

HYDROGEOLOGICAL INVESTIGATION REPORT WELTON & INNES LIMITED PARTNERSHIP

PROPOSED RESIDENTIAL DEVELOPMENT

299 Lynden Road Brantford, Ontario

FINAL REPORT

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2.0 INTRODUCTION

Terrapex Environmental Ltd. (**Terrapex**) has been retained by Welton & Innes Limited Partnership to carry out a hydrogeological investigation for the proposed residential development at the property with the municipal address 299 Lynden Road, in Brantford, Ontario (hereafter referred to as the "Site"). Authorization to proceed with this study was given by Welton & Innes Limited Partnership (dated April 5, 2022).

It is understood that a hydrogeological report including a site water balance has been carried out under separate cover (Terraprobe, 2008). The purpose of this additional work is to (1) characterize the subsurface groundwater conditions, and (2) carry out a Feature-Based Water Balance (FBWB) assessment for the riparian wetland surrounding the creek which cuts through the north part of the property.

Terrapex used information included in logs of boreholes advanced at the Site by Terrapex as part of a geotechnical investigation that was carried out in conjunction with the hydrogeological investigation and is reported under separate cover.

This report is intended for the guidance of the client to and the design architects or engineers only. It is assumed that the design will be in accordance with the applicable building codes and standards.

3.0 SUBJECT AREA

3.1 CONTEXT

The Site is located north of the intersection of Lynden Road and Garden Avenue in Brantford, Ontario, and has an approximate area of 600,000 m². As shown in **Figure 1** and **Figure 2**, Welton Road passes through the southern section of the site and a storage shed is present on the east end of Welton Road. The site is currently used for agricultural purposes and is bounded by Lynden Road to the south, a rail line to the east, vacant lands and a creek to the north, and residential houses to the west.

The subject area is understood to be within the purview controlled by the Grand River Conservation Authority (GRCA) and the Grand River Source Protection Area (SPA). Ministry of the Environment, Conservation and Parks (MECP) mapping indicates that the subject property is not located in a recognized groundwater recharge area or over highly vulnerable aquifers.

Based on information shown on the Detailed Concept Plan by Sorbara, dated March 8, 2022, we understand that it is proposed to develop the property with a low-rise residential subdivision consisting of single detached houses and townhouses.

3.2 PHYSIOGRAPHY AND GEOLOGY

The ground surface topography of the site is extensively undulating. The ground surface elevations at the locations of the boreholes range by as much as 6.3 metres. It is assumed that runoff is directed to ditches along the property boundary.

Available mapping indicates that the subject property is located over massive to well laminated fine textured glaciolacustrine deposits, characterized by silt and clay with minor sand and gravel (MRD128, 2010). Fairchild Creek is located approximately 450 metres to the east (VuMap, 2022).

The bedrock beneath the reported overburden is reported to be composed of sandstone, shale, dolostone, and siltstone of the Guelph Formation (MRD126, 2011). Bedrock was inferred at depths ranging from 28.5 to 32 metres below ground surface (mbg).

Review of the geotechnical borehole report information (**Appendix I**) and Terraprobe's investigation (2008) indicates that the soil profile at the site under a thin layer of topsoil and rare fill material consists of predominantly stiff to soft clayey silt to silty clay soil. The encountered native subsurface package is consistent with the information reported in the available mapping. A more detailed review of the soil units is provided under separate cover with the geotechnical report (Terrapex; 2022).

3.3 AVAILABLE BACKGROUND GROUNDWATER INFORMATION

A review of the available well records shows that there are 15 reported wells within approximately 500 metres of the subject property (see **Figure 3** and **Appendix II**). Of the known wells, 10 wells were reported to be purposed for water supply use. The water supply wells were listed as being used for livestock or domestic purposes, and were drilled between March 24, 1947, and June 16, 2004. No records exist for decommissioning of these wells.

It is noted that older wells may no longer be operational, and that historically there was not a requirement to register dug wells with the MECP; as such, they can be under-represented in the water well record database.

4.0 METHODOLOGY

4.1 GROUNDWATER MONITORING WELL CONSTRUCTION

A previous field investigation was carried out by Terraprobe between February 19 and 27, 2007, that consisted of advancing thirty (30) boreholes, BH1 – BH30, extending to depths of 8.1 to 11.2 mbg. Standpipe type piezometers were installed in BH2, BH7, BH10, BH13, BH18, BH21, BH23, BH25, and BH30 to monitor shallow groundwater. These piezometers were not located during the field investigation. Terrapex's drilling operations were carried out from June 13 to July 21, 2022. Fieldwork consisted of advancing nine (9) boreholes by a drilling contractor commissioned by Terrapex utilizing mud rotary drilling technique. The boreholes are designated as MW101, BH102, BH103, MW104, BH105, BH106, MW107, MW108, and BH109. The boreholes were advanced to depths ranging from 12.7 to 33.5 mbg. Monitoring wells were installed in Boreholes MW101, MW104, MW107, and MW108 for long-term monitoring of the groundwater table. Two shallow minipiezometers were also installed by post hammer to depths of 1.1 to 1.3 mbg. The reported instrument construction conditions are summarized in **Table 1**, below. Detailed borehole logs are provided in **Appendix I**.

Boreholes BH106 and BH109 were located to determine the subsurface conditions at the potential locations of a proposed pumping station, and Boreholes MW107 and MW108 were located within the footprint of the proposed SWM pond.

Standard Penetration Testing (SPT N-values) and sampling were carried out at regular depth intervals in the boreholes using conventional nominal 35 mm internal diameter split spoon sampling equipment. Reported findings indicate that the native soils encountered were mostly stiff to soft.

The groundwater monitoring wells used in this study are screened from depths of 3.1 to 6.1 mbg, generally adjacent to clayey silt. The minipiezometers are screened from 0.9 to 1.4 mbg. The location of the completed groundwater monitoring wells and minipiezometers are provided in **Figure 2**.

Well ID	Reported Date of Construction	Approximate Location ¹ (UTM Zone 17T)		Approximate GroundReportedSurface Elevation 1Interval		Soils Reported at Screened	Reported SPT N- Value at Screened	
	(2022)	metres east	metres north	masl	mbg	Interval	Interval	
MW101	June 15, 16, 17, 2022	563069	4781512	221.44	3.1 to 4.6	Clayey silt	6 to 8	
MW104	June 20, 21, 22, 2022	563609	4781473	217.57	3.7 to 5.2	Clayey silt	4 to 5	
MW107	July 18, 19, 2022	563410	4780817	215.92	3.1 to 6.1	Clayey silt	6 to 9	
MW108	July 18, 2022	563539	4780908	220.19	3.1 to 6.1	Clayey silt	7 to 21	
Minipiezom	eters							
MP22-1	June 10, 2022	563061 ²	4781618 ²	-	0.9 to 1.1	-	-	
MP22-2	August 30, 2022	563717 ²	4780956 ²	-	1.2 to 1.4	-	-	
Staff Gauge	•							
SG22-1	June 10, 2022	563069 ²	4781618 ²	-	NA	NA	NA	

Table 1: Summary of Instrument Construction Conditions

mbg = metres below ground

¹ UTM locations and elevations obtained from TOPCON GNSS

² UTM locations obtained from GPS handheld device

NA – not applicable

Italics - monitoring wells constructed by others (Hydrogeologic Study, Proposed Residential Subdivision Innes and Welton Property, County of Brant, Ontario; Terraprobe, Feb2008)

It is noted that the boundaries between the strata have been inferred from drilling observations carried out by others and non-continuous samples. They generally represent a transition from one soil type to another and should not be inferred to represent an exact plane of geological change. Further, conditions will vary between and beyond the boreholes.

4.2 WATER LEVEL MONITORING

Groundwater depths have been measured manually over the course of three measurement events carried out on August 24, August 30, and September 6, 2022, by Terrapex field staff. Terraprobe piezometers were previously monitored on April 9 and October 10, 2007. The recorded water levels for these wells are summarized in **Table 2**, below. These water levels reflect the groundwater conditions on the dates they were measured.

	Oneverd		20	007	2022			
Well ID	Surface	Screened Interval	April 9	October 10	August 24	August 30	September 6	
	(masl)	mbg (masl)	mbg (masl)	mbg (masl)	mbg (masl)	mbg (masl)	mbg (masl)	
Piezomete	rs installed	by Terraprobe						
BH2	_	_	1.9	-	-	-	-	
DITZ	-	-	(218.4)	-	-	-	-	
BH7	_	_	0.9	2.5	-	-	-	
BIII	_	-	(215.4)	(213.8)	-	-	-	
BH10	_	_	-	3.0	-	-	-	
ыню	_	_	-	(208.1)	-	-	-	
BH13	_	_	0.9	4.8	-	-	-	
ына	_	-	(220.1)	(216.2)	-	-	-	
BH18	_	_	1.3	5.9	-	-	-	
ыню	-	-	(219.1)	(214.5)	-	-	-	
BH21	_	_	2.5	-	-	-	-	
DITZI	_	_	(216.6)	-	-	-	-	
BH23	_	_	-	-	-	-	-	
DI120	_	_	-	-	-	-	-	
BH25	_	_	1.2	-	-	-	-	
DH25	-	-	(219.6)	-	-	-	-	
BH30	_	_	1.0	-	-	-	-	
BHSC	-	-	(210.0)	-	-	-	-	
Monitoring	g wells insta	lled by Terrapex	-		•			
MW101	221 439	3.1 to 4.6	-		4.11	3.82	4.06	
101001	221.400	(219.2 to 217.7)	-		(217.32)	(217.62)	(217.38)	
MW104	217 57	3.7 to 5.2	-		2.03	1.98	2.17	
10100104	211.51	(214.7 to 213.2)	-		(215.54)	(215.59)	(215.40)	
MW107	215 922	3.1 to 6.1	-		1.38	1.46	1.59	
10101	210.022	(213.7 to 210.7)	-		(214.54)	(214.46)	(214.33)	
MW108	220 187	3.1 to 6.1	-		4.83	5.07	5.27	
1000	220.107	(217.9 to 214.9)	-		(215.36)	(215.12)	(214.92)	
Minipiezor	neters				•			
MP22-1	_	0 9 to 1 1	-	-	Dry	Dry	Dry	
		0.0 10 1.1	-	-	-	-	-	
MP22-2	_	1 2 to 1 4	-	-	-	Dry	Dry	
	_	1.2 10 1.4	-	-	-	-	-	
Staff Gaug	je	1						
SG22-1	-	NA	-	-	-0.103	-	-	

Table 2: Summary of the Summary of t	of Reported	Groundwater	Elevations
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mbg = metres below ground

NA – not applicable

Negative values indicate groundwater is above surface

Italics – water level measurements completed by others (Hydrogeologic Study, Proposed Residential Subdivision Innes and Welton Property, County of Brant, Ontario; Terraprobe, Feb2008)

Bold values indicate highest and lowest values mentioned in verbiage.

Based on visual examination of the soil samples collected during drilling operations, the native soil was grey in appearance beginning at approximate depths of 3.1 to 6.0 mbg, indicating that groundwater may be present for long periods of time during the year. The native grey soil consisted of mostly clayey silt.

Based on *in-situ* measurements of the static groundwater levels, historical measurements carried out in 2007 appear to provide the highest and lowest groundwater levels. Groundwater levels in 2007 are reported to range from 5.9 metres below ground level (mbg) through 0.9 mbg, whereas groundwater elevations are reported to range from 208.1 metres above sea level (masl) through 220.1 masl. Groundwater levels measured as part of this investigation in 2022 are reported to range from 1.38 mbg through 5.27 mbg, with groundwater elevations ranging from equivalent to 214.33 masl through 217.62 masl.

It should be noted that groundwater levels are subject to seasonal fluctuations. A higher groundwater level condition will likely develop later in the spring freshet period or following significant rainfall events.

5.0 HYDRAULIC TESTING

5.1 HYDRAULIC CONDUCTIVITY

To estimate the hydraulic conductivity (K) of the soil materials adjacent to the screened intervals of the tested monitoring wells, two (2) single well response tests were completed on Site during the measurement events carried out on August 30 and September 6, 2022. The Bouwer and Rice method was applied to the falling head test data, and hydraulic conductivities were calculated using the Aquifer Test Software. The groundwater monitoring wells were screened adjacent to clayey silt. The results are summarized in **Table 3**, and The field values and analytical hydraulic conductivities ranged from 2.2×10^{-8} m/sec to 4.4×10^{-8} m/sec in the locations tested. These results indicate relatively impervious materials and are consistent with values expected for silt, loess, and glacial tills (Bear, 1972; Freeze and Cherry, 1979).

Location Identification	DescriptionSoilsof WellReported atMoistureScreenedConditionsInterval		Reported Screened Interval	Reported SPT N- Value at Screened	Estimated Hydraulic Conductivity
Conditions		Interval	mbg (masl)	Interval	K (m/s)
MW101	saturated	Clayey silt	3.1 to 4.6 (219.2 to 217.7)	6 to 8	2.20 x 10 ⁻⁸
MW104	saturated	Clayey silt	3.7 to 5.2 (214.7 to 213.2)	4 to 5	4.37 x 10 ⁻⁸

Table 3.	Hydraulic	Conductivity	Estimates
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mbgl - indicates 'metres below ground surface

5.2 INTERPRETED GROUNDWATER FLOW DIRECTION

Groundwater flow directions were estimated using manual piezometric head measurements recorded on April 9, 2007 and August 24, 2022. As shown in **Figure 4A** and **Figure 4B**, piezometric equipotential contours indicate that groundwater was flowing in a generally southeast direction on August 24, 2022, whereas piezometric equipotential contours indicate that groundwater was flowing north and south from a central location near BH13 on April 9, 2007.

6.0 LOW IMPACT DEVELOPMENT (LID) MEASURES

In general principles, precipitation incident to a pervious soil surface may infiltrate downward to move through the unsaturated zone, to then recharge the shallow groundwater aquifer. From there, shallow groundwater moves toward a watercourse to contribute to baseflow or percolates downward to replenish deeper aquifers. Impervious surfaces, such as buildings or paving, prevent infiltration and so precipitation instead becomes runoff directed to storm water sewers.

Low impact development (LID) measures promote infiltration, and generally requires there to be at least one metre of soil above the seasonal high groundwater level and should generally reside lower than the understood frost depth (OPSD3090.101 Rev#1 Nov2010).

As outlined above, groundwater at the Site is likely located at depths measured to as high as 0.9 mbg at some locations. Based on these estimates, conditions are considered challenging for the design of LID measures in some areas, while being favourable for the design of LID measures in others. Fill materials could be used in some locations to create the ideal design space for infiltration These conditions are summarized visually in the drawing, below.



7.0 SITE SPECIFIC WATER BALANCE ASSESSMENTS

A comparative site-specific global water balance (WB) assessment was carried out for the subject property.

In addition to this, a Feature-Based Water Balance (FBWB) assessment was carried out for one feature of interest on the subject property:

- The riparian wetland surrounding the creek which cuts through the north part of the property;

Estimates for existing conditions, proposed conditions, and proposed conditions with low impact development methods are compared below.

7.1 METHODS

Pre-development and post-development groundwater recharge (infiltration) and surface water run-off parameters were estimated at monthly resolutions to characterize the hydrological and hydrogeological dynamics of the subject property. The estimates take into account the following seven components:

"Inputs"	(P) Precipitation
	(S _i) Surface water inflow
	(G _i) Groundwater inflow
"Outputs"	(So) Surface water outflow
	(Go) Groundwater outflow
	(ET) Evapotranspiration
Available Storage	(SMC) soil moisture holding capacity

The basic water balance for a particular area can be expressed as:

$$P = Qs + ET + RE + \Delta S$$

(Thornthwaite and Mather 1955)

where,

- P = Precipitation (rain and snow)
- Qs = Runoff
- ET = Evapotranspiration
- RE = Recharge
- ΔS = Change in Storage (assumed to be zero under steady state conditions)

Climate data was sourced from historical Environment Canada data available for Brantford Airport weather station, located approximately 10 km southeast of the subject property (approximately 43.14 °N, -80.33 °W, 245.5 masl). An average of four years (June 2018 through June 2022) were used for meteorological estimates.

Local solar radiation, incoming solar radiation, sunset hour angles, and solar declination conditions used to estimate the evapotranspiration rate were sourced from the National Aeronautical and Space Administration Langley Research Center (NASA 2018). An average of three years (2018 through 2020) were used for astro-meteorological estimates.

Standard soil water holding capacities and infiltration coefficients used were provided in the *Stormwater Management Planning and Design Manual* (MOECC 2003). The infiltration coefficients used in the estimate calculations were based on the sum of topography, surficial soil classification and cover factors, provided in the *Stormwater Management Planning and Design Manual* (MOECC 2003).

The parameters used for the calculations are provided in **Table 5**, below, based on the above descriptions and assumptions, as well as proposed conditions.

7.2 EVALUATION OF CONDITIONS

The water balance assessments were carried for the subject property. The purpose of the water balance assessment is to compare the hydrological conditions of the proposed development conditions with the hydrological conditions of the existing conditions. The proposed surface area of the subject property is noted to change with the addition of fill, grading, and with roofed areas dedicated to directing rainwater to proposed storage tanks.

Land areas are divided into Permeable Area and Impermeable Area, based on the runoff coefficient provided to Terrapex for each subcatchment area. Impermeable Areas contribute to runoff, but do not contribute to evapotranspiration or to infiltration. Permeable area within each subcatchment area is assessed using the appropriate Infiltration Ratio (per SWM Planning & Design Manual, 2003), and infiltration and runoff volumes are estimated. Runoff from permeable areas is added to the runoff from impermeable areas. Asphalt areas contribute to runoff, but do not contribute to evapotranspiration or to infiltration.

7.2.1 EVALUATION OF CONDITIONS - Full site

Pre-Development Area Constraints -

Pre-development conditions for the subject property were based on MECP mapping, and design drawings provided to Terrapex. Based on these drawings, **the existing area of the subject property used in the calculations was approximately 758,689 m² in area**.

For the purposes of evaluating the pre-development conditions, the existing conditions were generalized into five (5) land use areas, with hydrological parameters summarized in **Table 5**, below.

Post-Development Area Constraints -

Post-development conditions for the subject property were based on MECP mapping and design drawings provided to Terrapex. Based on these drawings, **the proposed area of the subject property used in the calculations was approximately 758,689 m² in area.**

For the purposes of evaluating the pre-development conditions, the existing conditions were generalized into eleven (11) land use areas, derived from seventy-four (74) sub-catchment areas, as well as the areas not planned for development within the subject property. Hydrological parameter for these land use areas are summarized in **Table 6**, below. Based on information provided by Urbantech[®] Consulting, A Division of Leighton-Zec West Ltd. (Urbantech) on September 29, 2023 via email, the **area of the subject property proposed for development is 533,200 m² in area.**

7.2.2 EVALUATION OF CONDITIONS – North Riparian Wetland Catchment

Pre-Development Area Constraints -

Pre-development conditions for the subject property were based on MECP mapping, and design drawings provided to Terrapex. Based on these drawings, **the existing area catchment of the North Riparian Wetland used in the calculations was approximately 261,156** m² **in area**.

A visual representation of the areas evaluated, and separated for use of cover, soil, and topographic co-efficients are provided in **Figure 5**.

For the purposes of evaluating the pre-development conditions, the existing conditions were generalized into four (4) land use areas, with hydrological parameters summarized in **Table 7**, below.

Post-Development Area Constraints -

A visual representation of the existing catchment area, and the areas separated for use of cover, soil, and topographic co-efficients are provided in **Figure 5**.

For the purposes of evaluating the pre-development conditions, the proposed conditions were generalized into eleven (11) land use areas, derived from twenty-two (22) subcatchment areas designated 2E through 20E, 1C, 2C, and 3C, as well as the areas not planned for development within the catchment of the north riparian wetland. Hydrological parameter for these land use areas are summarized in Table 8, below. The proposed catchment of the North Riparian Wetland proposed for development is approximately 392,213 m² in area, inclusive of areas directed to the North Stormwater Pond.

