Guelph Innovation District (GID) Lands, Blocks 1 & 2

Hydrogeological Characterization Report

Project Location:

328 Victoria Road South and 588 Stone Road East, Guelph, Ontario

Prepared for:

Fusion Homes
500 Hanlon Creek Boulevard
Guelph, Ontario N1C 0A1

Prepared by:

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Engineers, Scientists, Surveyors.

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1.0 INTRODUCTION

Fusion Homes (Fusion) retained MTE Consultants Inc. (MTE) to conduct a hydrogeological investigation to support the approval and development of the Guelph Innovation District (GID) Lands, Blocks 1 and 2 (hereby referred to as the 'Site'). The Site is formed from two contiguous properties located at 328 Victoria Road South and 588 Stone Road East in Guelph, ON. The Site location and Study Area are illustrated on **Figure 1**. The Study Area is defined as lands within 500 m of the overall Site boundary.

The Site is an irregular shaped parcel of land that covers an area of ~ 118 hectares (Ha) and is comprised of two legal properties:

- Former Wellington Detention Centre Lands (Detention Centre Lands):
  - 588 Stone Road East.
- Turfgrass Institute Lands (Turfgrass):
  - 328 Victoria Road South.

The Site identification information is presented below:

	328 Victoria Road South	588 Stone Road East
Property Identification Number (PIN)	712360125	712360118
Legal Description*	Pt Broken Front Lts 10, 11 & 12, Con 1 Division G Guelph Township Pts 1 To 13 And 16 To 19 Incl. 61r10430 Except Pts 1, 2, 4 & 7, 61r11036; Guelph; T/w Ros651254, S/t Easement Over Pts 3 & 4, 61r10430 As In Ros390891; S/t Easement Over Pts 9, 10 & 11, 61r10430 As In Wc166385; T/w Over Pt 20, 61r10430 As In Wc166386	Pt Broken Front Lts 10 & 11, Con 1 Division G Guelph Township, Pts 14,15, 20 & 21, 61r10430; Guelph; T/w Ros651254; S/t Easement Over Pt 15,61r10430 As In Wc81211; S/t Easement Over Pt 20, 61r10430 As In Wc166386
Property Area	108.33 hectares	9.76 hectares
Universal Transverse Mercator (UTM) coordinates of approximate centroid of property	563,837 m east and 4,821,911 m north (zone 17T)	564,149 m east and 4,821,299 m north (zone 17T)
Property Owner	Fusion Homes	Fusion Homes

1.1 Proposed Development

The GID Lands are part of a Secondary Plan (OPA 54) as identified in the City of Guelph's Official Plan (March 2018 Office Consolidation). The blocks owned by Fusion homes and part of this development project are Block Plan Area 1 and 2 as shown on Map Schedule D (City of Guelph Official Plan, 2015).

MTE understands the development goal is to establish residential, mixed-use, commercial, and employment blocks. Park space and trails are also to be developed. Three stormwater management facilities are also proposed (MTE 2024). MTE understands that the Site will be serviced by municipal water and sanitary sewers.

1.2 Previous Investigations

MTE reviewed the following reports as part of this hydrogeological characterization:

1.2.1 Turfgrass Institute Lands

- Phase II Environmental Site Assessment, Franz Environmental Inc. (May 2007);
- Phase Two Environmental Site Assessment, GHD (November 2017);
- Geotechnical Investigation and Slope Stability Assessment, DS Consultants Ltd. (January 2020); and
- Supplemental Soil Sampling and Analysis Program, MTE (July 2020).

A brief description of each of the above referenced studies is provided below for reference purposes.

Phase II Environmental Site Assessment, Final Report, Guelph Turfgrass Institute, 328 Victoria Road South, Guelph, Ontario; by Franz Environmental Inc.; dated March 27, 2007, for Ontario Realty Corporation.

- Franz Environmental Inc. (Franz) was retained by the Ontario Realty Corporation to conduct a Phase II ESA to address the APEC's identified in a previously completed Phase I ESA conducted by URS in 2006.
- As part of the Phase II Environmental Site Assessment, Franz advanced:
    - Three Pits (GTP1-06 through GTP3-06) to depths ranging from ~1.5 to 2.2 metres below ground surface (mBGS).
    - Three boreholes (BH/MW1-06 through BH3-03) to depths ranging from 5.5 to 7.6 mBGS. BH/MW1-06 was instrumented as a groundwater monitoring well.

Phase Two Environmental Site Assessment, Guelph Turfgrass Institute and Environmental Research Centre, 328 Victoria Road South, Guelph, Ontario; by GHD Limited; dated November 24, 2017; for Infrastructure Ontario.

- GHD was retained by Infrastructure Ontario to conduct a Phase Two ESA to document environmental conditions at the Turfgrass Lands prior to the potential disposition of the Site.
- GHD advanced 25 boreholes across the Turfgrass Lands to depths ranging from ~0.9 to 6.1 mBGS. Boreholes were advanced to allow for the collection and screening of subsurface soil samples and to document geological conditions at the Site.
- 10 boreholes were converted to overburden monitoring wells to depths ranging from ~4.0 to 5.5 mBGS. Monitoring wells were constructed to allow for the collection and screening of groundwater samples and to document hydrogeological conditions.
- GHD advanced 58 test pits across the Turfgrass Lands to depths ranging from ~0.5 to 3.0 mBGS. Test pits were advanced to allow for the collection of subsurface soil samples and to document geological conditions at the Site.
- GHD described the general stratigraphy of the Turfgrass Lands as topsoil (0.06-0.45 mBGS) underlain by silty sand fill (0.18-2.07 mBGS) and native silty sand/sandy silt (0.15-5.79 mBGS) and/or a native clayey silt/silty clay (0.12-4.81). Bedrock was encountered between 0.46 to 2.44 mBGS within some boreholes and was observed at ground surface in some areas along the northeastern portion of the Turfgrass Lands.

- GHD encountered the following material and geologic deposits at the Site. GHD notes that the deposits were encountered at various areas of the Site and not at all investigative locations:
    - Topsoil was encountered at all locations except for MW4 and MW5. Topsoil thicknesses ranged from 0.06 m to 0.45 m.
    - Silty Sand Fill was encountered at limited locations across the Site at depths ranging from 0.18 mBGS to 2.1 mBGS. GHD notes very limited fill was encountered across the Site.
    - Silty Sand and Sandy Silt was encountered at numerous locations across the Site at depths from ground surface to 5.8 mBGS.
    - Clayey Silt and Silty Clay was encountered at numerous locations across the Site at depths ranging from 0.12 mBGS to 4.81 mBGS.
    - Bedrock was generally encountered at shallow depths along the eastern portion of the Site.
- Groundwater was encountered in eight of the GHD installed monitoring wells and one existing groundwater monitoring well at depths ranging from ~1.7 to 4.9 mBGS.

Geotechnical Investigation and Slope Stability Assessment, Guelph Innovation District Lands, Victoria Road S, Guelph, ON; by DS Consultants Ltd., dated January, 2020; for Mattamy Homes Canada.

- DS Consultants Ltd. (DS) was retained by Mattamy Homes Limited (Mattamy) to perform subsurface investigation work within the Turfgrass and Detention Lands in January of 2020, however, no formal report of these activities was provided to MTE;
- Based on borehole logs and Site figures provided to MTE, DS advanced seven boreholes across the Turfgrass Lands (BH301-20 to BH307-20); and
- Two boreholes, MW304-20 and MW306-20 were converted to groundwater monitoring wells.

Supplemental Soil Sampling and Analysis Program, Guelph Innovation District (GID) Lands, Guelph, Ontario; by MTE Consultants Inc.; dated July 16, 2020; for Mattamy Homes Limited.

- MTE was retained by Mattamy to conduct a supplemental soil sampling program to delineate the extent of impacts previously identified at the Turfgrass Lands and to develop cost estimates for remediation of these areas; and
- MTE advanced 62 boreholes across the Turfgrass Lands to depths ranging from 1.5 mBGS to 3.7 mBGS to facilitate the collection of soil samples and determine shallow geological conditions.

1.2.2 Former Wellington Detention Centre Lands

- Phase II Environmental Site Assessment, Franz Environmental Inc. (2007);
- Soil and Groundwater Delineation, MTE Consultants Inc. (2010);
- Phase Two Environmental Site Assessment, WESA (2012);
- Undocumented Supplemental Soil Sampling and Analysis Program, MTE (2019); and
- Geotechnical Investigation and Slope Stability Assessment, DS Consultants Ltd. (2020).

A brief description of each of the above referenced studies is provided below for reference purposes.

Phase II Environmental Site Assessment, Wellington Detention Centre, 588 Stone Road East, Guelph, Ontario; by Franz Environmental Inc.; dated March 26, 2007; for Ontario Realty Corporation.

- Franz was retained by the Ontario Realty Corporation to conduct a Phase II ESA for the Detention Lands to address the four APECs identified in a Phase I ESA previously conducted by URS in 2006.
- Franz constructed 13 test pits and three boreholes across the Detention Centre Lands to allow for the collection of soil samples and determine geological conditions across the Site.
- One borehole was completed as a monitoring well to allow for the collection of groundwater samples and hydrogeological properties.
- Franz noted that the general soil stratigraphy within the Detention Lands consisted of a thin layer of topsoil underlain by native silt till formation. However, a layer of fill material was encountered within the Detention Centre compound consisting of sand and gravel mixed with some cobbles and/or pebbles to depths up to 4.5 mBGS.

Final Soil and Groundwater Delineation, 588 Stone Road East, Guelph, Ontario; by MTE Consultants Inc.; dated October 4, 2010; for Ontario Realty Corporation.

- MTE was retained by the Ontario Realty Corporation to delineate the soil and groundwater quality in the vicinity of the former fuel oil USTs based on findings in the 2007 Franz Phase II ESA report.
- MTE advanced seven boreholes in the vicinity of the former USTs to a maximum depth of 10 mBGS. Three boreholes were completed as monitoring wells.
- MTE noted that the soil stratigraphy consisted of sand and gravel fill material with asphalt or brick fragments to a maximum depth of 2.13 mBGS, underlain by a native sands and gravel layer, with a slity sand layer encountered between 5.5 and 7.3 mBGS. Groundwater was observed at 9.32 mBGS and 10.52 mBGS.

Phase Two Environmental Site Assessment, 588 Stone Road East, Guelph, Ontario; by WESA Inc.; dated December, 2012; for Infrastructure Ontario.

- WESA was retained by Infrastructure Ontario to conduct a Phase Two ESA to assess the three APECs identified in their Phase One ESA in preparation for the future sale of the Site; and
- WESA advanced four boreholes and 14 test pits across the Detention Centre Lands. Each borehole was completed as a groundwater monitoring well.

Undocumented Supplemental Soil Sampling and Analysis Program, Former Detention Centre Land, performed by MTE, 2019-2020, for Mattamy Homes Canada.

During the 2019-2020 subsurface investigation program conducted in the Turfgrass Lands on behalf of Mattamy (as documented in the Section above), MTE also conducted a subsurface investigation that was within the Detention Lands; however, this work was not documented in a formal report. A summary of the available information regarding the work performed in the Detentions Lands is provided below.

- MTE conducted 15 boreholes across the Detention Lands, one of which was instrumented as a permanent monitoring well (MW217-19).

Geotechnical Investigation and Slope Stability Assessment, Guelph Innovation District Lands, Victoria Road S, Guelph, ON; by DS Consultants Ltd., dated January, 2020; for Mattamy Homes Canada.

DS was retained by Mattamy to perform subsurface investigation work within the Turfgrass and Detention Lands in January of 2020, however, no formal report of these activities was provided to MTE. A summary of the available information regarding the work performed within the Detention Lands is provided below.

- Based on DS borehole logs and Site figures obtained by MTE, DS advanced two boreholes within the Detention Lands.

The location of the historical monitoring wells, boreholes, and test pits described above are illustrated on **Figure 2.**

2.0 SITE DESCRIPTION

The Site is developed with three buildings (Frost Building, maintenance workshop, pump house), a gravel parking lot, and an irrigation pond/lagoon within the west central portion of the Site. The remainder of the Site consists of gravel laneways, natural heritage areas, former agricultural, agroforestry, and turfgrass research lands. The former land uses are presented on **Figure 3a**.

Figure 3b shows the current concept plan for the Site (MHBC, 2024 dated: 2024-03-27). The proposed development will consist of a mix of low and medium density residential, employment, mixed use, open space, a school, and three stormwater management blocks.

2.1 Topography and Surface Water

MTE completed at detailed topographical survey of the Site in 2022. A northwest to southeast running topographical ridge bisects the Site. Topography slopes away from this ridge towards Victoria Road to the southwest; Stone Road to the southeast; and the Eramosa River valley to the northwest and northeast. Topographic slopes towards the Site boundaries are between 2 – 5% with steeper slopes, up to 13 % along the northeast Site boundary.

The Site is located in the Lower Eramosa Subwatershed. The Eramosa River is located along the northern and eastern Site boundary. The Eramosa generally flows from east to west towards its confluence with the Speed River, located approximately 1.9 kilometers west of the Site.

There is an irrigation pond\lagoon located in the west central portion of the Site.

There are no Provincially mapped surface watercourses or wetlands on the Site. The Torrence Creek Swamp and Eramosa River Blue Springs Creek Wetland Complex are located to the south and east of the Site and are mapped as Provincially Significant Wetlands. Other unevaluated wetlands are located northeast of the Site in the Eramosa floodplain and surrounding small surface waterbodies located southwest of the Site.

On July 14, 2022, a small on-Site wetland feature was surveyed by Natural Resource Solutions Inc. (NRSI) and confirmed with City of Guelph and Grand River Conservation Area staff.

Topography and surface water features surrounding the Site are illustrated on **Figure 2.**

2.2 Adjacent Land Use

The Site is bounded by:

- Institutional lands and parklands to the southwest;
- A mix of residential and extractive lands to the southeast; and
- Floodplain to the northwest and northeast between the Site and the Eramosa River.

2.3 Physiography

Figure 4a shows the Site lies within the Guelph Drumlin Field which is bordered by the Horseshoe Moraines to the southeast. The Guelph Drumlin field covers ~ 830 square kilometers lying northwest or in front of the Paris Moraine. Within the Guelph Drumlin field, the dominant soil types are stony tills of the drumlins and deep gravel terraces of old meltwater spillways (Chapman and Putnam, 1984).

Figure 4b shows physiographic features at the Site include drumlins, old meltwater spillways and drumlinized till plains.

2.4 Quaternary Geology

Figure 5 shows, from oldest to youngest, the Site has the following:

- Paleozoic bedrock (Map Unit 3). Details regarding the Paleozoic bedrock underlying the Site are discussed in **Section 2.6** (below);
- Sandy silt to silty sand textured till (Map Unit 5b);
- Ice-Contact sand and gravel (Map Unit 6); and
- Glaciofluvial sand deposits (Map Unit 7b).

As shown on **Figure 5**, exposed Paleozoic bedrock is mapped along the eastern and northern Site boundary between the Site and the Eramosa River.

At the Site, Map Unit 5b is identified as the Wentworth Till. Karrow (1968) describes the Wentworth Till as the youngest till sheet in the Guelph area and is a sandy to silty sand till that is usually buff in colour. The Wentworth Till is the surface till sheet over most of the Guelph area forming the streamlined hills of the Guelph Drumlin Field. Karrow (1968) describes the thickness of the Wentworth till as variable and that generally the thickness of this till sheet is related to its surface topography. Generally, the till thickness can be up to ~30 metres in the Drumlins but much less in the low areas between the Drumlins (Karrow, 1968).

Map Unit 6 covers the southern portion of the Site and is described as Ice-Contact Stratified Drift consisting mainly of sand and gravel with minor clay, silt and till components. Karrow (1968) generally identifies these hummocky sand and gravel accumulations as kames that were formed when sediment laden meltwaters poured off glacial ice. These deposits sometimes grade into outwash plains in directions away from the ice-front into outwash plains.

Map Unit 7b is described as glaciofluvial outwash deposits that are comprised primarily of gravelly deposits. Karrow (1968) associates this deposit with a major outwash plain that formed in front of the Paris Moraine. This outwash plain extends southward towards Galt as an enlarged spillway along the Speed River (Karrow, 1968).

2.5 Paleozoic Geology

Figure 6 shows bedrock beneath the Site mapped as the Silurian aged dolostone of the Guelph Formation (Map Unit 20) and what is interpreted as the Eramosa Formation (formerly part of the Amabel Formation) (Map Unit 19).

The Guelph Formation is generally characterized by tan- to brown-coloured fine- to medium-crystalline, moderately to very fossiliferous dolostone (Armstrong and Carter, 2010). The Guelph Formation can form an unconfined bedrock aquifer within the Study area and forms the Guelph Hydrogeological Unit (HGU) (Brunton, 2008).

The Eramosa Formation is generally characterized by tan to black, thin- to thickly-bedded fine- to medium-crystalline variable fossiliferous, bituminous dolostone (Armstrong and Carter, 2010). Under the revisions to Silurian stratigraphy of the Niagara Escarpment (Brunton, 2008; Brunton, 2009; Brunton et. al, 2010; and Brunton and Brintnell, 2011), the Eramosa Formation is a regional aquitard with the basal Vinemount member containing the main aquitard lithofacies.

Under the revised OGS model of the Silurian aged stratigraphy in the Guelph area, the Eramosa Formation separates the two major bedrock aquifers of the area; the upper unconfined Guelph HGU and lower confined Gasport HGU (Brunton, 2008). The Gasport HGU represents the main confined bedrock aquifer in the area.

2.6 Water Well Record Search

Hydrogeological data relate to private water supply wells within 500 m of the Site were obtained from water well records on-file with the Ministry of the Environment, Conservation, and Parks (MECP). A total of 117 water well records were located within 500 m of the Site **(Figure 7)**. Of the 117 water well records, the following primary use was listed on the water well record:

- Two dewatering wells;
- 19 abandonment records;
- 19 records with no use specified;
- 19 test holes;
- 21 water supply wells or recharge wells; and
- 37 monitoring/observation wells.

MECP water well records are summarized in **Table 1**. **Table 1** contains a hyperlink to the MECP water well record, should a digital well record exist. Based on the available water well records, there are private water supply wells within the Study Area that are used for Public and Domestic water supply. According to the water well records, these wells are completed into the underlying bedrock.

Water well records that identify wells as abandonment, dewatering, monitoring/observation wells, test holes, or no specified use have been excluded from further discussion as these are not considered to be water users.

2.7 Geological Cross-Sections

Hydrogeological data related to private water supply wells on-Site were obtained from water well records on-file with the MECP **(Section 2.7)** and from boreholes and monitoring wells constructed on-Site **(Section 1.2** and **Section 4.1)**. These resources were used to construct five geological cross-sections (A-A' through E-E') through the Site. The location of the geological cross-sections is shown on **Figure 2**.

The well/borehole name or MECP water well number are presented above the cross-section followed by the off-set distance from the cross-section line and well location. Wells/boreholes further from the cross-section line may, in paces, be displayed as having the borehole above or below ground surface. Similarly, static water levels at individual wells may be situated above or below the interpreted water-table surface presented on the individual cross-section. As such, elevation variability of overburden units may occur along the cross-section line at individual well/boreholes and may differ from the professional geological interpretation presented on the cross-section. MTE notes that the water table surface along each section is a projection of the water table surface as depicted on Figure 11.

Geological Cross-Section A-A' (Figure 8a)

Geological cross-section A-A' runs ~1,365 metres northwest to southeast through the eastern portion of the Site and shows the spatial distribution of the various geological units. Geological cross-section A-A' shows topography rises from ~310 mAMSL at the start (NW end) of the cross-section to 341 mAMSL at ~ 600 metres from the start of the cross-section. From ~ 600 m from the start of the cross-section the topography is generally hummocky and falls to ~325 mAMSL at the southeast end of the cross-section.

The interpreted geology along geological cross-section A-A' is consistent with Quaternary geology mapping presented on **Figure 5**. Bedrock **(Figure 5** – Map Unit 3**)** that is exposed or covered in thin drift (<0.9 m) is interpreted along the first ~110 metres of geological cross-section A-A'. Exposed bedrock gives way to a sandy silt till **(Figure 5** – Map Unit 5b) that is interpreted at ground surface along the entire geological cross-section except for a sand deposit interpreted between ~600 m and 1,150 m.

The sandy silt till unit is interpreted to be the Wentworth Till and overlies bedrock across the entire geological cross-section.

Geological cross-section A-A' shows an interpreted water-table surface for the April 24, 2023 monitoring event **(Section 4.4)**. The water-table surface falls radially from a peak elevation of ~337 mAMSL at ~760 m from the start of the geological cross-section. The water-table is interpreted to flow to the northwest towards the Eramosa River and to the southeast towards Stone Road.

Geological Cross-Section B-B' (Figure 8b)

Geological cross-section B-B' runs ~1,477 metres northwest to southeast through the central portion of the Site and shows the spatial distribution of the various geological units. Geological cross-section B-B' shows topography rises steeply from ~ 305 mAMSL at the start (NW end) of the geological cross-section to ~341 mAMSL at ~340 metres from the start of the geological cross-section. From this point to the end of the geological cross-section, topography undulates gently around ~340 mAMSL.

The interpreted geology along geological cross-section B-B' is consistent with Quaternary geology mapping presented on **Figure 5**. Sand **(Figure 5** – Map Unit 7b**)** overlies bedrock for the first ~150 m from the start of the geological cross-section. From ~150 metres from the northwestern start of the geological cross-section to the end of the geological cross-section, a sandy silt till **(Figure 5** – Map Unit 5b) is interpreted to overlay the bedrock. The sandy silt till is overlain by intermittent sand **(Figure 5** – Map Units 6 and 7b) and fill deposits associated with historical on-Site operations.

Geological cross-section B-B' shows an interpreted water-table surface for the April 24, 2023 monitoring event **(Section 4.4)**. The water-table surface is generally flat through the central portion of the geological cross-section (~320 m to 1,200m). As with geological cross-section A-A', the average water-table is interpreted to flow radially to the northwest towards the Eramosa River and southeast towards Stone Road.

Geological Cross-Section C-C' (Figure 8c)

Geological cross-section C-C' runs ~ 1,460 metres northwest to southeast through western portion of the Site and shows the spatial distribution of the various geological units. Geological cross-section C-C' shows topography rises steeply from ~305 mAML at the northwestern start of the geological cross-section to ~330 metres at ~100 m from the start of the geological cross-section. From this point to the southeastern end of the geological cross-section, topography undulates gently between ~330 and ~335 mAMSL.

The interpreted geology along the geological cross-section C-C' is consistent with Quaternary geology mapping presented on **Figure 5**. Sand **(Figure 5** – Map Units 6 and 7b) is the predominate overburden material encountered at ground surface. The sand deposits overlay bedrock at the start of the geological cross-section to ~300 meters from the start of the geological cross-section. From this point to the end of the geological cross-section, sand overlies a sandy silt till (Wentworth Till).

The sandy silt till is interpreted to be exposed at ground surface from ~750 m to 900 m from the start of the geological cross-section.

Geological cross-section C-C' shows an interpreted water-table surface for the April 24, 2023 monitoring event **(Section 4.4)**. The interpreted water table surface is interpreted to flow radially from a high of ~334 mAMSL northwest towards the Eramosa River and southeast towards Stone Road.

Geological Cross-Section D-D' (Figure 8d)

Geological cross-section D-D' runs ~650 metres southwest to northeast through the northern portion of the Site and shows the spatial distribution of the various geological units. Geological cross-section D-D' shows topography is relatively flat at ~330 mAMSL from the southwestern start of the geological cross-section to ~410 metres. At ~410 metres from the start (SW end) of the geological cross-section topography falls sharply from ~330 mAMSL to ~310 mAMSL towards the Eramosa River valley at the northeastern end of the geological cross-section.

The interpreted geology along geological cross-section D-D' is consistent with Quaternary geology presented on **Figure 5**. Sand **(Figure 5** – Map Unit 7b) is interpreted to overlie bedrock from the start of the geological cross-section to ~ 600 m from the start of the geological cross-section at which point bedrock is interpreted to be exposed at ground surface.

Geological cross-section D-D' shows an interpreted water-table surface for the April 24, 2023 monitoring event **(Section 4.4)**.

The interpreted water-table flows radially to the:

- Southwest generally flowing the flow of the Eramosa River; and
- Northwest towards the Eramosa River.

Geological Cross-Section E-E' (Figure 8e)

Geological cross-section E-E' runs ~850 from southwest to northeast through the southern portion of the Site and shows the spatial distribution of the various geological units. Geological cross-section shows topography rises gently from ~335 mAMSL at the southwestern start of the geological cross-section to ~340 mAMSL at ~450 metres from the start of the geological cross-section. From ~450 m to the northeastern end of the geological cross-section, the topography falls moderately to ~315 mAMSL towards the Eramosa River Valley at the end of the geological cross-section.

The interpreted geology along geological cross-section E-E' is generally consistent with Quaternary geology presented on **Figure 5**. Sand **(Figure 5** – Map Unit 6**)** is the surficial unit

across the first ~500 metres from the start of the geological cross-section and is interpreted to overlie a sandy silt till. The sand unit gives way to a silty sand till as the predominant surficial unit from ~500 m to the end of the geological cross-section. The silty sand till is interpreted to overlie bedrock across the entire length of the geological cross-section.

Geological cross-section E-E' shows an interpreted water-table surface for the April 24, 2023 monitoring event **(Section 4.4)**. Groundwater flow is interpreted to flow radially from a high of ~335 mAMSL towards the Eramosa River valley to the northeast and towards Victoria Road to the southwest.

3.0 SOURCE WATER PROTECTION

3.1 Municipal Wells and Well Head Protection Areas

Figure 9 shows the location of municipal wells and Well Head Protection Areas (WHPA) near the Site. The nearest municipal wells are the two wells associated with the Carter Well Field. These wells are located ~ 800 m southeast of the Site. The Carter well system consists of two bedrock wells located ~ 3 m apart. These wells obtain their water from the shallow bedrock of the Guelph Formation which at this location is hydraulically connected to the water table. Additionally, some of the water pumped from these wells is reportedly derived from the adjacent Torrance Creek (LERSPC, 2022). The Carter Wells are considered groundwater under the direct influence (GUDI) of surface water.

The Site is located in WHPA-B for the Guelph Wells which represents a two-year time-of-travel to the municipal wells. The Site is not located in WHPA-E (GUDI) for the Carter Well Field.

Figure 9 also shows portions of the Site lies within an Issue Contributing Area for the Membro Well. The Grand River Source Protection Area Approved Assessment Report identified Trichloroethylene (TCE) as an issue for the Membro Well.

3.2 Significant Groundwater Recharge Areas (SGRAs)

Groundwater recharge occurs where precipitation and snowmelt infiltrate into the ground to feed aquifers, watercourses, and wetland. Significant Groundwater Recharge Areas (SGRAs) are typically associated with coarse grained soils. **Figure 10** shows portions of the Site have been mapped as being a SGRA and generally correspond to those areas mapped as sand and gravel on surface towards the perimeter of the Site as shown on **Figure 5.**

3.3 Source Protection Policies

As the Site lies within a WHPA-B with an issue contributing area, source water protection policies may apply to future development activities. MTE recommends an additional source water protection policy assessment during the development of the detailed design process.

4.0 FIELD PROGRAM

4.1 Borehole Advancement and Monitoring Well Installation

Between February 28 and March 7, 2022, a total of 20 boreholes (MW501-22 through MW520-22) where advanced as part of a concurrent geotechnical investigation completed by MTE. The results of the geotechnical investigation are provided under a separate report. Boreholes were advanced to depths ranging from 2.1 to 11.1 m.

Upon completion of drilling, monitoring wells were constructed in seven boreholes (MW501-22, MW507A-22, MW507B-22, MW512A-22, MW512B-22, MW514-22, and MW520-22) to allow for the collection of stabilized groundwater levels, groundwater sampling, single well hydraulic conductivity testing.

The groundwater monitoring wells at MW507A-22, MW507B-22, MW512A-22, and MW512B-22 consists of two monitoring wells installed at different depths in the underlying overburden. The 'B' well was constructed first to a target depth. The 'A' well was installed in a separate borehole off-set from the 'B' well at a shallower depth. The purpose of this installation was to allow for the assessment of vertical hydraulic gradients within underlying overburden materials.

Between October 20, 2022 and December 12, 2022, an additional 53 boreholes (MW601-22 through BH651-22, BH654-22, BH655-22 were advanced across the Site to depths ranging from ~0.9 mBGS to 12.2 mBGS. The purpose of these boreholes was to support this hydrogeological characterization and the concurrent geotechnical and Phase Two ESA investigations. Boreholes were advanced to allow for the collection and screening of subsurface soil samples and to document geological conditions at the Site.

Seven boreholes (MW601-22 through MW607-22) were instrumented with groundwater monitoring wells to allow for the collection of stabilized groundwater levels, groundwater quality samples and to determine hydrogeological properties of the underlying geological materials.

A minipiezometer (MP101-23) was installed in the on-Site wetland on April 24, 2023 to allow for the collect of stabilized groundwater levels and to determine any potential groundwater/surface water connection.

Based on the drilling results soils at the Site generally consist of topsoil and/or fill overlying till and sand and gravel deposits which in turn overlie bedrock. **Table 2** provides a summary of the generalized stratigraphy encountered at each borehole during the 2022 drilling programs.

Borehole, monitoring well, and minipiezometer locations are illustrated on **Figure 2**. Borehole logs from the 2022 drilling programs are provided in **Appendix A.** Borehole logs from previous studies are available upon request.

Data from the borehole logs was incorporated into a relational database (HydroGeo Analyst – HGA). HGA is an environmental data management system that integrates customizable database structures to allow for the effective and efficient management of environmental data thus allowing MTE to make informed decisions regarding the environment and water resources. HGA was used to assist in the development of the Site Conceptual Geological Model.

4.2 Monitoring Well Development and Sampling

Following installation, monitoring wells were developed with the Waterra™ inertial pump to purge remaining fine-grained sediments in the well caused by drilling and to create a hydraulic connection to the surrounding native geologic formation.

On November 29, 2022, groundwater samples were obtained from MW512B-22, MW514-22, MW604-22, and MW606-22 to establish existing groundwater quality conditions at the Site. The remaining groundwater monitoring wells from the 2022 drilling program (MW501-22, MW507A-22, MW507B-22, MW512A-22, MW520-22, MW512A-22, MW601-22, MW602-22, MW603-22, MW605-22, and MW607-22) were dry or had insufficient volumes of water for sample collection.

Between May 9, 2023 and May 12, 2023, additional groundwater samples were obtained from BH/MW10-06, MW1-17, MW204-19, MW209-19, MW210-19, MW507A-22, MW507B-22m MW512A-22, MW512B-22, MW514-22, MW520-22, MW601-22, MW603-22, MW604-22, MW605-22, MW606-22, MW607-22, and MP101-23 to further establish existing groundwater quality samples.

Prior to sample collection, each monitoring well was purged to remove stagnant water from the monitoring and surrounding sand pack to allow for a representative sample to be collected from the groundwater system. Each well was purged a minimum of three standing well volumes or until three times 'dry'.

The sample was collected using a dedicated Waterra™ foot valve and tubing; placed into laboratory supplied jars and transported in ice-packed coolers under chain-of-custody to ALS Laboratories - Environmental Division (ALS) in Waterloo, ON. The groundwater samples were analyzed for select dissolved metals, anions, and general chemistry parameters. Analytical results are summarized in **Table 3.** Unabbreviated laboratory certificates of analysis are maintained on file at MTE and are available upon request.

4.3 In-Situ Hydraulic Conductivity Testing

On October 6, 2022, single well hydraulic responses tests were carried out on BH/MW1-06, MW2-11, MW217-19, MW512b-22, and MW514-22. An additional single well response test was carried on MW209-19 on October 24, 2022.

Between May 4, 2023 and May 16, 2023, additional single well hydraulic response tests were carried out on BH/MW1-06, MW1-17, MW204-19, MW209-19, MW210-19, MW217-19, MW507A-22, MW507B-22, MW512A-22, MW512B-22, MW514-22, MW520-22, MW601-22, MW603-22, MW604-22, MW605-22, MW606-22, and MW607-22,

4.3.1 Recovery Tests

For the October 2022 single well hydraulic response testing program, recovery or bail tests were completed for BH/MW1-06, MW2-11, MW217-19, and MW514-22.

Each tested well was purged dry and the rate of recovery recorded using a data logger programmed to collect a water level every second. Where possible the recovery tests were repeated to assess the validity of the assumptions underlying the slug test analysis methods. Repeat recovery tests were completed at MW2-11 and MW514-22. Due to the slow response, repeat recovery tests were not completed at BH/MW1-06, MW209-19, and MW217-19.

For the May 2023 single well hydraulic response testing program, recovery or bail tests were completed for BH/MW1-06, MW1-17, MW209-19, MW217-19, MW507A-22, MW507B-22, MW512A-22, MW514-22, MW520-22, MW601-22, MW603-22, MW604-22, MW605-22, MW606-22.

Each tested well was purged dry and the rate of recovery recorded using a data logger programmed to collect a water level 0.5 secs to 5 seconds. Where possible, the recovery tests were repeated to assess the validity of the assumptions underlying the slug test analysis methods. Repeat recovery tests were completed at all tested wells with the exception of MW507A-22.

4.3.2 Slug Tests

At MW210-19, MW512B-22, and MW607-22, falling and rising head response test were performed.

The response test was initiated by rapidly inserting (falling head) or removing (rising head) a solid slug of a predetermined displacement to cause a near instantaneous change in the water level in the well. The rate of recovery back to static conditions was recorded using a data logger programmed to collect a water level every second. The response tests were carried out a minimum of three times using solid slugs of different known displacements to assess the validity of the assumptions underlying the slug test analysis methods.

4.3.3 Analysis

Prior to analysis, recovery data was normalized by dividing the observed head change (H_o) by the expected head change (H_o*). Normalized data plots from repeat tests (at the same well) were compared to determine coincidence between tests. Coincidence between tests suggests assumptions underlying conventional analysis methods can be considered valid at that well (Butler et. al., 1996; Butler et. al., 2003).

October 2022

The normalized head plots for MW2-11 and MW512b-22 show an acceptable coincidence. The normalized head plot for MW514-22 does not show an acceptable coincidence suggesting that further development at this well may be required. As only a single response test was completed at BH/MW1-06, MW209-19, and MW217-19, no comment on coincidence can be made.

For tested wells showing an acceptable coincidence, a representative test from each well was analyzed using the Bouwer and Rice (1976) model in the AquiferTest© Pro software package Version 10 (Waterloo Hydrogeologic, 2020) to estimate the horizontal hydraulic conductivity of the saturated materials adjacent to the well screen.

The single well response tests at BH/MW1-06, MW209-19, and MW217-19 were also analyzed using the Bouwer and Rice (1976) model in the AquiferTest© Pro software package Version 10 (Waterloo Hydrogeologic, 2020) to estimate the horizontal hydraulic conductivity of the saturated materials adjacent to the well screen.

A single response test from MW514-22 was analyzed using the Bouwer and Rice (1976) model in the AquiferTest© Pro software package Version 10 (Waterloo Hydrogeologic, 2020) to estimate the horizontal hydraulic conductivity of the saturated materials adjacent to the well screen.

The estimated horizontal hydraulic conductivity from October 2022 tests at BH/MW1-06, MW209-19, MW217-19, and MW514-22 are considered preliminary.

The estimated horizontal hydraulic conductivities from the 2022 single well hydraulic response tests are summarized in **Table 4**. Aquifer Test data sheets are provided in **Appendix B**.

May 2023

The normalized head plots for MW512B-22, MW514-22, MW604-22, MW605-22 show and acceptable coincidence. The remaining well tested in May 2023 do not show an acceptable coincidence suggesting that further well development may be required. As only a single response test was completed at MW507A-22, no comment on coincidence can be made.

For tested well showing and acceptable coincidence, a representative test from each well was analyzed using the Bouwer and Rice (1976) model in AquiferTest© Pro software package Version 10 (Waterloo Hydrogeologic, 2020) to estimate the horizontal hydraulic conductivity of the saturated materials adjacent to the well screen.

For tested wells that did not show an acceptable coincidence, the normalized head plots generally showed the rate of response increased from the first test to the second test. This suggests that some well development was taking place during the first test and/or sampling events (if any) thus improving the connection between the well screen and adjacent formation.

To provide a preliminary estimate of the horizontal hydraulic conductivity at wells that did not show an acceptable coincidence, the test that had the fastest rate of recovery was analyzed using the Bouwer and Rice (1976) model in AquiferTest© Pro software package Version 10 (Waterloo Hydrogeologic, 2020). MTE cautions that the estimated horizontal hydraulic

conductivity obtained from these tests may be biased low and that if a more refined estimate is required then additional well development and single well response testing be undertaken.

4.3.4 Results Summary

The estimated hydraulic conductivities ranged from $1.0x10^{-5}$ to $7.2x10^{-7}$ m/sec for wells screened across coarse grained sand and gravel/silty sand with a geometric mean of $1.9x10^{-6}$ m/sec.

The estimated hydraulic conductivities ranged from $7.2x10^{-6}$ to $6.3x10^{-9}$ m/sec for wells screened across fine grained silty clay to silty sand till with a geometric mean of $1.7x10^{-7}$ m/sec.

Despite the above noted limitations in testing, these results are consistent with published values soils encountered across the Site (Freeze and Cherry, 1979).

4.4 Groundwater Levels and Elevations

MTE completed a relative elevation survey of the top of the casing and ground surface at all active monitoring wells in 2022 relative to mean sea level utilizing a local benchmark. The relative elevation survey allows for groundwater levels collected from each monitoring well to be compared to each other and allow for the determination of the groundwater flow direction.

MTE collected manual groundwater level measurements from select groundwater monitoring wells on seven occasions in 2022 and 15 occasions in 2023. Manually measured groundwater levels, groundwater depths below ground surface, and groundwater elevations are presented in **Table 5a** through **Table 5c**, respectively.

Table 5a shows the shallow groundwater table was encountered between ~0.6 mBGS and 12 mBGS. Several monitoring wells have been reported dry throughout the year. These monitoring wells may only have groundwater present during periods when the water-table is elevated. Elevated water-table conditions generally occur following the spring melt or following periods of prolonged precipitation events.

In addition to the manually collected groundwater levels, dedicated pressure transducers (data loggers) were installed in the following wells across the Site: MW204-19, MW210-19, MW507a-22, MW507b-22, MW512a-22, MW512b-22, MW514-22, MW520-22, MW601-22, MW601-22, MW604-22, MW605-22, MW606-22, and MW607-22. The data loggers were programmed to collect a water level every hour to establish seasonal trends and to determine the maximum groundwater elevation at the Site.

The data loggers measure total pressure above the pressure sensor. Prior to calculating groundwater levels, the raw pressure data was compensated for changes in atmospheric pressure using atmospheric pressure data collected by a dedicated on-Site barometric pressure transducer.

Calculated groundwater elevations as collected by the on-Site data loggers are illustrated on **Hydrograph C1** through **Hydrograph C11**. Hydrographs are provided in **Appendix C**. In addition to the calculated groundwater level, daily precipitation was plotted on the hydrographs to determine how the water table responds to precipitation events. Precipitation data was obtained from Environment Canada as reported by the Guelph Turfgrass Institute weather station.

MW204-19

Hydrograph C1 shows continuous groundwater elevations for MW204-19 which is located in the northern portion of the Site and completed in fine grained materials. The hydrograph shows that during the monitoring period, groundwater elevations as collected by the data logger fell

from a peak of ~340.9 mAMSL to a low of ~337.1 mAMSL before the well went dry in the fall 2022.

MW210-19

Hydrograph C2 shows continuous groundwater elevations for MW210-19 which located in the eastern portion of the Site and complete in fine grained materials. The hydrograph shows that during the monitoring period, groundwater elevations as collected by the data logger fell from a peak of ~336.9 mAMSL to a low of ~331.5 mAMSL.

MW507A-22 and MW507B-22

Hydrograph C3 shows continuous groundwater elevations for MW507A-22 and MW507B-22 which are located in the eastern portion of the Site and completed in fine grained materials. These two wells are a set of nested wells located approximately 1.4 m from each other. The screened interval of MW507A-22 is from ~2.3 to 3.8 mBGS while the screened interval of MW507B-22 is from ~4.6 to 6.0 mBGS. Both wells are screened in a silty till unit, interpreted to be the Wentworth Till **(Section 2.5)**.

As shown on **Hydrograph C3** the groundwater elevation at these locations appear to stabilize at different elevations. The groundwater elevation in the deeper well (MW507B-22) is lower than the groundwater elevation of the shallower well (MW507A-22). This is interpreted to indicate a downward vertical hydraulic gradient within the till unit and is characteristic of these types of fine-grained materials. Groundwater levels measured at MW507B-22 are considered to represent the water-table. Groundwater levels measured at MW507A-22 are influenced by the shallower depth of the screened interval in the till unit and effected in part by flow in the unsaturated (vadose) zone.

Hydrograph C3 shows that during the monitoring period groundwater elevations at MW507A-22 as collected by the data logger fell from a peak of ~330.5 mAMSL to ~328.5 mAMSL before the well went dry in June 2022 and July 2023. Similarly, **Hydrograph C3** shows groundwater elevations at MW507B-22 as collected by the data logger fell from a peak ~328.0 mAMSL to ~326.3 mAMSL before the well went dry in August 2022; however, groundwater levels were continuously recorded by the data logger from February 2023 to the end of the monitoring period.

MW512A-22 and MW512B-22

Hydrograph C4 shows continuous groundwater elevations for MW512A-22 and MW512B-22 which are located in the north-central portion of the Site. These two wells are a set of nested wells located approximately 2.1 m from each other. The screened interval of MW512A-22 is from ~1.5 mBGS to 3.1 mBGS while the screen interval of MW512B-22 is from ~6.9 to 7.6 mBGS. MW512A-22 is screened in a sandy silt till interpreted to be the Wentworth Till **(Section 2.5)**. MW512B-22 is screened in a silty sand seam in the till.

As shown on **Table 5**, groundwater has been intermittently measured at MW512A-22. **Hydrograph C4** shows that groundwater was recorded by the data logger between February and June 2023 before the well went dry. **Hydrograph C4** shows groundwater elevations at MW512B-22 as collected by the data logger fell range from ~334.4 mAMSL in March 2022 to a low of ~329.8 mAMSL during the monitoring period.

As with MW507A-22 and MW507B-22, **Hydrograph C4** shows groundwater elevations at MW512A-22 and MW512B-22 appear to stabilize at different elevations when groundwater is recorded at MW512A-22. The groundwater elevation in the deeper (MW512B-22) well is lower than the groundwater elevation in the shallower well (MW512A-22). This is interpreted to indicate a downward vertical hydraulic gradient within till unit and is characteristic of these types of fine-grained materials. Groundwater levels measured at MW512b-22 are considered to

represent the water-table. Groundwater levels measured at MW512A-22 are influenced by the shallower depth of the screened interval in the till unit and effected in part by flow in the unsaturated (vadose) zone, capturing a portion of water migrating to the water-table.

MW514-22

Hydrograph C5 shows continuous groundwater elevations for MW514-22 which is located in the south-central portion of the Site. The data logger at this location was not installed until October 2022 and as such only collected continuous groundwater elevation from the latter half of 2022 through the end of the monitoring period. **Hydrograph C5** show groundwater elevations (as recorded by the data logger) range from ~344.0 mAMSL to ~338.1 mAMSL during the monitoring period.

MW520-22

Hydrograph C6 shows continuous groundwater elevations for MW520-22 which is located in the southern portion of the Site. **Hydrograph C6** shows that during the monitoring period groundwater elevations fell from a peak of ~326.5 mAMSL to ~324.9 mAMSL. The well was dry between September 2022 and March 2023 and from November 2023 to the end of the monitoring period.

MW601-22

Hydrograph C7shows continuous groundwater elevations for MW601-22 which located in the northwestern portion of the Site and is screened into the underlying bedock. The data logger at this locations was installed in October 2022 and as such only had the potential to record water levels during the last two months of 2022 through the end of the monitoring period. **Hydrograph C7** shows that groundwater levels were recorded by the data logger from February 2023 to September 2023. During this period, groundwater elevations ranged from ~318.4 mAMSL to ~317.6 mAMSL.

MW604-22

Hydrograph C8 shows continuous groundwater elevations for MW604-22 which is located in central portion of the Site. The data logger at this location was installed in November 2022 and as such only shows groundwater elevations from the last two months of 2022 through then end of the monitoring period. **Hydrograph C8** shows that during the monitoring period groundwater elevations ranged from ~341.6 mAMSL to ~336.78 mAMSL.

MW605-22

Hydrograph C9 shows continuous groundwater elevations for MW605-22 which is located in the southwestern portion of the Site. The data logger at this location was installed in November 2022; as such, **Hydrograph C9** only shows groundwater levels from the last two months of 2022 through to the end of the monitoring period. **Hydrograph C9** shows that during the monitoring period groundwater elevations ranged from ~328.5 mAMSL to ~326.7 mAMSL.

MW606-22

Hydrograph C10 shows continuous groundwater elevations for MW606-22 which is located in western portion of the Site. The data logger at this location was not installed until November 2022; as such, **Hydrograph C10** only shows groundwater elevations for the last two months of 2022 through the end of the monitoring period. **Hydrograph C10** shows that during the monitoring period groundwater elevations ranged from ~327.8 mAMSL to a low of ~323.7 mAMSL.

MW607-22

Hydrograph C11 shows continuous groundwater elevations for MW607-22 which is located in southeastern portion of the Site. The data logger at this location was not installed until November 2022 and as such only shows groundwater elevations from last two months of 2022 through the end of the monitoring period. **Hydrograph C11** shows that during the monitoring period groundwater elevations ranged from ~333.3 mAMSL to a low of ~329.8 mAMSL.

4.5 Groundwater Flow

Groundwater elevations and local shallow groundwater flow direction for the April 24, 2023 monitoring event are illustrated on **Figure 11**. For the purposes of this Characterization Report, the April 24, 2023 monitoring event is considered to be representative of a spring high groundwater condition.

MW507A-22 and MW507A-22 have been excluded from flow mapping as MTE does not consider water levels obtained from these wells to be representative of the water-table at the Site **(Section 4.4)** at these locations.

Figure 11 shows groundwater flows generally mimics topography flowing radially from two groundwater mounds at the Site.

The first groundwater mound is generally centered around the topographic high in the northern portion of the Site near the main irrigation pond. The irrigation pond may be connected to the shallow water-table and serving in part to recharge the water-table. Groundwater flows from this mound towards the Eramosa River to the north and east. Groundwater also flows westerly from this mound generally following the westerly flow direction of the Eramosa River. Horizontal hydraulic gradients around this mound are steep in the direction of the Eramosa River and are on the order of 0.1 m/m. Horizontal hydraulic gradients west of this mound are flatter relative to those discussed above and are on the order of 0.05 m/m.

The second groundwater mound is generally centered on a topographic high in the southern portion of the Site and suggests that this topographic high may be serving as a localized groundwater recharge area. Groundwater from this mound generally flows in an easterly direction towards Torrence Creek and westerly towards Victoria Road. Horizontal hydraulic gradients in both directions from this mound are generally the same at ~0.05 m/m.

5.0 PRELIMINARY IMPACT ASSESSMENT

The following is a preliminary groundwater impact assessment related to the proposed Concept Plan ((MHBC, 2024 dated: 2024-03-27) **(Figure 3b)** and Engineering Master Servicing Plan (MSP) (MTE, 2024) in particular the proposed Preliminary Grading Plan (MTE Drawing 46927-104-AG1.1) and Stormwater Management Facilities.

5.1 Groundwater Elevations

MTE compared the April 24, 2023 (Spring high) groundwater elevations to the proposed preliminary grading plan to determine preliminary groundwater separation distances. This analysis shows two areas (Area 1 and Area 2) of the Site where the Spring groundwater elevations have the potential to be at or near the preliminary finished grade. These locations are illustrated on **Figure 3b** and **Figure 11.**

Area 1 is located in the northern portion of the Site and is roughly centred on the on-Site irrigation pond/lagoon. Area 1 covers mostly proposed residential and park blocks and intersects some mixed use blocks.

Area 2 is located in the southern portion of the Site and is roughly centered on the western slope of the southern topographic high. Area 2 covers a mix of proposed residential, employment, park, and school blocks.

Where the Area 1 and Area 2 intersect proposed residential blocks, groundwater collection systems, or waterproofing with sump pumps may be considered to ensure that during Spring high groundwater conditions do not adversely affect residential basements.

MTE understands that proposed non-residential blocks (e.g. employment) and/or residential that will be multi-storey (e.g. condominium) will either be constructed as slab on grade or be designed with dedicated groundwater control measures (e.g. waterproofing and/or sump pumps, etc).

5.2 Private Water Supply Wells

Based on water wells records on file with the Ministry of the Environment, there are 20 private water supply wells and one recharge well located within 500 m of the Site **(Figure 7)**. Water well records that identify wells as abandonment, dewatering, monitoring/observation wells, test holes, or no specified use have been excluded from further discussion as these are not considered to be water users.

5.2.1 On-Site Water Supply Wells

The MECP well records indicate four water supply wells (6701021, 6711142, 6707181, and 6701014) and one recharge well (6711143) are located within the Site boundary. Well 6711142 and 671143 served to heat and cool the existing on-Site building.

While MTE has not been able to locate a well abandonment record for well 6711143, MTE has visually confirmed that this well not longer exists on-Site and has presumed that that well has been abandoned. Well 6711143 is still present on-Site.

The MECP well record shows well 6701021 is located on the northern portion of the Site in proximity to a former on-Site building. MTE has been unable to visually locate this well or find a well abandonment record associated with this well. Should this well be located in the future, MTE recommends that the well be abandoned in accordance with *O.Reg. 903 (as amended).*

Well 6701014 is located in the Detention Centre lands. MTE has located a well abandonment record (7050663) that can be associated with this well.

