HYDROGEOLOGY INVESTIGATION REPORT

PUSLINCH INDUSTRIAL
7335 WELLINGTON ROAD 34

TOWN OF PUSLINCH
WELLINGTON COUNTY

PREPARED FOR:

SHADE SPRINGS INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
GUELPH, ON N1H 7T8
55 WYNDHAM ST N, SUITE 215

AUGUST 2026

CFCA FILE NO. 2676-7116

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CROZIER

Revision Number	Date	Comments
Rev.0	August 6, 2025	Draft submission to Client and external project team.
Rev.1	March 3, 2026	Issued to Client.
Rev. 2	August 7, 2026	Issued for first submission.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Shade Springs Inc. (Client) to prepare a comprehensive Hydrogeological Investigation in support of the Zoning By-Law Amendment (ZBA) application for the proposed industrial development located at 7335 Wellington Road 34 in the Township of Puslinch, Wellington County. This report outlines the existing hydrogeological conditions and presents the findings of the hydrogeological investigation, including groundwater conditions, water supply considerations, and a post-development water balance assessment. This report has been prepared considering the Grand River Conservation Authority's (GRCA) Hydrogeological Assessment Submission Guidelines for Development Applications.

1.1 Site Background

The subject property (herein referred to as the Site) is located at 7335 Wellington Road 34 in the Township of Puslinch, Wellington County, north of Highway 401 (**Figure 1**). The Site is bounded by Wellington 34 to the north, agricultural properties to the east, a paving operation (Capital Paving) to the south and residential properties and Concession 7 to the west. The Site currently consists of a detached dwelling, associated structures, a gravel driveway, agricultural lands, and a wooded area along Concession 7.

The Site is located within the Mill Creek Subwatershed which is a part of the greater Grand River Watershed. Aberfoyle Creek is located approximately 400 m south of the Site and flows from the northeast/east to the southwest/west.

1.2 Proposed Development

Based on the proposed Site Plan prepared by Baldassarra Architects Inc. dated June 2026, the proposed industrial development will consist of the following elements:

- One (1) industrial building (total area of 142,917.67 m^2)
- Associated parking spaces (total of 1,034 parking spaces)
- One (1) SWM pond (total area of 35,454.72 m^2)
- One (1) sewage disposal area (total area of 19,811.51 m^2)
- Internal paved areas including access to Wellington Road 34

It is assumed that the proposed building will be constructed to be slab on grade and serviced by an individual private water well.

2.0 Existing Conditions

The following sections below outline the existing conditions of the Site area based on literature review and field observations.

2.1 Physiography, Topography & Drainage

According to Chapman and Putnam (1984), the Site is located within the Horseshoe Moraines physiographic region (**Figure 2**), immediately north of the Flamborough Plains and south of Guelph Drumlin physiographic regions. The Horseshoe Moraines physiographic region is described as a series of clay ridges flanked by sand and gravel spillways. The land is primarily hilly and moraine-like, with some local plains consisting of smoother lacustrine deposits and limestone plains.

Based on topographic contours of the surrounding area, surface water drainage appears to be directed south towards Aberfoyle Creek. Aberfoyle Creek flows to Mill Creek and eventually to the Grand River. Site topography ranges from approximately 314 meters above sea level (masl) at Concession Road 7 to 320 masl at the Site's eastern boundary.

2.2 Regional Geology

The Site sites atop a bedrock basement of the Guelph Formation. The Guelph Formation primarily consists of dolostone with sandstone, shale and siltstone in various degrees of occurrence (**Figure 3**). According to the Ontario Geological Survey (OGS) mapping, depth to bedrock is estimated to be between 10 meters below ground surface (mbgs) to approximately 25 mbgs. The surficial sediments within the Site area are mapped as ice-contact stratified deposits comprised of sand, gravel with minor silt, clay and till. Glaciofluvial deposits are mapped within the forested area of the Site (**Figure 4**).

The Site is located within an "area of potential karst" according to OGS resources. Karst is a landform feature formed by the dissolution of carbonate bedrock by water. In areas of thin or absent overburden material, exposures of dolostone and limestone can be weathered, and dissolution can occur, forming karstic features such as caves, springs, and sinkholes. The nearest occurrence of "known karst" is approximately 7 km southeast of the Site. However, since overburden thickness is greater than 1 m thick on the Site, significant karst formation on the property is not anticipated.

2.3 Local Geology

A Geotechnical Investigation was completed on Site to characterize the existing geological conditions and determine design constraints. In May 2024, twelve (12) boreholes were advanced on Site by Soil-Mat Engineers and Consultants Ltd. (Soil-Mat), four (4) of which were converted into monitoring wells. According to the Geotechnical Investigation, the following stratigraphy was encountered:

2.3.1 Topsoil

Dark brown, topsoil was encountered at all borehole locations, ranging from 0.30 to 0.45 m in thickness. The range in thickness of topsoil was interpreted to be varied due to the agricultural history of the Site. No fill material was observed beneath this layer.

2.3.2 Silty Sand/Sandy Silt

Native silty sand to sandy silt was observed in all borehole locations beneath the topsoil layer to the maximum extent of exploration of 6.7 mbgs in most boreholes. At Borehole 1 (BH-1), sandy silt/silty sand extents to a depth of 3 mbgs. In general, the soils are described as brown with fine to coarse sandy seams and occasional cobble to boulder inclusions. The soil was generally dry to moist and loose to compact.

2.3.3 Silty Clay/Clayey Silt

Silty clay to clayey silt was encountered from 3 mbgs to 6.7 mbgs at BH-1 only. This unit is described as grey, suggesting the soil holds water for a period of time.

For further details, please refer to the Geotechnical Investigation (Soil-Mat, 2024) submitted under separate cover. Borehole logs are appended to this report as **Appendix A**.

2.4 Hydrostratigraphy

The Site is located within the Mill Creek Subwatershed which is a part of the greater Grand River Watershed. According to the Tier Three Water Budget and Local Area Risk Assessment Characterization report (Golder, 2022), the hydrostratigraphic system of the Puslinch Area is comprised of thirteen (13) units. From youngest to oldest, the hydrostratigraphic units are described in **Table 1**.

Table 1: Hydrostratigraphy of the Town of Puslinch Area

System	Unit	Hydrostratigraphic Unit Name	Function	Material	Water Supply
Overburden	1 - Youngest	Grand River Outwash	Aquifer	Gravel, Sand	Domestic
	2	Wentworth Till	Aquitard/ Aquifer	Silt, Sand, Clay	
	3	Glaciolacustrine, Glaciofluvial Sediments	Aquifer	Silt, Sand, Clay	Domestic
	4	Port Stanley Till, Catfish Creek Till	Aquitard	Silt, Clay	
	5	Older Glaciofluvial Sediments	Aquifer	Sand, Gravel	Domestic
Bedrock	6	Contact Aquifer	Aquifer	Weathered Bedrock	Domestic, Cambridge
	7	Guelph Formation	Aquifer	Medium to thick bedded fossiliferous Dolostone	Domestic
	8	Eramosa Formation	Aquitard	Dolomitic Limestone, Shale	
	9	Goat Island	Aquifer	Dolomitic Limestone	
	10	Upper Gasport Formation	Aquifer	Dolomitic Limestone, Dolostone	Guelph
	11	Middle Gasport Formation	Aquifer	Dolomitic Limestone, Dolostone	Guelph, Puslinch, Cambridge
	12	Lower Gasport Formation	Aquifer	Dolomitic Limestone, Dolostone	Guelph, Puslinch
	13 - Oldest	Cabot Head Formation	Aquitard	Shale	

2.5 MECP Well Records

A review of the Ministry of Environment Conservation and Parks (MECP) well records was completed for all wells within 500 metres of the Site boundary (**Figure 5**). A summary table of the well records is provided in **Appendix B**. In general, the following can be observed from the MECP well records:

- The majority of well records reported gravel, sand, silt, clay and brown to grey rock. The majority of water supply wells are completed within the shallow bedrock, while observation wells are typically installed at depths of less than 10 mbgs within sand and silt deposits.

- A total of 86 water supply wells were identified within 500 m of the Site. The majority are reported to be used for domestic purposes representing private water supply wells associated with the Heritage Lake Subdivision and surrounding rural residential properties. One (1) record (Well ID 6712626) lists the well use as "public supply." Based on the mapping, this well appears to be located off Wellington Road 34, west of Highway 6, near a sports bar. It is likely that this well has been mis-plotted in the database and is not actually situated within 500 m of the Site.

- Reported recommended pumping rates within the bedrock aquifer range from 22.71 litres per minute (LPM) to 1703.44 LPM, with an average recommended pumping rate of 78.53 LMP. Static water levels in water supply wells range from flowing conditions to approximately 41.45 mbgs, with an average static water level of 5.08 mbgs.

- Based on the recorded well depths and the local hydrostratigraphic framework, it is interpreted that the majority of bedrock wells in the area are completed within the Guelph Formation or the deeper Gasport Formation.

2.6 Source Water Protection Information

Based on the MECP Source Protection Information Atlas, the Site is located within the Grand River Source Protection Area which is regulated by the Grand River Source Protection Plan. The Site is located in an Intake Protection Zone (IPZ-3) with a vulnerability score of 1 and a Significant Groundwater Recharge Area (SGRA). An IPZ-3 is an area where modelling shows that a spill of a chemical or pathogen contaminant would reach the intake zone. An SGRA is an area where precipitation infiltrates the ground to recharge an aquifer, helping sustain drinking water supplies and sensitive ecosystems.

No significant drinking water threats and source protection policies related to the IPZ-3 and SGRA are identified for the Site Area under Ontario's Clean Drinking Water Act (2006). Despite no *significant* drinking water threats being identified for the Site Area, there are numerous activities identified in the Grand River Source Protection Plan that pose low to moderate threats to future drinking water use, including the following:

- The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage.

- The handling and storage of a dense non-aqueous phase liquid (DNAPLs).

- The handling, storage, or application of commercial fertilizer.

- The handling, storage, or application of road salt.

- The handling and storage of fuel.

- The storage of snow.

- An activity that reduces the recharge of an aquifer.

In summary, given that the proposed development is industrial, the seven (7) activities identified above should be managed using a Best Management Practice approach. Consultation with a Wellington County Risk Management Official (RMO) may be required to ensure that proper policy instruments are considered for any proposed on-site activities that may induce a potential drinking water threat. If deemed necessary, a Source Water Impact Assessment and Mitigation Plan (SWIAMP) may be required to support the proposed development and can be prepared at a later stage.

2.7 Regional Groundwater Levels

Regional shallow and deep groundwater flow direction is interpreted to follow surface and bedrock topography and flow south/southwest towards the Grand River. According to the Oak Ridges Moraine Groundwater Program Mapping, regional groundwater elevations range from 310 masl at Aberfoyle Creek to 75 masl at Lake Ontario.

2.8 Regional Groundwater Quality

Groundwater quality within the Grand River Watershed is obtained from monitoring wells within the Provincial Groundwater Monitoring Network (PGMN) and municipal data. Groundwater sampling results are compared to the Ontario Drinking Water Quality Standards and any exceedances are flagged and investigated to determine the potential source, impact, and mitigation of that parameter.

The Site, located within the Grand River Watershed, has experienced rising chloride levels due to runoff from urban areas that rely heavily on road salt and water softeners. This increased chloride load has been documented in the Grand River downstream of major urban centers since the 1970s (GRCA, 2024).

3.0 Field Work

The following section outlines the field investigation conducted by Crozier staff to characterize the existing Site conditions.

3.1 Methodology

As mentioned in Section 2.3, four (4) monitoring wells were installed by Soil-Mat for Geotechnical purposes in May 2024 (**Figure 6**). Soil sampling was conducted at regular intervals during drilling to classify the soils. A summary of the monitoring wells is provided in **Table 2** below.

Table 2: Monitoring Well Details

Monitoring Well Name	Screened Interval (mbgs)	Screened Material
MW1	3.0 – 6.1	Base of Silty Sandy/Silt and Clayey Silt/Silty Clay
MW3		Silty Sand/Sandy Silt
MW4		
MW9		

For detailed borehole logs, please refer to the Geotechnical Report prepared by Soil-Mat submitted under separate cover.

3.2 Groundwater Monitoring

Manual groundwater measurements were collected using an electronic water level meter and automatic level loggers were deployed in all wells across the Site. The water level loggers were set to measure water levels on an hourly basis to collect a more comprehensive dataset for a greater understanding of the shallow groundwater system. Results of groundwater monitoring to date is covered in Section 3.3 below.

3.3 Groundwater Monitoring Results

Table 3 below shows the manual groundwater levels collected by Soil-Mat in 2024, and Crozier from May 2024 to June 2025.

Table 3: Manual Groundwater Levels (May 2024 – June 2025)

MW Name	Existing Grade (masl)[1]	Soil-Mat				Crozier					
		May 2024		June 2024		August 2024		November 2024		June 2025	
		Water Level (mbgs)	Water Level (masl)	Water Level (mbgs)	Water Level (masl)	Water Level (mbgs)	Water Level (masl)	Water Level (mbgs)	Water Level (masl)	Water Level (mbgs)	Water Level (masl)
MW1	311.68	1.41	310.27	1.37	310.31	1.73	309.95	1.49	310.19	1.36	310.32
MW3	310.50	1.53	308.97	1.66	308.84	2.12	308.38	2.27	308.23	1.71	308.79
MW4	310.33	1.64	308.86	1.68	308.82	1.83	308.67	2.12	308.38	1.81	308.69
MW9	318.94	5.54	313.40	5.65	313.29	6.55	313.36	6.11	312.83	5.53	313.41

1. Existing grade elevations were retrieved from the Site Plan prepared by Baldassarra Architects Inc. (June 2026).

Manual groundwater levels across the Site ranged from 5.53 mbgs (313.41 masl) to 2.27 mbgs (308.23 masl) between May 2024 and June 2025. The highest recorded manual water level occurred in June 2025, while the lowest measurable level was observed in November 2024. Based on these measurements, groundwater flow at the Site is interpreted to be generally toward the south/southwest direction (**Figure 7**).

Automatic level loggers were installed in all monitoring wells, and the resulting hydrographs are provided in **Appendix C**. These hydrographs show continuous water level data from August 2024 to June 2025. Groundwater levels in all monitoring wells exhibited minor responses to precipitation events throughout the monitoring period, with MW1 showing the greatest degree of fluctuation.