TABLE 5: EXISTING PRE-DEVELOPMENT CONDITIONS – Full Site

Land Uses	Approximate Pervious Land Area (m ²)	Approximate Impervious Land Area (m²)	Cover Co- Efficient ⁽¹⁾ (unitless)	Soil Co- Efficient ⁽¹⁾ (unitless)	Topographic Co-Efficient ⁽¹⁾ (unitless)	Infiltration Ratio ⁽²⁾ (unitless)	Water Holding Capacity ⁽¹⁾ (mm)
Riparian Forest - north of Creek	40,731	-	0.2	0.2	0.1	0.5	400
Watershed - agricultural	478,158	_	0.1	0.2	0.2	0.5	200
Riparian Forest - south of creek	121,701	-	0.2	0.2	0.2	0.6	400
Riparian Flat Forest	53,042	_	0.2	0.2	0.2	0.6	400
Wetland	65,057	-	0.2	0.2	0.1	0.5	900
Sub-Totals	758,689	-					
Total		758,689					

SWM Planning & Design Manual (2003)
 Cover Co-Efficient) + (Soil Co-Efficient) + (Topographic Co-Efficient)

TABLE 6: PROPOSED POST-DEVELOPMENT CONDITIONS – Full Site

Land Uses	Approximate Pervious Land	Approximate Impervious Land	Cover Co- Efficient ⁽¹⁾	Soil Co- Efficient ⁽¹⁾	Topographic Co-Efficient ⁽¹⁾	Infiltration Ratio ⁽²⁾	Water Holding Capacity ⁽¹⁾	Runoff is ultimately
	Area (m ²)	Area (m ²)	(unitless)	(unitless)	(unitless)	(unitless)	(mm)	directed to
Riparian Forest - north of Creek	40,731	-	0.2	0.2	0.1	0.5	400	Creek
Watershed - agricultural	96,039	-	0.1	0.2	0.2	0.5	200	Creek
Riparian Forest - south of creek	121,701	-	0.2	0.2	0.2	0.6	400	Creek
Riparian Flat Forest	-	-	0.2	0.2	0.2	0.6	400	-
Wetland	65,057	-	0.2	0.2	0.3	0.7	900	Creek
Front Yard Drainage (blue areas)	77,500	116,251	0.1	0.2	0.2	0.5	100	Storm sewers in roadway
Rear Yard Drainage (pink areas)	37,376	56,064	0.1	0.2	0.2	0.5	100	Infiltration swales in rear yards
South Pond (43A)	2,366	9,463	0.2	0.2	0.2	0.6	900	Groundwater
North Pond (20E)	1,668	6,673	0.2	0.2	0.2	0.6	900	Groundwater
Asphalt Roads	-	127,800	dna	dna	dna	dna	dna	variable
Sub-Totals	442,438	316,251						
Total		758,689						

¹ SWM Planning & Design Manual (2003) Only Applied for permeable areas

 2 = (Cover Co-Efficient) + (Soil Co-Efficient) + (Topographic Co-Efficient) Only applied for permeable areas shaded areas are planned to be undeveloped

dna denotes 'does not apply'

TABLE 7: EXISTING PRE-DEVELOPMENT CONDITIONS – North Riparian Wetland

	Approximate	Approximate	Cover Co-	Soil Co-	Topographic	Infiltration	Water Holding
Land Uses	Pervious Land Area	Impervious Land Area	Efficient (1)	Efficient ⁽¹⁾	Co-Efficient (1)	Ratio ⁽²⁾	Capacity ⁽¹⁾
	(m²)	(m²)	(unitless)	(unitless)	(unitless)	(unitless)	(mm)
Agricultural	47,259	-	0.1	0.2	0.3	0.6	200
Riparian Forest	121,701	-	0.2	0.2	0.1	0.5	400
Forest (table lands)	27,139	-	0.2	0.2	0.3	0.7	400
Wetland	65,057	-	0.2	0.2	0.3	0.7	900
Sub-Totals	261,156	-					
Total		261,156					

¹ SWM Planning & Design Manual (2003) Only Applied for permeable areas

² = (Cover Co-Efficient) + (Soil Co-Efficient) + (Topographic Co-Efficient) Only applied for permeable areas

TABLE 8: PROPOSED POST-DEVELOPMENT CONDITIONS – North Riparian Wetland

Land Uses	Approximate Pervious Land Area	Approximate Impervious Land Area	Cover Co-Efficient ⁽¹⁾	Soil Co-Efficient ⁽¹⁾	Topographic Co-Efficient ⁽¹⁾	Infiltration Ratio ⁽²⁾	Water Holding Capacity ⁽¹⁾
	(m ²)	(m²)	(unitless)	(unitless)	(unitless)	(unitless)	(mm)
Agricultural	41,455	-	0.1	0.2	0.3	0.6	200
Riparian Forest	121,701	-	0.2	0.2	0.1	0.5	400
Forest (table lands)	18,039	-	0.2	0.2	0.2	0.6	400
Wetland	65,057	-	0.2	0.2	Soil -Efficient(1)Topographic Co-Efficient (1)Infiltration Ratio (2)(unitless)(unitless)(unitless)0.20.30.60.20.10.50.20.20.60.20.20.60.20.30.60.20.30.60.20.30.60.20.30.60.20.30.60.20.30.70.30.70.7		
Front Yard Drainage	11,162	16,744	0.1	0.2	0.3	0.6	100
Rear Yard Drainage	30,316	45,475	0.1	0.2	0.3	0.6	100
Asphalt Roads	-	33,923	dna	dna	dna	dna	dna
North Pond (20E)	1,668	6,673	0.2	0.2	0.3	0.7	900
Sub-Totals	289,398	102,815					
Total		392,213					

¹ SWM Planning & Design Manual (2003) Only Applied for permeable areas

² = (Cover Co-Efficient) + (Soil Co-Efficient) + (Topographic Co-Efficient) Only applied for permeable areas

7.3 COMPARISON OF PRE-DEVELOPMENT AND POST-DEVELOPMENT CATCHMENT-BASED WATER BALANCE CONDITIONS

The pre-development hydrologic budgets for the subject property were estimated based on the existing catchment conditions summarized above, and the post-development hydrologic budgets were estimated based on the provided designs. The estimated pre-development conditions are compared to anticipated post-development conditions in **Table 9 to Table 10**, below. A more detailed analysis of the proposed conditions are provided at monthly resolutions in **Appendix IV**.

Component	Pre- Development Conditions	Proposed Post- Development Conditions	Annual Variation
	(m ³ per annum)	(m³ per annum)	(% per annum)
(P) Precipitation	626,649	626,649	-
(ET) Evapotranspiration	399,484	233,129	-
(Q _G) Infiltration	146,024	88,875	-39
(Qs) Run-off	81,159	304,688	+275

TABLE 9: COMPARISON OF THEORETICAL WATER BALANCE BUDGET – Full Site

TABLE 10: COMPARISON OF THEORETICAL WATER BALANCE BUDGET- North Riparian Wetland

Component	Pre- Development Conditions	Proposed Post- Development Conditions (no mitigations)	Annual Variation	Average Monthly Variation (Apr/May)	Average Monthly Variation (Aug/Sept)
	(m ³ per	(m ³ per	(% per	(% per	(% per
	annum)	annum)	annum)	month)	month)
(P) Precipitation	215,705	323,954	+50	-	-
(ET) Evapotranspiration	137,596	152,492	+10	-	-
(Q _G) Infiltration	52,254	58,273	+11.5	+11.5	+11.8
(Qs) Run-off	25,861	113,205	+338	+511	+692

Site Specific Global Site Water Balance:

Annual Variances

Based on the summary of analyses provided in **Table 9** it is noted that the proposed changes to the subject property are anticipated to result in an annual decrease in infiltration of approximately 57,149 m³/year (-39%) in comparison to existing conditions, and an increase in run-off of approximately 223,528 m³/year (+275%) in comparison to existing conditions.

Feature-Based Water Balance – North Riparian Wetland

Annual Variances

Based on the summary of analyses provided in **Table 10** it is noted that the proposed changes to the catchment to the north riparian wetland feature are anticipated to result in an annual increase in infiltration of approximately 6,019 m³/year (+12%) in comparison to existing conditions, and an increase in run-off of approximately 87,344 m³/year (+338%) in comparison to existing conditions.

Monthly Variances

As shown in **Appendix IV**, review of infiltration and run-off volumes at monthly intervals appear to have similar trends to that of the existing catchment condition, including a period of increased runoff and infiltration during the spring freshet months and autumn rains, and reduced run-off during the winter months (held in snow storage).

From a monthly resolution perspective, variance in significant spring months (April/May) appears to be approximately 12% per month (infiltration), and 511% per month (run-off). Variance in autumn months (Aug/Sept) appears to be approximately 12% per month (infiltration), and 692% per month (run-off).

8.0 SUMMARY AND DISCUSSION

The following summarizes the information above:

Hydrogeological Findings

- The encountered subsurface package is generally comprised of native soils consisting of predominantly stiff to soft clayey silt to silty clay soil.
- In-situ measurements of the static groundwater levels indicate that groundwater levels range from range from 5.9 metres below ground level (mbg) through 0.9 mbg across the site, whereas groundwater elevations range from 208.1 metres above sea level (masl) through 220.1 masl.
- Based on the groundwater measurements, infiltration potential is variable across the site, with ideal design space to accommodate infiltration range from approximately 0 m to 3.7 metres.

Site-Specific Global Water Balance Findings

• The proposed changes to the **full subject property** are anticipated to result in an annual decrease in infiltration of approximately 39% for infiltration, and an annual increase of 275% for runoff in comparison to existing conditions.

Feature-Based Water Balance Findings

• The proposed changes to the catchment to the **north riparian wetland feature** are anticipated to result in an annual decrease in infiltration of approximately 11.5% for infiltration, and an annual increase of 424% for runoff.

Monthly trends appear to follow existing trends and are anticipated to result in a monthly decrease in infiltration of approximately 11% during spring months, and a decrease in infiltration of approximately 12% during autumn months. Monthly run-off trends appear to follow existing trends and are anticipated to result in a monthly increase in run-off of approximately 900% during spring months, and an increase of run-off of approximately 424% in autumn months.

9.0 CLOSURE

This report has been completed in accordance with the terms of reference for this project as agreed upon by Welton & Innes Limited Partnership (the Client) and Terrapex Environmental Ltd. (Terrapex) and generally accepted hydrogeological consulting practices in this area.

The reported information is believed to provide a reasonable representation of the general hydrogeological conditions at the site; however, studies of this nature have inherent limitations. The data were collected at specific locations and conditions may vary at other locations, or with the passage of time. Where applicable, the assessment of the environmental quality of groundwater was limited to a study of those chemical parameters specifically addressed in this report.

Terrapex has relied in good faith on information and representations obtained from the Client and third parties and, except where specifically identified, has made no attempt to verify such information. Terrapex accepts no responsibility for any deficiency or inaccuracy in this report as a result of any misstatement, omission, misrepresentation, or fraudulent act of those providing information. Terrapex shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time of the study.

This report has been prepared for the sole use of Welton & Innes Limited Partnership. Terrapex accepts no liability for claims arising from the use of this report, or from actions taken or decisions made as a result of this report, by parties other than Welton & Innes Limited Partnership.

Respectfully submitted,

TERRAPEX ENVIRONMENTAL LTD.

Zen Keizars, P.Geo., FGC Senior Hydrogeologist



FIGURES



swilliams W:\PROJECTS\Toronto\CT3087.00 299 Lynden Road, Brantford\MXD\CT3087.00 FIG1 SITE LOCATION.mxd







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1	WELTON	& INNES	LIMITED PART	INERSHIP
2	SITE LOCATION:			
		299 LY	NDEN ROAD	
		BRANIF(JRD, ONTARI	0
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POST-DEVELOPMENT WATERSHED
0/12
PROJECT# CT3087.00
DATE JULY 2022 DRAWN JOB CHECKED
DRAWING # FIGURE 5

APPENDIX I BOREHOLE LOG SHEETS

CLIENT: Welton & Innes Limited Partnership		PRO	RD OF:											
ADDRESS: 299 Lynden Road													V101	
CITY/PROVINCE: Brantford, Ontario		NOF	RTHING (m):	4781	511.77		EASTI	NG	(m):	563068.63 ELEV. (m) 221.44				
CONTRACTOR: Profile Drilling Inc.			METH	OD: H	ollow S	item Au	ger +	Mu	IUG KOTARY + SPIIT Spoon Sampling					
BOREHOLE DIAMETER (cm): 15 WELL DIA	METER	(cm): 5		EN SLO	DT #: 10		TYPE:	0	SEALANT TYPE: 2					
			SHEAR STRE	NGTH	U DY W	ATER	CONE							
	DEPTH (m)	ELEVATION (m)	(kPa) <u>40</u> 80 120 <u>+ N-VALUI</u> (Blows/300) 20 40 60	0 <u>160</u> mm)▲	CO PL 7	NTENT (%) W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL NSTALLATION	REMARKS	
Topsoil (200mm)	0	-	1		19		,						Bentonite	
stiff to very stiff, very moist, brown CLAYEY SILT trace sand with occasional silty clay layers loose to compact, wet, brown SILT trace sand, trace clay stiff to very stiff, very moist CLAYEY SILT trace sand with occasional silty clay layers with occasional silty clay layers	-0.5 -1.5 -2.5 -3.5 -4.5 -4.5	221 - 220.5 - 220.5 - 219.5 - 219.5 - 218.5 - 218.5 - 217.5 - 217.5 -	4 5 9 12 ▲ 8 ▲ 6 5		18 24 23 21 29 27 24		1 2 3 4 5 6 7		21 100 83 100 100				50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.52 mbg	
grey compact, wet, grey SILT some clay	- 5.5 - 6.5 - 7 - 7.5 - 8 - 8.5 - 8 - 8.5 - 9	216 - 215.5 - 215.5 - 214.5 - 214.5 - 214.5 - 213.5 - 213.5 - 213.5 - 213.5 -	▲ 8 ▲ 6	LOGG	21 24 GED BY:	: EMZ	8		- 100 - 100 -	LING D	DATE: 1	5&168	\$17-June-2022	
TFRRAPFX	TERRAPEX											E: 29-	July-2022	
				REVI	EWED E	<u>BY: VN</u>			PAG	E 1 OF	4		·	

CLIEN	IT: Welton & Innes Limited Partnership		PRO	DJECT	NO.:	CT3	8087	.02			RECORD OF:					
ADDR	ESS: 299 Lynden Road												MW101			
CITY/F	PROVINCE: Brantford, Ontario		NO	RTHING (m): 4781	511.77	7	E	AST	ING	(m):	56306	68.63	ELEV	. (m) 221.44	
CONT	RACTOR: Profile Drilling Inc.			METH	HOD: H	ollow S	Stem	Aug	ger +	- Mu	/lud Rotary + Split Spoon Sampling					
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	(cm):	5 SCRE	EEN SLOT #: 10 SAND TYPE: 0						SEALANT TYPE: 2					
SAMP	LE TYPE AUGER DRIV	EN				D'	YNAN		ONE	<u> </u>		SHELB	Y	SPL	IT SPOON	
GWL (m) GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 80 12 + N-VAL (Blows/30) 20 40 6	20 160 DE + 0mm)	▲ CC PL 20 4	W.C.	NT LL 0 80	SAMPI F NO	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	و) LABORATORY TESTING	WELL	REMARKS	
	compact, wet, grey SILT some clay stiff to very stiff, wet, grey	- 9.5 - 10	212 - 	18		2 0			10	0	100					
	CLAYEY SILT trace sand with occasional silty clay layers	- 10.5 	211 – 211 – 210.5 –	7		28			1	1	100					
		- 11.5	210 -													
		- 12 - 12 - 12.5	209.5 -	4		27			1:	2	100					
		- - - 13	208.5 -												shelby tube sample: 12.8-13.4 mbg	
		- 13.5 - - - 14	208 -	▲ 6		27 ■			1;	3	100					
		- 14.5	207 -													
		- 15 - - - - - - - - - - - - - - - - - - -	206 -	▲ 7		25 ■			14	4	100					
		-16	205.5 -													
		- 10.5 - - - - - 17	204.5 –	15		25 ■			1	5	100					
		- 17.5	204 -													
			-													
		_ 18.5	203 -	1/					Щ							
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CLIENT: Welton & Innes Limited Partnership		PR	OJECT NO.:	CT308	37.0	2		RECORD OF:					
ADDRESS: 299 Lynden Road											MN	/101	
CITY/PROVINCE: Brantford, Ontario		NC	RTHING	G (m): 4781	1511.77	EAS	STIN	G (m	3 (m): 563068.63 ELEV. (m) 221.44				
CONTRACTOR: Profile Drilling Inc.			N	NETHOD: H	Iollow Sten	n Auger	· + N	/lud Rotary + Split Spoon Sampling					
BOREHOLE DIAMETER (cm): 15 WELL DIA	METER	2 (cm):	5 5	SCREEN SL	ot #: 10 s	AND TYPI	e: 0	SEALANT TYPE: 2					
SAMPLE TYPE AUGER DRIV	EN T			RING STRENGTH	DYNA	MIC CO	NE		SHE	LBY			
	EPTH (m)	LEVATION (m)	40 8 (Blov	(kPa) 30_120_160 VALUE 1 vs/300mm)	CONTE (%) PL W.C	NT	AMPLE NO.	AMPLE TYPE		apm or %LEL)	VELL VSTALLATION	REMARKS	
Image: Stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers Image: Stiff to very stiff, wet, grey SILT trace clay	- 19 - 19.5 - 20.5 - 21.5 - 22.5 - 23.5 - 23.5 - 24.5 - 24.5 - 25.5	202.5 - 202 - 201.5 - 201 - 201 - 200.5 - 200 - 199.5 - 199.5 - 198.5 - 198.5 - 198.5 - 198.5 - 198.5 - 198.5 - 198.5 - 198.5 - 198.5 - 197.5 - 197.5 -	20 4 2 35 6 7 7 7 3		20 40 6 30 23 23 25 26 26 36	<u>80</u> 80	Wys 16 17 18 19 20			(ppm)	WEI		
	- 26.5 - 26.5 - 27 - 27.5	195.5 - 195 - 194.5 - 194 -	▲ 15		26		21		00				
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CLIEN	IT: Welton & Innes Limited Partnership		PROJECT NO.: CT3087.02										RECORD OF:							
ADDR	ESS: 299 Lynden Road						MW101								/101					
CITY/I	PROVINCE: Brantford, Ontario		NO	RTH	IING	(m):	478 [′]	1511	1.77		E	EAS	TIN	G (I	3 (m): 563068.63 ELEV. (m) 221.44					
CONT	RACTOR: Profile Drilling Inc.				M	ETHO	OD: H	lollo	w S	Stem	Au	ger	+ N	Aud Rotary + Split Spoon Sampling						
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	(cm):	5	S	CREE									SEALANT TYPE: 2					
SAMP		EN I		SHE	CORING DYNAMIC CONE				NE		SHELBY SPLIT SPOON									
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	4 (I	(I 0 80 N-5 Blows 0 40	<pa) 120 ALUE 3/300r 0 60</pa) 	160 nm) 80	2	CO PL	NTEN (%) W.C. <u>0 60</u>	NT LL <u>80 80</u>)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS	
	loose, wet, grey SILT trace clay	- 28	193.5 -																	
	stiff to very stiff, wet, grey CLAYEY SILT	- 	193 -																	
		- 29	192.5 -	▲ 4					28 ■				23		100					
	loose wet grev	- 29.5	192 -																	
	SILT trace to some clay	- 30 - - - - 30.5	191 -																	
		- 31	190.5 -	4	4				31 ■			2	24	1	100					
		- 31.5	190 -																	
	Inferred BEDROCK	- 32	189.5 -	5	0/75			4					25		67					
7 0 0 7 0 0 7 0 0 7 0 0 7 0 0 7 0 0		- 	189 -																	
		- 33	188.5 -																	
	END OF BOREHOLE	_ 33.5	188 -	5	0/12							_	<u>5</u> 9		∖⊍∕					
							LOG	GED) BY	EN	ΛZ				DRI	LING [DATE: 1	15&168	417-June-2022	
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ADDR	ESS: 299 Lynden Road															<u>_BH</u>	<u>102</u>
CITY/F	PROVINCE: Brantford, Ontario		NC	RTHI	NG (m):	4781	301.	90		EAS	STIN	IG (m): 563826.99 ELEV. (m) 220.20				
CONT	RACTOR: Profile Drilling Inc.				METH	DD: H	ollov	/ Sten	n Au	ger	· + N	Aud Rotary + Split Spoon Sampling					
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	(cm):		SCREE	EEN SLOT #: SAND TYPE:						SEALANT TYPE: 2					
SAMP	LE TYPE AUGER DRIV	EN				G DYNAMIC CONE											
GWL (m) GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Blo 20	(kPa) 80 120 N-VALUE ows/300r 40 60	160 nm)	P 20	CONTE (%) L W.C	NT . LL	D	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS
	topsoil (250mm)	0	220 -	6													
	stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	- 0.5	219.5 - 219 - 218.5 -	5							1 2 3		13 100 100				
	compact, moist, brown SILT trace sand, trace clay	- 2.5	218 -		8						4		100				
	stiff to very stiff, grey	- 3.5	217 - 216.5 -	22							5		100				
	CLAYEY SILT trace sand with occasional silty clay layers	- 4 - - - 4.5	216 -	▲ 6							6		100				
		-5	215.5 - 215 -	▲ 6							7		100				
	moist to very moist	- 5.5 - - - - - - - -	214.5 - 214 -														
		- 6.5	213.5 - 213.5 - 213 -								0		100				
	wet	- 7.5 - 7.5 	212.5 -	▲ 6							9		100				
		- 8.5 - - - 9	211.5 -														
						LOGGED BY: EMZ							DRIL	LING [DATE: 2	28238	24-June-2022
	TERRAPEX					INPU	T BY	EMZ	<u>z</u>			I	MON	IITORII	NG DAT	E:	
							REVIEWED BY: VN PAGE 1 OF 4										
CLIENT: Welton & Innes Limited Partnership				PRO	DJECT	NO.:	СТ3	087.	02			F	RECO	RD OF:			
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ADDRESS: 299 Lynden Road													BH	102			
CITY/PROVINCE: Brantford, Ontario		NO	RTHING (m	: 4781	301.90	0	E	ASTI	NG	(m):	56382	6.99	ELEV.	(m) 220.20			
CONTRACTOR: Profile Drilling Inc.			METH	HOD: H	ollow	Stem	n Aug	er +	Mu	d Ro	tary +	Split S	poon S	ampling			
BOREHOLE DIAMETER (cm): 15 WELL DIA	METER	(cm):	SCRE	EN SLO	OT #:	SA	AND TY	YPE:				SE/		TYPE: 2			
SAMPLE TYPE AUGER DRIV	EN				D	YNA		ONE		5	HELB	<u>Y</u>	SPLI	T SPOON			
(II) TORM SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 80 12 (kPa) 40 80 12 	20 160 JE - Dmm) 0 80	▲ C0 PL 20	WATE ONTE (%) W.C.	NT LL 0 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	ش LABORATORY TESTING	WELL	REMARKS			
S Stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	= 9.5 = 10 = 10.5 = 11.5 = 12.5 = 12.5 = 13.5 = 13.5 = 14.5 = 14.5 = 15.5 = 16.5 = 16.5 = 17 = 17.5 = 18	Image: constraint of the second state of the second sta	20 40 6 ▲ 6 ▲ 6 59 ▲ 4	0 80				<u>8</u> 10 11 11 12 13 13 14									
	18.5	_							Ш								
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ADDRESS: 299 Lynden Road													BH	102
CITY/PROVINCE: Brantford, Ontario		NO	RTHING (m):	4781	301.9	0	EA	ASTIN	NG ((m):	56382	26.99	ELEV.	(m) 220.20
CONTRACTOR: Profile Drilling Inc.			METH	od: H	ollow	Stem	Auge	er +	Mud	d Ro	tary +	Split S	poon S	ampling
BOREHOLE DIAMETER (cm): 15 WELL DIA	METER	(cm):	SCRE	EN SLO	DT #:	SA	ND TY	PE:				SEA	ALANT 1	TYPE: 2
SAMPLE TYPE AUGER DRIV	EN I	<u> </u>	CORING	NGTH		YNAN WATEF		ONE		5		Y	SPLI	T SPOON
IN THE SOIL SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(kPa) 40 80 120 + N-VALU (Blows/300 20 40 60	0 160 E mm) 80	▲ C PL 20	ONTEN (%) W.C. 40 60	ν Τ LL 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	 □ □	Щ 201.5 - 200.5 - 200.5 - 199.5 - 199.5 - 198.5 - 199.5 -	20 40 60 10 4 9 4 4 12 14	80	20			Neg 16 17 17 18 19 20 21			SV/T (Ppm	LAB		
	- 21.5	1925-	17					22		100				
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CLIEN	T: Welton & Innes Limited F	Partnership					PR	OJE	CT NO	: C	Г308	37.0)2			F	RECO	RD OF:
ADDRE	ESS: 299 Lynden Road													BH	102			
CITY/P	ROVINCE: Brantford, Ontari	0	RTH	ING (m)	: 4781	301	.90		EAS	STIN	1G (m):	56382	26.99	ELEV.	(m) 220.20		
CONTR	RACTOR: Profile Drilling Inc.		METH	HOD: H	lollo	w Ste	m Aı	uger	· + N	Muc	d Ro	otary +	Split S	poon S	ampling			
BORE	HOLE DIAMETER (cm): 15		SCRE	EN SL	OT #	: [:	SAND	TYP	E:				SEA		TYPE: 2			
SAMPL	E TYPE AUGER	DRIVEN	<u> </u>	₽	SHF	CORING	B FNGTH		DYN/	AMIC FR	COI	NE		1	SHELB	Y	I SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTIO	ЛС	DEPTH (m)	ELEVATION (m)	40 (E	(kPa)) 80 12 N-VALt Blows/300) 40 6	20 160 JE - Dmm) 0 80	2	CONT (% PL W.(ENT) C. LL 60 8	- 30	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	d LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, CLAYEY SILT trace sand with occasional silty clay	192	20	14						23		100						
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Inferred BEDROC	K -s	31.5 18 32	88.5 -														
	END OF BOREHO	LE										52						
	TER		LOG	GED IT B`	вү: Е /: ЕМ	EMZ Z					LING I	DATE: 2 NG DAT	22&238 E:	24-June-2022				
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		m):	SURE	EN SLO		SAND								TPE: 2
		S⊦	EAR STRE	NGTH	WA		, 001	NE	_		new title	r e)		T SPOUN
INDERCONTION	DEPTH (m)		(kPa) = 40 80 120 1 N-VALU (Blows/300 20 40 60	2 160 E mm)	CON (' PL W 20 40	ITENT %) /.C. Ll	L 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
topsoil (150mm)	0 2				20 40			.,	Ĩ	_				
topsoil (150mm) stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers moist to very moist brown	$\begin{array}{c c} 0 & 2 \\ \hline 0.5 & 214 \\ \hline 1 & 2 \\ \hline 1 & 2 \\ \hline 1.5 & 213 \\ \hline 2 & 2 \\ \hline -1.5 & 213 \\ \hline -2 & 2 \\ \hline -3.5 & 212 \\ \hline -3.5 & 211 \\ \hline -3.5 & 211 \\ \hline -4 & 2 \\ \hline -3.5 & 211 \\ \hline -4 & 2 \\ \hline -5.5 & 209 \\ \hline -5.5 & 209 \\ \hline -6.5 & 208 \\ \hline -6.5 & 208 \\ \hline -7 & 24 \\ \hline -$	15 - 6 4.5	99		30 35 22 29 30 26 20 20			1 2 3 4 5 7 8		25 28 100 100 100				
	- 7.5 207 - 8 - 20 - 8 - 206 - 206 	7.5 07 - 6.5 - - - - - - - - - - - - -	5		19			9		100				
	20	06 –							П					
<u> </u>		_	Ι	LOG	GED BY:	EMZ			C	RIL		DATE: C	8&11-	July-2022
TERRAPEX		INPU	TBY: E	MZ			Ν	/ON	ITORI	NG DAT	E:			
▼			Γ	REVI	EWED B	Y: VN	1		F	PAGE	= 1 OF	4		

