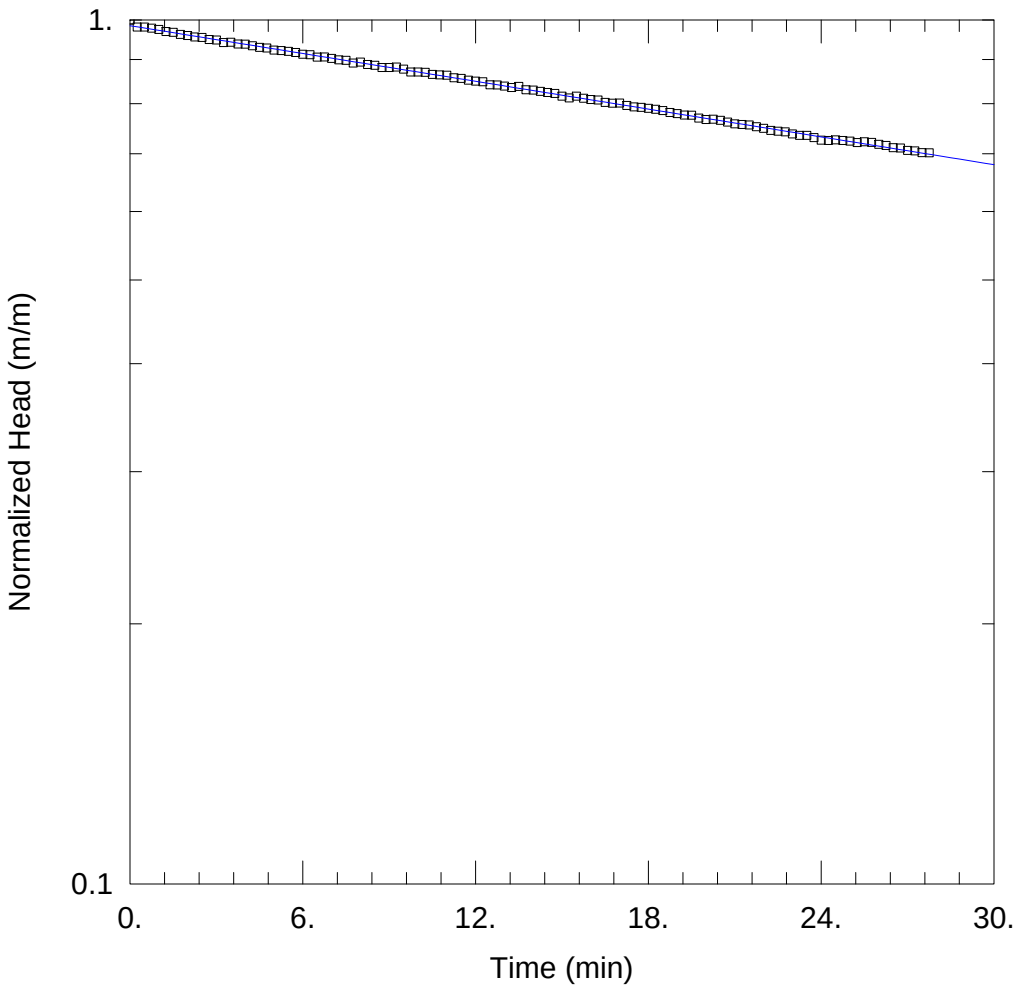
Saturated Thickness: 5.845 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW104)

Initial Displacement: 0.3266 m Static Water Column Height: 0.945 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 1.41E-7 m/sec y0 = 0.3294 m



WELL TEST ANALYSIS

Data Set: C:\Users\KenleyBairos\Desktop\17 Elm\Slug Processing\MW104 Test 3.aqt
Date: 07/15/22 Time: 14:52:02

PROJECT INFORMATION

Company: GEMS
Project: 22-1422
Location: 17 Elm
Test Well: MW-104
Test Date: 22/07/06

AQUIFER DATA

Saturated Thickness: 5.845 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW104)

Initial Displacement: 0.4024 m Static Water Column Height: 0.931 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.026 m Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 1.106E-7 m/sec y0 = 0.3962 m

Appendix D

Water Quality Analysis

Your Project #: 22-1422
Site Location: 17 ELM ST
Your C.O.C. #: 884848-01-01

Attention: Laura Maharaj

Groundwater Environmental Management Services Inc.
8800 Dufferin St
Suite 303
Concord, ON
CANADA L4K 0C5

Report Date: 2022/07/14
Report #: R7210113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2I7132
Received: 2022/07/06, 15:34

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sewer Use By-Law Semivolatile Organics	1	2022/07/07	2022/07/08	CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2022/07/07	2022/07/12	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2022/07/11	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2022/07/11	2022/07/11	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2022/07/08	2022/07/08	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2022/07/08	2022/07/08	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2022/07/11	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2022/07/06	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2022/07/11	2022/07/12	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2022/07/11	2022/07/12	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2022/07/14	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2022/07/13	2022/07/13	CAM SOP-00326	EPA1664B m,SM5520B m
Polychlorinated Biphenyl in Water	1	2022/07/08	2022/07/09	CAM SOP-00309	EPA 8082A m
pH	1	2022/07/08	2022/07/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2022/07/08	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2022/07/08	2022/07/11	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2022/07/11	CAM SOP - 00301	
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2022/07/13	2022/07/13	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2022/07/08	2022/07/11	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/07/12	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your Project #: 22-1422
Site Location: 17 ELM ST
Your C.O.C. #: 884848-01-01

Attention: Laura Maharaj

Groundwater Environmental Management Services Inc.
8800 Dufferin St
Suite 303
Concord, ON
CANADA L4K 0C5

Report Date: 2022/07/14
Report #: R7210113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2I7132

Received: 2022/07/06, 15:34

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Total PAHs include only those PAHs specified in the sewer use by-by-law.
(2) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Jolanta Goralczyk, Project Manager
Email: Jolanta.Goralczyk@bureauveritas.com
Phone# (905)817-5751

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C2I7132
Report Date: 2022/07/14

Groundwater Environmental Management Services Inc.
Client Project #: 22-1422
Site Location: 17 ELM ST
Sampler Initials: KB