The limited groundwater level response to precipitation suggests that the interpreted unconfined silty sand/sandy silt unit is relatively permeable and allows for effective drainage. The greater groundwater level response observed at MW1 is likely attributable to its screened interval at the base of the silty sand/sandy silt and the lower permeability clayey silt/silty clay unit. Infiltrating water may temporarily accumulate above this lower permeability unit, resulting in greater groundwater level fluctuations at MW1.

From the groundwater level data collected, it is interpreted that seasonally high groundwater conditions on Site are experienced in the Spring following the freshet. It is assumed that the water levels captured during Spring 2025 are representative of seasonally high groundwater conditions and can be used for design purposes. Please see **Table 4** below which summarizes peak automatic readings that were captured in Spring 2025 which represent on Site seasonally high conditions.

Table 4: Seasonally High Groundwater Levels

MW Name	Peak Automatic Water Level (April 2025)	
	Water Level (mbgs)	Water Level (masl)
MW1	0.67	311.01
MW3	1.01	309.49
MW4	1.43	309.07
MW9	4.97	313.97

4.0 Design Considerations

The following section outlines preliminary design constraints and considerations that should be considered in the design of the proposed development.

4.1 Dewatering Considerations

Discussion on the potential for future dewatering below is based on the interaction between the groundwater surface and proposed design elements for the Site.

If proposed building footings are to be extended below the reported seasonally high groundwater conditions as identified in Table 3, it can be expected that short-term and/or long-term groundwater dewatering will be required. Discharge of any dewatering flows should be analyzed against applicable criteria depending on the discharge method. It should also be noted that dependent on the required discharge volumes during and post-construction, additional permitting requirements may apply. If construction volumes exceed 50,000 L/day, registration with the MECP Environmental Activity Sector Register is required. Similarly, if daily permanent dewatering volumes are to exceed 50,000 L/day post-construction, an additional Permit to Take Water will be required for the groundwater discharge. Local permitting will also likely be required prior to any groundwater discharge.

Groundwater dewatering volumes should be evaluated once final footings for the proposed buildings are determined.

4.2 Water Supply

The proposed development will be serviced by a private water supply well. According to the Functional Servicing & Stormwater Management Report prepared by Urbtech Engineering Inc. (August 2026), the estimated average daily water demand for the proposed development is approximately 40.49 LPM, equivalent to 58,300 litres a day (L/day).

As outlined in Section 2.4 and **Appendix B**, nearby water supply wells completed within the Guelph Formation Aquifer report recommended pumping rates ranging from 22.71 litres per minute (LPM) to 1703.44 LPM, with an average recommended pumping rate of 78.53 LMP. Based on the available well records, a water supply well completed within the Guelph Formation at the Site would generally be expected to provide a yield exceeding the estimated average daily water demand of 40.49 L/min. However, it should be noted that some nearby wells report recommended pumping rates below this value, indicating that well yields may vary depending on local hydrogeological conditions.

Crozier recommends that site-specific groundwater quantity and quality testing be completed following well installation to confirm whether the proposed well can provide an adequate yield and acceptable water quality for the proposed development. In addition, the following recommendations should be considered during the installation and long-term operation of the proposed water supply well:

- Site grading should be designed to direct surface water runoff away from the wellhead and prevent ponding in the vicinity of the well. Gasoline, chemicals, paints, de-icing products, and other potential contaminants should be properly contained and stored away from the wellhead.

- The well must be constructed in accordance with the Ontario Regulation 903 and consider all local regulations. The well must be constructed upgradient from any proposed onsite sewage system and be sited following all setbacks outlined in the Ontario Building Code.

- For educational purposes on well ownership, the Owner should refer to the MECP's Water Supply Wells: Requirements and the local health unit for resources. Additional resources for the Owner can be accessed through the Walkerton Clean Water Centre, Green Communities Canada and the Government of Canada website.

- Following installation, the well should be pumped, disinfected, and tested following approval to inform the design of any water treatment system.

- The Owner should follow the regulatory well maintenance requirements as outlined in the MECP's Water Supply Wells: Requirements and Best Practices. The well must be accessible for maintenance purposes permanently.

- It is recommended that any new well water be tested on roughly an annual basis for bacterial parameters. Public Health Ontario offers free well water testing for E.Coli and total coliforms bacteria through the local Health Unit. Additional water quality testing for the full suite of potable water testing parameters should occur on a biannual basis.

4.3 Water Balance

A water balance assessment was conducted to assess potential impacts of the proposed development on the local groundwater conditions. The water balance was conducted under existing (pre-development) and proposed (post-development) conditions. The water balance assessment was conducted in accordance with accepted site condition values from Table 6.3 of the Urban Storm Drainage Criteria Manual: Volume 1 (Urban Drainage and Flood Control District, 2016) and Table 3.1 of the MECP Stormwater Management Planning and Design Manual (MECP, 2003). The appropriate reference tables are provided in **Appendix D**.

The results of the water balance assessment are presented in **Table 5** below.

Table 5: Summary of Water Balance

Pre-Development Infiltration (mm/yr)	**Post-Development Infiltration without Mitigation** (mm/yr)	**Infiltration Deficit** (mm/yr)
183	68	115

4.3.1 Methodology

The water balance on a site can be estimated from the following equation described in Thornthwaite and Mather 1957:

$$P = S + R + I + ET$$

Where: P = precipitation

S = change in groundwater storage

R = surface water runoff

I = infiltration

ET = evapotranspiration/evaporation

The components of the water balance equation can be estimated using field observations of drainage conditions, land cover, soil types, groundwater conditions and local climate records.

4.3.2 Precipitation (P)

The nearest climate station with available 1991–2020 data is the Kitchener/Waterloo Climate Station (Climate ID 6144239), located approximately 17.11 km away from the Site at 43°27'39.000" N, 80°22'43.000" W, with an elevation of 321.6 masl. As noted, long-term monthly average precipitation and climate data from 1991–2020 were used to support the Site's water balance calculations. The long-term monthly averages are presented in **Table 6** below.

Table 6: Climate Data (1991 – 2020) for Kitchener/Waterloo Climate Station

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Precipitation (mm)	66.3	46.1	57	81.2	80.2	80.5	96.2	67.2	75.2	71	74.9	54.9	850.6[1]
Temperature (°C)	-6.3	-5.9	-0.8	5.9	12.6	17.8	20.2	19.1	15.2	8.8	2.6	-2.8	7.2[2]

1. Total average annual precipitation from 1991-2020.
2. Average annual temperature from 1991-2020.

Therefore, based on the data above, the long-term annual average precipitation for the area is 850.6 mm/year and the long-term average temperature for the Site area is 7.2 °C.

4.3.3 Storage (S)

Long-term groundwater storage (S) is assumed to be negligible as no evidence of groundwater impact on significant groundwater pumping or withdrawal is noted in regional studies of the area. The seasonal changes in water levels are expected to balance annually.

4.3.4 Evapotranspiration (ET)

The rate of evapotranspiration is a function of the water holding capacity of the soil, soil and vegetation type and land cover. Through the Thornthwaite and Mather method or a soil moisture balance approach and local climate data, the Potential Evapotranspiration (PET) and the Actual Evapotranspiration (AET) can be calculated (see **Appendix D**) using the following equations:

$$PET = 16 \times \left(\frac{10Ta}{H_i}\right)^a$$

Where: Ta = average daily temperature, 0 degrees for negative temperature months

Hi = heat index value, assuming 12 hours per day, 30 days a month of daylight

The average heat index value is estimated using the following equation:

$$Hi = \sum_{i=1}^{12} \left(\frac{10Ta}{5}\right)^{1.514}$$

The evapotranspiration factor (α) is determined using the following equation:

$$\alpha = 0.49 + (0.0179 \times H_i) - (0.0000771 \times H_i^2) + (0.000000675 \times H_i^3)$$

PET is adjusted to account for the average number of hours of daylight per month for a given location. The adjustment factor is dependent on the subject property's latitude and is presented in **Appendix D** (Thornthwaite and Mather, 1957). The PET is multiplied by the adjustment factor per month to determine the Adjusted Potential Evapotranspiration (PET_{adj}).

The Actual Evapotranspiration (AET) is determined using the following equation:

$$AET = PET_{adj} - \Delta S$$

The Change in Soil Storage (ΔS) is depended on the types of soil on the property and the Accumulated Potential Water Loss (APWL) per month. The Change in Soil Storage and Accumulated Potential Water Loss can be calculated using the following equations:

$$\Delta S = S_{mc} \text{ x}$$

Where: Smc = soil moisture capacity

APWL = accumulated potential water loss

For ΔP < 0: $APWL = -\Sigma_{i=0}^{12} PET_i$

For ΔP < 0: $APWL = \frac{ln\left(\frac{|AET-PET|}{S_{mc}}\right)}{S_{mc}}$

As discussed in Section 2.3 above, the soils on the property were determined to be silty sands and sandy silts. Using the Ministry Environment, Conservation and Parks (MECP) Stormwater Management and Design Manual Table 3.1. (2003), the soil moisture capacity was estimated to be 75 mm for sandy loam soils in urban lawn environments.

4.3.5 Water Surplus (R+I)

The difference between mean annual P and mean annual ET outputs the amount of water surplus for the Site. The water surplus either infiltrates (I) into the soil or travels across the site as runoff (R).

The distribution of water that infiltrates into the soil is a function of an infiltration factor as described in Table 3.1 of the MECP Stormwater Management Planning and Design Manual (MECP, 2003). The infiltration factor for the Site is assumed to be 0.7 based on topographic factor of 0.3 for flat land, a soils factor of 0.3 for fine sandy loam combinations of soil and a land cover factor of 0.1 for open area.

The water balance components were used to estimate the pre-development and post-development water balance scenarios. Detailed water balance calculations for the subject property can be seen in **Appendix D**.

4.3.6 Pre-Development Infiltration

The pre-development water balance calculations are presented in **Appendix D** Under existing conditions, the infiltration for the Site is calculated to be 183 mm/yr.

4.3.7 Post-Development Infiltration

To complete the post-development infiltration calculation, the proposed development was separated by land use and assigned a percent imperviousness. Based on the water balance components, the calculated post-development infiltration volumes are estimated to be 68 mm/yr. In comparing the pre and post development infiltration volumes, the proposed development has the potential to decrease by 63%.

4.3.8 Water Balance Impact Assessment

Based on the results of the water balance, the proposed development has the potential to decrease infiltration by 115 mm/yr. Low impact development features should be designed to infiltrate 115 mm/yr to achieve water balance.

5.0 Conclusions & Recommendations

Based on the information presented in this report, the following conclusions are made:

- In stratigraphic order, the soils of the Site area primarily consist of topsoil, sandy silt/silty sand and clayey silt to silty clay.

- Between May 2024 and June 2025, manual groundwater levels ranged from 313.41 masl to 308.23 masl. Seasonally high groundwater level conditions were observed in Spring 2025 with groundwater levels ranging from 313.97 masl to 309.07 masl. Groundwater is interpreted to flow in a south/southwest direction towards Aberfoyle Creek.

- According to the MECP Source Protection Information Atlas, the Site is located within an IPZ-3 and SGRA, however, no specific source protection policies apply.

- Crozier recommends that site-specific groundwater quantity and quality testing be completed following well installation to confirm whether the proposed well can provide the estimated average daily water demand of 40.49 L/min while meeting acceptable water quality standards for the proposed development.

- A site wide water balance was completed for the Site. Using the Thornthwaite and Mather method pre-development infiltration was determined to be 183 mm/yr and post-development infiltration was determined to be 68 mm/yr. Therefore, the infiltration deficit is calculated to be 115 mm/yr.

Respectfully submitted,

C.F.CROZIER & ASSOCIATES INC.



Victoria Mazur, Engineering Intern
Hydrogeology, Land Development

C.F. CROZIER & ASSOCIATES INC.



Jessica Doherty, P.Eng.
Project Manager, Private Services

VM/tc

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APPENDIX A

Borehole Logs (Soil-Mat, 2024)

Log of Borehole No. 1

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812348
E: 567147

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	95.39	Ground Surface								
0 / 0	95.09	**Topsoil** Approximately 300 millimetres of topsoil.		SS	1	1,3,2,3	5			
1 /		**Silty Sand/Sandy Silt** Brown, trace gravel, occasional cobbles, growing more clayey with depth, very dense to compact.		SS	2	2,2,4,5	6			
2 /				SS	3	6,35,43,40	78			
3 / 1	92.79	Transition to grey in colour.		SS	4	5,7,6,4 Wet Spoon	13			
4 /	92.29	**Clayey Silt/Silty Clay** Grey, trace gravel, stiff to firm.		SS	5	5,4,4,4	8			
5 /				SS	6	4,2,3,4	5		1.5	
6 / 2	88.69			SS	7	4,5,3,3	8		0.5	
7 /		End of Borehole								

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 6.7 metres.

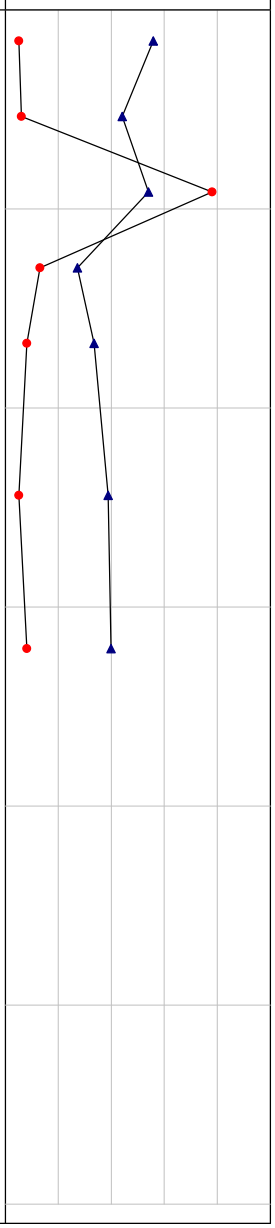
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:
June 19, 2024 - >94.02 metres

Moisture Content w% (10 20 30 40)

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



Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 2

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812361
E: 567409

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	96.35	Ground Surface									
0–2 / 0	95.95	**Topsoil** Approximately 400 millimetres of topsoil.		SS	1	2,2,3,3	5				
2–5 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel in the upper levels, compact.		SS	2	5,7,7,8	14				
5–8 / 2				SS	3	7,10,19,9	29				
8–11 / 3				SS	4	4,5,8,7	13				
11–12 / 3				SS	5	6,9,11,11	20				
12 / 3.7	92.65	End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 21, 2024 to termination at a depth of 3.7 metres.