CLIENT: Welton	& Innes Limited F	Partnership					PRC	DJECT	' NO.:	CT	308	7.0	2		-	F	RECO	RD OF:
ADDRESS: 299	Lynden Road																BH	103
CITY/PROVINCE	Brantford, Ontar	10		NC	DRTHI	NG (m):	4780	958.4	9 01	E	EAS	TIN	G (I	m):	56337	/5.62		. (m) 215.13
CONTRACTOR:	Profile Drilling Inc			METH	OD: H		Sten	n Au	ger	+ N	/luc	I RO	tary +	Split S	poon S			
BOREHOLE DIAN	IETER (cm): 15	WELL DIAN	METER	(cm):		SCRE	EN SLO) #:	S	AND T	YPE	:				SE/		TYPE: 2
SAMPLE TYPE	AUGER	DRIV	EN I		C SHE	ORING	NGTH		DYNA WATE	MIC (NE I	_		SHELB	Y		IT SPOON
	SOIL ESCRIPTI	ON	DEPTH (m)	ELEVATION (m)	40 (B	(kPa) 80 120 N-VALUI lows/3000	0 160 E mm) 80	▲ (PL 20	CONTE (%) . W.C	NT . LL		SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS
Tion Stiff with o	f to very stiff, wet, CLAYEY SILT trace sand ccasional silty clay	grey y layers	9.5 - 10 - 10.5 - 11 - 11.5 - 12.5 - 12.5 - 13.5 - 13.5 - 14.5 - 15.5 - 16.5 - 16.5 - 17	205.5 - 204.5 - 204.5 - 204.5 - 204.5 - 203.5 - 203.5 - 202.5 - 202.5 - 202.5 - 202.5 - 202.5 - 202.5 - 202.5 - 202.5 - 200.5 - 200	20 20 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6	40 60	80		40 6 9 9 1 1			WWS 10 11 11 12 112 113 113 114 115		022 1000 1000 1000 1000	SV/T (Ppm		MEL	shelby tube sample: 9.8-10.4mbg
			- 17.5	197.5 - 197 -														
			_ 18.5	· ·	1												<u> </u>	
						┝	LOGO	GED B	Y: E	MZ_				DRIL	LING [DATE: (08&11-	July-2022
	TERRAPEX								EMZ	2			Ν	MON	IITORII	NG DAT	E:	
	V					[REVI	EWED	BY:	VN			F	PAG	E 2 OF	4		

CLIEN	T: Welton & Innes Limited Partnership					PRO	DJECT	⁻ NO.:	CT	308	7.0	2		-	F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road														BH	103	
CITY/F	PROVINCE: Brantford, Ontario	NC	RTHI	NG (m)	: 4780	958.4	19 0:	E	AS	TIN	G (m):	56337	5.62	ELEV.	(m) 215.13	
CONT	RACTOR: Profile Drilling Inc.		METH	IOD: H	lollow	Sten	n Aug	ger	+ N	/luc	l Ro	tary +	Split S	poon S	ampling		
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	: (cm):		SCRE	EN SLO	DT #:	S	AND T	YPE	:				SEA	ALANT 1	TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN I			ORING	I ENGTH		DYNA WATE	MIC (١E		S		Y	I∐ SPLI T	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (B 20	(kPa) 80 12 N-VALU lows/300 40 60	0 160 HE + Imm) 0 80	▲ (Pl 20	CONTE (%) - W.C 40 6	NT . LL		SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 19.5	196.5 - 196 - 195.5 - 195.5 -	7			2	7			16		100				
	compact, wet, grey SILT some clay	- 20.5 - 21 - 21 - 21.5 - 21.5	194.5 - 194 - 193.5 -		2		2	8			18		100				
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 22.5	193 - 192.5 - 192 - 192 -		2		2	7			19		28				
		- 24.5 - 24.5 - 25.5 - 25.5 - 25.5	191 - 190.5 - 190 - 189.5 -	8				35		2	20		100				
			1	LOGO	2 GED E	7 	MZ		22		100 DRIL	LING E	DATE: ()8&11	July-2022		
	TERRAPEX							EMZ	2			Ν	NON	ITORI	NG DAT	E:	
	V	Ē	REVI	EWED	BY:	VN			F	PAG	E 3 OF	4					

CLIEN	NT: Welton & Innes Limited Partnersh	ip			PF	OJEC	T NO.:	СТ	308	37.0	2		_	F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road														<u>_BH</u>	103
CITY/	PROVINCE: Brantford, Ontario		NO	RTHING	(m): 478	0958.	49		EAS	STIN	G (r	m):	56337	75.62	ELEV.	(m) 215.13
CONT	RACTOR: Profile Drilling Inc.			M	ETHOD:	Hollov	v Sten	n Au	iger	+ N	/lud	l Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL [DIAMETER	(cm):	SC	CREEN SI	_OT #:	S	AND .	TYPE	:	_			SE		TYPE: 2
SAMF	PLE TYPE AUGER D			COR SHEAR S	ING STRENGTH		DYNA WATE	MIC R	CON	NE		5		Y		T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(k 40 80 1 N-V (Blows 20 40	(Pa) 120 160 ALUE /300mm) 60 80	P 20	CONTE (%) L W.C 40 6	NT . LL	0	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	ی Laboratory Testing	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers Inferred BEDROCK	- 28	187 - - - - 186.5 -	50/10						10.01						
	LINE OF BOREHOLE		186.5	50/10						63						
					LOC	GED	BY: E	ΜZ			C	DRIL	LING [DATE: (8&11-	July-2022
	\\T TERRAPE		INP	UT BY	EM2	2			Ν	/ON	IITORII	NG DAT	E:			
1	*				RE\	/IEWE	D BY:	VN			F	PAG	E 4 OF	4		

CLIEN	IT: Welton & Innes Limited Partnership					PRO	DJEC	T NO.:	СТЗ	3087	7.02			F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road														MM	V104
CITY/I	PROVINCE: Brantford, Ontario		NC	RTH	IING (m)	4781	472.	49	E	AST	ING	(m):	56360	9.02	ELEV	. (m) 217.57
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	lollov	v Sten	n Aug	ger -	⊦ Mu	id Ro	otary +	Split S	poon S	Sampling
BORE	HOLE DIAMETER (cm): 15 WELL DIA	METER	(cm):	5	SCRE	EN SLO	:# TC	10 s/	AND T	YPE:	0			SE/	LANT	TYPE: 2
SAMP	PLE TYPE AUGER DRIV	EN I		SH	CORING	NGTH		DYNA			E		SHELB	Y		IT SPOON
GWL (m) GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	4	(kPa) 0 80 120 ¹ N-VALU Blows/300	0 160 E mm)▲	F	CONTE (%)	NT LL		SAMPLE NO. SAMPI F TYPF	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL NSTALLATION	REMARKS
	topsoil (220mm)	0	217.5 -	6			20	40 0				_				Bentonite
	stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers damp brown	- 0.5	217 - 216.5 - 216 - 216 -		11					2	3	17 			V	50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.24 mbg
		- 2.5 	215 - 214.5 -	9						2	4	100				
	moist grey	- 3.5	214 - 213.5 -	▲ 5							5 6	100 				Sand Screen + Sand
	wet	- 4.5	213 - 212.5 -	▲ 5						7	7	100				
	loose, wet, grey SILT some clay	- 6.5	212 - 211.5 - 211 -	▲ 5						٤	в	83				
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 7.5 	210.5 - 210 - 209.5 -	- - - - - - - - - - - - - - - - - - -						Ş	э	_ 100 _				
		- 8.5 - - - 9 -	209 - 208.5 -													shelby tube sample: 8.4-9.0mbg
						LOG	GED	BY: El	ΜZ			DRI	LING	DATE: 2	20&218	22-June-2022
	TERRAPEX					INPU	TBY	: EMZ				MON	ITORI	NG DAT	E: 29-	July-2022
	V					REVI	EWE	D BY:	VN			PAG	E 1 OF	4		

CLIEN	T: Welton & Innes Limited Partnersh	ip				PRC	DJEC	T NO.:	СТ	308	7.0	2			F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road															MW	/104
CITY/F	ROVINCE: Brantford, Ontario		NO	RTHI	NG (m):	4781	472	.49	1	EAS	TIN	G (r	m):	56360	9.02	ELEV.	(m) 217.57
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	ollo	v Sten	ו Au	ger	+ N	/lud	Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL [DIAMETER	(cm):	5	SCRE	EN SLO) (10 s/	AND 1	TYPE	: 0				SEA	ALANT T	TYPE: 2
SAMP	LE TYPE AUGER DI	RIVEN				NOTU		DYNA	MIC		NE		s	HELB	Y	SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Bl	(kPa) 80 12(N-∀ALU ows/300 40 60	2 160 mm) 80	▲ F 20	CONTE (%) PL W.C.	NT . LL 0 80	D	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 9.5 - 10 - 10.5 - 11 - 11.5 - 12 - 12.5 - 13 - 13.5	207.5 207.5 207.5 206.5 206.5 205.5 205.5 205.5 205.5	▲ 3 ▲ 4 ▲ 3	9						10		 100 100				
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 14 - 14.5 - 15 - 15.5	203.5	9 1 1 1							13		100				
		- 16.5 - 16.5 - 17 - 17.5 - 18.5	201.5 - 201 - 200.5 - 200.5 - - 200 - - - - - - - - - - - - - - - - - - -	2							15		100				
					Ļ	LOG	GED	BY: El	MZ			C	DRIL	LING E	DATE: 2	20&21&	22-June-2022
	TERRAPEX						ТBY	: EMZ	-			Ν	/ON	ITORI	NG DAT	E: 29-J	luly-2022
					1	REVI	EWE	D BY:	VN			F	PAG	E 2 OF	4		

CLIEN	T: Welton & Innes Limited P	artnership				PF	ROJE	CT NO	.: C1	F308	37.0	2		-	F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road												/104				
CITY/F	PROVINCE: Brantford, Ontario	0	RTH	ING (n T	n): 478	3147:	2.49		EAS	STIN	G (m):	56360	9.02	ELEV	. (m) 217.57	
CONT	RACTOR: Profile Drilling Inc.	· · · · · · · · · · · · · · · · · · ·			MET	HOD:	Hollo	ow Ste	m Aı	uger	+ N	/luc	l Ro	tary +	Split S	poon S	ampling
BORE			(cm):	5	SCF	EENS	LOT	#: 10	SAND	TYPE	E: 0				SE/		TYPE: 2
SAMP		DRIVEN		SHE	AR ST	G RENGTH	-	DYN. WAT	AMIC ER	CO	NE			HELB	Y e)	II SPLI	I SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTIC		ELEVATION (m)	40 (E	(kP:	a) 20 160 UE 00mm) 60 80		CONT (% PL W. 20 40	ENT 5) C. LL 60 8	-	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, g CLAYEY SILT trace sand with occasional silty clay	grey ayers 19 19.5 -20 -20.5 -21.5	199	2 4 5	³³						16 17 18		100				shelby tube sample: 19.1-19.7mbg
	loose, wet, grey SILT some clay	- 22 - 22.5 - 23 - 23.5	195.5 - - - 195 - - - - - - - - - - - - - - - - - - -	▲ 5							19		100				
	stiff to very stiff, wet, o CLAYEY SILT trace sand with occasional silty clay	grey - 24 layers - 24.5 - 25.5 - 26.5 - 26.5 - 27 - 27.5	193.5 - 193.7 - 192.5	1	1	17					20 21 21 22		100				
		<u>F</u>		L - ['			GGE	BY· I	- - M7		22	l l l	יייי ארי		DATE: 2	L 20&218	22-June-2022
	TFR	RAPFX				INP	UT B	Y: EN	Z				MON	ITORI	NG DAT	E: 29-	July-2022
			RE	VIEW	ED BY	: VN			F	PAG	E 3 OF	4					

CLIENT: Welton & Innes Limited Partnership	T: Welton & Innes Limited Partnership ESS: 299 Lynden Road										37.0)2			F	RECO	RD OF:
ADDRESS: 299 Lynden Road																MN	/104
CITY/PROVINCE: Brantford, Ontario	RESS: 299 Lynden Road //PROVINCE: Brantford, Ontario											IG (m):	56360	09.02	ELEV	. (m) 217.57
CONTRACTOR: Profile Drilling Inc.	PROVINCE: Brantford, Ontario TRACTOR: Profile Drilling Inc. EHOLE DIAMETER (cm): 15 WELL DIAMETER (cm)										· + 1	Muc	d Ro	otary +	Split S	poon S	ampling
BOREHOLE DIAMETER (cm): 15 WELL DIAM	IETER	(cm):	5	SCRE	EN S		·#: 1	10 s.	AND	TYPE	E: ())			SE	ALANT	TYPE: 2
SAMPLE TYPE AUGER DRIVE	N						D	YNA	MIC	COI	NE			SHELB	Y _		T SPOON
	DEPTH (m)	ELEVATION (m)	40 (Blc 20	R STRI (kPa) 80 12 I-VALU ws/300 40 60	0 160 JE)mm)		▲ C0 PL 20	WATE ONTE (%) W.C	NT		SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	መ LABORATORY TESTING	WELL INSTALLATION	REMARKS
vv stiff to very stiff, wet, grey vv CLAYEY SILT vv trace sand vv with occasional silty clay layers vv Inferred BEDROCK vv vv	- 28	189.5 - - - 189 -															
END OF BOREHOLE																	
						GGF	- D B/	 (* F	 M7			г 	וואכ			08218	22-June-2022
				ŀ			BY.	EM7	7			\mid			NG DAT	E: 29-	Julv-2022
	TERRAPEX					VIE	VED	BY:	VN				PAG	E 4 OF	4	(,

CLIEN	IT: Welton & Innes Limited Partnership					PRO	DJECT	NO.:	СТ	308	37.0	2		-	F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road															BH	105
CITY/I	PROVINCE: Brantford, Ontario		NO	RTHI	NG (m):	4781	159.7	9		EAS	TIN	IG (m):	56331	8.41	ELEV.	(m) 221.24
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	ollow	Sten	n Au	ger	+ N	Лuc	d Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	(cm):		SCRE	EN SLO	DT #:	S	AND 1	TYPE	:				SE/		TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN		C SHE/	ORING	NGTH		OYNA WATE	R		NE			(new title	Y	I SPLI	T SPOON
GWL (m) GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Bl 20	(kPa) [■] 80 120 N-VALU ows/300 <u>40 60</u>	2 160 E mm)▲	C PL 20	ONTE (%) W.C <u>40 6</u>	:NT . LL 60 80	0	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS
	topsoil (230mm)	0		4													
	stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	- 1.5	220.5	4							1 2 3A		25 50 100				
	loose to compact, moist to wet, brown		219.5 -								20						
	SILT	-								зБ							
	trace sand, some clay	- 2.5	219 - - - 218.5 - - -	1	7						4		100				
		- 3.5	218 – - - 217.5 –	4 11							5		83				
	stiff to very stiff, grey	-4 - - 	217 -	8							6		22				
	CLAYEY SILT trace sand with occasional silty clay layers	- 4.5 - - - 5 -	216.5 - - - - - 216 -	5							7		100				
	very moist	- 5.5 	- - 215.5 - - -								-						
		- 6.5	215 - - - 214.5 - -	▲ 5	82						8		100				
		- 7.5	214 - - - 213.5 -										100				
	wet	213 -	6							9		100					
		-9	212.5 - - - 212 ⁻														
				4		LOG	GED B	Y: E	MZ					LING E	DATE: 1	3&148	15-June-2022
	TERRAPEX						T BY:	EMZ	2			1	MON	ITORI	NG DAT	E:	
	V					REVI	EWED	BY:	VN			F	PAG	E 1 OF	4		

CLIEN	IT: Welton & Innes Limited Partnership			PRO	DJECT	⁻ NO.:	CT3	3087	7.02			F	RECO	RD OF:		
ADDR	ESS: 299 Lynden Road														BH	105
CITY/	PROVINCE: Brantford, Ontario		NC	ORTHI	NG (m)	4781	159.7	79	E	AST	ING	(m):	5633′	18.41	ELEV.	(m) 221.24
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	ollow	Sterr	n Aug	ger -	⊦ Mi	ud R	otary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIA	METER	t (cm):		SCRE	EN SLO	DT #:	S	AND T	YPE:				SE	ALANT 1	TYPE: 2
SAMP	DE TYPE AUGER DRIV	/EN	/		ORING	NGTH		DYNA WATE	MIC (E		SHELB	Y	I SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (B 20	(kPa) 80 12 N-VALU lows/300 40 60	0 160 E + mm) 0 80	▲ (PL 20	CONTE (%) - W.C. 40 6	NT LL 0 80		SAMPLE NU.	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers loose, wet, grey SILT	- - - - - - - - - - - - - - - - - - -	211.5 - 211 -	- 6 						1	0	100				
	trace sand, trace clay	- 10.5 - 11 - 11 - 11.5	210.5 - 210 -	- - - - - - - - - - - - - - - - - - -						1	1	56				
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 12 - 12.5 - 13	209.5 - 209 - 208.5 - 208 -	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2						1	2	100				
		- 13.5 - 14 - 14 - 14.5	207.5 - 207 - 206.5 -							1	3	56				
		- 15.5	206 - 205.5 - 205 -		2					1	4	100				
		- 16.5 - 17 - 17 - 17.5 - 17.5 - 18 - 18	204.5 - 204 - 203.5 - 203 -	6						1	5	100				
		∟ 18.5	I	11				 }Y+ ⊑I	ш L MZ	1		יפח יפח			 3&14&	15lune-2022
	TERRADEY	•			ŀ	INPI	T RY	EM7			+	MOI			E:	
		-	REVI	EWED) BY:	VN		+	PAG	E 2 OF	- 4					