Well 6707181 is located in the Detention Centre lands. MTE has not been able to locate this well or find an abandonment record associated with this well. Should this well be located in the future, MTE recommends that the well be abandoned in accordance with *O.Reg. 903 (as amended).*

5.2.2 Off-Site Water Supply Wells

Four water supply wells (6701057, 6701022, 6708591, and 6704301) are located north of the Eramosa River and are not anticipated to be affected by the proposed development.

There are 10 off-Site wells south of the Eramosa River that are mapped as being south of Stone Road East and one well east of Victoria Road South. According the MECP well records, these wells are completed into the underlying bedrock to depths ranging from 12 mBGS to >60 mBGS.

MTE does not anticipate that the proposed development will affect the ability of these wells to meet their water supply needs. However, MTE recommends a private water supply inventory

be conducted during the detailed design process to further evaluate private water supplies within 500m of the Site.

5.3 Wetlands

5.3.1 On-Site Wetland

There is one on-Site wetland located in Open Space Block (Block 88) west of the Stormwater Management Block (Block 86) **(Figure 3b)**. MTE established a minipiezometer in this wetland in April 2024 and collected six manual measurements from the mini-piezometer. In 2024, no standing water was observed in the wetland **(Table 5)**. Limited groundwater level measurements were obtained in 2024 and are insufficient to characterize the hydroperiod of this feature.

MTE will be installing a dedicated data logger at this location in 2024 to better understand the hydroperiod of this feature in order to better groundwater/surface water connections at this feature. Once the hydroperiod has been established, MTE will assess potential groundwater impacts to the feature.

5.3.2 Off-Site Wetlands

The Torrence Creek Swamp and Eramosa River Blue Springs Creek Wetland Complex are located to the south and east of the Site and are mapped as Provincially Significant Wetlands. Other unevaluated wetlands are located northeast of the Site in the Eramosa floodplain and surrounding small surface waterbodies located southwest of the Site **(Section 2.1)**.

The proposed development may affect groundwater recharge to some degree that in turn supports, in part, these wetland features. MTE recommends Low Impact Development Measures (LID) are investigated to minimize stormwater runoff and increase infiltration and that on-Site infiltration or water-reuse strategies be designed to maintain pre-development infiltration rates post-development and reduce potential groundwater impacts to these off-Site wetland features.

6.0 SUMMARY AND CONCLUSIONS

Based on the above hydrogeological characterization, MTE offers the following:

- Geology at the Site consists of the following:
  - The central portion of the Site consists of a sandy silt till that is interpreted to be Wentworth Till and generally overlies bedrock across most the Site.
    - Where the Wentworth Till overlies bedrock, the till will act as an Aquitard, limiting recharge and offering protection to the underlying bedrock aquifer.
  - Sand, sand and gravel overlie the central till mound along its southeastern and northwestern flanks. Sand and gravel can overlie bedrock in these portions of the Site where the Wentworth Till is not present.
  - Bedrock is exposed or covered with thin drift along the northeastern portion of the Site along the Eramosa River valley.
- Since the Site lies within a WHPA-B and an issue contributing area, Source Water Protection Polices may apply to any future development.
- The shallow groundwater table was encountered between ~0.6 mBGS and 12 mBGS based on groundwater levels collected to date.
- Horizontal hydraulic conductivity values ranged from 7.2×10^{-6} to 6.3×10^{-9} m/sec for wells screened across fine grained till materials. These values are consistent with published values for these types of materials are representative of the till encountered across the Site.
- Horizontal hydraulic conductivity values ranged from 1.0×10^{-5} to 7.2×10^{-7} m/sec for wells screened across coarse grained materials at the Site. These values are consistent with published values for these types of materials and are representative of the sand encountered across the Site.
- Local groundwater flow in the shallow water table is radial from two topographic highs located in the central portion of the Site. Groundwater flow generally mimics topography.

7.0 RECOMMENDATIONS

MTE recommends the following:

- Conduct monthly site visits during March, April, and May 2024 to collect manual groundwater levels from the monitoring wells and download data loggers. Monthly Site visits are recommended during spring months to ensure the spring high groundwater level is captured.
- Conduct quarterly site visits from June 2024 onwards to collect manual groundwater levels and download data loggers.
- Collect an annual groundwater sample from select monitoring wells to be analyzed for general chemistry parameters. Sampling during Spring 2024 ensures the best opportunity to have sufficient volumes of groundwater in each well.
- Groundwater collection systems be assessed in Area 1 and Area 2 where Spring high groundwater elevations have the potential to be at or near the preliminary finished grade in order to prevent adverse affects to residential basements.
- A private well inventory be completed to identify private water well users within 500 m of the Site.
- Collect surface water levels and water quality sample(s) from the on-Site wetland which could potentially be impacted by development on the Site to document pre-development surface water quality conditions and determine potential groundwater and surface water interactions.
- Additional assessment and reporting take place during the detailed design process to assess:
    - Source water protection policies;
    - Potential hydrogeological impacts that may result from the development design; and
    - Construction dewatering requirements and associated permits (if required).
- Groundwater wells not in use be decommissioned in accordance with *Ontario Regulation 903* (as amended).

8.0 LIMITATIONS

Services performed by **MTE Consultants Inc.** (MTE) were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the Environmental Engineering & Consulting profession. No other warranty or representation expressed or implied as to the accuracy of the information, conclusions or recommendations is included or intended in this report.

This report was completed for the sole use of MTE and Fusion Homes. It was completed in accordance with the Scope of Work. As such, this report may not deal with all issues potentially applicable to the Site and may omit issues, which are or may be of interest to the reader. MTE makes no representation that the present report has dealt with any and all of the important features, including any or all important environmental features, except as provided in the Scope of Work. All findings and conclusions presented in this report are based on Site conditions as they existed during the time period of the investigation. This report is not intended to be exhaustive in scope or to imply a risk-free facility.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based upon it, are the responsibility of such third parties. MTE accepts no responsibility for liabilities incurred by or damages, if any, suffered by any third party as a result of decisions made or actions taken, based upon this report. Others with interest in the Site should undertake their own investigations and studies to determine how or if the condition affects them or their plans.

It should be recognized that the passage of time may affect the views, conclusions and recommendations (if any) provided in this report because environmental conditions of a property can change. Should additional or new information become available, MTE recommends that it be brought to our attention in order that we may re-assess the contents of this report.

All of which is respectfully submitted,

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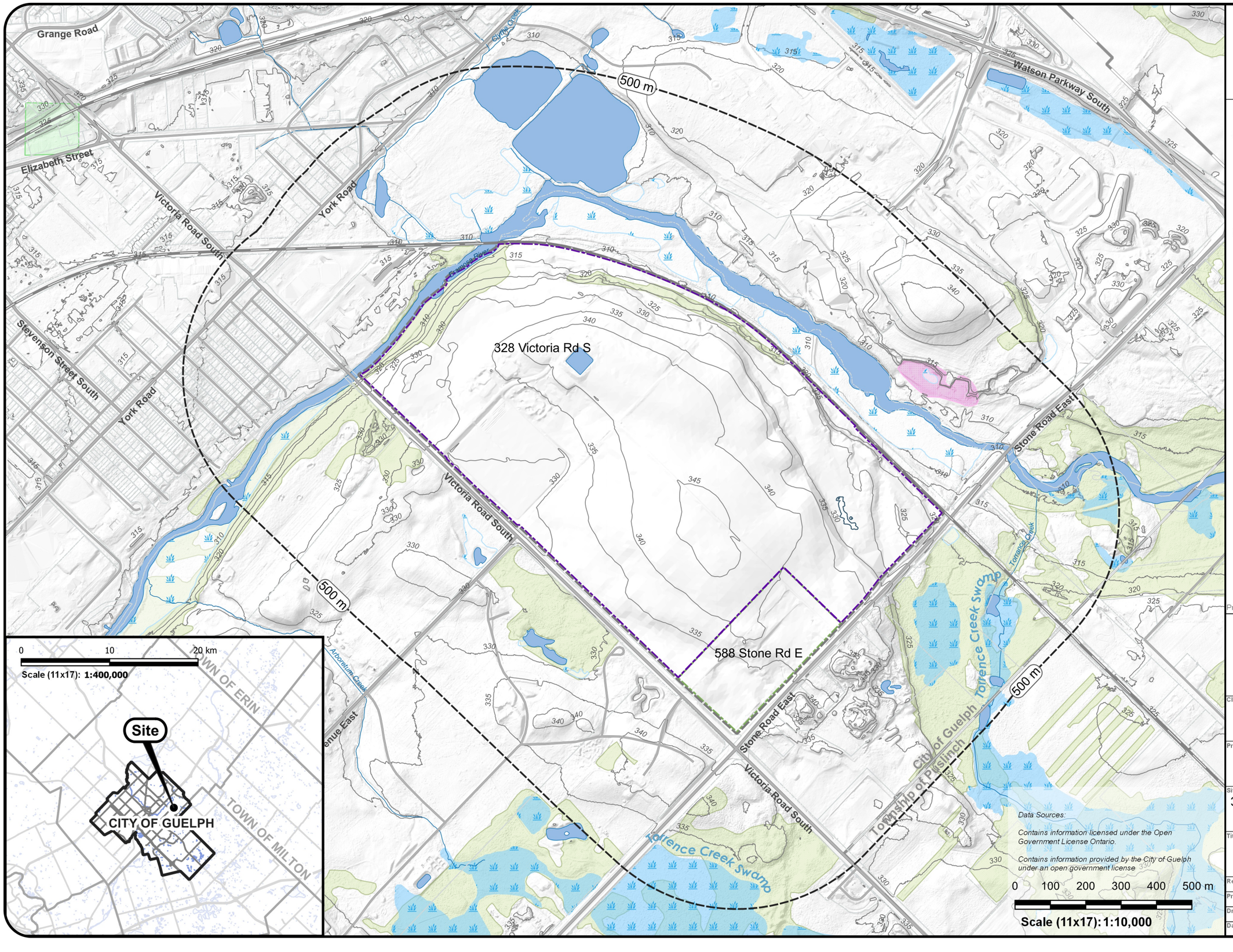
Figures



N
NORTH

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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary
- Former Wellington Detention Centre Lands
- Turfgrass Lands
- Study Area

Base Map

Boundaries
- Municipal Boundary (Lower Tier)
- Parcel Fabric (City of Guelph)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (5 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

ANSI
- Provincial - Eath Science
- Regional - Earth Science

Project CRS: NAD83 / UTM zone 17N

MTE
Engineers,Scientists, Surveyors
Ph. (519) 743-6500

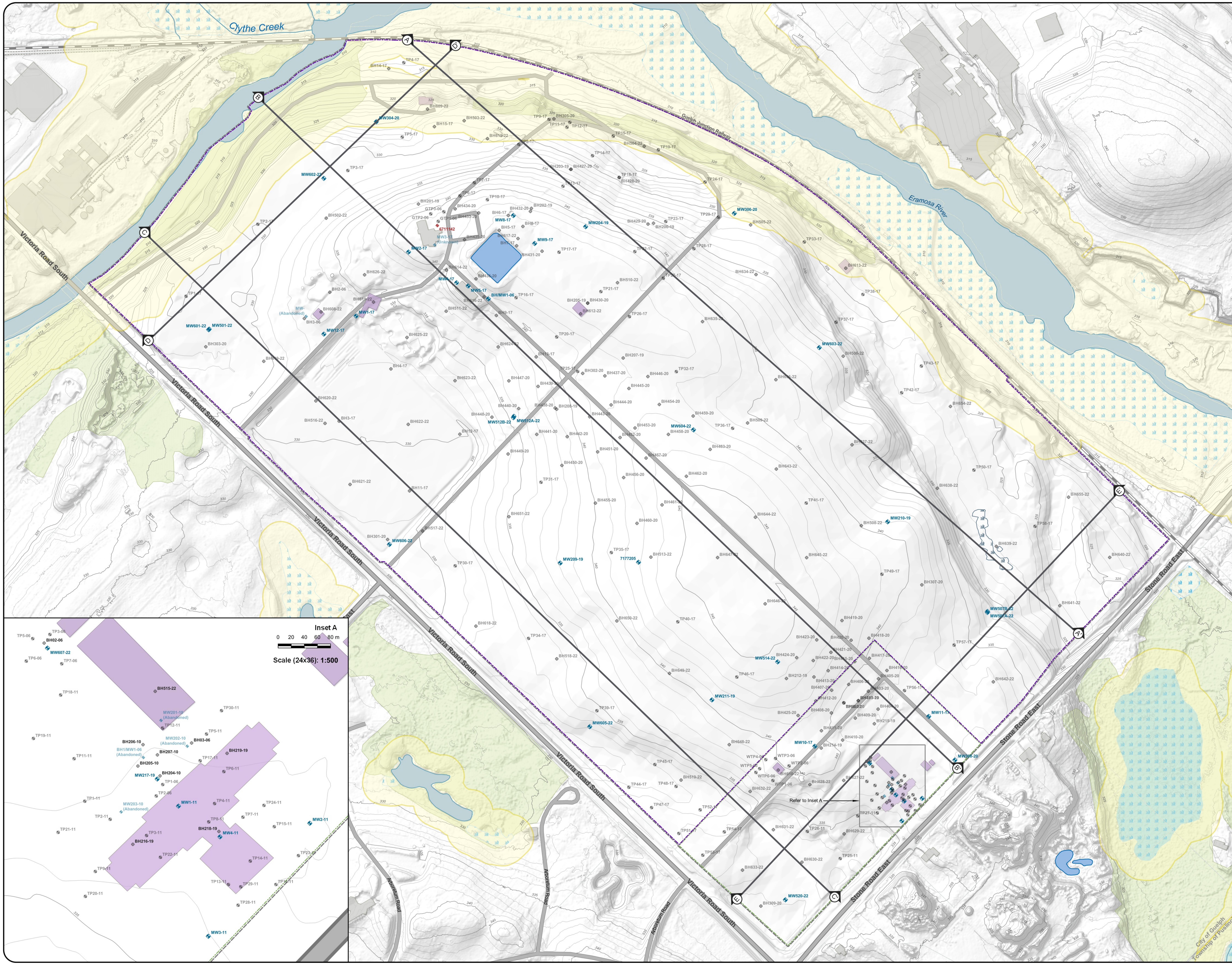
Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: Key Map

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	1
Date	April 2024		



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PROJECT NORTH

Legend

Site Data

Site Boundaries
- Site Boudnary
- Former Wellington Detention Centre Lands
- Turfgrass Lands

Monitoring Locations
- Monitoring Well
- Test Pit
- Private Well
- Borehole

Geological Cross-Sections
- Geological Cross Section Location

GRCA Data

GRCA Boundaries
- Regulation Limit (GRCA)

Base Mapping

Boundaries
- Parcel Fabric (City of Guelph)
- Municipal Boundary (Lower Tier)

Buildings
- Existing Building Footprint
- Former Building Footprint

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (5 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincially Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Data Sources:

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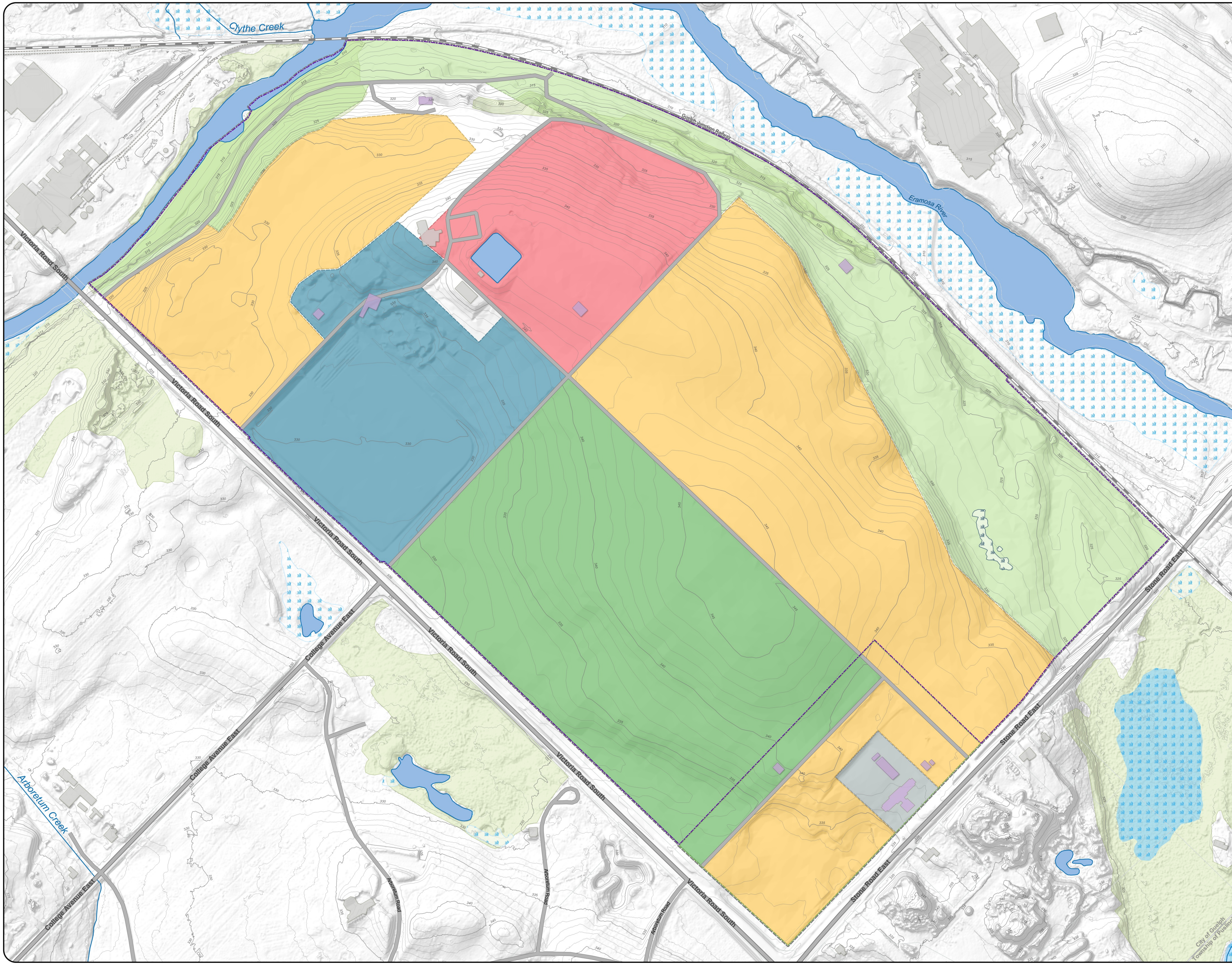
0 50 100 150 200 250 m

Scale (24x36): 1:2,500

Project CRS: NAD83 / UTM zone 17N

MTE
Engineers, Scientists, Surveyors
Ph. (519) 743-6500

Client	Fusion Homes
Project	Guelph Innovation District Lands - Hydrogeological Characterization
Site	328 Victoria Road S. and 588 Stone Road E., Guelph, On
Title	**Site Layout and Features**
Reviewed By	PAG
Prepared By	MDE
Project No	46927-104
Drawn By	MDE
Figure No	2
Date	April 2024



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PROJECT NORTH

Legend

Site Data

Site Boundaries
- Overall Site Boundary
- Subject Lands
- Turfgrass Lands

Past Land Use
- Conservation Lands
- Former Agricultural Lands
- Former Agroforestry Lands
- Former Detention Centre Buildings\Compound Area
- Former Orchard
- Former Putting Greens\Research Turf Ranges

Base Mapping

Boundaries
- Parcel Fabric (City of Guelph)
- Municipal Boundary (Lower Tier)

Buildings
- Existing Building Footprint
- Former Building Footprint

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (5 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincially Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

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0 50 100 150 200 250 m

Scale (24x36): 1:2,500

Project CRS: NAD83 / UTM zone 17N

MTE
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Ph. (519) 743-6500

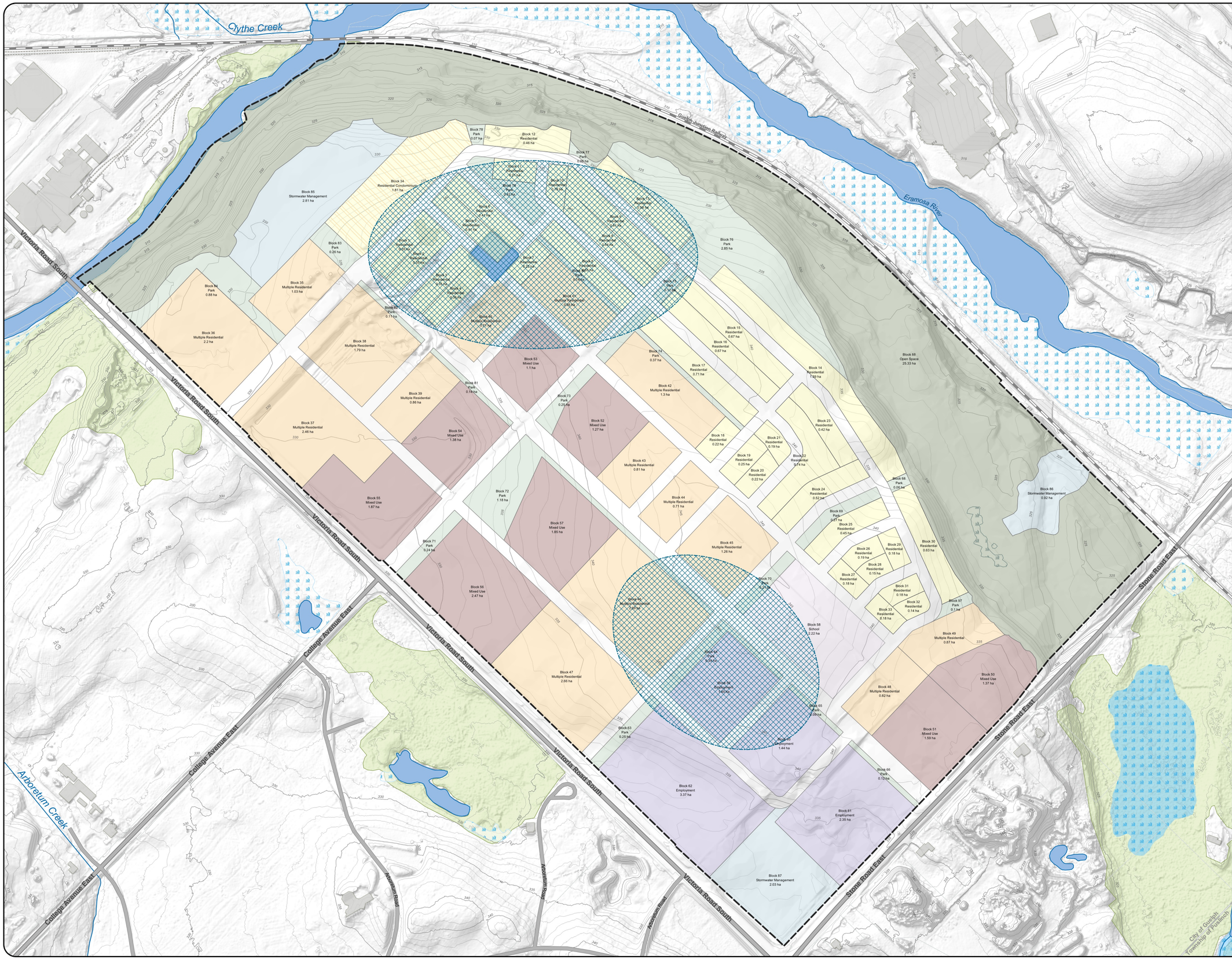
Client
Fusion Homes

Project
Guelph Innovation District Lands - Hydrogeological Characterization

Site
328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title
Past Land Uses

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	3a
Date	April 2024		



NORTH

PROJECT NORTH

Legend

Site Data

Boundaries
- Subject Lands
- Areas where Groundwater Elevations are above Proposed Finished Grade (Approximate)

Concept Plan

Residential
- Low Density Residential
- Low Density Residential (Condominium)
- Medium Density Residential

- Employment
- Mixed Use
- Open Space
- Park
- School
- Stormwater Management

Base Mapping

Boundaries
- Parcel Fabric (City of Guelph)
- Municipal Boundary (Lower Tier)

Buildings
- Existing Building Foorprint
- Former Building Footprint

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (5 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Data Sources:

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0 50 100 150 200 250 m

Scale (24x36): 1:2,500

Project CRS: NAD83 / UTM zone 17N

MTE

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Client

Fusion Homes

Project

Guelph Innovation District Lands - Hydrogeological Characterization

Site

328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title

Concept Plan

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	3b
Date	April 2024		

Project No: 46927-104 P:\P46927\104\46927_104_gwr2_qgis_v_3_22_11.qgz
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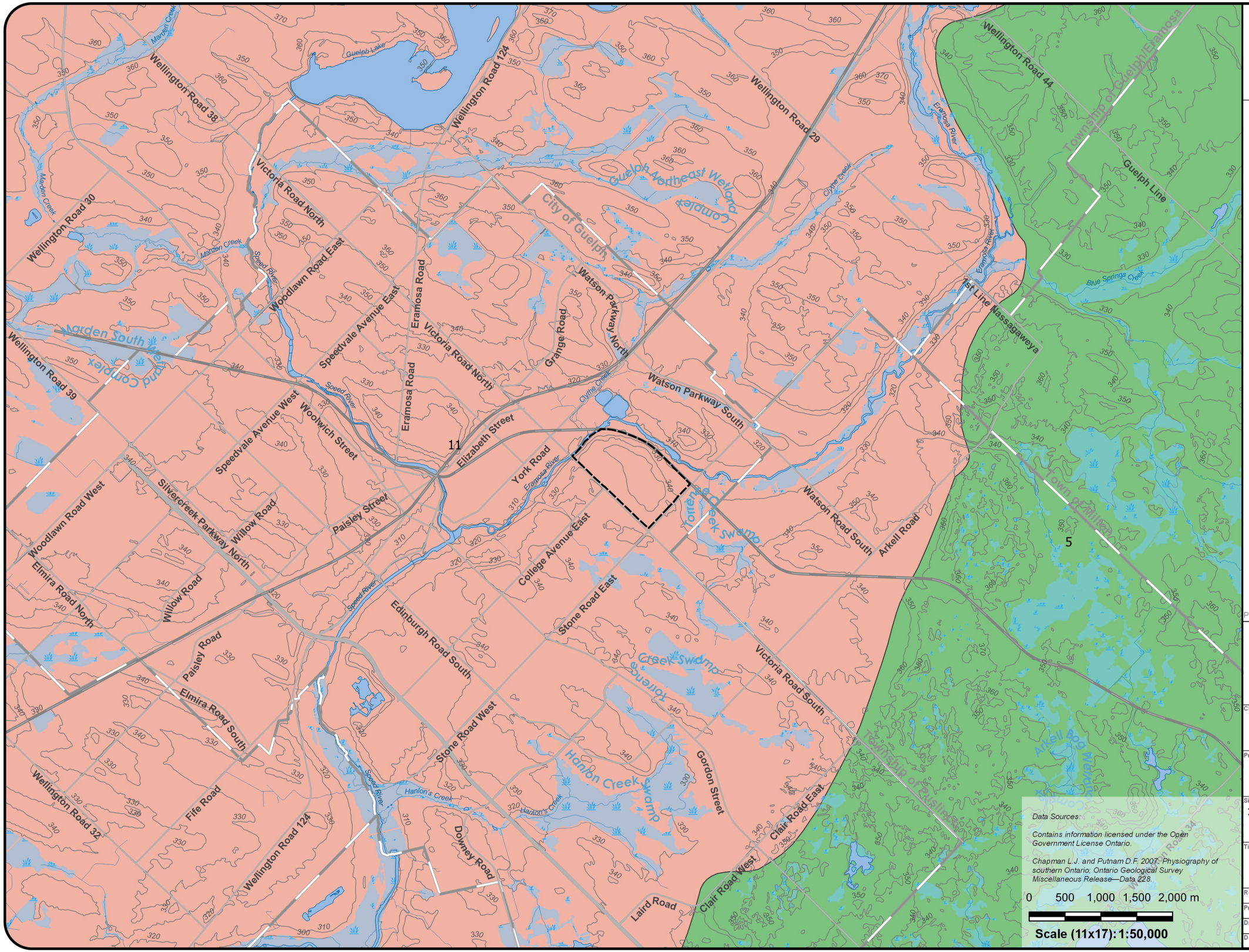
April 16, 2024 - 16:36 - Plotted By: MEllenor



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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Physiography

Physiographic Regions
- 5. Horseshoe Moraines
- 11. Guelph Drumlin Field

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland

Project CRS: NAD83 / UTM zone 17N

Data Sources:

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Chapman L.J. and Putnam D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey Miscellaneous Release—Data 228.

0 500 1,000 1,500 2,000 m

Scale (11x17): 1:50,000

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Client
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Project
Guelph Innovation District Lands - Hydrogeological Characterization

Site
328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title
Physiographic Regions

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	4a
Date	April 2024		

Project No: 46927-104 P:\P46927\104\46927_104_gwr2_qgis_v_3_22_11.qgz
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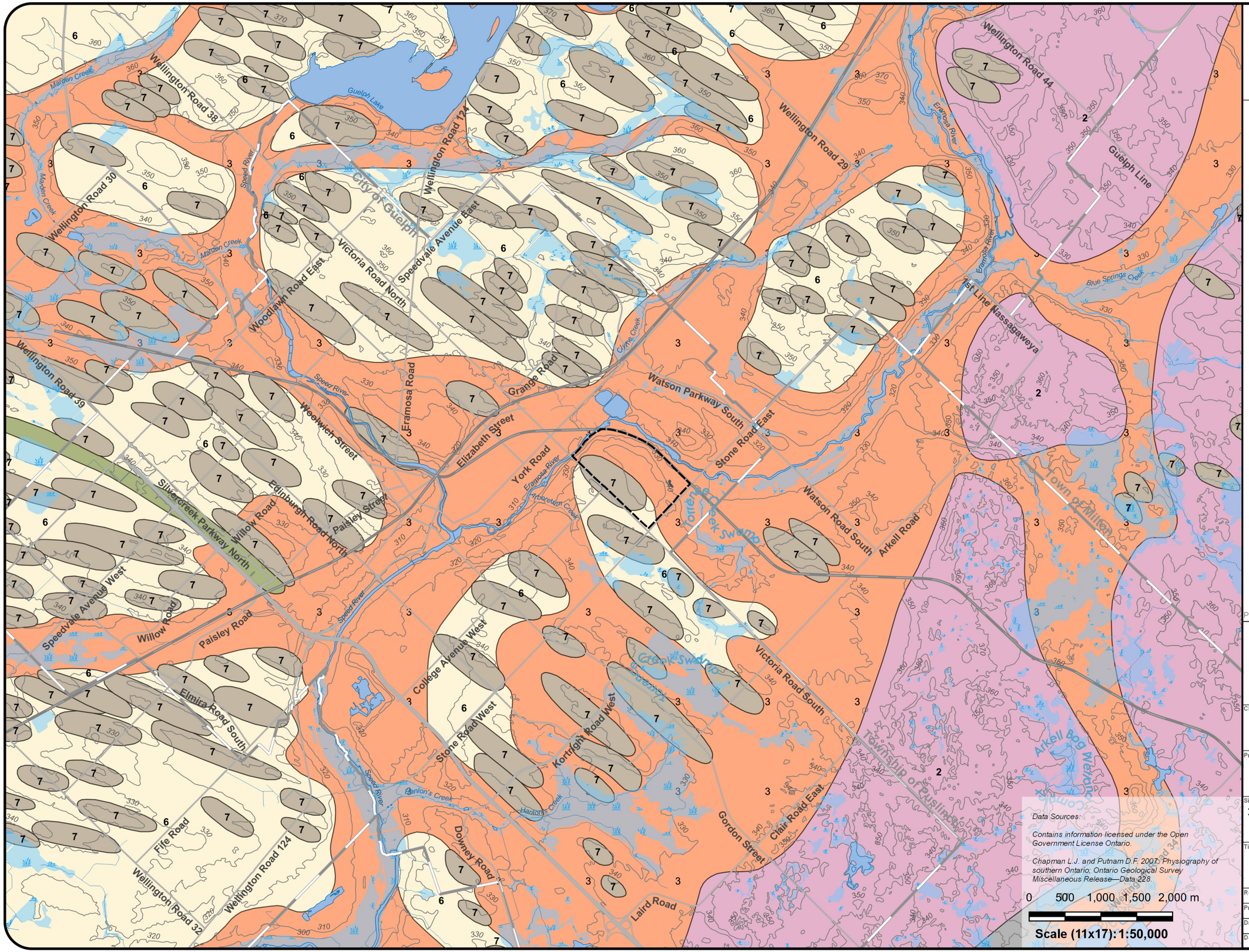

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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Physiography

Physiographic Landforms
- 2. Till Moraines
- 3. Spillways
- 6. Till Plains (Drumlinized)
- 7. Drumlins
- 13. Eskers

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincially Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland

Project CRS: NAD83 / UTM zone 17N

Data Sources:

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Chapman L.J. and Putnam D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey Miscellaneous Release—Data 228.

0 500 1,000 1,500 2,000 m

Scale (11x17): 1:50,000

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Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: Physiographic Landforms

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	4b
Date	April 2024		

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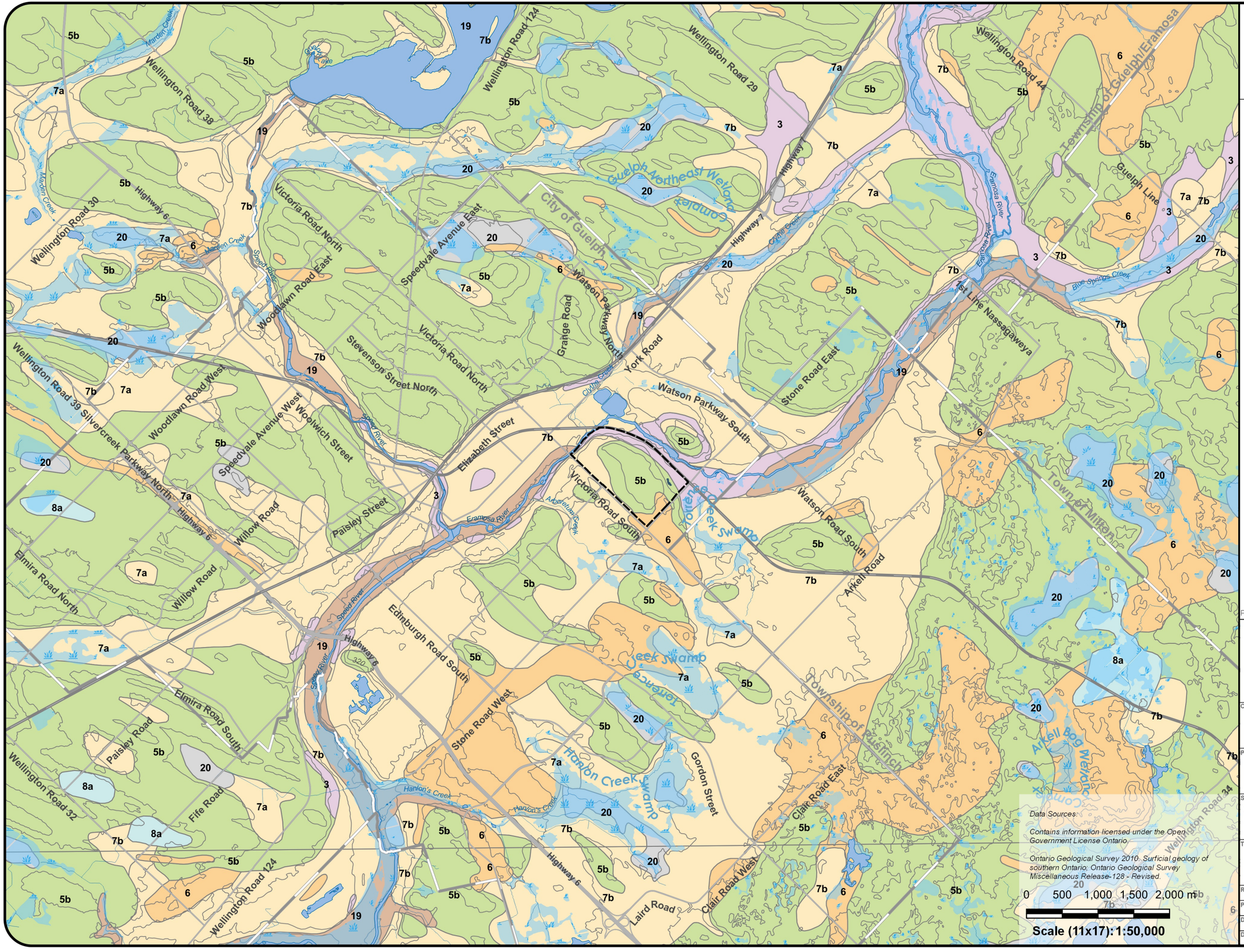

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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Quaternary Geology

Quaternary
- 20. Organic Deposits: peat, muck, marl
- 19. Modern alluvial deposits: clay, silt, sand, gravel, may contain organic remains
- 8. Fine-textured glaciolacustrine deposits: silt and clay, minor sand and gravel
- 8a. Massive to well laminated
- 7. Glaciofluvial deposits: river deposits and delta topset facies
- 7a. Sandy deposits
- 7b. Gravelly deposits
- 6. Ice-contact stratified deposit: sand and gravel, minor silt, clay and till
- 5b. Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain

Paleozoic
- 3. Paleozoic bedrock

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland

Project CRS: NAD83 / UTM zone 17N

Data Sources:

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Ontario Geological Survey 2010. Surficial geology of southern Ontario: Ontario Geological Survey Miscellaneous Release-128 - Revised.

0 500 1,000 1,500 2,000 m

Scale (11x17): 1:50,000

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Client
Fusion Homes

Project
Guelph Innovation District Lands - Hydrogeological Characterization

Site
328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title
Quaternary Geology

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	5
Date	April 2024		

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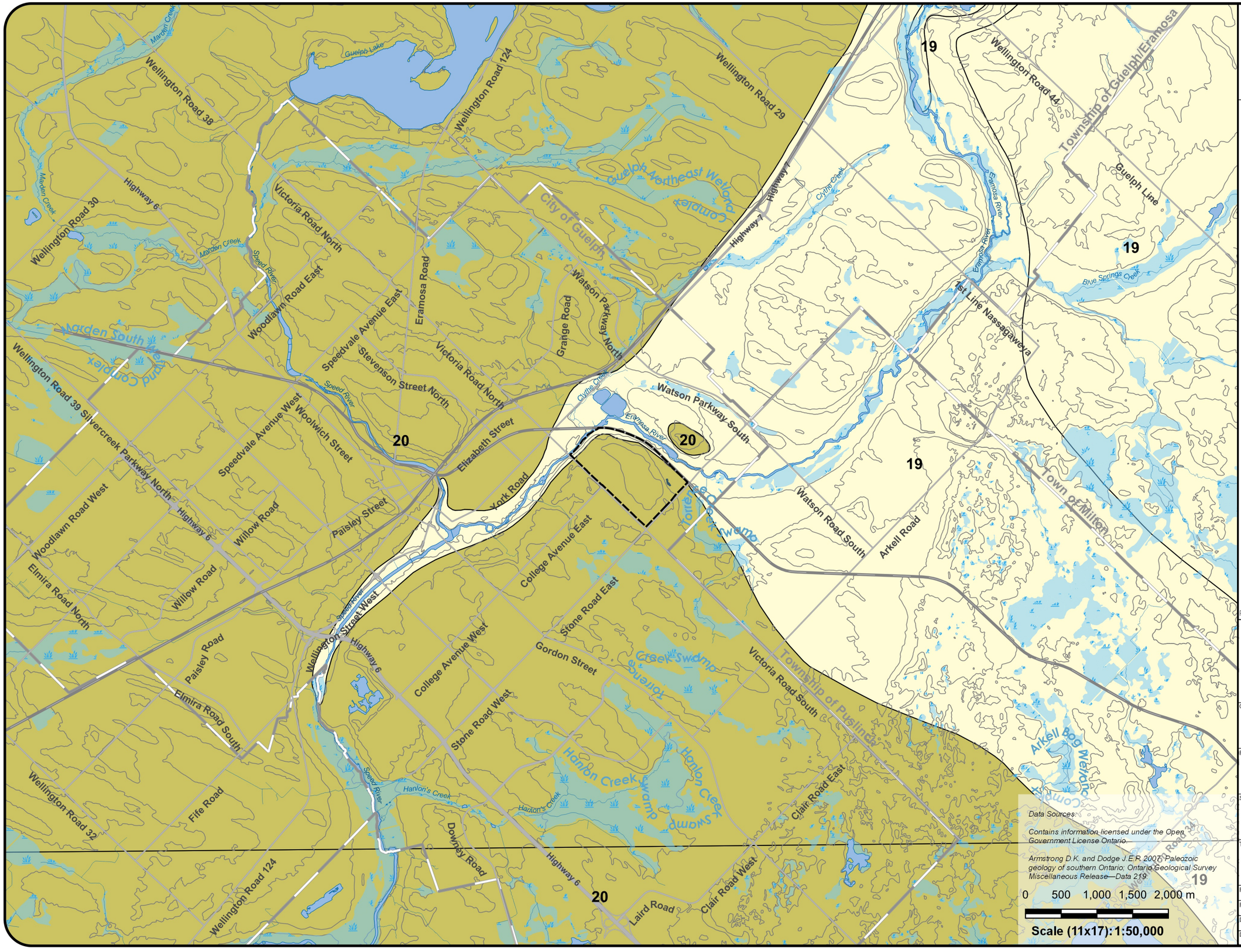

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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Paleozoic Geology

Upper Silurian
- 20. Guelph Formation: dolostone: sucrosic, fossiliferous, locally biohermal; includes bituminous dolostone on Bruce Peninsula (=Eramosa Member)

Lower Silurian
- 19. Amabel Formation: dolostone; thick-bedded, crinoidal, locally biohermal; includes bituminous dolostone in Guelph to Burlington area (=Eramosa Member)

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland

Project CRS: NAD83 / UTM zone 17N

Data Sources:

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Armstrong D.K. and Dodge J.E.P. 2007. Paleozoic geology of southern Ontario: Ontario Geological Survey Miscellaneous Release—Data 219.

0 500 1,000 1,500 2,000 m

Scale (11x17): 1:50,000

MTE
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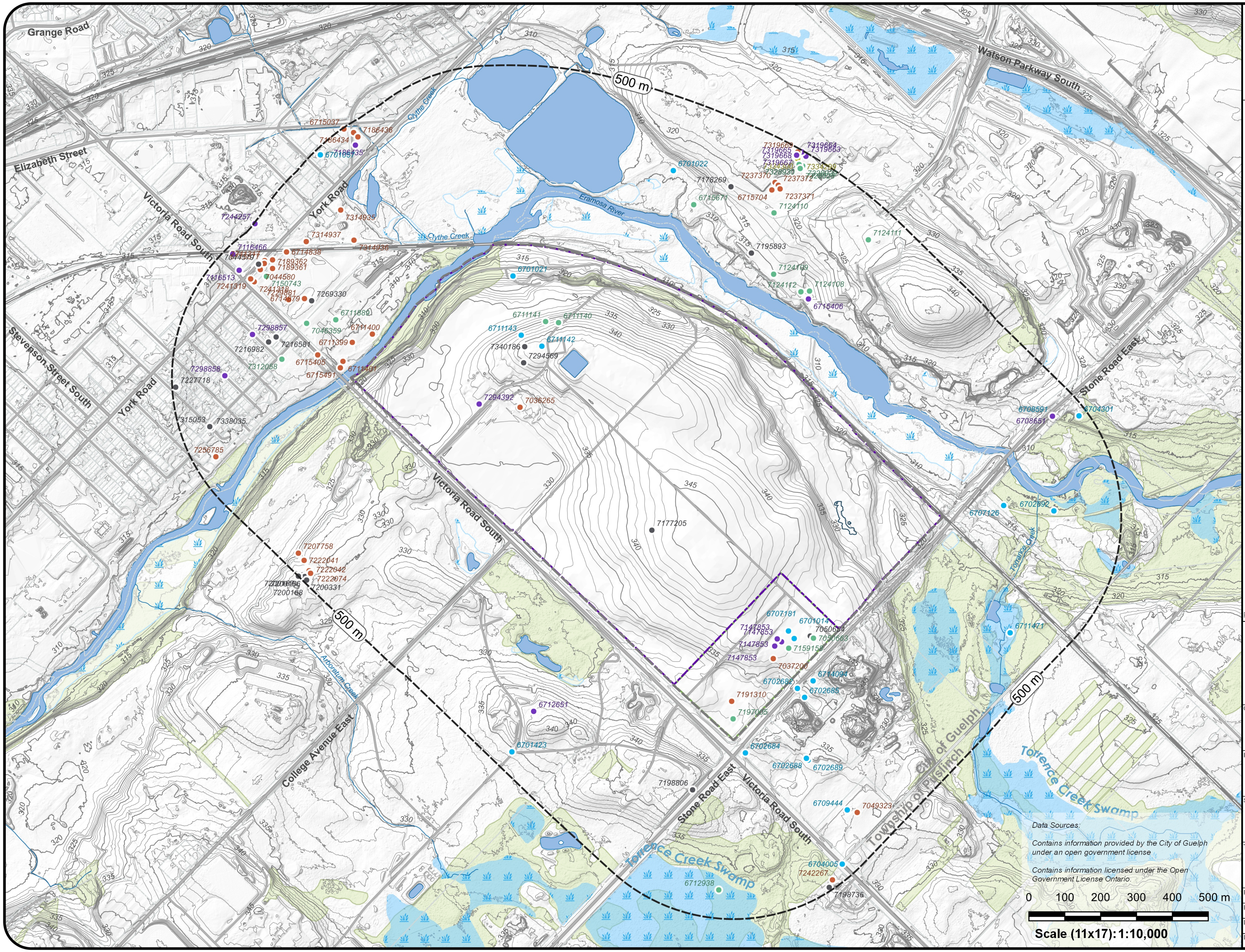
Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: Paleozoic Geology

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	6
Date	April 2024		



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PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary
- Former Wellington Detention Centre Lands
- Turfgrass Lands
- Study Area

MECP Well Locaions and MECP Well Number
- Abandoned
- Dewatering
- Monitoring
- Test Hole
- Water Supply
- No Use Specified

Base Map

Boundaries
- Municipal Boundary (Lower Tier)
- Parcel Fabric (City of Guelph)

Buildings
- Existing Building Foorprint
- Former Building Footprint

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (5 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincially Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Project CRS: NAD83 / UTM zone 17N

MTE
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Ph. (519) 743-6500

Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: MECP Water Well Records

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	7
Date	April 2024		

Project No. 46927-104 P:\P46927\104\46927_104_gwr2_qgis_v_3_22_11.qgz

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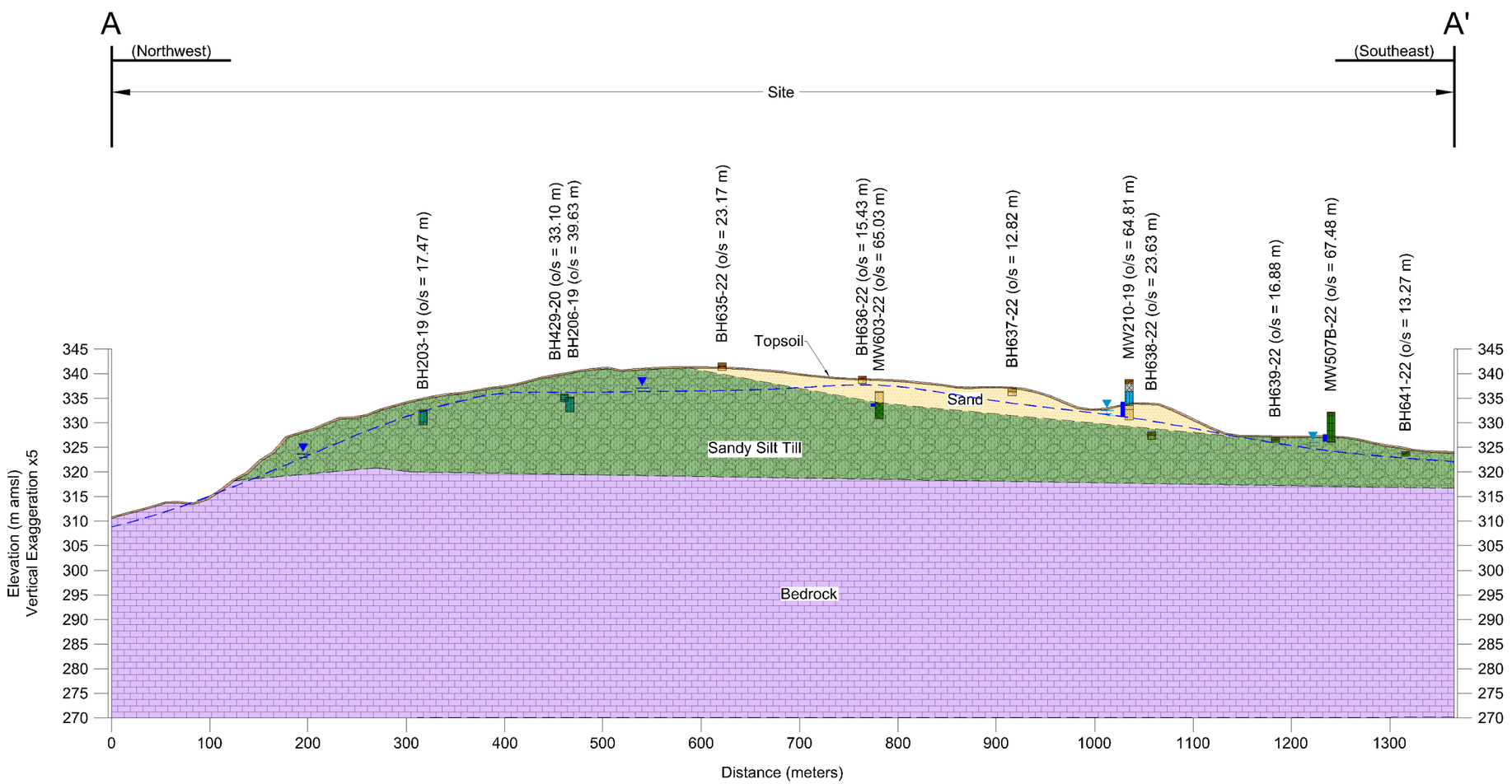

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BOREHOLE WIDTH IS FOR ILLUSTRATION PURPOSES ONLY AND DOES NOT CORRESPOND TO THE ACTUAL SPATIAL EXTENT OF THE BOREHOLE.