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

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

Drill Method: Hollow Stem Augers
Drill Date: May 21, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 3

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812189
E: 567486

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	92.38	Ground Surface							
1 / 0	91.93	**Topsoil** Approximately 450 millimetres of topsoil.							
2 / 1		**Silty Sand/Sandy Silt** Brown, occasional coarse sand seams, occasional cobbles, trace to some gravel, compact to dense.	SS	1	3,3,4,5	7			
3 / 1			SS	2	4,5,6,13	11			
4 / 2			SS	3	5,10,14,9 Wet Spoon	24			
5 / 2			SS	4	9,11,25,29 Wet Spoon	36			
6 / 3			SS	5	6,15,14,15 Wet Spoon	29			
7 / 4			SS	6	11,12,7,19 Wet Spoon	19			
8 / 5									
9 / 6									
10 / 6	85.68		SS	7	9,12,22,15 Wet Spoon	34			
11 / 7		End of Borehole							

NOTES:

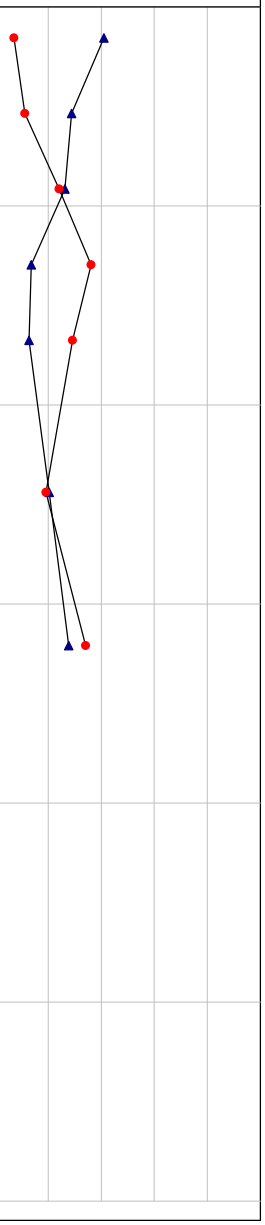
1. Borehole was advanced using hollow stem auger equipment on May 21, 2024 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 6.3 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:
June 19, 2024 - >90.72 metres

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



Drill Method: Hollow Stem Augers
Drill Date: May 21, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 4

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812273
E: 567562

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	92.32	Ground Surface							
0 / 0	92.02	**Topsoil** Approximately 300 millimetres of topsoil.							
1 / 0		**Silty Sand/Sandy Silt** Brown, occasional coarse sand seams, trace to some gravel, loose to compact.	SS	1	3,3,5,6	8			
2 / 1			SS	2	5,6,9,8	16			
5 / 2			SS	3	4,7,7,7 Wet Spoon	14			
8 / 2			SS	4	6,8,9,7 Wet Spoon	17			
10 / 3			SS	5	9,6,6,7 Wet Spoon	12			
16 / 5			SS	6	2,2,3,7 Wet Spoon	5			
21 / 6	85.62		SS	7	9,10,6,3 Wet Spoon	16			
22 / 7		End of Borehole							

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 21, 2024 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 6.1 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:
June 19, 2024 - >90.64 metres

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

Drill Method: Hollow Stem Augers
Drill Date: May 21, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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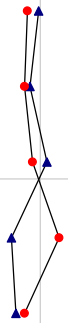
Log of Borehole No. 5

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812418
E: 567629

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	95.06	Ground Surface								
0 / 0	94.76	**Topsoil** Approximately 300 millimetres of topsoil.		SS	1	5,7,8,8	15			
3 / 1		**Silty Sand/Sandy Silt** Brown, occasional cobbles, trace to some gravel, loose to compact.		SS	2	6,7,7,8	14			
7 / 2				SS	3	6,7,10,7	17			
10 / 3				SS	4	6,13,14,14	27			
11 / 3				SS	5	7,6,11,8	14			
12 / 4	91.36	End of Borehole NOTES: 1. Borehole was advanced using hollow stem auger equipment on May 21, 2024 to termination at a depth of 6.7 metres. 2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client.								

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



Drill Method: Hollow Stem Augers
Drill Date: May 21, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 6

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812778
E: 568015

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		103.19	Ground Surface							
0	0	102.89	**Topsoil** Approximately 300 millimetres of topsoil.	SS	1	3,4,4,4	8			
3	1		**Silty Sand/Sandy Silt** Brown, becoming coarser with depth, trace to some gravel, compact.	SS	2	4,6,11,6	17			
6	2			SS	3	5,8,16,13	24			
9	3			SS	4	8,13,13,15	26			
11		99.49		SS	5	6,8,13,10	21			
12	4		End of Borehole							

NOTES:

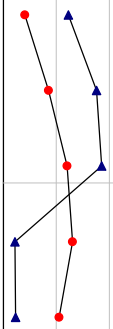
1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 3.7 metres.

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

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

Moisture Content w% (10 20 30 40)

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



Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 7

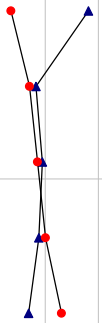
Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812830
E: 567870

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	102.45	Ground Surface								
0–3 / 0–1	102.05	**Topsoil** Approximately 400 millimetres of topsoil.		SS	1	3,3,4,5	7			
3–12 / 1–4		**Silty Sand/Sandy Silt** Brown, trace to some gravel, compact.		SS	2	6,6,8,9	14			
				SS	3	5,7,10,10	17			
				SS	4	7,8,12,13	20			
				SS	5	8,13,13,14	26			
12 / 4	98.75	End of Borehole								

Moisture Content w% (10 20 30 40)

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



NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 3.7 metres.

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

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

Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 8

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812534
E: 567771

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		101.74	Ground Surface								
0	0	101.39	**Topsoil** Approximately 350 millimetres of topsoil.								
1–3	1		**Silty Sand/Sandy Silt** Brown, occasional cobbles, trace to some gravel, compact.		SS	1	2,2,3,3	5			
3–6	1				SS	2	3,4,2,1	6			
6–9	2				SS	3	5,6,8,4	14			
9–11	3				SS	4	6,11,14,9 Wet Spoon	25			
11–12	3	98.04			SS	5	12,11,8,16 Wet Spoon	19			
13	4		End of Borehole								

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 21, 2024 to termination at a depth of 3.7 metres.

2. Borehole was recorded as open and 'wet' at adepth of 3.0 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Hollow Stem Augers
Drill Date: May 21, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 9

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812614
E: 567860

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	98.87	Ground Surface							
0 / 0	98.47	**Topsoil** Approximately 400 millimetres of topsoil.							
1 / 0		**Silty Sand/Sandy Silt** Brown, becoming coarser with depth, occasional cobbles, trace to some gravel, compact.	SS	1	1,2,3,2	5			
3 / 1			SS	2	3,3,3,2	6			
6 / 2			SS	3	2,4,6,7	10			
9 / 3			SS	4	10,15,15,8	30			
11 / 3			SS	5	14,17,12,15	29			
16 / 5			SS	6	4,5,10,10	15			
21 / 6	92.17		SS	7	26,8,7,9 Wet Spoon	15			
23 / 7		End of Borehole							

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 6.5 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:
June 19, 2024 - >93.22 metres

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

Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 10

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812754
E: 567625

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 ft / 0 m	103.12		Ground Surface									
0	102.77		**Topsoil** Approximately 300 millimetres of topsoil.		SS	1	3,4,26,4	30				
1 ft / 0 m			**Silty Sand/Sandy Silt** Brown, occasional cobbles, trace to some gravel, compact to dense.		SS	2	7,12,17,9	29				
2 ft / 1 m					SS	3	13,21,25,18	46				
3 ft / 1 m					SS	4	5,12,10,15	22				
3 ft / 1 m					SS	5	5,10,11,11	21				
12 ft / 4 m	99.42		End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 3.7 metres.

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

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

Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 11

Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812648
E: 567417

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	98.17	Ground Surface								
0 / 0	97.87	**Topsoil** Approximately 300 millimetres of topsoil.		SS	1	3,4,6,3	10			
3 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel, compact.		SS	2	9,10,8,6	18			
6 / 2				SS	3	9,6,5,7	11			
9 / 3				SS	4	6,6,16,8	22			
11 / 3				SS	5	8,7,7,6	14			
12 / 4	94.47	End of Borehole								

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 3.7 metres.

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

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

Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

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Log of Borehole No. 12

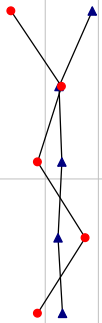
Project No: SM 240354-EG
Project: Proposed Industrial Site
Location: Concession Road 7, Puslinch
Client: The Milo Group

Project Manager: Kyle Richardson, P.Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4812862
E: 567711

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	97.01	Ground Surface								
0 / 0	96.71	**Topsoil** Approximately 300 millimetres of topsoil.		SS	1	3,3,4,6	7			
3 / 1		**Silty Sand/Sandy Silt** Brown, trace gravel, compact.		SS	2	10,10,16,13	26			
6 / 2				SS	3	8,7,10,9	17			
9 / 3				SS	4	7,18,17,12 Wet Spoon	35			
11 / 3				SS	5	7,8,9,9	17			
12 / 4	93.31	End of Borehole								

Moisture Content w% (10 20 30 40)

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



NOTES:

1. Borehole was advanced using hollow stem auger equipment on May 22, 2024 to termination at a depth of 3.7 metres.

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

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

Drill Method: Hollow Stem Augers
Drill Date: May 22, 2024
Hole Size: 200 Millimetres
Drilling Contractor: Elements Geo Corp.

Soil-Mat Engineers & Consultants Ltd.
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T: 905.318.7440 · TF: 800.243.1922 · F: 905.318.7455
www.soil-mat.ca · E: info@soil-mat.ca

Datum: Temporary Benchmark
Field Logged by: JS
Checked by: KR
Sheet: 1 of 1

APPENDIX B

MECP Well Records Summary

MECP Well Records

Project Number: 2676-7116-2
Prepared by: VM

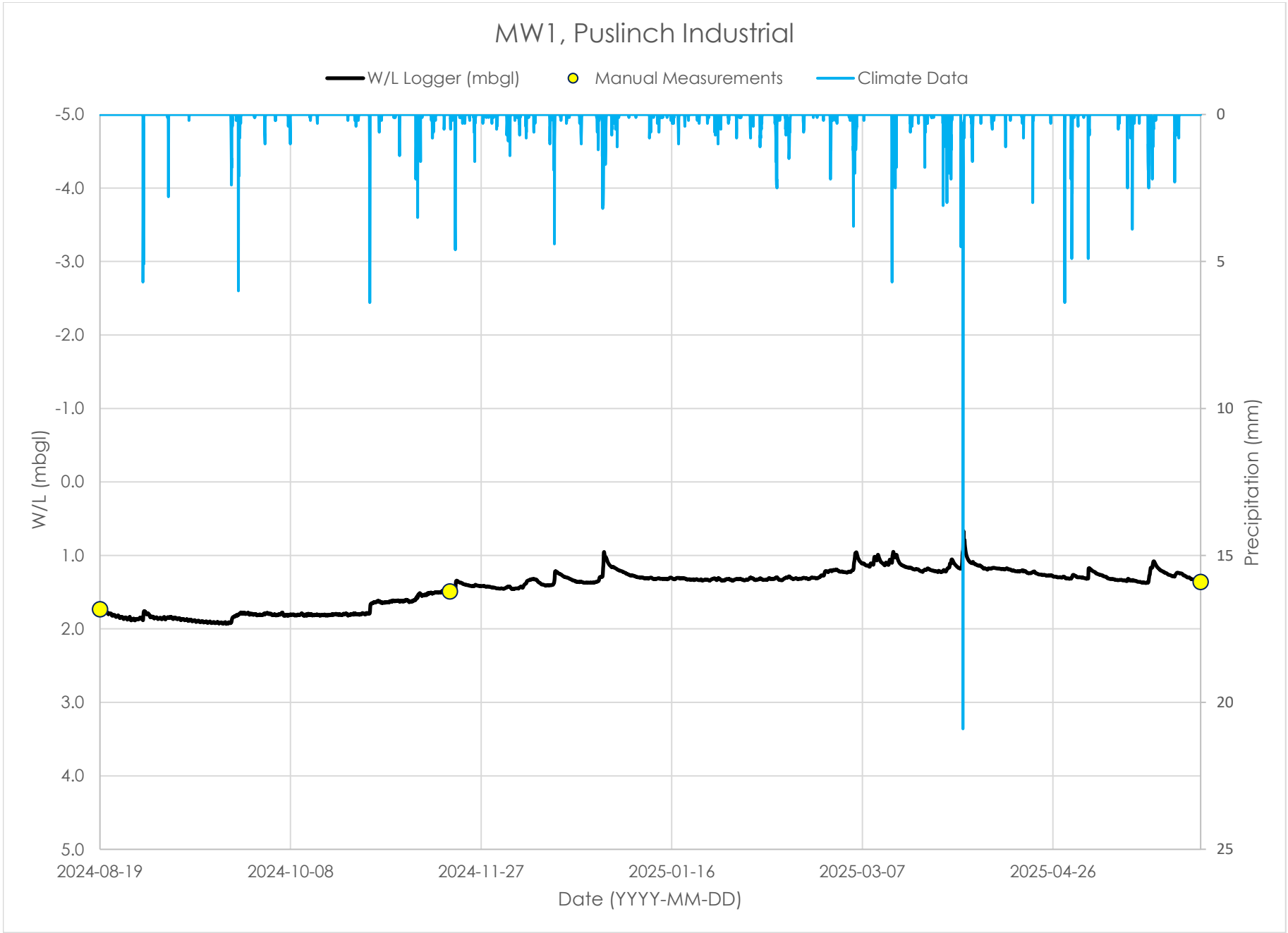
Address: Puslinch Industrial
Date Completed: 11-25-2024