CLIENT: Welton & Innes Limited Partnership	IENT: Welton & Innes Limited Partnership DDRESS: 299 Lynden Road											F	RECO	RD OF:
ADDRESS: 299 Lynden Road				4704	450 7								ВП	
CITY/PROVINCE: Brantford, Ontario		NORT	HING (m):	4781	159.7	9	E/	AST	ING	6 (m):	56331	18.41	ELEV.	(m) 221.24
CONTRACTOR: Profile Drilling Inc.		```	METH	OD: H		Stem	Aug	er +	- IVI	ua R	stary +		poon S	
BOREHOLE DIAMETER (cm): 15 WELL DIAM		:m):	SCRE	EN SLO) #:	SA SA		(PE:		П				TYPE: 2
SAMPLE TYPE AUGER DRIVE	N	Sł	CORING IEAR STRE	NGTH		WATE	AIC CO R		-	┛	SHELB	Y e)		I SPOON
	DEPTH (m)	ELEVATION (m)	(kPa) 40 80 12(' N-VALU (Blows/300 20 40 60	0 160 mm) 80	▲ C PL 20	ONTEI (%) W.C. 40 60	NT LL) 80	SAMPLE NO	SAMPLE NO.	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
S Stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers Compact, wet, grey SILT some clay		Image: Constraint of the second se	9	80	20			11 11 11 11 21			AS (p)	LA TE	NN	
F MMM E	19	3.5 📕 🛉	12					2	2	100				
			ļ	LOGO	GED B	Y: EN	ΛZ		+	DRI	LLING [DATE: 1	3&14&	15-June-2022
			Ļ	INPU	T BY:	EMZ				MO	NITORI	NG DAT	E:	
				REVI	EWED	BY:	VN			PAC	GE 3 OF	4		

CLIEN	T: Welton & Innes Limited P			PR	DJEC	T NO.	: C1	Г308	87.0	2		-	F	RECO	RD OF:				
ADDR	ESS: 299 Lynden Road																BH	105	
CITY/F	PROVINCE: Brantford, Ontari	0		NC	RTH	ING (m)): 4781	159	.79		EAS	STIN	G (I	m):	56331	8.41	ELEV.	. (m) 221.24	
CONT	RACTOR: Profile Drilling Inc.	1				METH	HOD: H	lollo	v Stei	n Au	uger	+ N	/luc	l Ro	otary +	Split S	poon S	ampling	
BORE	HOLE DIAMETER (cm): 15	WELL DIAN	IETER	(cm):		SCRE	EEN SLO	OT #:	5	SAND	TYPE	:				SE	ALANT 1	TYPE: 2	
SAMPI	LE TYPE AUGER	DRIVE	EN			ORINC	ENGTH		DYNA	MIC ER	CON	NE			SHELB	Y	I SPLI	T SPOON	
GWL (m) GWL (m)	SOIL DESCRIPTIC	NC	DEPTH (m)	ELEVATION (m)	40 (B 20	(kPa) 80 12 N-VALt Blows/300	20 160 JE Omm) 0 80	F 20	CONT (%) PL W.C	ENT)))))))))))))))))))	-	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV	ع Laboratory Testing	WELL INSTALLATION	REMARKS	
	CCLAYEY SILT some clay stiff to very stiff, wet, g CLAYEY SILT trace sand with occasional silty clay Inferred BEDROCI	y grey r layers	28.5 29 29.5 30 30.5 31 31.5 31.5 32 32.5 33.5	193 - 192.5 - 192.5 - 192.5 - 192.5 - 192.5 - 190.5 - 190.5 - 190.5 - 189.5 - 189.5 - 188.5 - 188.5 -	(e) 20 3 50 50	0/10 ▲ 	0 80	20		LL 60 8		223 224 25		100 100 100	SV/TG (ppm.	LABO	MEIT		
							LOG	GED	BY: E	EMZ 7			C	DRIL	LING	DATE: 1	13&148	15-June-2022	
	V IER		INPU	I BY	: EM	۷			N	NON	NIIORI	NG DAT	E:						
	V		REV	EWE	D BY:	VN			F	PAG	E 4 OF	4							

CLIEN	T: Welton & Innes Limited Partnership			PRO	DJECT	NO.:	CT	308	7.02	2			F	RECO	RD OF:		
ADDR	ESS: 299 Lynden Road															BH	106
CITY/F	ROVINCE: Brantford, Ontario		NO	RTHI	NG (m):	4780	769.7	78	E	EAS	TIN	G (r	m):	56326	51.31	ELEV.	. (m) 216.56
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	ollow	Sten	n Au	ger	+ N	lud	Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIA	METER	(cm):		SCRE	EN SLO	DT #:	S	AND T	YPE	:				SEA	ALANT 1	TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN T				NGTH		DYNA WATE	MIC (R	CON	1E	_	S	HELB	Y _	L SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Bk	(kPa) 80 120 N-VALU ows/300 40 60	0 160 E ▲ mm)	(PL 20	CONTE (%) - W.C	NT . LL 0 80		SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS
	topsoil (150mm)	0	216.5 -							<u> </u>							
	stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers moist brown	-0.5 -1 -1.5 -2.5 -3.5 -3.5 -4.5 -4.5 -5.5 -6.5	216 - 215.5 - 215.5 - 214.5 - 214.5 - 214.5 - 214.5 - 213.5 - 214.5 - 2115.5 - 214.5 - 211.5 -	 7 12 10 7 5 5 5 111 	2						1 2 3 4 5 6 7 8		25 100 100 100 100				
		-7 -7.5 -8	209.5 - 209 - 208.5 -	5							9		100				
		- 8.5 - - - 9	208 -														
					Ļ	LOG	GED E	BY: E	MZ			C	RIL	LING E	DATE: 1	2&13-	July-2022
	\\TERRAPEX	L	INPU	T BY:	EMZ				Ν	/ON	ITORI	NG DAT	E:				
1	ΤΕΚΚΑΡΕΧ						EWED	BY:	VN			F	PAGI	E 1 OF	4		

CLIEN	NT: Welton & Innes Limited Partnership			PRO	OJEC	T NO.:	СТ	308	37.0	2			F	RECO	RD OF:		
ADDF	RESS: 299 Lynden Road															<u>_BH</u>	106
CITY/	PROVINCE: Brantford, Ontario		NO	RTHIN	IG (m)	: 4780	769	.78		EAS	STIN	IG (m):	56326	61.31	ELEV.	(m) 216.56
CONT	TRACTOR: Profile Drilling Inc.				METH	IOD: H	lollo	v Sten	n Au	iger	+ 1	Лuc	l Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIA	METER	(cm):	_⊥	SCRE	EN SLO	DT #	S	AND -	TYPE	E:	_			SEA		TYPE: 2
SAMF	PLE TYPE AUGER DRIV	EN						DYNA	MIC	CON	NE		S	SHELB'	Y		T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Bk	(kPa) 80 12 N-VALt ows/300 40 60	0 160 E	▲ F 20	CONTE (%) PL W.C	. LL	0	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	ع Laboratory Testing	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand	- 9.5	207 -	4							10		100				
	with occasional silty clay layers	- - - 10	- 206.5 -		88 •												
	SILT trace sand, some clay	- - - 10.5	206 -														
		- 11	- - 205.5 —	▲ 5							11		100				
		- - - - 11.5	205 -														
		- 12															
		- - - - 12.5		▲ 5							12		67				
		- 13	204 -														
			203.5 - - -														
		- 13.5	203 -								13		100				
		- 14 - - -	202.5 -										100				
		- 14.5 - -	202 -														
		15	201.5 -								-						
		- 	201 -	▲ 9							14		100				
	stiff to very stiff, wet, arev	- 16	200.5 -														
	CLAYEY SILT trace sand with occasional silty clay layers	- - 16.5	200 -														
		- 17	199.5 -	4							15		100				
		- - - 17.5	- - 199 -														
		- 18	- - 198.5 –														
		-	-									Π					
		∟ 18.5	-	1					ш M7				ואכ		 ז⊿ד⊏י 1	 2&13-	l July-2022
	TERRADEY				ŀ	INPL	TRY	: EM7	7							E:	July 2022
		F	REVI	EWE	D BY:	VN				PAGI	E 2 OF	4					

CLIENT: Welton & Innes Limited Partnership				PRC	JECT NO.:	CT3087	.02	F	RECO	RD OF:
ADDRESS: 299 Lynden Road				1700	700 70	- LEVOT		500004.04		
		NO	KIHING (m): 4780	109.18	EAST		503261.31	LEV.	(m) ∠10.50
CONTRACTOR: Profile Drilling Inc.		(000);	ME	THOD: H		n Auger +	iviua Ro	tary + Split S	poon Sa	
BOREHOLE DIAMETER (Chi): 15 WELL DIA		(cm):								
			SHEAR S	TRENGTH	WATE			(new title)		I SFOON
INDERVISED SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(Ki 40 80 	² a) 120 160 ↓LUE + 300mm) 60 80	CONTE (%) PL W.C 20 40 6	ENI CZ LL ⊡ 60 80 00	SAMPLE TYPE RECOVERY (%	SV/TOV (ppm or %LEL) LABORATORY TESTING	WELL INSTALLATION	REMARKS
stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 19 - 19 - 19.5	198 - 	7				5 100			
	- 20	196.5 — 	▲ 6			1	7 100			
	- 21	196 — - - 195.5 — -								
	- - 21.5 - - - 22	195 – 	▲ 8			1	3 100			
	- 22.5	194 - 193.5 -				11				
	- 23.5	193 - 								
	- 24.5	192 - 192 - 191.5 -	▲ 12			20	100			
compact to loose, wet, grey SILT some clay	- 25.5	191 - 								
	- 26.5	190.9 - - - - - - - - - - -				2	1 100			
	- 27 - - - 27.5	189.5 - - - 189 -	9			22	2 100			
	. I			LOGO	GED BY: E	MZ	DRIL	LING DATE: 1	12 <u>&1</u> 3-J	uly-2022
TERRAPEX				INPU	TBY: EM2	2	MON	IITORING DAT	E:	
· · · · · · · · · · · · · · · · · · ·				REVI	EWED BY:	VN	PAG	E 3 OF 4		

CLIEN	IT: Welton & Innes Limited Partnership			PR	OJEC	CT N	0.: C	CT30	87.0)2			F	RECO	RD OF:		
ADDR	ESS: 299 Lynden Road															BH	106
CITY/I	PROVINCE: Brantford, Ontario		NC	RTH	IING (m) T	: 4780	0769	.78		EA	STIN	1G (m):	56326	51.31	ELEV.	(m) 216.56
CONT	RACTOR: Profile Drilling Inc.				METH	IOD: F	lollo	w St	em A I	Auge	r +	Mud	d Ro	otary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	: (cm):		SCRE	EN SL	OT #	: 	SAN	D TYF	ΡE:				SE	ALANT 1	IYPE: 2
SAMP	PLE TYPE AUGER DRIVI	EN I		SH	CORING	i ENGTH		IYD WA		c cc	NE			SHELB	Y	∐ SPLI T	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	4	(kPa) 0 80 12 N-VALU Blows/300 0 40 60	0 160 HE + Imm) 0 80	2	CON (PL W 0 40	NTENT %) √.C. L <u>60</u>	- _L _80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	с LABORATORY TESTING	WELL INSTALLATION	REMARKS
	loose, wet, grey SILT some clay stiff to very stiff, wet, grey	- 28	188.5 -														
	CLAYEY SILT trace sand with occasional silty clay layers	- 29 - 29 - 29 - 29.5	188 -	8							23		100				
	Inferred BEDROCK		187-														
	END OF BOREHOLE		<u> </u>	5	0/10 🔺			\uparrow		1	124		v			1	
1					ļ	LOG	GED	BY:	EM2	Z			DRII	LING [DATE: 1	2&13-	July-2022
	V TERRAPEX	Ļ	INPL	IT BY	': El	MZ				MON	ITORI	NG DAT	E:				
1	¥					DEV		ים ח:	v. \/I	м		1					

CLIEN	T: Welton & Innes Limited Part			PRO	OJEC	T NO.:	СТЗ	087.0)2			R	ECO	RD OF:		
ADDR	ESS: 299 Lynden Road														MV	/107
CITY/F	PROVINCE: Brantford, Ontario		NC	ORTH	ING (m):	4780	816.	53	E	ASTIN	NG ((m):	56341	0.23	ELEV	. (m) 215.92
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	lollov	/ Sterr	n Aug	er + S	Spli	t Sp	oon S	ampling	1	
BORE	HOLE DIAMETER (cm): 15 W		ER (cm):	5	SCRE	EN SLO	OT #:	10 s/	AND TY	YPE: ()			SEA		TYPE: 2
SAMP	LE TYPE AUGER	DRIVEN		L SH	CORING	NGTH			MIC C	ONE		S	HELB	Y _	SPL	IT SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	4	(kPa) 0 80 120 1 N-VALU Blows/300	0 160 E ▲ mm)▲	P 20	CONTE (%) L W.C.	NT LL 0 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL	REMARKS
	topsoil (200mm)	0		- 7												Bentonite
	stiff to very stiff CLAYEY SILT trace sand with occasional silty clay lay	yers - 0.5 yers - 1 moist - 1.5 brown - 2 - 2.5	215.5 - 215 - 215 - 214 - 214 - 213 - 213 -		12					1 2 3 4 5		42 56 100 100				50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.12 mbg Sand Screen + Sand
	v	rery moist grey - 4.5	212.5 - 212 - 5 211.5 -							6		100				
			211 - 210.5 - 210 - 209.5 -		11					8		100				
		wet 7.5	209 · 208.5 · 208 · 208 · 207 · 207 ·		10					9		100				
						LOG	GED	BY: El	ΜZ	_	Γ	DRIL	LING E	DATE: 1	8&19-	July-2022
	TERRA		INPU	T BY	EMZ				MON	ITORI	NG DATI	E: 29-	July-2022			
	V	Γ	REVI	EWE	DBY:	VN			PAG	E 1 OF	2					

CLIEN	T: Welton & Innes Limited Partnersh	nip			PRC	DJECT	NO.:	CT30)87.0	02			R	ECO	RD OF:
ADDR	ESS: 299 Lynden Road													MN	/107
CITY/F	PROVINCE: Brantford, Ontario		NO	RTHING (m)	: 4780	816.53	3	EA	STIN	NG ((m):	56341	0.23	ELEV.	(m) 215.92
CONT	RACTOR: Profile Drilling Inc.			METH	IOD: H	ollow	Stem	Auge	er + 3	Spli	it Sp	oon S	ampling]	
BORE	HOLE DIAMETER (cm): 15 WELL I	DIAMETER	(cm):	5 SCRE	EN SLO	DT #: 1	0 SA	ND TY	PE: ()			SEA		TYPE: 2
SAMP	LE TYPE AUGER D	RIVEN		CORING) ENGTH		YNAN NATEI		DNE				۲ Y	L SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(kPa) 40 80 12 	0 160 JE ')mm)	▲ Co PL 20	ONTEI (%) W.C.	LL 1 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
80	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	円 -9.5 -10 -10.5 -11 -11.5 -12 -12.5	206.5 - 206.5 - 205.5 - 205.5 - 204.5 - 204.5 - 204.5 -	20 40 6 ↑ 7 • 9 • 9 • 5				3 80	10		<u><u></u><u></u><u></u> 100 100</u>	SV/			
									<u> </u>						
		ŀ	LOG	GED BY	/: EN	ΛZ			DRIL	LING [DATE: 1	8&19-、	July-2022		
	TERRAPE	TERRAPEX									MON	IITORII	NG DATI	E: 29-J	July-2022
1	*				REV/I	EWED	BV.	VN			PAG		: 2		

CLIEN	IT: Welton & Innes Limited Partnership		PRO	OJECT	NO.: C	T308	7.02		-	R	ECO	RD OF:		
ADDR	ESS: 299 Lynden Road												MV	108
CITY/F	PROVINCE: Brantford, Ontario		NO	RTHING (n I	n): 478 0	0908.1	2	EAS	TING	(m):	56353	8.86	ELEV	. (m) 220.19
CONT	RACTOR: Profile Drilling Inc.		<i>(</i>)	MET	HOD: H	lollow	Stem A	uger	+ Spl	it Sp	oon Sa	ampling	 	
BORE			(cm):						: 0			, SEA		TYPE: 2
SAMP	LE TYPE DRIVE	=N		SHEAR ST	RENGTH		WATER				(new title	<u> </u>		IT SPOON
GWL (m) GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(KP) 40 80 - - N-VAI (Blows/3	a) 120 160 UE 1 00mm)	PL 20	ONTENT (%) W.C. L	.L	SAMPLE NO. SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	topsoil (230mm)	0	220 -				1							Bentonite
	stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	- 0.5	219.5 -	7					2	67				50 mm monitoring well was installed. Water level measured on July 29, 2022: 3.48 mbg
		-2	218.5 - - - 218 -	12					3	100				
	siLT siLT trace sand, trace clay	-2.5	217.5 - -	24					4	100				Sand
			217 - - 216.5 -	21					5	100				
	stiff to very stiff, grey CLAYEY SILT trace sand with occasional silty clay layers	- 4 - - - 4.5	216 -	▲ 10					6	100				
			215.5 - - 215 -	7					7	100				
	very moist	- 5.5 - 6 - 6.5 - 7	214.5 - 214 - 214 - 213.5 -	7					8	100				
	wet	- 7.5	213 - 212.5 - 212 - 212 - 212 -	6					9	100				
		-9												
		-	211 -						_μ					
					LOG		Y: EMZ	<u></u>	+	DRIL	LING D	ATE: 1	8-July	-2022
			INPU	FBY:			+				:: 29-	July-2022		
			REVI	IEWED	RA: AL	N		۲AG	E 1 OF	2				

CLIENT: Welton & Innes Limited Partnership				PRC	DJECT	NO.:	СТЗС)87.0)2			R	ECO	RD OF:
ADDRESS: 299 Lynden Road													MN	/108
CITY/PROVINCE: Brantford, Ontario		NO	RTHING (m)): 4780	908.1	2	EA	STIN	IG (m):	563538	.86	ELEV.	(m) 220.19
CONTRACTOR: Profile Drilling Inc.			METH	HOD: H	ollow	Stem	Auge	er + S	Spli	t Sp	oon Sa	mpling		
BOREHOLE DIAMETER (cm): 15 WELL DIAM	NETER	(cm):	5 SCRE	EEN SLO	DT #: 1	10 SA	ND TY	PE: ()			SEA	LANT T	TYPE: 2
SAMPLE TYPE AUGER DRIV	EN		CORING SHEAR STR	G ENGTH		YNAN WATER	AIC CO R	ONE		5	SHELBY			T SPOON
	DEPTH (m)	ELEVATION (m)	(kPa) 40 80 12 • N-VALU (Blows/300 20 40 6) 20 160 9E - 0mm) 0 80	▲ C PL 20	ONTE (%) W.C. 40 60	NT LL) 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
Stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers Ioose, wet, brown SILT trace sand, trace clay Stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers END OF BOREHOLE	- 9.5 - 10 - 11.5 - 11.5 - 12.5	210.5 210- 209.5 208.5 208.5	(BIOWS 300 20 40 6 ▲ 6 ▲ 8 ▲ 5		20			10 11 12		100 100	SV/TC	LABO	METT	
							47							0000
	TERRADEY										LING DA	ATE: 1	8-July-	2022
	TERRAPEX											JATE E	:: 29-J	July-2022

CLIEN	T: Welton & Innes Limited Partnership			PRO	DJECT	' NO.:	СТ	308	87.0	2			F	RECO	RD OF:		
ADDR	ESS: 299 Lynden Road															<u> </u>	109
CITY/F	PROVINCE: Brantford, Ontario		NC	RTHIN	IG (m):	4780	870.5	59		EAS	STIN	G (r	n):	56364	7.58	ELEV	. (m) 216.02
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	ollow	Sten	n Au	iger	+ N	Лud	Ro	tary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIAI	METER	(cm):		SCRE	EN SLO	DT #:	S	AND	TYPE	:		-		SEA	ALANT '	TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN				NGTH		DYNA WATE	MIC	COI	NE		S	HELB	Y	SPL	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (Blo	(kPa) 80 12(N-VALU bws/300	0 160 E ▲ mm) 80	0 PL 20	CONTE (%) . W.C 40 6	NT . LL	0	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	topsoil (230mm)	0	216	7													
	topsoil (230mm) stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers moist brown 	-0.5 -1.5 -1.5 -2.5 -3.5 -4.5 -5.5 -6.5 -6.5 -7	215.5 215.5 215.5 214.5 214.5 214 213.5 215.5 213.5 213.5 213.5 213.5 213.5 213.5 213.5 213.5 215.	 ↓ 11 ↓ 11 ↓ 9 ↓ 9 ↓ 6 ↓ 10 ↓ 115 	5						1 2 3 4 5 6 7 8		63 100 100 100 100				
	CLAYEY SILT trace sand with occasional silty clay layers	- 7.5	208.5 -	5							9		100				shelby tube sample:
		- 9	207.5 -														8.2-8.8mbg
						LOG	GED B	Y: E	ΜZ				RILI	LING	DATE: C	6&078	08-July-2022
	TERRAPEX		Γ	INPU	T BY:	EMZ	2			Ν	ION	ITORI	NG DAT	E:			
	V		REVI	EWED	BY:	VN			F	AGE	1 OF	4					

CLIEN	T: Welton & Innes Limited Partnership					PR	OJEC.	T NO.:	СТЗ	3087	7.02	2		F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road														BH	109
CITY/F	PROVINCE: Brantford, Ontario		NO	RTH	NG (m)	: 4780	870.	59	E	EAST	ΓINC	6 (m)	: 5636	47.58	ELEV.	(m) 216.02
CONT	RACTOR: Profile Drilling Inc.				METH	OD: H	lollow	Sten	n Aug	ger -	+ M	ud F	lotary	+ Split S	ipoon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIAM	METER	(cm):		SCRE	EN SL	OT #:	S	AND T	YPE:				SE		TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN				NGTH		DYNA	MIC (E		SHEL	3Y		T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	40 (B 20	(kPa) 80 12 N-VALU lows/300 40 60	0 160 E ' mm) 0 80	▲ P 20	CONTE (%) L W.C 40 6	NT . LL		SAMPLE NO.	SAMPLE LYPE RECOVERY (%)	SV/TOV	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 9.5	206.5 - 206 - 206 - 205.5 - 205.5 -	4						1	1	10	D			
		- 11 - 11.5 ; - 12 - 12	205 - - 204.5 - - - - - - - - - - - - - - - - - - -		19					12	2A	⊥ 10	0			
	loose to compact, wet, grey SILT trace to some clay	- 12.5 ; - 13 - 13.5 ;	203.5 - - - 203 - - - - - - - - - - - - - - - - - - -							12	2B					
		- - 14 - 14.5 ; 	202 - 	4						1	3	10	0			
		- 15.5 ; - 16.5 - 16.5 - 17	200.5 - - 200 - - 200 - - - - 199.5 - - - - - - - - - - - - - - - - - - -	25)					1	14	10	0			
		- - - - - - - - - - - - - - - - - - -	198.5 - 													
					ŀ	LOG	GEDE	BY: E	MZ		+	DR	ILLING	DATE: (06&078	08-July-2022
	TERRAPEX				ŀ	INPU	IT BY:	EMZ	-		+	MC	NITOR	ING DAT	E:	
1						REVI	EWEI	D BY:	VN			PA	GE 2 O	F 4		