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				TCB532			TCB532		
Sampling Date				2022/07/06 11:00			2022/07/06 11:00		
COC Number				884848-01-01			884848-01-01		
	UNITS	Criteria	Criteria-2	MW-103	RDL	QC Batch	MW-103 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	-	150	ND	0.50	8092820			
Inorganics									
Total BOD	mg/L	15	300	ND	2	8095057			
Fluoride (F-)	mg/L	-	10	0.30	0.10	8098289			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	7.2	0.20	8098179			
pH	pH	6.0:9.5	6.0:11.5	7.90		8098296			
Phenols-4AAP	mg/L	0.008	1.0	ND	0.0010	8098825			
Total Suspended Solids	mg/L	15	350	**17**	10	8098506			
Total Cyanide (CN)	mg/L	0.02	2	ND	0.0050	8101155			
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	ND	0.50	8107218			
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	ND	0.50	8107221			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	0.01	0.2	ND	0.005	8101163			
Nonylphenol (Total)	mg/L	0.001	0.02	ND	0.001	8101158			
Metals									
Chromium (VI)	ug/L	40	2000	ND	0.50	8101112			
Mercury (Hg)	mg/L	0.0004	0.01	ND	0.00010	8098012			
Total Aluminum (Al)	ug/L	-	50000	220	4.9	8101173	230	4.9	8101173
Total Antimony (Sb)	ug/L	-	5000	ND	0.50	8101173	ND	0.50	8101173
Total Arsenic (As)	ug/L	20	1000	7.0	1.0	8101173	6.7	1.0	8101173
Total Cadmium (Cd)	ug/L	8	700	ND	0.090	8101173	ND	0.090	8101173
Total Chromium (Cr)	ug/L	80	4000	ND	5.0	8101173	ND	5.0	8101173
Total Cobalt (Co)	ug/L	-	5000	ND	0.50	8101173	ND	0.50	8101173
Total Copper (Cu)	ug/L	40	2000	1.0	0.90	8101173	0.92	0.90	8101173
Total Lead (Pb)	ug/L	120	1000	ND	0.50	8101173	ND	0.50	8101173
Total Manganese (Mn)	ug/L	50	5000	**290**	2.0	8101173	**300**	2.0	8101173

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C2I7132
Report Date: 2022/07/14

Groundwater Environmental Management Services Inc.
Client Project #: 22-1422
Site Location: 17 ELM ST
Sampler Initials: KB

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				TCB532			TCB532		
Sampling Date				2022/07/06 11:00			2022/07/06 11:00		
COC Number				884848-01-01			884848-01-01		
	UNITS	Criteria	Criteria-2	MW-103	RDL	QC Batch	MW-103 Lab-Dup	RDL	QC Batch
Total Molybdenum (Mo)	ug/L	-	5000	3.1	0.50	8101173	3.1	0.50	8101173
Total Nickel (Ni)	ug/L	80	2000	1.6	1.0	8101173	1.5	1.0	8101173
Total Phosphorus (P)	ug/L	400	10000	**820**	100	8101173	**800**	100	8101173
Total Selenium (Se)	ug/L	20	1000	ND	2.0	8101173	ND	2.0	8101173
Total Silver (Ag)	ug/L	120	5000	ND	0.090	8101173	ND	0.090	8101173
Total Tin (Sn)	ug/L	-	5000	1.8	1.0	8101173	1.9	1.0	8101173
Total Titanium (Ti)	ug/L	-	5000	14	5.0	8101173	14	5.0	8101173
Total Zinc (Zn)	ug/L	40	2000	ND	5.0	8101173	ND	5.0	8101173
Semivolatile Organics									
Di-N-butyl phthalate	ug/L	15	80	ND	2	8096840			
Bis(2-ethylhexyl)phthalate	ug/L	8.8	12	ND	2	8096840			
3,3'-Dichlorobenzidine	ug/L	0.8	2	ND	0.8	8096840			
Pentachlorophenol	ug/L	2	5	ND	1	8096840			
Phenanthrene	ug/L	-	-	ND	0.2	8096840			
Anthracene	ug/L	-	-	ND	0.2	8096840			
Fluoranthene	ug/L	-	-	ND	0.2	8096840			
Pyrene	ug/L	-	-	ND	0.2	8096840			
Benzo(a)anthracene	ug/L	-	-	ND	0.2	8096840			
Chrysene	ug/L	-	-	ND	0.2	8096840			
Benzo(b/j)fluoranthene	ug/L	-	-	ND	0.2	8096840			
Benzo(k)fluoranthene	ug/L	-	-	ND	0.2	8096840			
Benzo(a)pyrene	ug/L	-	-	ND	0.2	8096840			
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND	0.2	8096840			
Dibenzo(a,h)anthracene	ug/L	-	-	ND	0.2	8096840			
Benzo(g,h,i)perylene	ug/L	-	-	ND	0.2	8096840			
Dibenzo(a,i)pyrene	ug/L	-	-	ND	0.2	8096840			
Benzo(e)pyrene	ug/L	-	-	ND	0.2	8096840			
Perylene	ug/L	-	-	ND	0.2	8096840			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				TCB532			TCB532		
Sampling Date				2022/07/06 11:00			2022/07/06 11:00		
COC Number				884848-01-01			884848-01-01		
	UNITS	Criteria	Criteria-2	MW-103	RDL	QC Batch	MW-103 Lab-Dup	RDL	QC Batch
Dibenzo(a,j) acridine	ug/L	-	-	ND	0.4	8096840			
7H-Dibenzo(c,g) Carbazole	ug/L	-	-	ND	0.4	8096840			
1,6-Dinitropyrene	ug/L	-	-	ND	0.4	8096840			
1,3-Dinitropyrene	ug/L	-	-	ND	0.4	8096840			
1,8-Dinitropyrene	ug/L	-	-	ND	0.4	8096840			
Calculated Parameters									
Total PAHs (18 PAHs)	ug/L	2	5	ND	1	8093326			
Volatile Organics									
Benzene	ug/L	2	10	ND	0.40	8100133			
Chloroform	ug/L	2	40	ND	0.40	8100133			
1,2-Dichlorobenzene	ug/L	5.6	50	ND	0.80	8100133			
1,4-Dichlorobenzene	ug/L	6.8	80	ND	0.80	8100133			
cis-1,2-Dichloroethylene	ug/L	5.6	4000	ND	1.0	8100133			
trans-1,3-Dichloropropene	ug/L	5.6	140	ND	0.80	8100133			
Ethylbenzene	ug/L	2	160	ND	0.40	8100133			
Methylene Chloride(Dichloromethane)	ug/L	5.2	2000	ND	4.0	8100133			
1,1,2,2-Tetrachloroethane	ug/L	17	1400	ND	0.80	8100133			
Tetrachloroethylene	ug/L	4.4	1000	ND	0.40	8100133			
Toluene	ug/L	2	16	ND	0.40	8100133			
Trichloroethylene	ug/L	7.6	400	ND	0.40	8100133			
p+m-Xylene	ug/L	-	-	ND	0.40	8100133			
o-Xylene	ug/L	-	-	ND	0.40	8100133			
Total Xylenes	ug/L	4.4	1400	ND	0.40	8100133			
PCBs									
Total PCB	ug/L	0.4	1	ND	0.05	8098001			
Microbiological									
Escherichia coli	CFU/100mL	200	-	<10	10	8094409			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C2I7132
Report Date: 2022/07/14

Groundwater Environmental Management Services Inc.
Client Project #: 22-1422
Site Location: 17 ELM ST
Sampler Initials: KB

TORONTO SANITARY&STORM SEWER (100-2016)

Bureau Veritas ID				TCB532			TCB532		
Sampling Date				2022/07/06 11:00			2022/07/06 11:00		
COC Number				884848-01-01			884848-01-01		
	UNITS	Criteria	Criteria-2	MW-103	RDL	QC Batch	MW-103 Lab-Dup	RDL	QC Batch
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	98		8096840			
2-Fluorobiphenyl	%	-	-	83		8096840			
D14-Terphenyl (FS)	%	-	-	101		8096840			
D5-Nitrobenzene	%	-	-	81		8096840			
D8-Acenaphthylene	%	-	-	91		8096840			
Decachlorobiphenyl	%	-	-	69		8098001			
4-Bromofluorobenzene	%	-	-	90		8100133			
D4-1,2-Dichloroethane	%	-	-	108		8100133			
D8-Toluene	%	-	-	96		8100133			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Storm Sewer Discharge Use By-Law
Criteria-2: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