THE SIMPLIFIED STRATIGRAPHY PRESENTED HEREIN IS BASED ON PROFESSIONAL INTERPRETATION FROM THE MATERIALS RECORDED DURING DRILLING. ACTUAL STRATIGRAPHIC CONDITIONS MAY VARY BETWEEN AND BEYOND LOCATIONS.

THE WELL/BOREHOLE NAME OR MECP WATER WELL NUMBER ARE PRESENTED ABOVE THE CROSS-SECTION FOLLOWED BY THE OFF-SET DISTANCE FROM THE CROSS-SECTION LINE AND WELL LOCATION. WELLS/BOREHOLES FURTHER FROM THE CROSS-SECTION LINE MAY, IN PACES, BE DISPLAYED AS HAVING THE BOREHOLE ABOVE OR BELOW GROUND SURFACE. SIMILARLY, STATIC WATER LEVELS AT INDIVIDUAL WELLS MAY BE SITUATED ABOVE OR BELOW THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE INDIVIDUAL CROSS-SECTION. THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE CROSS-SECTION WAS OBTAINED FROM FIGURE 11.

ALL LOCATIONS ARE APPROXIMATE.

LEGEND

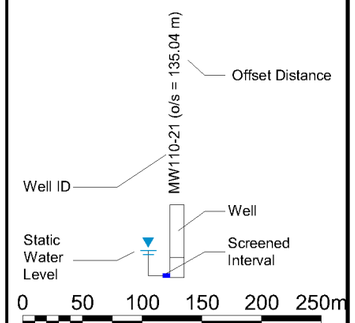
Interpreted Water Table

HYDROSTRATIGRAPHIC LEGEND

- Topsoil
- Sand
- Sandy Silt Till
- Bedrock

BOREHOLE LEGEND

- Fill
- Gravel
- Sand & Gravel
- Sand & Gravel Till
- Sandy Silt
- Sandy Silt Till
- Silt Till
- Silty Sand



Scale(11x17): 1:5000

MTE
Engineers, Scientists, Surveyors
Ph. (905) 639-2552

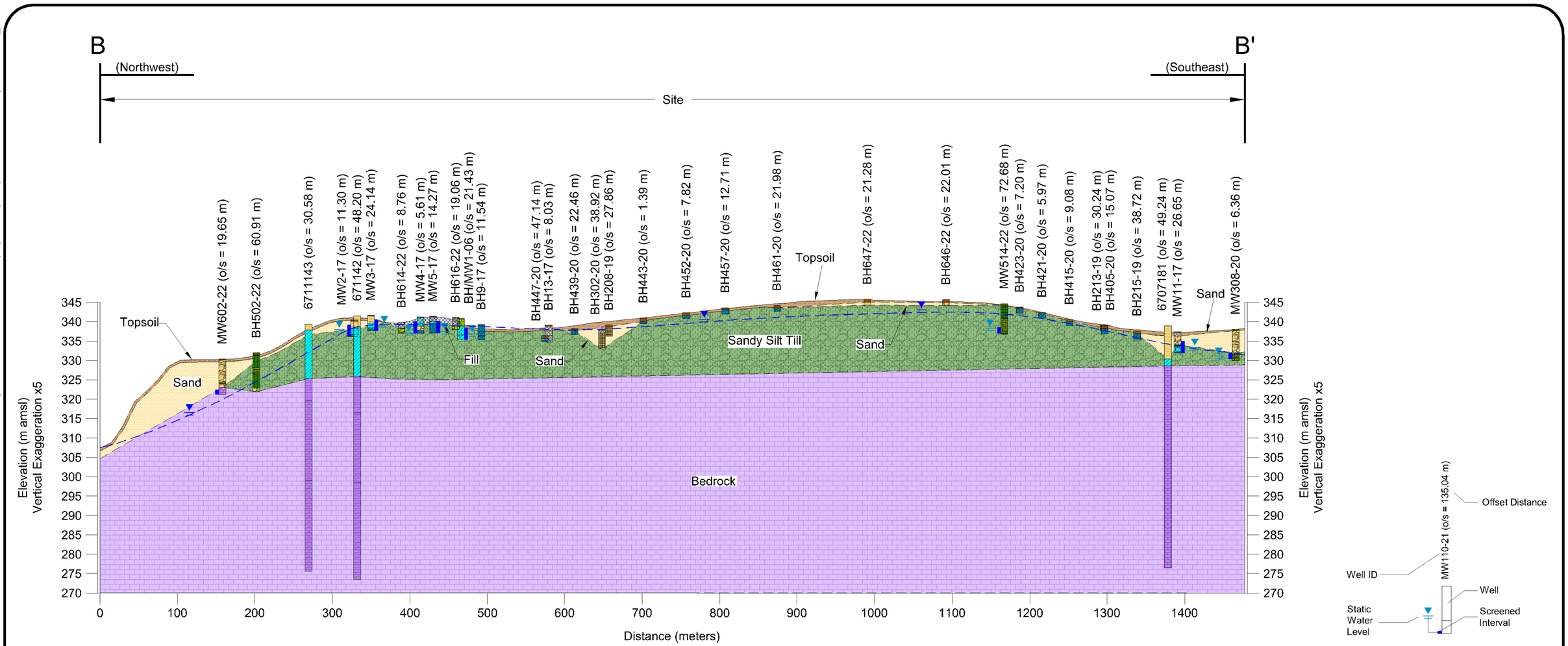
CLIENT
Fusion Homes

PROJECT
Guelph Innovation District Lands - Hydrogeological Characterization

SITE
328 Victoria Road S. and 588 Stone Road E., Guelph, ON

TITLE
Geological Cross-Section A-A'

Reviewed By	PAG		
Prepared By	MDE	Project No.	46927-104
Drawn By	SGL	Figure No.	8a
Date	February 2023		



LEGEND

Interpreted Water Table

HYDROSTRATIGRAPHIC LEGEND

- Topsoil
- Fill
- Sand
- Sandy Silt Till
- Bedrock

BOREHOLE LEGEND

- Asphalt
- Topsoil
- Clay
- Clayey Silt
- Sand
- Sandy Silt
- Sandy Silt Till
- Sand & Gravel
- Sand & Gravel Till
- Fill
- Gravel
- Silt
- Silt Till
- Silty Clay
- Silty Sand and Gravel
- Dolostone
- Limestone

0 50 100 150 200 250m

Scale(11x17): 1:5000

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THE WELL/BOREHOLE NAME OR MECP WATER WELL NUMBER ARE PRESENTED ABOVE THE CROSS-SECTION FOLLOWED BY THE OFF-SET DISTANCE FROM THE CROSS-SECTION LINE AND WELL LOCATION. WELLS/BOREHOLES FURTHER FROM THE CROSS-SECTION LINE MAY, IN PACES, BE DISPLAYED AS HAVING THE BOREHOLE ABOVE OR BELOW GROUND SURFACE. SIMILARLY, STATIC WATER LEVELS AT INDIVIDUAL WELLS MAY BE SITUATED ABOVE OR BELOW THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE INDIVIDUAL CROSS-SECTION. THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE CROSS-SECTION WAS OBTAINED FROM FIGURE 11.

ALL LOCATIONS ARE APPROXIMATE.

MTE
Engineers, Scientists, Surveyors
Ph. (905) 639-2552

CLIENT
Fusion Homes

PROJECT
Guelph Innovation District Lands - Hydrogeological Characterization

SITE
328 Victoria Road S. and 588 Stone Road E., Guelph, ON

TITLE
Geological Cross-Section B-B

Reviewed By	PAG		
Prepared By	MDE	Project No.	46927-104
Drawn By	SGL	Figure No.	8b
Date	February 2023		

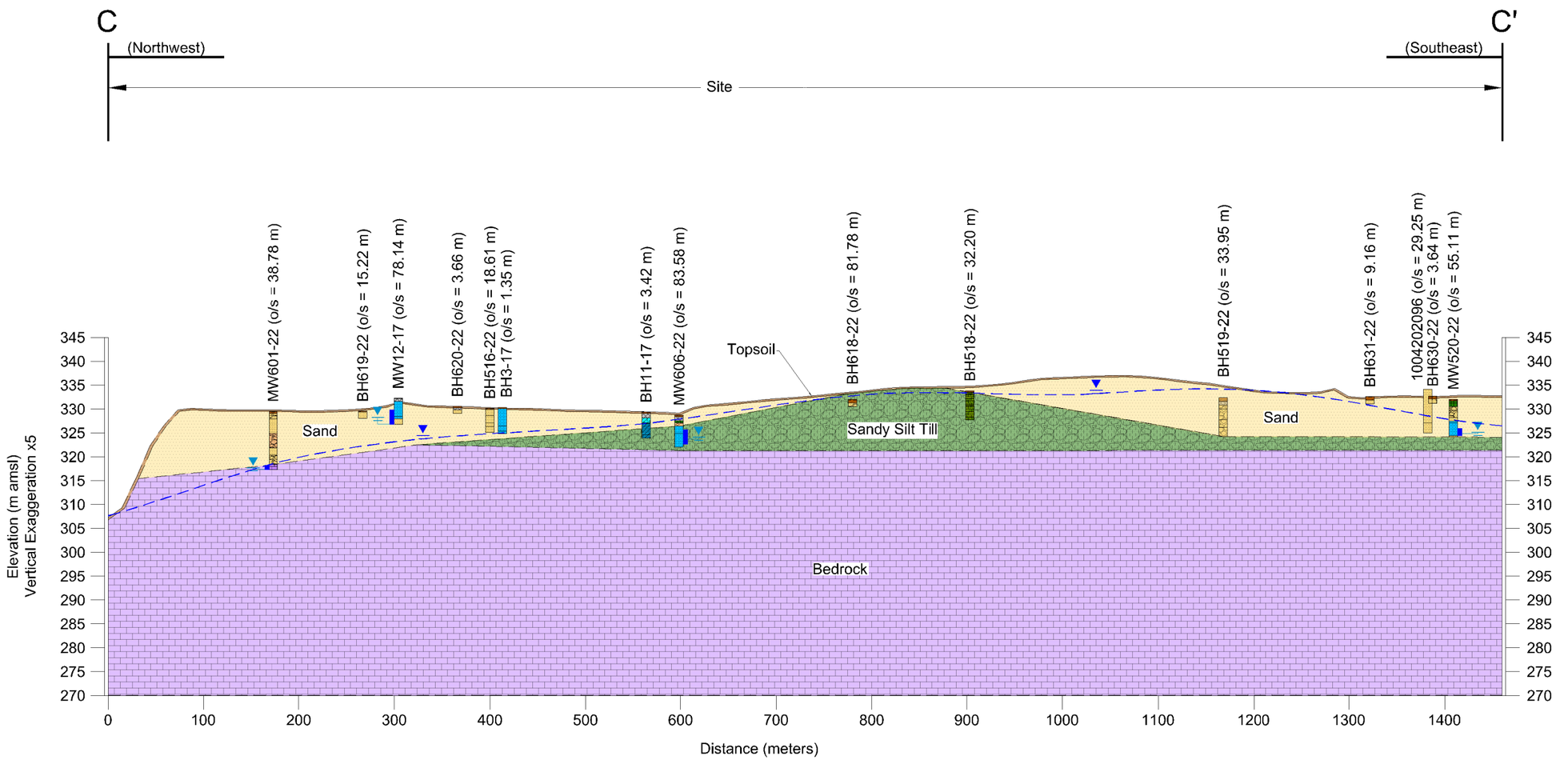
C

(Northwest)

C'

(Southeast)

Site



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ALL LOCATIONS ARE APPROXIMATE.

LEGEND

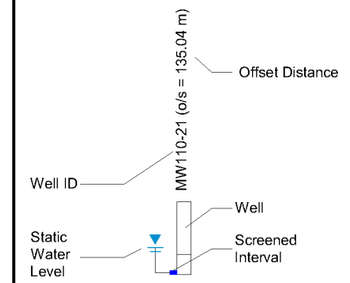
Interpreted Water Table

HYDROSTRATIGRAPHIC LEGEND

- Topsoil
- Sand
- Sandy Silt Till
- Bedrock

BOREHOLE LEGEND

- Fill
- Sand
- Gravel
- Sand & Gravel
- Sandy Silt Till
- Limestone



Scale(11x17): 1:5000

MTE
Engineers, Scientists, Surveyors
Ph. (905) 639-2552

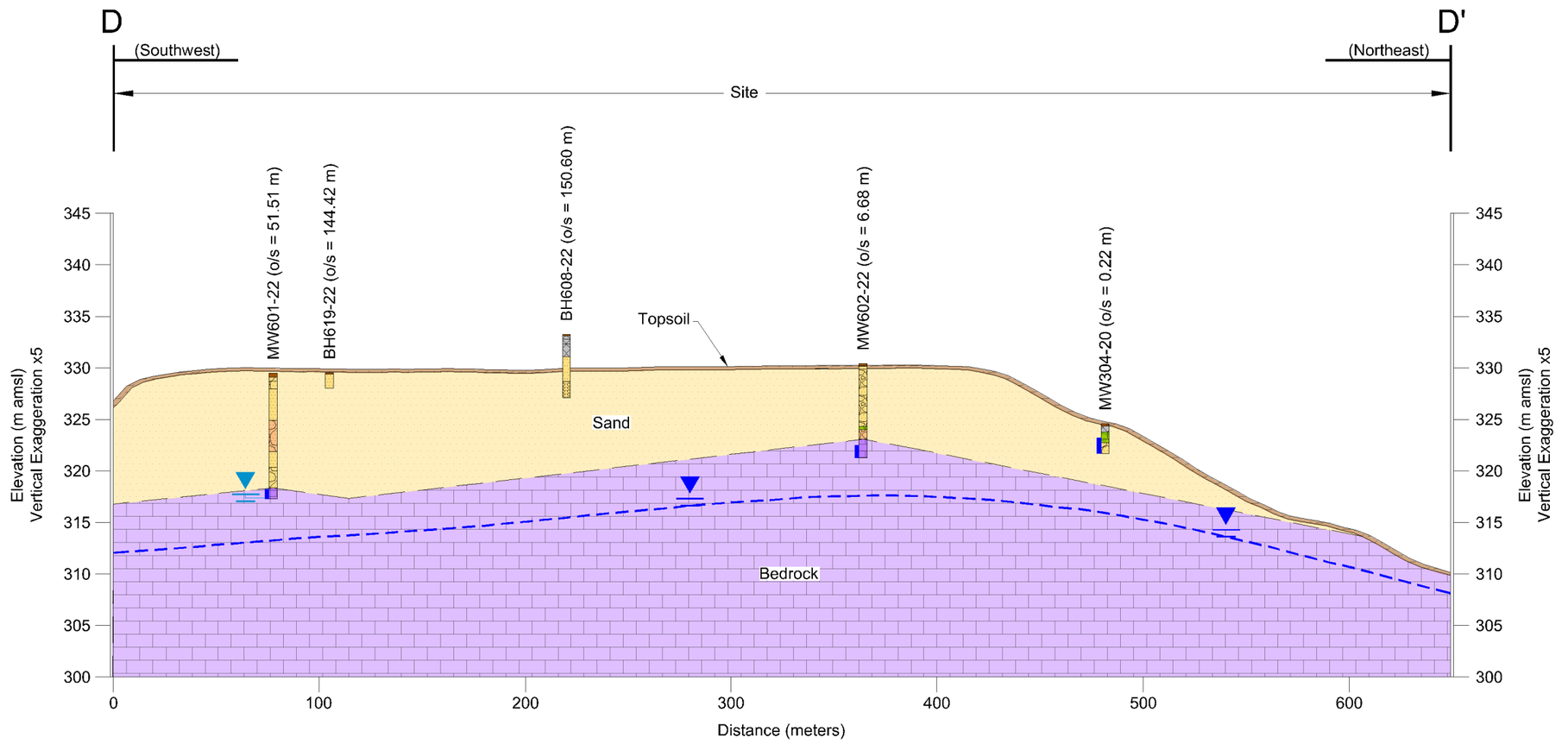
CLIENT
Fusion Homes

PROJECT
Guelph Innovation District Lands - Hydrogeological Characterization

SITE
328 Victoria Road S. and 588 Stone Road E., Guelph, ON

TITLE
Geological Cross-Section C-C'

Reviewed By	PAG		
Prepared By	MDE	Project No.	46927-104
Drawn By	SGL	Figure No.	8c
Date	February 2023		



THIS FIGURE IS A SCHEMATIC ONLY AND IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING TEXT.

BOREHOLE WIDTH IS FOR ILLUSTRATION PURPOSES ONLY AND DOES NOT CORRESPOND TO THE ACTUAL SPATIAL EXTENT OF THE BOREHOLE.

THE SIMPLIFIED STRATIGRAPHY PRESENTED HEREIN IS BASED ON PROFESSIONAL INTERPRETATION FROM THE MATERIALS RECORDED DURING DRILLING. ACTUAL STRATIGRAPHIC CONDITIONS MAY VARY BETWEEN AND BEYOND LOCATIONS.

THE WELL/BOREHOLE NAME OR MECP WATER WELL NUMBER ARE PRESENTED ABOVE THE CROSS-SECTION FOLLOWED BY THE OFF-SET DISTANCE FROM THE CROSS-SECTION LINE AND WELL LOCATION. WELLS/BOREHOLES FURTHER FROM THE CROSS-SECTION LINE MAY, IN PACES, BE DISPLAYED AS HAVING THE BOREHOLE ABOVE OR BELOW GROUND SURFACE. SIMILARLY, STATIC WATER LEVELS AT INDIVIDUAL WELLS MAY BE SITUATED ABOVE OR BELOW THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE INDIVIDUAL CROSS-SECTION. THE INTERPRETED WATER-TABLE SURFACE PRESENTED ON THE CROSS-SECTION WAS OBTAINED FROM FIGURE 11.

ALL LOCATIONS ARE APPROXIMATE.

LEGEND

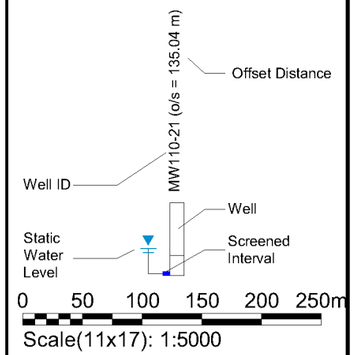
Interpreted Water Table

HYDROSTRATIGRAPHIC LEGEND

- Topsoil
- Sand
- Bedrock

BOREHOLE LEGEND

- Topsoil
- Fill
- Sand
- Sand & Gravel
- Silt & Sand
- Gravel
- Sandy Silt Till
- Limestone



Scale(11x17): 1:5000

MTE
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Ph. (905) 639-2552

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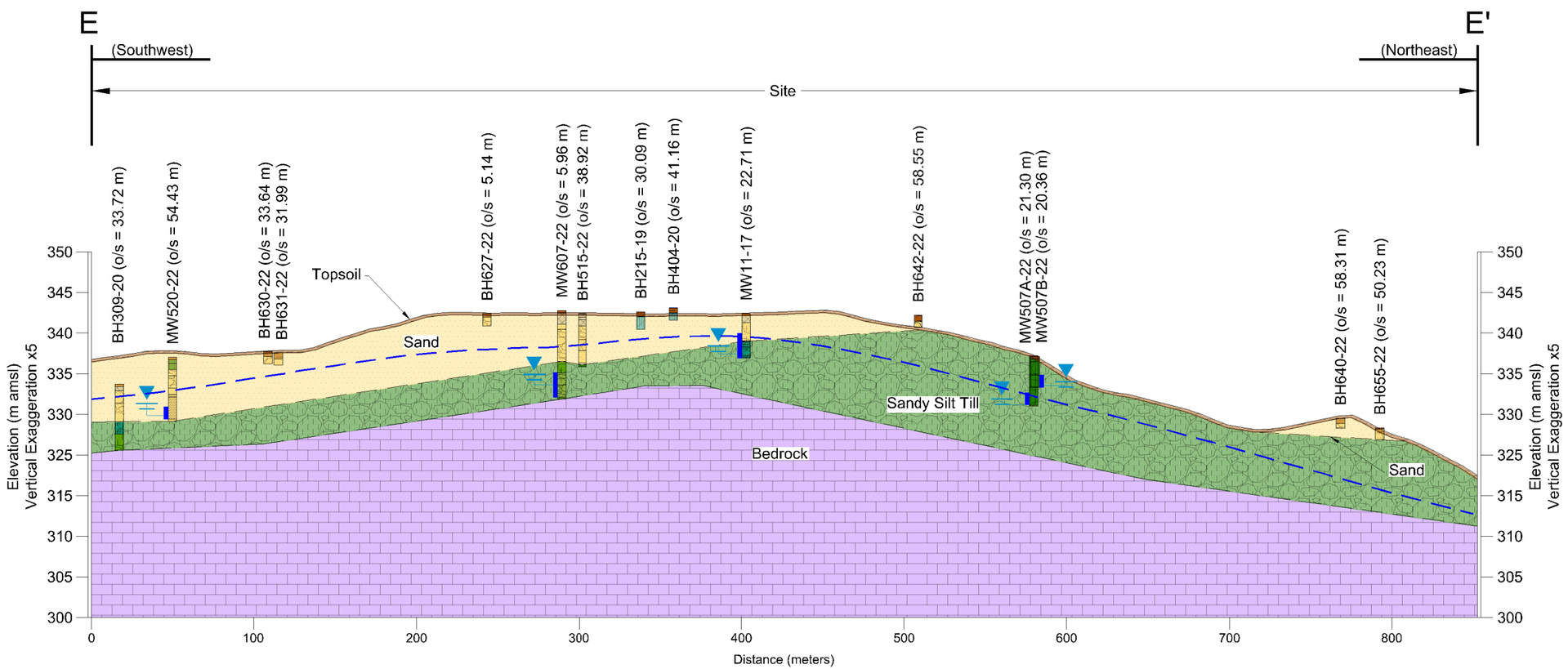
Fusion Homes

PROJECT
Guelph Innovation District Lands - Hydrogeological Characterization

SITE
328 Victoria Road S. and 588 Stone Road E., Guelph, ON

TITLE
Geological Cross-Section D-D

Reviewed By	PAG		
Prepared By	MDE	Project No.	46927-104
Drawn By	SGL	Figure No.	8d
Date	February 2023		



LEGEND

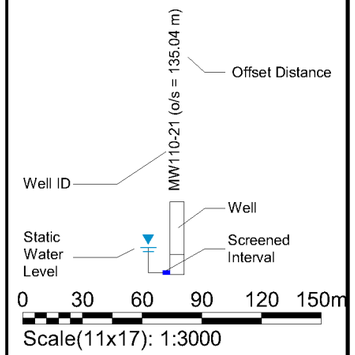
Interpreted Water Table

HYDROSTRATIGRAPHIC LEGEND

- Topsoil
- Sand
- Sandy Silt Till
- Bedrock

BOREHOLE LEGEND

- Topsoil
- Fill
- Sand
- Sand & Gravel
- Sandy Silt Till
- Silt Till
- Clayey Silt



Scale(11x17): 1:3000

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ALL LOCATIONS ARE APPROXIMATE.

MTE
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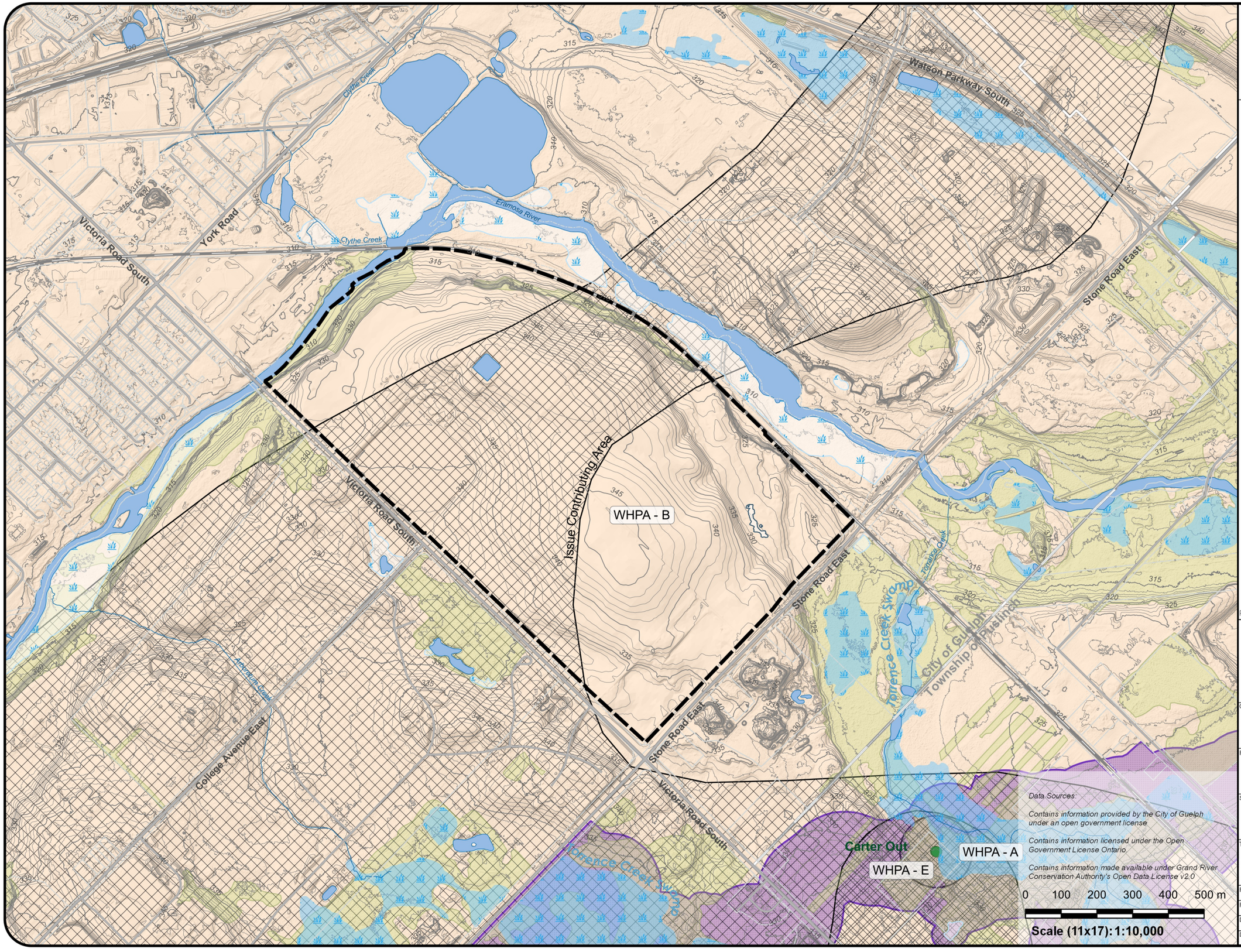
PROJECT
Guelph Innovation District Lands - Hydrogeological Characterization

SITE
328 Victoria Road S. and 588 Stone Road E., Guelph, ON

TITLE
Geological Cross-Section E-E'

Reviewed By	PAG		
Prepared By	MDE	Project No.	46927-104
Drawn By	SGL	Figure No.	8e
Date	February 2023		



NORTH

PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Source Water Protection

Wells
- SWP Wells

Boundaries
- Issue Contributing Area (GRCA)

WHPA
- A - 100 m Exclusion Zone
- B - 0 to 2 Year Time of Travel
- C - 2 to 5 Year Time of Travel
- D - 5 to 25 Year Time of Travel
- E - Groundwater Under Direct Influence

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Project CRS: NAD83 / UTM zone 17N

MTE
Engineers,Scientists, Surveyors
Ph. (519) 743-6500

Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: Well Head Protection Area (WHPA)

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	9
Date	April 2024		

Project No: 46927-104 P:\P46927\104\46927_104_gwr2_qgis_v_3_22_11.qgz
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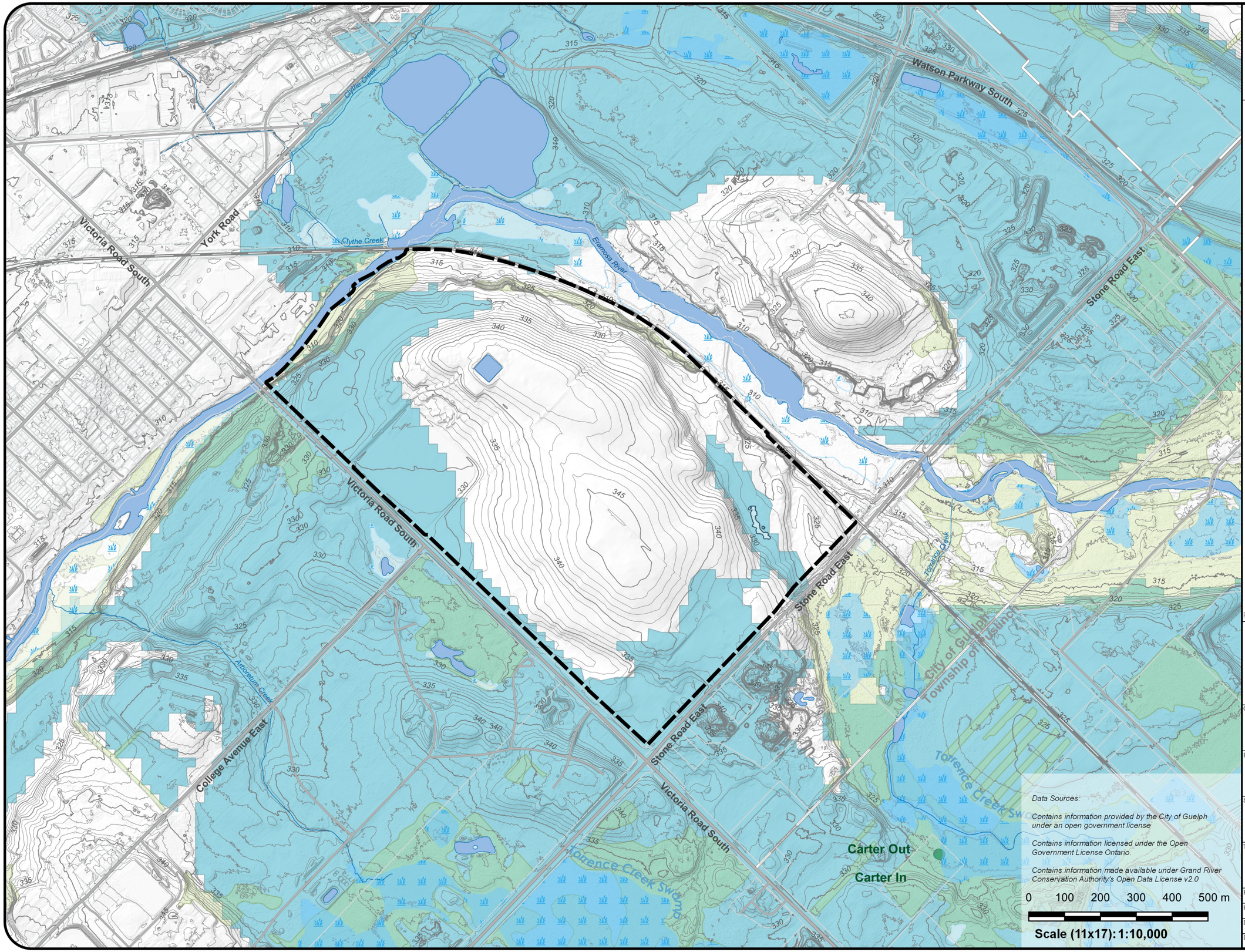
April 18, 2024 - 08:46 - Plotted By: MEllenor



N
NORTH

N
PROJECT NORTH

Legend

Site Data

Boundaries
- Site Boundary

Source Water Protection

Wells
- SWP Wells

Boundaries
- SGRA (GRCA)

Base Map

Boundaries
- Municipal Boundary (Lower Tier)

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (10m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincally Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Project CRS: NAD83 / UTM zone 17N

0 100 200 300 400 500 m

Scale (11x17): 1:10,000

MTE
Engineers,Scientists, Surveyors
Ph. (519) 743-6500

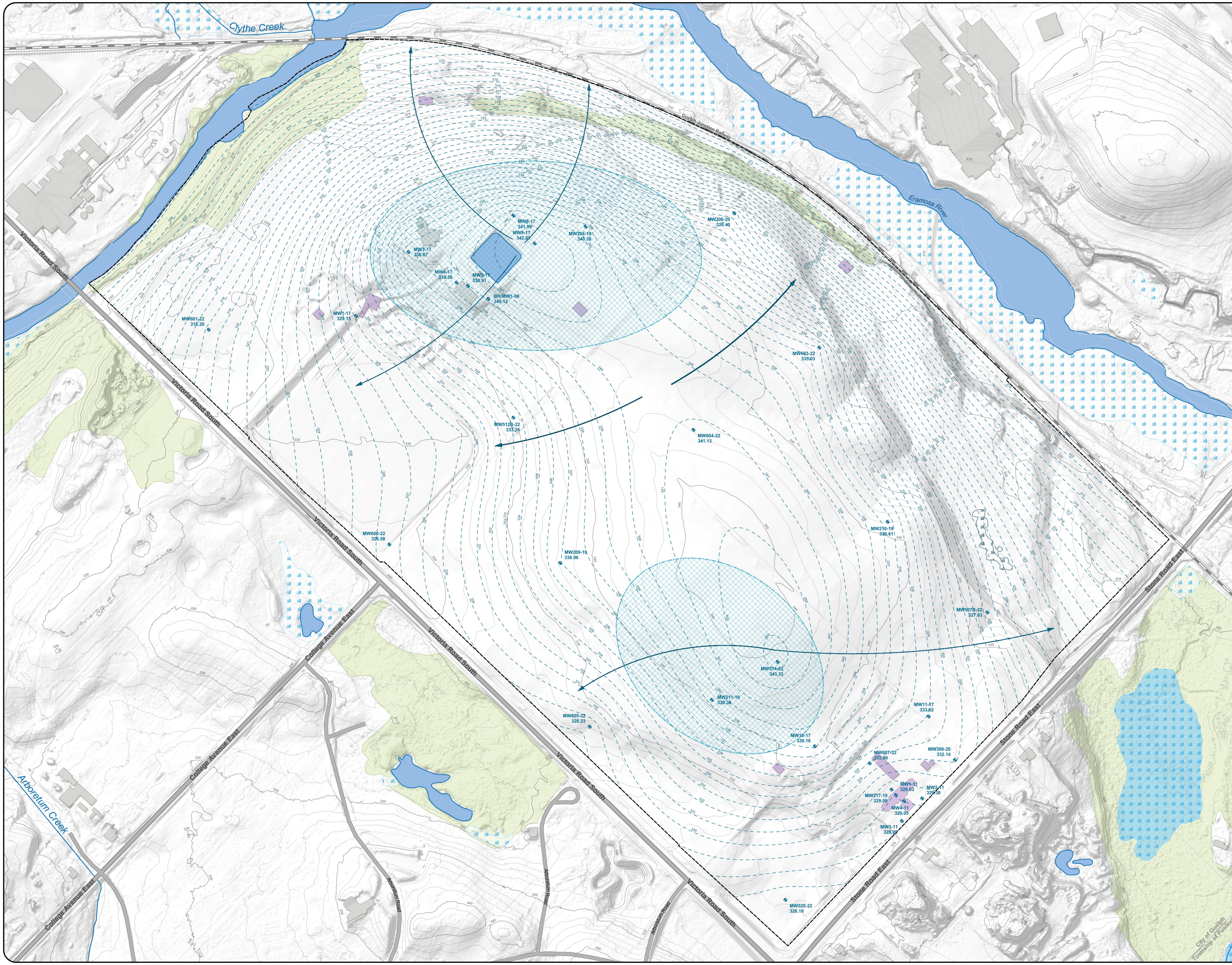
Client: Fusion Homes

Project: Guelph Innovation District Lands - Hydrogeological Characterization

Site: 328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title: Signficant Groundwater Recharge Areas (SGRAs)

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	10
Date	April 2024		



NORTH

PROJECT NORTH

Legend

Site Data

Site Boundaries
- Site Boundary
- Areas where Groundwater Elevations are above Proposed Finished Grade (Approximate)

Monitoring Locations
- Monitoring Well
- 342.81 Groundwater Elevation mAMSL

Groundwater Flow
- Groundwater Elevation Contour (1 m Interval)
- Groundwater Flow Direction (Inferred)

Base Mapping

Boundaries
- Parcel Fabric (City of Guelph)
- Municipal Boundary (Lower Tier)

Buildings
- Existing Building Footprint
- Former Building Footprint

Transportation
- Roads
- Railway

Groundsurface
- Groundsurface Contour (1 m Interval)

Surface Water
- Surface Waterbody
- Surface Watercourse
- Provincially Significant Wetland
- Non-Provincially Significant Wetland (Evaluated)
- Unevaluated Wetland
- Wetland - Other (NRSI)

Landuse
- Wooded Area

Data Sources:

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0 50 100 150 200 250 m

Scale (24x36): 1:2,500

Project CRS: NAD83 / UTM zone 17N

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Client

Fusion Homes

Project

Guelph Innovation District Lands - Hydrogeological Characterization

Site

328 Victoria Road S. and 588 Stone Road E., Guelph, On

Title

Groundwater Elevations and Inferred Groundwater Flow Direction - April 24, 2023

Reviewed By	PAG		
Prepared By	MDE	Project No	46927-104
Drawn By	MDE	Figure No	11
Date	April 2024		

Tables

Table 1: MECP Well Record Summary

MECP Well No.	MECP Well Tag No.	Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Casing Start (mBGS)	Casing End (mBGS)	Drilling Method	Well Status	Well Use	Water Quality	First Water Found (mBGS)	Total Depth (mBGS)	Screen		Pumping Test				Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3	Well Record Link
														Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Final Level (mBGS)	Rate (LPM)	Duration (Hours)						
6701014	-	564230.3	4821402	1957	203.2	-	39	Cable Tool	Water Supply	Public	Not Stated	18.3	61.26	-	-	10.7	51.8	109.1	18	0.6		Topsoil			mecp well record
																				0.6		Topsoil			
																				5.5		Medium Sand	Boulders		
																				5.5		Medium Sand	Boulders		
																				12.8		Medium Sand	Clay		
																				12.8		Medium Sand	Clay		
																				36.6		Limestone			
																				36.6		Limestone			
																				39		Shale			
																				39		Shale			
																				61.3		Limestone			
																				61.3		Limestone			
6701021	-	563446.3	4822413	1949	152.4	-	20.7	Cable Tool	Water Supply	Domestic	Fresh	20.1	20.73	-	-	12.8	15.2	45.5	2	1.8		Clay	Stones		mecp well record
																				4		Gravel			
																				12.8		Hardpan			
																				20.7	Brown	Limestone			
6701022	-	563893.3	4822707	1962	177.8	-	22.6	Cable Tool	Water Supply	Public	Sulphur	2.4	22.56	-	-	-0.6	4	181.8	4	1.2		Medium Sand			mecp well record
																				19.5		Limestone			
																				22.6	Grey	Limestone			
6701057	-	562909.3	4822751	1961	101.6	-	12.2	Cable Tool	Water Supply	Commerical	Fresh	12.2	12.19	-	-	1.8	10.7	22.7	1	0.9		Clay			mecp well record
																				4		Shale			
																				12.2	Black	Limestone			
6701423	-	563443.3	4821086	1953	254	-	63.4	Cable Tool	Water Supply	Irrigation	Sulphur	63.4	63.4	-	-	12.2	39	18.2	9	0.3	Black	Topsoil			mecp well record
																				3		Clay	Stones		
																				3.7		Gravel	Stones		
																				12.2		Hardpan	Stones		
																				12.5		Gravel			
																				12.8		Hardpan	Stones		
																				17.1		Medium Sand	Clay		
																				21		Gravel	Clay		
																				32.9	Grey	Limestone			
																				47.2	Black	Limestone			
																				63.4	Blue	Limestone			
6702682	-	564239.3	4821263	1955	101.6	-	34.4	Cable Tool	Water Supply	Domestic	Fresh	32	34.44	-	-	8.5	12.2	36.4	-	1.2		Topsoil			mecp well record
																				7.6		Gravel			
																				9.1	Grey	Clay			
																				10.7		Gravel			
																				11.3	Grey	Clay			
																				12.5		Gravel			
																				17.4	Grey	Stones	Clay		
																				23.8	Brown	Limestone			
																				32	Black	Limestone			
																				34.4	Grey	Limestone			
6702684	-	564094.3	4821083	1954	101.6	-	22.3	Cable Tool	Water Supply	Domestic	Fresh	-	22.56	-	-	9.1	-	27.3	3	19.8		Gravel	Stones		mecp well record
																				22.3		Clay			
6702685	-	564259.3	4821238	1955	101.6	-	30.5	Cable Tool	Water Supply	Domestic	Fresh	30.5	30.48	-	-	8.8	8.8	45.5	2	14.3		Gravel	Stones		mecp well record
																				28	Brown	Rock			
																				30.5	Black	Rock			
6702688	-	564264.3	4821068	1962	101.6	-	16.8	Cable Tool	Water Supply	Livestock	Fresh	16.8	16.76	-	-	9.8	10.7	45.5	1	5.5		Previously Dug			mecp well record
																				9.8	Brown	Clay	Coarse Sand		
																				16.8	Brown	Rock			
6702689	-	564269.3	4821063	1963	101.6	-	24.4	Cable Tool	Water Supply	Livestock	Fresh	24.4	24.38	-	-	13.7	15.2	45.5	3	16.8		Prev. Drilled			mecp well record
																				24.4	Black	Rock			
6702692	-	564954.3	4821758	1964	127	-	11.9	Cable Tool	Water Supply	Domestic	Fresh	10.7	11.89	-	-	1.5	6.1	68.2	4	4.3		Gravel	Boulders		mecp well record
																				7.9	Brown	Limestone			
																				11.9	Black	Rock			
6704005	-	564364.3	4820773	1971	101.6	-	33.5	Cable Tool	Water Supply	Domestic	Fresh	22.9	33.53	-	-	9.8	10.7	45.5	1	8.5		Clay	Medium Sand		mecp well record
																				10.4	Brown	Shale			
																				26.5	Brown	Rock			
																				33.5	Black	Rock			
6704301	-	565024.3	4822023	1972	127	-	15.5	Cable Tool	Water Supply	Domestic	Fresh	15.2	15.54	-	-	7.3	12.2	45.5	2	9.1		Clay	Stones		mecp well record
																				15.5	Brown	Rock			
6707126	-	564814.3	4821773	1979	127	-	26.5	Rotary (Air)	Water Supply	Domestic	Sulphur	26.2	26.52	-	-	7.9	14.6	54.6	1	6.7	Brown	Clay	Sand	Gravel	mecp well record
																				15.2	Brown	Stones			
																				26.5	Black	Stones			
6707181	-	564214.3	4821423	1979	152.4	-	62.5	Air Percussion	Water Supply	Public	Sulphur	46	62.48	-	-	21.3	39.6	318.2	24	8.5		Sand	Gravel		mecp well record
																				10.4		Clay			
																				62.5		Limestone			
6708591	-	564950.3	4822022	1986	127	-	1.2	Rotary (Convent.)	Water Supply	Domestic	Fresh	9.1	42.67	-	-	3	6.1	500.1	-	0.9		Shale			mecp well record
																				9.1	Black	Rock	Soft		
																				9.8	Blue	Rock			
																				14	Grey	Rock			
																				18.9		Limestone	Soft		
																				26.2	Grey	Limestone	Soft		
																				28.7	Brown	Limestone			
																				42.7	Grey	Limestone			

Table 1: MECP Well Record Summary

MECP Well No.	MECP Well Tag No.	Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Casing Start (mBGS)	Casing End (mBGS)	Drilling Method	Well Status	Well Use	Water Quality	First Water Found (mBGS)	Total Depth (mBGS)	Screen		Pumping Test				Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3	Well Record Link
														Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Final Level (mBGS)	Rate (LPM)	Duration (Hours)						
6708651	-	564950.3	4822022	1987	304.8	-	45.7	Cable Tool	Test Hole	Municipal	Fresh	9.1	45.72	-	-	2.1	-	-	-	0.9	Brown	Rock	Fractured		mecp well record
																				10.7	Brown	Rock			
																				24.4	Grey	Rock			
																				26.8	Brown	Rock			
																				42.1	Grey	Rock			
																				45.7	Grey	Rock			
6709444	-	564378.3	4820924	1988	152.4	-	25.6	Rotary (Air)	Water Supply	Domestic	Fresh	24.4	25.6	-	-	9.4	15.2	113.7	1	3	Brown	Clay	Stones		mecp well record
																				10.7	Brown	Clay	Sand	Gravel	
																				18.3	Brown	Rock			
																				25.6	Brown	Rock			
6711140	-	563573.3	4822283	1992	152.4	-	68	Rotary (Air)	Abandoned-Supply	Not Used	Fresh	43	67.97	-	-	32	36.6	113.7	2	3	Brown	Sand	Stones	Boulders	mecp well record
																				15.5	Brown	Clay	Stones	Boulders	
																				25	Brown	Dolomite	Hard		
																				43	Brown	Limestone	Hard		
																				68	Grey	Limestone	Hard	Porous	
6711141	-	563537.3	4822286	1992	152.4	-	63.7	Rotary (Air)	Abandoned-Supply	Not Used	Fresh	40.2	63.7	-	-	31.7	36.6	113.7	2	1.5	Brown	Sand	Stones	Boulders	mecp well record
																				14	Brown	Clay	Silt	Stones	
																				19.8	Brown	Dolomite	Hard		
																				40.2	Brown	Limestone	Hard		
																				63.7	Grey	Limestone	Hard	Porous	
6711142	-	563506.3	4822198	1992	254	-	68	Rotary (Air)	Water Supply	Commerical	Fresh	43	67.97	-	-	32	45.7	454.6	14	3	Brown	Sand	Stones	Boulders	mecp well record
																				15.5	Brown	Clay	Stones	Boulders	
																				25	Brown	Dolomite	Hard		
																				43	Brown	Limestone	Hard		
																				68	Grey	Limestone	Porous	Hard	
6711143	-	563469.3	4822248	1992	241.3	-	63.7	Rotary (Air)	Recharge Well	Cooling And A/C	Fresh	40.2	63.7	-	-	31.7	45.7	454.6	14	1.5	Brown	Sand	Stones	Boulders	mecp well record
																				14	Brown	Clay	Stones	Boulders	
																				19.8	Brown	Dolomite	Hard		
																				40.2	Brown	Limestone	Hard		
																				63.7	Grey	Limestone	Porous	Hard	
6711399	-	562998.3	4822228	1993	152.4	-	4	Rotary (Air)	Observation Wells	Industrial	-	-	6.71	4	5.5	-	-	9.1	5	3.4	Black	Fill	Sand	Gravel	mecp well record
																				5.5	Black	Coarse Sand	Sand	Stones	
																				6.7	Grey	Till	Stones		
6711400	-	563054.3	4822251	1993	152.4	-	4.6	Rotary (Air)	Observation Wells	Industrial	-	-	7.01	4.6	6.1	-	-	45.5	4	0.6	Black	Gravel	Sand	Stones	mecp well record
																				1.5	Black	Sand	Fill	Stones	
																				2.7	Brown	Coarse Sand	Stones		
																				6.1	Brown	Coarse Sand	Boulders	Stones	
																				7	Grey	Till	Silty	Stones	
6711401	-	562972.3	4822175	1993	152.4	-	5.5	Rotary (Air)	Observation Wells	Industrial	-	-	7.92	5.5	7	-	-	90.9	3	1.2	Black	Sand	Silty	Gravel	mecp well record
																				2.4	Black	Sand	Gravel	Stones	
																				4.3	Grey	Sand	Stones	Boulders	
																				6.7	Brown	Coarse Sand	Stones	Boulders	
																				7.9	Grey	Till	Silty	Stones	
6711471	-	564832.3	4821418	1994	152.4	-	38.1	Rotary (Air)	Water Supply	Domestic	Fresh	38.1	38.1	-	-	13.7	26.5	45.5	1	1.8	Brown	Clay	Stones		mecp well record
																				9.1	Brown	Rock			
																				21.3	Brown	Rock			
																				27.4	Grey	Rock			
																				38.1	Grey	Rock			
6711889	-	562952.3	4822291	1994	-	-	50	-	Abandoned-Supply	-	-	-	-	-	-	-0.3	-	227.3	-						mecp well record
6712651	-	563504	4821199	1998	304.8	-	67.1	Rotary (Convent.)	Test Hole	-	-	-	67.06	-	-	-	-	-	-	0.6	Brown	Clay	Sandy		mecp well record
																				1.8	Brown	Clay	Sandy	Stones	
																				3	Brown	Gravel	Sand		
																				9.8	Brown	Limestone			
																				22.6	Brown	Limestone	Shale		
																				27.1	Grey	Limestone			
																				28	Brown	Limestone			
																				42.4	Grey	Limestone			
																				42.7	Brown	Limestone			
																				47.2	Grey	Limestone			
																				51.5	Grey	Limestone	Light-Coloured		
																				52.4	Brown	Limestone	Hard		
																				60.7	Grey	Limestone	Dark-Coloured		
																				64.9	Green	Shale	Limestone	Sharp	
																				66.8	Green	Shale	Limestone	Sharp	
																				67.1	Green	Shale			
6712938	-	564020	4820701	1999	-	-	-	Cable Tool	Abandoned-Other	Irrigation	-	-	-	-	-	-	-	-	-						mecp well record
6714094	-	564283	4821284	2002	152.4	-	-	Rotary (Air)	Water Supply	Domestic	Fresh	61	60.96	-	-	17.1	25.3	31.8	1	7.6	Brown	Clay	Stones		mecp well record
																				13.4	Brown	Clay	Gravel		
																				15.2	Brown	Rock	Fractured		
																				27.4	Brown	Rock			
																				39.6	Black	Rock			
																				61	Grey	Rock			
6714838	A007462	562815	4822480	2004	50	0	9.5	Boring	Observation Wells	-	Fresh	9.5	10.7	3	6	-	-	-	-	7	Brown	Sand	Gravel	Rock	mecp well record
																				10.7	Brown	Clay	Silt		
6714879	A007462	562865	4822350	2004	50	0	1.5	Boring	Observation Wells	-	Fresh	-	4.5	1.5	4.5	-	-	-	-	4.5	Brown	Sand	Gravel	Rock	mecp well record
6715037	A007117	562975	4822823	2004	117.4	-0.6	9.1	Rotary (Air)	Observation Wells	Commerical	Fresh	7.6	9.14	-	-	-	-	-	-	1.2	Brown	Clay	Stones		mecp well record
																				9.1	Brown	Limestone			
6715405	A027610	562902	4822193	2005	51	0	3	Boring	Observation Wells	Not Used	-	4.6	6	3	6	-	-	-	-	0.2					mecp well record
																				2.2		Sand	Gravel		
																				6		Sand	Gravel		