CLIEN	T: Welton & Innes Limited Partne	ership			PRO	DJECT	NO.:	СТ30)87.0)2			R	ECO	RD OF:
ADDR	ESS: 299 Lynden Road							_						ВН	109
CITY/F	PROVINCE: Brantford, Ontario		NO	RTHING (n	n): 4780	870.59	9	EA	STIN	NG (m):	563647	7.58	ELEV.	(m) 216.02
CONT	RACTOR: Profile Drilling Inc.			MET	HOD: H	ollow	Stem	Auge	er + I	Muc	d Ro	tary + S	Split	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WE		(cm):	SCR	EEN SLO	OT #:	SA	ND TYI	PE:				SEA		YPE: 2
SAMP	LE TYPE AUGER	DRIVEN		CORIN SHEAR ST	G RENGTH		YNAN VATER		DNE		l s				T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	(kPa 40 80 	a) 20 160 UE D0mm) 60 80	▲ C0 PL 20	ONTEN (%) W.C. 40 60	IT LL <u>80</u>	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
	compact, wet, grey SILT trace to some clay	- 19	197.5 _ - - 197 _						16		100				
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay laye	- 19.5 - 20 - 20.5	196.5 – 196 – 196 – 195.5 –	▲ 6					17		100				
		21.5	195 - - - 194.5 - - - - - 194 - - - - -	9					18		100				
		- 22.5 - 23 - 23.5	193.5 - - - 193 - - - - - - - - - - - - - - - - - - -	7					19		100				
	very loose to loose, wet, gre SILT trace to some clay	24 - 24.5 - 25	192 - - - 191.5 - - - - - - - - - - - - - - - - - - -	9					20		100				
		- 25.5 - 26 - 26.5 - 27	190.5 	▲ 3					21		100				
		- 27.5	188.5						20	\square	100				
				4				47	22	μ.	001		ATE: 0		08 101/ 2022
		DEV						ΊZ						ro&U/& ⊑.	06-JUIY-2022
	V IEKKA	ΓΕΛ						/NI		+				=:	
					I REVI	EWED	BA: /	/N			PAGI	E 3 OF 4	7		

CLIEN	IT: Welton & Innes Limited Partnership						PRO	OJEC	CT N	0.:	CT	308	7.0	2			F	RECO	RD OF:
ADDR	ESS: 299 Lynden Road																	BH	109
CITY/	PROVINCE: Brantford, Ontario		NO	RTH	ING	(m): 4	4780	870	.59		E	EAS	TIN	IG (m):	56364	47.58	ELEV	. (m) 216.02
CONT	RACTOR: Profile Drilling Inc.				ME	тно	D: H	lollo	w S	tem	Au	ger	+ N	Лuc	d Ro	otary +	Split S	poon S	ampling
BORE	HOLE DIAMETER (cm): 15 WELL DIAI	METER	(cm):		SC	REE	N SLO)	:	SA	ND 1	TYPE	:				SE	ALANT	TYPE: 2
SAMP	LE TYPE AUGER DRIV	EN			CORI	NG			DY	NAM	IIC (CON	NE			SHELB	Y	SPLI	T SPOON
GWL (m) SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHI 4 (I	EAR S (k 0 80 N-V/ Blows/	TREN Pa) 120 ALUE /300mr	GTH 1 <u>60</u> n) 80	21		ATER NTEN (%) W.C.	R NT LL		SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL)	ھ LABORATORY TESTING	WELL	REMARKS
	stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	- 28 - 28.5 - 28.5 - 29	188 - 		16				<u> </u>			2	23A		96				
	Inferred BEDROCK												<u>23</u> 5	±					
							LOG	GED	BY:	ΕN	١Z				DRII	LING	DATE: (06&078	08-July-2022
	TERRAPEX						INPU	ΤB	/: E	MZ					NON	NITORI	NG DAT	E:	
1	*						REVI	EWE	ED B	Y: \	٧N				PAG	E 4 OF	4		

LOG OF BOREHOLE 1

	PROJECT: Proposed Residentia	a <u>t Subd</u> den Ro	ivisie ad	on Brant	ford (Intorio				<u>:</u> די ידי	26 Fe Solid	<u>bruar</u> Storn	y 200 Augo	7				
	CLIENT: First Urban Inc.		, 				<u>_</u>	ELEV			UM:	G	eodeti	<u>c</u>			FILE:	1-1
	SOIL PROFILE		1	SAME	LES	ш	PEN	TRATIC	N	~							0	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	ТүрЕ	"N" VALUES	ELEVATION SCAL	SHE 0 (20 4 AR STF JNCONF POCKET 20 4	PLOT CENG INED PEN. O 6	30 8 TH kPa + ×	I FIELD	VANE	PLASTI LIMIT		URAL TURE TENT 	LIQUID LIMIT ——– T(%)	(mdd) VAPOUR	INS R
221.3	300mm TOPSOIL	<u></u>		+	 -			1					1		· · ·			
0.3	Weathered / Disturbed	XXX	1	AS		221									0			
	trace organics		1-	•		221												
220.5		- 14	2	SS	13		Ι.								0			
1.0	CLAYEY SUT TO SUTY CLAY		1_															
	trace to some sand,					220				-								
	stiff, brown, moist		3	SS	15						1	50kPa			0			
219.2				1				Ì										
2.3	· · · · ·		1		1	219		R.SA.SI	CL									
	SILT - Dilatant,		4	55	12			4.81.1	5									
	trace to some clay, trace to some sand.			<u> </u>	-													
	compact, brown, very moist to wet		5	SS	15									C	5			
			_	+	-	218												
						217												
216.8	· · · · · · · · · · · · · · · · · · ·		6	SS	5				FOLDE						0			
4.1	SILTY CLAY	1H	┢	ļ	-				oukra					C	þ			
	trace sand		1															
	TO CLAY		1			216	H											
	(with intermittent wet dilatant		1															
	fine sand / silt lenses),]—		-				50kPa					:				
	tirm to stiff, brownish grey, moist to wet		7	ss	9	215									0			
			┢──		ł													
			1															
		KX	1															
		HH	<u> </u>			214												
		TH .	8	SS	8			n. SA.SI. 0.46.5	UL 14	75KP	d				I	•		
8.1	End of Borehole	-ki N	1															
							•											
				ĺ					I									
						:	1									ļ		



LOG OF BOREHOLE 2

/	CLIENT: Eirst Urban Inc.									IM-	6	ndet	~				1-06-130
	CLIENT: First Urban Inc.								IDALI	UM:		eodet	<u>с</u>				1-00-135
:V	SOIL PROFILE	AT PLOT	IMBER	SAMPL	VALUES	ATION SCALE	20 SHEAR ST O LINCONI	ON E PLOT 40 6 RENGT	0 80 H kPa + F	10 10	0 /ANF	PLAST LIMIT ₩ p	IC NATI MOIS CON	URAL ITURE TENT	LIQUID LIMIT * L	ORGANIC VAPOUR	STANDPIPI INSTALLATIC OR REMARKS
		STR	Ñ		, z	EV	POCKE1	PEN.	×L	AB VA	NE	WAT	ER CC		T(%)	(ppm)	
0.3	Ground Surface	<u></u>				<u> </u>		40 u		- 10				. 0			
0.0	Weathered / Disturbed	XX	1	AS		220								0			
9.5	trace organics																
0.8	SILT some clav		2	SS	8	219								0			X
	TO CLAYEY SILT trace to some sand, loose to compact / firm to stiff, brown moist to very moist		3	SS	10				75kPa	•				0			¥
7.0	arown, moist to very moist		4	SS	7	218									•		
7.3	SILTY CLAY		5	SS	6	217		50kPa				- - -		0			
	trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant					216											
	fine sand / silt lenses), firm, brownish grey, moist to very moist						25gPa										
		H/	6	\$S	5										o		
						215											
			7	ss	6	214	25kPa										
						213											
2.7 7.6 2.2	SILT - Dilatant, trace to some clay, trace to some sand, loose, brown, wet		6	SS	5									o			
8.1	End of Borehole				:												
																i	
						L											



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LOG OF BOREHOLE 3

	SOIL PROFILE		<u> </u>	SAMP	LES	щ	PENE	TRATIC						NAT	104		() ~	STANDING
	DESCRIPTION Ground Surface	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCAL	SHE OU	AR STE NCONF OCKET	RENGT INFD PEN.	0 8 TH kPa + X 0 8	0 1 FIELD LAB V	00 VANE ANE 00				LIQUID LIMIT 	(mdd) VAPOUF	INSTALLATIO OR REMARKS
0 4	300mm TOPSOIL	<u></u>													_			
3	Weathered / Disturbed trace organics			AS		219									0			
- €	SILT some clay		2	SS	6		\backslash		50kPa						0			
	TO CLAYEY SILT trace to some sand, loose to compact / firm to stiff,		3	SS	15	218				75 <u>k</u> P	a				•			
	brown, moist to very moist		4	SS	15	217					100	кРа			(>		
	SILTY CLAY trace sand		5	ss	11	216				75 k P	a				0			
	TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses),					210												
	firm to stiff, brownish grey, moist to wet		6	SS	6	215			50kPa									
						214												
			7	SS	5	213		38 <u>k</u>	Pa							o		
	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, very moist to wet		8	SS	13	212								c				
	End of Borehole																	-
													1					

Terraprobe

LOG OF BOREHOLE 4

/	CLIENT: First Urban Inc.						-				1 I.M.	C.	tehne	ic			FII C.	1-06-130
	CEIENT: First Orbait Inc.						_ "		ATION	IDAI	UNI:		eouer				FILE:	1-00-139
<u>еv</u> •тн	SOIL PROFILE	STRAT PLOT	NUMBER	SAMF	"N" VALUES	ELEVATION SCALE	PENE RESIS SHEA O UI • Pi	TRATIC STANCE 20 AR STI NCONF OCKET	ON E PLOT 40 6 RENGT INED INED PEN. 40 6	0 8 H kPa + ×	FIELD	00 VANE ANE 00	PLAST LIMIT		URAL STURE TENT	LIQUID LIMIT T (%)	add DRGANIC (add VAPOUR	STANDPIPE INSTALLATIO OR REMARKS
21.0	Ground Surface	<u>~~</u> ,	<u>.</u>			221			Ĭ			Ĩ	<u> </u>	Ť—	<u> </u>			
0.2	Weathered / Disturbed trace organics	Ī	1	AS		ř									0			
0.8	SILT - Dilatant, trace to some clay,		2	SS	6	220-												
.0.7	trace to some sand, loose, brown, wet		3	ss	5	219-									0			
2.3	SILT - some clay TO CLAYEY SILT trace to some sand.		4	SS	10		GF	.SA.SI 3.79.	ICL 18						0			
	compact / stiff to very stiff, brown, very moist to wet		5	ss	20	218	\ 			. <u> </u>					000			
I	sand, wet					217 -												
16.5 4.5	SILTY CLAY		6	ss	9				50kPa						0			
	trace sand, TO CLAY some silt. trace sand, (with intermittent wet dilatant fine sand / silt lenses)					216												
	soft to stiff, brownish grey, moist to wet		7	ss	5			38	Pa						. 0			
						214-										-		
							2	5kPa							0			V
12.9 8.1	End of Borehole			55	3	213	• 		<u></u>									
											:							
			I			I							[L	L			



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LOG OF BOREHOLE 5

	PROJECT: Proposed Residen LOCATION: Highway 403 / Ly CLIENT: First Urban Inc.	tial Subdi nden Ro	ivisio ad,	n Brant	ford, (Ontario) 	DATE EQUII ELEV	: PMEN ATIOI	IT:	26 Fe Solid FUM:	ebrua Sterr G	ry 200 n Auge eodet	i7 ers ic			FILE:	1-0
	SOIL PROFILE			SAMF	PLES	1 5	PENE	TRATIC	ON E PLOT	>				NATI	IRAL		۲	STA
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCAL	SHEA O U O P	NCONF	40 6 RENG INED PEN. 40 6	50 E TH kPa + 50 E	FIELD	00 VANE ANE 00	WAT			iQUID LIMIT ♥L (%)	(mdd) VAPOUF	INST/ RE
0.0 216.3 0.3	300mm TOPSOIL Weathered / Disturbed trace organics		1	AS	-	216									0			
215.7 0.9	SILT - some clay TO CLAYEY SILT trace to some sand,		2	SS	8										a			
214.3	(with fine sand seams), loose to compact / firm to stiff, brown, moist to wet		3	SS	13	215									0		•	
2.3	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses)		4	SS	9	214	-				10	kPa			0			
	very soft to stiff, brownish grey, moist to very moist		5	55	13	213	$\left \right $			7581	a				0			
	brownish grey at 3.0m					212		51-Da										
			6	SS	4										0			
			7	SS	7	211			50kPa						0	-		
					-	210												
208.5			8	SS	2	209	13 <u>k</u> P	.							0			
8.1	End of Borehole																	



LOG OF BOREHOLE 6

Ż	PROJECT: <u>Proposed Resident</u> LOCATION: <u>Highway 403 / Lyr</u>	ial Subdi nden Ro	visio ad,	on Brant	ford, (Ontario	 	DATE:	19 T: <u>So</u>	Februar	ry 200 Auge	7 rs				
	CLIENT: First Urban Inc.					r			DATU	M: _G	eodeti T	с			FILE:	: <u>1-</u>
	SOIL PROFILE		ļ	SAMP	LES	ALE	RESI	STANCE PLOT	\geq		PLAST				NIC VIC	ST
	DESCRIPTION	STRAT PLOT	NUMBER	ЗqҮТ	"N" VALUES	ELEVATION SC	SHE OU ● P	20 40 6 AR STRENGT NCONFINED OCKET PEN. 20 40 6	0 80 TH kPa + Fii × LA 0 80	100 ELD VANE B VANE 100	WAT	CON ER CC 0 2		—————————————————————————————————————	(ppm)	R
216.3	350mm TOPSOIL	<u></u>	<u>†</u>		1											
0.4	Weathered / Disturbed		1	AS		216							0			
215.5	trace organics	-	<u> </u>													
0.0	CLAYEY SILT TO SILTY CLAY		2	SS	10	045	1			150kPa	1		0			
	trace to some sand, stiff to very stiff, brown				-	215										
	moist to very moist		3	SS	17					175kPa	1		0			
						214										
			4	ss	11		a	SA.SI.CL		150kPa	•		⊦⊷	4	7	
			╞	<u> </u>	-											
			5	55	13	213			75kFa				0	ļ		
			╞	<u> </u>	-											
						212							ļ			
211.8 4.5	SILTY CLAY - trace sand							50 <u>k</u> Pa								
	TO CLAY - some silt, trace sand,		6	SS	9											
	(with intermittent wet dilatant fine sand / silt lenses),		1			211								ļ		
	firm to stiff, brownish grey, moist to very moist		1													
			1													
			7	SS	13	210					.		.			
	dilatant silt		1		-											
			1													
			1			209										
			1_		-											
208.2			8	SS	6		1						0			
8.1	End of Borehole		[1								
					1											
E					1											1



LOG OF BOREHOLE 7

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	SOIL PROFILE			SAM	PLES	ш	PENE RESIS		N PLOT	~					URAL		9 m	STANDPI
EV TH	DESCRIPTION	STRAT PLOT	NUMBER	ТҮРЕ	"N" VALUES	ELEVATION SCA	2 SHEA O UI • P(NCONF OCKET	0 60 ≷ENGT INED PEN. 0 6) 80 H kPa + ×	FIELD	00 VANE ANE		ER C(LIQUID LIMIT → IT (%) 30	(mdd) VAPOUF	INSTALLAT OR REMARH
0.0	Ground Surface 300mm TOPSQIL	<u></u>	ł	<u> </u>		\vdash		1			<u> </u>	Ť	نــــــــــــــــــــــــــــــــــــ	Ē	Ť	Ĩ		
16.U	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, very loose, brown, moist to wet		2	AS SS	- 3	216-									0			, , , , , , , , , , , , , , , , , , ,
4.0 1.5	dilatant silt, wet		3	ss	10							150kPa	ł		0			
	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist to wet		4	ss	8	214						125kPa	 		0			
2.9			5	ss	5	213			50kPa Pa				 		0	0		
3.4	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm brownish grev, moist to very moist					212												
<u>1.7</u> 4.6	SILT - Dilatant,		6	ss	7										0			
	trace to some clay, trace to some sand, loose, brown, wet					211						<u> </u>						
<u>0.2</u> 6.1	SILTY CLAY trace sand,			ss	5	210		25kPa							+	e		
	TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses)					209		 		 					-			
08.2	firm, brownish grey, very moist		8	ss	6		2	25kPa								a		

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LOG OF BOREHOLE 8

										·· _		~						4 00 404
	CLIENT: First Urban Inc.							ELEV	ATION	I DA	TUM:	_G	eodet	ic			FILE:	1-06-139
V TH	SOIL PROFILE	STRAT PLOT	NUMBER	SAMP H	S	ELEVATION SCALE	PENE RESI SHE O L	ETRATI STANC 20 AR ST INCONI POCKET 20	ON E PLOT 40 6 RENGT FINED FINED	0 H kP + X	80 1(a FIELD LAB V/		PLAST LIMIT			LIQUID LIMIT 	d ORGANIC (a vapour	STANDPIP INSTALLATI OR REMARKS
20.8 0.0	Ground Surface	<u> </u>						20	+0 0						Ť	Ĩ		
0.5 0.3 0.0	Weathered / Disturbed trace organics		1	AS										:	0			
0.8	SILT trace to some clay, trace to some sand,		2	SS	11	220									o			
	compact, brown, very moist to wet		3	SS	11	219	-								0			
	dilatant		4	SS	26	218		/	-		<u> </u>				6			
	dilatant, grey, wet		5	SS	10	217						-						
<u>63</u> 45	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatent		6	SS	6	216			50kPa						0			
	fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		7	SS	10	215					₿₿ţ₽а				0			
2.7			8	\$\$	5	213		38	kPa									
8.1	End of Borehole																	
				:														

LOG OF BOREHOLE 9

		iden Ro	had	Brantf	ord C)ntario	EQUI	PMEN"	r: s	olid S	tem	Auae	rs				
<i>J</i>	CLIENT: First Urban Inc		, aa,		<u>v</u> , c		ELEV	ATION	DATI	JM:	Ge	odeti	с			FILE:	1-06-139
	SOIL PROFILE			SAMP	LES	ALE	PENETRATI		2			PLAST				일면	STANDPIPE
EV TH	DESCRIPTION	STRAT PLOT	NUMBER	түре	"N" VALUES	ELEVATION SC/	20 SHEAR ST O UNCONI O POCKET 20	40 64 RENGT FINED FINED FPEN. 40 64) 80 HkPa + F × L	iELD V/ AB VAN 0 100	ANE	WAT	ER CC		LIMIT **L T (%) 30	(ado) (ado) (ado)	INSTALLATIO OR REMARKS
0.0	300mm TOPSOIL	<u>.</u>												†			
0.3	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, very loose, brown, moist to wet		1	AS SS	1	221								0			
1.5	SILT - Dilatant, trace to some clay, trace to some sand,		3	ss	17	220								0			
	compact, brown, very moist to wet		4	SS	15	219	GR.SA.S 0.4.83	1.CL 13						0			
	dilatant		5	ss	15	218								0			
217.4				00	-	210			75kP	a				ō			Ω
	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, molst to very moist			55		217 216		50kPa						0			
						215											
<u>213.8</u> 8.1	End of Borehole		6	SS	7	214		50kPa						0		-	


	PROJECT: Proposed Reside LOCATION: Highway 403 / I CLIENT: First Urban Inc.	ential Subd	visio ad,	n Brant	ford, (Ontario	_ D _ E _ E	ATE: QUIF LEV/	MEN	T:	26 Fe Solid TUM:	brua Sterr G	ry 200 Auge eodet)7 ers ic			FILE:	1-06-1
	SOIL PROFILE			SAMF	PLES	Щ	PENET			~~~				NAT			۲	STANDP
<u>ЕLEV</u> DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	түрЕ	"N" VALUES	ELEVATION SCAL	20 SHEA ○ UN ● PC 20	CKET	0 6 RENGI INED PEN. 0 6	ο ε ΓΗ kPa + ×	FIELD	VANE ANE 00	PLAST LIMIT			LIQUID LIMIT 	(mdd) VAPOUF	INSTALLA OR REMAR
0.0	600mm TOPSOIL	<u>178</u>	1	AS		211											8	
0.6	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, losse brown very moist to wet		2	SS	9	210							 		0			
209.6	SILT - some clay TO CLAYEY SILT trace to some sand,		3	SS	12	209									0			
208.5 2.6	loose to compact / firm to stiff, brown, moist to wet		4	SS	7				50kPa			5				0		
	trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses).		5	55	10	208			50kPa							0		
	firm to stiff, brownish grey, moist to very moist		6	SS	5	207		38k	Ра					-	o			
205.0					-	205									:			
6.1	CLAYEY SILT trace sand, with dilatant silt layers, soft to stiff, grey, wet		7	SS	13	204				•					0			
203.0				SS	Э			.SA.SI 6 .62.(CL 2					-	- 1 >			
8.1	End of Borehole					203												

Sheet 1 of 1



Ż	PROJECT: Proposed Resider	ntial Sub ynden F	odivisio Road,	on Brant	ford, (Ontario	I > I	DATE: Equip	MEN	: T: _:	23 Fe Solid	ebrua Stem	ry 200 1 Aug)7 ers				
	CLIENT: First Urban Inc.		<u></u>								UM:	G						; <u> </u>
	SOIL PROFILE			SAME	PLES	ALE	RESIS	STANCE	PLOT	\geq			PLAS		URAL STURE	LIQUID	N N	ST
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SC	SHEA OU P	20 4 AR STF NCONF OCKET 20 4	0 6 RENGT INED PEN. 0 6	50 8 FHkPa + × 50 8	0 1 FIFLD LAB V 0 1	VANE ANE	WA	COM TER CI		UMII 	(bbu)	R
0.0 214.7	300mm TOPSOIL	71.5%			+	215												
0.3	Weathered / Disturbed		1	AS				1								0		
214.2	trace organics			_	-													
0.0	SILT		2	SS	10	214	1						1					
	trace to some clay, trace to some sand.						11											
	loose to compact, brown,		3	SS	5											٩		
	very moist to wet					213	\square	1										
			4	ss	12		}									•		
212.0						1 040												
3.0			5	55	3		1	25kPa							6			
	trace sand				-													
	TO CLAY some silt_trace sand	H				211												
	(with intermittent wet dilatant					2												
	fine sand / silt lenses), soft to stiff, brownish arev, moist to v	vet			-				50kPa									
	3 ,		6	SS	5	210			•									
		Ĺ																
		Ľ	1			209												
		V	7	SS	7					75 k F	а			<				
			1—		-													
						208	ļ					-		ļ			-	
			И															
				-	-					75kF	а							
			8	SS	6	207				•		<u> </u>			-	4		
			Ш_						ļ									
			H															
			11_			206	<u> -</u>	. 										
			9	ss	11		G	F.SA.SI	.CL 39		10	0kPa		+		-1		
		H		+	-				Ē									
						205		-						+		+	-	₽
			И	-														
			H_	-	_			201	Pa									
203.8			10	ss	8	204		38	- d						<u> </u>		i	
	End of Borehole	- f	<u> </u>			1	1	1	1	1			1		1	-	1	1

.