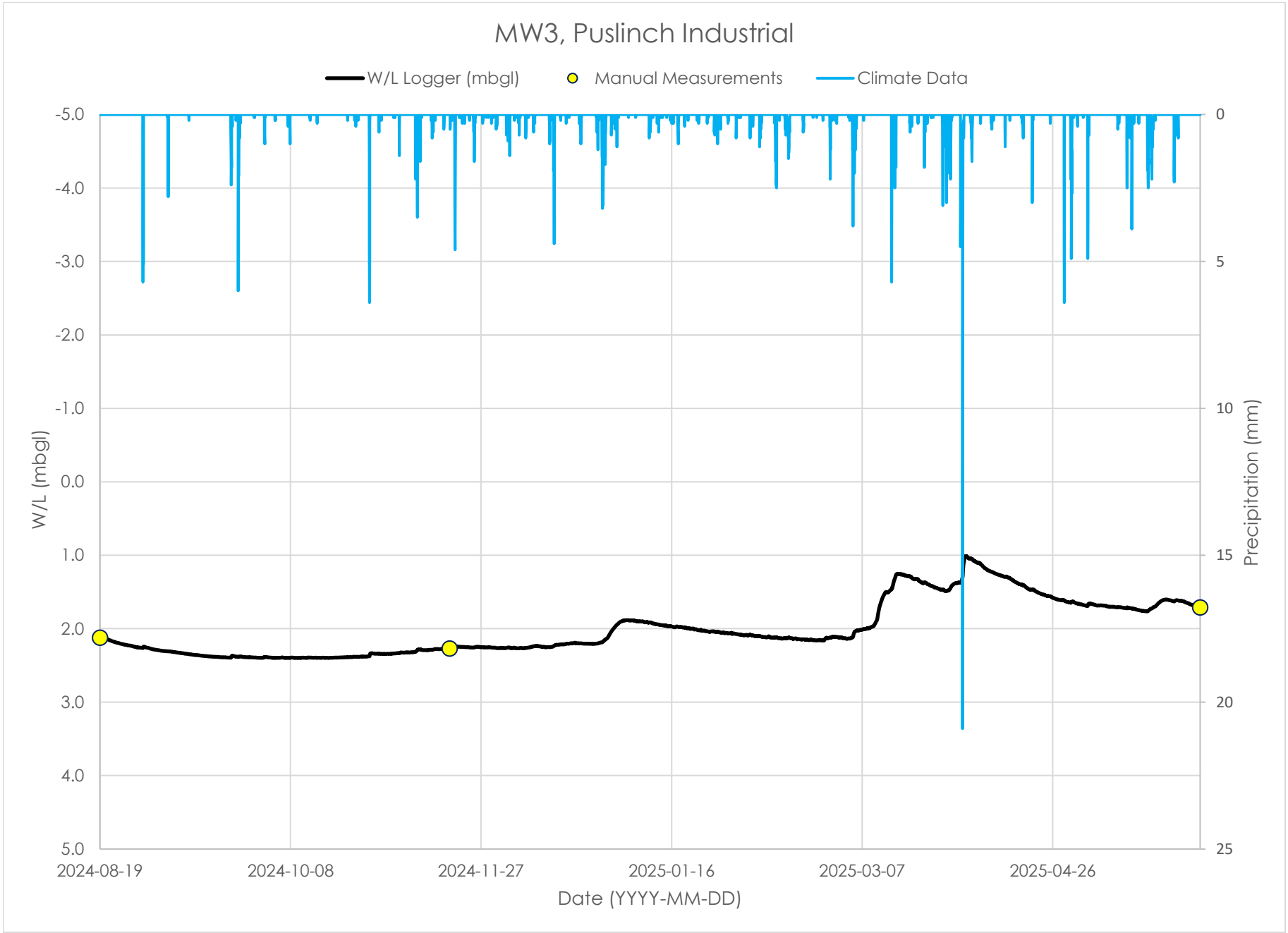
Well ID	Diameter (cm)	Depth (m)	Static Level (m)	Quality (Lpm)	Quality	Materials	Aquifer	Use	Date Completed
6702354	15.88	19.20	6.40	37.85	Clear	Bed Rock	BR	Domestic	12/06/1965
6702507	15.88	21.95	7.32	37.85	Clear	Rock	BR	Domestic	08/24/1967
6702508	15.88	19.81	6.40	37.85	Clear	Limestone	BR	Domestic	11/03/1966
6702510	15.88	28.35	16.15	30.28	Clear	Lime Rock	BR	Domestic	01/22/1964
6702513	10.80	35.97	10.36	22.71	Fresh	Black Rock	BR	Domestic	04/22/1955
6702518	15.88	18.29	4.27	37.85	Clear	Rock	BR	Domestic	07/20/1967
6703314	15.88	9.14	4.27	56.78	Clear	Dark Grey Limestone	BR	Domestic	10/28/1968
6703552	12.70	20.42	1.52	113.56	Fresh & Clear	Dark Grey Limestone	BR	Domestic	10/28/1969
6703852	15.24	9.75	1.22	56.78	Fresh & Clear	Brown Gravel	OB	Domestic	06/27/1970
6704041	15.24	17.98	2.74	37.85	Fresh & Clear	Grey Gravel	OB	Domestic	07/17/1971
6704325	15.24	18.90	4.57	56.78	Fresh & Clear	Grey Limestone	BR	Domestic	07/26/1972
6704673	15.24	11.28	0.61	37.85	Fresh & Clear	Grey Sand with Gravel	OB	Domestic	07/20/1973
6704969	12.70	48.77	18.29	56.78	Fresh & Clear	Blue Shale Rock	BR	Domestic	12/19/1973
6705008	12.70	21.95	3.66	37.85	Fresh & Clear	Brown Rock	BR	Domestic	03/18/1974
6705029	30.48	33.53	1.83	113.56	Fresh & Clear	Dark Grey Rock	BR	Commercial	04/15/1974
6705870	15.24	21.34	8.53	37.85	Fresh & Clear	Gray Gravel	OB	Domestic	07/11/1975
6706619	12.70	35.97	9.45	56.78	Fresh & Clear	Brown Rock	BR	Domestic	11/27/1977
6706705	12.70	42.67	1.52	75.71	Fresh & Clear	Blue Grey Rock	BR	Domestic	05/16/1978
6706771	12.70	29.87	14.02	37.85	Fresh & Clear	Brown Rock	BR	Domestic	08/14/1978
6707581	15.24	42.67	4.88	113.56	Fresh & Clear	Grey Limestone	BR	Irrigation	08/14/1978
6707935	15.24	41.15	13.41	75.71	Fresh & Clear	Grey Limestone	BR	Domestic	12/17/1983
6708076	15.24	42.37	13.41	75.71	Fresh & Clear	Grey Limestone	BR	Domestic	11/30/1983
6708127	30.48	4.11	0.91	-	Fresh	Grey Clay with Sand	OB	Observation Well	11/04/1983
6708205	12.70	24.69	1.52	37.85	Fresh & Clear	Brown Rock	BR	Domestic	05/14/1985
6710678	15.24	19.51	1.22	75.71	Fresh & Clear	Brown Rock	BR	Domestic	07/09/1991
6711394	26.04	25.91	3.38	1703.44	Fresh & Clear	Brown Limestone	BR	Commercial	03/30/1994
6711410	10.16	9.63	-	-	Fresh	Grey Clay with Silt	OB	Observation Well	05/20/1994
6711936	15.56	18.44	1.68	-	Fresh	Brown Limestone	BR	Test Hole	05/15/1995
6712369	15.24	36.58	3.35	75.71	Fresh	Brown Limestone	BR	Domestic	10/29/1997
6712544	15.24	50.90	0.30	-	Fresh & Clear	Grey Rock	BR	Commercial	04/30/1998
6712625	15.24	19.81	FLOWS	30.28	Fresh & Clear	Grey Dolostone	BR	Domestic	07/23/1998
6712626	15.24	54.56	3.26	378.54	Fresh & Clear	Grey Limestone	BR	Public Supply	08/03/1998
6712627	15.24	18.29	3.35	37.85	Fresh & Clear	Grey Rock	BR	Domestic	08/03/1998
6712929	25.40	15.24	4.88	492.10	Fresh	Brown Rock	BR	Industrial	01/28/1999
6713204	15.24	54.86	4.57	30.28	Fresh & Clear	Grey Rock	BR	Domestic	11/30/1999
6713335	15.24	55.47	41.45	60.57	Fresh & Clear	Brown Limestone	BR	Domestic	04/17/2000
6713775	15.24	18.29	3.35	47.32	Fresh & Clear	Brown Rock	BR	Domestic	07/05/2001
6713990	20.32	60.96	4.72	-	Fresh & Clear	Brown Limestone	BR	Domestic	12/06/2001
6714809	16.00	13.80	2.14	-	Fresh	Brown Limestone	BR	Domestic	01/12/2004
7112772	-	-	-	-	-	-	-	Abandoned	09/09/2008
7112773	-	-	-	-	-	-	-	Abandoned	09/09/2008
7140736	-	-	-	-	-	-	-	Abandoned	01/23/2010
7157856	-	-	-	-	-	-	-	Commercial	10/31/2010
7161969	15.56	16.46	2.74	51.10	Fresh & Clear	Brown Rock	BR	Domestic	03/15/2011
7161970	15.56	31.70	2.74	34.07	Fresh & Clear	Grey Rock	BR	Domestic	03/14/2011
7193674	15.56	17.07	4.88	56.78	Fresh & Clear	Brown Limestone	BR	Domestic	11/05/2012
7200440	15.56	18.29	6.10	45.42	Fresh & Clear	Grey Rock	BR	Domestic	03/04/2013
7223625	15.88	15.85	2.74	56.78	Fresh & Clear	Brown Rock	BR	Domestic	06/05/2014
7229167	15.88	37.19	9.14	37.85	Fresh & Clear	Grey Limestone	BR	Domestic	07/15/2014
7229168	15.88	37.19	6.10	37.85	Fresh & Clear	Grey Limestone	BR	Domestic	07/16/2014
7239663	15.88	16.46	4.27	56.78	Fresh & Clear	Brown Rock	BR	Domestic	03/09/2015
7242624	15.88	15.24	4.57	56.78	Fresh & Clear	Brown Rock	BR	Commercial	05/15/2015
7246399	15.88	16.76	2.44	56.78	Fresh & Clear	Brown Rock	BR	Domestic	07/08/2015
7251736	15.88	15.24	2.74	56.78	Fresh & Clear	Brown Rock	BR	Domestic	10/26/2015
7253129	15.24	-	5.18	37.85	Clear	-	-	Domestic	11/09/2015
7255635	15.88	17.37	4.57	56.78	Fresh & Clear	Brown Rock	BR	Domestic	12/17/2015
7261162	15.88	19.20	5.18	56.78	Fresh & Clear	Brown Rock	BR	Domestic	03/30/2016
7261163	15.88	19.20	2.74	45.42	Fresh & Clear	Brown Rock	BR	Domestic	03/21/2016
7268485	15.88	15.54	5.79	56.78	Fresh & Clear	Brown Rock	BR	Domestic	07/19/2016
7268486	15.88	15.85	4.57	56.78	Fresh & Clear	Brown Rock	BR	Domestic	07/19/2016
7270846	15.88	16.76	4.88	56.78	Fresh & Clear	Brown Rock	BR	Domestic	08/24/2016
7270851	15.88	32.00	3.05	45.42	Fresh & Clear	Grey Rock	BR	Domestic	08/17/2016
7274474	15.88	18.29	5.49	56.78	Fresh & Clear	Brown Limestone	BR	Domestic	10/13/2016
7274475	15.88	15.85	3.35	56.78	Fresh & Clear	Brown Rock	BR	Domestic	10/12/2016
7280761	15.56	16.76	4.88	56.78	Clear	Brown Rock	BR	Domestic	08/04/2016
7285978	12.70	-	-	-	Clear	-	-	Domestic	05/03/2017
7298572	15.88	43.28	5.79	37.85	Fresh & Clear	Brown Limestone	BR	Domestic	10/17/2017
7298792	15.88	16.76	2.44	56.78	Fresh & Clear	Brown Gravel with Sand	OB	Domestic	10/10/2017
7304977	15.88	19.51	4.88	56.78	Fresh & Clear	Brown Rock	BR	Domestic	01/26/2018
7307507	15.88	18.29	3.05	45.42	Fresh & Clear	Brown Rock	BR	Domestic	02/26/2018
7312402	5.08	7.01	-	-	-	Till	OB	Observation Well	05/25/2018
7315729	15.88	33.53	3.66	56.78	Fresh & Clear	Grey Rock	BR	Domestic	07/10/2018
7320128	15.56	33.53	3.96	56.78	Fresh & Clear	Grey Rock	BR	Domestic	09/14/2018
7322878	15.56	18.29	1.22	34.07	Fresh & Clear	Brown Rock	BR	Domestic	10/10/2018
7333200	15.56	42.67	3.96	37.85	Fresh & Clear	Grey Rock	BR	Domestic	04/17/2019
7334559	15.56	17.68	3.35	41.64	Fresh & Clear	Brown Gravel with Sand	BR	Domestic	05/07/2019
7339433	15.56	20.73	3.96	45.42	Fresh & Clear	Brown Rock	BR	Domestic	07/31/2019