Table 1: MECP Well Record Summary

MECP Well No.	MECP Well Tag No.	Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Casing Start (mBGS)	Casing End (mBGS)	Drilling Method	Well Status	Well Use	Water Quality	First Water Found (mBGS)	Total Depth (mBGS)	Screen		Pumping Test				Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3	Well Record Link
														Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Final Level (mBGS)	Rate (LPM)	Duration (Hours)						
6715406	A028074	564270	4822349	2005	50	0	1.5	Boring	Test Hole	Not Used	-	7	4.5	1.5	4.5	-	-	-	-	1.5		Fill	Sand	Gravel	mecp well record
																				4.5	Brown	Gravel	Sand	Loose	
																				4.5	Grey	Limestone			
6715491	A026520	562965	4822157	2005	51	-0.7	8.9	Boring	Observation Wells	-	-	1.3	11.9	8.9	11.9	-	-	-	-	4	Brown	Sand	Gravel		mecp well record
																				8.7					
																				11.9	Brown	Sand	Gravel		
6715671	A036531	563950.2	4822612	2006	50.8	0	2.1	Other Method	Abandoned-Other	-	-	-	3.66	2.1	3.7	-	-	-	-	1.2	Brown	Gravel	Sand		mecp well record
																				3.7	Brown	Fill	Gravel		
6715677	A005434	562753	4822448	2006	60	2.2	0	Boring	Observation Wells	Not Used	-	-	5.18	2.2	5.2	-	-	-	-	2	Brown	Fill	Gravel		mecp well record
																				5.2	Brown	Gravel	Sand		
6715704	A037833	564168	4822653	2006	50	0	9	Boring	Observation Wells	-	Fresh	5	12	9	12	-	-	-	-	5.5	Brown	Sand			mecp well record
																				12	Grey				
7036265	A035825	563466	4822047	2006	50	0	2.3	Boring	Observation Wells	Not Used	-	-	5.3	2.3	5.3	-	-	-	-	3	Brown	Silt	Stones		mecp well record
																				5.3	Brown	Silt	Stones		
7037200	A035857	564172	4821346	2006	50	0	4.8	Boring	Observation Wells	Not Used	-	-	10.6	4.5	10.6	-	-	-	-	4	Brown	Sand	Gravel		no digital well log
																				10.6	Brown	Sand	Gravel	Silt	
7044579	A005434	562737	4822446	2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						mecp well record
7044580	A005354	562742	4822431	2007	50	0	3.1	Boring	Observation Wells	Not Used	-	-	6.1	3.1	6.1	-	-	-	-	6.1	Brown	Sand	Gravel	Dense	mecp well record
7046359	-	562871	4822281	2007	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7049323	A058328	564406	4820917	2007	51	0	2.5	Rotary (Convent.)	Observation Wells	-	-	-	9	2.5	4	-	-	-	-	4.5	Brown	Sand	Gravel		mecp well record
																				9	Brown	Silt	Till		
7050654	-	564275	4821409	2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						mecp well record
7050663	-	564284	4821403	2007	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7116466	A067361	562665	4822474	2008	32	0	4.6	Diamond	Test Hole	Monitoring	Not Stated	2.4	4.6	-	-	-	-	-	-	1	Brown	Silt			mecp well record
																				2.4	Brown	Sand	Gravel		
																				4.6	Grey	Dolomite		Rock	
7116513	A067360	562683	4822429	2008	32	0	5.9	Diamond	Test Hole	Monitoring	Not Stated	4	5.9	-	-	-	-	-	-	0	Black	Other			mecp well record
																				0.1	Brown	Sand	Gravel		
																				1	Black	Silt	Gravel	Topsoil	
																				2.7	Brown	Sand	Gravel		
																				5.9		Rock		Dolomite	
7124108	-	564273	4822371	2009	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7124109	-	564173	4822418	2009	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7124110	-	564174	4822589	2009	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7124111	-	564437	4822514	2009	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7124112	-	564249	4822369	2009	-	-	-	-	Abandoned-Other	-	-	-	-	-	-	-	-	-	-						mecp well record
7147853	A099594	564183	4821401	2010	50	0	10.6	Auger	Test Hole	Monitoring	-	-	10.6	-	-	-	-	-	-	7.6	Brown	Gravel	Sand		no digital well log
																				10.6	Brown	Sand	Silt	Stones	
7147853	A099594	564183	4821401	2010	-	-	7.6	-	Test Hole	Monitoring	-	-	10.6	7.6	10.6	-	-	-	-						no digital well log
7147853	A099594	564195	4821393	2010	-	-	7.6	-	Test Hole	Monitoring	-	-	10.6	7.6	10.6	-	-	-	-						no digital well log
7147853	A099594	564176	4821381	2010	-	-	7.6	-	Test Hole	Monitoring	-	-	10.6	7.6	10.6	-	-	-	-						no digital well log
7150743	-	562759	4822412	2010	-	-	-	-	Abandoned-Other	-	-	-	7.62	-	-	-	-	-	-	7.6					mecp well record
7159158	A099594	564215	4821375	2011	-	-	-	-	Abandoned-Other	-	Fresh	8.7	-	-	-	-	-	-	-						mecp well record
7177205	A121106	563832	4821703	2011	6	0	36	Other Method	Observation Wells	Monitoring	-	-	23	-	-	-	-	-	-	1	Brown	Sand	Fine Sand	Topsoil	mecp well record
																				5.8	Brown				
																				7	Brown	Sand	Medium Sand		
																				7.4	Brown	Gravel			
																				7.6	Brown	Granite	Boulders		
																				13.5	Brown				
																				15	Brown	Sand	Fine Sand	Silt	
																				19	Brown				
																				23	Grey	Limestone	Rock		
7178269	A126027	564054	4822662	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7186434	A109932	563002	4822813	2012	52	0	0.8	Other Method	Observation Wells	Monitoring	-	-	1.4	0.8	1.4	-	-	-	-	0.1	Black	Other		Soft	mecp well record
																				1	Brown	Sand	Gravel	Loose	
																				1.1	Black	Silt	Sand	Fill	
																				1.4	Brown	Silt	Limestone	Hard	
7186435	A109931	563007	4822778	2012	52	0	0.7	Other Method	Test Hole	Monitoring And Test Hole	-	-	1.6	0.7	1.6	-	-	-	-	0.1	Black	Other		Soft	mecp well record
																				1.6	Brown	Sand	Gravel	Loose	
7186436	A109750	563014	4822801	2012	52	0	0.7	Other Method	Observation Wells	Monitoring And Test Hole	-	-	1.6	0.7	1.6	-	-	-	-	0.1	Black	Other		Soft	mecp well record
																				1	Brown	Sand	Gravel	Loose	
																				1.3	Black	Sand	Other	Soft	
																				1.6	Brown	Silt	Limestone	Hard	
7189361	A093899	562776	4822458	2012	50.8	7.6	0.2	Diamond	Observation Wells	Monitoring	-	-	9.14	9.1	7.6	-	-	-	-	4.3	Grey	Fill	Sand	Hard	mecp well record
																				9.1	Grey	Limestone	Shale	Hard	
7189362	A093900	562776	4822434	2012	50.8	7.9	0.2	Diamond	Observation Wells	Monitoring	-	-	9.45	9.4	7.9	-	-	-	-	1.8	Black			Hard	mecp well record
																				6.1	Brown	Fill		Hard	
																				7.3	Grey	Silt	Clay	Dense	
																				9.4	Grey	Limestone	Shale	Hard	
7191310	A135582	564056	4821227	2012	50.8	0	6.1	Auger	Observation Wells	Monitoring	-	-	9.14	6.1	9.1	-	-	-	-	7	Brown	Sand	Silt	Gravel	mecp well record
																				9.1	Grey	Sand	Silty	Gravel	
7195893	A139709	564111	4822477	2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7197005	A135582	564060	4821178	-	-	-	-	-	Abandoned-Other	-	Untested	-	-	-	-	-	-	-	-						mecp well record
7198736	A134330	564328	4820708	2013	50.8	0	4.6	Rotary (Convent.)	-	-	-	3	6.1	4.6	6.1	-	-	-	-	3.7	Brown	Sand	Gravel		mecp well record
																				6.1	Brown	Sand	Silt	Gravel	
7198806	A139709	563947	4820980	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						mecp well record

Table 1: MECP Well Record Summary

MECP Well No.	MECP Well Tag No.	Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Casing Start (mBGS)	Casing End (mBGS)	Drilling Method	Well Status	Well Use	Water Quality	First Water Found (mBGS)	Total Depth (mBGS)	Screen		Pumping Test				Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3	Well Record Link
														Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Final Level (mBGS)	Rate (LPM)	Duration (Hours)						
7200166	A145175	562866	4821575	2013	2030	0	12.8	Diamond	-	Test Hole	-	-	73.7	-	-	-	-	-	-	9.8	Brown	Sand	Topsoil	Stones	mecp well record
																				11.9	Grey	Till	Stones		
																				25	Grey	Rock			
																				34.4	Grey	Rock			
																				46.3	Grey	Rock			
																				63.4	Grey	Rock			
																				71.2	Grey	Rock			
																				73.7	Grey	Rock			
7200167	A143080	562848	4821576	2013	203	0	13.7	Diamond	-	Test Hole	-	-	73.8	-	-	-	-	-	-	9.8	Brown	Sand	Topsoil	Stones	mecp well record
																				12.8	Grey	Till	Stones		
																				25.9	Grey	Rock			
																				36	Grey	Rock			
																				46.3	Grey	Rock			
																				64.9	Grey	Rock			
																				67.1	Grey	Rock			
																				71.3	Grey	Rock			
																				73.8	Grey	Rock			
7200168	A143083	562868	4821563	2013	203	0	13.4	Diamond	-	Monitoring	-	-	73.6	-	-	-	-	-	-	1	Brown	Sand	Topsoil		mecp well record
																				9.5	Brown	Sand	Stones		
																				12.6	Grey	Till	Stones		
																				22.5	Grey	Rock			
																				35	Grey	Rock			
																				44	Grey	Rock			
																				71.6	Grey	Rock			
																				73.6	Grey	Rock			
7200331	A145176	562871	4821565	2013	203	0	13.4	Diamond	-	Test Hole	-	-	73.2	-	-	-	-	-	-	9.8	Brown	Sand	Topsoil		mecp well record
																				12.5	Grey	Till	Stones		
																				19.8	Grey	Rock			
																				31.4	Grey	Rock			
																				34.8	Grey	Rock			
																				70.7	Grey	Rock			
																				73.2	Grey	Rock			
7207758	A142214	562848	4821640	2013	177.8	0	13.9	Sonic	Observation Wells	Monitoring	Untested	10.4	13.87	0	13.9	-	-	-	-	0.6	Brown	Sand	Topsoil		mecp well record
																				1.4	Brown	Clay	Silt	Sand	
																				2.6	Brown	Sand	Gravel		
																				4	Brown	Silt	Clay	Sand	
																				6.4	Brown	Sand	Silt		
																				10.4	Brown	Sand	Gravel		
																				13.9	Brown	Rock			
7216581	A093900	562786	4822243	2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7216982	-	562765	4822229	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7222041	A161895	562864	4821620	2014	101.6	0	15.2	Rotary (Convent.)	Observation Wells	Monitoring	-	-	90.83	-	-	-	-	-	-	12.2	Brown	Sand	Gravel	Sand	mecp well record
																				15.2	Brown	Silt	Gravel	Silt	
																				89.9	Grey	Limestone		Dolomite	
																				90.8	Green	Shale			
7222042	A155085	562882	4821584	2014	127	0	18.3	Rotary (Convent.)	Observation Wells	Monitoring	Untested	18.3	92.05	-	-	-	-	-	-	14	Brown	Sand	Sand	Stones	mecp well record
																				85.3	Grey	Limestone			
																				89.9	Grey	Shale			
																				92	Red	Shale			
7222074	A161817	562878	4821591	2014	48.7	0	11.8	Auger	Observation Wells	Monitoring And Test Hole	-	-	72.2	-	-	-	-	-	-	7	Brown	Sand	Silt	Gravel	mecp well record
																				11.8	Brown	Sand	Boulders	Silt	
																				18.2	Grey	Stones			
																				37	Grey	Stones			
																				38	Grey	Stones			
																				69	Grey	Stones			
																				72.2	Black	Shale			
7227718	A155068	562506	4822103	2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7229881	A149671	562821	4822347	2014	32	0	1.5	-	Observation Wells	Monitoring	-	-	3.1	1.5	3.1	-	-	-	-	0.2	Black	Other			mecp well record
																				3.1	Brown	Sand			
7237370	A174392	564177	4822674	2015	50.8	0	11.9	Diamond	Observation Wells	Monitoring	-	-	14.94	11.9	14.9	-	-	-	-	4.6	Brown	Sand	Gravel	Loose	no digital well log
																				14.9	Grey	Rock			
7237371	A174394	564191	4822656	2015	50.8	0	12	Diamond	Observation Wells	Monitoring	-	-	15.29	12	15.1	-	-	-	-	4	Brown	Sand	Gravel	Loose	no digital well log
																				15.3	Grey	Rock			
7237372	A174393	564186	4822666	2015	50.8	0	12.3	Diamond	Observation Wells	Monitoring	-	-	15.39	12.3	15.4	-	-	-	-	4.3	Brown	Sand	Gravel	Loose	no digital well log
																				15.4	Grey	Rock			
7241317	A175392	562754	4822456	2015	51	0.1	3.3	Other Method	Observation Wells	Monitoring	Untested	3.9	4.8	3.3	4.8	-	-	-	-	4.8	Brown	Sand	Gravel	Loose	no digital well log
7241318	A175414	562725	4822397	2015	51	0.1	3.6	Boring	Observation Wells	Monitoring	Untested	3.9	5.1	3.6	5.1	-	-	-	-	5.1	Brown	Sand	Gravel	Loose	mecp well record
7241319	A175350	562715	4822405	2015	51	0	3.5	Boring	Observation Wells	Monitoring	Untested	3.9	5	3.5	5	-	-	-	-	5	Brown	Sand	Gravel	Loose	mecp well record
7242267	A174304	564337	4820729	2015	50.8	0	7	Auger	Observation Wells	Monitoring And Test Hole	Untested	8.2	9.14	7.6	9.1	-	-	-	-	3	Brown	Silt	Sand		mecp well record
																				8.5	Brown	Silt	Sand	Gravel	
																				9.1	Grey	Limestone			
7244257	A187811	562727	4822559	2015	51	0	1.8	Boring	Test Hole	Test Hole	Untested	2.9	3.3	1.8	3.3	-	-	-	-	2.7	Brown	Sand	Gravel	Packed	mecp well record
																				3.3	Grey	Limestone			
7256785	A191762	562618	4821909	2015	51	0	2.1	Boring	Monitoring And Test Hole	Monitoring And Test Hole	-	-	3.6	2.1	3.6	-	-	-	-	0.3	Black	Topsoil			no digital well log
																				1.5	Black	Gravel	Stones		
																				3.6	Black	Silt	Sand		
7269330	A190363	562885	4822344	2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7294392	A218619	563352	4822056	2017	50.8	2.4	0	Rotary (Convent.)	Test Hole	Test Hole	Untested	3.7	5.49	5.5	2.4	-	-	-	-	0.3	Brown	Topsoil		Loose	no digital well log
																				0.3	Brown	Sand	Gravel	Loose	
																				5.5	Brown	Sand	Gravel	Packed	

Table 1: MECP Well Record Summary

MECP Well No.	MECP Well Tag No.	Easting	Northing	Year Drilled	Nominal Casing Diameter (mm)	Casing Start (mBGS)	Casing End (mBGS)	Drilling Method	Well Status	Well Use	Water Quality	First Water Found (mBGS)	Total Depth (mBGS)	Screen		Pumping Test				Depth to Unit Base (m)	Colour	Material 1	Material 2	Material 3	Well Record Link
														Top (mBGS)	Bottom (mBGS)	Static Level (mBGS)	Final Level (mBGS)	Rate (LPM)	Duration (Hours)						
7294569	A218594	563476	4822171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7298857	A238260	562720	4822250	2017	50.8	3	0	Sonic	Test Hole	Test Hole	-	-	6.1	6.1	3	-	-	-	-	0.6	Brown	Fill	Loose		mecp well record
																				5.8	Brown	Sand	Dense		
																				6.1	Grey	Clay	Dense		
7298858	A238258	562643	4822135	2017	50.8	2.7	0	Sonic	Test Hole	Test Hole	-	-	5.79	5.8	2.7	-	-	-	-	0.3	Brown	Topsoil	Loose		mecp well record
																				4	Brown	Sand	Dense		
																				5.2	Brown	Sand	Gravel		
																				5.8	Grey	Clay	Dense		
7312058	-	562802	4822181	-	50	0	3.1	-	Abandoned-Other	-	Untested	2.9	-	3.1	6.1	-	-	-	-						mecp well record
7314935	A243810	562966	4822597	2018	50.8	0	3	Boring	Observation Wells	Monitoring	-	3.4	2.29	3	4.6	3.4	-	-	-	0.2	Black	Topsoil			no digital well log
																				2.3	Brown	Sand	Gravel	Fill	
																					Brown	Sand	Gravel	Boulders	
7314936	A243811	563003	4822513	2018	50.8	0	3	Boring	Observation Wells	Monitoring	-	3.7	4.57	3	4.6	3.7	-	-	-	0.1	Black	Topsoil	Loose		no digital well log
																				3	Brown	Sand	Gravel	Fill	
																				4.6	Brown	Sand	Gravel	Boulders	
7314937	A243812	562870	4822509	2018	50.8	0	3	Boring	Observation Wells	Monitoring	-	3.4	4.57	3	4.6	3.4	-	-	-	0.1	Black	Topsoil	Loose		no digital well log
																				1.5	Brown	Sand	Gravel	Fill	
																				4.6	Brown	Sand	Gravel	Boulders	
7315053	-	562601	4821993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7319663	A235050	564263	4822747	2018	101.6	0	4.6	Rotary (Convent.)	Test Hole	Test Hole	Untested	6.7	7.62	4.6	7.6	-	-	-	-	6.7	Brown	Sand	Gravel		mecp well record
																				7.6	Grey	Rock			
7319664	A235051	564252	4822759	2018	101.6	0	11.6	Rotary (Convent.)	Test Hole	Test Hole	Untested	6.7	14.63	-	-	-	-	-	-	6.7	Brown	Gravel	Sand		mecp well record
																				14.6	Grey	Rock			
7319665	A235052	564235	4822745	2018	101.6	0	4.9	Rotary (Convent.)	Test Hole	Test Hole	Untested	6.1	7.92	4.9	7.9	-	-	-	-	6.1	Brown	Gravel	Sand		mecp well record
																				7.9	Grey	Rock			
7319667	A235054	564237	4822750	2018	50.8	0	5.8	Rotary (Convent.)	Test Hole	Test Hole	Untested	5.8	8.84	5.8	8.8	-	-	-	-	5.8	Brown	Gravel	Sand		mecp well record
																				8.8	Grey	Rock			
7319668	A235056	564236	4822749	2018	101.6	0	4.3	Rotary (Convent.)	Test Hole	Test Hole	Untested	4.3	7.62	4.6	7.6	-	-	-	-	4.3	Brown	Sand	Gravel		mecp well record
																				7.6	Grey	Rock			
7319669	A235055	564240	4822759	2018	50.8	0	7.2	Boring	Observation Wells	Test Hole	Untested	6.7	10.21	7.2	10.2	-	-	-	-	6.7	Brown	Gravel	Sand		mecp well record
																				10.2	Grey	Rock			
7328928	-	564247	4822713	2019	-	-	-	-	Abandoned-Supply	-	-	-	-	-	-	-	-	-	-						mecp well record
7328929	-	564254	4822720	2019	-	-	-	-	Abandoned-Supply	-	-	-	-	-	-	-	-	-	-						mecp well record
7328930	-	564244	4822724	2019	-	-	-	-	Abandoned-Supply	-	-	-	-	-	-	-	-	-	-						mecp well record
7328931	-	564244	4822724	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						mecp well record
7334299	A269962	564251	4822718	2019	327.7	0	4	Digging	Dewatering	Dewatering	-	-	5	4	5	-	-	-	-	0.1		Gravel			mecp well record
																				4		Sand	Fill		
																				5		Gravel			
7334300	A269963	564240	4822740	2019	327.7	0	4.6	Digging	Dewatering	Dewatering	-	-	6.1	4.6	6.1	-	-	-	-	0.1		Gravel			mecp well record
																				4.5		Sand	Fill		
																				6.1		Gravel			
7338035	A265019	562605	4821989	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log
7340186	-	563479	4822216	2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						no digital well log

Table 2: General Lithological Summary - 2022 Drilling Program

Location	Soil Type Simple	Soil Type	Shallowest Depth First Encountered (mBGS)	Deepest Depth First Encountered (mBGS)
BH616-22	Asphalt	Asphalt	0	0
BH502-22, BH503-22, BH504-22, BH505-22, BH506-22, BH508-22, BH509-22, BH510-22, BH511-22, BH513-22, BH515-22, BH516-22, BH517-22, BH518-22, BH519-22, BH608-22, BH612-22, BH613-22, BH615-22, BH617-22, BH618-22, BH619-22, BH620-22, BH621-22, BH622-22, BH623-22, BH624-22, BH627-22, BH628-22, BH629-22, BH630-22, BH631-22, BH632-22, BH633-22, BH634-22, BH635-22, BH636-22, BH637-22, BH638-22, BH639-22, BH640-22, BH641-22, BH642-22, BH643-22, BH644-22, BH645-22, BH646-22, BH647-22, BH648-22, BH649-22, BH650-22, BH651-22, BH654-22, BH655-22, MW501-22, MW507A-22, MW507B-22, MW512A-22, MW512B-22, MW514-22, MW520-22, MW601-22, MW602-22, MW603-22, MW604-22, MW605-22, MW606-22, MW607-22	Topsoil	Topsoil	0	0
BH504-22, BH511-22, BH515-22, BH519-22, BH608-22, BH609-22, BH610-22, BH611-22, BH613-22, BH614-22, BH616-22, BH617-22, BH620-22, BH621-22, BH622-22, BH623-22, BH624-22, BH625-22, BH626-22, MW606-22, MW607-22	Fill	Fill	0	0.76
BH515-22, BH516-22, BH608-22, BH608-22, BH610-22, BH611-22, BH612-22, BH615-22, BH619-22, BH620-22, BH631-22, BH647-22, MW501-22, MW512B-22, MW520-22, MW520-22, MW601-22, MW603-22, MW604-22, MW604-22, MW605-22, MW606-22, MW607-22	Sand	Sand, Silty Sand	0.15	6.71
BH502-22, BH503-22, BH509-22, BH515-22, BH515-22, BH519-22, BH609-22, BH610-22, BH618-22, BH621-22, BH625-22, BH627-22, BH628-22, BH629-22, BH630-22, BH632-22, BH633-22, BH634-22, BH635-22, BH636-22, BH637-22, BH638-22, BH640-22, BH642-22, BH643-22, BH645-22, BH646-22, BH649-22, BH650-22, BH651-22, BH654-22, BH655-22, MW501-22, MW501-22, MW520-22, MW601-22, MW601-22, MW602-22, MW602-22, MW605-22, MW606-22, MW607-22	Sand and Gravel	Sand and Gravel, Gravelly Sand, Gravel	0.15	9.14
BH502-22, BH502-22, BH504-22, BH505-22, BH506-22, BH508-22, BH508-22, BH509-22, BH510-22, BH511-22, BH511-22, BH513-22, BH515-22, BH517-22, BH517-22, BH518-22, BH611-22, BH614-22, BH616-22, BH617-22, BH622-22, BH639-22, BH641-22, BH644-22, BH648-22, MW507A-22, MW507B-22, MW507B-22, MW512A-22, MW512A-22, MW512B-22, MW512B-22, MW514-22, MW514-22, MW520-22, MW602-22, MW603-22, MW606-22, MW607-22	Till	Silt Till, Sandy Silt Till, Clayey Silt Till, Silty Sand Till	0.25	6.3
BH513-22	Silt and Sand	Silt and Sand	0.33	0.33
BH505-22	Sandy Silt	Sandy Silt	0.38	0.38
BH504-22, BH505-22, BH506-22, MW601-22, MW602-22	Limestone	Bedrock, Limestone	1.73	7.32

Table 3: Groundwater Quality Results - 2022 - 2023

Parameter	Units	Name	MW604-22	MW606-22	MW512B-22	MW1-17	BH/MW1-06	MW512A-22	MW512B-22	MW606-22	MW607-22
		Lab Sample ID	WT2223649-001	WT2223649-002	WT2223649-003	WT2312336-001	WT2312336-002	WT2312336-003	WT2312336-004	WT2312336-005	WT2312465-001
		Sample Date	2022-11-29 10:45	2022-11-29 10:10	2022-11-29 10:25	2023-05-09 10:10	2023-05-09 15:40	2023-05-09 13:05	2023-05-09 11:35	2023-05-09 14:25	2023-05-10 09:45
		Reporting Detection Limit									
Anions and Nutrients											
Ammonia	mg/L	0.005	0.0791	<0.005	<0.005	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride	mg/L	0.5/2.5	30.9	54.4	47.2	351 DLDS	47.6	5.65	127	9.48	2.17
Fluoride	mg/L	0.02/0.1	0.162	0.044	0.077	<0.1 DLDS	0.049	0.054	0.062	0.067	0.052
Nitrate	mg/L	0.02/0.1	<0.02	0.859	0.619	5.78 DLDS	0.562	5.16	1.87	3.35	4.21
Nitrite	mg/L	0.01/0.05	<0.01	<0.01	<0.01	<0.05 DLDS	<0.01	<0.01	<0.01	<0.01	<0.01
Orthophosphate	mg/L	0.001	<0.001	0.0072	0.0024	0.0358	0.002	0.0055	<0.001	0.0021	0.0038
Sulfate	mg/L	0.3/1.5	77.3	5.2	88.3	22.1 DLDS	45.6	2.09	61.1	6.1	10.3
Metals - Dissolved											
Aluminum	mg/L	0.001/0.01	0.0043	0.0043	0.0049	0.0018	<0.001	0.0032	0.0012	0.0034	0.0029
Antimony	mg/L	0.0001/0.001	0.00012	<0.0001	<0.0001	0.00026	<0.0001	<0.0001	0.00014	<0.0001	<0.0001
Arsenic	mg/L	0.0001/0.001	0.00301	0.00015	0.00174	0.00219	0.00014	0.00017	0.0005	0.00013	0.00019
Barium	mg/L	0.0001/0.001	0.0606	0.0242	0.0544	0.0685	0.0617	0.0161	0.0446	0.0127	0.0224
Beryllium	mg/L	2e-005/0.0002	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005
Bismuth	mg/L	5e-005/0.0005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005
Boron	mg/L	0.01/0.1	0.031	0.015	0.012	0.057	0.034	<0.01	0.017	<0.01	0.015
Cadmium	mg/L	5e-006/5e-005	<5e-006	1.12e-005	8e-006	9.4e-005	2.46e-005	1.15e-005	5e-006	1e-005	9.1e-006
Calcium	mg/L	0.05/0.5	48.5	102	94.9	167	137	91.2	111	74.1	71.6
Cesium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005
Chromium	mg/L	0.0005/0.005	<0.0005	0.00063	<0.0005	0.00056	<0.0005	0.00082	<0.0005	<0.0005	0.00053
Cobalt	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012
Copper	mg/L	0.0002/0.002	<0.0002	0.0008	0.00879	0.0037	0.00062	0.0168	0.0021	0.00229	0.00176
Iron	mg/L	0.01/0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	mg/L	5e-005/0.0005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	9.3e-005	<5e-005	<5e-005	<5e-005
Lithium	mg/L	0.001/0.01	0.0096	<0.001	0.0057	0.0038	0.0011	<0.001	0.0041	<0.001	0.0013
Magnesium	mg/L	0.005/0.05	52.3	33.1	44.1	62.1	50.7	27.1	44.4	23.1	31.6
Manganese	mg/L	0.0001/0.001	0.0133	0.0192	0.00041	0.00024	0.0017	0.00126	0.00062	0.00328	0.0196
Molybdenum	mg/L	5e-005/0.0005	0.0109	0.000608	0.000553	0.000728	0.000181	0.000248	0.000603	0.00015	0.000538
Nickel	mg/L	0.0005/0.005	0.00059	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus	mg/L	0.05/0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium	mg/L	0.05/0.5	5.32	0.576	0.996	15.1	1.26	0.357	0.896	0.902	1.04
Rubidium	mg/L	0.0002/0.002	0.00125	0.00052	0.00045	0.00217	0.00049	0.00022	0.00075	0.00041	0.00043
Selenium	mg/L	5e-005/0.0005	<5e-005	0.000257	0.000166	0.000526 DLM	<0.0005 DLM	<0.0005 DLM	<0.0005 DLM	<0.0005 DLM	0.000679
Silicon	mg/L	0.05/0.5	8.51	5.04	8.71	4.97	6.54	4.38	8.74	3.56	5.18
Silver	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005
Sodium	mg/L	0.05/0.5	10.5	3.8	7.28	159	33.5	3.05	25.3	4.6	4.71
Strontium	mg/L	0.0002/0.002	0.26	0.124	0.199	0.932	7.81 DLHC	0.116	0.207	0.25	0.0972
Sulfur	mg/L	0.5/5	28.5	2.03	32.8	9.49	18	0.82	24.8	2.42	4.38
Tellurium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002	0.00034	<0.0002	<0.0002	<0.0002	<0.0002
Thallium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	1.3e-005	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005
Thorium	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	0.0001/0.001	0.00023	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	0.0003/0.0006/0.003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	0.0001/0.001	0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	1e-005/0.0001	0.000656	0.000528	0.000562	0.00123	0.000437	0.00031	0.00101	0.00016	0.000459
Vanadium	mg/L	0.0005/0.005	<0.0005	<0.0005	<0.0005	0.00079	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.001/0.01	<0.001	<0.001	0.0048	0.0091	0.0046	0.0022	0.0046	0.0014	0.0019
Zirconium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Physical Tests											
Alkalinity	mg/L	1	273	292	261	549	522	349	299	274	299
Colour	CU	2/4/20/40/200	201	9.2	84.3	2470 DLHC, DLM	388 DLHC	442 DLHC	227	255 DLHC	142
Electrical Conductivity	µS/cm	1	651	715	771	2030	1090	621	1040	527	515
Hardness	mg/L	0.5	336	391	418	673	551	339	460	280	309
pH	pH units	0.1	8.21	7.96	7.9	7.61	7.59	7.84	7.73	7.93	7.91
Total Dissolved Solids	mg/L	20/40	382 DLDS	402 DLDS	467 DLDS	1110 DLDS	624 DLDS	340 DLDS	572 DLDS	296 DLDS	272 DLDS
Turbidity	NTU	0.1	474	3.39	105	1100	69.6	108	56.8	60.6	69.2

Notes:

DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical

DLHC - Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

DLIS - Detection Limit Adjusted due to insufficient sample.

DLM - Detection Limit Adjusted due to sample matric effects.

DLUI - Detection Limit Raised: Unknown interference generated an apparent false positive

TMV - Turbidity exceeded upper limit of nephelometric method. Minimum value reported.

Table 3: Groundwater Quality Results - 2022 - 2023

Parameter	Units	Name	MW520-22	MW605-22	MW514-22	MW507A-22	MW507B-22	MP101-23	MW210-19	MW604-22	MW603-22
		Lab Sample ID	*WT2312465-002*	*WT2312465-003*	*WT2312465-004*	*WT2312465-005*	*WT2312465-006*	*WT2312465-007*	*WT2312895-001*	*WT2312895-002*	*WT2312895-003*
		Sample Date	*2023-05-10 10:30*	*2023-05-10 10:55*	*2023-05-10 11:30*	*2023-05-10 12:20*	*2023-05-10 12:35*	*2023-05-10 12:50*	*2023-05-12 08:35*	*2023-05-12 09:10*	*2023-05-12 09:40*
		Reporting Detection Limit									
Anions and Nutrients											
Ammonia	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0642	<0.005	0.0073	<0.005
Chloride	mg/L	0.5/2.5	8.04	5.19	8.64	2.96	7.49	13.2	1.29	22.6	3.62
Fluoride	mg/L	0.02/0.1	0.138	0.133	0.063	0.043	0.04	0.173	0.038	0.176	0.043
Nitrate	mg/L	0.02/0.1	3.28	5.5	1.83	0.397	0.94	<0.02	0.053	0.025	<0.02
Nitrite	mg/L	0.01/0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Orthophosphate	mg/L	0.001	0.0029	0.0048	0.0015	0.0029	<0.001	<0.001	0.0011	0.005	0.0026
Sulfate	mg/L	0.3/1.5	10.3	3.6	40.3	9.4	7.24	13.7	2.18	66.2	7.88
Metals - Dissolved											
Aluminum	mg/L	0.001/0.01	0.002	0.0038	0.0014	0.0024	0.0517	<0.01 DLHC	1.2	0.0019	0.0033
Antimony	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00119 DLHC	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001/0.001	0.00017	0.00014	0.00022	0.00015	0.00014	<0.001 DLHC	0.00061	0.00362	0.00018
Barium	mg/L	0.0001/0.001	0.0185	0.0159	0.0326	0.00876	0.0121	0.0326 DLHC	0.0226	0.0534	0.017
Beryllium	mg/L	2e-005/0.0002	<2e-005	<2e-005	<2e-005	<2e-005	<2e-005	<0.0002 DLHC	5.6e-005	<2e-005	<2e-005
Bismuth	mg/L	5e-005/0.0005	<5e-005	<5e-005	<5e-005	<5e-005	<5e-005	<0.0005 DLHC	<5e-005	<5e-005	<5e-005
Boron	mg/L	0.01/0.1	0.012	0.011	0.018	<0.01	0.01	1.96 DLHC	0.011	0.024	<0.01
Cadmium	mg/L	5e-006/5e-005	3.96e-005	1.13e-005	1.5e-005	1.91e-005	1.65e-005	<5e-005 DLHC	0.0003	6e-006	1.22e-005
Calcium	mg/L	0.05/0.5	78.1	75.3	97.6	82.4	89.2	88.8 DLHC	110	44.9	74.9
Cesium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<0.0001 DLHC	7.8e-005	<1e-005	<1e-005
Chromium	mg/L	0.0005/0.005	<0.0005	<0.0005	0.0005	0.00055	0.00056	<0.005 DLHC	0.00184	<0.0005	<0.0005
Cobalt	mg/L	0.0001/0.001	<0.0001	0.00061	<0.0001	<0.0001	<0.0001	0.00285 DLHC	0.0008	<0.0001	0.00011
Copper	mg/L	0.0002/0.002	0.00287	0.0008	0.0136	0.00148	0.00128	<0.002 DLHC	0.00434	0.0387	0.00082
Iron	mg/L	0.01/0.1	<0.01	<0.01	<0.01	<0.01	0.037	0.69 DLHC	1.95	<0.01	<0.01
Lead	mg/L	5e-005/0.0005	5.6e-005	<5e-005	<5e-005	<5e-005	0.000282	<0.0005 DLHC	0.00948	<5e-005	<5e-005
Lithium	mg/L	0.001/0.01	<0.001	<0.001	0.0018	<0.001	<0.001	<0.01 DLHC	0.0018	0.0088	0.0013
Magnesium	mg/L	0.005/0.05	24.2	26.9	42.3	14.5	24.2	27.9 DLHC	35.2	44.8	27
Manganese	mg/L	0.0001/0.001	0.0002	0.0121	0.0118	0.00013	0.00286	2.96 DLHC	0.115	0.0124	0.0111
Molybdenum	mg/L	5e-005/0.0005	0.000443	0.000484	0.00127	0.000121	0.000177	0.00845 DLHC	0.000332	0.0107	0.000711
Nickel	mg/L	0.0005/0.005	<0.0005	<0.0005	0.001	<0.0005	<0.0005	0.0287 DLHC	0.00127	<0.0005	<0.0005
Phosphorus	mg/L	0.05/0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5 DLHC	0.134	<0.05	<0.05
Potassium	mg/L	0.05/0.5	1.47	2.13	1.25	0.362	0.581	4.86 DLHC	1.08	3.56	0.779
Rubidium	mg/L	0.0002/0.002	0.00032	0.00043	0.00059	<0.0002	0.00045	<0.002 DLHC	0.00194	0.00079	0.00024
Selenium	mg/L	5e-005/0.0005	0.00045	0.000283	0.000389	0.000422	0.00028	<0.0005 DLHC	0.000125	<5e-005	0.000291
Silicon	mg/L	0.05/0.5	4.09	3.7	7.15	3.36	4.78	2.94 DLHC	11.4	8.14	4.48
Silver	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<0.0001 DLHC	<1e-005	<1e-005	<1e-005
Sodium	mg/L	0.05/0.5	5.93	2.42	25	2.58	3.18	5.17 DLHC	3.67	13.6	4.81
Strontium	mg/L	0.0002/0.002	0.174	0.118	0.151	0.0845	0.125	0.126 DLHC	0.125	0.244	0.0954
Sulfur	mg/L	0.5/5	4.4	1.81	15.7	4.16	3.07	6.83 DLHC	0.95	25.9	3.31
Tellurium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.002 DLHC	<0.0002	<0.0002	<0.0002
Thallium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005	<1e-005	<0.0001 DLHC	1.9e-005	<1e-005	<1e-005
Thorium	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001 DLHC	0.00055	<0.0001	<0.0001
Tin	mg/L	0.0001/0.001	<0.0001	<0.0001	0.00013	<0.0001	<0.0001	<0.001 DLHC	<0.0001	0.00013	<0.0001
Titanium	mg/L	0.0003/0.0006/0.003	<0.0003	<0.0003	<0.0003	<0.0003	0.00203	<0.003 DLHC	0.127	<0.0003	<0.0003
Tungsten	mg/L	0.0001/0.001	0.00024	0.00076	0.00022	<0.0001	<0.0001	<0.001 DLHC	<0.0001	0.00011	<0.0001
Uranium	mg/L	1e-005/0.0001	0.000371	0.000237	0.000372	0.00021	0.000274	0.00203 DLHC	0.000426	0.00078	0.000405
Vanadium	mg/L	0.0005/0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005 DLHC	0.00252	0.00051	<0.0005
Zinc	mg/L	0.001/0.01	0.0089	<0.001	0.0127	0.0016	0.0066	<0.01 DLHC	0.0649	0.0012	<0.001
Zirconium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.002 DLHC	0.00218	<0.0002	<0.0002
Physical Tests											
Alkalinity	mg/L	1	288	276	418	287	327	564	362	240	316
Colour	CU	2/4/20/40/200	132	181	97.2	579 DLHC	342 DLHC	12200 DLM	484 DLHC	109	114
Electrical Conductivity	µS/cm	1	533	505	765	475	531	573	532	576	529
Hardness	mg/L	0.5	295	299	418	265	322	337	420	297	298
pH	pH units	0.1	7.98	7.95	7.73	7.98	7.79	8.15	7.8	8.27	7.97
Total Dissolved Solids	mg/L	20/40	257 DLDS	260 DLDS	421 DLDS	251 DLDS	284 DLDS	222 DLIS	258 DLDS	290 DLDS	258 DLDS
Turbidity	NTU	0.1	65	56.6	46.8	201	79.6	>4000 TMV	228	33.4	34.6

Notes:

DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical

DLHC - Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

DLIS - Detection Limit Adjusted due to insufficient sample.

DLM - Detection Limit Adjusted due to sample matric effects.

DLUI - Detection Limit Raised: Unknown interference generated an apparent false positive

TMV - Turbidity exceeded upper limit of nephelometric method. Minimum value reported.

Table 3: Groundwater Quality Results - 2022 - 2023

Parameter	Units	Name	MW209-19	MW204-19	MW601-22	MW514-22
		Lab Sample ID	*WT2312895-004*	*WT2312895-005*	*WT2312895-006*	*WT2223649-004*
		Sample Date	*2023-05-12 10:15*	*2023-05-12 10:50*	*2023-05-12 11:20*	*2022-11-29 11:05*
		Reporting Detection Limit				
			Anions and Nutrients			
Ammonia	mg/L	0.005	<0.005	<0.005	<0.005	<0.005
Chloride	mg/L	0.5/2.5	15.7	3.98	33.2 DLDS	13
Fluoride	mg/L	0.02/0.1	0.05	0.038	<0.1 DLDS	0.108
Nitrate	mg/L	0.02/0.1	4.06	0.027	6.12 DLDS	1.36
Nitrite	mg/L	0.01/0.05	<0.01	<0.01	<0.05 DLDS	<0.01
Orthophosphate	mg/L	0.001	0.0037	0.0011	0.0039	0.0081
Sulfate	mg/L	0.3/1.5	54.5	3.63	151 DLDS	28.2
			Metals - Dissolved			
Aluminum	mg/L	0.001/0.01	0.0573	0.002	0.0155	0.0024
Antimony	mg/L	0.0001/0.001	0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.0001/0.001	0.00022	0.0002	0.00017	0.0003
Barium	mg/L	0.0001/0.001	0.0479	0.00708	0.0322	0.0454
Beryllium	mg/L	2e-005/0.0002	<2e-005	<2e-005	<2e-005	<2e-005
Bismuth	mg/L	5e-005/0.0005	<5e-005	<5e-005	<5e-005	<5e-005
Boron	mg/L	0.01/0.1	0.011	0.012	0.026	0.018
Cadmium	mg/L	5e-006/5e-005	6.7e-006	1.37e-005	2.85e-005	1.58e-005
Calcium	mg/L	0.05/0.5	89.7	73.4	106	99.9
Cesium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005
Chromium	mg/L	0.0005/0.005	0.0007	0.00057	0.00078	0.00054
Cobalt	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001
Copper	mg/L	0.0002/0.002	0.00074	0.00144	0.00104	0.0159
Iron	mg/L	0.01/0.1	0.051	<0.01	0.036	<0.01
Lead	mg/L	5e-005/0.0005	0.000415	<5e-005	0.00077	<5e-005
Lithium	mg/L	0.001/0.01	0.0047	<0.001	0.0016	0.0034
Magnesium	mg/L	0.005/0.05	38.1	23.3	31.6	50.7
Manganese	mg/L	0.0001/0.001	0.0188	0.00012	0.0075	0.0151
Molybdenum	mg/L	5e-005/0.0005	0.00082	0.000339	0.000612	0.00129
Nickel	mg/L	0.0005/0.005	0.00177	<0.0005	<0.0005	0.00123
Phosphorus	mg/L	0.05/0.5	<0.05	<0.05	<0.05	<0.05
Potassium	mg/L	0.05/0.5	1.18	0.158	1.12	2.27
Rubidium	mg/L	0.0002/0.002	0.00055	<0.0002	0.00064	0.00074
Selenium	mg/L	5e-005/0.0005	0.00148	0.000109	0.000661	0.000255
Silicon	mg/L	0.05/0.5	7.29	3.43	5.3	8.35
Silver	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005
Sodium	mg/L	0.05/0.5	9.54	3.87	19.5	10.4
Strontium	mg/L	0.0002/0.002	0.182	0.0785	0.198	0.186
Sulfur	mg/L	0.5/5	22.8	1.73	11.7	10.7
Tellurium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002
Thallium	mg/L	1e-005/0.0001	<1e-005	<1e-005	<1e-005	<1e-005
Thorium	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	0.0001/0.001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	0.0003/0.0006/0.003	0.00211	<0.0003	<0.0006 DLUI	<0.0003
Tungsten	mg/L	0.0001/0.001	<0.0001	0.00022	0.0002	0.00054
Uranium	mg/L	1e-005/0.0001	0.00152	0.000428	0.000491	0.000662
Vanadium	mg/L	0.0005/0.005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.001/0.01	0.0029	0.0016	0.017	0.0087
Zirconium	mg/L	0.0002/0.002	<0.0002	<0.0002	<0.0002	<0.0002
			Physical Tests			
Alkalinity	mg/L	1	316	296	1480 DLHC	407
Colour	CU	2/4/20/40/200	27.9	16.9	9130 DLHC, DLM	53.4
Electrical Conductivity	µS/cm	1	679	495	1090	800
Hardness	mg/L	0.5	381	279	395	458
pH	pH units	0.1	8.01	7.97	7.72	7.84
Total Dissolved Solids	mg/L	20/40	362 DLDS	272 DLDS	632 DLDS	451 DLDS
Turbidity	NTU	0.1	7	3.44	>4000 TMV	39.3

Notes:

DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical

DLHC - Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

DLIS - Detection Limit Adjusted due to insufficient sample.

DLM - Detection Limit Adjusted due to sample matric effects.

DLUI - Detection Limit Raised: Unknown interference generated an apparent false positive

TMV - Turbidity exceeded upper limit of nephelometric method. Minimum value reported.