Sheet 1 of 1

Ż	PROJECT:Proposed Residential LOCATION:Highway 403 / Lynd	Subd	ivisio bad,	n Brant	ford, C	Ontario	_ (OATE:	20 Februa Solid Ster	n Augers			
	CLIENT: First Urban Inc.						_ I	ELEVATION D	ATUM: _G	Seodetic		FILE:	1-06
	SOIL PROFILE			SAMP	LES	ALE	PENE RESIS	TRATION	>	PLASTIC NA		등氓	STAN
ELEV DEPTH	DESCRIPTION Ground Surface	STRAT PLOT	NUMBER	ТҮРЕ	"N" VALUES	ELEVATION SC/	SHEA OU P	0 40 60 IR STRENGTH I NCONFINED DCKET PEN. 0 40 60	80 100 Pa + FIELD VANE × LAB VANE 80 100	WATER C	STURE LIMIT NTENT LIMIT → ↓ ONTENT (%) 20 30	(mdd) VAPOL	INSTAL C REM
0.0 221.0	300mm TOPSOIL	<u></u>	-			221							
0.3 220.5	Weathered / Disturbed trace organics		1	AS							0		
0.8	SILT - Dilatant, trace to some clay,		2	SS	8	220					<u>е</u>		
	trace to some sand, with clay seams, loose to compact, brown, very moist to wet		3	SS	13						0	2	
			4	ss	22	219					2		
			5	ss	21	218					с 		
215.8						217	-	E0k Pa				-	
4.0	SILTY CLAY trace sand TO CLAY		6	SS	9	216		30674			0		
	some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff brownich arey, moist to wet												
	nin to sun, brownion groy, moist to wet		7	SS	8	215		50 <u>k</u> Pa					
						214							
213.2			8	SS	9			50kpa			•		
8.1	End of Borehole												
					:								

NOTES:

Borehole was open and wet at base upon completion of drilling.



LOG OF BOREHOLE 13

CLIENT: First Urban Inc.						1	ELEV		N DAT	'UM:	Ge	eodet	ic			FILE:	1-06-13
SOIL PROFILE			SAMP	LES	ΓE	PENE	TRATIC	ON E PLOT	\geq					URAL		υ Σ	STANDPIP
DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCA	SHEA OU ● P	AR STI	io e RENG ^T INED I PEN. IO e	50 8 TH kPa + ×	0 1 FIELD LABV	VANE ANE 00	WA1			т (%)	(mdđ) VAPOU	INSTALLATI OR REMARK
350mm TOPSOIL	<u></u>				- 221			1			1						
Weathered / Disturbed	4. 4 <i>1</i> 		AS							1				0			
SILT trace to some clay,	-	2	SS	11	220	1								• •	-		Ţ
trace to some sand, loose to compact, brown, moist to wet		3	SS	7	219									0			
		4	S S	18	210												
CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist		5	<u>\$</u> \$	16	217						125kPa			0			
		6	55	12				6	3¥Pa					o			
				-	210	; ;	381	Pa							- - - -		
SILTY CLAY trace sand TO CLAY some silt, trace sand,		7	SS	10	214	J								0			
(with intermittent wet dilatant fine sand / silt lenses), stiff, brownish grey, moist to very moist		8	SS	11	213				75 6 F	a				0			
End of Borehole													-				
	CLIENT: <u>First Urban Inc.</u> SOIL PROFILE DESCRIPTION Ground Surface 350mm TOPSOIL Weathered / Disturbed trace organics SILT trace to some clay, trace to some sand, loose to compact, brown, moist to wet CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), stiff, brownish grey, moist to very moist End of Borehole	CLIENT: First Urban Inc. SOIL PROFILE Image: Solid Surface 350mm TOPSOIL Image: Solid Surface 350mm TOPSOIL Image: Solid Surface SILT trace organics SILT trace to some clay, trace to some sand, loose to compact, brown, moist to wet CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), stiff, brownish grey, moist to very moist End of Borehole	CLIENT: First Urban Inc. SOIL PROFILE Image: Solid surface John TOPSOIL John State Weathered / Disturbed 1 trace organics SILT trace to some clay, 1 trace to some clay, 3 trace to some sand, 3 loose to compact, brown, moist to wet 3 CLAYEY SILT TO SILTY CLAY 5 trace to some sand, 6 SULTY CLAY 6 SILTY CLAY 7 trace sand 7 TO CLAY 5 some silt, trace sand, 7 (with intermittent wet dilatant 6 End of Borehole 8	SOIL PROFILE SAMF DESCRIPTION Image: Same second surface Image: Same second surface	CLIENT: First Urban Inc. SOIL PROFILE SAMPLES DESCRIPTION Image: Section of the section	CLIENT: First Orban Inc. SOIL PROFILE SAMPLES ungest of the second se	CLIENT: First Urban Inc. SOIL PROFILE SAMPLES u </td <td>CLIENT: First Urban Inc. ELLEV. SOIL PROFILE SAMPLES up of the second sec</td> <td>CLEENT: First Urban Inc. ELEVAND SOIL PROFILE SAMPLES up bind in the same state of th</td> <td>CLENT: First Urban Inc. SAMPLES Part Provided to the second tothe</td> <td>CLEENT: First Urban Inc. ELEVATION DATUM: SOIL PROFILE SAMPLES a<td>CLEENT: First Urban Inc. ELEVATION DATION: Sold SOIL PROFILE SAMPLES and background states and background states<td>CLEWI First Urban Inc. ELEVATION ATUM Geodesic SOIL PROFILE SAMPLES a a b</td><td>CLEMI: Instructionanine. Description SMMPLES Weight of the second second</td><td>CLENT Inst Urpan Inc. ELEVATION LATUR: Description USCRIPTION USCRIPTION<td>CLENT: First Urban Inc. SAMPLES President Control Data Data Description ULSCRIPTON 1</td><td>CLENT: </td></td></td></td>	CLIENT: First Urban Inc. ELLEV. SOIL PROFILE SAMPLES up of the second sec	CLEENT: First Urban Inc. ELEVAND SOIL PROFILE SAMPLES up bind in the same state of th	CLENT: First Urban Inc. SAMPLES Part Provided to the second tothe	CLEENT: First Urban Inc. ELEVATION DATUM: SOIL PROFILE SAMPLES a <td>CLEENT: First Urban Inc. ELEVATION DATION: Sold SOIL PROFILE SAMPLES and background states and background states<td>CLEWI First Urban Inc. ELEVATION ATUM Geodesic SOIL PROFILE SAMPLES a a b</td><td>CLEMI: Instructionanine. Description SMMPLES Weight of the second second</td><td>CLENT Inst Urpan Inc. ELEVATION LATUR: Description USCRIPTION USCRIPTION<td>CLENT: First Urban Inc. SAMPLES President Control Data Data Description ULSCRIPTON 1</td><td>CLENT: </td></td></td>	CLEENT: First Urban Inc. ELEVATION DATION: Sold SOIL PROFILE SAMPLES and background states and background states <td>CLEWI First Urban Inc. ELEVATION ATUM Geodesic SOIL PROFILE SAMPLES a a b</td> <td>CLEMI: Instructionanine. Description SMMPLES Weight of the second second</td> <td>CLENT Inst Urpan Inc. ELEVATION LATUR: Description USCRIPTION USCRIPTION<td>CLENT: First Urban Inc. SAMPLES President Control Data Data Description ULSCRIPTON 1</td><td>CLENT: </td></td>	CLEWI First Urban Inc. ELEVATION ATUM Geodesic SOIL PROFILE SAMPLES a a b	CLEMI: Instructionanine. Description SMMPLES Weight of the second	CLENT Inst Urpan Inc. ELEVATION LATUR: Description USCRIPTION USCRIPTION <td>CLENT: First Urban Inc. SAMPLES President Control Data Data Description ULSCRIPTON 1</td> <td>CLENT: </td>	CLENT: First Urban Inc. SAMPLES President Control Data Data Description ULSCRIPTON 1	CLENT:

	PROJECT: Proposed Residential	Subdi en Ro	visio ad,	n Branti	ford, C	Ontario	() (DATE:	PMEN	T: _;	19 Fe Solid	ebruai Stem	y 200 Auge	7 rs			<u>.</u> .	
	CLIENT: First Urban Inc.						{	ELEV	ATION	N DAT	'UM:	_ <u>_</u> G	eodeti	c,			FILE:	: <u>1-0</u>
	SOIL PROFILE			SAMP	LES	ALE	RESIS	TANCE	DN E PLOT	\geq			PLASTI		JRAL	LIQUID	읒뚝	STA
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SC	2 SHEA ○ UI ● P0	0 4 R STF NCONF DCKET	NO 6 RENGT INED PEN.	io a TH kPa + ×	I FIELD LAB V	00 VANE ANE 00				LIMHY ₩L T (%)	(mdd) vAPOI	RE
218.7	Ground Surface	<u>.</u>									ř	Ť				+		
218.4	Weathered / Disturbed	4	1	AS											0			
217.8	trace organics					218										-		
0.9			2	SS	9				ł						0			
	SILT - trace to some clay, trace to some sand						$ \setminus$:							
	loose to compact, brown,		3	ss	22	217	<u> </u>	<u> </u>						0		ļ		
	moist to very moist		Ľ.					[
216.4		╇╋	┣_				/				100	14Da						
2.5	TO CLAY - trace sand TO CLAY - some silt, trace sand,		4	SS	10	216					100				0			
	(with intermittent wet dilatant																	
	firm to stiff, brown, moist to wet	HH.	5	SS	6				50kPa					4	<u> </u>	°		
			 			-												
	brownish grey at 3.2m		ł			210												
		H	1															
		11	<u> </u>		-				504Da									
			6	SS	7	214			DUKFa							þ		
																-		
		H.														-		
						213						-				-		
			 		-											!		
		H	7	SS	6			38	Ра							0		
			╞──			212	4					-						
			1						:									
		H	1															1
211.1	SILT - Dilatant trace to some clay	H	-			211				<u> </u>		-	 					
210.6	trace to some sand, compact, grey, wet		8	SS	20				L									
8.1	End of Borehole			<u> </u>														
		ļ]			1					'		
								1										
																Í		
								1	i i]								
		1	1		ł	I I	1	1	ł	1	1	1	1		Í	1.		1



	PROJECT: Proposed Resid	ential Subdi	visio	n				DATE	·		19 Fe	bruar	y 200	7				
\mathcal{T}	LOCATION: Highway 403 /	Lynden Ro	ad,	Brant	ford, (Ontario	<u>></u>	EQUIF	PMEN	T: _ <u>s</u>	Solid	Stem	Auge	rs				
\sim	CLIENT: First Urban Inc							ELEV	ATION	N DAT	UM:	G	eodeti	c			FILE:	<u>1-0</u>
	SOIL PROFILE		Γ	SAMF	LES	ш	PENE	TRATIC		~>				. NATI	JRAL		υĸ	ST/
ELEV DEPTH	DESCRIPTION	AT PLOT	JMBER	түре	VALUES	ATION SCA	SHE	20 4 AR STF	ID E RENGT	io 8 IH kPa +	0 10 FIELD		PLASTI LIMIT ₩P				ORGAN	INST RE
		STR	Ž		Ż	ELE	• F	•ОСКЕТ 20 4	PEN. KO E	× 80 8	LAB V/ 0 10	ANE DO	WAI	ER CO 0 2	NIEN 0 3	I(%) 30	(ppm)	
214.0	350mm TOPSOIL	<u> 17</u>	1		+	214												
213.7			1	AS												0		
	FILL - Silt to Clayey Silt,																	
	trace to some sand,		2	SS	4	213										•		
	loose, brown, very moist to wet		-		-													
212.4	· · ·				1										0			
1.6	SILT		3	SS	6	211	<u> </u>						L					
-	trace to some clay,																	ł
	trace to some sand, loose brown very moist to wet		4	ss	8										o			
211.0	icese, cromit, tory molecto net		-	<u> </u>	-							İ						
3.0					-	21				75kP	8		ţ—	(
	CLAYEY SILT TO SILTY CLAY		5	SS	11	[1	-			ł		0			
1	trace to some sand, stiff, brown, moist															Ì		
	dua, prown, molor					210)	-										
					-													
209.5 4.5		¥#2	1	+	-													
	SILT - Dilatant,		6	SS	14									ľ				
	trace to some clay,					20	ΊT											
	compact, grey, very moist to wet																	
207.9				.	-	20	°		+	+			-			-		
6.1		HH	7	SS	3			25kPa							Ô			
	trace sand		┢		1					1								
	TO CLAY	H	1			20	,											
	some silt, trace sand, (with intermittent wet dilatant	H	1															
	fine sand / silt lenses),	H	1		_	1			1									
	soft, brownish grey, moist to wet	111	8	ss	3		1	25kPa					1			¢		
205.9 8 1	End of Basabala	rl¥				20	5	-	+			-	1			1		
0.1																		
							1										1	
											1							
										-		1	1					
i				1										1				1
																	1	
		-																
			1	-		1				1	1		1		1		1	1

Terraprobe

y -	LOCATION: Highway 403 / Lynd	en Koa	ad,	Branti	ora, C	Untario)	EQUI	PMEN	I:	Solid	Stem	Auge	ers				
	CLIENT: First Urban Inc.							ELEV	ATIO	DA1	'UM:	_Ge	odet	ic			FILE:	1-06-139
-	SOIL PROFILE	LOT	ËR	SAMP	LES	ON SCALE	PEN	ETRATI	ON E PLOT 40 E			00	PLAST LIMIT ₩ P	IC NATU MOIS CON		LIQUID LIMIT	RGANIC	STANDPIPE INSTALLATIO OR
<u>ЕV</u> РТН 16.0	DESCRIPTION Ground Surface	STRATE	IAMUN	ЧYР	'N" VAL	ELEVATIO	0 U ● I	JNCONI POCKET 20	INED PEN 40 6	+ ×	FIELD	VANE NE 0	WAT	ER CC 0 2	DNTEN 0 3	T(%)	(ppm)	REMARKS
1 5.9	150mm FILL - Silty Sand and Gravel /					210												
0.2	FILL - Clayey to Sandy Silt, trace to some gravel		1	AS										0				-
	firm to stiff, brown, moist		2	SS	4	215												
			3	SS	9	214									0			
	asphalt, cinders at 2.3m		4	ss	5									0	0			
2.8 3.2			5	SS	8	213					100	kPa			0			
	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, very moist					212												
			6	55	11	211					 1	125kPa				0	:	
			7	SS	7	210		GR SA S 0 2 69	1.CL 29		100	kPa			0			
						209										-		
)8.4 7.6	SILT - Dilatant, trace to some clay, trace to some sand, toose, grey, wet		8	ss	9	208									0			
81	End of Borehole																	



LOG OF BOREHOLE 17

	PROJECT:	Proposed Residential (<u>Subdi</u> r	visio	<u>n</u>				DAT	E:			<u>19 Fe</u>	bruar	<u>y 200</u>	7				
\mathbf{T}	LOCATION: _	Highway 403 / Lynde	<u>an Ro</u>	ad,	<u>Brant</u>	ford, C	<u> Ontaric</u>)	EQU	IPN	/IEN7	Г: _!	<u>Solid</u>	Stem	Auge	irs				
\bigcirc	CLIENT:	First Urban Inc.							ELE	VAT	FION	DAT	'UM:	Ge	eodeti	iC			FILE:	1-06-1397
	SOIL PR	OFILE	STRAT PLOT	NUMBER	SAMP	"N" VALUES	ELEVATION SCALE	PENE RESI SHE OL • F	TRAT STAN 20 AR S JNCOI POCKI) 8 H kPa	0 1 FIELD LAB V	00 VANE ANE	PLAST LIMIT WP WAT			LIQUID LIMIT ** L 	ORGANIC VAPOUR (mdd)	STANDPIPE INSTALLATION OR REMARKS
213.8	Ground Surface		1.12	↓ _'	ļ'	<u> </u> '	 	 	20	40) 0	·0 /	1			, o,	1		
213.5	FILL - Silt to Claye trace to some sand trace organics, trac soft to stiff, brown,	y Silt, 1, trace gravel, ce topsoil moist to wet		2	AS SS SS	9	213										0	0		
211.5	SILT - Dilatant, trace to some clay, trace to some sand loose, brown, very	, J, moist to wet		4	55 55	8	211	G	₩.SA. J. 1.8	SI.C 2.17	Ļ						0			
	wet at 4.6m brownish grey	at 4.7m		6	SS	9	209 205										0	0		-
207.7 6.1 205.7	SILTY CLAY trace sand TO CLAY some silt, trace sa (with intermittent w fine sand / silt lens soft to firm, grey, r	nd, vet dilatant ses), noist to very moist		7	SS SS	4	207											•		
8.1	End of	Borehole																		

	CLIENT: First Urban Inc.	en R	oad,	Brant	ford, (Ontario	_ E _ E	EQUIPME	NT:	Solid Si FUM:	em Au Geod	gers etic			FILE:	1.
[····-	SOIL PROFILE		Τ	SAMF	PLES	ц	PENE RESIS	TRATION TANCE PLO)T >>						С м	s
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	түре	"N" VALUES	ELEVATION SCA	2 SHEA O UI O PC	0 40 IR STRENO NCONFINED DCKET PEN	60 GTH kP + 	30 100 FIELD VA LAB VAN 30 100		ATER C		LIQUID LIMIT *L T (%)	(mdđ) VAPOUI	INS
220.4 0.0 220.1	300mm TOPSOIL	<u>xt Iy</u>	<u>.</u>									- <u>+</u>	\uparrow			
0.3	Weathered / Disturbed		1	AS		220								•		
219.6	SILT - some clay TO CLAYEY SILT - trace to some sand, loose to compact / stiff, brown, very moist		2	SS	13	219				100 k F	a		0			
1.5	SILT trace to some clay,		3	ss	22	213	,						0			
	trace to some sand, compact, brown, very moist to wet		4	SS	25	218		}	-				0			
			5	SS	13	217	+						•			
215.9						216										
4.5	SILTY CLAY trace sand TO, CLAY		6	SS	6			50 k F	Pa					o		
	some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses),					215										
	firm, brownish grey, very moist		7	SS	5	214	-	38kPa				_		0		
									8							
212.3			8	35	4	213		5kPa					0			
8.1	End of Borehole												-			

NOTES:

Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 1.3m below grade on April 9, 2007.