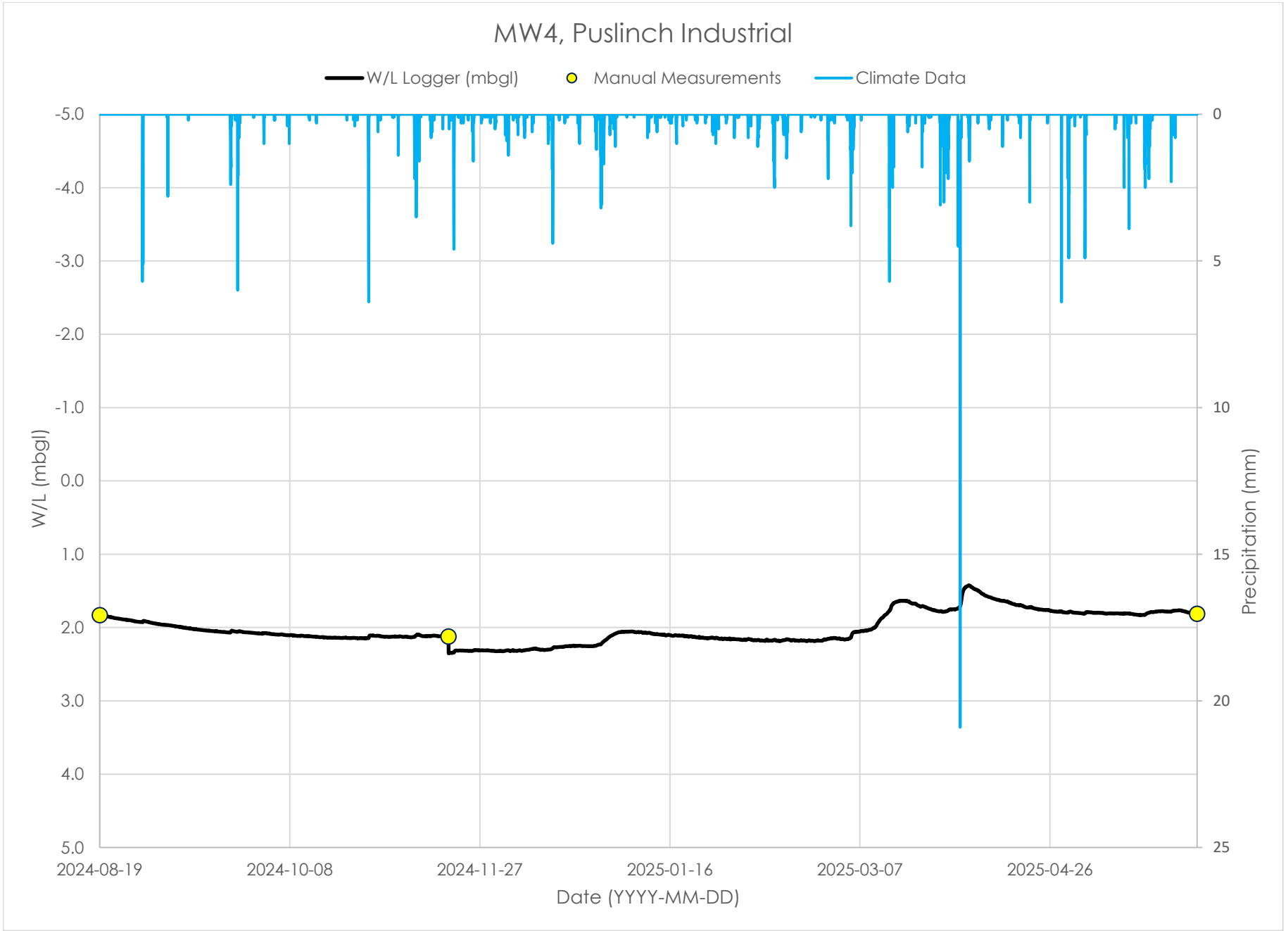
7339436	15.56	20.12	4.88	45.42	Fresh & Clear	Brown Rock	BR	Domestic	07/18/2019
7341677	15.56	48.77	3.35	37.85	Fresh & Clear	Grey Rock	BR	Domestic	08/23/2019
7341681	15.56	17.07	3.05	56.78	Fresh & Clear	Brown Rock	BR	Domestic	08/01/2019
7341682	15.56	21.33	4.88	56.78	Fresh & Clear	Brown Rock	BR	Domestic	09/01/2019
7344215	15.56	30.48	2.74	37.85	Fresh & Clear	Brown Rock	BR	Domestic	09/06/2019
7346928	15.56	18.29	5.18	56.78	Fresh & Clear	Brown Rock	BR	Domestic	10/19/2019
7350237	-	-	-	-	-	-	-	Abandoned	10/19/2019
7353359	15.56	18.29	6.71	45.42	Fresh & Clear	Brown Rock	BR	Domestic	01/28/2020
7362436	15.56	18.29	2.44	56.78	Fresh & Clear	Brown Rock	BR	Domestic	06/18/2020
7364168	15.56	17.07	2.44	56.78	Fresh & Clear	Brown Rock	BR	Domestic	07/14/2020
7364169	-	-	-	-	-	-	-	Abandoned	07/11/2020
7366980	15.56	20.73	5.18	56.78	Fresh & Clear	Brown Rock	BR	Domestic	08/12/2020
7370892	5.08	9.60	-	-	-	-	-	Abandoned	08/25/2020
7372398	15.56	21.03	4.88	56.78	Fresh & Clear	Brown Rock	BR	Domestic	10/20/2020
7372399	15.56	17.68	5.18	41.64	Fresh & Clear	Brown Limestone	BR	Domestic	10/19/2020
7372882	15.24	9.14	2.13	-	-	Brown Sand with Gravel	OB	Test Hole	04/23/2020
7374519	15.56	21.94	4.27	45.42	Fresh & Clear	Brown Rock	BR	Domestic	11/06/2020
7384675	15.56	20.12	4.57	37.85	Fresh & Clear	Brown Rock	BR	Domestic	03/29/2021
7384678	15.56	42.67	3.66	37.85	Fresh & Clear	Grey Rock	BR	Domestic	03/18/2021
7384680	15.56	21.33	4.57	45.42	Fresh & Clear	Brown Rock	BR	Domestic	03/08/2021
7384684	15.56	24.38	3.66	37.85	Fresh & Clear	Brown Rock	BR	Domestic	01/21/2021
7387119	15.56	22.55	-	-	Fresh & Clear	Brown Rock	BR	Domestic	04/19/2021
7389098	15.56	22.86	5.18	37.85	Fresh & Clear	Brown Rock	BR	Domestic	05/27/2021
7389101	15.56	18.90	3.35	45.42	Fresh & Clear	Brown Rock	BR	Domestic	05/12/2021
7391874	15.56	26.82	4.57	45.42	Fresh & Clear	Brown Rock	BR	Domestic	06/22/2021
7391876	15.56	22.25	4.57	-	Fresh & Clear	Brown Rock	BR	Domestic	06/09/2021
7391877	15.56	19.81	3.05	41.64	Fresh & Clear	Brown Gravel with Sand	OB	Irrigation	06/08/2021
7394415	15.56	42.67	3.96	-	Fresh & Clear	Grey Rock	BR	Domestic	07/06/2021
7397584	15.56	18.29	2.44	37.85	Fresh & Clear	Brown Rock	BR	Domestic	08/05/2021
7397942	5.08	6.86	-	-	-	Brown Sand with Gravel	OB	Observation Well	07/14/2021
7416866	-	-	-	-	-	-	-	-	04/02/2022
7416869	-	-	-	-	-	-	-	-	03/22/2022
7416871	-	-	-	-	-	-	-	-	03/14/2022
7426910	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7426911	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7426912	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7426913	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7426914	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7426915	3.81	4.57	-	-	-	Brown Sand with Silt	OB	Observation Well	08/17/2022
7435716	3.81	4.88	-	-	-	Brown Sand with Silt	OB	Observation Well	10/04/2022
7435717	3.81	4.88	-	-	-	Brown Sand with Silt	OB	Observation Well	10/04/2022
7435718	3.81	6.10	-	-	-	Brown Sand with Silt	OB	Observation Well	10/04/2022
7440248	-	-	-	-	-	-	-	-	12/12/2022

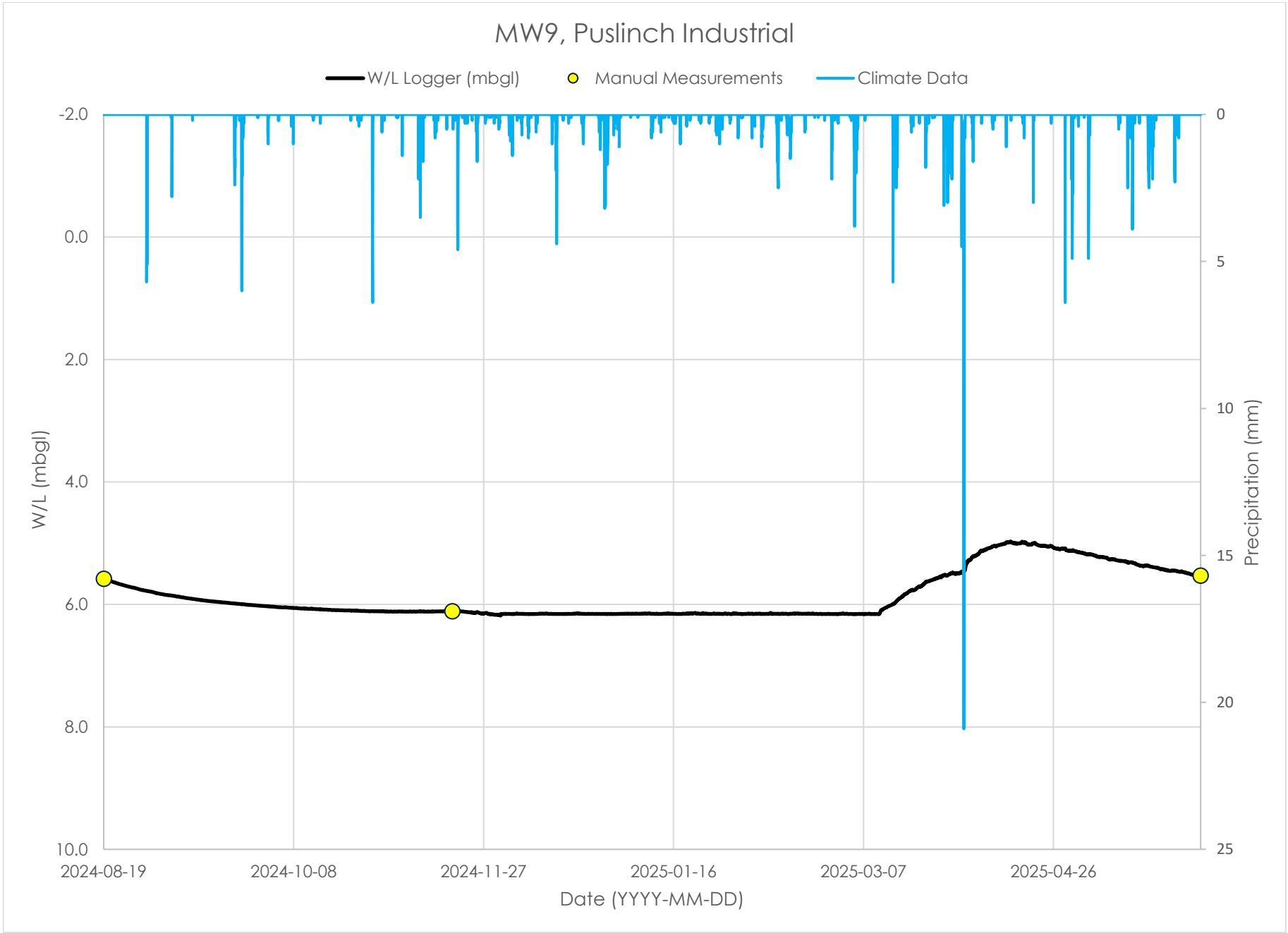
APPENDIX C

Hydrographs


MW1, Puslinch Industrial
W/L Logger (mbgl)
Manual Measurements
Climate Data
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
W/L (mbgl)
0
5
10
15
20
25
Precipitation (mm)
2024-08-19
2024-10-08
2024-11-27
2025-01-16
2025-03-07
2025-04-26
Date (YYYY-MM-DD)


MW3, Puslinch Industrial
W/L Logger (mbgl)
Manual Measurements
Climate Data
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
W/L (mbgl)
0
5
10
15
20
25
Precipitation (mm)
2024-08-19
2024-10-08
2024-11-27
2025-01-16
2025-03-07
2025-04-26
Date (YYYY-MM-DD)


MW4, Puslinch Industrial
W/L Logger (mbgl)
Manual Measurements
Climate Data
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
W/L (mbgl)
0
5
10
15
20
25
Precipitation (mm)
2024-08-19
2024-10-08
2024-11-27
2025-01-16
2025-03-07
2025-04-26
Date (YYYY-MM-DD)


MW9, Puslinch Industrial
W/L Logger (mbgl)
Manual Measurements
Climate Data
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
W/L (mbgl)
0
5
10
15
20
25
Precipitation (mm)
2024-08-19
2024-10-08
2024-11-27
2025-01-16
2025-03-07
2025-04-26
Date (YYYY-MM-DD)

APPENDIX D

Water Balance Assessment

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Project Information

Thornthwaite & Mather Method

Project Name: Puslinch Industrial
Location: Township of Puslinch

Pre-Development Conditions

Catchment ID	Agricultural Lands	Natural Environmental Area	Dwellings	Gravel Driveway		
Catchment Area (m^2)	318482	78237	799	6288		
Pervious Area (m^2)	318482	78237	0	629		
Impervious Area (m^2)	0	0	799	5659		
Percent Imperviousness (%)	0%	0%	100%	90%		
Infiltration Factors						
Topography - Description	Rolling	Flat	Flat	Flat		
Topography - Infiltration Factor	0.20	0.30	0.30	0.30		
Soil - Description	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam		
Soil - Infiltration Factor	0.30	0.30	0.30	0.30		
Cover - Description	Pasture and Shrubs	Mature Forests	Shallow Rooted Crops	Shallow Rooted Crops		
Cover - Infiltration Factor	0.10	0.20	0.10	0.10		
Total Infiltration Factor	0.60	0.80	0.70	0.70		
Soil Moisture Capacity (mm)	150	300	75	75		

Post-Development Conditions

Catchment ID	Building	Paved Area	SWM Pond	Green Space Area	Natural Environmental Area	
Catchment Area (m^2)	142918	101638	35455	45558	78237	
Pervious Area (m^2)	0	0	0	45558	78237	
Impervious Area (m^2)	142918	101638	35455	0	0	
Percent Imperviousness (%)	100%	100%	100%	0%	0%	
Infiltration Factors						
Topography - Description	Flat	Flat	Flat	Flat	Flat	
Topography - Infiltration Factor	0.30	0.30	0.30	0.30	0.30	
Soil - Description	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam	Fine Sandy Loam	
Soil - Infiltration Factor	0.30	0.30	0.30	0.30	0.30	
Cover - Description	Urban Lawns	Urban Lawns	Urban Lawns	Urban Lawns	Mature Forests	
Cover - Infiltration Factor	0.10	0.10	0.10	0.10	0.20	
Total Infiltration Factor	0.70	0.70	0.70	0.70	0.80	
Soil Moisture Capacity (mm)	75	75	75	75	300	