Table 4: Horizontal Hydraulic Conductivity (m/sec) Summary

Location	2022	2023	Screened Material
	K_x (m/sec)	K_x (m/sec)	
BH/MW1-06	1.17E-08	9.95E-07	Silty Clay
MW2-11	1.22E-06	-	Sand and Gravel
MW1-17	-	2.70E-07	Sandy Silt
MW204-19	-	2.53E-07	Sandy Silt/ClayeySilt
MW209-19	3.16E-08	4.88E-08	Silty Sand
MW210-19	-	7.22E-06	Sandy Silt/SiltySand
MW217-19	6.74E-08	2.47E-07	Sandy Silt
MW507a-22	-	1.17E-07	Silt Till
MW507b-22	-	3.24E-06	Silt Till
MW512b-22	1.03E-06	2.74E-06	Silty Sand
MW514-22	6.27E-09	1.15E-07	Sandy Silt Till
MW515a-22	-	5.11E-07	Silt Till
MW520-22	-	1.00E-05	Sand/SiltySand
MW601-22	-	4.29E-05	Limestone
MW603-22	-	2.21E-08	Silt Till
MW604-22	-	7.64E-07	Silty Sand
MW605-22	-	2.07E-06	Sand and Gravel
MW606-22	-	3.61E-07	Silt Sand
MW607-22	-	7.15E-07	Sand and Gravel

Table 5a: Manual Groundwater Levels (mBTOC) - 2022 - 2023

Date	BH/MW1-06	MW1-11	MW2-11	MW3-11	MW4-11	MW1-17	MW2-17	MW3-17	MW4-17	MW5-17	MW8-17	MW9-17	MW10-17	MW11-17	MW12-17	MW204-19	MW209-19
2022-02-15	2.89	10.34	9.93	9.79	dry	-	-	-	-	-	nm	nm	3.33	5.95	not located. snow	3.37	2.57
2022-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.92	-
2022-07-05	3.12	10.29	9.85	9.72	dry	-	-	-	-	-	3.82	2.93	3.57	5.89	5.21	3.45	-
2022-09-26	4.17	10.62	10.22	10.12	dry	dry	-	-	dry	not found	dry	dry	dry	dry	5.31	dry	4.20
2022-11-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-11-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-12-19	4.11	10.98	10.52	10.49	dry	dry	-	-	dry	3.78	dry	dry	dry	dry	dry	dry	4.73
2023-03-15	1.79	10.83	10.42	10.37	10.67	dry	nm well under ice	-	nm well under ice	nm well under ice	2.37	1.65	3.18	6.01	nm well under ice	2.46	2.28
2023-04-24	1.55	8.72	8.49	8.64	8.55	3.56	1.50	-	1.57	1.38	2.14	1.52	2.32	4.38	dry	1.91	2.16
2023-05-02	1.47	-	-	-	-	3.67	-	-	-	-	-	-	-	-	-	-	-
2023-05-04	1.44	-	-	-	-	3.63	-	-	-	-	-	-	-	-	-	1.84	2.12
2023-05-05	-	9.13	-	8.89	8.99	-	-	-	-	-	-	-	-	4.69	-	-	-
2023-05-08	-	-	-	8.96	-	-	-	-	-	-	-	-	-	4.72	-	2.00	2.17
2023-05-09	1.60	-	-	-	-	3.39	-	-	-	-	-	-	-	-	-	-	-
2023-05-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.17	nm tape broken, sampling event
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-16	1.94	-	-	-	-	3.64	-	-	-	-	-	-	-	-	-	2.35	2.28
2023-05-17	-	-	-	-	-	3.76	-	-	-	-	-	-	-	-	-	-	-
2023-05-31	2.40	9.64	9.24	9.23	9.50	4.32	1.96	-	2.08	1.89	2.88	2.33	3.12	5.07	dry	2.85	2.63
2023-08-25	2.34	10.39	9.96	9.89	10.25	4.90	2.81	-	2.36	2.18	3.74	3.46	3.14	5.95	dry	4.62	2.10
2023-12-20	2.99	10.69	10.30	10.22	10.54	dry	not located	-	2.96	2.64	dry	dry	3.74	dry	dry	dry	2.28

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5a: Manual Groundwater Levels (mBTOC) - 2022 - 2023

Date	MW210-19	MW211-19	MW217-19	MW304-20	MW306-20	MW308-20	MW501-22	MW507A-22	MW507B-22	MW512A-22	MW512B-22	MW514-22	MW520-22	MW601-22	MW602-22	MW603-22	MW604-22
2022-02-15	5.29	2.83	10.15	dry	dry	8.07	-	-	-	-	-	-	-	-	-	-	-
2022-03-08	-	-	-	-	-	-	dry	3.43 - pre-development	5.19 - pre-development	1.63 mbtoc - pre-development	2.19 - pre-development	1.57 - pre-development	7.09 - pre-development	-	-	-	-
2022-07-05	6.09	3.20	10.14	dry	dry	7.87	well damaged	dry	6.51	dry	4.02	3.29	7.43	-	-	-	-
2022-09-26	7.85	4.30	10.39	dry	dry	8.10	-	dry	dry	dry	5.78	4.94	dry	-	-	-	-
2022-11-03	dry	-	-	-	-	-	-	-	-	-	-	-	-	12.95	dry	dry	6.27
2022-11-28	-	-	-	-	-	-	dry	dry	dry	dry	6.29	6.60	dry	dry	dry	dry	6.59
2022-12-19	dry	dry	10.51	dry	dry	8.11	dry	dry	dry	dry	6.37	7.04	dry	dry	dry	dry	6.90
2023-03-15	7.33	2.24	10.38	dry	5.35	8.11	dry	dry	6.33	2.98	3.43	2.48	8.07	12.80	dry	3.19	3.19
2023-04-24	3.16	2.18	8.69	dry	5.34	6.78	dry	3.32	5.52	2.44	2.99	2.11	6.81	12.10	dry	2.12	2.68
2023-05-02	-	-	-	-	-	-	-	-	-	2.44	2.97	-	-	12.10	-	-	-
2023-05-04	3.06	-	9.01	-	-	-	-	-	-	2.35	2.98	-	-	12.20	-	1.98	2.59
2023-05-05	3.06	2.08	9.01	-	5.36	-	-	3.29	5.51	-	-	-	-	-	-	-	-
2023-05-08	-	2.12	-	-	-	-	-	-	-	-	-		6.90	-	-	-	-
2023-05-09	-	-	-	-	-	-	-	-	-	2.34	2.97	-	-	-	-	-	-
2023-05-10	-	-	9.11	-	-	-	-	3.34	5.54	-	-	2.15	6.90	-	-	-	-
2023-05-12	3.17	-	-	-	-	-	-	-	-	-	-	-	-	nm - tape broken, sampling event	-	2.26	2.66
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	12.33	-	-	-
2023-05-16	3.33	-	9.21	-	-	-	-	3.48	5.63	2.59	3.13	2.25	6.97	12.26	-	2.32	2.75
2023-05-17	-	-	-	-	-	-	-	-	-	-	3.21	2.41	-	-	-	-	-
2023-05-31	4.08	2.77	9.49	dry	dry	7.15	dry	3.92	5.92	3.27	3.64	2.73	7.18	12.41	dry	2.73	3.15
2023-08-25	5.51	2.25	10.29	dry	dry	7.98	dry	dry	6.26	dry	4.12	2.38	7.72	12.74	dry	2.82	2.90
2023-12-20	7.45	2.92	10.38	dry	dry	dry	dry	dry	6.79	dry	4.46	2.98	8.13	12.95	dry	3.72	3.55

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5a: Manual Groundwater Levels (mBTOC) - 2022 - 2023

Date	MW605-22	MW606-22	MW607-22	MP101-23 (out)	MP101-23 (in)
2022-02-15	-	-	-	-	-
2022-03-08	-	-	-	-	-
2022-07-05	-	-	-	-	-
2022-09-26	-	-	-	-	-
2022-11-03	dry	5.53	8.23	-	-
2022-11-28	dry	5.62	-	-	-
2022-12-19	dry	5.71	8.60	-	-
2023-03-15	6.20	4.39	7.45	-	-
2023-04-24	4.84	2.88	5.69	dry	dry
2023-05-02	-	-	-	-	-
2023-05-04	-	2.25	-	-	-
2023-05-05	-	-	5.80	dry	1.16
2023-05-08	4.93	-	5.72	-	-
2023-05-09	-	2.74	-	-	-
2023-05-10	4.97	-	5.75	dry	1.25
2023-05-12	-	-	-	-	-
2023-05-15	-	-	-	-	-
2023-05-16	4.99		5.76	-	-
2023-05-17	-	3.24	-	-	-
2023-05-31	5.20	3.54	6.09	dry	1.63
2023-08-25	5.72	3.88	7.03	dry	1.75
2023-12-20	6.35	5.30	7.92	dry	dry

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5b: Manual Groundwater Depths (mBGS) - 2022 - 2023

Date	BH/MW1-06	MW1-11	MW2-11	MW3-11	MW4-11	MW1-17	MW2-17	MW3-17	MW4-17	MW5-17	MW8-17	MW9-17	MW10-17	MW11-17	MW12-17	MW204-19	MW209-19
2022-02-15	2.07	9.36	8.96	8.88	dry	-	-	-	-	-	nm	nm	2.43	5.06	not located. snow	2.50	1.72
2022-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.05	-
2022-07-05	2.30	9.31	8.88	8.81	dry	-	-	-	-	-	2.97	2.01	2.67	5.00	5.31	2.58	-
2022-09-26	3.35	9.64	9.25	9.21	dry	dry	-	-	dry	not found	dry	dry	dry	dry	5.41	dry	3.35
2022-11-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-11-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-12-19	3.29	10.00	9.55	9.58	dry	dry	-	-	dry	3.88	dry	dry	dry	dry	dry	dry	3.88
2023-03-15	0.97	9.85	9.45	9.46	9.78	dry	nm well under ice	-	nm well under ice	nm well under ice	1.52	0.73	2.28	5.12	nm well under ice	1.59	1.43
2023-04-24	0.73	7.74	7.52	7.73	7.66	3.62	1.57	-	1.71	1.48	1.29	0.60	1.42	3.49	dry	1.04	1.31
2023-05-02	0.65	-	-	-	-	3.74	-	-	-	-	-	-	-	-	-	-	-
2023-05-04	0.62	-	-	-	-	3.70	-	-	-	-	-	-	-	-	-	0.97	1.27
2023-05-05	-	8.15	-	7.98	8.10	-	-	-	-	-	-	-	-	3.80	-	-	-
2023-05-08	-	-	-	8.05	-	-	-	-	-	-	-	-	-	3.83	-	1.13	1.32
2023-05-09	0.78	-	-	-	-	3.46	-	-	-	-	-	-	-	-	-	-	-
2023-05-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.30	nm tape broken, sampling event
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-16	1.12	-	-	-	-	3.70	-	-	-	-	-	-	-	-	-	1.48	1.43
2023-05-17	-	-	-	-	-	3.82	-	-	-	-	-	-	-	-	-	-	-
2023-05-31	1.58	8.66	8.27	8.32	8.61	4.38	2.03	-	2.22	1.99	2.03	1.41	2.22	4.18	dry	1.98	1.78
2023-08-25	1.52	9.41	8.99	8.98	9.36	4.96	2.88	-	2.50	2.28	2.89	2.54	2.24	5.06	dry	3.75	1.25
2023-12-20	2.17	9.71	9.33	9.31	9.65	dry	not located	-	3.10	2.74	dry	dry	2.84	dry	dry	dry	1.43

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5b: Manual Groundwater Depths (mBGS) - 2022 - 2023

Date	MW210-19	MW211-19	MW217-19	MW304-20	MW306-20	MW308-20	MW501-22	MW507A-22	MW507B-22	MW512A-22	MW512B-22	MW514-22	MW520-22	MW601-22	MW602-22	MW603-22	MW604-22
2022-02-15	4.37	1.92	9.22	dry	dry	7.20	-	-	-	-	-	-	-	-	-	-	-
2022-03-08	-	-	-	-	-	-	dry	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	-	-	-	-
2022-07-05	5.17	2.29	9.21	dry	dry	7.00	well damaged	dry	5.57	dry	3.25	2.46	6.47	-	-	-	-
2022-09-26	6.93	3.39	9.46	dry	dry	7.23	-	dry	dry	dry	5.01	4.11	dry	-	-	-	-
2022-11-03	dry	-	-	-	-	-	-	-	-	-	-	-	-	12.05	dry	dry	5.46
2022-11-28	-	-	-	-	-	-	dry	dry	dry	dry	5.52	5.77	dry	dry	dry	dry	5.78
2022-12-19	dry	dry	9.58	dry	dry	7.24	dry	dry	dry	dry	5.60	6.21	dry	dry	dry	dry	6.09
2023-03-15	6.41	1.33	9.45	dry	4.41	7.24	dry	dry	5.39	2.16	2.66	1.65	7.11	11.90	dry	2.39	2.38
2023-04-24	2.24	1.27	7.76	dry	4.40	5.91	dry	2.30	4.58	1.62	2.22	1.28	5.85	11.20	dry	1.32	1.87
2023-05-02	-	-	-	-	-	-	-	-	-	1.62	2.20	-	-	11.20	-	-	-
2023-05-04	2.14	-	8.08	-	-	-	-	-	-	1.53	2.21	-	-	11.30	-	1.18	1.78
2023-05-05	2.14	1.17	8.08	-	4.42	-	-	2.27	4.57	-	-	-	-	-	-	-	-
2023-05-08	-	1.21	-	-	-	-	-	-	-	-	-		5.94	-	-	-	-
2023-05-09	-	-	-	-	-	-	-	-	-	1.52	2.20	-	-	-	-	-	-
2023-05-10	-	-	8.18	-	-	-	-	2.32	4.60	-	-	1.32	5.94	-	-	-	-
2023-05-12	2.25	-	-	-	-	-	-	-	-	-	-	-	-	nm - tape broken, sampling event	-	1.46	1.85
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	11.43	-	-	-
2023-05-16	2.41	-	8.28	-	-	-	-	2.46	4.69	1.77	2.36	1.42	6.01	11.36	-	1.52	1.94
2023-05-17	-	-	-	-	-	-	-	-	-	-	2.44	1.58	-	-	-	-	-
2023-05-31	3.16	1.86	8.56	dry	dry	6.28	dry	2.90	4.98	2.45	2.87	1.90	6.22	11.51	dry	1.93	2.34
2023-08-25	4.59	1.34	9.36	dry	dry	7.11	dry	dry	5.32	dry	3.35	1.55	6.76	11.84	dry	2.02	2.09
2023-12-20	6.53	2.01	9.45	dry	dry	dry	dry	dry	5.85	dry	3.69	2.15	7.17	12.05	dry	2.92	2.74

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5b: Manual Groundwater Depths (mBGS) - 2022 - 2023

Date	MW605-22	MW606-22	MW607-22	MP101-23 (out)	MP101-23 (in)
2022-02-15	-	-	-	-	-
2022-03-08	-	-	-	-	-
2022-07-05	-	-	-	-	-
2022-09-26	-	-	-	-	-
2022-11-03	dry	4.79	7.45	-	-
2022-11-28	dry	4.88	-	-	-
2022-12-19	dry	4.97	7.82	-	-
2023-03-15	5.35	3.65	6.67	-	-
2023-04-24	3.99	2.14	4.91	dry	dry
2023-05-02	-	-	-	-	-
2023-05-04	-	1.51	-	-	-
2023-05-05	-	-	5.02	dry	0.01
2023-05-08	4.08	-	4.94	-	-
2023-05-09	-	2.00	-	-	-
2023-05-10	4.12	-	4.97	dry	0.10
2023-05-12	-	-	-	-	-
2023-05-15	-	-	-	-	-
2023-05-16	4.14		4.98	-	-
2023-05-17	-	2.50	-	-	-
2023-05-31	4.35	2.80	5.31	dry	0.48
2023-08-25	4.87	3.14	6.25	dry	0.60
2023-12-20	5.50	4.56	7.14	dry	dry

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5c: Manual Groundwater Elevations (mAMSL) - 2022 - 2023

Date	BH/MW1-06	MW1-11	MW2-11	MW3-11	MW4-11	MW1-17	MW2-17	MW3-17	MW4-17	MW5-17	MW8-17	MW9-17	MW10-17	MW11-17	MW12-17	MW204-19	MW209-19
2022-02-15	338.78	327.41	327.94	327.14	dry	-	-	-	-	-	nm	nm	338.17	332.35	not located. snow	338.92	336.55
2022-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	340.37	-
2022-07-05	338.55	327.46	328.02	327.21	dry	-	-	-	-	-	340.31	341.40	337.93	332.41	326.94	338.84	-
2022-09-26	337.50	327.13	327.65	326.81	dry	dry	-	-	dry	not found	dry	dry	dry	dry	326.84	dry	334.92
2022-11-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-11-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2022-12-19	337.56	326.77	327.35	326.44	dry	dry	-	-	dry	337.51	dry	dry	dry	dry	dry	dry	334.39
2023-03-15	339.88	326.92	327.45	326.56	326.93	dry	nm well under ice	-	nm well under ice	nm well under ice	341.76	342.68	338.32	332.29	nm well under ice	339.83	336.84
2023-04-24	340.12	329.03	329.38	328.29	329.05	329.15	338.87	-	339.56	339.91	341.99	342.81	339.18	333.92	dry	340.38	336.96
2023-05-02	340.20	-	-	-	-	329.04	-	-	-	-	-	-	-	-	-	-	-
2023-05-04	340.23	-	-	-	-	329.08	-	-	-	-	-	-	-	-	-	340.45	337.00
2023-05-05	-	328.62	-	328.04	328.61	-	-	-	-	-	-	-	-	333.61	-	-	-
2023-05-08	-	-	-	327.97	-	-	-	-	-	-	-	-	-	333.58	-	340.29	336.95
2023-05-09	340.07	-	-	-	-	329.32	-	-	-	-	-	-	-	-	-	-	-
2023-05-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	340.12	nm tape broken, sampling event
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2023-05-16	339.73	-	-	-	-	329.07	-	-	-	-	-	-	-	-	-	339.94	336.84
2023-05-17	-	-	-	-	-	328.95	-	-	-	-	-	-	-	-	-	-	-
2023-05-31	339.27	328.11	328.63	327.70	328.10	328.39	338.41	-	339.05	339.40	341.25	342.00	338.38	333.23	dry	339.44	336.49
2023-08-25	339.33	327.36	327.91	327.04	327.35	327.81	337.56	-	338.77	339.11	340.39	340.87	338.36	332.35	dry	337.67	337.02
2023-12-20	338.68	327.06	327.57	326.71	327.06	dry	not located	-	338.17	338.65	dry	dry	337.76	dry	dry	dry	336.84

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5c: Manual Groundwater Elevations (mAMSL) - 2022 - 2023

Date	MW210-19	MW211-19	MW217-19	MW304-20	MW306-20	MW308-20	MW501-22	MW507A-22	MW507B-22	MW512A-22	MW512B-22	MW514-22	MW520-22	MW601-22	MW602-22	MW603-22	MW604-22
2022-02-15	334.48	338.73	327.63	dry	dry	330.85	-	-	-	-	-	-	-	-	-	-	-
2022-03-08	-	-	-	-	-	-	dry	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	n/a - pre-development water level	-	-	-	-
2022-07-05	333.68	338.36	327.64	dry	dry	331.05	well damaged	dry	326.64	dry	332.23	342.15	325.56	-	-	-	-
2022-09-26	331.92	337.26	327.39	dry	dry	330.82	-	dry	dry	dry	330.47	340.50	dry	-	-	-	-
2022-11-03	dry	-	-	-	-	-	-	-	-	-	-	-	-	317.44	dry	dry	337.54
2022-11-28	-	-	-	-	-	-	dry	dry	dry	dry	329.96	338.84	dry	dry	dry	dry	337.22
2022-12-19	dry	dry	327.27	dry	dry	330.81	dry	dry	dry	dry	329.88	338.40	dry	dry	dry	dry	336.91
2023-03-15	332.44	339.32	327.40	dry	326.39	330.81	dry	dry	326.82	333.37	332.82	342.96	324.92	317.59	dry	333.96	340.62
2023-04-24	336.61	339.38	329.09	dry	326.40	332.14	dry	329.81	327.63	333.91	333.26	343.33	326.18	318.29	dry	335.03	341.13
2023-05-02	-	-	-	-	-	-	-	-	-	333.91	333.28	-	-	318.29	-	-	-
2023-05-04	336.71	-	328.77	-	-	-	-	-	-	334.00	333.27	-	-	318.19	-	335.17	341.22
2023-05-05	336.71	339.48	328.77	-	326.38	-	-	329.84	327.64	-	-	-	-	-	-	-	-
2023-05-08	-	339.44	-	-	-	-	-	-	-	-	-		326.09	-	-	-	-
2023-05-09	-	-	-	-	-	-	-	-	-	334.01	333.28	-	-	-	-	-	-
2023-05-10	-	-	328.67	-	-	-	-	329.79	327.61	-	-	343.29	326.09	-	-	-	-
2023-05-12	336.60	-	-	-	-	-	-	-	-	-	-	-	-	nm - tape broken, sampling event	-	334.89	341.15
2023-05-15	-	-	-	-	-	-	-	-	-	-	-	-	-	318.06	-	-	-
2023-05-16	336.44	-	328.57	-	-	-	-	329.65	327.52	333.76	333.12	343.19	326.02	318.13	-	334.83	341.06
2023-05-17	-	-	-	-	-	-	-	-	-	-	333.04	343.03	-	-	-	-	-
2023-05-31	335.69	338.79	328.29	dry	dry	331.77	dry	329.21	327.23	333.08	332.61	342.71	325.81	317.98	dry	334.42	340.66
2023-08-25	334.26	339.31	327.49	dry	dry	330.94	dry	dry	326.89	dry	332.13	343.06	325.27	317.65	dry	334.33	340.91
2023-12-20	332.32	338.64	327.40	dry	dry	dry	dry	dry	326.36	dry	331.79	342.46	324.86	317.44	dry	333.43	340.26

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Table 5c: Manual Groundwater Elevations (mAMSL) - 2022 - 2023

Date	MW605-22	MW606-22	MW607-22	MP101-23 (out)	MP101-23 (in)
2022-02-15	-	-	-	-	-
2022-03-08	-	-	-	-	-
2022-07-05	-	-	-	-	-
2022-09-26	-	-	-	-	-
2022-11-03	dry	323.93	330.32	-	-
2022-11-28	dry	323.84	-	-	-
2022-12-19	dry	323.75	329.95	-	-
2023-03-15	326.87	325.07	331.10	-	-
2023-04-24	328.23	326.58	332.86	dry	dry
2023-05-02	-	-	-	-	-
2023-05-04	-	327.21	-	-	-
2023-05-05	-	-	332.75	dry	327.09
2023-05-08	328.14	-	332.83	-	-
2023-05-09	-	326.72	-	-	-
2023-05-10	328.10	-	332.80	dry	327.00
2023-05-12	-	-	-	-	-
2023-05-15	-	-	-	-	-
2023-05-16	328.08		332.79	-	-
2023-05-17	-	326.22	-	-	-
2023-05-31	327.87	325.92	332.46	dry	326.62
2023-08-25	327.35	325.58	331.52	dry	326.50
2023-12-20	326.72	324.16	330.63	dry	dry

Notes:
mBTOC = metres below top of casing
mBGS = metres below ground surface
mAMSL = metres above mean sea level
nm = not measured during monitoring event

Appendix A

Borehole Logs

ID No.: MW501-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 2/28/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mounted

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
	Ground Surface	329.5					
0	**TOPSOIL** dark brown sandy silt, frozen (380mm)	0.0 / 329.1					
1.3		0.4 / 328.7					
2.6	**SAND AND GRAVEL** brown sand and gravel, some silt, moist	0.8	1	SS	26		3
4.3	compact	328.0					
4.9	**SAND** compact to very dense brown sand, trace gravel and silt, moist	1.5	2	SS	19		3
6.6			3	SS	52		4
8.2			4	SS	61		3
9.8			5	SS	40		3
13.1		324.9	6	SS	21		3
15.1	**GRAVELLY SAND** compact brown gravelly sand, trace silt, moist	4.6					
19.7			7	SS	22		4
23.0		321.9					
24.9	**SAND** dense brown sand, trace gravel, moist	7.6	8	SS	30		5
29.5		320.4					
30		9.1					

Groundwater Observations and Standpipe Details: Concrete; Bentonite; 51mm PVC Riser

Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Notes:
Auger refusal at 11.1mbgs on suspected bedrock.
Borehole dry upon drilling completion.
Well dry on March 8, 2022.

ID No.: MW501-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 2/28/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mounted

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
32		**SAND AND GRAVEL** very dense brown sand and gravel, trace silt, occasional cobbles, moist		9	SS	51		5	
34 – 10									
36				10	SS	50/80mm		8	
		Drilling Terminated	318.4 / 11.1						
38									
40 – 12									
42									
44									
46 – 14									
48									
50									
52 – 16									
54									
56									
58									
60 – 18									

Sand Pack

51mm Slotted Screen

Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Notes:
Auger refusal at 11.1mbgs on suspected bedrock.
Borehole dry upon drilling completion.
Well dry on March 8, 2022.

ID No.: BH502-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 2/28/2022

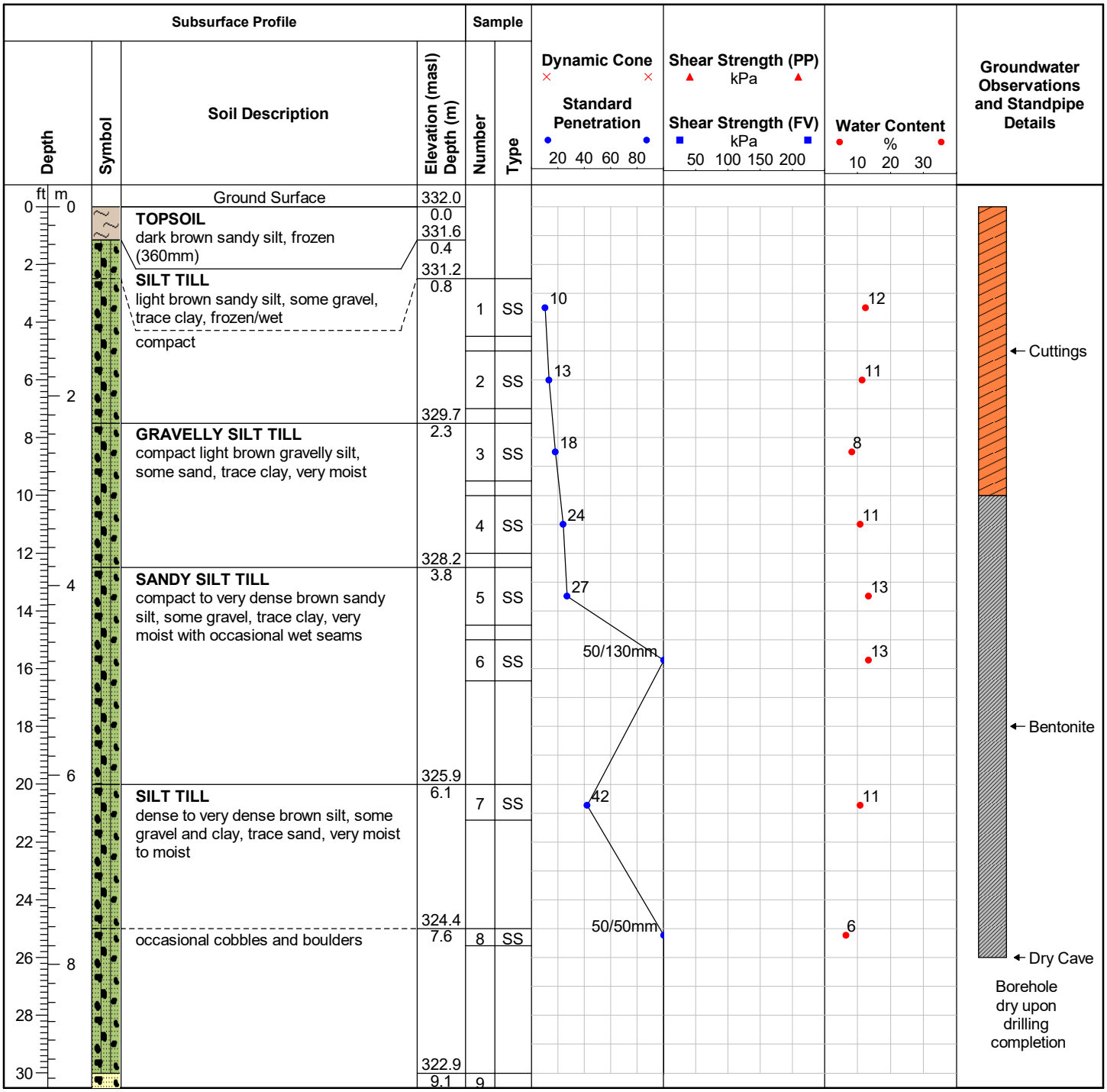
Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type
0 / 0	Ground Surface	332.0		
	TOPSOIL dark brown sandy silt, frozen (360mm)	0.0 / 331.6		
		0.4 / 331.2		
2 / 0.5	**SILT TILL** light brown sandy silt, some gravel, trace clay, frozen/wet	0.8	1	SS
4 / 1	compact		2	SS
6 / 2		329.7		
8 / 2.5	**GRAVELLY SILT TILL** compact light brown gravelly silt, some sand, trace clay, very moist	2.3	3	SS
10 / 3			4	SS
12 / 4		328.2		
14 / 4.5	**SANDY SILT TILL** compact to very dense brown sandy silt, some gravel, trace clay, very moist with occasional wet seams	3.8	5	SS
16 / 5			6	SS
18 / 5.5				
20 / 6		325.9		
20 / 6	**SILT TILL** dense to very dense brown silt, some gravel and clay, trace sand, very moist to moist	6.1	7	SS
22 / 6.5				
24 / 7		324.4		
24 / 7	occasional cobbles and boulders	7.6	8	SS
26 / 8				
28 / 8.5		322.9		
30 / 9		9.1	9	



Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Notes:
Auger refusal at 10.1mbgs on suspected bedrock

ID No.: BH502-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 2/28/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile				Sample		Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type				
32		**SAND AND GRAVEL** very dense brown sand and gravel, trace silt, occasional cobbles, damp to moist		9	SS	50/100mm		4	
10			321.9	10	SS	50/50mm		8	
34		Drilling Terminated	10.1						
36									
38									
12 40									
42									
44									
14 46									
48									
50									
16 52									
54									
56									
58									
18 60									

Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Notes:
Auger refusal at 10.1mbgs on suspected bedrock

ID No.: BH503-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 2/28/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mounted

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone – Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	328.6						
		TOPSOIL dark brown sandy silt, frozen (380mm)	0.0 328.2						
2			0.4 327.8						
		SAND AND GRAVEL brown sand and gravel, some silt, occasional cobbles, moist	0.8	1	SS	22		3	Cuttings
4		compact to very dense	327.1						
		numerous cobbles	1.5	2	SS	62		5	
6									
2 m				3	SS	50/50mm		4	Bentonite
8									
10			325.6			50/0mm		5	Dry Cave
		Drilling Terminated	3.0						Borehole dry upon drilling completion
12									
4 m									
14									
16									
18									
6 m									
20									
22									
24									
26									
8 m									
28									
30									

Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Notes:
Auger refusal at 3.0mbgs on suspected bedrock

ID No.: BH504-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
0 / 0		Ground Surface	323.4						
0 / 0		**FILL (TOPSOIL)** dark brown sandy silt, frozen (760mm)	0.0	1	GS			4	
			322.6						
2 /		**FILL** loose dark brown gravelly silt, some sand and organics, wet	0.8 / 322.2	2	SS	8		32	
4 /			1.2			82/100mm			
		GRAVELLY SILT TILL compact to very dense brown gravelly silt, some sand, trace clay, moist	321.7	3	SS			5	
6 / 2			1.7						
		BEDROCK limestone	321.3 / 2.1						
8 /		Drilling Terminated							
10 /									
12 / 4									
14 /									
16 /									
18 /									
20 / 6									
22 /									
24 /									
26 / 8									
28 /									
30 /									

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content %: 10 20 30

Groundwater Observations and Standpipe Details: Cuttings; Bentonite; Dry Cave

Borehole dry upon drilling completion

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Notes:
Bedrock outcrops visible on slope near borehole.

ID No.: BH505-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

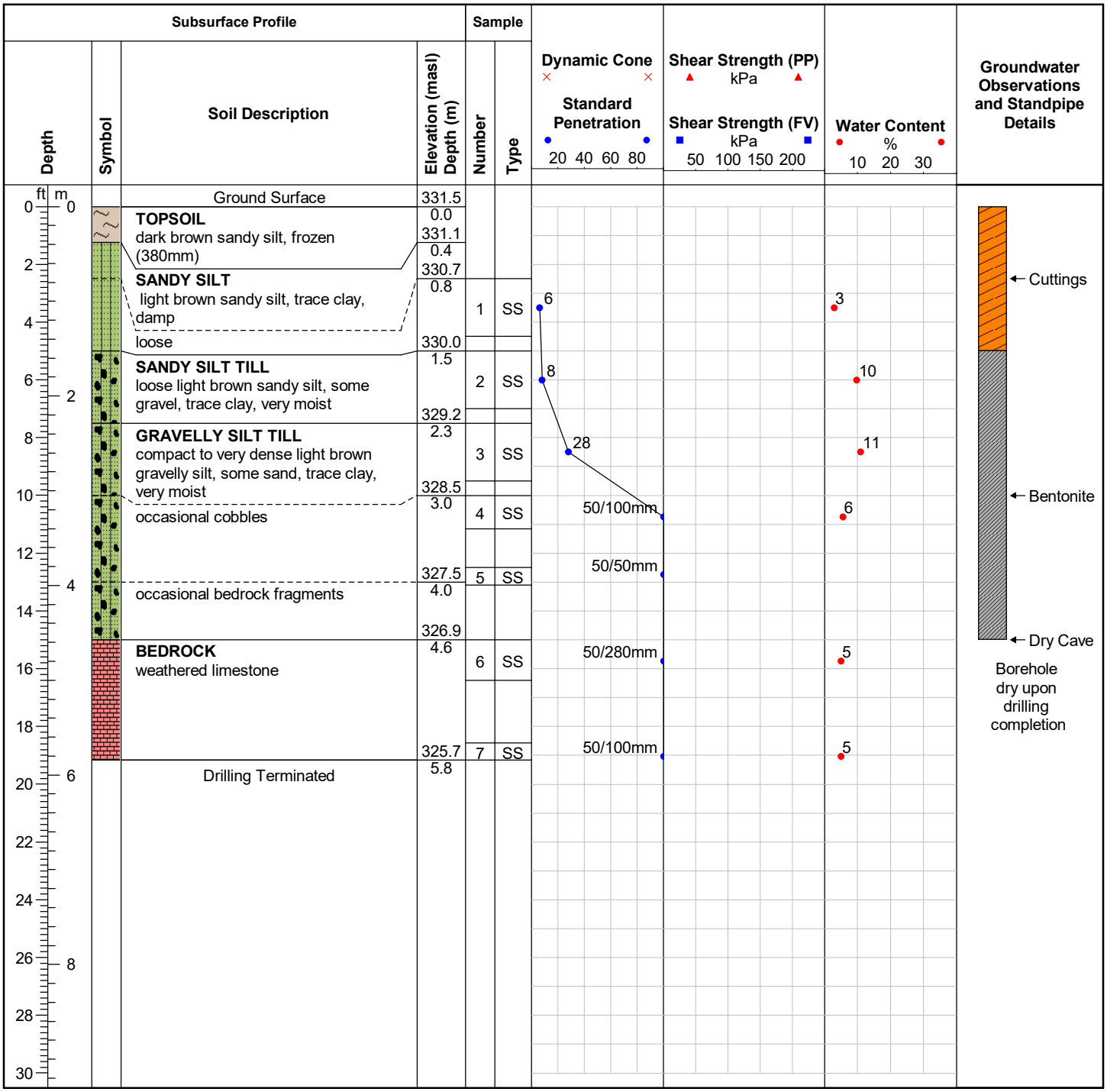
Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Notes:
Auger refusal at 5.8mbgs on suspected bedrock

Sheet: 1 of 1

ID No.: BH506-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

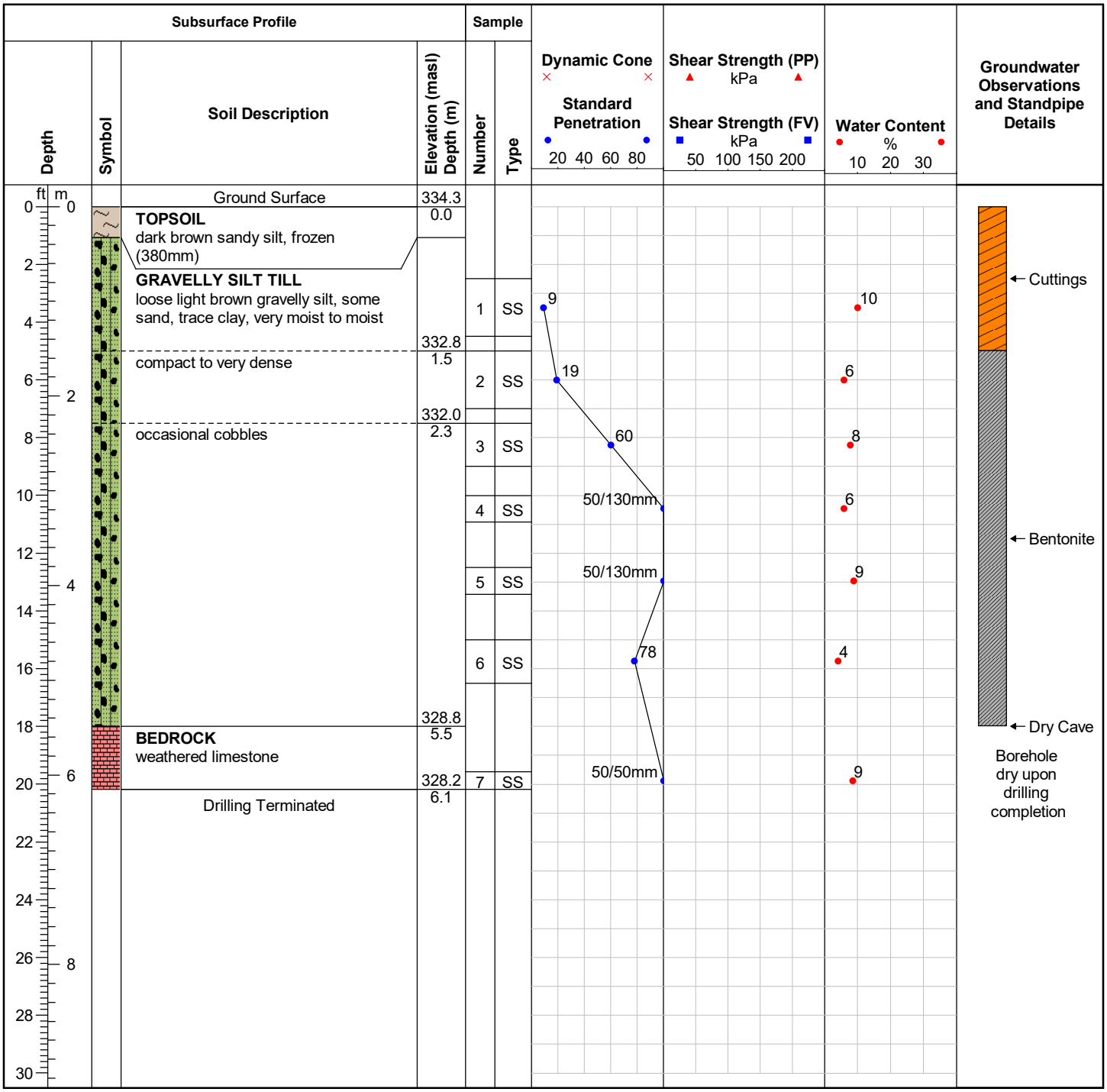
Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

Notes:
Auger refusal at 6.1mbgs on suspected limestone bedrock

ID No.: MW507A-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/2/2022

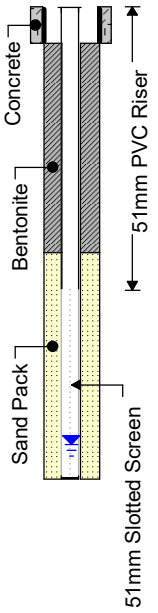
Drilling Contractor: Envirocore

Drill Rig: D50T Track

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	332.1						
0		**TOPSOIL** dark brown sandy silt, frozen (360mm)	0.0 / 331.7						
0.4									
2 ft / 0.6 m		**SILT TILL** brown silt, some sand and gravel, trace clay, wet to very moist							
2 m									
6 ft / 1.8 m			329.8						
8 ft / 2.3 m		**GRAVELLY SILT TILL** brown gravelly silt, some sand, trace clay, wet	2.3						
12 ft / 3.7 m			328.3						
4 m		Drilling Terminated	3.8						
14 ft / 4.3 m									
16 ft / 4.9 m									
18 ft / 5.5 m									
6 m									
20 ft / 6.1 m									
22 ft / 6.7 m									
24 ft / 7.3 m									
26 ft / 7.9 m									
8 m									
28 ft / 8.5 m									
30 ft / 9.1 m									



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

Notes:
Stratigraphy inferred from Borehole MW507B-22.
Water measured at 3.5mbgs (Elevation 328.6masl) on July 5, 2022.

ID No.: MW507B-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/2/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

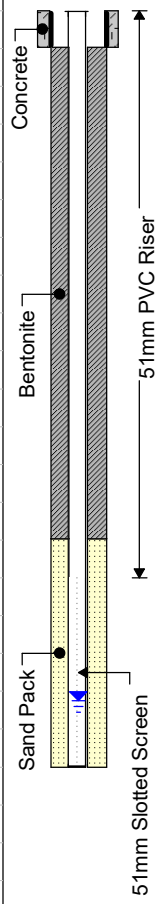
Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
	Ground Surface	332.2					
0 / 0	**TOPSOIL** dark brown sandy silt, frozen (360mm)	0.0 / 331.8					
		0.4 / 331.4					
2 /	**SILT TILL** brown silt, some sand and gravel, trace clay, wet to very moist compact	0.8	1	SS	15		17
4 /			2	SS	17		11
6 / 2		329.9					
8 /	**GRAVELLY SILT TILL** compact brown gravelly silt, some sand, trace clay, wet	2.3	3	SS	18		10
10 /			4	SS	28		12
12 /		328.4					
14 / 4	**SILT TILL** compact brown silt, some gravel and sand, trace clay, very moist with occasional saturated sand seams	3.8	5	SS	19		10
16 /			6	SS	26		10
18 /							
20 / 6		326.1	7	SS	50/100mm		13
	SANDY SILT TILL very dense light brown sandy silt, some gravel, saturated	6.1					
22 /	Drilling Terminated						
24 /							
26 / 8							
28 /							
30 /							

Dynamic Cone: Standard Penetration — 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa — 50 100 150 200

Water Content % — 10 20 30

Groundwater Observations and Standpipe Details



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

Notes:
Auger refusal at 6.2mbgs on suspected bedrock.
Water encountered at 3.8mbgs during drilling.
Water measured at 5.6mbgs (Elevation 326.6masl) on July 5, 2022.

ID No.: BH508-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/3/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	339.9					
	TOPSOIL dark brown sandy silt, frozen (330mm)	0.0 / 339.1					
2	**SANDY SILT TILL** brown sandy silt, some gravel,trace clay, very moist	0.8	1	SS	4		14
4	loose, saturated	338.4					
6 / 2	compact, occasional cobbles, very moist	1.5 / 337.6	2	SS	15		12
8	**SILT TILL** compact to very dense light brown silt, some sand and gravel, trace clay, very moist	2.3	3	SS	19		15
10			4	SS	50/100mm		10
12 / 4	occasional saturated sand seams	336.1 / 3.8	5	SS	50/130mm		8
14		335.3					
16	**SANDY SILT TILL** very dense brown sandy silt, some gravel, trace clay, moist to very moist	4.6	6	SS	50/100mm		8
18							
20 / 6			7	SS	50/100mm		11
22							
24							
26 / 8		332.1	8	SS	50/25mm		6
28	Drilling Terminated	7.8					
30							

Groundwater Observations and Standpipe Details: Cuttings; Bentonite; Wet Cave; Water encountered at 0.8 and 3.8mbgs during drilling

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: A. Challis

Sheet: 1 of 1

ID No.: BH509-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

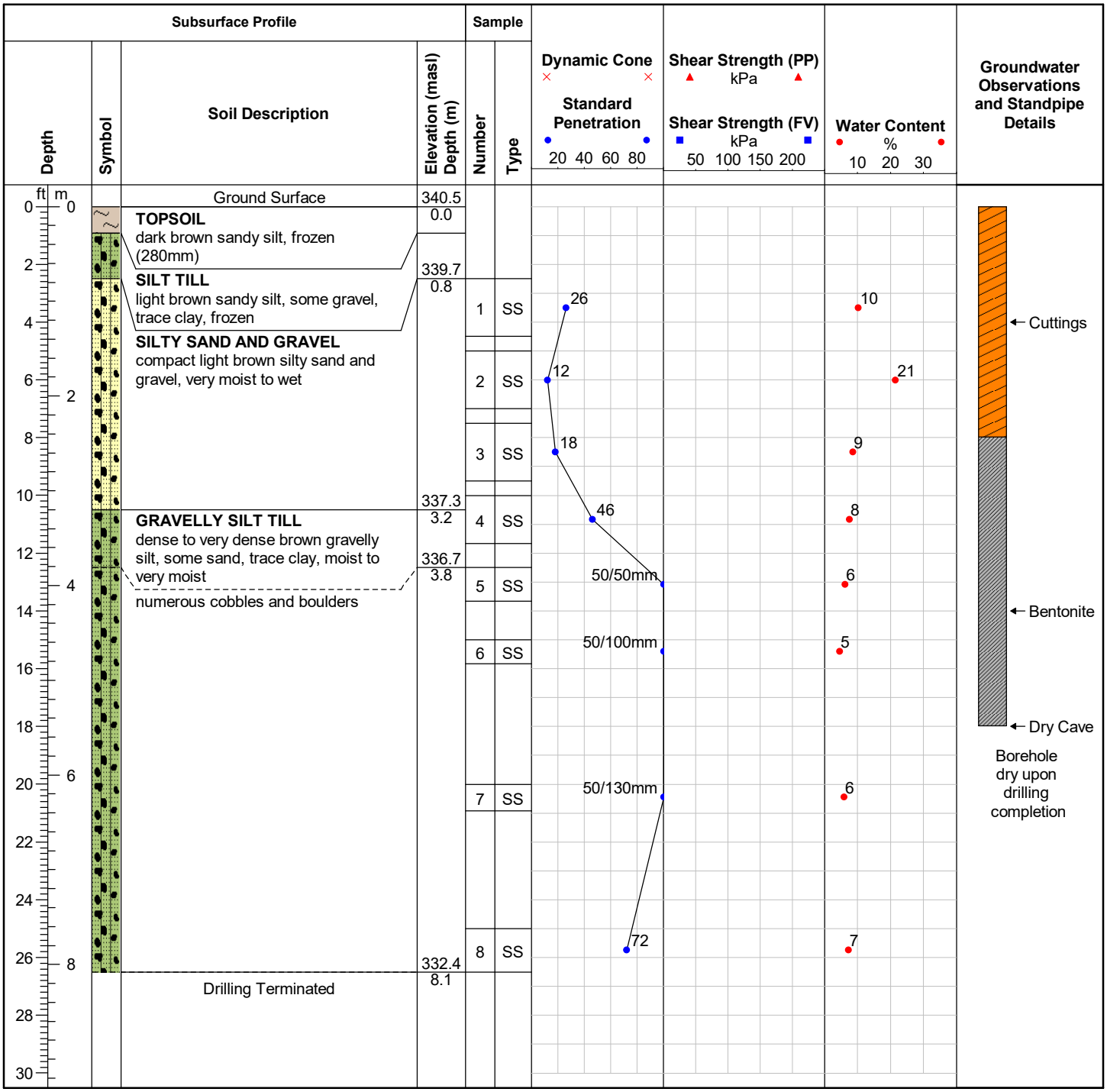
Date Completed: 3/3/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: BH510-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

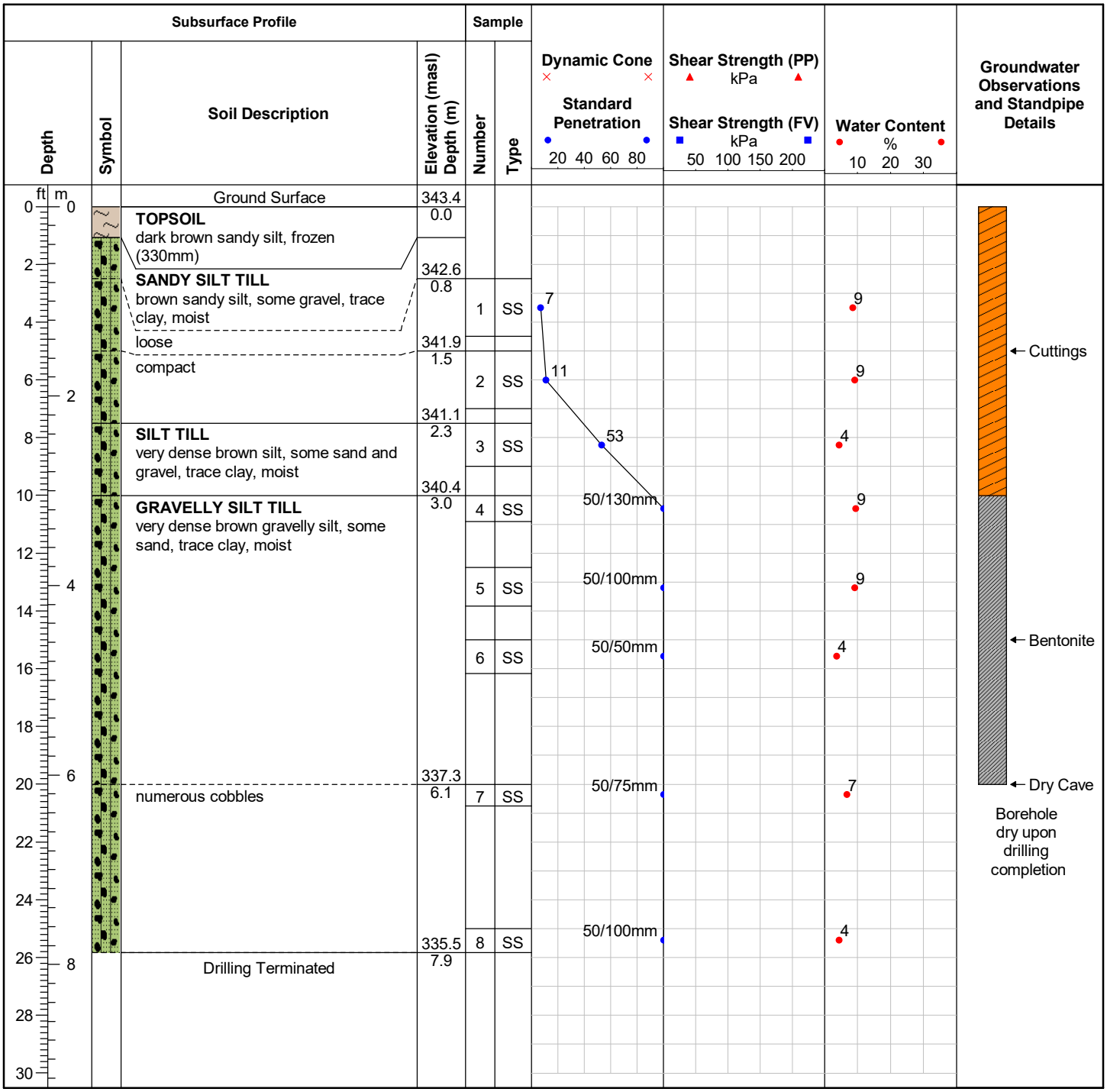
Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: BH511-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/2/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

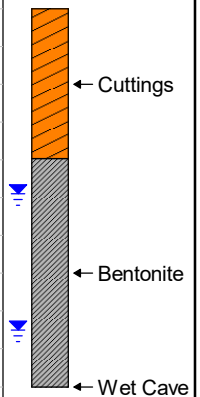
Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	336.9					
	FILL (TOPSOIL) dark brown sandy silt, frozen (50mm)	0.0 / 336.1					
2 /	**FILL** dark brown sandy silt, some organics, trace gravel, frozen/wet	0.8 / 335.4	1	SS	2		11
4 /	**SILT AND SAND TILL** very loose light brown silt and sand, trace to some gravel, wet	1.5 / 334.6	2	SS	12		14
6 / 2	compact, saturated						
8 /	**SILT TILL** compact brown silt, some gravel and sand, trace clay, very moist	2.3 / 333.9	3	SS	23		10
10 /	50mm saturated sand seam	3.0 / 332.3	4	SS	72		11
12 / 4	**SANDY SILT TILL** very dense brown sandy silt, some gravel, trace clay, very moist		5	SS	50/75mm		12
14 /							
16 /	**GRAVELLY SANDY SILT TILL** very dense brown gravelly sandy silt, trace clay, very moist	4.6 / 330.3	6	SS	50/130mm		10
18 /							
20 / 6			7	SS	77		9
22 /	Drilling Terminated	6.6					
24 /							
26 / 8							
28 /							
30 /							

Dynamic Cone: Standard Penetration (20 40 60 80)

Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)

Water Content % (10 20 30)

Groundwater Observations and Standpipe Details



Water encountered at 1.5 and 2.6mbgs during drilling

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

MTE

ID No.: MW512A-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mounted

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

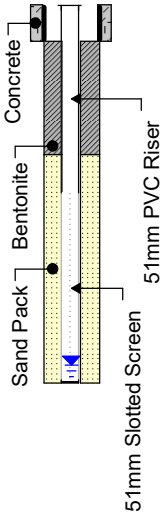
Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type
0 / 0	Ground Surface	335.5		
0 / 0	**TOPSOIL** dark brown sandy silt, frozen (250mm)	0.0		
2 /	**SILT TILL** light brown silt, some sand and gravel, trace clay, wet			
4 /		334.0		
6 / 2	occasional saturated sand seams	1.5		
8 /	**SANDY SILT TILL** brown sandy silt, some gravel, trace clay, saturated	333.2 2.3		
10 /		332.5		
12 / 4	Drilling Terminated	3.0		
14 /				
16 /				
18 /				
20 / 6				
22 /				
24 /				
26 / 8				
28 /				
30 /				

Dynamic Cone / Standard Penetration: 20 40 60 80

Shear Strength (PP) kPa / Shear Strength (FV) kPa: 50 100 150 200

Water Content %: 10 20 30

Groundwater Observations and Standpipe Details



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

Notes:
Stratigraphy inferred from Borehole MW512B-22.
Water measured at 2.9mbgs (Elevation 332.6masl) on July 5, 2022.