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Bureau Veritas Job #: C2I7132
Report Date: 2022/07/14

Groundwater Environmental Management Services Inc.
Client Project #: 22-1422
Site Location: 17 ELM ST
Sampler Initials: KB

TEST SUMMARY

Bureau Veritas ID: TCB532
Sample ID: MW-103
Matrix: Water

Collected: 2022/07/06
Shipped:
Received: 2022/07/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	8096840	2022/07/07	2022/07/08	Adriana Zurita
Biochemical Oxygen Demand (BOD)	DO	8095057	2022/07/07	2022/07/12	Gurjot Kaur
Chromium (VI) in Water	IC	8101112	N/A	2022/07/11	Theodora Luck
Total Cyanide	SKAL/CN	8101155	2022/07/11	2022/07/11	Prgya Panchal
Fluoride	ISE	8098289	2022/07/08	2022/07/08	Surinder Rai
Mercury in Water by CVAA	CV/AA	8098012	2022/07/08	2022/07/08	Thuy Linh Nguyen
Total Metals Analysis by ICPMS	ICP/MS	8101173	N/A	2022/07/11	Azita Fazaeli
E.coli, (CFU/100mL)	PL	8094409	N/A	2022/07/06	Sonja Elavinamannil
Total Nonylphenol in Liquids by HPLC	LC/FLU	8101158	2022/07/11	2022/07/12	Furneesh Kumar
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	8101163	2022/07/11	2022/07/12	Furneesh Kumar
Animal and Vegetable Oil and Grease	BAL	8092820	N/A	2022/07/14	Automated Statchk
Total Oil and Grease	BAL	8107218	2022/07/13	2022/07/13	Maulik Jashubhai Patel
Polychlorinated Biphenyl in Water	GC/ECD	8098001	2022/07/08	2022/07/09	Farag Mansour
pH	AT	8098296	2022/07/08	2022/07/08	Surinder Rai
Phenols (4AAP)	TECH/PHEN	8098825	N/A	2022/07/08	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	8098179	2022/07/08	2022/07/11	Massarat Jan
Total PAHs	CALC	8093326	N/A	2022/07/11	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	8107221	2022/07/13	2022/07/13	Maulik Jashubhai Patel
Total Suspended Solids	BAL	8098506	2022/07/08	2022/07/11	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	8100133	N/A	2022/07/12	Manpreet Sarao

Bureau Veritas ID: TCB532 Dup
Sample ID: MW-103
Matrix: Water

Collected: 2022/07/06
Shipped:
Received: 2022/07/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	8101173	N/A	2022/07/11	Azita Fazaeli