CROZIER

Climate Parameters

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

PROJECT LOCATION PUSLINCH, ON
PROJECT LATITUDE ° **43**

Month	Mean Temperature (C°)[1]	Heat Index [i =(t/5)$^{1.514}$]	α	Potential Evapotranspiration (PET) (mm)	Correction Factor[2]	Adjusted Potential Evapotranspiration (APET) (mm)	Precipitation (P) (mm)[1]
January	-6.3	0.00		0.0	1.37	0.0	66.3
February	-5.9	0.00		0.0	0.82	0.0	46.1
March	-0.8	0.00		0.0	1.02	0.0	57.0
April	5.9	1.28		27.0	1.12	30.3	81.2
May	12.6	4.05		60.9	1.26	76.8	80.2
June	17.8	6.84		88.3	1.28	113.0	80.5
July	20.2	8.28		101.1	1.29	130.4	96.2
August	19.1	7.61		95.2	1.2	114.2	67.2
September	15.2	5.38		74.5	1.04	77.5	75.2
October	8.8	2.35		41.5	0.95	39.4	71.0
November	2.6	0.37		11.2	0.81	9.1	74.9
December	-2.8	0.00		0.0	0.77	0.0	54.9
TOTAL	7.2	**36.2**	**1.1**	**499.7**		**590.7**	**850.7**

NOTES: 1. Precipitation and temperature data referenced from Environment Canada (Kitchener/Waterloo Weather Station).
2. Latitude adjustment/correction factors determined based on site location assuming 12 hours of sunlight per day for 30 days

CROZIER

Pre-Development Water Balance

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Agricultural Lands**												
Catchment Parameters	**Pervious Area**			31.85 ha	**Impervious Area**			0.00 ha	**Total Area**			31.85 ha	
	Soil Moisture Holding Capacity			150 mm	**Infiltration Factor**			0.60	**% Impervious Evaporation**			15%	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	110	121	93	76	39	9	0	**555**
Storage (mm)	150	150	150	150	150	121	96	70	69	101	150	150	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	17	55	**295**
Infiltration (mm)	40	28	34	31	2	0	0	0	0	0	10	33	**177**
Surface Water Runoff (mm)	27	18	23	20	1	0	0	0	0	0	7	22	**118**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	9,641	24,458	34,937	38,478	29,645	24,291	12,552	2,898	0	**176,899**
Impervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Infiltration (m^3)	12,669	8,809	10,892	9,732	651	0	0	0	0	0	3,176	10,491	**56,420**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	8,446	5,873	7,261	6,488	434	0	0	0	0	0	2,118	6,994	**37,613**
Impervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Pre-Development Water Balance Summary: Catchment Agricultural Lands				
Pre-Development Evapotranspiration	176899	m^3/yr	555.4	mm/yr
Pre-Development Infiltration	56420	m^3/yr	177.2	mm/yr
Pre-Development Runoff	37613	m^3/yr	118.1	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.
2. Assumptions:
- Evapotranspiration does not occur when average temperature is below zero.
- Infiltration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

CROZIER

Pre-Development Water Balance

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Natural Environmental Area**												
Catchment Parameters	**Pervious Area**			7.82 ha	**Impervious Area**			0.00 ha	**Total Area**			7.82 ha	
	Soil Moisture Holding Capacity			300 mm	**Infiltration Factor**			0.80	**% Impervious Evaporation**			15%	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	111	125	102	77	39	9	0	**571**
Storage (mm)	300	300	300	300	300	269	240	205	204	235	300	300	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	1	55	**280**
Infiltration (mm)	53	37	46	41	3	0	0	0	0	0	1	44	**224**
Surface Water Runoff (mm)	13	9	11	10	1	0	0	0	0	0	0	11	**56**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	2368	6008	8706	9795	7984	6006	3083	712	0	**44663**
Impervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Infiltration (m^3)	4150	2885	3568	3188	213	0	0	0	0	0	75	3436	**17515**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	1037	721	892	797	53	0	0	0	0	0	19	859	**4379**
Impervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Pre-Development Water Balance Summary: Catchment Natural Environmental Area				
Pre-Development Evapotranspiration	44663	m^3/yr	571	mm/yr
Pre-Development Infiltration	17515	m^3/yr	224	mm/yr
Pre-Development Runoff	4379	m^3/yr	56	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.

2. Assumptions:

- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

CROZIER

Pre-Development Water Balance

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Dwellings**												
Catchment Parameters	**Pervious Area**			0.00 ha	**Impervious Area**			0.08 ha	**Total Area**			0.08 ha	
	Soil Moisture Holding Capacity			75 mm	**Infiltration Factor**			0.70	**% Impervious Evaporation**			15%	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage (mm)	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious ET (m^3)	8	6	7	10	10	10	12	8	9	9	9	7	**102**
Pervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Runoff (m^3)	45	31	39	55	54	55	65	46	51	48	51	37	**577**

Pre-Development Water Balance Summary: Catchment Dwellings				
Pre-Development Evapotranspiration	102	m^3/yr	128	mm/yr
Pre-Development Infiltration	0	m^3/yr	0	mm/yr
Pre-Development Runoff	577	m^3/yr	723	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.

2. Assumptions:

- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

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Pre-Development Water Balance

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Gravel Driveway**												
Catchment Parameters	**Pervious Area**			0.06 ha	**Impervious Area**			0.57 ha	**Total Area**			0.63 ha	
	Soil Moisture Holding Capacity			75 mm	**Infiltration Factor**			0.70	**% Impervious Evaporation**			15%	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage (mm)	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	19	48	67	72	51	48	25	6	0	**336**
Impervious ET (m^3)	56	39	48	69	68	68	82	57	64	60	64	47	**722**
Pervious Infiltration (m^3)	29	20	25	22	1	0	0	0	0	0	17	24	**140**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	13	9	11	10	1	0	0	0	0	0	7	10	**60**
Impervious Runoff (m^3)	319	222	274	391	386	387	463	323	362	342	360	264	**4092**

Pre-Development Water Balance Summary: Catchment Gravel Driveway				
Pre-Development Evapotranspiration	1058	m^3/yr	168	mm/yr
Pre-Development Infiltration	140	m^3/yr	22	mm/yr
Pre-Development Runoff	4152	m^3/yr	660	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.

2. Assumptions:

- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Post-Development Water Balance

Thornthwaite & Mather Method

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Building**												
Catchment Parameters	**Pervious Area**		0.00 ha	**Impervious Area**			14.29 ha	**Total Area**			14.29 ha		
	Soil Moisture Holding Capacity		75 mm	**Infiltration Factor**			0.70	**% Impervious Evaporation**			15%		

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious ET (m^3)	1421	988	1222	1741	1719	1726	2062	1441	1612	1522	1606	1177	**18237**
Pervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Runoff (m^3)	8054	5600	6924	9864	9743	9779	11686	8163	9135	8625	9099	6669	**103343**

Post-Development Water Balance Summary: Catchment Building				
Post-Development Evapotranspiration	18237.0	m^3/yr	127.6	mm/yr
Post-Development Infiltration	0.0	m^3/yr	0.0	mm/yr
Post-Development Runoff	103343.1	m^3/yr	723.1	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.
2. Assumptions:
- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Post-Development Water Balance

Thornthwaite & Mather Method

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Paved Area**					
Catchment Parameters	**Pervious Area**	0.00 ha	**Impervious Area**	10.16 ha	**Total Area**	10.16 ha
	Soil Moisture Holding Capacity	75 mm	**Infiltration Factor**	0.70	**% Impervious Evaporation**	15%

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious ET (m^3)	1011	703	869	1238	1223	1227	1467	1025	1146	1082	1142	837	**12970**
Pervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Runoff (m^3)	5728	3983	4924	7015	6929	6955	8311	5806	6497	6134	6471	4743	**73494**

Post-Development Water Balance Summary: Catchment Paved Area				
Post-Development Evapotranspiration	12969.6	m^3/yr	127.6	mm/yr
Post-Development Infiltration	0.0	m^3/yr	0.0	mm/yr
Post-Development Runoff	73494.2	m^3/yr	723.1	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.
2. Assumptions:
- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Post-Development Water Balance

Thornthwaite & Mather Method

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**SWM Pond**					
Catchment Parameters	**Pervious Area**	0.00 ha	**Impervious Area**	3.55 ha	**Total Area**	3.55 ha
	Soil Moisture Holding Capacity	75 mm	**Infiltration Factor**	0.70	**% Impervious Evaporation**	15%

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious ET (m^3)	353	245	303	432	427	428	512	357	400	378	398	292	**4524**
Pervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Runoff (m^3)	1998	1389	1718	2447	2417	2426	2899	2025	2266	2140	2257	1654	**25637**

Post-Development Water Balance Summary: Catchment SWM Pond				
Post-Development Evapotranspiration	4524.2	m^3/yr	127.6	mm/yr
Post-Development Infiltration	0.0	m^3/yr	0.0	mm/yr
Post-Development Runoff	25637.1	m^3/yr	723.1	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.
2. Assumptions:
- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

Post-Development Water Balance

Thornthwaite & Mather Method

Project Name: Puslinch Industrial
Location: Township of Puslinch

Catchment ID	**Green Space Area**					
Catchment Parameters	**Pervious Area**	4.56 ha	**Impervious Area**	0.00 ha	**Total Area**	4.56 ha
	Soil Moisture Holding Capacity	75 mm	**Infiltration Factor**	0.70	**% Impervious Evaporation**	15%

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation	66	46	57	81	80	81	96	67	75	71	75	55	**851**
Pervious Area Water Balance													
Evapotranspiration (mm)	0	0	0	30	77	107	114	82	76	39	9	0	**534**
Storage	75	75	75	75	75	49	31	16	16	48	75	75	
Water Surplus (mm)	66	46	57	51	3	0	0	0	0	0	38	55	**317**
Infiltration (mm)	46	32	40	36	2	0	0	0	0	0	27	38	**222**
Surface Water Runoff (mm)	20	14	17	15	1	0	0	0	0	0	12	16	**95**
Impervious Area Water Balance													
Evaporation (mm)	10	7	9	12	12	12	14	10	11	11	11	8	**128**
Surface Water Runoff (mm)	56	39	48	69	68	68	82	57	64	60	64	47	**723**
Combined Water Balance													
Pervious ET (m^3)	0	0	0	1379	3499	4868	5194	3716	3449	1796	414	0	**24314**
Impervious ET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Infiltration (m^3)	2114	1470	1818	1624	109	0	0	0	0	0	1224	1751	**10109**
Impervious Infiltration (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Runoff (m^3)	906	630	779	696	47	0	0	0	0	0	524	750	**4333**
Impervious Runoff (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Post-Development Water Balance Summary: Catchment Green Space Area				
Post-Development evapotranspiration	24314.3	m^3/yr	533.7	mm/yr
Post-Development Infiltration	10109.3	m^3/yr	221.9	mm/yr
Post-Development Runoff	4332.6	m^3/yr	95.1	mm/yr

NOTES: 1.The infiltration factor is determined using the MECP methodology outlined in the Stormwater Management Planning and Design Manual 2003.
2. Assumptions:
- Surplus water is unavailable for runoff and recharge in months where water losses from APET exceed precipitation inputs.
- Evapotranspiration does not occur when average temperature is below zero.
- Approximately 15% of the precipitation on impervious surfaces will evaporate.
- When calculating the water balance, evaporation is subtracted from precipitation, then soil storage is replenished. If any precipitation remains it is considered surplus and divided between infiltration and runoff

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Site Water Balance Summary

Thornthwaite & Mather Method

Project: Puslinch Industrial
Project No.: 2676-7116
Created By: VM
Checked By: JD
Date: 2026.07.24

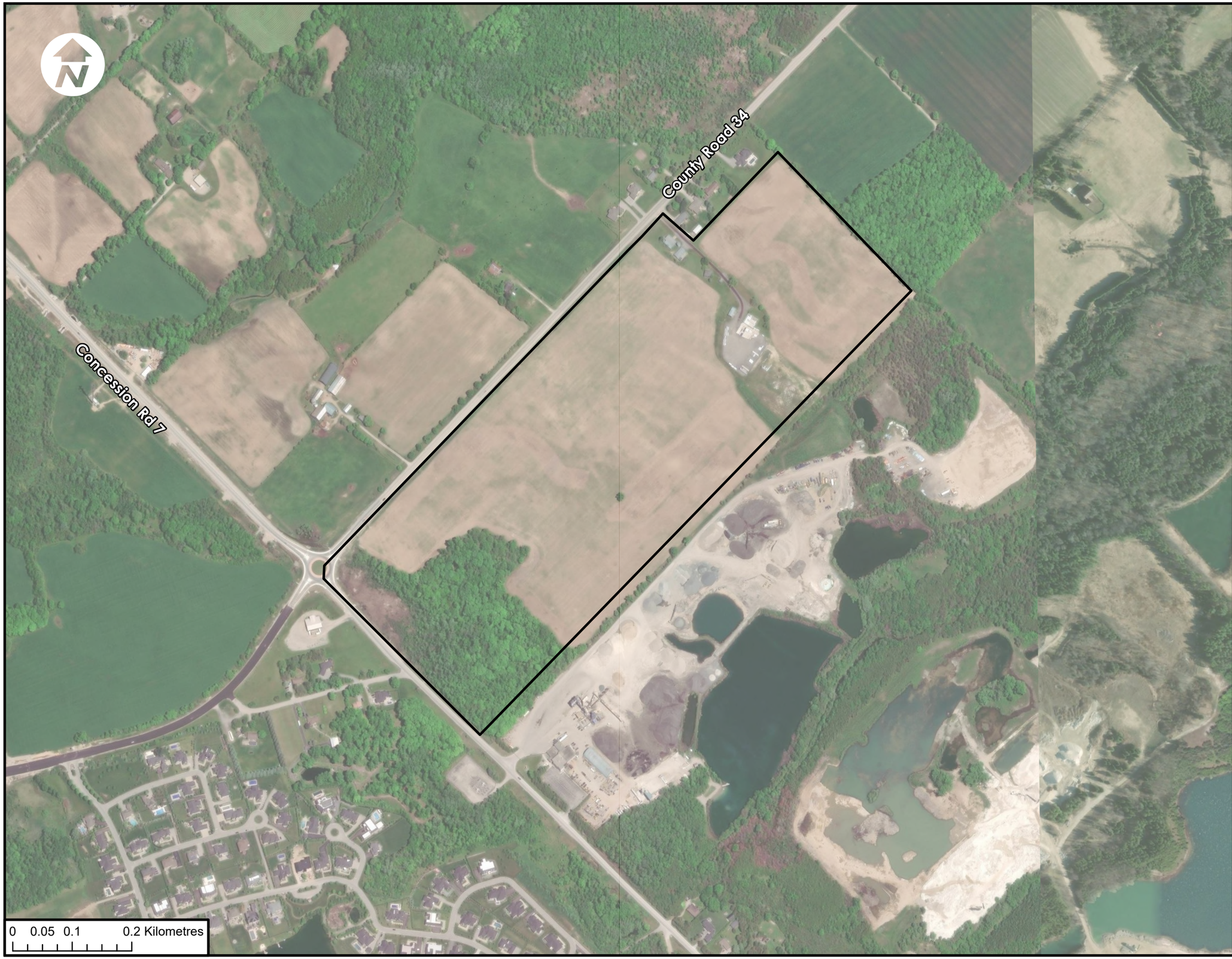
Pre-Development Water Balance							
Catchment ID	Area	Evapotranspiration		Infiltration		Runoff	
	(ha)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)
Agricultural Lands	31.85	176,899	555	56,420	177	37,613	118
Natural Environmental Area	7.82	44,663	571	17,515	224	4,379	56
Dwellings	0.08	102	128	0	0	577	723
Gravel Driveway	0.63	1,058	168	140	22	4,152	660
Total	**40.38**	**222,722**	**552**	**74,074**	**183**	**46,721**	**116**