	PROJECT: Proposed Resident LOCATION: Highway 403 / Lyr CLIENT: First Urban Inc.	ial Subdi iden Ro	ivisio bad,	n Brant	ford, (Ontario	 	DATE EQUII ELEV	: PMEN AT101	T:	20 Fe Solid rUM:	ebrua Sterr G	ry 2 <u>00</u> I Auge eodeti	7 ers			FILE:	
	SOIL PROFILE		Γ	SAMF	LES	Щ	PENE	TRATIC									0.~	67
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCAL	RESIS SHEA O U ● P	AR STI NCONF	E PLOT		FIELD	00 VANE ANE	PLAST LIMIT P P WAT			LIQUID LIMIT 	(bbu) VAPOUR	INST RI
220.9 0.0	Ground Surface	<u></u>			-			1 -	+0 6			+	· ·			1	· · · ·	
220.6 0.3	Weathered / Disturbed		1	AS												•		ĺ
220.1	trace organics																	
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, very stiff, brown, moist		2	SS	12	220									0			
1.5	SILT		3	ss	13	219		ļ							0			
	trace to some clay, trace to some sand,		1			l												
	compact, brown, very moist to wet	H	4	ss	17							-			0			
		HH.	F		-	218	$\left - \right $				\vdash					+		
217.6 3.3	dilatant at 3.0m SILTY CLAY - trace sand TO CLAY - some silt, trace sand,		5	SS	12						10	kPa			0			
	(with intermittent wet dilatant fine sand / silt lenses), firm, brown, moist to wet					217												
	 brownish grey at 4.6m		6	\$S	5	216	-								: - 	o		
			_		-	215			Da						+			
			7	SS	7			30							0			
			1]	214							<u> </u>			-		
			1															
			1															
240.0		HH.	8	ss	6	213		38	(Pa	<u> </u> .			<u> </u>	-	0	·		
8.1	End of Borehole	<u> </u> r/	1	<u>+</u>	+	<u>†</u>			1	1			†			<u> </u>		
																	-	
														-				
										-								
										1								
										1								
		1	1															



Ż	PROJECT: Proposed Residential Sul LOCATION: Highway 403 / Lynden I CLIENT: First Urban Inc.	bdivis Road	on Brant	ford, C	Ontario	E	DATE: EQUIP ELEVA		T: _:	20 Fi Solid 'UM:	ebrua Sterr G	ry 200 Auge eodeti	7 rs c			FILE:	: _1
	SOIL PROFILE		SAME	LES	щ	PÊNE	TRATIO	N	-			<u> </u>				0	
<u>ELEV</u> DEPTH 218.7	DESCRIPTION	NIMBER	I T PE		ELEVATION SCAL	RESIS SHEA O UI • Pr	AR STR NCONFI	PLOT 6 ENGT NED PEN.) 6	0 8 TH kPa + × 0 8	FIELD	100 VANE (ANE	PLASTI LIMIT			⊔QUID LIMIT , , (%)	(mdd) UAPOUR UAPOUR	IN:
0.0 218.4	300mm TOPSOIL	<u></u>															
0.3	Weathered / Disturbed	1	AS							1					0		
<u>217.9</u> 0.8	CLAYEY SILT TO SILTY CLAY	2	ss	12	218						125kPa	•		o			
	firm to stiff, brown, moist	3	SS	9	217		-				113ki	7 a			, 		
		4	SS	10	216					10	0kPa			0			
		5	ss	7					75 ⊾ P	a				0			
					215						-						
214.2																	
4.5	SILT - Dilatant, trace to some clay, trace to some sand,	6	SS	12	214									o o			
	compact, grey, wet				213												
		7	SS	12	212				- 					0			
211.1																	
7.6	SILTY CLAY-trace sand, TO CLAY - some silt, trace sand, (with intermittent	8	SS	8	211	- 2	5kPa -							0			
8.1	wet dilatant fine sand / silt lenses),	¥1															

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LOG OF BOREHOLE 21

PROJECT: Proposed Residential Subdivision 23 February 2007 DATE: LOCATION: Highway 403 / Lynden Road, Brantford, Ontario EQUIPMENT: Hollow Stem Augers FILE: 1-06-1397 ELEVATION DATUM: Geodetic CLIENT: First Urban Inc. PENETRATION SAMPLES SOIL PROFILE **ELEVATION SCALE** PLASTIC NATURAL LIQUID LIMIT CONTENT LIMIT RESISTANCE PLOT ORGANIC VAPOUR STANDPIPE INSTALLATION 40 60 80 100 20 'N" VALUES STRAT PLOT NUMBER OR ۳L ΨP w ΤYPE SHEAR STRENGTH kPa REMARKS ELEV DEPTH DESCRIPTION O UNCONFINED + FIELD VANE WATER CONTENT (%) POCKET PEN. × LAB VANÉ (ppm) 40 60 80 100 10 20 30 20 219.1 Ground Surface 514 219 218.9 250mm TOPSOIL Ø 0.3 1 AS Weathered / Disturbed trace organics 218.1 2 SS 5 218 1.0 CLAYEY SILT TO SILTY CLAY trace to some sand, 88<u>k</u>Pa 0 3 SS 7 very stiff, brown, moist 217 GR SA SI CL Q 150kPa 4 SS 12 0.2.49.49 216 100kPa n 5 SS 11 215 214.6 4.5 SILTY CLAY - trace sand 38kPa o SS 6 6 TO CLAY - some silt, trace sand, (with intermittent wet dilatant 214 fine sand / silt lenses), firm to very stiff, brownish grey, moist to very moist 213 ---- dilatant silt, wet 7 SS 16 212 38kPa 7 0 6 SS 211 210 38kPa 9 SS 9 209 ---- dilatant silt, wet GR.SA.SI.CL 10 ss 11 0 9.65.26 207.9 208 End of Borehole 11.2

NOTES:

Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 2.5m below grade on April 9, 2007.

	PROJECT: Proposed Residential LOCATION: Highway 403 / Lynd CLIENT: First Urban Inc.	Subd en Ro	visio ad,	on Brant	ford, (Ontario	 	DATE: EQUIPMENT: ELEVATION DA	22 Februar Hollow Ste ATUM: G	ry 2007 m Augers eodetic		FILE:	: _1-
	SOIL PROFILE		Γ	SAMF	LES	 	PENE						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	ТүрЕ	"N" VALUES	ELEVATION SCAL	RESIS SHE∕ ○ U ● P	AR STRENGTH ki NCONFINED + OCKET PEN > 20 40 60	≥ 80 100 Pa FIELD VANE < LAB VANE 80 100		TURAL LIQUID STURE LIMIT NTENT LIMIT W WL -0 ONTENT (%) 20 30	(mdd) VAPOUR	INS R
0.0 217.8	300mm TOPSOIL	15			+	218							
0.3 217.3 0.8	Weathered / Disturbed trace organics		1	AS	-						0		
	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to very stiff, brown, moist		2	SS	5	217							
			3	SS	19	216			175kPa			-	
			4	SS	14				150kPa		0		
	silt, some clay, compact		5	SS	14	215					0		
213.6						214	$\left \right $						
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses / particles), firm, brownish grey, moist to very moist		6	SS	6	213		50kPa			0	-	
	silt, wet		7	ss	- 7	212		50 k Pa			0		
					_	211							
					_			38k ^p a			0		
						210							
				SS	5	209		38kPa			0		
			╞		-	200							
					_			384Pa					
206.9 11.2	End of Borehole		10	SS	8	207					•		

Sheet 1 of 1

	PROJECT: Proposed Residential	Subdi	ivisio	n			_ [DATE:		22 Fel	oruary	y 20 <u>07</u>	,			
\mathcal{T}	LOCATION: Highway 403 / Lynd	len Ro	ad, I	Brant	tford,	Ontario) E	EQUIPME	NT:	Solid S	Stem	Auger	s			
. –	CLIENT: First Urban Inc						_ 1	ELEVATIO	ON DA'	TUM:	_Ge	odetic	:		FILE:	1-06-139
	SOIL PROFILE	,		SAME	PLES	ALE	PENE	TRATION)T <u>></u>	-		PLASTIC			⋼₽₽₩	STANDPIPE
<u>ELEV</u> DEPTH	DESCRIPTION	RAT PLOT	NUMBER	TYPE	4" VALUES	EVATION SC	SHE/	20 40 AR STREN NCONFINED	60 (GTH kP) > + ×	90 10 9 FIELD V	0 /ANE NE	UMIT				
212.9	Ground Surface	- S			f	Ē		20 40	60	80 10	0	10) 20	30		
0.0 212.6	300mm TOPSOIL	<u>× · · /</u>	<u>}</u>		-									_		
03	Weathered / Disturbed trace organics			AS	-											
211.9			2	ss	3	212			-					o	-	
1.0	CLAYEY SILT TO SILTY CLAY		_		_											
-	trace to some sand,			55										0		
1	Solutionana, brown, moist to very moist				-	211	H		-						-	
			_		-			50 <u>k</u>	Pa					0		
			4	SS	6									0		
						210		50k	Pa						1	
			5	SS	6			•								
1						209										
208.4			1		_											
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand,		6	ss	6	208			63kPa							
	(with intermittent wet dilatant		/──		-											
	firm, brownish grey, moist to wet		1													
		\mathcal{N}	1			207									_	
	wet				-			38kPa								
			Ľ	SS	4	1								ĺ		
			1			208	, 		_							
:																
			1	-												
204 8			8	ss	8	205	, 	+	63KHa					<u>0</u>	_	
204.0 8.1	End of Borehole		1	1			1									1
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LOG OF BOREHOLE 24

	SOIL PROFILE		Γ	SAMP	LES	щ	PENE	TRATIO	N					NAT			0~	STANDBIRG
, Ŧ	DESCRIPTION	STRAT PLOT	NUMBER	ТҮРЕ	"N" VALUES	ELEVATION SCAL	SHEA O U	AR STR NCONFI DCKET 20 4	ENGT ENGT NED PEN. 0 60) 80 H kPa + F × L) 1(TIELD AB V/	VANE				LIQUID LIMIT 	d ORGANI(ad VAPOUF	INSTALLATIO OR REMARKS
0	300mm TOPSOIL	<u> <u> 1</u></u>														+		
.3	Weathered / Disturbed	XXX	1	AS											0			
.1	trace organics																	
в	CLAYEY SILT TO SILTY CLAY		2	SS	10	215	1				1	50kPa	•		0			
	trace to some sand, stiff, brown, moist to very moist		3	ss	9						1	50kPa			0			
			 			214												
6									50kPa									
	SILTY CLAY		4	SS	6											o		
	trace sand					213					-					+		
	some silt, trace sand,		5	S S	5			386	-a							2	1	
	(with intermittent wet dilatant fine sand / silt lenses)							i	i									
	very soft to firm, brownish grey,					212	-											
	very moist to wet																	
Ì	dilatant silt, grey, wet		╞															
		11	6	SS	5	211										1		
						210												
4	wet	KK	1						50kPa									
			7	SS	5				•									
						200												
						203												
						-			ł									
		\mathbb{H}							·						0			
8			Ľ	55	2	208												
1	End of Borehole																	
														1				
						-		· .										
i					ļ ,													
		1	1												1			



	GLIENT: First Orban Inc.							ELEV	A LION	UAT	UM:	Ge	odeti	C _			LITE;	1-00-13
	SOIL PROFILE	oT		SAMP	rLES	SCALE	PENE RESIS	TRATIC STANCE	DN EPLOT) 100	5	PLASTI LIMIT		URAL TURE TENT	LIQUID LIMIT	GANIC	
	DESCRIPTION	STRAT PL	NUMBER	TYPE	"N" VALUE	ELEVATION	SHE/ OU P	AR STI NCONF OCKET	RENGT INED PEN.	H kPa + (× (FIELD V LAB VAI	ANE NE	WAT	ER CC	NTEN	₩L 17(%) 30	(ppm)	REMARKS
0.8 0.0	Ground Surface	<u>, 07</u>							t i									
0.5 0.3	Weathered / Disturbed trace organics		1	AS	Ì	220									0			
.8	CLAYEY SILT TO SILTY CLAY		2	SS	6		\backslash									0		Ţ
	trace to some sand, firm to stiff, brown, moist		3	SS	13	219	$\left \right\rangle$				18	50kPa	•		0			
.5 .3	SILT - Dilatant,		4	SS	11	218									0			
	trace to some clay, trace to some sand, compact, brown, very moist to wet		5	SS	15										0			
5.3					-	217											·	
5	SILTY CLAY trace sand TO CLAY		6	SS	7	216				75 6 P	a				0			
	(with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		7	ss	8	215			50k Pa						0			
						214												
2.7			8	\$5	9	213			50kPa						-0			
3.1	End of Borehole																	
•																		



LOG OF BOREHOLE 26

			VISIO	<u>n</u>			_ '		·	T .			y 200	· /				
y	LOCATION: Highway 403 / Lync	len Ro	ad,	Branti	ford, C	Ontario			MEN	I:	Solid	Stem	Auge	ers				
	CLIENT: First Urban Inc.						_ (ELEV	ATION	N DA'	TUM:	G	eodet	ic			FILE:	1-06-139
EV TH	SOIL PROFILE	STRAT PLOT	NUMBER	SAMP Ha	"N" VALUES	LEVATION SCALE	PENE RESIS SHEA O UI	TRATIC STANCE 20 4 AR STF NCONF OCKET	PLOT PLOT RENGT INED PEN.	ю к ГН кР: + ×	BO 1 a FIELD LAB V					LIQUID LIMIT ₩L 	B ORGANIC B VAPOUR	STANDPIPI INSTALLATIC OR REMARKS
15.7	Ground Surface		 			ш	2	20 4	0 6		BO 1	100	1	0 2	:0 : 	30		
15.4	300mm TOPSOIL																	
0.3	Weathered / Disturbed trace organics			A5		215												
1.0	CLAYEY SILT TO SILTY CLAY		2	SS	8											D		
	trace to some sand, stiff to very stiff, brown, moist to very moist		3	\$S	16	214					— ,	225kPa			0	-		
			4	SS	10	213						150kPa			0			:
			5	SS	13							188kPa			a			
						212												
1.2 4.5	SILT - Dilatant, trace to some clay, trace to some sand		6	ss	15	211									0			
0.0	compact, brown, wet					210	+											
6.1	SILTY CLAY trace sand		7	SS	8	209		38k	Pa						0			
	IO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses),								E)									
	firm, brownish grey, moist to very moist		8	SS	4	208	1	38	Ра						0			
97.6 8.1	End of Borehole																	
																	-	
															-			

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	PROJECT: Proposed Residential St LOCATION: Highway 403 / Lynden	ubdivisi Road	on , Bran	ford, (Ontario	DATE:	21 Februa Solid Sterr	ny 2007		
r	CLIENT: First Urban Inc.	····					DATUM: <u>G</u>			· <u> </u>
ļ	SOIL PROFILE		SAM	PLES	ALE	RESISTANCE PLOT	>	PLASTIC NATURAL LIQUID	ы Х Ч	ST
ELEV DEPTH	DESCRIPTION	STRAT PLOT NUMBER	ТҮРЕ	"N" VALUES	ELEVATION SC	20 40 60 SHEAR STRENGTH • UNCONFINED • POCKET PEN. 20 40 60	80 100 kPa + FIELD VANÉ × LAB VANE 80 100	UMII CONTENT UMII ₩ P ₩ ₩ L ↓ WATER CONTENT (%) 10 20 30	(mdd) VAPO	RI
0.0 207.8	300mm TOPSOIL	7 -		-	208					
0.3 207.3	Weathered / Disturbed trace organics	1	AS	-				o		
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand,	2	ss	6	207		175kPa	3 e o		
	firm, brown, very moist	3	ss	6	000		113 k	Pa		
205.8	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent	4	SS	5	206	50kPa		•		
205.1 3.0	wet dilatant fine sand / silt lenses), firm, brownish grey, very moist	5	SS	8	205			0		
	SILT - Dilatant, trace to some clay, trace to some sand, loose, grey, wet				204					
		G	ss	9	203			0		
					202					
		7	SS	8				0		
					201					
200.5 7.6 200.0	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent	e	SS	4	200			0		
6.1	firm, brownish grey, very moist End of Borehole									

Sheet 1 of 1

	PROJECT: Proposed Residentia LOCATION: Highway 403 / Lyn	al Subd den Ro	ivisio bad,	n Brant	ford,	Ontario	C 6	DATE: EQUIP	MEN	: T: _:	22 Fe <u>Solid</u>	bruai Stem	<u>y 2007</u> Auge	7 rs			FIL F	1-06-
[·	T	CAL			PENE	TRATIC	N				1					
ELEV DEPTH	DESCRIPTION	RAT PLOT	JUMBER	SAMI H H L	. VALUES	VATION SCALE	RESIS 2 SHEA 0 UI	R STF	PLOT 0 6 RENGT	20 8 I'H kPa +	0 1 FIELD	00 VANE					ORGANIC	STANI INSTAL O REM/
209.2	Ground Surface	ST			7	ELE	• P(0 4 0 4	PEN. 0 6	io e	LABV. 10 1	ANE. 00	1(2 2	0 3	10	(ppm)	
0.0 208.9	300mm TOPSOIL				-	209												
0.3	Weathered / Disturbed trace organics		_	A3	-										Ŭ			
208.2		- 14	2	ss	4										0			
1.0	CLAYEY SILT TO SILTY CLAY		1		-	208	\uparrow											
	trace to some sand, firm to stiff, brown, moist		3	SS	9							125kPa				0		
	nin to sta, brown, moist		_		_												ł	
			-		-	207					10	жРа				<u> </u>		
			4	SS	10											1		
								38k	Pa	GI	R.SA.S	ICL			0			
			5	SS	5	206	1			0	. 4 .57	39			0			
						205												
204.3			6	SS	11						10	0kPa			0			
4.9		Ĥ	-		-	204												
	trace sand,																	
	TO CLAY some silt, trace sand.	H	1															
	(with intermittent wet dilatant		┢		-	203	1.	- 38k	Pa	ļ								
	firm, brownish grey, moist to very mois	t 🗐	7	SS	7										0			
											1							
						202			ļ	ļ	<u> </u>					<u> </u>		
201.6			1	ļ	_													₽
7.6	SILT - trace to some clay, trace to some sand, compact, grey		8	ss	12		{								'n			
8.1	Very moist to wet	/	1	<u> </u>	1	1				<u>†</u>	+	+	<u>+</u>					
	End of Borehole																	
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	PROJECT: <u>Proposed Residen</u> LOCATION: <u>Highway 403 / Ly</u> CLIENT: First Urban Inc.	tial Subd Inden Ro	ivisio bad,	on Brant	ford, (Ontario		DATE EQUIF ELEV	: PMEN ATIO	IT:	22 Fe Solid TUM:	ebrua Stem G	ry 200 n Auge eodet)7 ers ic			FILE	
			T	SAME	אבפ	ш	PENE	TRATIC					I					1
ELEV DEPTH 205.1	DESCRIPTION Ground Surface	STRAT PLOT	NUMBER	J-YPE	"N" VALUES	ELEVATION SCAL	RESI SHE O U I	STANCE 20 4 AR STI JNCONF POCKET 20 4	E PLOT IO (RENG INED PEN. IO (50 6 TH kPa + × 60 6	IO 1 FIELD LAB V IO 1	00 VANE ANE 00	PLAST LIMIT + WA1		URAL STURE ITENT O ONTEN 20	LIQUID LIMIT * L IT (%) 30	(mdd) VAPOUR	ST/ INST RE
0.0 204.8	300mm TOPSOIL	<u></u>	╞		-	205				-								
0.3	Weathered / Disturbed trace organics	·	1	AS	-											¢		
0.0	SILT trace to some clay,		2	SS	10	204		1										
	trace to some sand, loose to compact, brown, very moist to wet		3	SS	9	203									¢			
202.8	CLAYEY SILT TO SILTY CLAY trace to some sand, firm, brown, very moist to wet		4	SS	7					75k	а					c		
	grey		5	SS	5	202		25kPa							0			
						201												
			6	53	7											0		
						200												
			7	SS	5	199										 >		÷
					_	198												
197.0			8	SS	5	19										_		
. 8.1	End of Borehole											-				-		
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LOG OF BOREHOLE 30

ATTON:			SAMP AS SS SS SS		210 200	PENE RESIS SHE/ O UI	TRATIC TRATIC STANCE 20 4 AR STF NCONF 20 4	ATION DN E PLOT IO 60 RENGT INED PEN IO 60 63 63	0 8(H kPa + I 0 8(kPa	0 100 FIELD V/ LAB VAN 0 100		ATER CC		LIQUID LIMIT *L T (%) 0	PILE: ORGANIC VAPOUR (mdd)	1-06-135 STANDPIPI INSTALLATIC OR REMARKS
SOIL PROFILE DESCRIPTION I TOPSOIL ared / Disturbed rganics Y SILT TO SILTY CLAY I some sand, stiff, brown, moist to wet	STRAT PLOT	HERMINN 1 2 3	SAMP	CLES SJUNANN. 6 4	210 205 205	PENE RESIK SHEA O UI	TRATIC STANCE 20 4 AR STF NCONF OCKET 20 4	DN E PLOT 40 64 RENGT 1NED PEN. 40 64 63 63	0 80 H kPa + F × L 0 80 kpa	FIELD V/ LAB VAN 0 100		ATER CC	URAL STURE TENT N NTEN 0 3 0 0	LIQUID LIMIT *L T (%) 0	URGANIC (mdð) ORGANIC	
DESCRIPTION urface 1 TOPSOIL ered / Disturbed rganics Y SILT TO SILTY CLAY some sand, stiff, brown, moist to wet	STRAT PLOT		AS SS SS SS	6 4 15	210 205	: SHE/ 0 U • P	AR STF NCONF OCKET 20 4	10 6/ RENGT INED PEN. 10 6/ 63 63	0 8(+ 1 × 1 0 8(kPa	0 100 FIELD V/ LAB VAN 0 100				со	(mdð) VAPC	
Y SILT TO SILTY CLAY some sand, stiff, brown, moist to wet		1	AS SS SS SS	6	210			63	kPa kPa				•	0		¥
ered / Disturbed rganics Y SILT TO SILTY CLAY some sand, stiff, brown, moist to wet		1 2 3 4	AS SS SS SS	6	210			63 63	kPa kPa				0	0		Ţ
Y SILT TO SILTY CLAY some sand, stiff, brown, moist to wet		2	SS SS SS	4	210			63	k₽a k₽a				e	0		¥
stiff, brown, moist to wet		3	SS SS	4	209			63	k₽a ●					。		
		4	SS	15						1	<u> </u>					
				-	1					12	5kPa•		o			
	KXX	2°	SS	14	208					100 k F	'a		0			
					207					 		-				
CI AY - trace sand		6	\$5	2			'au ·	GR.SA.	SI.CL 46.53				с			
AY - some silt, trace sand, termittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to) wet				206											
dilatant, grey		7	ss	11									0			
					204							-				
		8	ss	4	20'	:	25kPa						0			
End of Borehole	¥⊥⊿	-	+	+		1	+					1	 			
	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey 7 End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey 7 SS 8 SS End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey 7 SS 11 6 SS 4 End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, termittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, termittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet dilatant, grey End of Borehole	AY - some silt, trace sand, itermittent wet dilatant nd / silt lenses), stiff, brownish grey, moist to wet 206 dilatant, grey 7 SS 11 204 204 204 204 204 204 204 204 204 204 204 204 205	AY - some silt, trace sand, itermittent wet dilatant ind / silt lenses), stiff, brownish grey, moist to wet 206 dilatant, grey 7 SS 4 204 8 SS 8 SS 4 203	AY - some silt, trace sand, itermittent wet dilatant ind / silt lenses), stiff, brownish grey, moist to wet 206 205 dilatant, grey 7 SS 11 8 SS 4 203	AY - some silt, trace sand, itermittent wet dilatant ind / silt lenses), stiff, brownish grey, moist to wet 206 206 dilatant, grey 7 SS 11 0 5 S 4 204 204 204 204 204 204 204 204 204