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	17.7°C

Sample TCB532 [MW-103] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8095057	GUJ	QC Standard	Total BOD	2022/07/12		99	%	80 - 120
8095057	GUJ	Method Blank	Total BOD	2022/07/12	ND,RDL=2		mg/L	
8095057	GUJ	RPD	Total BOD	2022/07/12	NC		%	30
8096840	AZ	Matrix Spike	2,4,6-Tribromophenol	2022/07/08		103	%	10 - 130
			2-Fluorobiphenyl	2022/07/08		96	%	30 - 130
			D14-Terphenyl (FS)	2022/07/08		95	%	30 - 130
			D5-Nitrobenzene	2022/07/08		83	%	30 - 130
			D8-Acenaphthylene	2022/07/08		97	%	30 - 130
			Di-N-butyl phthalate	2022/07/08		88	%	30 - 130
			Bis(2-ethylhexyl)phthalate	2022/07/08		85	%	30 - 130
			3,3'-Dichlorobenzidine	2022/07/08		74	%	30 - 130
			Pentachlorophenol	2022/07/08		73	%	30 - 130
			Phenanthrene	2022/07/08		93	%	30 - 130
			Anthracene	2022/07/08		93	%	30 - 130
			Fluoranthene	2022/07/08		96	%	30 - 130
			Pyrene	2022/07/08		92	%	30 - 130
			Benzo(a)anthracene	2022/07/08		87	%	30 - 130
			Chrysene	2022/07/08		94	%	30 - 130
			Benzo(b/j)fluoranthene	2022/07/08		96	%	30 - 130
			Benzo(k)fluoranthene	2022/07/08		110	%	30 - 130
			Benzo(a)pyrene	2022/07/08		104	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2022/07/08		124	%	30 - 130
			Dibenzo(a,h)anthracene	2022/07/08		115	%	30 - 130
			Benzo(g,h,i)perylene	2022/07/08		119	%	30 - 130
			Dibenzo(a,i)pyrene	2022/07/08		108	%	30 - 130
			Benzo(e)pyrene	2022/07/08		103	%	30 - 130
			Perylene	2022/07/08		87	%	30 - 130
			Dibenzo(a,j) acridine	2022/07/08		124	%	30 - 130
			7H-Dibenzo(c,g) Carbazole	2022/07/08		117	%	30 - 130
			1,6-Dinitropyrene	2022/07/08		36	%	30 - 130
			1,3-Dinitropyrene	2022/07/08		21 (1)	%	30 - 130
			1,8-Dinitropyrene	2022/07/08		30	%	30 - 130
8096840	AZ	Spiked Blank	2,4,6-Tribromophenol	2022/07/08		86	%	10 - 130
			2-Fluorobiphenyl	2022/07/08		80	%	30 - 130
			D14-Terphenyl (FS)	2022/07/08		96	%	30 - 130
			D5-Nitrobenzene	2022/07/08		75	%	30 - 130
			D8-Acenaphthylene	2022/07/08		80	%	30 - 130
			Di-N-butyl phthalate	2022/07/08		88	%	30 - 130
			Bis(2-ethylhexyl)phthalate	2022/07/08		97	%	30 - 130
			3,3'-Dichlorobenzidine	2022/07/08		103	%	30 - 130
			Pentachlorophenol	2022/07/08		45	%	30 - 130
			Phenanthrene	2022/07/08		87	%	30 - 130
			Anthracene	2022/07/08		86	%	30 - 130
			Fluoranthene	2022/07/08		95	%	30 - 130
			Pyrene	2022/07/08		94	%	30 - 130
			Benzo(a)anthracene	2022/07/08		100	%	30 - 130
			Chrysene	2022/07/08		93	%	30 - 130
			Benzo(b/j)fluoranthene	2022/07/08		94	%	30 - 130
			Benzo(k)fluoranthene	2022/07/08		88	%	30 - 130
			Benzo(a)pyrene	2022/07/08		95	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2022/07/08		110	%	30 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dibenzo(a,h)anthracene	2022/07/08		101	%	30 - 130
			Benzo(g,h,i)perylene	2022/07/08		105	%	30 - 130
			Dibenzo(a,i)pyrene	2022/07/08		91	%	30 - 130
			Benzo(e)pyrene	2022/07/08		98	%	30 - 130
			Perylene	2022/07/08		83	%	30 - 130
			Dibenzo(a,j) acridine	2022/07/08		113	%	30 - 130
			7H-Dibenzo(c,g) Carbazole	2022/07/08		96	%	30 - 130
			1,6-Dinitropyrene	2022/07/08		118	%	30 - 130
			1,3-Dinitropyrene	2022/07/08		127	%	30 - 130
			1,8-Dinitropyrene	2022/07/08		110	%	30 - 130
8096840	AZ	Method Blank	2,4,6-Tribromophenol	2022/07/08		84	%	10 - 130
			2-Fluorobiphenyl	2022/07/08		80	%	30 - 130
			D14-Terphenyl (FS)	2022/07/08		103	%	30 - 130
			D5-Nitrobenzene	2022/07/08		80	%	30 - 130
			D8-Acenaphthylene	2022/07/08		85	%	30 - 130
			Di-N-butyl phthalate	2022/07/08	ND,RDL=2		ug/L	
			Bis(2-ethylhexyl)phthalate	2022/07/08	ND,RDL=2		ug/L	
			3,3'-Dichlorobenzidine	2022/07/08	ND, RDL=0.8		ug/L	
			Pentachlorophenol	2022/07/08	ND,RDL=1		ug/L	
			Phenanthrene	2022/07/08	ND, RDL=0.2		ug/L	
			Anthracene	2022/07/08	ND, RDL=0.2		ug/L	
			Fluoranthene	2022/07/08	ND, RDL=0.2		ug/L	
			Pyrene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(a)anthracene	2022/07/08	ND, RDL=0.2		ug/L	
			Chrysene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(b/j)fluoranthene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(k)fluoranthene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(a)pyrene	2022/07/08	ND, RDL=0.2		ug/L	
			Indeno(1,2,3-cd)pyrene	2022/07/08	ND, RDL=0.2		ug/L	
			Dibenzo(a,h)anthracene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(g,h,i)perylene	2022/07/08	ND, RDL=0.2		ug/L	
			Dibenzo(a,i)pyrene	2022/07/08	ND, RDL=0.2		ug/L	
			Benzo(e)pyrene	2022/07/08	ND, RDL=0.2		ug/L	
			Perylene	2022/07/08	ND, RDL=0.2		ug/L	
			Dibenzo(a,j) acridine	2022/07/08	ND, RDL=0.4		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			7H-Dibenzo(c,g) Carbazole	2022/07/08	ND, RDL=0.4		ug/L	
			1,6-Dinitropyrene	2022/07/08	ND, RDL=0.4		ug/L	
			1,3-Dinitropyrene	2022/07/08	ND, RDL=0.4		ug/L	
			1,8-Dinitropyrene	2022/07/08	ND, RDL=0.4		ug/L	
8096840	AZ	RPD	Di-N-butyl phthalate	2022/07/08	NC		%	40
			Bis(2-ethylhexyl)phthalate	2022/07/08	NC		%	40
			3,3'-Dichlorobenzidine	2022/07/08	NC		%	40
			Pentachlorophenol	2022/07/08	NC		%	40
			Phenanthrene	2022/07/08	NC		%	40
			Anthracene	2022/07/08	NC		%	40
			Fluoranthene	2022/07/08	NC		%	40
			Pyrene	2022/07/08	NC		%	40
			Benzo(a)anthracene	2022/07/08	NC		%	40
			Chrysene	2022/07/08	NC		%	40
			Benzo(b/j)fluoranthene	2022/07/08	NC		%	40
			Benzo(k)fluoranthene	2022/07/08	NC		%	40
			Benzo(a)pyrene	2022/07/08	NC		%	40
			Indeno(1,2,3-cd)pyrene	2022/07/08	NC		%	40
			Dibenzo(a,h)anthracene	2022/07/08	NC		%	40
			Benzo(g,h,i)perylene	2022/07/08	NC		%	40
			Dibenzo(a,i)pyrene	2022/07/08	NC		%	40
			Benzo(e)pyrene	2022/07/08	NC		%	40
			Perylene	2022/07/08	NC		%	40
			Dibenzo(a,j) acridine	2022/07/08	NC		%	40
			7H-Dibenzo(c,g) Carbazole	2022/07/08	NC		%	40
			1,6-Dinitropyrene	2022/07/08	NC		%	40
			1,3-Dinitropyrene	2022/07/08	NC		%	40
			1,8-Dinitropyrene	2022/07/08	NC		%	40
8098001	FMA	Matrix Spike [TCB532-04]	Decachlorobiphenyl	2022/07/09		68	%	60 - 130
			Total PCB	2022/07/09		71	%	60 - 130
8098001	FMA	Spiked Blank	Decachlorobiphenyl	2022/07/08		69	%	60 - 130
			Total PCB	2022/07/08		72	%	60 - 130
8098001	FMA	Method Blank	Decachlorobiphenyl	2022/07/08		67	%	60 - 130
			Total PCB	2022/07/08	ND, RDL=0.05		ug/L	
8098001	FMA	RPD	Total PCB	2022/07/09	NC		%	40
8098012	TLG	Matrix Spike	Mercury (Hg)	2022/07/08		87	%	75 - 125
8098012	TLG	Spiked Blank	Mercury (Hg)	2022/07/08		93	%	80 - 120
8098012	TLG	Method Blank	Mercury (Hg)	2022/07/08	ND, RDL=0.00010		mg/L	
8098012	TLG	RPD	Mercury (Hg)	2022/07/08	NC		%	20
			Mercury (Hg)	2022/07/08	NC		%	20
			Mercury (Hg)	2022/07/08	20		%	20
			Mercury (Hg)	2022/07/08	12		%	20
			Mercury (Hg)	2022/07/08	NC		%	20
			Mercury (Hg)	2022/07/08	NC		%	20
			Mercury (Hg)	2022/07/08	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8098179	MJ1	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2022/07/11		NC	%	80 - 120
8098179	MJ1	QC Standard	Total Kjeldahl Nitrogen (TKN)	2022/07/08		102	%	80 - 120
8098179	MJ1	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2022/07/08		103	%	80 - 120
8098179	MJ1	Method Blank	Total Kjeldahl Nitrogen (TKN)	2022/07/08	ND, RDL=0.10		mg/L	
8098179	MJ1	RPD	Total Kjeldahl Nitrogen (TKN)	2022/07/11	NC		%	20
8098289	SAU	Matrix Spike	Fluoride (F-)	2022/07/08		73 (1)	%	80 - 120
8098289	SAU	Spiked Blank	Fluoride (F-)	2022/07/08		96	%	80 - 120
8098289	SAU	Method Blank	Fluoride (F-)	2022/07/08	ND, RDL=0.10		mg/L	
8098289	SAU	RPD	Fluoride (F-)	2022/07/08	NC		%	20
8098296	SAU	Spiked Blank	pH	2022/07/08		102	%	98 - 103
8098296	SAU	RPD	pH	2022/07/08	1.3		%	N/A
8098506	SHD	QC Standard	Total Suspended Solids	2022/07/11		102	%	85 - 115
8098506	SHD	Method Blank	Total Suspended Solids	2022/07/11	ND, RDL=10		mg/L	
8098506	SHD	RPD	Total Suspended Solids	2022/07/11	NC		%	25
8098825	MKX	Matrix Spike	Phenols-4AAP	2022/07/08		106	%	80 - 120
8098825	MKX	Spiked Blank	Phenols-4AAP	2022/07/08		107	%	80 - 120
8098825	MKX	Method Blank	Phenols-4AAP	2022/07/08	ND, RDL=0.0010		mg/L	
8098825	MKX	RPD	Phenols-4AAP	2022/07/08	0		%	20
8100133	MS4	Matrix Spike	4-Bromofluorobenzene	2022/07/11		100	%	70 - 130
			D4-1,2-Dichloroethane	2022/07/11		107	%	70 - 130
			D8-Toluene	2022/07/11		101	%	70 - 130
			Benzene	2022/07/11		93	%	70 - 130