ID No.: MW512B-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/1/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mounted

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft)	Depth (m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type
0	0	Ground Surface	335.5		
		TOPSOIL dark brown sandy silt, frozen (250mm)	0.0 / 334.7		
2		**SILT TILL** light brown silt, some sand and gravel, trace clay, wet	0.8	1	SS
4		loose	334.0		
6	2	occasional saturated sand seams	1.5 / 333.2	2	SS
8		**SANDY SILT TILL** compact brown sandy silt, some gravel, trace clay, saturated	2.3 / 332.5	3	SS
10		**GRAVELLY SILT TILL** very dense brown gravelly silt, some sand, trace clay, moist to very moist	3.0	4	SS
12	4			5	SS
14					
16				6	SS
18					
20	6		329.4		
		SANDY SILT TILL very dense brown sandy silt, some gravel, trace clay, very moist	6.1 / 328.8	7	SS
22		**SILTY SAND** brown silty sand, saturated	6.7		
24			327.9		
26	8	dense	7.6 / 327.4	8	SS
		Drilling Terminated	8.1		
28					
30					

Dynamic Cone / Standard Penetration (20 40 60 80): 5, 8, 17, 50, 50/130mm, 50/50mm, 76, 36

Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)

Water Content % (10 20 30): 10, 10, 22, 4, 7, 6, 4, 10

Groundwater Observations and Standpipe Details

Concrete

Bentonite

Sand Pack

51mm PVC Riser

51mm Slotted Screen

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Notes:
Water encountered at 1.5 and 6.7mbgs during drilling.
Water measured at 3.3mbgs (Elevation 332.2masl) on July 5, 2022.

ID No.: BH513-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

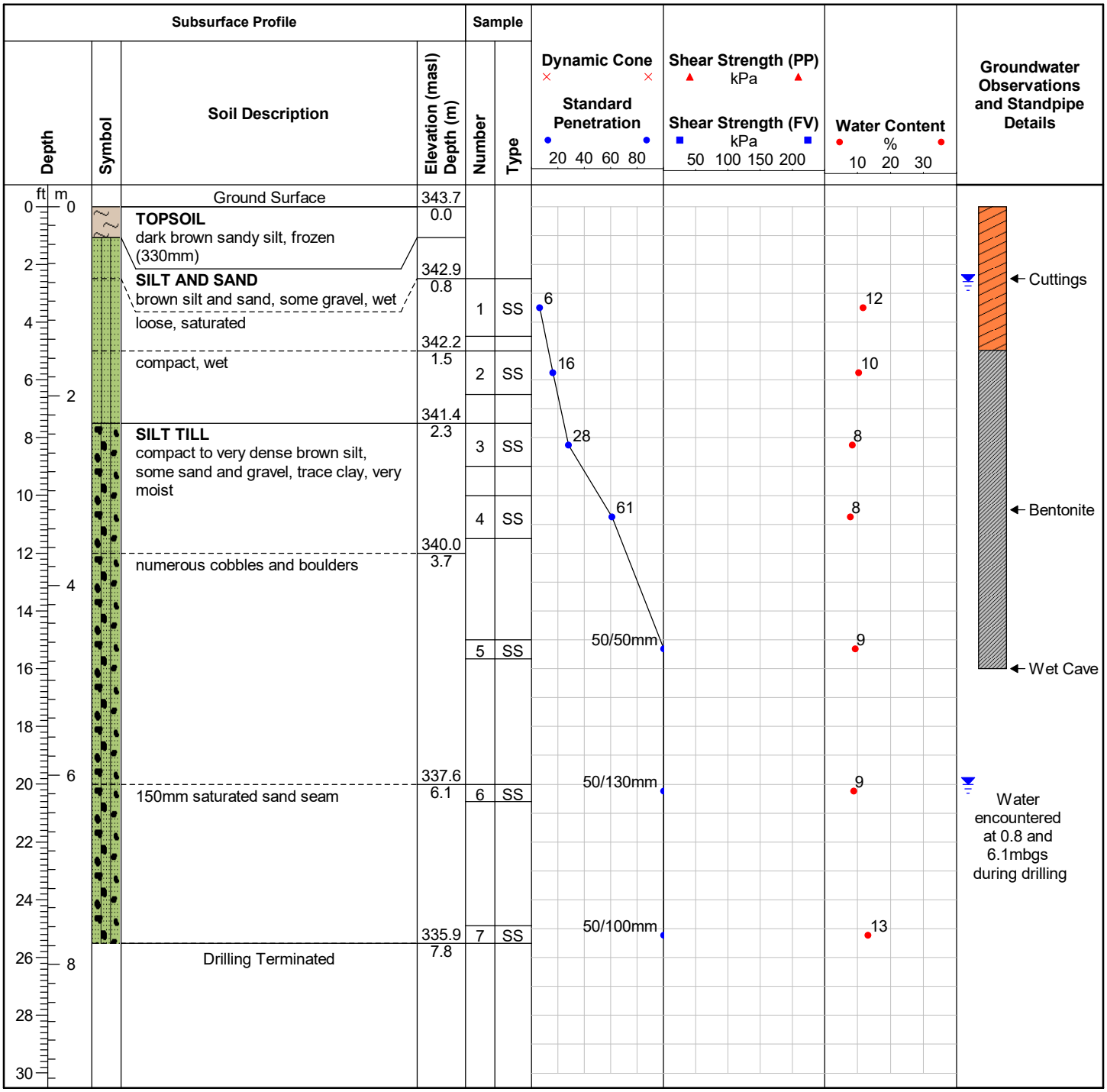
Date Completed: 3/7/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: MW514-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/3/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
	Ground Surface	344.6					
0	**TOPSOIL** dark brown sandy silt, frozen (360mm)	0.0 / 344.2 / 0.4					
2	**SANDY SILT TILL** brown sandy silt, some gravel, trace clay, moist	343.8 / 0.8	1	SS	16		11
4	compact to dense	343.1					
6	occasional cobbles	1.5	2	SS	35		7
		342.3					
8	**GRAVELLY SILT TILL** dense to very dense brown gravelly silt, some sand, trace clay, moist	2.3	3	SS	46		5
10	numerous cobbles and boulders	341.6 / 3.0	4	SS	50/130mm		8
12	**SANDY GRAVELLY SILT TILL** very dense brown sandy gravelly silt, trace clay, numerous boulders, very moist	340.9 / 3.7	5	SS	50/100mm		6
16			6	SS	50/130mm		6
20	wet to saturated	338.3 / 6.3	7	SS	50/130mm		7
22			8	SS	50/50mm		13
24		337.0					
26	**GRAVELLY SILT TILL** very dense brown gravelly silt, some sand, trace clay, very moist	7.6	9	SS	50/75mm		7
28	Drilling Terminated						
30							

Groundwater Observations and Standpipe Details: Concrete; Bentonite; Sand Pack; 51mm PVC Riser; 51mm Slotted Screen

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: A. Challis

Notes:
Water encountered at 6.3mbgs during drilling.
Water measured at 2.5mbgs (Elevation 342.1masl) on July 5, 2022.

ID No.: BH515-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

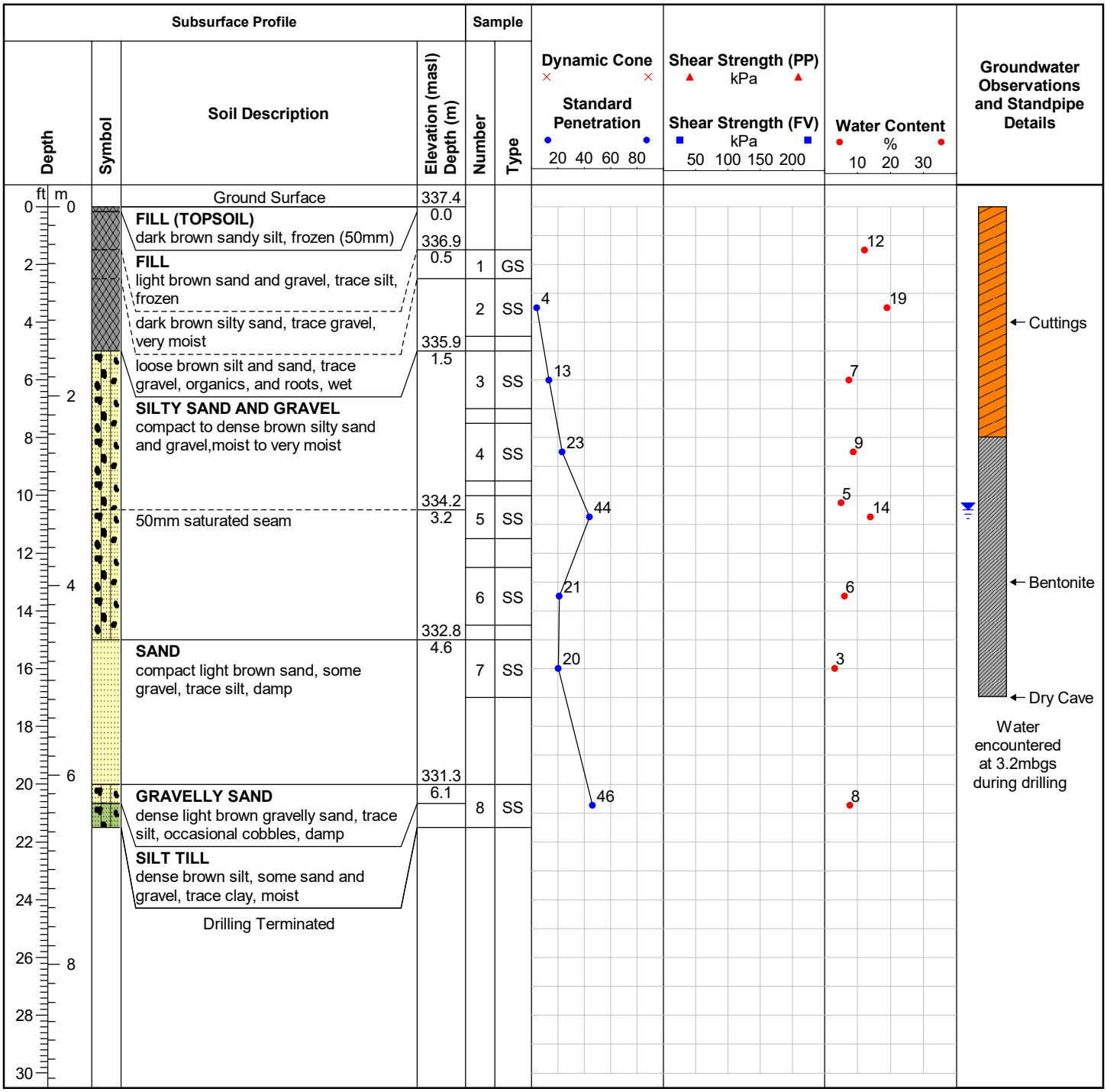
Date Completed: 3/2/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: BH516-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/7/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone – Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 ft / 0 m		Ground Surface	330.1						
		TOPSOIL dark brown sandy silt, frozen (250mm)	0.0						
		SAND loose light brown sand, trace to some gravel and silt, very moist to wet		1	SS	9		13	
			328.6						
		compact	1.5	2	SS	10		12	
				3	SS	11		12	
			327.1						
		loose	3.0	4	SS	7		10	
			326.3						
		compact	3.8	5	SS	15		10	
				6	SS	16		10	
			325.1						
		Drilling Terminated	5.0						

Groundwater Observations and Standpipe Details: ← Cuttings; ← Bentonite; ← Dry Cave

Borehole dry upon drilling completion

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

MTE

ID No.: BH517-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

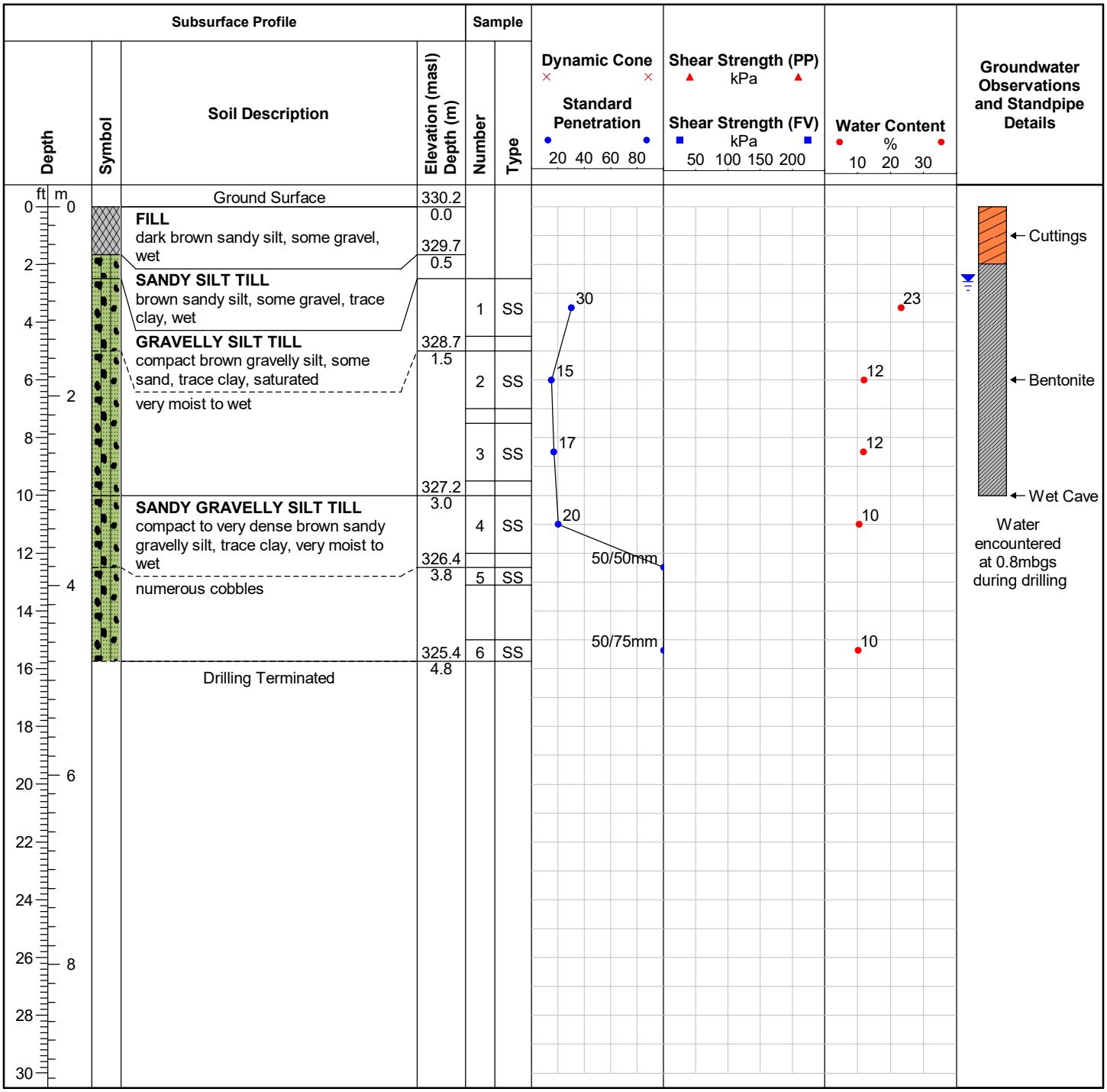
Date Completed: 3/7/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: BH518-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

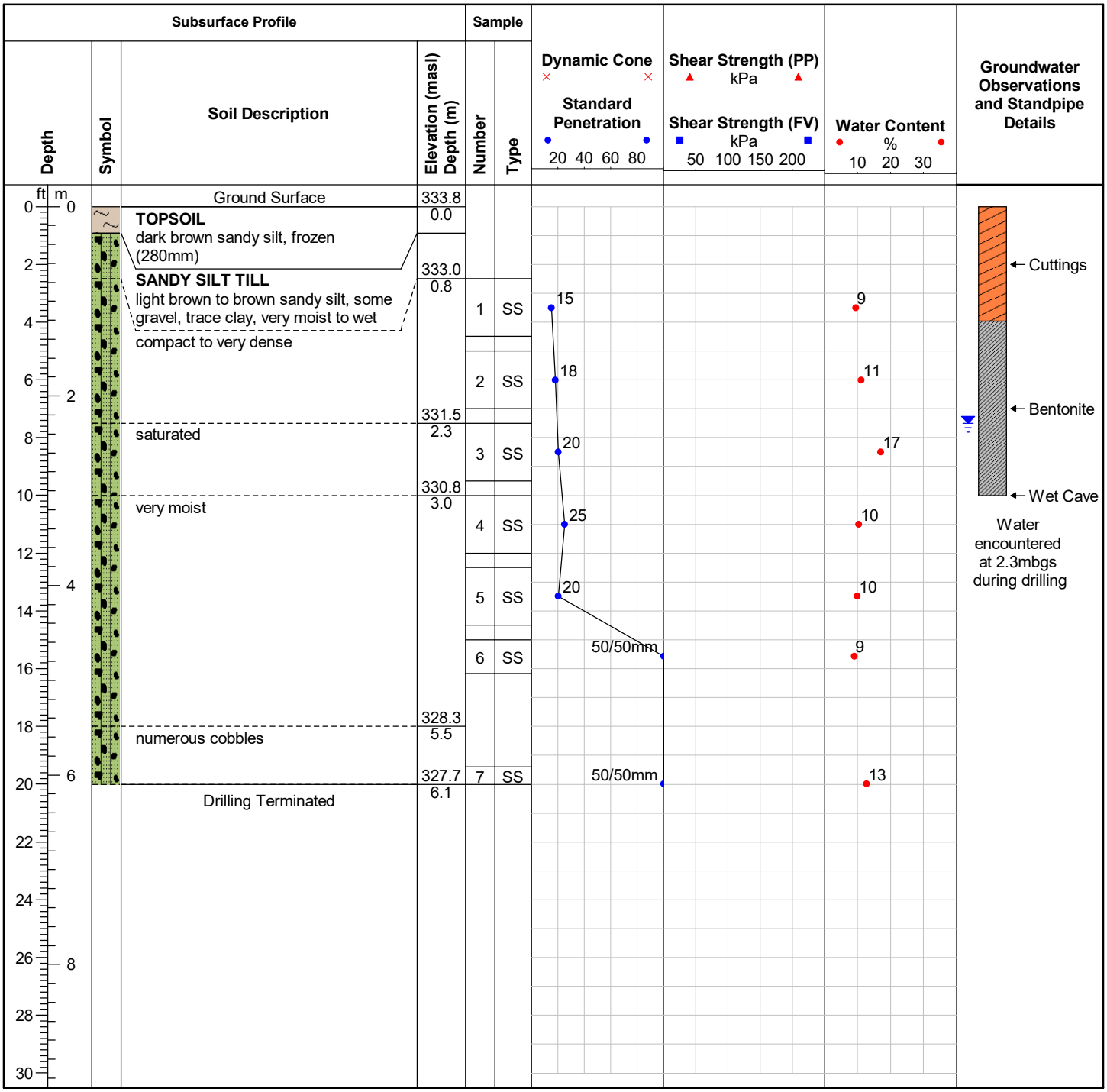
Date Completed: 3/7/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A



Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

ID No.: BH519-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/7/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %	Groundwater Observations and Standpipe Details
		Ground Surface	332.3						
0 / 0		**FILL (TOPSOIL)** dark brown sandy silt, frozen (760mm)	0.0 / 331.5						
2		**FILL** very loose dark brown silt and sand, trace gravel, wet	0.8 / 330.8	1	SS	3		16	Cuttings
6 / 2		**SILTY SAND AND GRAVEL** compact light brown silty sand and gravel, wet	1.5 / 330.0	2	SS	10		19	
8		**SAND AND GRAVEL** compact to very dense light brown to brown sand and gravel, some silt, moist	2.3	3	SS	17		4	
10				4	SS	26		4	Bentonite
12 / 4				5	SS	27		6	
14			327.7						
16		saturated	4.6	6	SS	25		21	Wet Cave
18									Water encountered at 4.6mbgs during drilling
20 / 6			326.2						
22		occasional cobbles and boulders, very moist	6.1	7	SS	50/130mm		10	
24									
26 / 8			324.2	8	SS	65		14	
28		Drilling Terminated	8.1						
30									

Standard Penetration: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Water Content %: 10 20 30

Field Technician: M. Dalgliesh

Drafted by: A. Challis

Reviewed by: D. Gonser

MTE

ID No.: MW520-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 3/2/2022

Drilling Contractor: Envirocore

Drill Rig: D50T Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone – Standard Penetration (blows)	Shear Strength (PP) kPa / Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	332.0					
	TOPSOIL dark brown sandy silt, some gravel (330mm)	0.0 / 331.2					
2	**GRAVELLY SILT TILL** light brown gravelly silt, some sand, trace clay, moist to very moist	0.8	1	SS	22		5
4	compact, occasional cobbles	330.5					
6 / 2	**SAND AND GRAVEL** compact to very dense brown sand and gravel, trace to some silt, very moist to moist	1.5	2	SS	25		14
8	numerous cobbles	329.7 / 2.3	3	SS	61		4
10			4	SS	50/130mm		7
12		328.2					
14 / 4	**SAND** compact light brown fine sand, some silt, very moist	3.8 / 327.4	5	SS	27		12
16	**SILTY SAND** dense to very dense light brown silty sand, trace to some gravel, wet	4.6	6	SS	32		20
18	saturated		7	SS	50/100mm		13
20 / 6			8	SS	50/75mm		15
22		324.4					
24							
26 / 8	**SAND** very dense light brown sand, some silt, trace gravel, occasional cobbles, saturated	7.6	9	SS	50/100mm		15
28	Drilling Terminated						
30							

Groundwater Observations and Standpipe Details: Concrete; Bentonite; 51mm PVC Riser; Sand Pack; 51mm Slotted Screen

Field Technician: M. Dalgliesh

Drafted by: H. Sandhu

Reviewed by: D. Gonser

Sheet: 1 of 1

Notes:
Water encountered at 4.9mbgs during drilling.
Water measured at 6.4mbgs (Elevation 325.6masl) on July 5, 2022.

ID No.: MW601-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/24/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 / 0	Ground Surface	329.5						Concrete
	TOPSOIL dark brown sandy silt, frozen (380mm)	0.0 / 329.1 / 0.4 / 328.7						
2 /	**SAND AND GRAVEL** brown sand and gravel, some silt, moist	0.8	1	SS	26		3	
4 /	compact	328.0						
6 / 2	**SAND** compact to very dense brown sand, trace gravel and silt, moist	1.5	2	SS	19		3	
8 /			3	SS	52		4	
10 /			4	SS	61		3	
12 / 4			5	SS	40		3	
14 /		324.9						Bentonite
16 /	**GRAVELLY SAND** compact brown gravelly sand, trace silt, moist	4.6	6	SS	21		3	
18 /								
20 / 6			7	SS	22		4	
22 /								
24 /		321.9						
26 / 8	**SAND** dense brown sand, trace gravel, moist	7.6	8	SS	30		5	
28 /								
30 /		320.3 / 9.1						51mm PVC Riser

Field Technician: TXG

Drafted by: TXG

Reviewed by: D. Gonser

Notes:
Soil descriptions assumed from MW501-22

ID No.: MW601-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/24/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument Casing

Depth	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
32									
10		**SAND AND GRAVEL** very dense brown sand and gravel, trace silt, occasional cobbles, moist		9	SS	51		5	
34									
36			318.4	10	SS	50/80mm		8	
38		**LIMESTONE** Limestone Bedrock	11.1						
12									
40			317.3						
		Drilling Terminated	12.2						
42									
44									
46									
14									
48									
50									
52									
16									
54									
56									
58									
18									
60									

Sand Pack

51mm Slotted Screen

Field Technician: TXG

Drafted by: TXG

Reviewed by: D. Gonser

Notes:
Soil descriptions assumed from MW501-22

ID No.: MW602-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/25/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

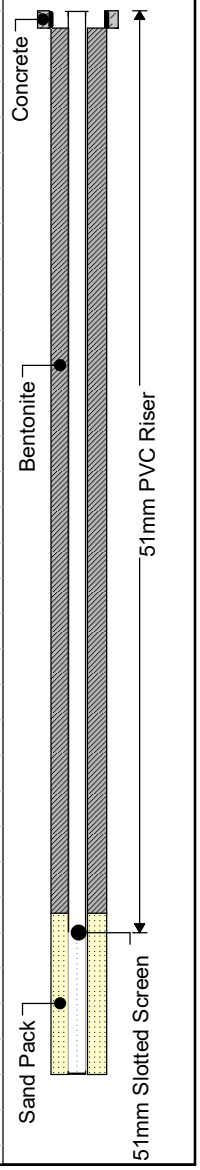
Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (Dynamic Cone)	Shear Strength (PP) kPa	Shear Strength (FV) kPa	Water Content %
0 / 0	Ground Surface	330.4						
0 / 0	**TOPSOIL** Brown topsoil, organic, trace gravel (250mm)	0.0	1	SS	11			13
2 /	**SAND AND GRAVEL** Dense to very dense brown sand and gravel, trace silt, very moist to damp.		2	SS	63			5
4 /			3	SS	78			
6 / 2			4	SS	53			3
8 /			5	SS	62			2
10 /			6	SS	50/130mm			4
12 / 4			7	SS	37			3
14 /								
16 /								
18 /		324.3						
20 / 6	**SANDY SILT TILL** Hard, light brown sandy silt till, trace gravel, moist.	6.1	8	SS	50/130mm			10
22 /	**GRAVEL** Cobbles (no sample)	323.1						
24 /	**LIMESTONE** Assumed bedrock	7.3						
26 / 8								
28 /								
30 /	Drilling Terminated	321.2 / 9.1						
32 /								

Groundwater Observations and Standpipe Details



Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes:

Sheet: 1 of 1

ID No.: MW603-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/25/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

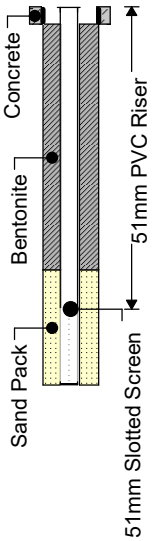
Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)
0 / 0		Ground Surface	336.4					
		TOPSOIL Dark brown topsoil, trace organics, moist (150mm)	0.0	1	SS	16		4
2 /		**SILTY SAND** Compact to dense, light grey silty sand, trace gravel, damp		2	SS	29		4
6 / 2				3	SS	46		
			334.1					
8 /		**SANDY SILT TILL** Hard, greyish brown sandy silt till, trace gravel,very moist.	2.3	4	SS	38		
10 /				5	SS	50/130mm		9
12 / 4				6	SS	50/130mm		13
14 /								
16 /				7	SS	50/140mm		12
18 /			330.9					
		Drilling Terminated	5.5					
20 / 6								
22 /								
24 /								
26 / 8								
28 /								
30 /								

Groundwater Observations and Standpipe Details



Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes: Auger refusal at 5.5 m, inferred bedrock

Sheet: 1 of 1

ID No.: MW604-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/21/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Depth (ft)	Depth (m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
			Ground Surface	343.0						
0	0		**TOPSOIL** Dark brown topsoil, sandy silt, moist (250mm)	0.0	1	SS	9		8	Concrete
2			**SILTY SAND** Compact to very dense brown silty sand, trace gravel, occasional cobbles, moist		2	SS	13		9	
6	2				3	SS	12		10	
8					4	SS	36		9	Bentonite
10					5		50/130mm		7	
12	4				6	SS	50/76mm		7	
14			grey	338.4 / 4.6	7		50/130mm		7	
18										
20	6				8	SS	50/50mm		7	
22										
24										
26	8				9		50/130mm		6	51mm PVC Riser
28										
30					10					

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes:

ID No.: MW604-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

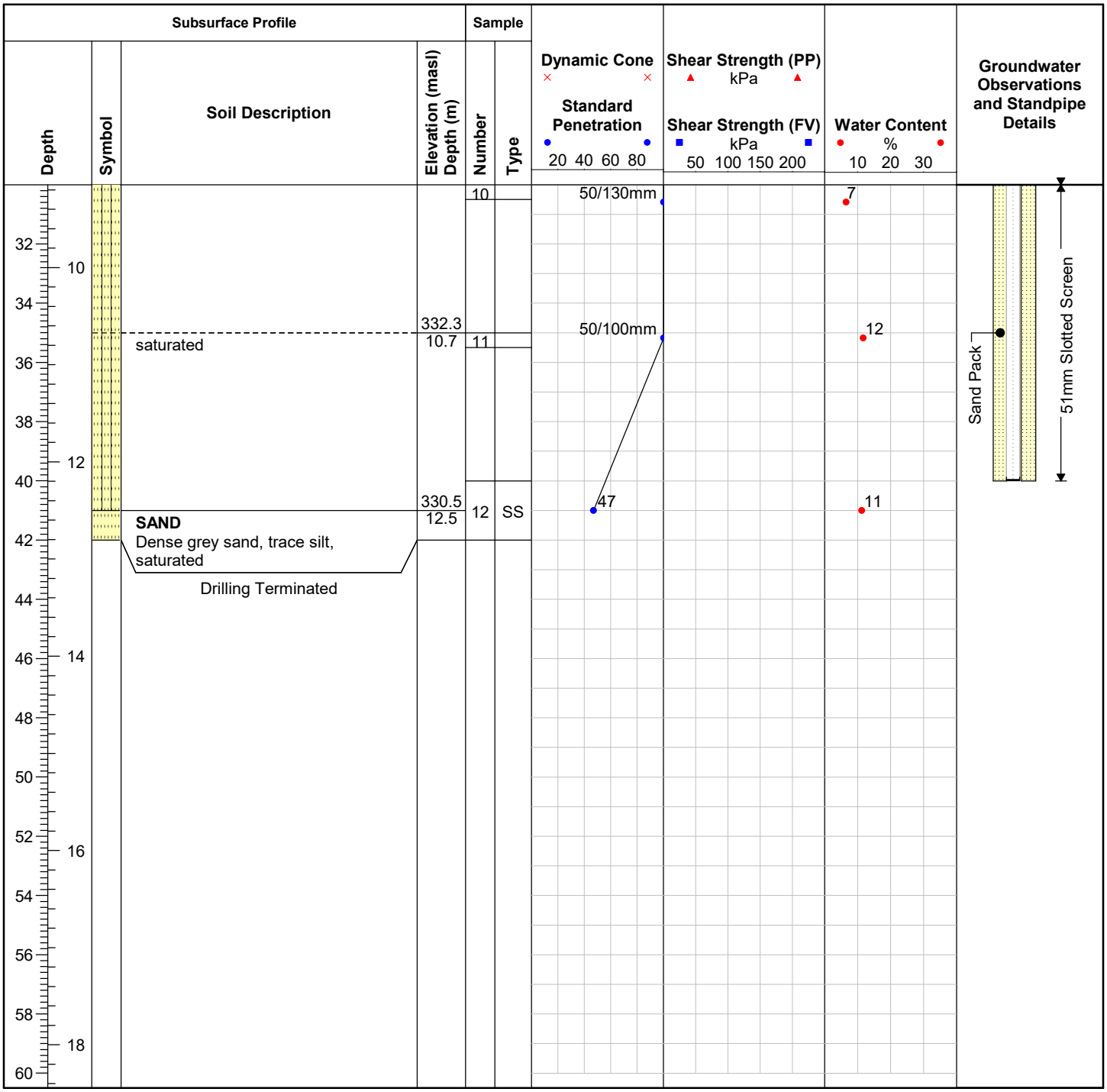
Date Completed: 10/21/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument



Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes:

Sheet: 2 of 2

ID No.: MW605-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/20/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

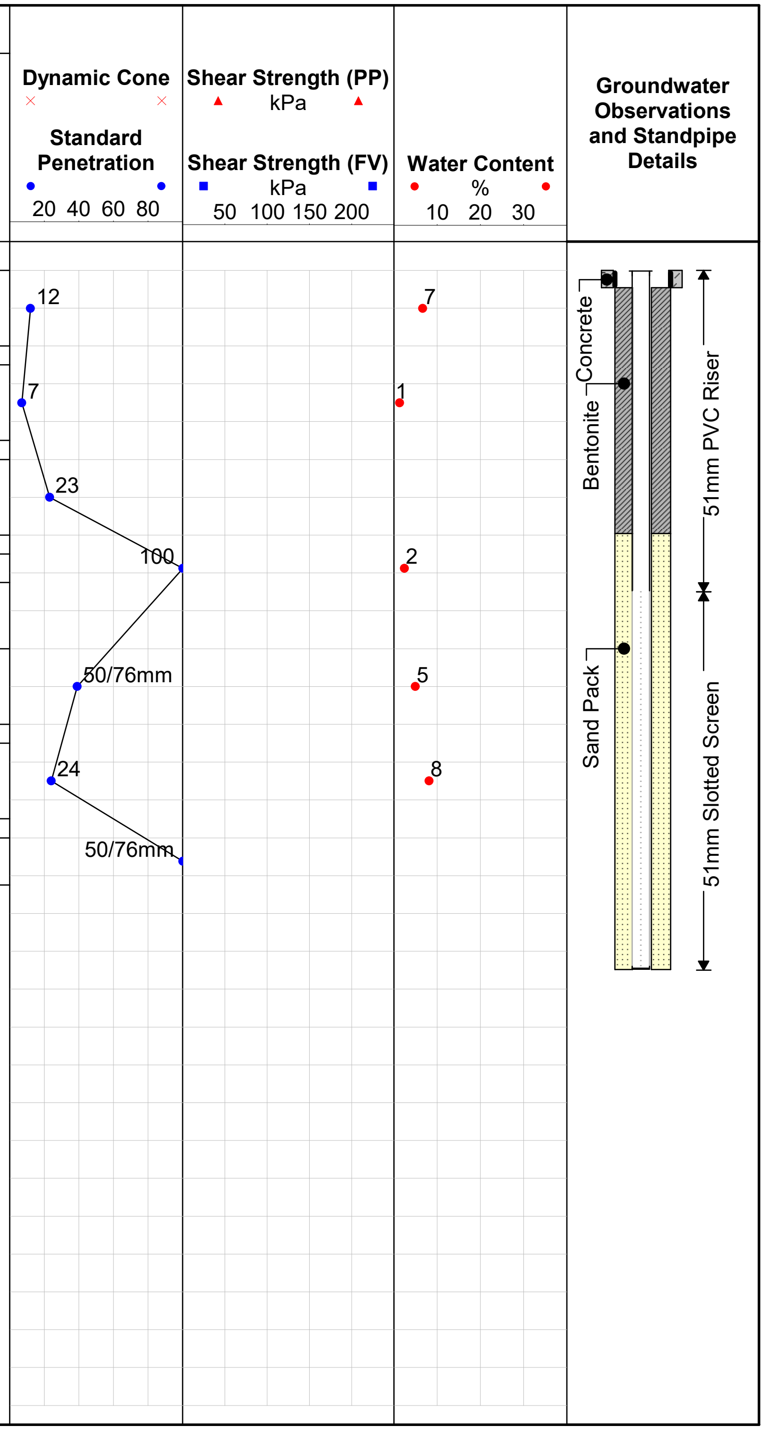
Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Subsurface Profile

Elevation (masl) / Depth (m)	Soil Description	Sample Number	Sample Type
332.2	Ground Surface		
0.0	**TOPSOIL** Dark brown topsoil, sandy silt (150mm)	1	SS
	SAND Loose to compact brown sand, some gravel, damp	2	SS
330.3 / 1.9	**SAND AND GRAVEL** Compact to very dense brown sand, moist	3	SS
329.8 / 2.4	large cobbles	4	SS
		5	SS
		6	SS
327.5 / 4.7	saturated	7	SS
326.6 / 5.6	Drilling Terminated		



Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes: Auger refusal at 5.6 m - inferred bedrock

Sheet: 1 of 1

ID No.: MW606-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

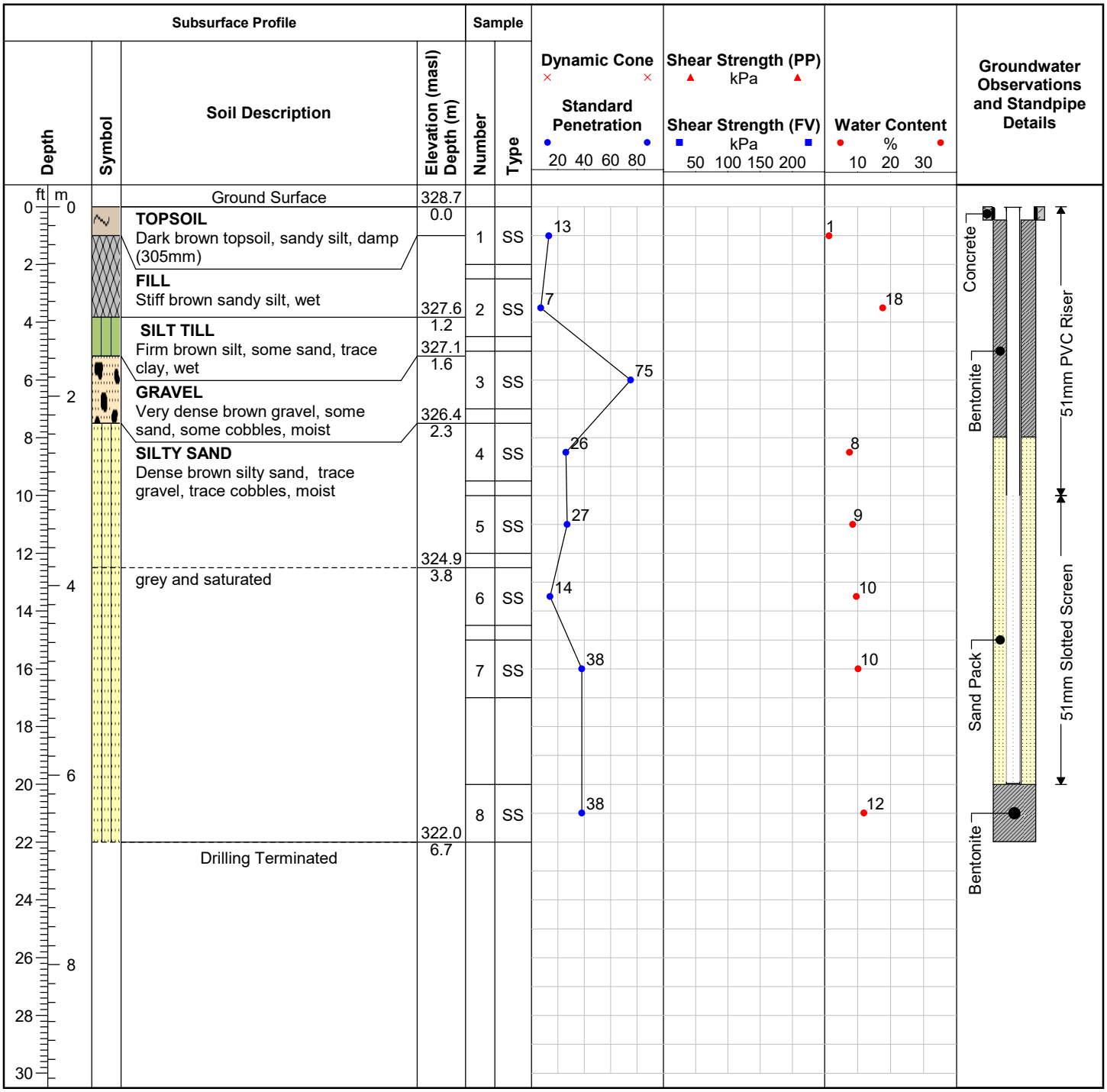
Date Completed: 10/21/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument



Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes:

Sheet: 1 of 1

ID No.: MW607-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 10/20/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	337.8						
0		**TOPSOIL** Dark brown topsoil, silty sand, trace organics	0.0	1	SS	90	metals, PAH		
2		**FILL** Brown silty sand fill, trace gravel		2	SS	90			
4			336.1						
6 / 2		**SAND** Brown sand, trace to some gravel, trace silt	1.7	3	SS	75			
			335.5						
8		**SAND AND GRAVEL** Brown sand and gravel, trace silt	2.3	4	SS	50	PHC, BTEX, pH		
10				5	SS	50			
12 / 4									
14				6	SS	50			
16				7	SS	100			
18									
20 / 6			331.5	8	SS	100			
22		**SANDY SILT TIL** Brown sandy silt	6.3						
24			330.2						
26 / 8		**SAND AND GRAVEL** Brown sand and gravel	7.6	9	SS	100			
28			328.6						
30			9.1	10					

Concrete

Bentonite

51mm PVC Riser

Sand Pack

51mm Slotted Screen

Field Technician: TXG

Drafted by: TXG

Reviewed by:

Notes:

ID No.: MW607-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 10/20/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: Monument

Subsurface Profile			Sample					Headspace	
Depth	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	Well Completion Details
32		saturated		10	SS	100			
34			327.1						
36		**SANDY SILT TILL** Grey sandy silt, trace gravel	10.7	11	SS	100			
38		Drilling Terminated							
40									
42									
44									
46									
48									
50									
52									
54									
56									
58									
60									

10 12 14 16 18

Field Technician: TXG

Drafted by: TXG

Reviewed by:

Notes:

Sheet: 2 of 2

ID No.: BH608-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/26/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile				Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis		PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	333.2							
		TOPSOIL Dark brown sandy topsoil, some silt	0.0 / 332.8	1	SS	100	metals, OCP, PAH, PHC, BTEX			
2		**FILL** Brown sand fill, trace to some silt	0.5 / 332.3	2	SS	75				
4		**FILL** Coarse sand and gravel fill	0.9							
6 / 2		**FILL** Silty sand fill	331.1	3	SS	60				
8		**SAND** Brown, fine sand, trace silt	2.1	4	SS	100	PHC, BTEX			
10				5	SS	100				
12 / 4				6	SS	NR				
14			328.7							
16		**SILTY SAND** Brown silty sand, trace gravel	4.6	7	SS	5				
18										
20 / 6			327.1							
		Drilling Terminated	6.1							
22										
24										
26 / 8										
28										
30										

Bentonite

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

NOTES: Auger refusel at 6.1 m - inferred bedrock

ID No.: BH609-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	325.4						
		FILL dark brown/black topsoil, some organics and gravel, trace glass and coal chunks, moist	0.0	1	DP	50	S1	0	Bentonite
2							S2	0	
		SAND AND GRAVEL brown sand and gravel, trace silt, moist	324.7 0.8 324.5						
		Drilling Terminated	0.9						
4									
6									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Refusal at 0.91 mbgs, assumed bedrock

Sheet: 1 of 1

ID No.: BH610-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 10/20/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	339.4						
		FILL Brown sand and gravel fill, some silt	0.0	1	SS	50			
2							metals, PAH, OCP, PHC, BTEX		
4				2	SS	75			
			337.9						
		SAND AND GRAVEL Brown sand and gravel, some silt	1.5	3	SS	75			
6 / 2									
8				4	SS	100			
10			336.4						
		SAND Brown sand, some silt, trace gravel	3.0	5	SS	100			
12									
				6	SS	100			
14 / 4									
				7					
16									
			334.1						
18		Grey and saturated	5.3	8	SS	100	PHC, BTEX		
			333.7						
20 / 6		Drilling Terminated	5.7						
22									
24									
26 / 8									
28									
30									

Bentonite

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

MTE

ID No.: BW611-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/26/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	334.3						
0		**FILL** Brown sand and gravel fill	0.0	1	SS	75	metals, OCP, PAH, PHC, BTEX		
2		Sandy silt fill, trace to some clay, trace gravel	333.4						
4		**CLAYEY SILT TILL** Brown clayey silt, some sand, trace gravel	0.9	2	SS	75			
6 / 2				3	SS	100			
			332.0						
8		**SILTY SAND** Brown silty sand, trace gravel	2.3	4	SS	100			
10				5	SS	100			
12				6	SS	100			
14 / 4									
16				7	SS	100			
18									
20 / 6				8	SS	100	PHC, BTEX		
22									
24			327.0						
		Drilling Terminated	7.3						
26 / 8									
28									
30									

Bentonite

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes: Auger refusal at 7.3 m - inferred bedrock

ID No.: BH612-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/26/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	343.4						
0		**TOPSOIL** Dark brown sandy silt topsoil	0.0	1	SS	75	metals, OCP, PAH, PHC, BTEX		
2		**SILTY SAND** Brown silty sand, trace to some gravel		2	SS	35			
4				3	SS	25			
6 / 2				4	SS	100			
8				5					
10				6	SS	100			
12 / 4				7	SS	100			
14				8					
16				9					
18				10					
20 / 6									
22									
24			335.8						
26 / 8		grey	7.6						
28									
30		wet	334.2 / 9.1				PHC, BTEX, pH		
32		Drilling Terminated							

Bentonite

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

MTE

ID No.: BH613-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/25/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	323.8						
		TOPSOIL Brown, silty topsoil, trace organics	0.0						
		FILL Brown sand fill		1	SS	50			
2									
				2	SS	50			
4			322.4	3	SS	NR			
		Drilling Terminated	1.4						
6 / 2									
8									
10									
12 / 4									
14									

Bentonite

Field Technician: TXG

Drafted by: TXG

Reviewed by: PAG

Notes: Auger refusal at 1.42 m - inferred bedrock

ID No.: BH614-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Hand Drill

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0	Ground Surface							
	FILL brown medium grained sand, some gravel, trace silt and organics, very moist	0.0				S1	0	
2	brown silty sand, some gravel, occasional cobbles, wet	0.6	1	DP	30			
						S2	0	
4								
	SANDY SILT TILL brown sandy silt, some gravel, occasional cobbles, very moist	1.5	2	DP	100	S3	20	
6 / 2								
	very compact, saturated	2.4	3	DP	85	S4	25	
8	Drilling Terminated	2.7						
10								