Sheet 1 of 1

APPENDIX II MECP WATER WELL DATABASE REPORT

MECP Water Well Records

Well Record #								
1300182	Lot 044 Conc 02	BRANTFORD TO	WNSHIP / BRANT		Flowing? N			
Date 1947-03-24 DD/MM/YYYY	Elev (masl) / Livestock Water Found 2.4 (mbgs)	Easting 564014 N Water Supply (masl) FR	orthing 4781283 UTM RC 9 unknown UTM ESH Depth (m)	Elev (masl)	SWL Pumping WL Pump Rate Spec. Cap.	2.4 8.5 36.4 5.97	(mbgs) (mbgs) (LPM) (LPM/m) He	(masl) (masl) 2 / 0 pur / Minute
	Top of Screen (mbgs) Screen Interval (m)	Casing Material: STEEL Bottom of Screen (mb Contractor	gs) 0.0	¢	blor		Soil Descriptions	
			3.7 8.5 10.7 37.8 42.7	YEI B BR BR G	LOW LUE DWN DWN MEDIU REY LIMI	CLAY / CLAY / CLAY / M SAND / ESTONE /	MEDIUM SAND MEDIUM SAND	
1300183	Lot 043 Conc 02	BRANTFORD TO	WNSHIP / BRANT		Flowing? N			
Date 1964-08-07 DD/MM/YYYY	Elev (masl) / Domestic Water Found 9.1 (mbgs) Casing Diameter 36 inch	Easting 563964 N Water Supply (masl) FR Casing Material: CONCRETE	orthing 4781003 UTM RC 5 margin of error : 100 ESH Depth (m)	m - 300 m Elev (masl)	SWL Pumping WL Pump Rate Spec. Cap.	9.1 11.0 13.6 7.46	(mbgs) (mbgs) (LPM) (LPM/m) He	(masl) (masl) 0 / 30 pur / Minute
	Top of Screen (mbgs) Screen Interval (m)	Bottom of Screen (mb Contractor	0.0 gs)	с	blor		Soil Descriptions	
			3.0 9.1 14.6 15.8 18.9	BR G	OWN REY	CLAY / CLAY / SILT / CLAY / CLAY /	SILT	
1300185 Date 1967-05-13 DD/MM/YYYY	Lot 044 Conc 02 Elev (masl) / Domestic / Domestic Water Found 4.6 (mbgs) Casing Diameter 36 inch Top of Screen (mbgs)	BRANTFORD TO Easting 564314 N Water Supply (masl) FR Casing Material: CONCRETE Bottom of Screen (mb Contractor	WNSHIP / BRANT orthing 4781003 UTM RC 5 margin of error : 100 ESH Depth (m) 0.0 gs)	m - 300 m Elev (masi) C	Flowing? N SWL Pumping WL Pump Rate Spec. Cap.	4.6 9.1	(mbgs) (mbgs) (LPM) (LPM/m) He Soil Descriptions	(masl) (masl) 6 / 0 pur / Minute
			4.6 23.5	BR B	OWN UE	CLAY / CLAY /	SILT	
1300231 Date 1966-08-06 DD/MM/YYYY	Lot 043 Conc 03 Elev (masl) / Domestic Water Found 6.1 (mbgs) Casing Diameter 36 inch Top of Screen (mbgs) Screen Interval (m)	BRANTFORD TO Easting 563784 N Water Supply (masl) FR Casing Material: CONCRETE Bottom of Screen (mb Contractor	WNSHIP / BRANT orthing 4780803 UTM RC 5 margin of error : 100 ESH Depth (m) 0.0 gs)	m - 300 m Elev (masl) C	Flowing? N SWL Pumping WL Pump Rate Spec. Cap.	7.3 8.2 13.6 14.91	(mbgs) (mbgs) (LPM) (LPM/m) He Soil Descriptions	(masl) (masl) 0 / 30 our / Minute
			0.3 3.4 6.1	BL BR B	ACK T DWN LUE	OPSOIL / CLAY / CLAY /		

Well Record

				13.4	BLUE		CLAY /	SILT	1
1300232	Lot 044 Conc 03		OWNSHID	BRANT		Flowing? N			
1300232		BRANTIORD	OWNSHII!	BRANT		SWL	6.1	(mbgs)	(masl)
Date 1964-09-26	Elev (masl)	Easting 564254	Northing	4780943		Pumping WL	9.1	(mbgs)	(masl)
DD/MM/YYYY	/ Domestic	Water Supply	UTM RC 5	margin of error : 100 m - 300 m		Pump Rate	13.6	(LPM)	0 / 30
	Water Found 6.1 (mbgs)	(masl)	FRESH			Spec. Cap.	4.47	(LPM/m)	Hour / Minute
	Casing Diameter 36 inch	Casing Material: CONCRETE		Depth (m) Elev (masl)	<u>.</u>				
	Top of Screen (mbgs)	Bottom of Screen (r	mbgs)	0.0	Color			Soli Descript	ions
	Screen Interval (m)	Contractor							
				3.0	BROWN		CLAY /		/
				24.4	BLUE		CLAY /	MEDIUM SA	ND /
1301251	Lot 041 Conc 02	BRANTFORD T		BRANT		Flowing? N			
						SWL	12.2	(mbgs)	(masl)
Date 1968-10-22	Elev (masi)	Easting 562934	Northing	4780713	I	Pumping WL	33.5	(mbgs)	(masl)
	Water Found 22.5 (mbro)	water Supply		margin of error : 100 m - 300 m		Pump Rate	27.3	(LPM)	2 / 0
	water Found 55.5 (hibgs)		FRESH	Depth (m) Elev (masl)		Spec. Cap.	1.28	(LPM/m)	Hour / Minute
	Casing Diameter 6 inch	Casing Material: STEEL		0.0	Color			Soil Descript	ions
	Top of Screen (mbgs)	Bottom of Screen (r	mbgs)						
	Screen Interval (m)	Contractor							
				3.7	BROWN		CLAY /		1
				32.9	BLUE		CLAY /		1
				36.6		LIME	STONE /		1
1301252	Lot 044 Conc 02	BRANTFORD T	OWNSHIP	BRANT		Flowing? N			(
Date 1968-01-16	Elev (masl)	Easting 564194	Northing	4780983		SWL	8.2	(mbgs)	(masi)
DD/MM/YYYY	/ Domestic	Water Supply	UTM RC 5	margin of error : 100 m - 300 m	I	Pumping WL	40.5	(mbgs)	(masi)
	Water Found 39.6 (mbgs)	(masl) I	FRESH	·		Spec Can	4.5	(LFW) (LPM/m)	2 / 0 Hour / Minute
	Casing Diameter 5 inch	Casing Material: STEEL		Depth (m) Elev (masl)		opec. oap.	0.14		filoar / Minute
	Ton of Sereen (mbro)	Bettern of Sereen	ente ene)	0.0	Color			Soil Descript	ions
	Top of Screen (mbgs)	Bottom of Screen (r	nbgs)						
	Screen Interval (m)	Contractor							
				12.2		PREVIOUS	Y DUG /		1
				36.9	GREY		CLAY /		1
				40.5	GREY	LIME	STONE /		/
13018/8	Lot 042 Conc 03		OWNCHID	BRANT		Flowing? N			
1301040		DRANTFURD I	CWNSHIP /	DIVANT		SWL	18.3	(mbgs)	(masl)
Date 1972-11-01	Elev (masl)	Easting 563694	Northing	4780433		Pumping WL		(mbgs)	(masl)
DD/MM/YYYY	/ Domestic	Water Supply	UTM RC 4	margin of error : 30 m - 100 m		Pump Rate		(LPM)	/
	Water Found 5.5 (mbgs)	(masl) I	FRESH			Spec. Cap.		(LPM/m)	Hour / Minute
	Casing Diameter 36 inch	Casing Material: CONCRETE		Depth (m) Elev (masl)	0.1				
	Top of Screen (mbgs)	Bottom of Screen (r	mbgs)	0.0	Color			Soli Descript	ions
	Screen Interval (m)	Contractor							
	()								
				0.3	BROWN	тс	opsoil /		1
				1.2	BROWN	OVERB	URDEN /		1
				5.5	BROWN		CLAY /		1
				17.1	GREY		SILT /	CLAY	/ SAND
				17.4	GREY		SAND /		/
				10.9	DI 11F				1

Vell Record #								
1304601	Lot 044 Conc 02	BRANTFORD TO	OWNSHIP / BRANT		Flowing?	N		
					SWL	4.6	(mbgs)	(masl)
Date 1993-05-25	Elev (masl)	Easting 564042	Northing 4780948		Pumping WL		(mbgs)	(masl)
DD/MM/YYYY	/ Domestic	Water Supply	UTM RC 3 margin of error	: 10 - 30 m	Pump Rate		(LPM)	1
	Water Found 4.6 (mbg	s) (masl) FF	RESH		Spec. Cap.		(LPM/m)	Hour / Minute
	Casing Diameter 36 inch	Casing Material: CONCRETE	Depth (r	n) Elev (masl)			. ,	
	Tax of Querran (mbar)		0.0		Color		Soil Description	ons
	Top of Screen (mbgs)	Bottom of Screen (m	bgs)					
	Screen Interval (m)	Contractor						
						/		,
			0.3		BROWN	TOPSOIL /		1
			4.6		BROWN	CLAY /	SANDY	/
			18.3		BLUE	CLAY /	SILT	/ LAYERED
1306184	Lot 044 Conc 02	BRANTFORD TO	OWNSHIP / BRANT		Flowing?			
					SWL		(mbgs)	(masl)
ate 2004-06-16	Elev (masl)	Easting 564349	Northing 4781054		Pumping WL		(mbgs)	(masl)
DD/MM/YYYY	/ Domestic	Water Supply	UTM RC 3 margin of error	: 10 - 30 m	Pump Rate		(LPM)	1
	Water Found 4.6 (mbg	s) (masi)			Spec. Cap.		(LPM/m)	Hour / Minute
	Casing Diameter 91 cm	Casing Material: CONCRETE	Depth (r	n) Elev (masl)				
	Top of Screen (mbgs)	Bottom of Screen (m	0.0		Color		Soil Description	ons
	Top of Screen (hbgs)	Bottom of Screen (in	nga)					
	Screen Interval (m)	Contractor						
			0.3		BROW/N	TOPSON /		1
			0.5		BROWN			,
			4.0		GREV			
			1.9		GREY		SAND	
1			10.0		GREI	3121 /	SAND	/ LATERED
7041625	Lot Conc 02	BRANTFO	ORD CITY / BRANT		Flowing?			
ate 2007-02-27	Elev (masl)	Easting 563490	Northing 4781212		SWL		(mbgs)	(masl)
	/ Not Used	Test Hole	UTM RC 3 margin of error	· 10 - 30 m	Pumping WL		(mbgs)	(masl)
00/1111/	Water Found (mbg	e) (mael)	of margin of enor	. 10 - 30 m	Pump Rate		(LPM)	1
	Water Found (hibg	3) (1163)	Dopth (r	a) Eloy (masi)	Spec. Cap.		(LPM/m)	Hour / Minute
	Casing Diameter 3 cm	Casing Material: PLASTIC	Deptil (i		Color		Sail Decorinti	
	Top of Screen 4.6 (mbgs)	Bottom of Screen 7.6 (ml	bgs)		COIDI		Soli Descriptio	0115
	Sereen Interval 2.0 (m)	Contractor						
	Screen Interval 5.0 (iii)	Connactor						
			0.3		BROWN	TOPSOIL /		1
			3.0		BROWN	SILT /	CLAY	
			7.6		GREY	CLAY /		Ì
	• - •				Elouine?			
/245505	Lot Conc	BRANTFO	JKD CITY ' BRANT		riowing?		(mbas)	(masl)
ate 2015-07-03	Elev (masl)	Easting 562776	Northing 4780715		JWL Bumping Wi		(mbgs)	(masl)
	/ Monitoring and	Te Observation Wells	UTM RC 4 margin of error	: 30 m - 100 m	Pumping WL		(IIIDgs) (I DM)	(111031)
	Water Found (mbg	s) (masl) Un	ntested		Pump Rate			/ Hour / Minuto
DD/MM/TTTT			Depth (r	n) Elev (masl)	Spec. Cap.			
	Cooling Diamotor 1.3 inch	Cooling Motorial, DIASTIC	· · · · ·					
DDMMVTTTT	Casing Diameter 1.3 inch	Casing Material: PLASTIC	0.0		Color		Soil Description	ons
<i>bb</i> , m w i i i i i	Casing Diameter 1.3 inch Top of Screen 4.6 (mbgs)	Casing Material: PLASTIC Bottom of Screen 1.5 (ml	0.0 bgs)		Color		Soil Description	ons
	Casing Diameter 1.3 inch Top of Screen 4.6 (mbgs) Screen Interval -3.0 (m)	Casing Material: PLASTIC Bottom of Screen 1.5 (ml Contractor Direct Environmenta	0.0 bgs) al Drilling inc.		Color		Soil Description	ons
<i>DD</i> , mn , r r r r	Casing Diameter 1.3 inch Top of Screen 4.6 (mbgs) Screen Interval -3.0 (m)	Casing Material: PLASTIC Bottom of Screen 1.5 (mi Contractor Direct Environmenta	0.0 bgs) al Drilling inc.		Color		Soil Description	ons
	Casing Diameter 1.3 inch Top of Screen 4.6 (mbgs) Screen Interval -3.0 (m)	Casing Material: PLASTIC Bottom of Screen 1.5 (mi Contractor Direct Environmenta	0.0 bgs) al Drilling inc. 1.5		Color BROWN	FILL /	Soil Descriptio	ons / TOPSOIL
	Casing Diameter 1.3 inch Top of Screen 4.6 (mbgs) Screen Interval -3.0 (m)	Casing Material: PLASTIC Bottom of Screen 1.5 (ml Contractor Direct Environmenta	bgs) 0.0 al Drilling inc. 1.5 3.4		Color BROWN BROWN	FILL / CLAY /	Soil Descriptio	ons / TOPSOIL /

Well Record #			
7347715 Date 2019-08-22 DD/MM/YYYY	Lot 043 Conc 03 BRANTFORD TOWNSHIP BRANT Elev (masl) 563852 Northing 4780631 Water Found 2.4 (mbgs) Observation Wells UTM RC 4 margin of error : 30 m - 100 m Casing Diameter 4 inch Casing Material: STEEL Depth (m) Elev (masl) 0.0 Top of Screen 3.0 (mbgs) Bottom of Screen 6.1 (mbgs) 0.0 Screen Interval 3.0 (m) Contractor London Soil Test Itd. Elev 100 m	Flowing? SWL Pumping WL Pump Rate Spec. Cap. Color	(mbgs) (masi) (mbgs) (masi) (LPM) / (LPM/m) Hour / Minute Soil Descriptions
	2.6 4.6 6.1	BROWN GREY GREY	SILT / CLAY / SILT / CLAY / CLAY / SILTY /
7347716 Date 2019-08-22 DD/MM/YYYY	Lot 043 Conc 03 BRANTFORD TOWNSHIP BRANT Elev (mas) Easing 563852 Northing 4780631 margin of error: 30 m 100 m W are Found (mas) (mas) (mas) UTM RC 4 1000 m 1000 m Casing Variation (mas) Casing Margin STEEL Depth (m) o.0 Elev (mas) 0.0 Top of Screener 3.0 (mbg) Bottom of Screener 6.1 (mbgs) Elev (mas) 0.0	Flowing? SWL Pumping WL Pump Rate Spec. Cap. Color	(mbgs) (masl) (mbgs) (masl) (LPM) / (LPM/m) Hour / Minute Soil Descriptions
	2.3 6.1	BROWN GREY	SILT / CLAYEY / SILT / CLAYEY /
7347801 Date 2019-08-22 DD/MM/YYYY	Lot 044 Conc 03 BRANTFORD TOWNSHIP / BRANT Elev (masl) Easting 564223 Northing 4780690 Vater Found 4.1 (mbgs) Observation Wells UTM RC 4 margin of error : 30 m - 100 m Casing Diameter 4 inch Casing Material: STEEL Depth (m) Elev (masl) Top of Screen 3.0 (mbgs) Bottom of Screen 6.1 (mbgs) Screen Interval 3.0 (m) Contractor London Soil Test ltd.	Flowing? SWL Pumping WL Pump Rate Spec. Cap. Color	(mbgs) (masl) (mbgs) (masl) (LPM) / (LPM/m) Hour / Minute Soil Descriptions
	1.5 4.1 6.1	BROWN BROWN GREY	SILT / CLAYEY / SILT / CLAY / SILT / CLAY /

APPENDIX III HYDRAULIC ANALYSES





APPENDIX IV WATER BALANCE ANALYSES



THEORETICAL WATER BALANCE ASSESSMENT - DRAFT

Project: Water Balance 299 Lynden Road, Brantford, Ontario Date: December 1, 2023 Reviewed By: ZK

Theoretical Existing Conditions

	Water Held In Soil Storage (theoretical					
	Precipitation (m3/month)	Evapotranspiration (m3/month)	buffer) (m3/month)	Infiltration (m3/month)	Run-Off (m3/month)	
January	25,366	13,143	240,373	13,511	2,208	
February	50,023	15,594	240,373	23,298	3,817	
March	39,047	32,810	240,373	12,352	6,824	
April	60,973	39,595	240,373	13,558	11,603	
Мау	57,762	52,853	240,373	2,993	2,738	
June	62,630	62,708	240,293	0	0	
July	43,726	61,306	222,712	0	0	
August	44,737	49,002	218,447	0	0	
September	69,066	32,437	240,373	7,691	7,018	
October	72,746	20,023	240,373	27,573	25,162	
November	53,124	15,751	240,373	19,547	12,189	
December	47,450	4,262	240,373	25,502	9,599	
Minimum (Monthly)	25,366	4,262	218,447	0	0	
Maximum (Monthly)	72,746	62,708	240,373	27,573	25,162	
Average Monthly	52,221	33,290	237,067	12,169	6,763	
Per Annum	626,649	399,484	-	146,024	81,159	

Theoretical Proposed Conditions

	Storage (theoretical					
	Precipitation (m ³ /month)	Evapotranspiration (m ^³ /month)	buffer) (m ³ /month)	Infiltration (m ³ /month)	Run-Off (m ³ /month)	
January	25,366	7,664	157,850	7,967	5,829	
February	50,023	9,094	157,850	14,086	9,622	
March	39,047	19,134	115,331	7,081	34,074	
April	60,973	23,090	157,850	8,223	49,168	
Мау	57,762	30,822	157,850	1,834	28,602	
June	62,630	36,569	157,804	0	26,106	
July	43,726	35,751	147,552	0	18,221	
August	44,737	28,576	145,064	0	18,649	
September	69,066	18,916	157,850	4,783	32,603	
October	72,746	11,677	157,850	17,149	43,927	
November	53,124	9,185	157,850	12,158	21,732	
December	47,450	2,651	157,850	15,594	16,156	
Minimum (Monthly)	25,366	2,651	115,331	0	5,829	
Maximum (Monthly)	72,746	36,569	157,850	17,149	49,168	
Average Monthly	52,221	19,427	152,379	7,406	25,391	
Per Annum	626.649	233.129	-	88.875	304,688	







THEORETICAL FEATURE-BASED WATER BALANCE ASSESSMENT

Project: Feature-Based Water Balance (North Feature of Interest) 299 Lynden Road, Brantford, Ontario Date: December 1, 2023 Reviewed By: ZK

Theoretical Existing Conditions

	Water Held In Soil					
	Precipitation (m3/month)	Evapotranspiration (m3/month)	buffer) (m3/month)	Infiltration (m3/month)	Run-Off (m3/month)	
January	8,731	4,524	127,539	4,719	685	
February	17,219	5,368	127,539	8,287	1,204	
March	13,441	11,294	115,331	4,210	2,073	
April	20,988	13,629	127,539	4,831	3,667	
Мау	19,883	18,193	127,539	1,077	873	
June	21,559	21,585	127,512	0	0	
July	15,051	21,103	121,460	0	0	
August	15,399	16,868	119,992	0	0	
September	23,774	11,165	127,539	2,801	2,262	
October	25,041	6,892	127,539	10,042	8,110	
November	18,286	5,422	127,539	7,119	3,929	
December	16,333	1,552	127,539	9,168	3,058	
Minimum (Monthly) Maximum (Monthly)	8,731 25,041	1,552 21,585	115,331 127,539	0 10,042	0 8,110	
Average Monthly	17,975	11,466	125,384	4,354	2,155	
Per Annum	215,705	137,596	-	52,254	25,861	

Theoretical Proposed Conditions

	Water Held In Soil Storage (theoretical					
	Precipitation (m ³ /month)	Evapotranspiration (m ^³ /month)	buffer) (m³/month)	Infiltration (m ³ /month)	Run-Off (m ³ /month)	
January	13,113	5,013	128,388	5,241	2,266	
February	25,860	5,948	128,388	9,233	3,784	
March	20,186	12,515	115,331	4,656	12,186	
April	31,521	15,103	128,388	5,384	17,982	
Мау	29,860	20,160	128,388	1,202	9,776	
June	32,377	23,920	128,357	0	8,487	
July	22,605	23,385	121,651	0	5,924	
August	23,127	18,692	120,024	0	6,063	
September	35,704	12,373	128,388	3,133	11,844	
October	37,607	7,638	128,388	11,231	18,742	
November	27,463	6,008	128,388	7,962	9,226	
December	24,530	1,736	128,388	10,232	6,926	
Minimum (Monthly)	13,113	1,736	115,331	0	2,266	
Maximum (Monthly)	37,607	23,920	128,388	11,231	18,742	
Average Monthly	26,996	12,708	126,039	4,856	9,434	
Per Annum	323,954	152,492	-	58,273	113,205	