			Chloroform	2022/07/11		102	%	70 - 130
			1,2-Dichlorobenzene	2022/07/11		93	%	70 - 130
			1,4-Dichlorobenzene	2022/07/11		104	%	70 - 130
			cis-1,2-Dichloroethylene	2022/07/11		99	%	70 - 130
			trans-1,3-Dichloropropene	2022/07/11		98	%	70 - 130
			Ethylbenzene	2022/07/11		82	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/07/11		106	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/07/11		98	%	70 - 130
			Tetrachloroethylene	2022/07/11		92	%	70 - 130
			Toluene	2022/07/11		92	%	70 - 130
			Trichloroethylene	2022/07/11		102	%	70 - 130
			p+m-Xylene	2022/07/11		87	%	70 - 130
			o-Xylene	2022/07/11		79	%	70 - 130
8100133	MS4	Spiked Blank	4-Bromofluorobenzene	2022/07/11		100	%	70 - 130
			D4-1,2-Dichloroethane	2022/07/11		105	%	70 - 130
			D8-Toluene	2022/07/11		103	%	70 - 130
			Benzene	2022/07/11		95	%	70 - 130
			Chloroform	2022/07/11		104	%	70 - 130
			1,2-Dichlorobenzene	2022/07/11		95	%	70 - 130
			1,4-Dichlorobenzene	2022/07/11		108	%	70 - 130
			cis-1,2-Dichloroethylene	2022/07/11		101	%	70 - 130
			trans-1,3-Dichloropropene	2022/07/11		91	%	70 - 130
			Ethylbenzene	2022/07/11		85	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/07/11		107	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/07/11		97	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Tetrachloroethylene	2022/07/11		97	%	70 - 130
			Toluene	2022/07/11		95	%	70 - 130
			Trichloroethylene	2022/07/11		106	%	70 - 130
			p+m-Xylene	2022/07/11		91	%	70 - 130
			o-Xylene	2022/07/11		86	%	70 - 130
8100133	MS4	Method Blank	4-Bromofluorobenzene	2022/07/11		95	%	70 - 130
			D4-1,2-Dichloroethane	2022/07/11		113	%	70 - 130
			D8-Toluene	2022/07/11		91	%	70 - 130
			Benzene	2022/07/11	ND, RDL=0.20		ug/L	
			Chloroform	2022/07/11	ND, RDL=0.20		ug/L	
			1,2-Dichlorobenzene	2022/07/11	ND, RDL=0.40		ug/L	
			1,4-Dichlorobenzene	2022/07/11	ND, RDL=0.40		ug/L	
			cis-1,2-Dichloroethylene	2022/07/11	ND, RDL=0.50		ug/L	
			trans-1,3-Dichloropropene	2022/07/11	ND, RDL=0.40		ug/L	
			Ethylbenzene	2022/07/11	ND, RDL=0.20		ug/L	
			Methylene Chloride(Dichloromethane)	2022/07/11	ND, RDL=2.0		ug/L	
			1,1,2,2-Tetrachloroethane	2022/07/11	ND, RDL=0.40		ug/L	
			Tetrachloroethylene	2022/07/11	ND, RDL=0.20		ug/L	
			Toluene	2022/07/11	ND, RDL=0.20		ug/L	
			Trichloroethylene	2022/07/11	ND, RDL=0.20		ug/L	
			p+m-Xylene	2022/07/11	ND, RDL=0.20		ug/L	
			o-Xylene	2022/07/11	ND, RDL=0.20		ug/L	
			Total Xylenes	2022/07/11	ND, RDL=0.20		ug/L	
8100133	MS4	RPD	Benzene	2022/07/11	NC		%	30
			Chloroform	2022/07/11	4.7		%	30
			1,2-Dichlorobenzene	2022/07/11	NC		%	30
			1,4-Dichlorobenzene	2022/07/11	NC		%	30
			cis-1,2-Dichloroethylene	2022/07/11	NC		%	30
			trans-1,3-Dichloropropene	2022/07/11	NC		%	30
			Ethylbenzene	2022/07/11	NC		%	30
			Methylene Chloride(Dichloromethane)	2022/07/11	NC		%	30
			1,1,2,2-Tetrachloroethane	2022/07/11	NC		%	30
			Tetrachloroethylene	2022/07/11	NC		%	30
			Toluene	2022/07/11	NC		%	30
			Trichloroethylene	2022/07/11	NC		%	30
			p+m-Xylene	2022/07/11	NC		%	30
			o-Xylene	2022/07/11	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Xylenes	2022/07/11	NC		%	30
8101112	TL2	Matrix Spike	Chromium (VI)	2022/07/11		100	%	80 - 120
8101112	TL2	Spiked Blank	Chromium (VI)	2022/07/11		101	%	80 - 120
8101112	TL2	Method Blank	Chromium (VI)	2022/07/11	ND, RDL=0.50		ug/L	
8101112	TL2	RPD	Chromium (VI)	2022/07/11	NC		%	20
8101155	GYA	Matrix Spike	Total Cyanide (CN)	2022/07/11		87	%	80 - 120
8101155	GYA	Spiked Blank	Total Cyanide (CN)	2022/07/11		93	%	80 - 120
8101155	GYA	Method Blank	Total Cyanide (CN)	2022/07/11	ND, RDL=0.0050		mg/L	
8101155	GYA	RPD	Total Cyanide (CN)	2022/07/11	NC		%	20
8101158	FKU	Matrix Spike	Nonylphenol (Total)	2022/07/12		92	%	50 - 130
8101158	FKU	Spiked Blank	Nonylphenol (Total)	2022/07/12		78	%	50 - 130
8101158	FKU	Method Blank	Nonylphenol (Total)	2022/07/12	ND, RDL=0.001		mg/L	
8101158	FKU	RPD	Nonylphenol (Total)	2022/07/12	NC		%	40
8101163	FKU	Matrix Spike	Nonylphenol Ethoxylate (Total)	2022/07/12		85	%	50 - 130
8101163	FKU	Spiked Blank	Nonylphenol Ethoxylate (Total)	2022/07/12		89	%	50 - 130
8101163	FKU	Method Blank	Nonylphenol Ethoxylate (Total)	2022/07/12	ND, RDL=0.005		mg/L	
8101163	FKU	RPD	Nonylphenol Ethoxylate (Total)	2022/07/12	NC		%	40
8101173	AFZ	Matrix Spike [TCB532-10]	Total Aluminum (Al)	2022/07/11		134 (2)	%	80 - 120
			Total Antimony (Sb)	2022/07/11		105	%	80 - 120
			Total Arsenic (As)	2022/07/11		100	%	80 - 120
			Total Cadmium (Cd)	2022/07/11		102	%	80 - 120
			Total Chromium (Cr)	2022/07/11		100	%	80 - 120
			Total Cobalt (Co)	2022/07/11		98	%	80 - 120
			Total Copper (Cu)	2022/07/11		98	%	80 - 120
			Total Lead (Pb)	2022/07/11		95	%	80 - 120
			Total Manganese (Mn)	2022/07/11		100	%	80 - 120
			Total Molybdenum (Mo)	2022/07/11		103	%	80 - 120
			Total Nickel (Ni)	2022/07/11		98	%	80 - 120
			Total Phosphorus (P)	2022/07/11		NC	%	80 - 120
			Total Selenium (Se)	2022/07/11		104	%	80 - 120
			Total Silver (Ag)	2022/07/11		99	%	80 - 120
			Total Tin (Sn)	2022/07/11		102	%	80 - 120
			Total Titanium (Ti)	2022/07/11		97	%	80 - 120
			Total Zinc (Zn)	2022/07/11		103	%	80 - 120
8101173	AFZ	Spiked Blank	Total Aluminum (Al)	2022/07/11		104	%	80 - 120
			Total Antimony (Sb)	2022/07/11		104	%	80 - 120
			Total Arsenic (As)	2022/07/11		103	%	80 - 120
			Total Cadmium (Cd)	2022/07/11		101	%	80 - 120
			Total Chromium (Cr)	2022/07/11		102	%	80 - 120
			Total Cobalt (Co)	2022/07/11		101	%	80 - 120
			Total Copper (Cu)	2022/07/11		100	%	80 - 120
			Total Lead (Pb)	2022/07/11		96	%	80 - 120
			Total Manganese (Mn)	2022/07/11		103	%	80 - 120
			Total Molybdenum (Mo)	2022/07/11		102	%	80 - 120
			Total Nickel (Ni)	2022/07/11		103	%	80 - 120
			Total Phosphorus (P)	2022/07/11		116	%	80 - 120
			Total Selenium (Se)	2022/07/11		107	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2022/07/11		101	%	80 - 120
			Total Tin (Sn)	2022/07/11		102	%	80 - 120
			Total Titanium (Ti)	2022/07/11		102	%	80 - 120
			Total Zinc (Zn)	2022/07/11		107	%	80 - 120
8101173	AFZ	Method Blank	Total Aluminum (Al)	2022/07/11	ND, RDL=4.9		ug/L	
			Total Antimony (Sb)	2022/07/11	ND, RDL=0.50		ug/L	
			Total Arsenic (As)	2022/07/11	ND, RDL=1.0		ug/L	
			Total Cadmium (Cd)	2022/07/11	ND, RDL=0.090		ug/L	
			Total Chromium (Cr)	2022/07/11	ND, RDL=5.0		ug/L	
			Total Cobalt (Co)	2022/07/11	ND, RDL=0.50		ug/L	
			Total Copper (Cu)	2022/07/11	ND, RDL=0.90		ug/L	
			Total Lead (Pb)	2022/07/11	ND, RDL=0.50		ug/L	
			Total Manganese (Mn)	2022/07/11	ND, RDL=2.0		ug/L	
			Total Molybdenum (Mo)	2022/07/11	ND, RDL=0.50		ug/L	
			Total Nickel (Ni)	2022/07/11	ND, RDL=1.0		ug/L	
			Total Phosphorus (P)	2022/07/11	ND, RDL=100		ug/L	
			Total Selenium (Se)	2022/07/11	ND, RDL=2.0		ug/L	
			Total Silver (Ag)	2022/07/11	ND, RDL=0.090		ug/L	
			Total Tin (Sn)	2022/07/11	ND, RDL=1.0		ug/L	
			Total Titanium (Ti)	2022/07/11	ND, RDL=5.0		ug/L	
			Total Zinc (Zn)	2022/07/11	ND, RDL=5.0		ug/L	
8101173	AFZ	RPD [TCB532-10]	Total Aluminum (Al)	2022/07/11	5.9		%	20
			Total Antimony (Sb)	2022/07/11	NC		%	20
			Total Arsenic (As)	2022/07/11	4.5		%	20
			Total Cadmium (Cd)	2022/07/11	NC		%	20
			Total Chromium (Cr)	2022/07/11	NC		%	20
			Total Cobalt (Co)	2022/07/11	NC		%	20
			Total Copper (Cu)	2022/07/11	9.2		%	20
			Total Lead (Pb)	2022/07/11	NC		%	20
			Total Manganese (Mn)	2022/07/11	3.2		%	20
			Total Molybdenum (Mo)	2022/07/11	3.1		%	20
			Total Nickel (Ni)	2022/07/11	6.4		%	20
			Total Phosphorus (P)	2022/07/11	1.9		%	20
			Total Selenium (Se)	2022/07/11	NC		%	20
			Total Silver (Ag)	2022/07/11	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Tin (Sn)	2022/07/11	7.6		%	20
			Total Titanium (Ti)	2022/07/11	2.1		%	20
			Total Zinc (Zn)	2022/07/11	NC		%	20
8107218	MJ2	Spiked Blank	Total Oil & Grease	2022/07/13		99	%	85 - 115
8107218	MJ2	RPD	Total Oil & Grease	2022/07/13	0.51		%	25
8107218	MJ2	Method Blank	Total Oil & Grease	2022/07/13	ND, RDL=0.50		mg/L	
8107221	MJ2	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2022/07/13		97	%	85 - 115
8107221	MJ2	RPD	Total Oil & Grease Mineral/Synthetic	2022/07/13	0.52		%	25
8107221	MJ2	Method Blank	Total Oil & Grease Mineral/Synthetic	2022/07/13	ND, RDL=0.50		mg/L	