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH615-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	329.9						Bentonite
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			329.3						
		SAND brown medium grained sand, trace silt and gravel, very moist	0.6	1	DP	50			
							S2	0	
4			328.4						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH616-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface							
		ASPHALT	0.0						
		FILL brown sand and gravel, trace silt and brick pieces, moist	0.2	1	DP	40	S1	0	
2 ft									
		brown/grey silt, some sand, occasional cobbles, moist, dark staining and faint PHC odour	0.9				S2	0	
4 ft									
6 ft / 2 m									
		SANDY SILT TILL brown sandy silt, some gravel, occasional cobbles, wet, no staining or odour	2.3	2	DP	50	S3	0	
8 ft									
10 ft		Drilling Terminated	3.0						
12 ft									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH617-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	343.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0 / 343.4				S1	0	
		FILL brown sand and gravel, some silt, occasional cobbles, moist	0.3 / 343.1						
2		**SANDY SILT TILL** brown sandy silt, trace gravel, moist	0.6	1	DP	40	S2	0	Bentonite
4			342.2						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH618-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	332.0						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			331.2	1	DP	50			
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	Bentonite
4			330.5						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH619-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	329.5						
		TOPSOIL dark brown/black topsoil, some organics and cobbles, trace gravel, very moist	0.0 / 329.3						
		SAND light brown medium grained sand, some gravel, trace silt, very moist	0.2					0	
2							S1		
				1	DP	50			
								0	
4							S2		
			328.0						
		Drilling Terminated	1.5						
6 / 2									Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH620-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	330.6						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0 – 330.3						
		FILL brown sandy silt, trace gravel, moist	0.3 – 329.8				S1	0	
2		**SAND** light brown fine grained sand, trace silt and gravel, moist	0.8 – 329.1	1	DP	75	S2	0	Bentonite
4		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH621-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	329.5						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			328.8						
		FILL brown fine grained sand, some silt, trace gravel, very moist	0.6						
			328.7	1	DP	60			
		SAND AND GRAVEL light brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	Bentonite
4			327.9						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH622-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	330.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
			329.8						
2		**FILL** brown sand and gravel, trace silt, occasional cobbles, moist	0.5	1	DP	70			Bentonite
			329.3						
		SILT TILL dark brown/grey silt, some sand, trace gravel, moist	0.9				S2	0	
4									
			328.7						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH623-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
0 / 0		Ground Surface	332.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			331.9	1	DP	75			
		FILL brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	Bentonite
4			331.1						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH624-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	336.9						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			336.3						
		FILL brown sand and gravel, trace silt, occasional cobbles, moist	0.6	1	DP	70	S2	0	Bentonite
4			335.4						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH625-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	332.9						Bentonite
		FILL brown medium grained sand, some gravel, trace organics, very moist	0.0				S1	0	
2		brown sandy silt, trace gravel, moist	332.3 0.6	1	DP	60			
		SAND AND GRAVEL light brown sand and gravel, some silt, moist	332.0 0.9				S2	0	
4			331.4						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH626-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	336.7						
		FILL brown medium grained sand, trace silt and organics, moist	0.0						
			336.2				S1	0	
		light brown fine grained sand, trace gravel and silt, wet	0.5						
2				1	DP	60			
			335.6						
		dark brown/black silt, trace gravel, moist	1.1						
4							S2	1	
			335.2						
		Drilling Terminated	1.5						
6									
2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH627-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	337.4						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
			336.9						
2		**SAND AND GRAVEL** brown sand and gravel, trace silt, occasional cobbles, moist	0.5	1	DP	50			Bentonite
							S2	0	
4			335.9						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH628-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	338.4						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	PID 0	
2		black stained seam, hydrocarbon odour	337.8 0.6 337.6						
		SAND AND GRAVEL brown sand and gravel, trace silt and organics, occasional cobbles, moist, no odour or staining	0.8	1	DP	50	S2	PID 0	Bentonite
4			336.9						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH629-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	334.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0					0	
2				1	DP	30	S1		
4		**SAND AND GRAVEL** brown sand and gravel, trace silt, occasional cobbles, moist	333.0 1.2				S2	0	
			332.7						
		Drilling Terminated	1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH630-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	332.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1		
2 /			332.1						
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.6	1	DP	50			Bentonite
4 /							S2		
			331.2						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH631-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	332.6						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			331.8	1	DP	70			
		SAND brown fine sand, trace silt and gravel, moist	0.8				S2	0	
4			331.1						
		Drilling Terminated	1.5						
6 / 2									Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH632-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
0 / 0		Ground Surface	336.1						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			335.3	1	DP	60			Bentonite
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	
4			334.6						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH633-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 588 Stone Road East, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	333.9						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0						
			333.7						
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.2					0	
2							S1		
				1	DP	50			
							S2		
4								0	
			332.4						
		Drilling Terminated	1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH634-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	335.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			334.6						
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.6	1	DP	75			Bentonite
							S2	0	
4			333.7						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH635-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	342.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			341.4	1	DP	60			
		SAND AND GRAVEL brown sand and gravel, some silt, moist	0.8				S2	0	Bentonite
4			340.7						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH636-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	339.5						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2									
		SAND AND GRAVEL brown sand and gravel, some silt, moist	338.7 0.8	1	DP	60	S2	0	Bentonite
4									
		Drilling Terminated	338.0 1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH637-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	337.1						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			336.3	1	DP	70			
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	Bentonite
4			335.6						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH638-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
0 / 0		Ground Surface	328.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			327.4	1	DP	60			
		SAND AND GRAVEL brown sand and gravel, trace silt, moist	0.8				S2	0	Bentonite
4			326.7						
		Drilling Terminated	1.5						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH639-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	
0 / 0		Ground Surface	327.0						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
			326.5						
		SILTY SAND TILL brown silty sand, some gravel, trace organics, moist	0.5	1	DP	50	S2	0	Bentonite
			326.1						
		Drilling Terminated	0.9						
2 /									
4 /									
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Refusal at 0.91 mbgs, assumed bedrock

ID No.: BH640-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	324.5						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2		**SAND AND GRAVEL** brown sand and gravel, trace silt, occasional cobbles, moist	323.9 0.6	1	DP	50	S2	0	Bentonite
4		Drilling Terminated	323.3 1.2						
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Refusal at 1.22 mbgs, assumed bedrock

ID No.: BH641-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm 20 40 60 80 / Hydrocarbon ppm 100 200 300 400	Well Completion Details
		Ground Surface	324.1						
0 / 0		**TOPSOIL** dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
			323.6	1	DP	50			
2		**SANDY SILT TILL** brown sandy silt, some organics, trace gravel, moist	0.5				S2	0	Bentonite
			323.2						
		Drilling Terminated	0.9						
4									
6 / 2									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Refusal at 0.91 mbgs, assumed bedrock

Sheet: 1 of 1

ID No.: BH642-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/9/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	337.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			336.4	1	DP	70			
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.8				S2	0	
4			335.7						
		Drilling Terminated	1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH643-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	342.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
			342.2						
		SAND AND GRAVEL brown sand and gravel, some silt, moist	0.5	1	DP	60			Bentonite
2							S2	0	
4			341.2						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

ID No.: BH644-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	345.0						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0 5	
2									
		SILTY SAND TILL brown silty sand, some gravel, moist	344.2 0.8	1	DP	60	S2	0	
4									
		Drilling Terminated	343.5 1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH645-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	343.8						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			343.2						
		SAND AND GRAVEL brown sand and gravel, some silt, occasional cobbles, moist	0.6	1	DP	60			Bentonite
4							S2	0	
			342.3						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH646-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	345.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			344.9	1	DP	50			
		SAND AND GRAVEL brown sand and gravel, some silt, occasional cobbles, moist	0.8				S2	0	Bentonite
4			344.2						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

Sheet: 1 of 1

ID No.: BH647-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/12/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	Headspace: PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 / 0		Ground Surface	345.8						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			345.0	1	DP	50			
		SAND brown fine grained sand, some gravel, trace silt, occasional cobbles, moist	0.8				S2	0	
4			344.3						
		Drilling Terminated	1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH648-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 ft / 0 m		Ground Surface	338.7						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			338.1						
		SANDY SILT TILL brown sandy silt, some gravel, occasional cobbles, moist	0.6	1	DP	50			
4							S2	0	
			337.2						
		Drilling Terminated	1.5						
6									
2 m									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH649-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	Well Completion Details
0 ft / 0 m		Ground Surface	340.2						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0						
			339.6				S1	0	
2		**SAND AND GRAVEL** brown sand and gravel, some silt, occasional cobbles, trace organics, moist	0.6	1	DP	70			Bentonite
							S2	0	
4			338.7						
		Drilling Terminated	1.5						
6									
2 m									

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH650-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	339.8						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0				S1	0	
2			339.2						
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, trace organics, moist	0.6	1	DP	65			
4							S2	0	
			338.3						
		Drilling Terminated	1.5						
6 / 2									

Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH651-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road South, Guelph, ON

Date Completed: 12/8/2022

Drilling Contractor: Ground Force Environmental Inc

Drill Rig: Geoprobe 7822DT

Drill Method: Direct Push

Protective Cover: N/A

Subsurface Profile			Sample					Headspace	Well Completion Details
Depth (ft / m)	Symbol	Soil Description	Elevation (masl) Depth (m)	Number	Type	Recovery (%)	Soil Sample Lab Analysis	PID ppm (20 40 60 80) / Hydrocarbon ppm (100 200 300 400)	
0 / 0		Ground Surface	335.3						
		TOPSOIL dark brown/black topsoil, some organics, trace gravel, moist	0.0						
			335.0						
		SAND AND GRAVEL brown sand and gravel, trace silt, occasional cobbles, moist	0.3				S1	0	
2				1	DP	50			
							S2	0	
4									
			333.8						
		Drilling Terminated	1.5						
6 / 2									Bentonite

Field Technician: KJJ

Drafted by: KJJ

Reviewed by: JGH

MTE

Sheet: 1 of 1

ID No.: BH654-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/25/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 / 0		Ground Surface	326.2						
0 / 0		**TOPSOIL** Compact dark brown silty sand topsoil	0.0	1	SS	10		3	
2 /		**SAND AND GRAVEL** Very dense brown sand and gravel, trace silt, moist		2	SS	50/100mm		6	
4 /			324.8	3		50/0mm			
6 / 2		Drilling Terminated	1.4						Bentonite
8 /									
10 /									
12 / 4									
14 /									
16 /									
18 /									
20 / 6									
22 /									
24 /									
26 / 8									
28 /									
30 /									

Field Technician: TXG

Drafted by: TXG

Reviewed by: D. Gonser

Notes: Auger refusal at 1.4m on suspected bedrock

ID No.: BH655-22

Project Name: Guelph Innovation District Lands

MTE File No.: 46927-104

Client: Fusion Homes

Site Location: 328 Victoria Road S., Guelph, ON

Date Completed: 10/25/2022

Drilling Contractor: Geo-Environmental Drilling Inc.

Drill Rig: CME 75 Track Mount

Drill Method: Hollow Stem Augers

Protective Cover: N/A

Depth (ft / m)	Symbol	Soil Description	Elevation (masl) / Depth (m)	Sample Number	Sample Type	Dynamic Cone / Standard Penetration (20 40 60 80)	Shear Strength (PP) kPa / Shear Strength (FV) kPa (50 100 150 200)	Water Content % (10 20 30)	Groundwater Observations and Standpipe Details
0 / 0		Ground Surface	323.3						
0 / 0		**TOPSOIL** Dark brown sandy silt, moist	0.0	1	SS	35		3	
2 /		**SAND AND GRAVEL** Very dense brown sand and gravel, trace silt, moist		2	SS	85/200mm		1	
4 /			321.9	3	SS	50/0mm			
6 / 2		Drilling Terminated	1.4						Bentonite
8 /									
10 /									
12 / 4									
14 /									
16 /									
18 /									
20 / 6									
22 /									
24 /									
26 / 8									
28 /									
30 /									

Field Technician: TXG

Drafted by: TXG

Reviewed by: D. Gonser

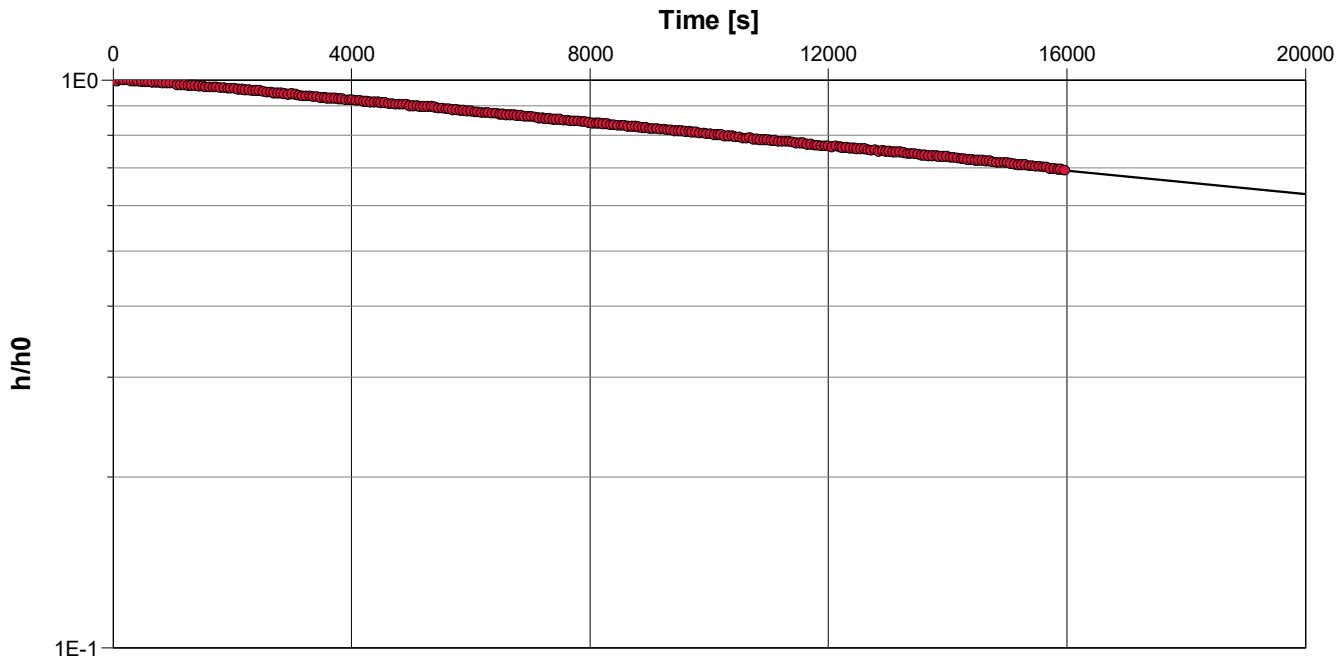
Notes: auger refusal at 1.4m on suspected bedrock

Appendix B

Aquifer Test Data Sheets

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: BH/MW1-06	Test Well: MW2-11
Test Conducted by: txg		Test Date: 10/6/2022
Analysis Performed by: mde	Bouwer and Rice	Analysis Date: 2/2/2023
Aquifer Thickness: 12.21 m		

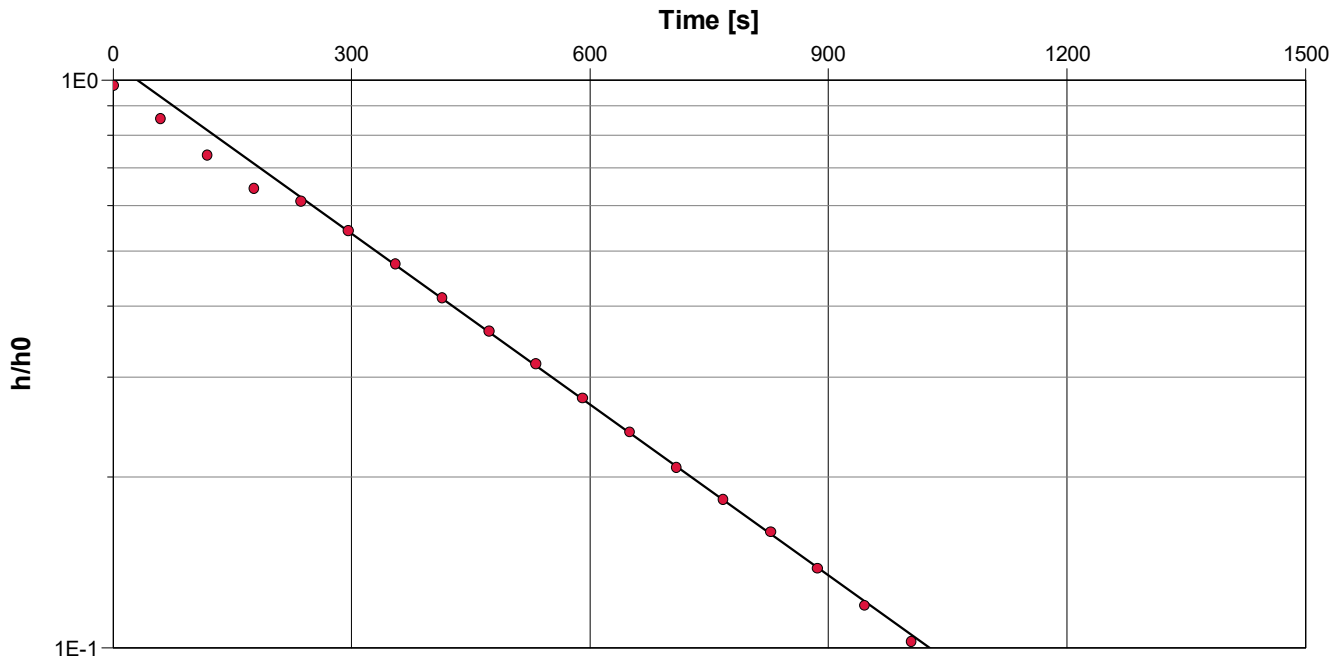


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW2-11	1.17×10^{-8}	

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW2-11	Test Well: MW2-11
Test Conducted by: txg		Test Date: 10/6/2022
Analysis Performed by: mde	Bouwer and Rice	Analysis Date: 2/2/2023
Aquifer Thickness: 3.06 m		

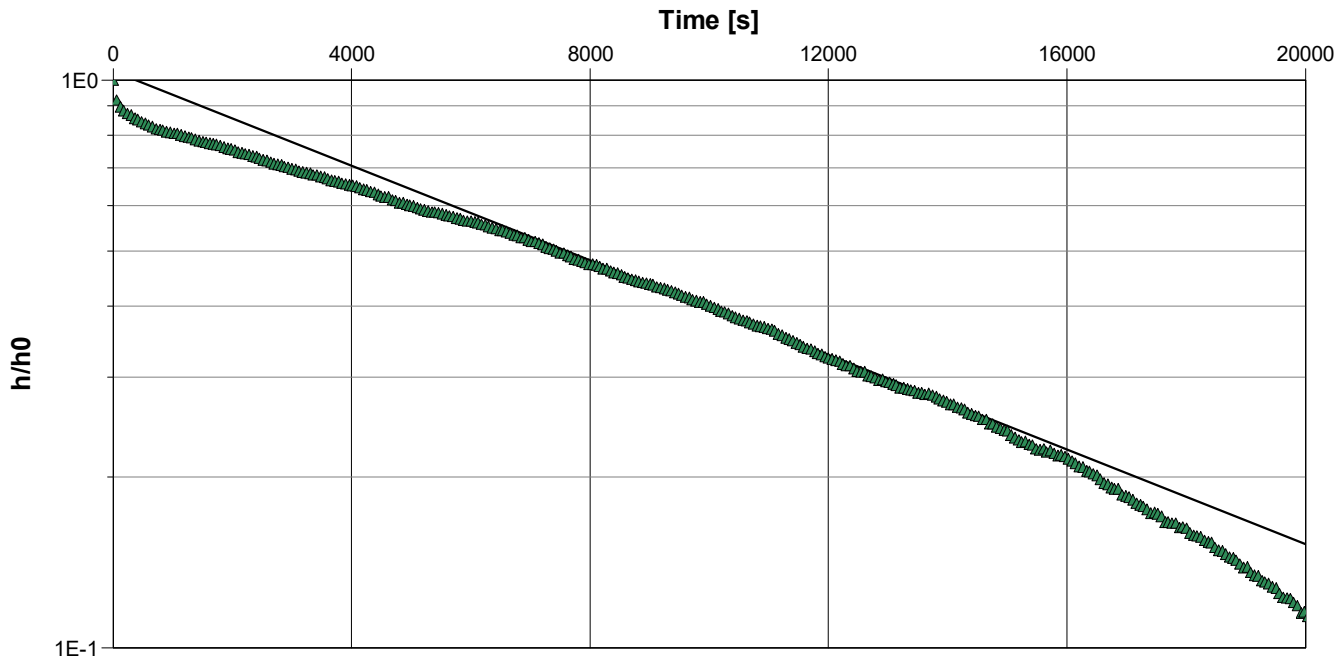


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW2-11	1.22×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW209-19	Test Well: MW209-19
Test Conducted by: TXG		Test Date: 10/24/2022
Analysis Performed by: mde	Bouwer and Rice	Analysis Date: 2/2/2023
Aquifer Thickness: 13.07 m		

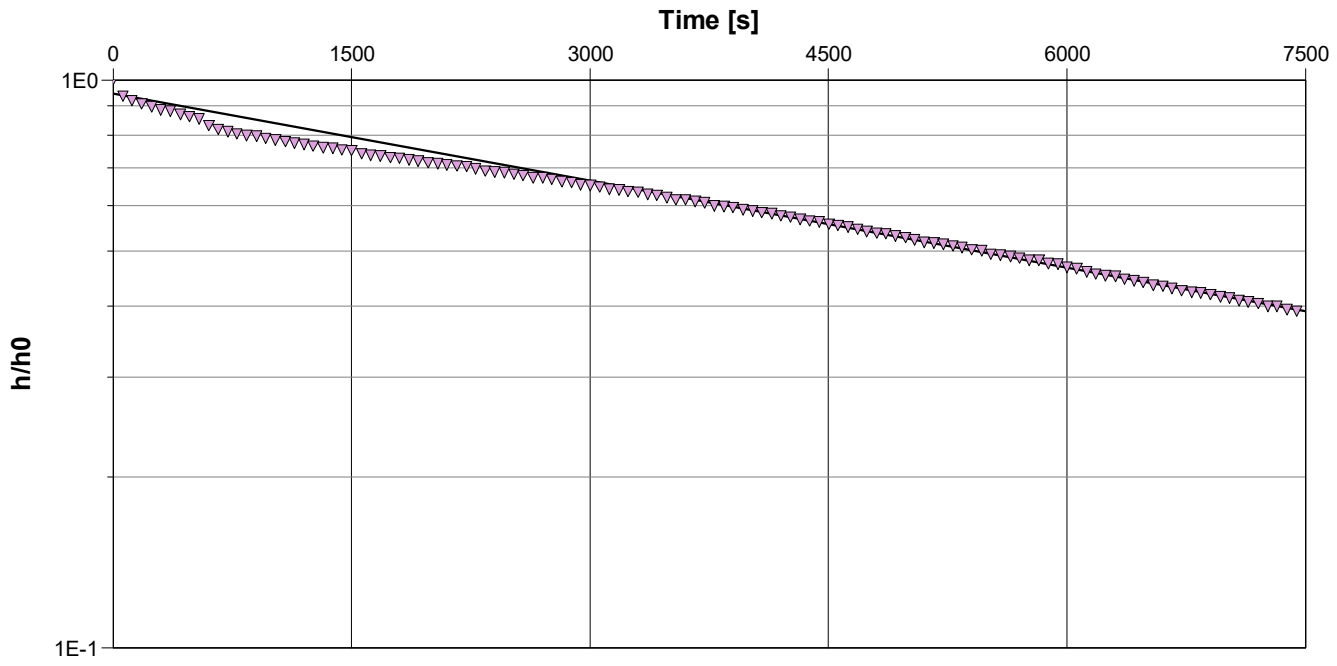


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW209-19	3.16×10^{-8}	

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW217-19	Test Well: MW217-19
Test Conducted by: txg		Test Date: 10/6/2022
Analysis Performed by:	New analysis 1	Analysis Date: 2/2/2023
Aquifer Thickness: 1.81 m		

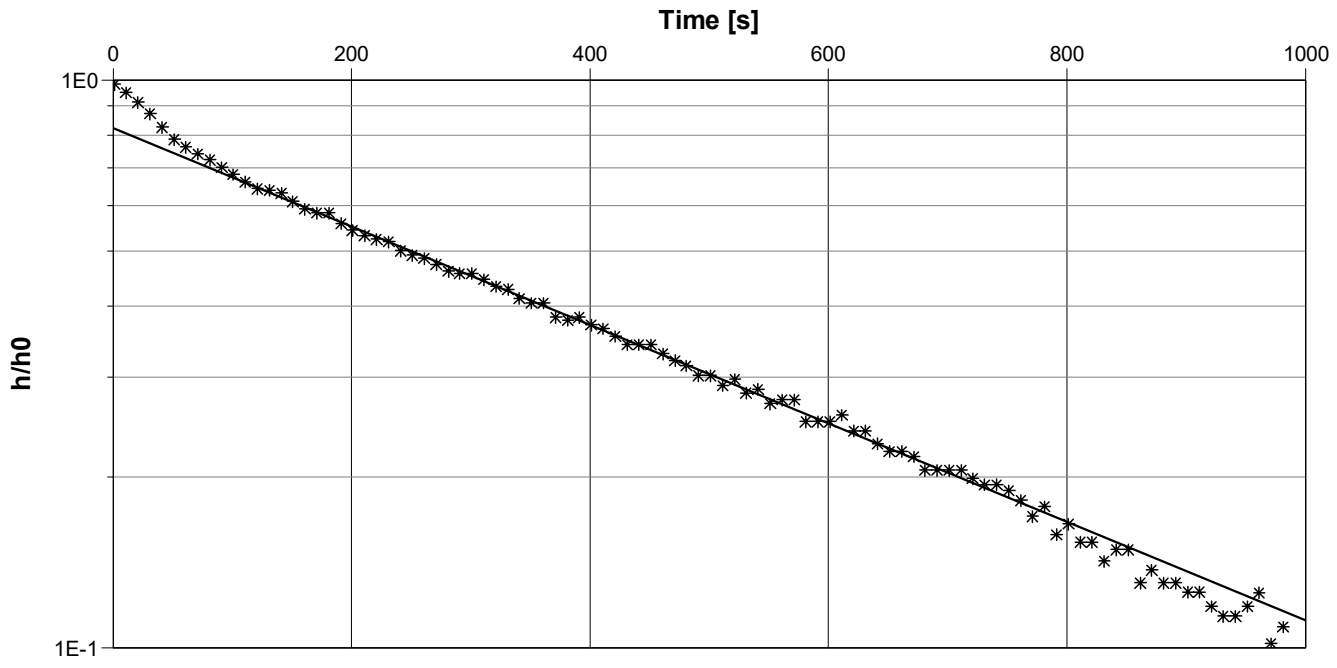


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW217-19	6.74×10^{-8}	

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW512b-22	Test Well: MW512b-22
Test Conducted by: txg		Test Date: 10/6/2022
Analysis Performed by: mde	Bouwer and Rice	Analysis Date: 2/3/2023
Aquifer Thickness: 3.00 m		

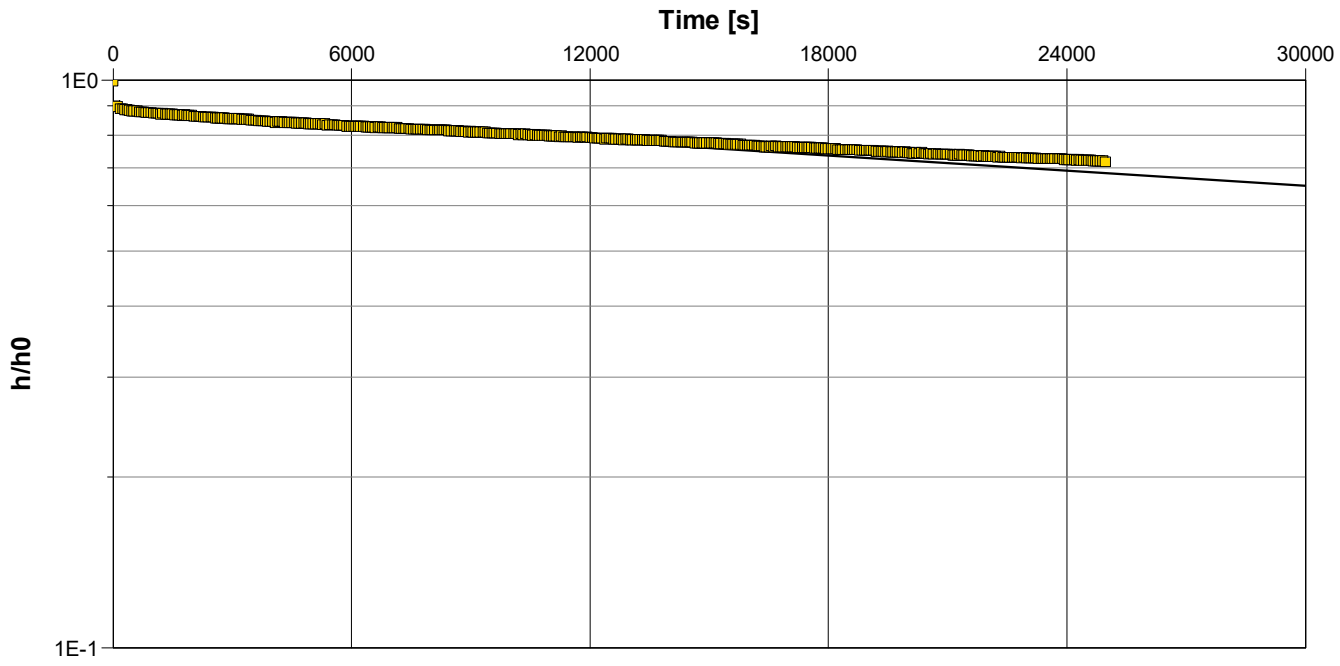


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW512b-22	1.03×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Dr. Kitchener, ON N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW514-22	Test Well: MW514-22
Test Conducted by: txg		Test Date: 10/6/2022
Analysis Performed by: mde	bouwer and rice	Analysis Date: 2/3/2023
Aquifer Thickness: 12.20 m		

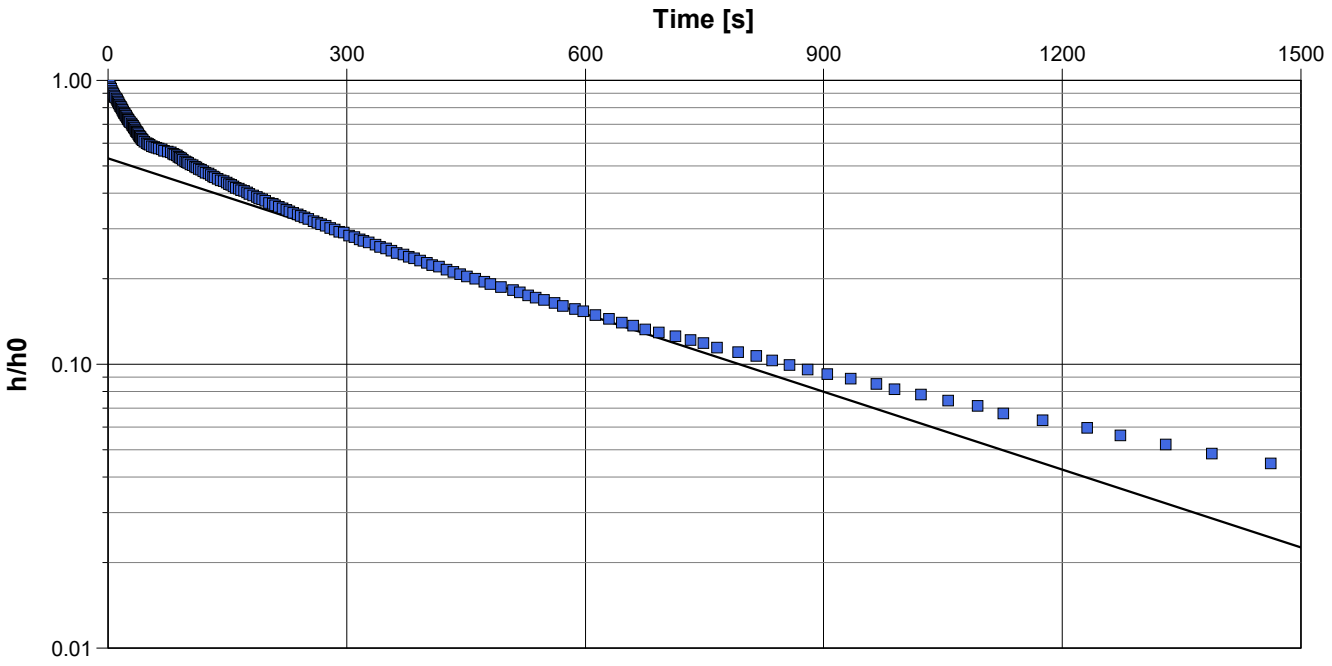


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW514-22	6.27×10^{-9}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: BH/MW1-06 2023	Test Well: BHMW1-06
Test Conducted by: TXG		Test Date: 5/4/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 4.88 m		

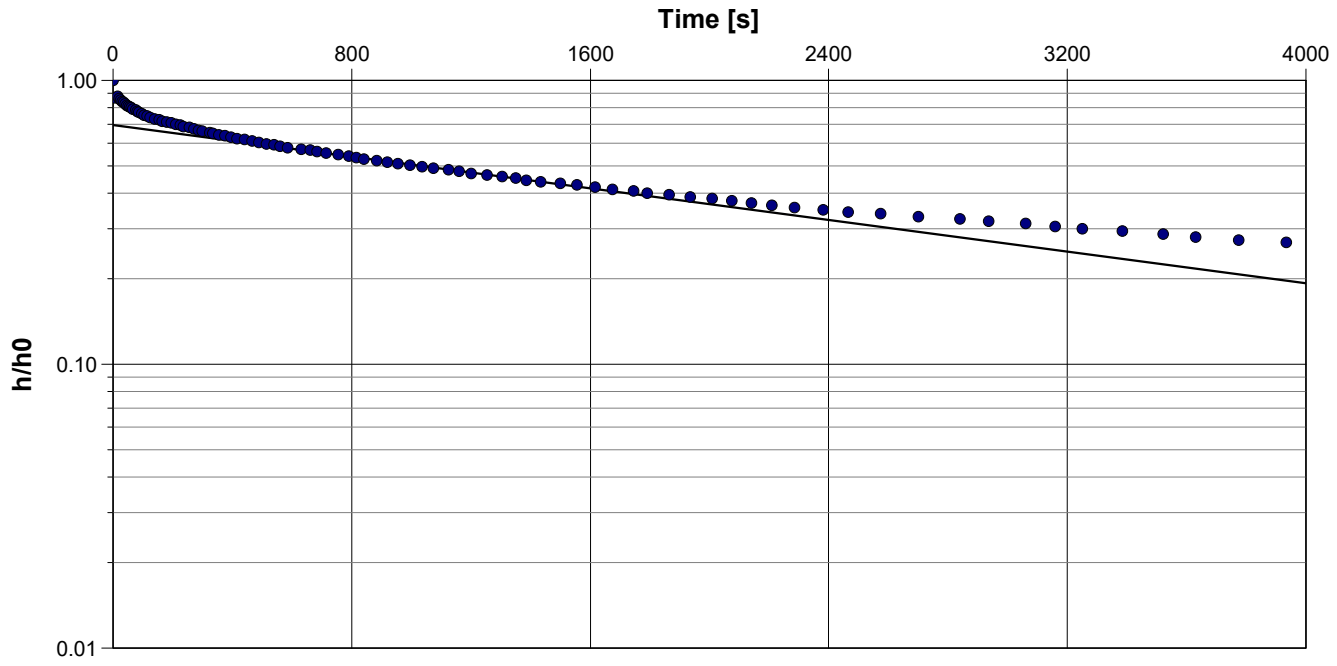


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BHMW1-06	9.95×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW1-17 2023	Test Well: MW1-17
Test Conducted by: TXG		Test Date: 5/4/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 1.78 m		

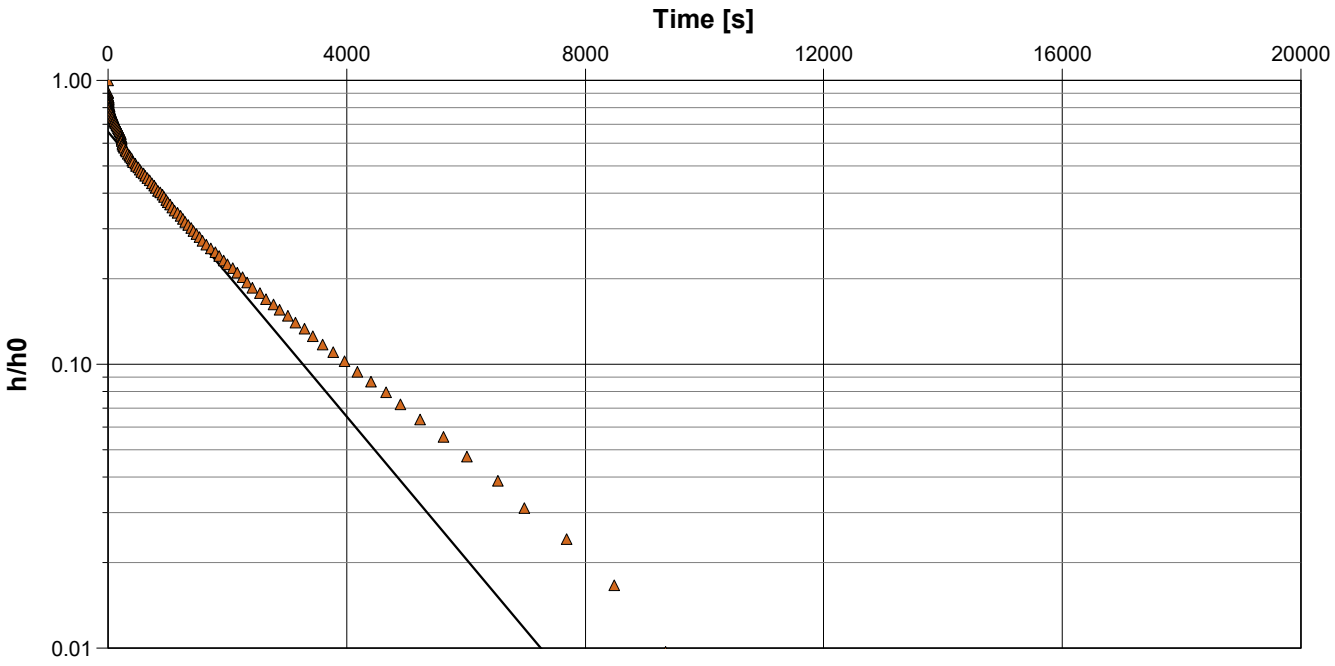


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW1-17	2.70×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW204-19 2023	Test Well: MW204-19
Test Conducted by: TXG		Test Date: 5/12/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 3.22 m		

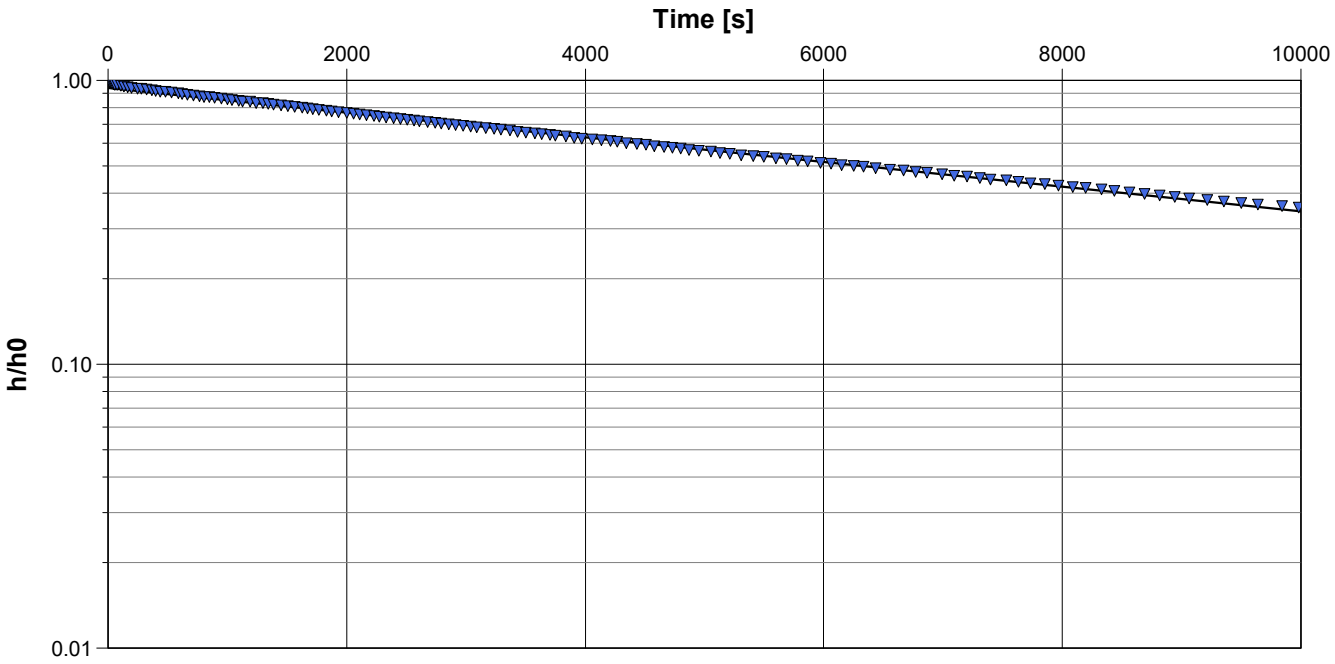


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW204-19	2.53×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW209-19 2023	Test Well: MW209-19
Test Conducted by: TXG		Test Date: 5/12/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 5.77 m		

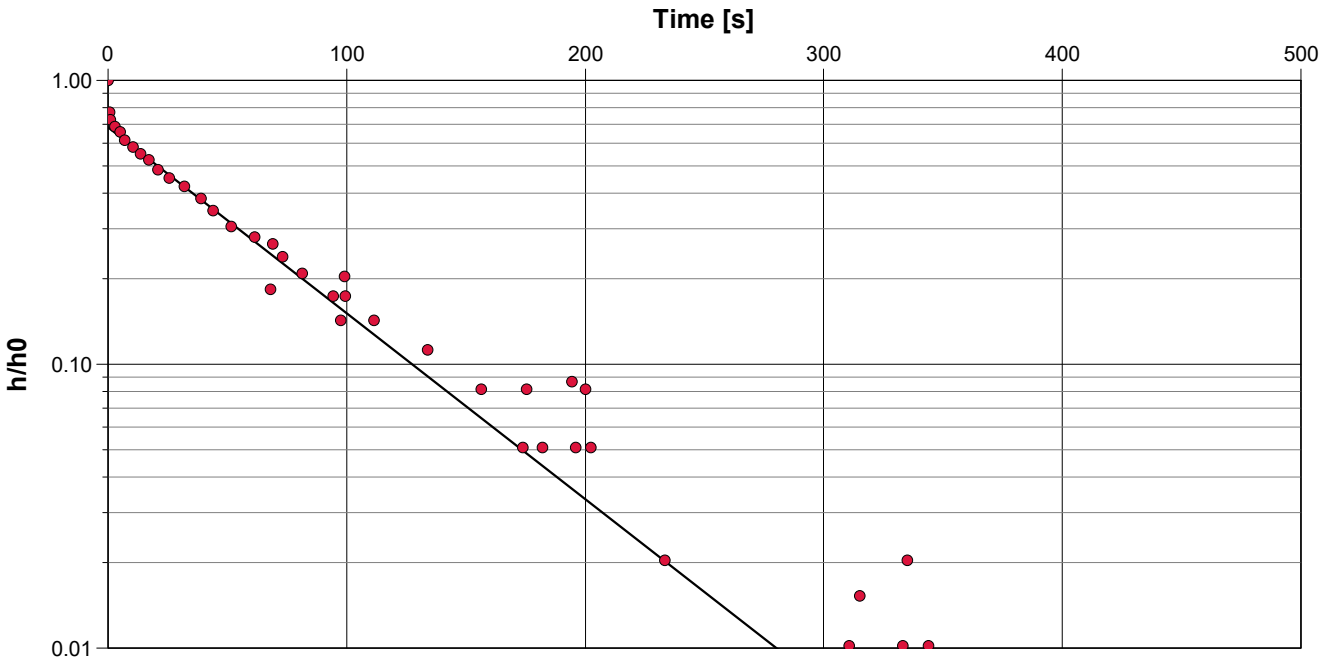


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW209-19	4.88×10^{-8}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW210-19 2023	Test Well: MW210-19
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 5.22 m		

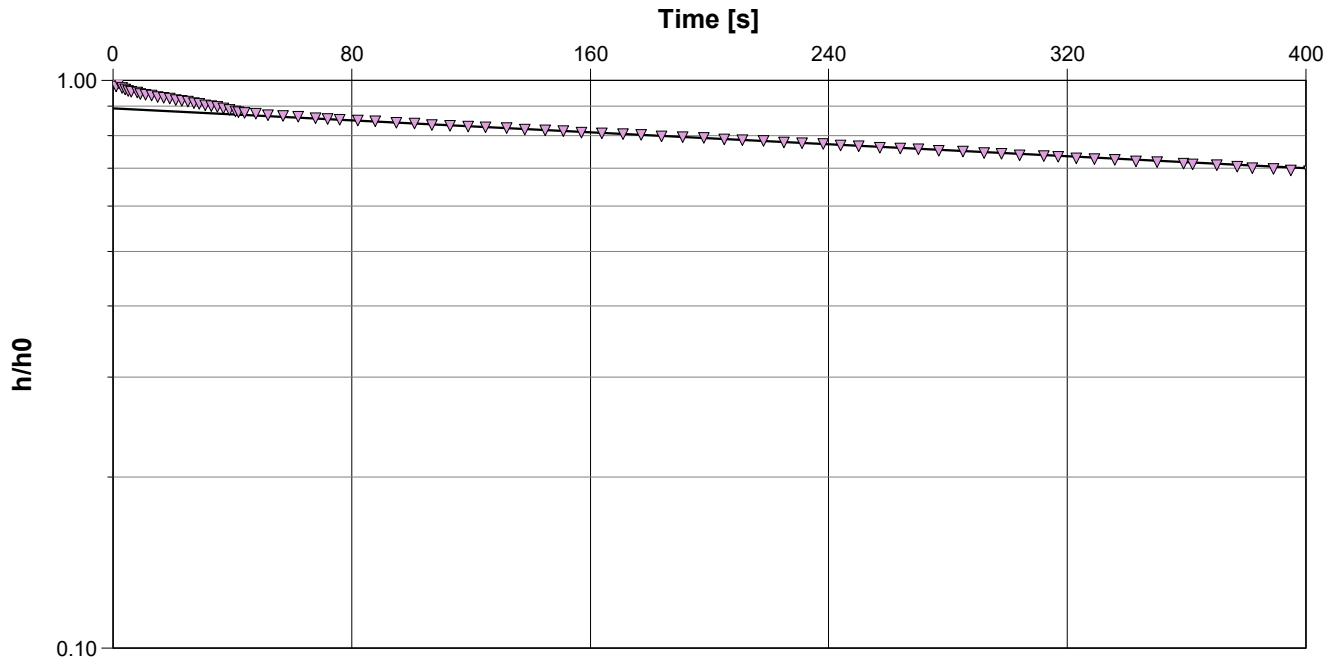


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW210-19	7.22×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW217-19 2023	Test Well: MW217-19
Test Conducted by: TXG		Test Date: 5/10/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 3.03 m		

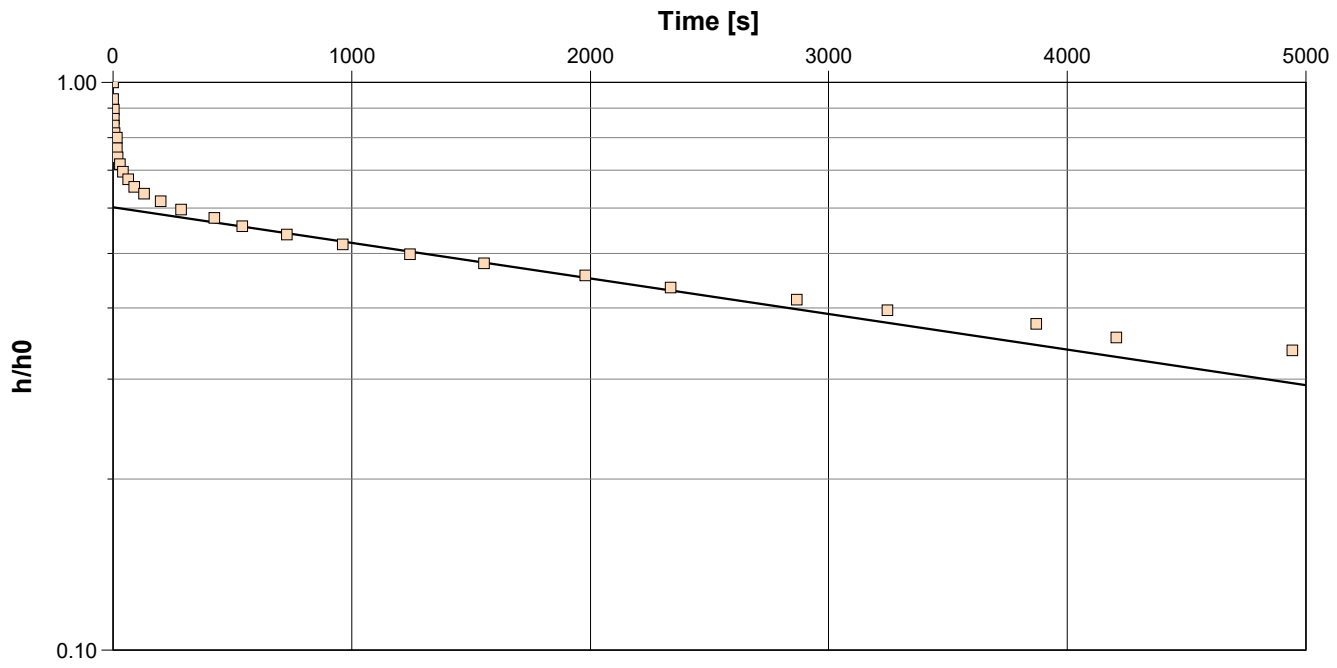


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW217-19	2.47×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW507A-22 2023	Test Well: MW507A-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 1.34 m		

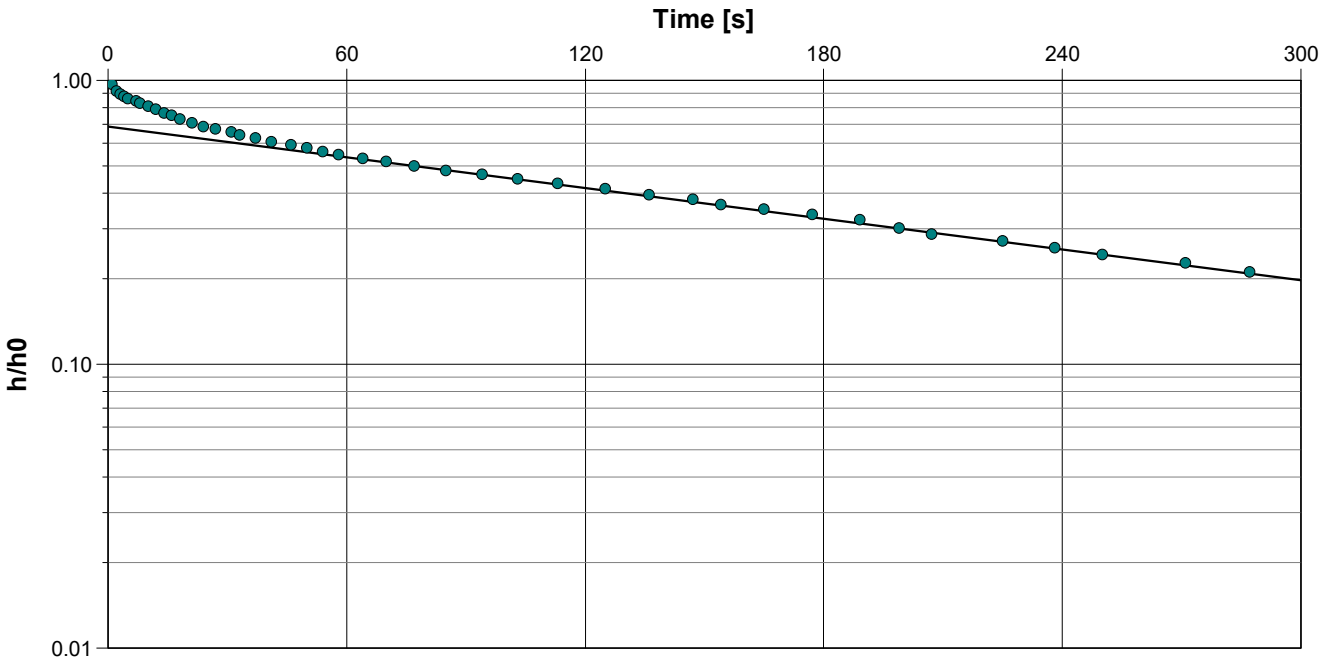


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW507A-22	1.17×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW507B-22 2023	Test Well: MW507B-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 1.41 m		