Post-Development Water Balance							
Catchment ID	Area	Evapotranspiration		Infiltration		Runoff	
	(ha)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)	(m^3/yr)	(mm/yr)
Building	14.29	18237	128	0	0	103343	723
Paved Area	10.16	12970	128	0	0	73494	723
SWM Pond	3.55	4524	128	0	0	25637	723
Green Space Area	4.56	24314	534	10109	222	4333	95
Natural Environmental Area	7.82	44663	571	17515	224	4379	56
Total	**40.38**	**104,708**	**259**	**27624**	**68**	**211,186**	**523**

Site Water Balance Summary							
Scenario	Area	Evapotranspiration		Infiltration		Runoff	
	(ha)	(m^3)	(mm)	(m^3)	(mm)	(m^3)	(mm)
Pre-Dev.	40.38	222722	552	74074	183	46721	116
Post-Dev.	40.38	104708	259	27624	68	211186	523
Difference	0	-118014	-292	-46450	-115	164464	407
% Difference	0%	-53%	-53%	-63%	-63%	352%	352%

Annual Infiltration Deficit **46450 m^3**
115 mm

FIGURES





Key Plan: Site Location 1:360,000

Legend

Site Limits

Figure Notes:

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Project:

Puslinch Industrial

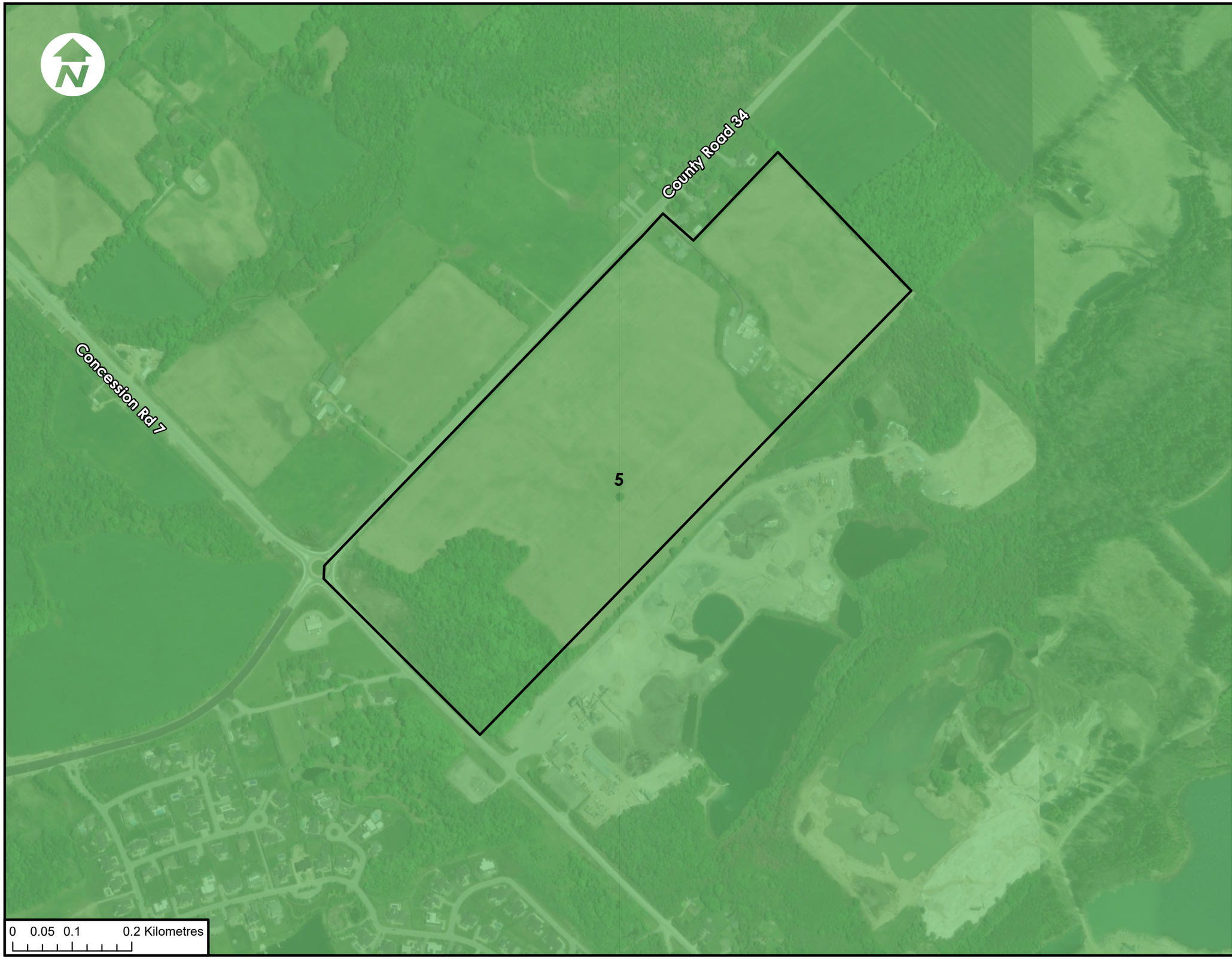
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Figure:

Site Location

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Date:	GCS:	Scale:	Fig. 1
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Key Plan: Site Location 1:360,000

Legend

- Site Limits

Physiographic Region

- 5: Horseshoe Moraines

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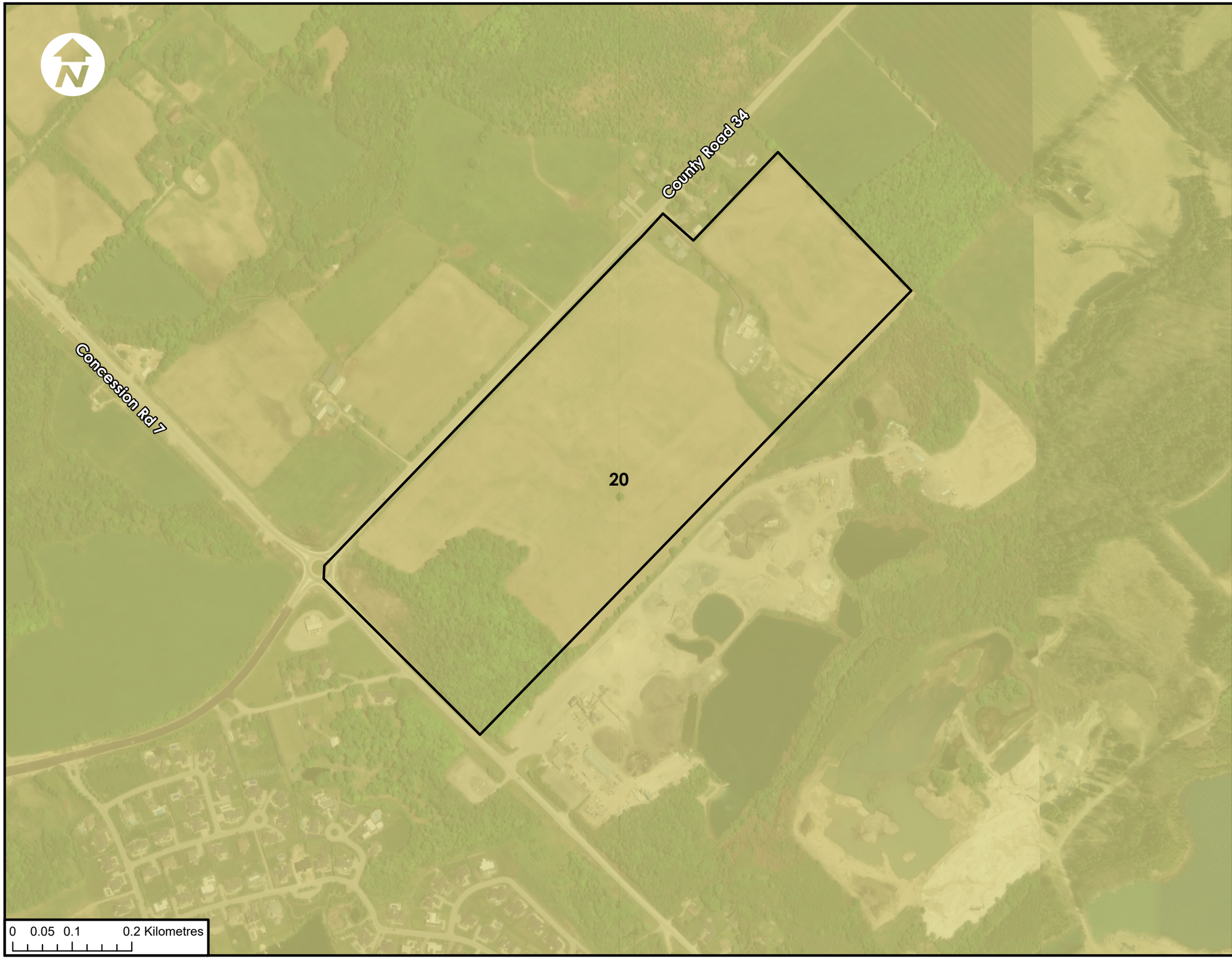
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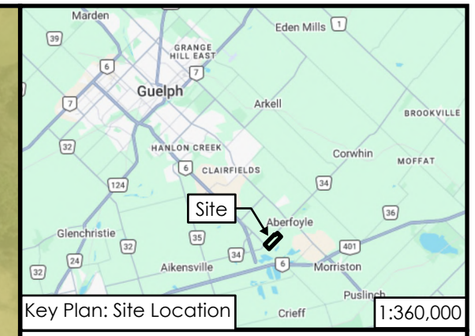
Figure:

Physiography

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Key Plan: Site Location

1:360,000

Legend

- Site Limits

Bedrock Geology

- 20: Guelph

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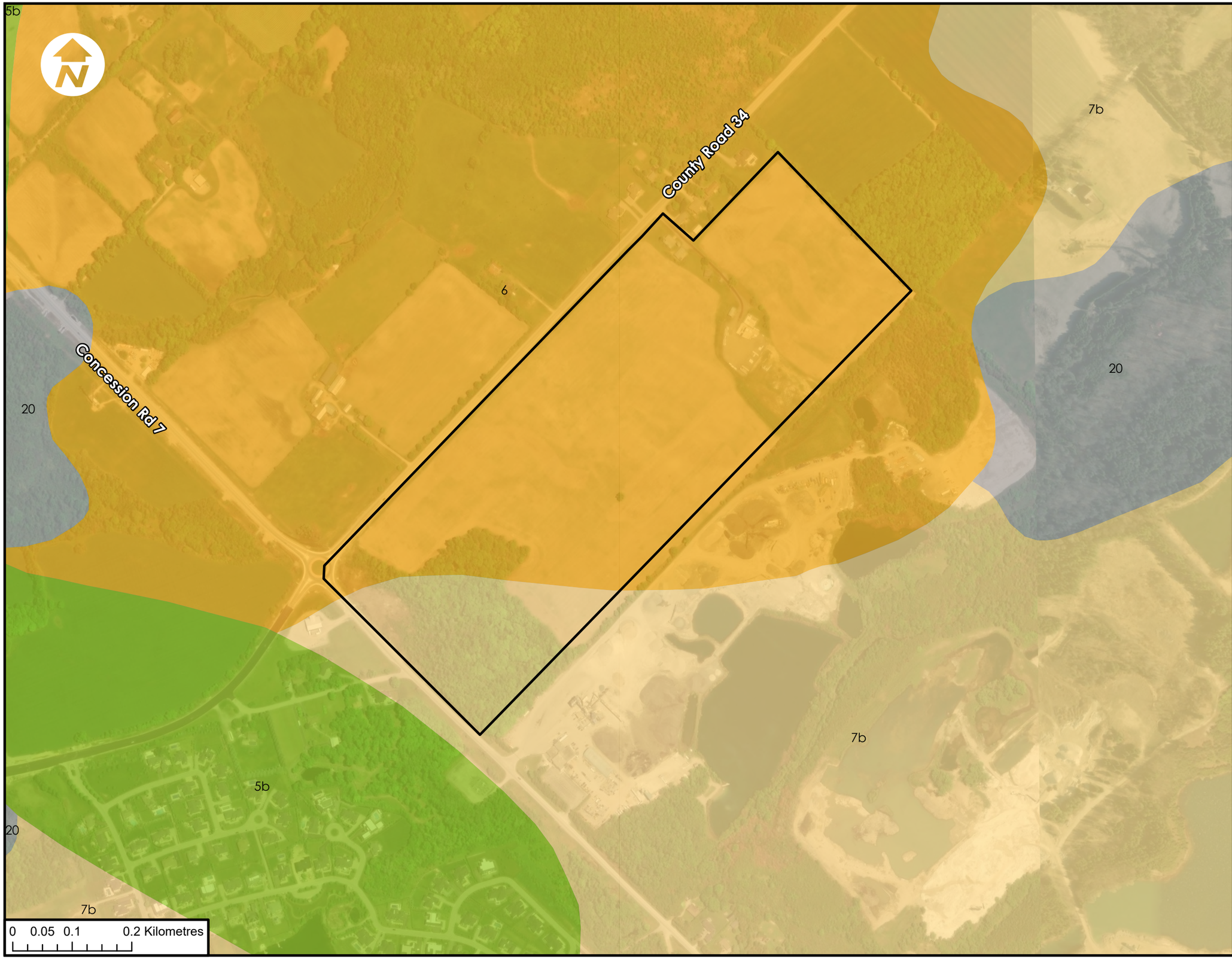
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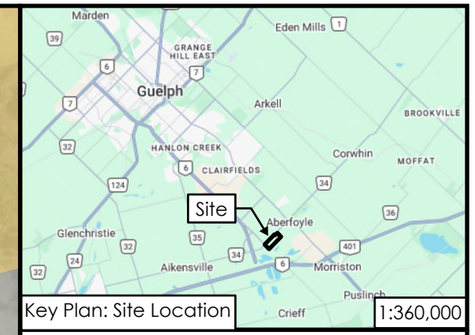
Figure:

Bedrock Geology

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Date:	GCS:	Scale:	Fig. 3
2026-02-25	NAD 1983	1:6,000	





Key Plan: Site Location

1:360,000

Legend

- Site Limits

Surficial Geology

- 5b: Stone-poor, carbonate-derived silty to sandy till
- 6: Ice-contact stratified deposits
- 7b: Gravelly deposits
- 20: Organic deposits

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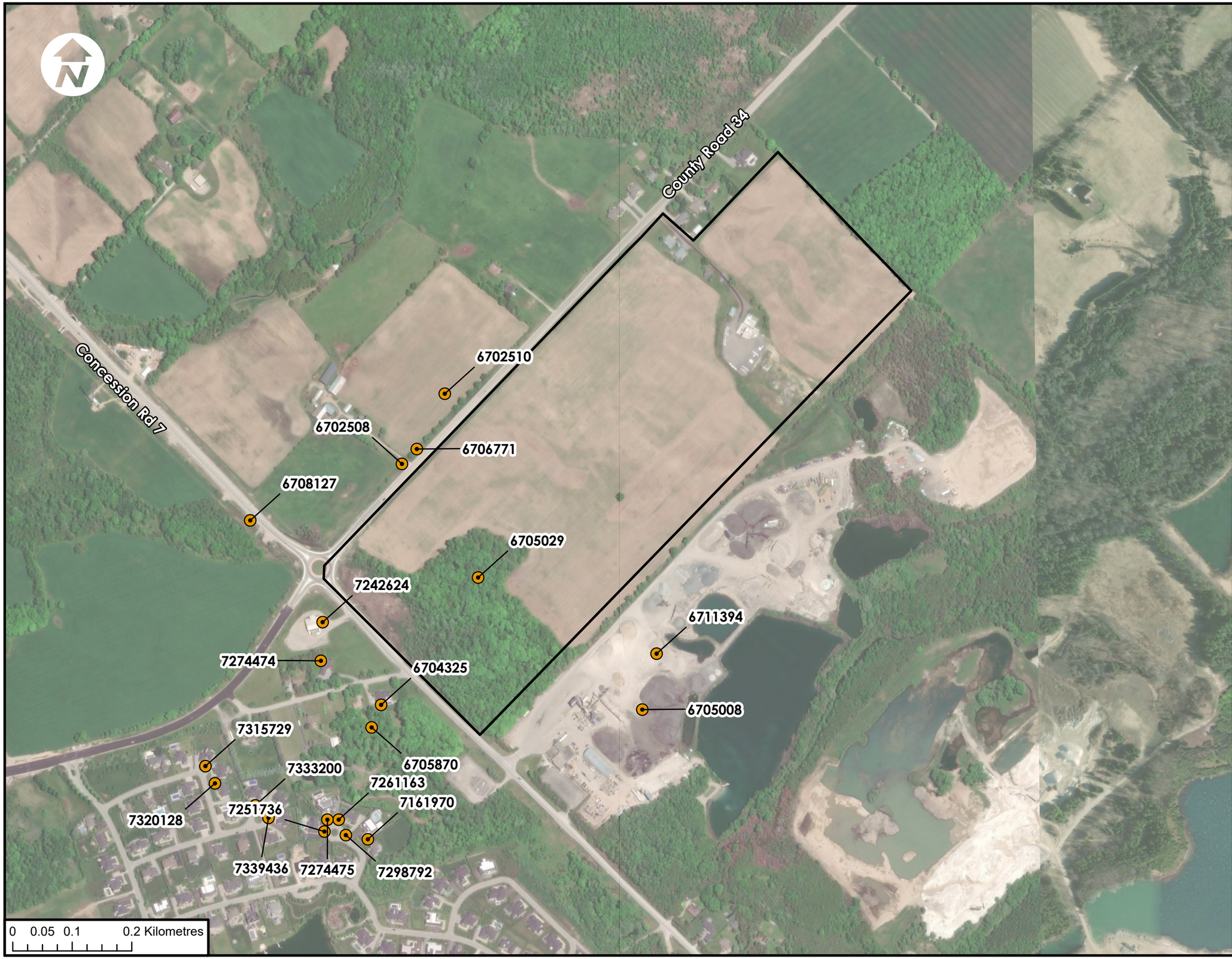
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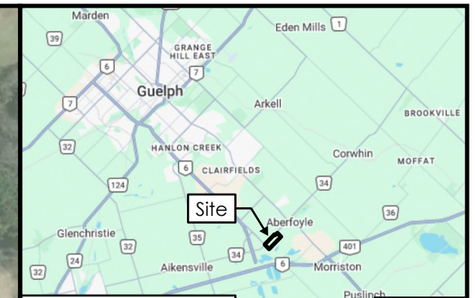
Figure:

Surficial Geology

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Key Plan: Site Location 1:360,000

Legend

- Site Limits
- MECP Well

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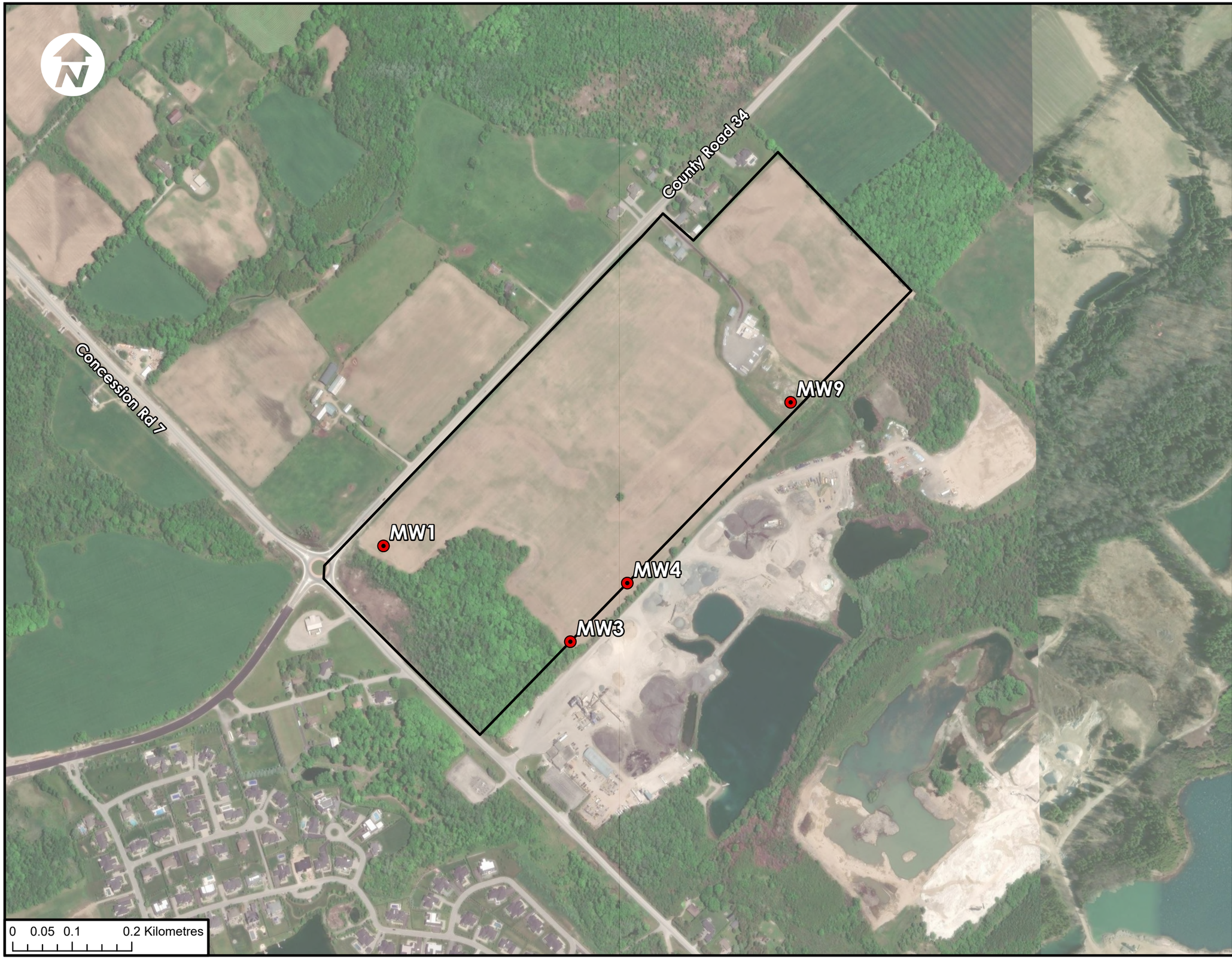
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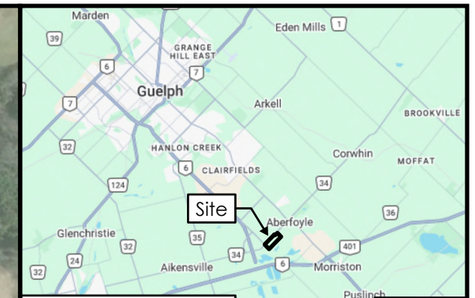
Figure:

MECP Well Location Plan

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Key Plan: Site Location 1:360,000

Legend

- Site Limits
- Monitoring Well

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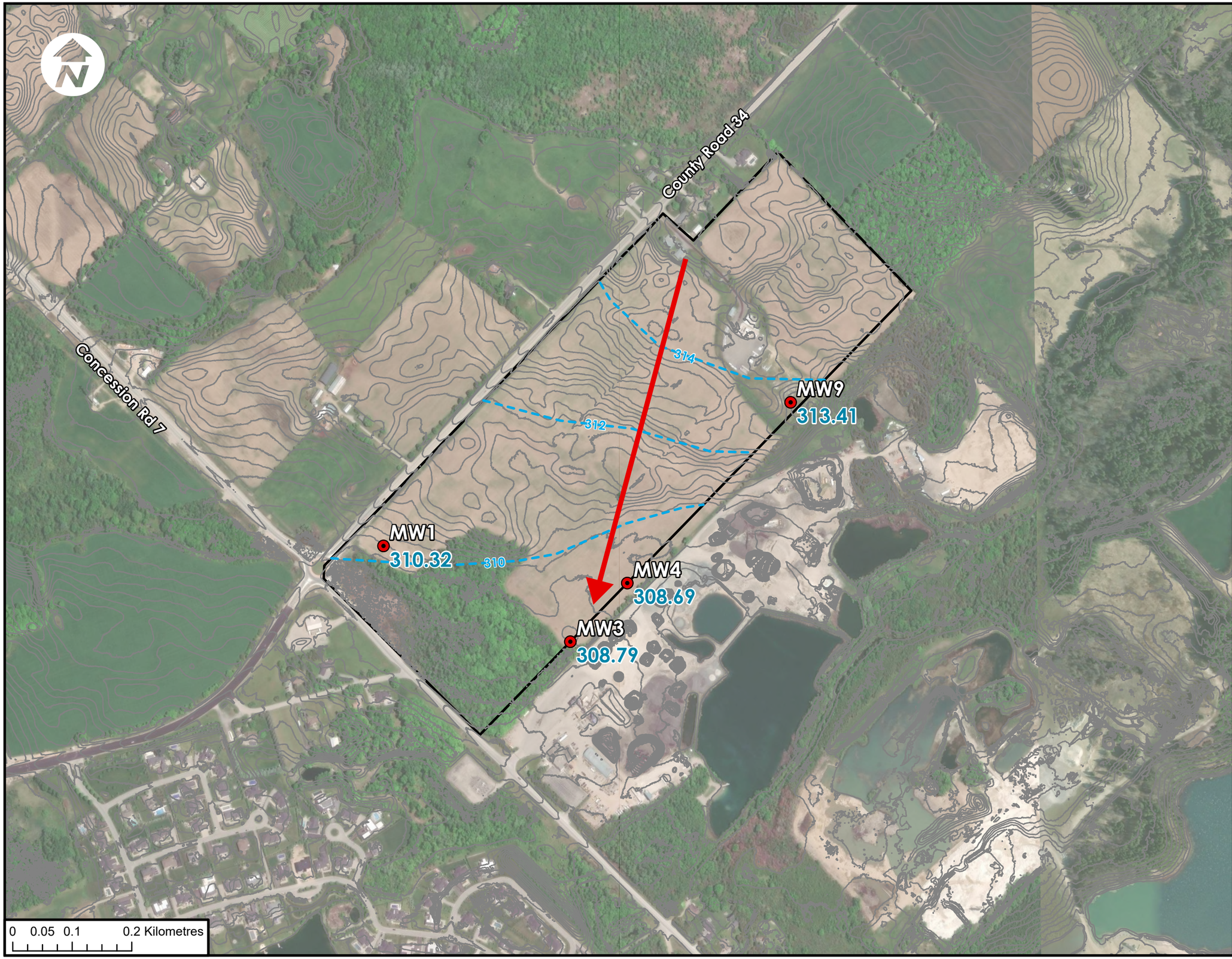
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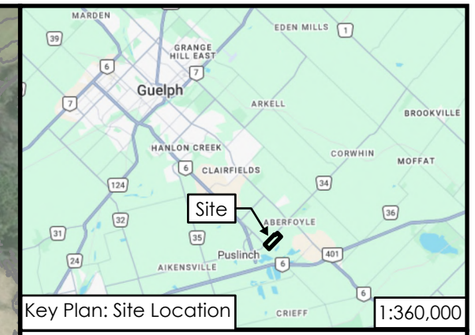
Figure:

Monitoring Well Location Plan

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2026-02-25	NAD 1983	1:6,000	





Key Plan: Site Location

1:360,000

Legend

- Site Limits
- Monitoring Well
- Interpreted Grounwater Flow Direction
- 300.00 June 2025 Groundwater Elevation (MASL)
- 1m Contour (OMAFRA, 2018)
- Interpreted Groundwater Contour (MASL)

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Figure:

Interpreted Groundwater Flow Direction

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