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Matrix Spike exceeds accaeptance limits, probable matrix interference.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Sonja Elavinamannil, Master of Biochemistry, Team Lead

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Page of

06-Jul-22 15:34
Jolanta Goralczyk
C2I7132
SPL ENV-1205
C#884848-01-01

Only:
Bottle Order #: 884848
Project Manager: Jolanta Goralczyk

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#24874 Groundwater Environmental Management Ser	Company Name:	GEMS	Quotation #:	C15394
Attention:	Accounting	Attention:	LAURA MAHARAJ	P.O. #:	
Address:	8800 Dufferin St Suite 303	Address:	8800 DUFFERIN ST SUITE 303	Project:	21-1234
	Concord ON L4K 0C5		CONCORD ON L4K 0C5	Project Name:	
Tel:	(905) 907-3077 Fax: (905) 907-6617	Tel:	(905) 907-3077 Fax:	Site #:	COURTICE TRUNK
Email:	valerie.noble@gemservicesinc.com	Email:	Laura.Maharaj@gemservicesinc.com	Sampled By:	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ For RSC
☐ Table ___

Other Regulations
☐ CCME ☑ Sanitary Sewer Bylaw
☐ Reg 558. ☑ Storm Sewer Bylaw
☐ MISA Municipality DURHAM
☐ PWQO ☐ Reg 406 Table
☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Toronto Sanitary&Storm Sewer (100-2016)	# of Bottles	Comments
1	MW-103	dd-MMM:17 ECM ST	07/06/22	11:00	GW	NO	X	18	
2									
3									
4									
5									
6									
7									
8									
9									
10									

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Keeley Baines	22/07/06	15:30		22/07/06	1534	

Laboratory Use Only
Time Sensitive
Temperature (°C) on Recei: 17/07/19
Custody Seal: Present ✓ Intact — Yes ✓ — No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client
Orig

Bureau Veritas Canada (2019) Inc.

Exceedance Summary Table – Toronto Storm Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
MW-103	TCB532-10	Total Manganese (Mn)	50	290	2.0	ug/L
MW-103	TCB532-10-Lab Dup	Total Manganese (Mn)	50	300	2.0	ug/L
MW-103	TCB532-10-Lab Dup	Total Phosphorus (P)	400	800	100	ug/L
MW-103	TCB532-10	Total Phosphorus (P)	400	820	100	ug/L
MW-103	TCB532-06	Total Suspended Solids	15	17	10	mg/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Exceedance Summary Table – Toronto Sanitary Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Appendix E

Dewatering Calculations

Table 1

Building 1 - Short-Term Dewatering Rate Calculations - 7 & 40 days

Proposed Development: 15 Elm Street, Toronto, ON **Project No. 22-1422**

Symbol	Description	Value 7 Days	Value 40 Days	Unit	Comment
Dewatering target heights and elevations					
$E_{Target} = E_{invert} - 1$	Dewatering target elevation	86.47	86.47	masl	
$E_{wp} = E_{Target} - 1$	Target water level	85.47	85.47	masl	
$H = E_{GW} - E_{wp}$	Initial height of groundwater	2.46	2.46	m	
$h = E_{Target} - E_{wp}$	Target height of groundwater	1.00	1.00	m	
H - h	Drawdown required	1.46	1.46	m	
t	Duration of Dewatering	7	40	days	
K	Hydraulic Conductivity	1.7E-06	1.7E-06	m/s	
T	Transmissivity	4.2E-06	4.2E-06	m^2/sec	$T = K \cdot (H - h)$
Cs	Storage Coefficient	0.30	0.30	no units	
C_4	Constant	4790	4790	no units	
a	Dewatered Area Length	23.0	23.0	m	
b	Dewatered Area Width	34.0	34.0	m	
r_w	Effective Well Radius of Open Excavation	18.1	18.1	m	$r_w = \frac{a+b}{\pi}$
R_o	**Radius of influence**	**22.5**	**28.6**	**m**	$R_o = r_w + \sqrt{\frac{T \cdot t}{C_4 \cdot C_s}}$
					Unconfined Conditions
Q	**Predicted Pumping Rate**	**7.6**	**3.6**	L/min	$Q = \frac{\pi \cdot K \left(H^2 - h^2\right)}{\ln\left(\frac{R_o}{r_w}\right)}$
		10,882	**5,164**	L/day	
					(Powers et al., 2008)

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Appendix F

MECP Wells

Table 1: MECP Well Summary
17 Elm Street, Toronto, Ontario

Well ID	Easting	Northing	FID	Well Usage
6928282	630908	4834608	0	Not Used
6929132	629952	4835397	1	Municipal
6929946	630106	4834969	2	N/A
6931118	630169	4835566	3	Not Used
7042961	630169	4835566	4	Not Used
7043550	629952	4835309	5	N/A
7043585	630699	4835011	6	N/A
7043590	629962	4834842	7	N/A
7101845	630738	4834751	8	Not Used
7104082	630130	4834707	9	Monitoring
7111309	630043	4835211	10	Test Hole
7119449	630028	4834878	11	Monitoring and Test Hole
7119450	630026	4834884	12	Monitoring and Test Hole
7122591	630652	4835382	13	Monitoring
7129574	629669	4834882	14	Monitoring
7130065	630019	4835583	15	Monitoring
7130066	630004	4835531	16	Monitoring
7130068	629942	4835574	17	Monitoring and Test Hole
7130070	630028	4835568	18	Monitoring
7130071	630028	4835568	19	Monitoring and Test Hole
7130072	630028	4835568	20	Monitoring and Test Hole
7145210	630226	4835141	21	N/A
7145211	630213	4835138	22	Dewatering
7145212	630205	4835135	23	N/A
7145213	630223	4835136	24	N/A
7145238	630218	4835136	25	Dewatering
7150698	630719	4835503	26	Monitoring
7151817	630719	4835503	27	Monitoring
7152728	630635	4834837	28	Monitoring
7152729	630634	4834819	29	Monitoring
7153152	630736	4835524	30	Monitoring
7155943	630699	4835064	31	Monitoring and Test Hole
7155944	630707	4835110	32	Monitoring and Test Hole
7156067	630075	4835552	33	Dewatering
7159354	630007	4835540	34	Monitoring and Test Hole
7159355	630007	4835538	35	Monitoring and Test Hole
7159705	630538	4835126	36	Monitoring
7159706	630541	4835138	37	Monitoring
7159707	630517	4835139	38	Monitoring
7163729	630682	4835067	39	Municipal
7163730	630676	4835071	40	Monitoring and Test Hole
7163731	630672	4835081	41	Monitoring and Test Hole
7168505	630782	4835492	42	Test Hole
7172340	630756	4835458	43	N/A

7175262	630693	4834716	44	Test Hole
7176281	630694	4834916	45	Monitoring and Test Hole
7182408	630302	4835193	46	Monitoring and Test Hole
7196725	630813	4834603	47	Other
7196726	630798	4834614	48	Monitoring
7196727	630786	4834640	49	Monitoring
7196728	630824	4834745	50	Monitoring
7204226	629992	4835532	51	Monitoring and Test Hole
7204227	629974	4835539	52	Monitoring and Test Hole
7204228	629990	4835508	53	Monitoring and Test Hole
7206175	630677	4834646	54	N/A
7211640	630738	4835511	55	Monitoring
7211641	630723	4835478	56	Monitoring
7211642	630750	4835487	57	Monitoring
7214548	630837	4835030	58	Monitoring
7214549	630831	4835036	59	Monitoring
7214550	630823	4835026	60	Monitoring
7214551	630809	4835021	61	Monitoring
7214552	630830	4835054	62	Monitoring
7214553	630814	4835048	63	Monitoring
7214554	630803	4835042	64	Monitoring
7214555	630808	4835067	65	Monitoring
7214556	630801	4835065	66	Monitoring
7214557	630796	4835062	67	Monitoring
7214558	630817	4835093	68	Monitoring
7214559	630803	4835089	69	Monitoring
7214560	630790	4835081	70	Monitoring
7216567	630855	4834781	71	Monitoring
7216568	630876	4834658	72	Monitoring
7216569	630917	4834744	73	Monitoring
7216571	630874	4834724	74	Monitoring
7216572	630856	4834767	75	Monitoring
7216573	630880	4834773	76	Monitoring
7216594	630727	4834684	77	N/A
7220160	630306	4835553	78	Monitoring
7221315	629998	4834816	79	Monitoring
7221396	630795	4834760	80	N/A
7224040	630712	4835409	81	Monitoring and Test Hole
7224041	630686	4835393	82	Monitoring and Test Hole
7230249	630691	4835461	83	N/A
7230559	630744	4835485	84	Monitoring
7230560	630734	4835467	85	Monitoring
7230561	630727	4835493	86	Monitoring
7233080	630313	4835552	87	Test Hole
7233270	630292	4835555	88	Monitoring and Test Hole
7236533	630714	4835503	89	Test Hole
7239355	630121	4834690	90	N/A

7239718	630920	4834867	91	Monitoring and Test Hole
7239906	630467	4834794	92	Test Hole
7240183	630923	4834860	93	Monitoring
7240184	630922	4834861	94	Monitoring
7240354	630673	4835489	95	Monitoring and Test Hole
7240355	630678	4835466	96	Monitoring and Test Hole
7240356	630691	4835474	97	Monitoring and Test Hole
7244483	630674	4834653	98	Monitoring
7244649	630472	4835049	99	N/A
7245848	630249	4835224	100	N/A
7249323	630834	4835035	101	N/A
7249324	630832	4835033	102	N/A
7249325	630823	4835028	103	N/A
7249326	630829	4835025	104	Monitoring and Test Hole
7249327	630815	4835018	105	Monitoring and Test Hole
7249328	630814	4835047	106	Monitoring and Test Hole
7249329	630806	4835044	107	Monitoring and Test Hole
7249330	630823	4835028	108	Monitoring and Test Hole
7249331	630830	4835050	109	Monitoring and Test Hole
7249332	630799	4835062	110	Monitoring and Test Hole
7249333	630801	4835065	111	Monitoring and Test Hole
7249334	630791	4835082	112	Monitoring and Test Hole
7249335	630817	4835094	113	Monitoring and Test Hole
7249336	630806	4835090	114	Monitoring and Test Hole
7250327	630895	4834938	115	Monitoring and Test Hole
7250328	630911	4834945	116	Monitoring and Test Hole
7250823	630047	4834621	117	Monitoring
7253213	630718	4835512	118	N/A
7253840	630476	4834798	119	N/A
7256478	630813	4835056	120	Monitoring and Test Hole
7256479	630824	4835038	121	Monitoring and Test Hole
7256480	630827	4835052	122	Monitoring and Test Hole
7257661	630122	4834686	123	Test Hole
7257662	630137	4834745	124	Test Hole
7257663	630154	4834649	125	Test Hole
7257673	630757	4835461	126	Test Hole
7259983	630154	4834648	127	Test Hole
7261959	630707	4835014	128	N/A
7261960	630716	4835023	129	Monitoring and Test Hole
7267869	630858	4835051	130	Monitoring
7267870	630877	4835050	131	Monitoring
7267871	630880	4835024	132	Monitoring
7267872	630866	4835023	133	Monitoring
7268612	630624	4835358	134	Monitoring
7270456	630432	4835167	135	Monitoring
7270708	630518	4835250	136	N/A
7271547	630636	4834800	137	N/A

7273885	630173	4834700	138	N/A
7275766	630040	4834784	139	N/A
7277543	630538	4835108	140	Monitoring
7277544	630547	4835116	141	Monitoring
7277545	630552	4835099	142	Monitoring
7287637	630053	4834620	143	N/A
7292778	630122	4834745	144	N/A
7293079	630829	4834751	145	Test Hole
7300661	630324	4835067	146	Test Hole
7300662	630322	4835079	147	Test Hole
7300663	630330	4835055	148	Test Hole
7302214	630056	4834867	149	Test Hole
7303385	630515	4835212	150	N/A
7303386	630511	4835194	151	Monitoring
7303387	630503	4835271	152	Monitoring
7303388	630480	4835267	153	Monitoring
7306943	630112	4834751	154	Monitoring
7308714	630457	4835151	155	N/A
7312290	630826	4835587	156	Test Hole
7312291	630847	4835590	157	Test Hole
7312292	630882	4835594	158	Test Hole
7314049	629938	4834607	159	Test Hole
7314665	630700	4835556	160	Monitoring
7318605	630025	4834877	161	N/A
7319129	630401	4835452	162	Test Hole
7323583	630780	4834961	163	Test Hole
7323584	630781	4834947	164	Test Hole
7325547	630128	4834670	165	Monitoring
7325663	630267	4835052	166	Monitoring
7325664	630260	4835055	167	Monitoring
7325665	630257	4835057	168	Monitoring
7330985	630728	4835133	169	N/A
7330990	630695	4835569	170	N/A
7331696	630735	4835180	171	Monitoring and Test Hole
7332512	630700	4835482	172	N/A
7334425	630908	4834987	173	N/A
7337038	630691	4834709	174	N/A
7345923	630871	4835058	175	Monitoring and Test Hole
7345924	630859	4835039	176	Monitoring and Test Hole
7345925	630880	4835030	177	Monitoring and Test Hole
7351898	630737	4835364	178	Monitoring
7353877	630837	4834947	179	N/A
7355821	630859	4834978	180	Monitoring and Test Hole
7355822	630861	4835055	181	Monitoring and Test Hole
7355823	630854	4835045	182	Monitoring and Test Hole
7355824	630861	4835055	183	Monitoring and Test Hole
7355825	630877	4835054	184	Monitoring and Test Hole

7355826	630897	4835028	185	Monitoring and Test Hole
7355827	630882	4835038	186	Monitoring and Test Hole
7355828	630877	4835054	187	Monitoring and Test Hole
7355829	630873	4835021	188	Monitoring and Test Hole
7355830	630873	4835201	189	Monitoring and Test Hole
7356114	630251	4835065	190	N/A
7363875	630685	4835129	191	Monitoring
7363876	630378	4835128	192	Monitoring
7363877	630381	4835131	193	Monitoring
7363878	630385	4835130	194	Monitoring
7363879	630378	4835129	195	Monitoring
7363880	630357	4835243	196	Monitoring
7363881	630376	4835250	197	Monitoring
7363882	630377	4835251	198	Monitoring
7363883	630387	4835256	199	Monitoring
7364003	630106	4834806	200	Monitoring
7364004	630112	4834796	201	N/A
7364005	630084	4834797	202	N/A
7364006	630105	4834800	203	N/A
7364007	630101	4834828	204	N/A
7364008	630101	4834828	205	N/A
7364829	630434	4835457	206	Monitoring and Test Hole
7364830	630427	4835454	207	Monitoring and Test Hole
7373140	630738	4834991	208	Monitoring
7373141	630740	4834991	209	Monitoring
7373142	630747	4834991	210	Monitoring
7374950	630432	4835247	211	N/A
7375180	630920	4834760	212	N/A
7375181	630915	4834793	213	N/A
7377222	630762	4834853	214	Monitoring
7377223	630770	4834830	215	Monitoring
7380079	629986	4834988	216	Monitoring
7383897	630730	4834969	217	N/A
7383898	630719	4834977	218	N/A
7383899	630728	4834969	219	N/A