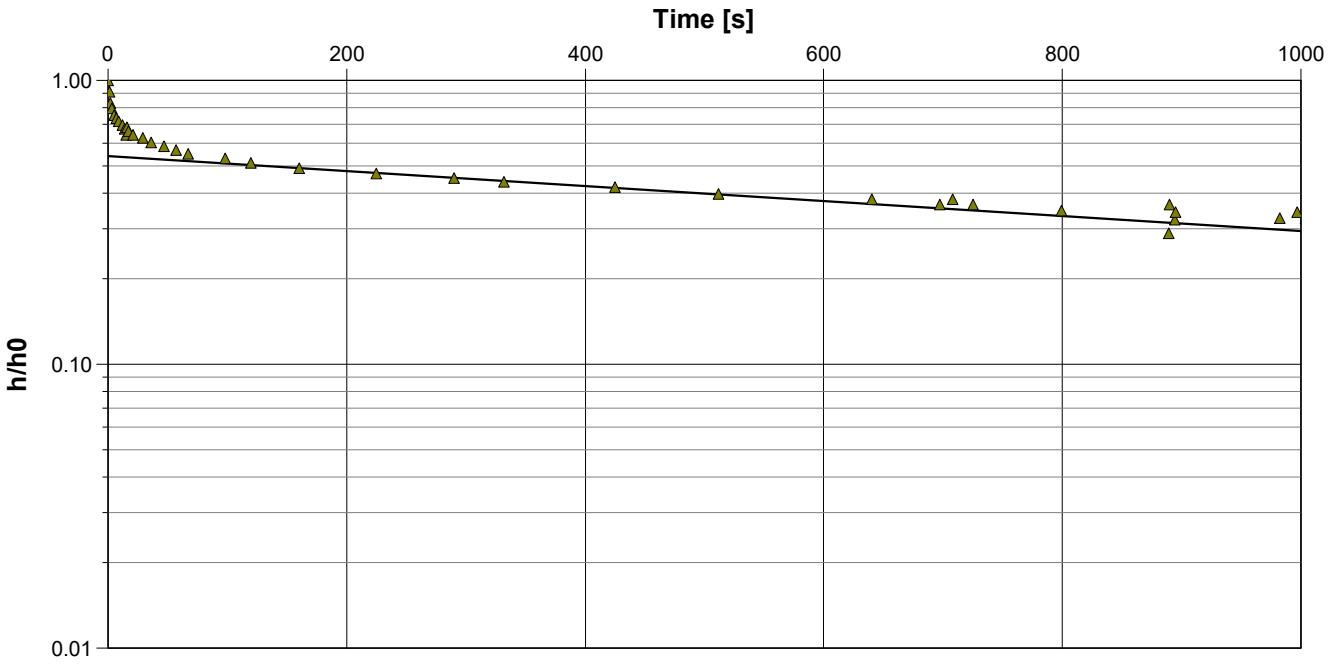


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW507B-22	3.24×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW512A-22 2023	Test Well: MW512A-22
Test Conducted by:		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 1.28 m		

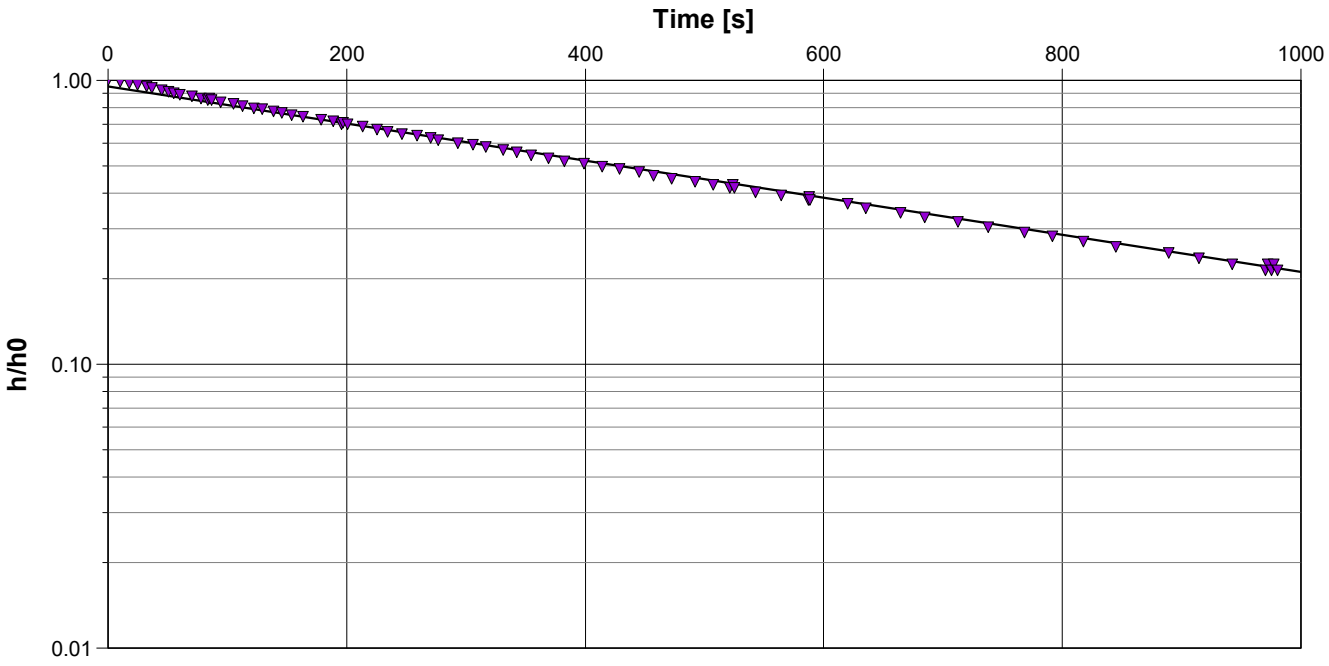


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW512A-22	5.11×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW512B-22 2023	Test Well: MW512B-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 5.23 m		

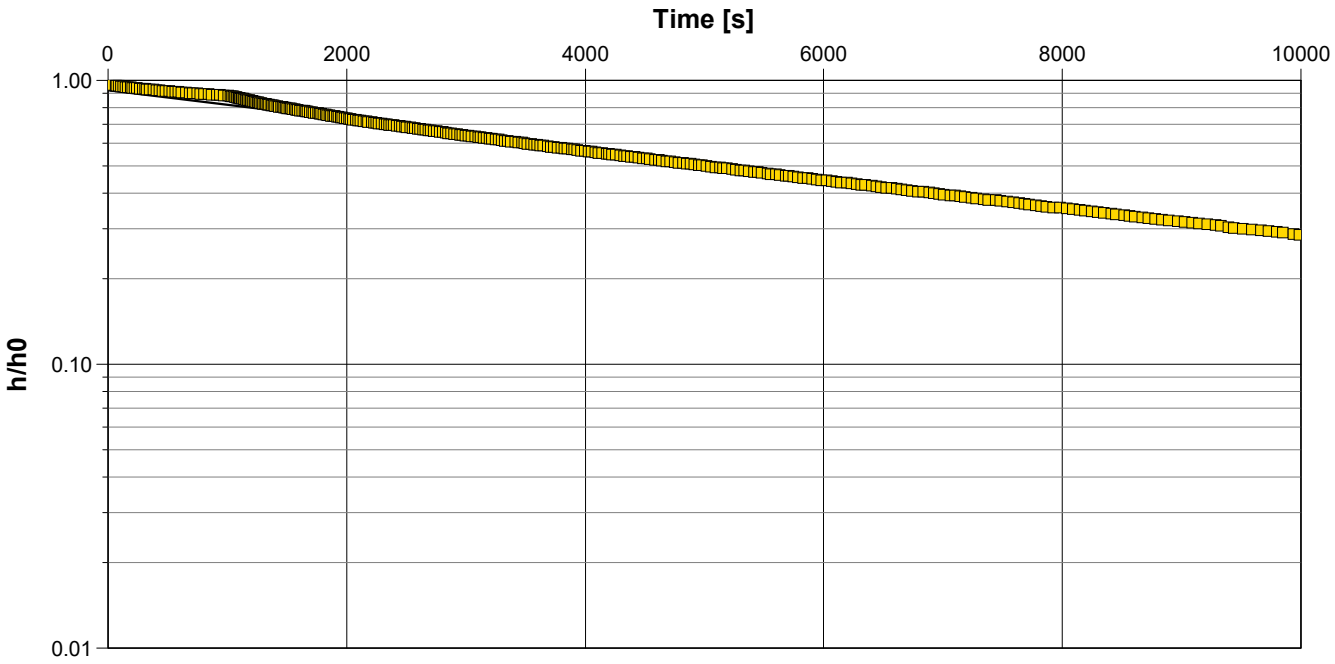


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW512B-22	2.74×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW514-22 2023	Test Well: MW514-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/11/2024
Aquifer Thickness: 6.19 m		

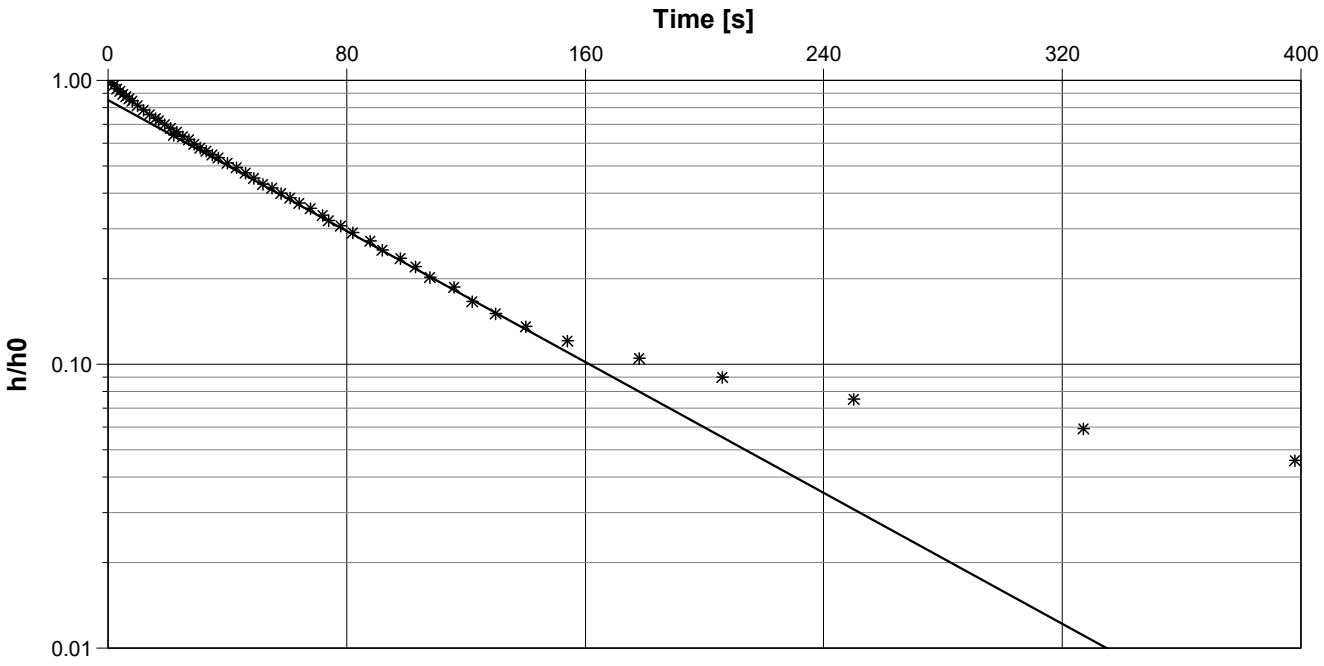


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW514-22	1.15×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW520-11 2023	Test Well: MW520-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 1.59 m		

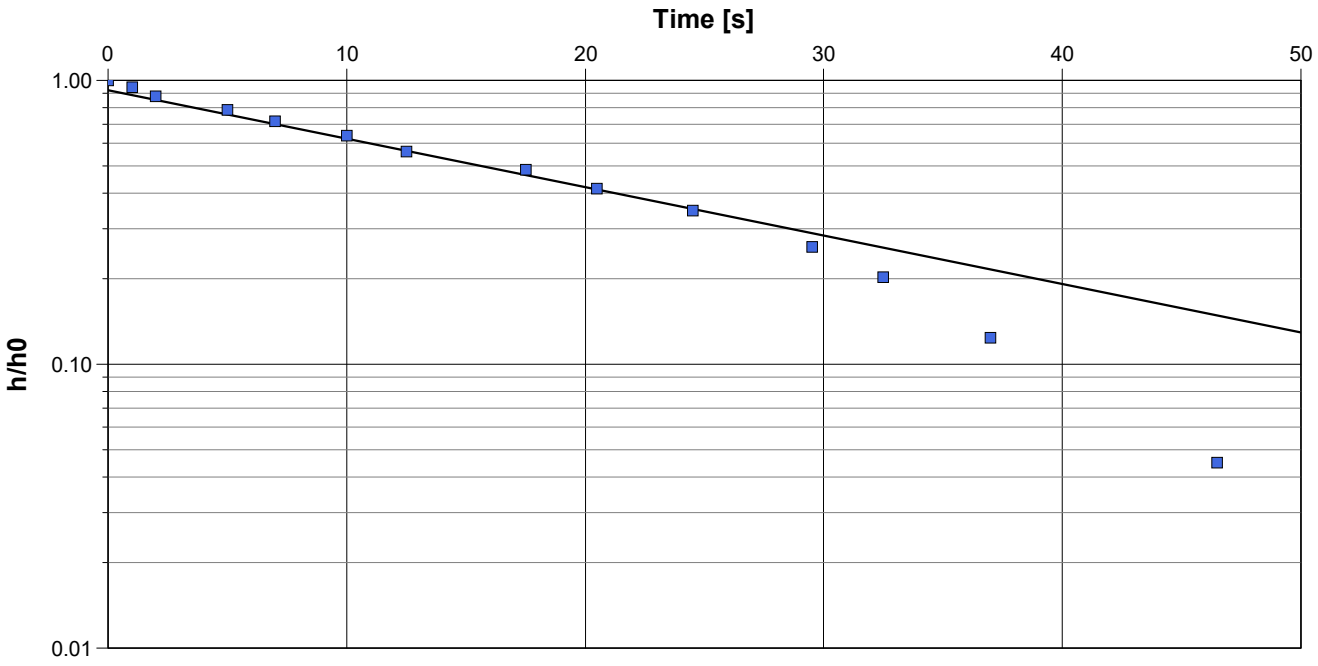


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW520-22	1.00×10^{-5}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW601-22 2023	Test Well: MW601-22
Test Conducted by: TXG		Test Date: 5/16/2022
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 0.95 m		

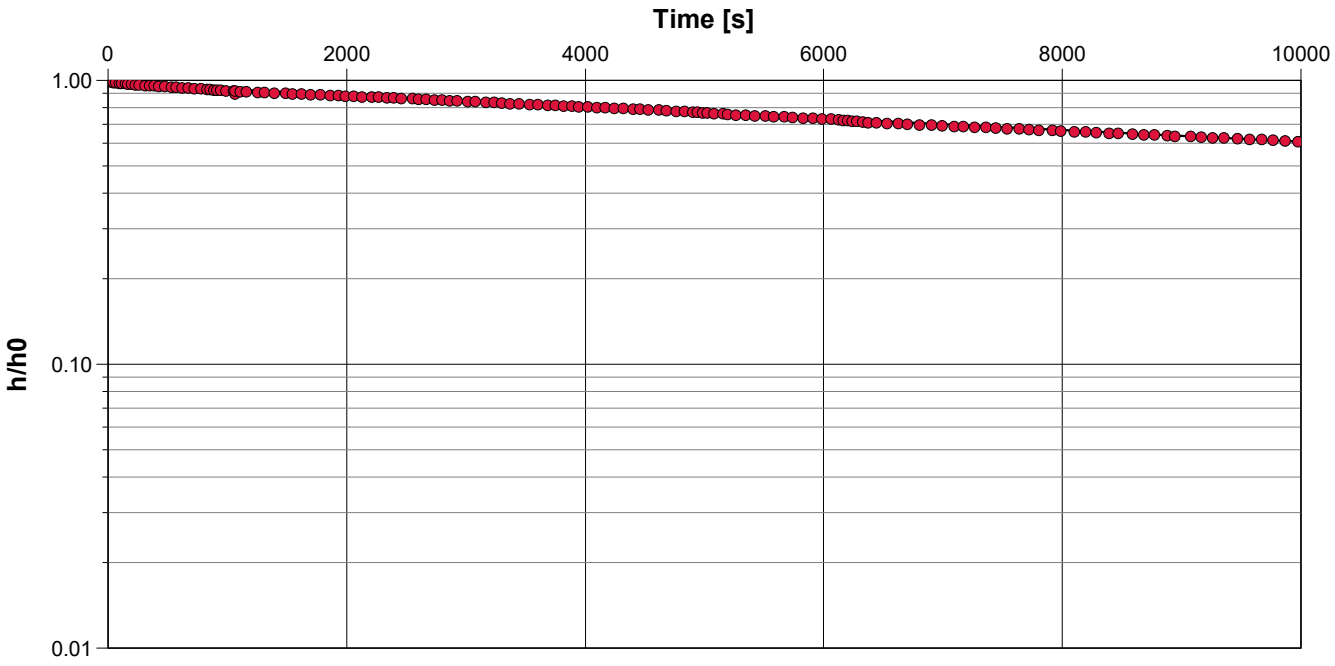


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW601-22	4.29×10^{-5}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW603-22 2023	Test Well: MW603-22
Test Conducted by: TXG		Test Date: 5/4/2024
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 4.32 m		

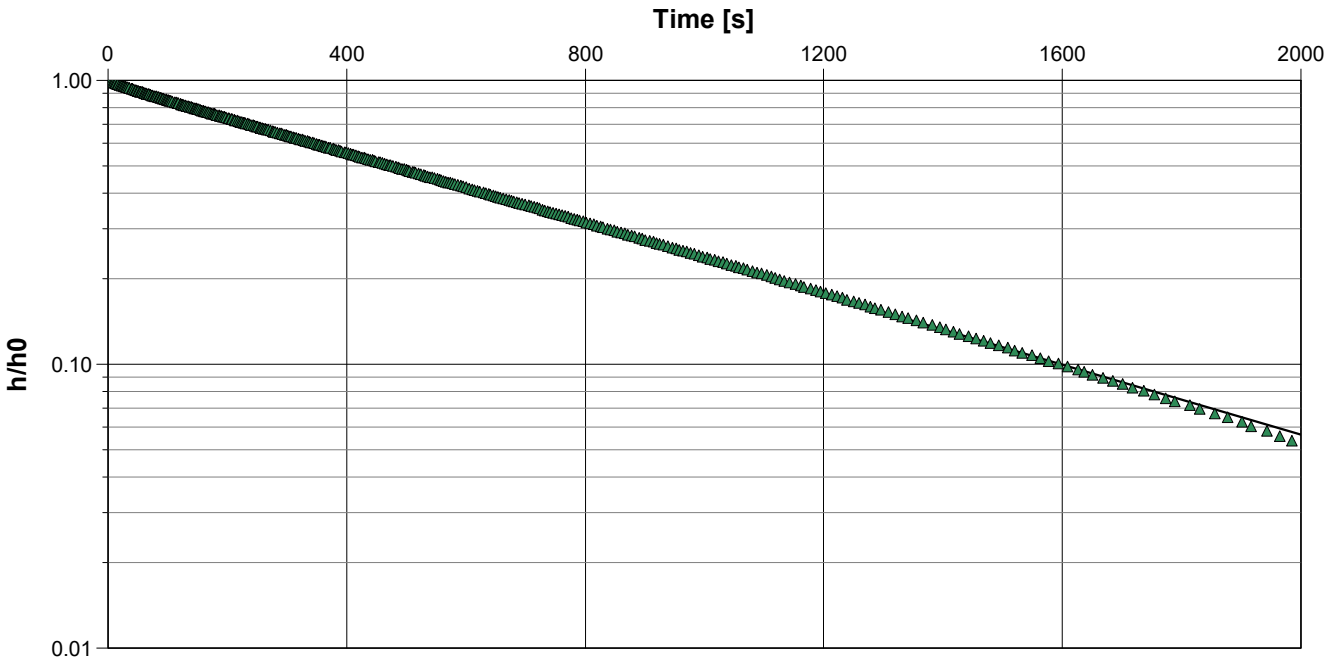


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW603-22	2.21×10^{-8}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW604-22 2023	Test Well: MW604-22
Test Conducted by: TXG		Test Date: 5/12/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 10.35 m		

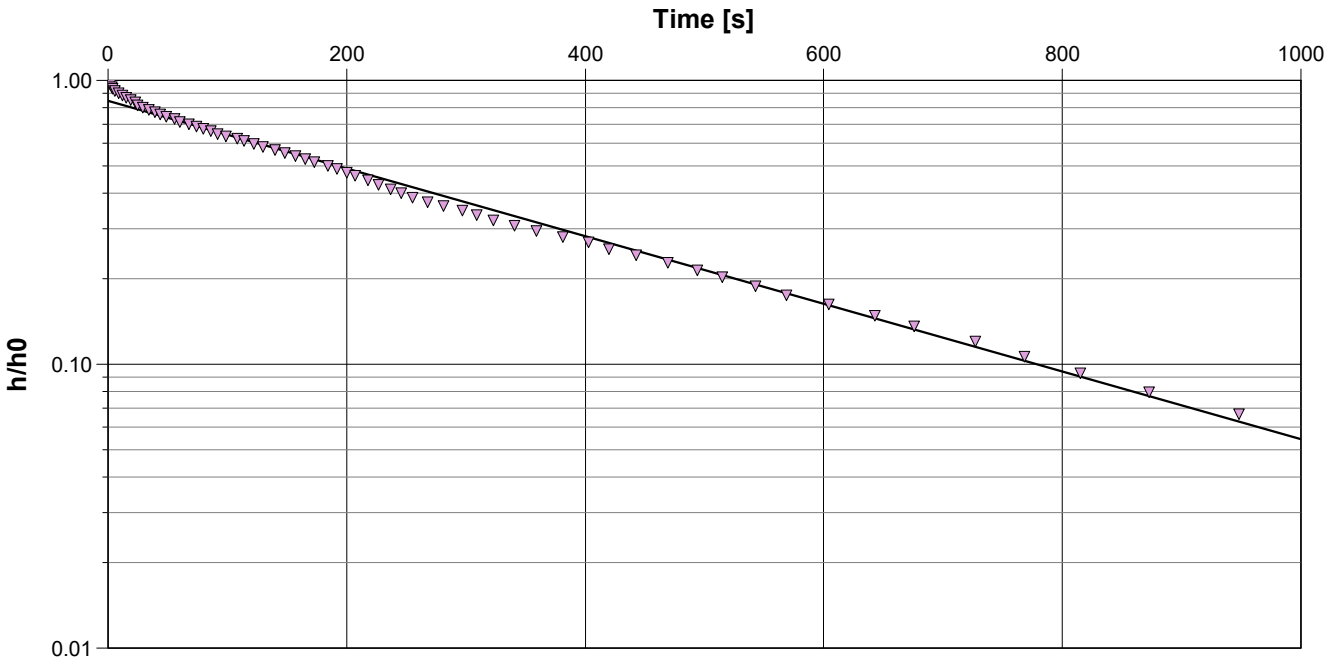


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW604-22	7.64×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW605-22 2023	Test Well: MW605-22
Test Conducted by: TXG		Test Date: 5/10/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 1.48 m		

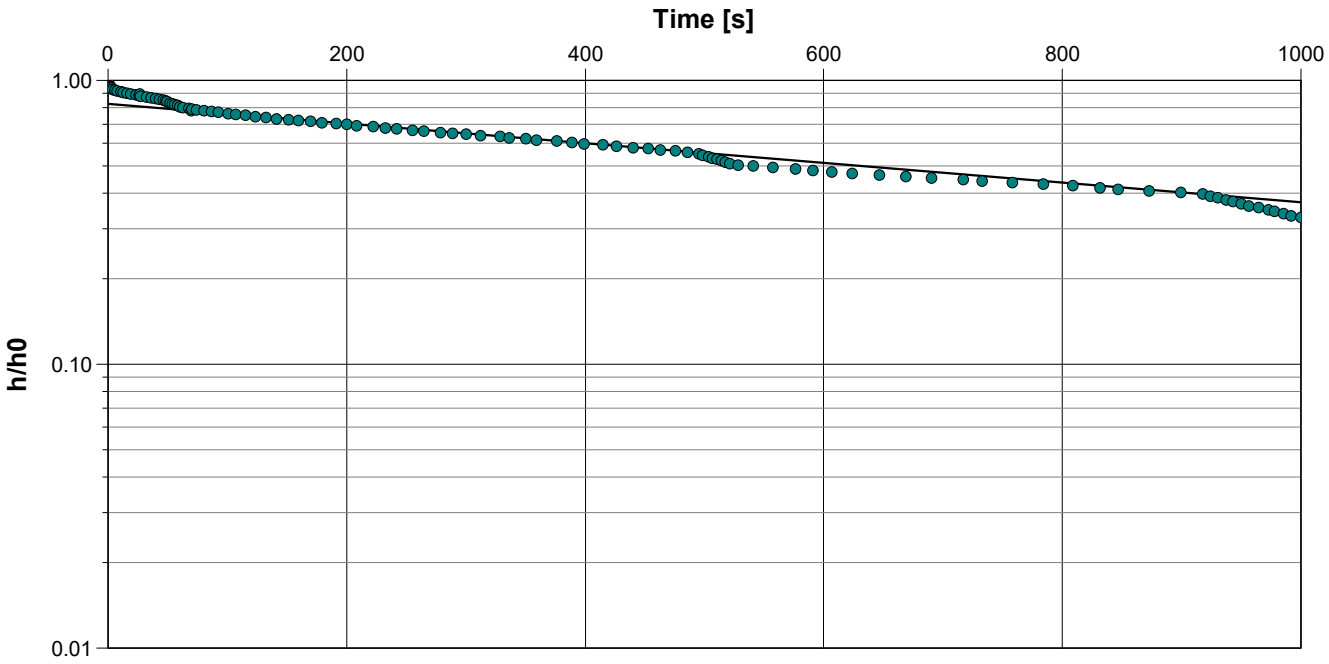


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW605-22	2.07×10^{-6}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW606-22 2023	Test Well: MW606-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 3.87 m		

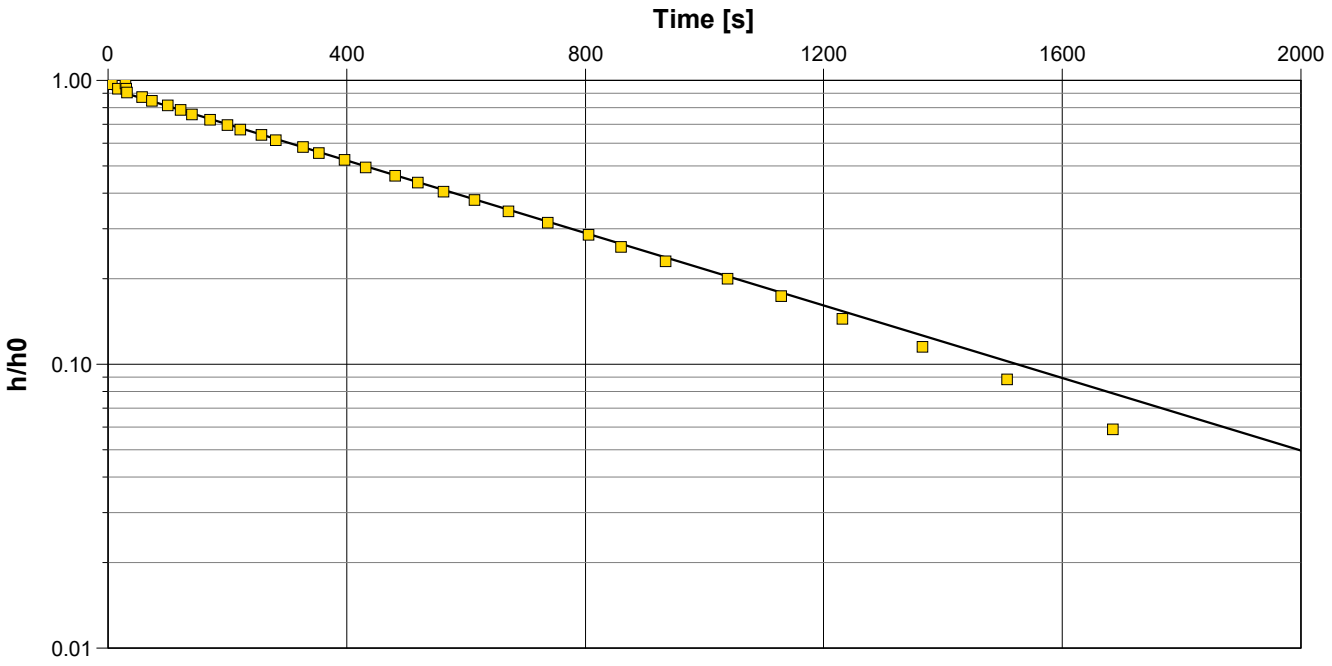


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW606-22	3.61×10^{-7}	

MTE Consultants Inc. 520 Bingemans Centre Drive Kitchener, Ontario N2B 3X9	**Slug Test Analysis Report**
	Project: Guelph Innovation District Lands
	Number: 46927-104
	Client: Fusion Homes

Location: Guelph, ON	Slug Test: MW607-22 2023	Test Well: MW607-22
Test Conducted by: TXG		Test Date: 5/16/2023
Analysis Performed by: JAK	Bouwer & Rice	Analysis Date: 4/12/2024
Aquifer Thickness: 5.73 m		



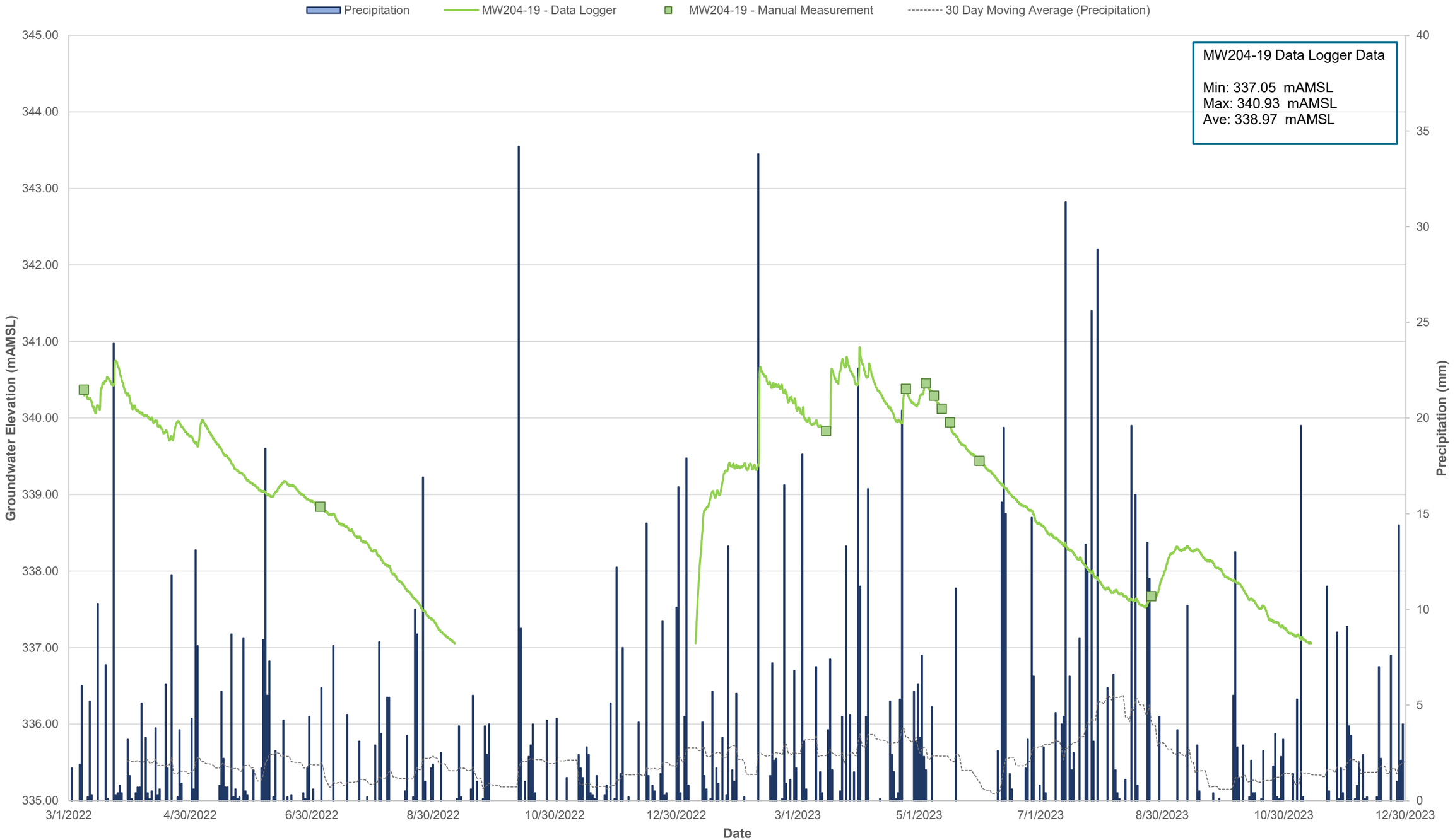
Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
MW607-22	7.15×10^{-7}	

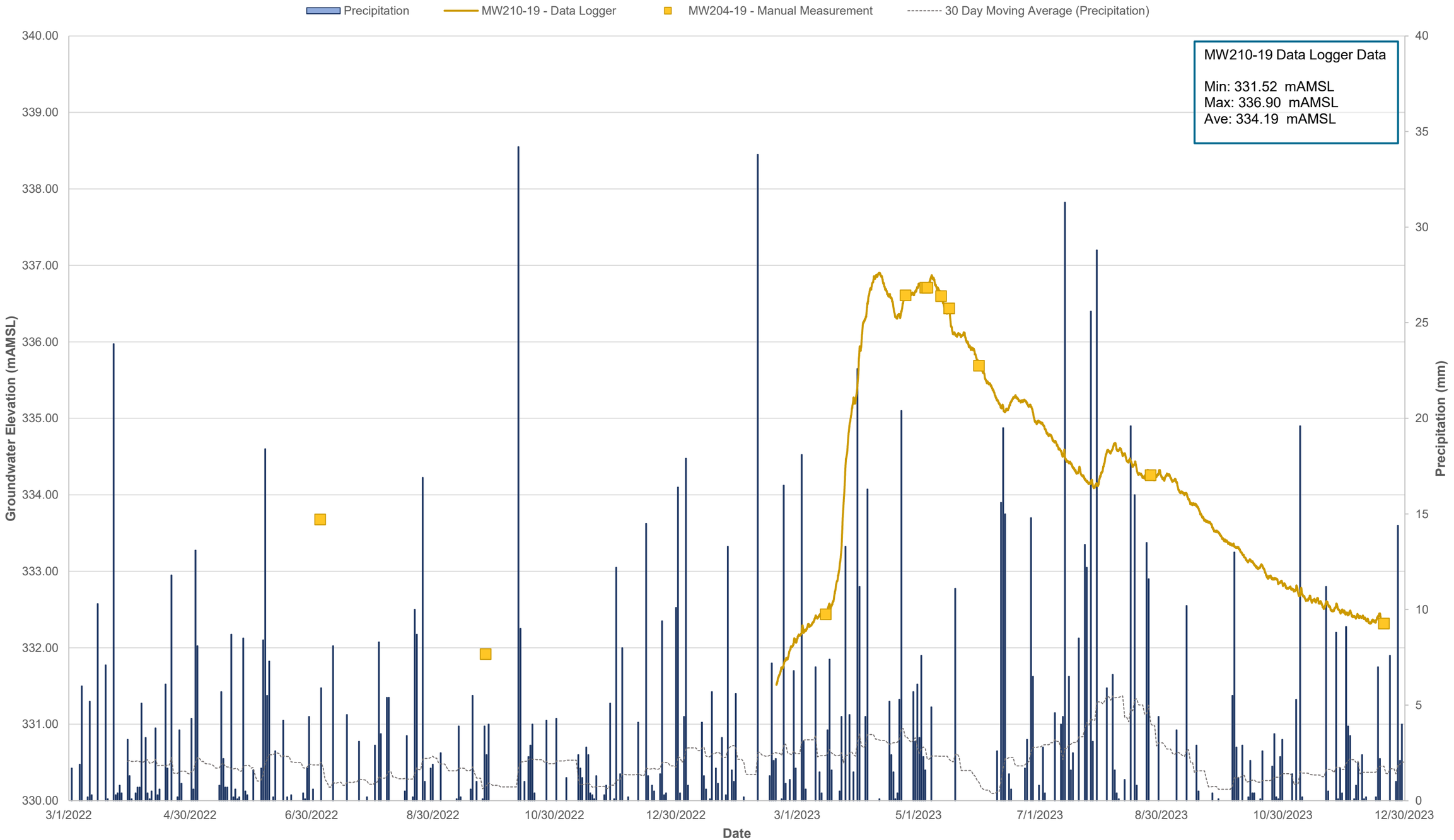
Appendix C

Hydrographs

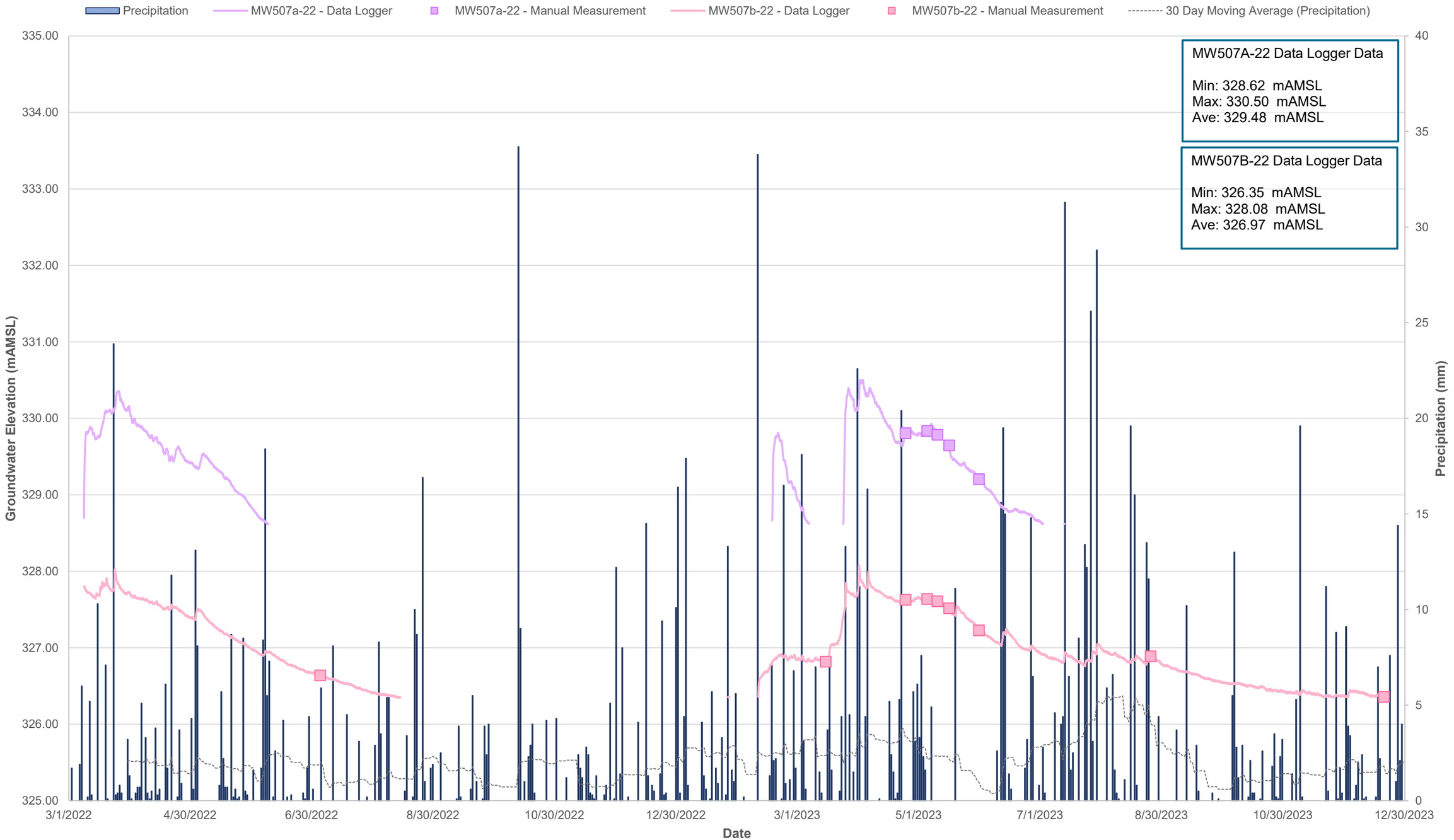
Hydrograph C1: Groundwater Elevations (mAMSL) - MW204-19



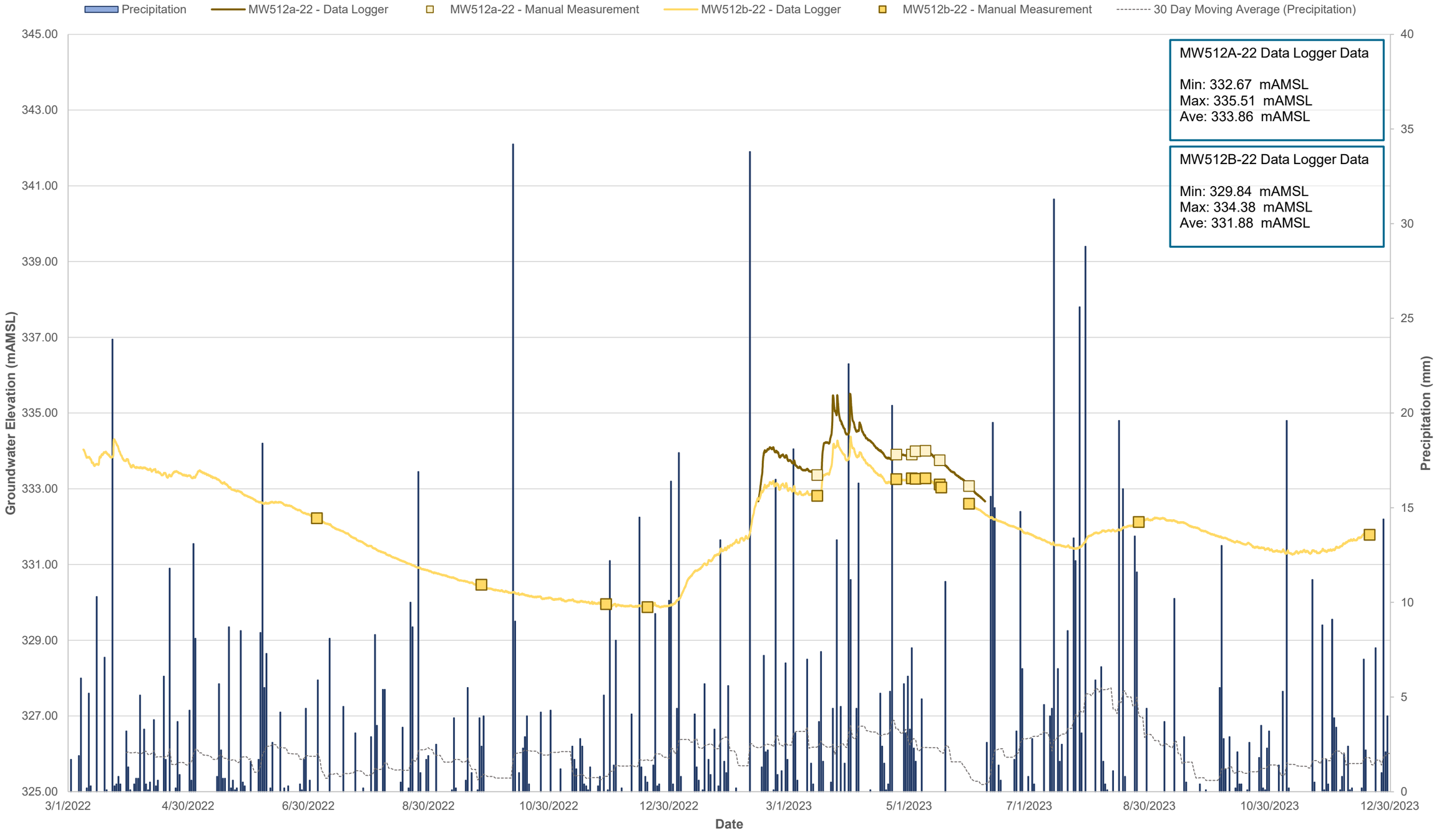
Hydrograph C2: Groundwater Elevations (mAMSL) - MW210-19



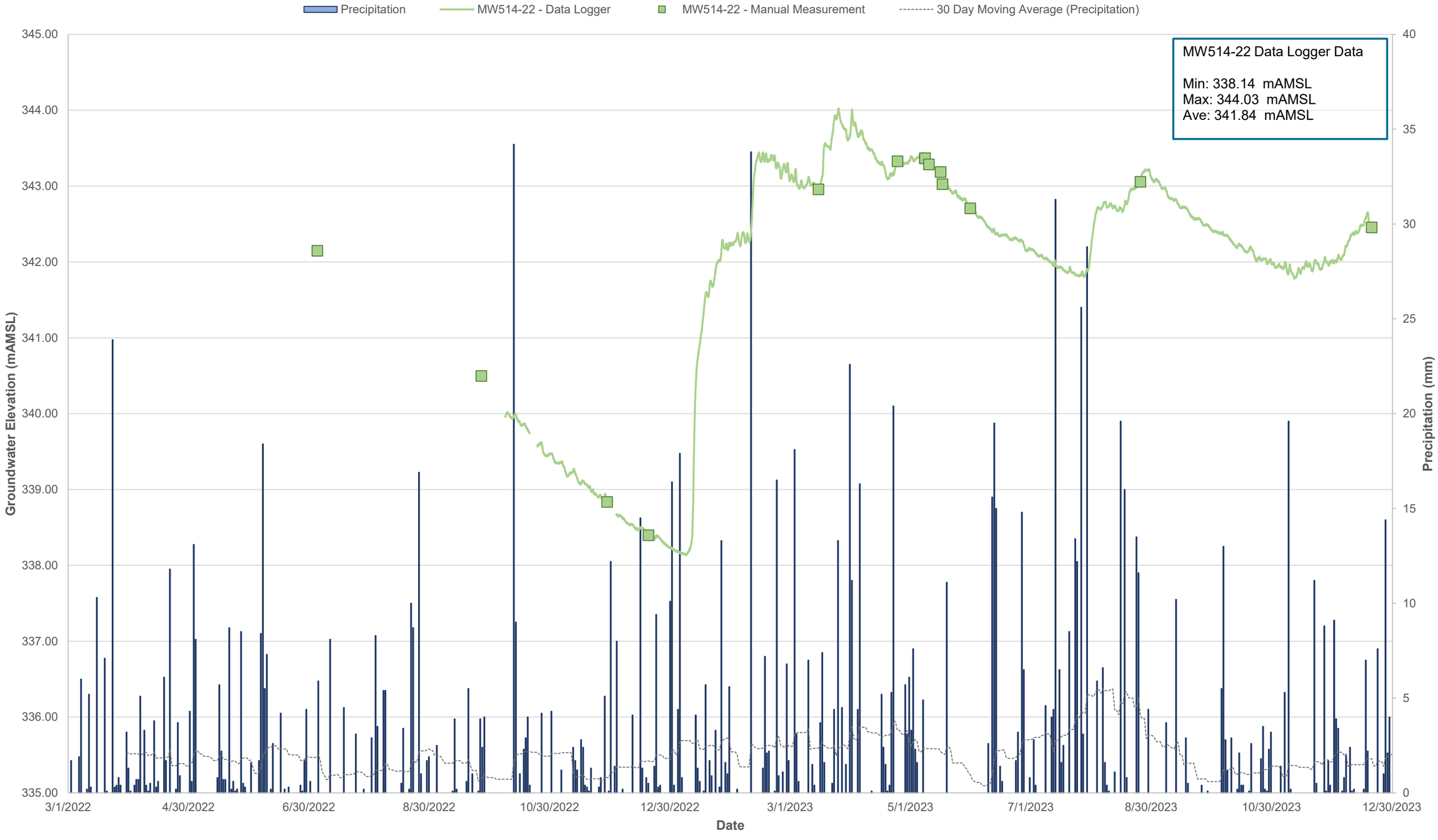
Hydrograph C3: Groundwater Elevations (mAMSL) - MW507-22



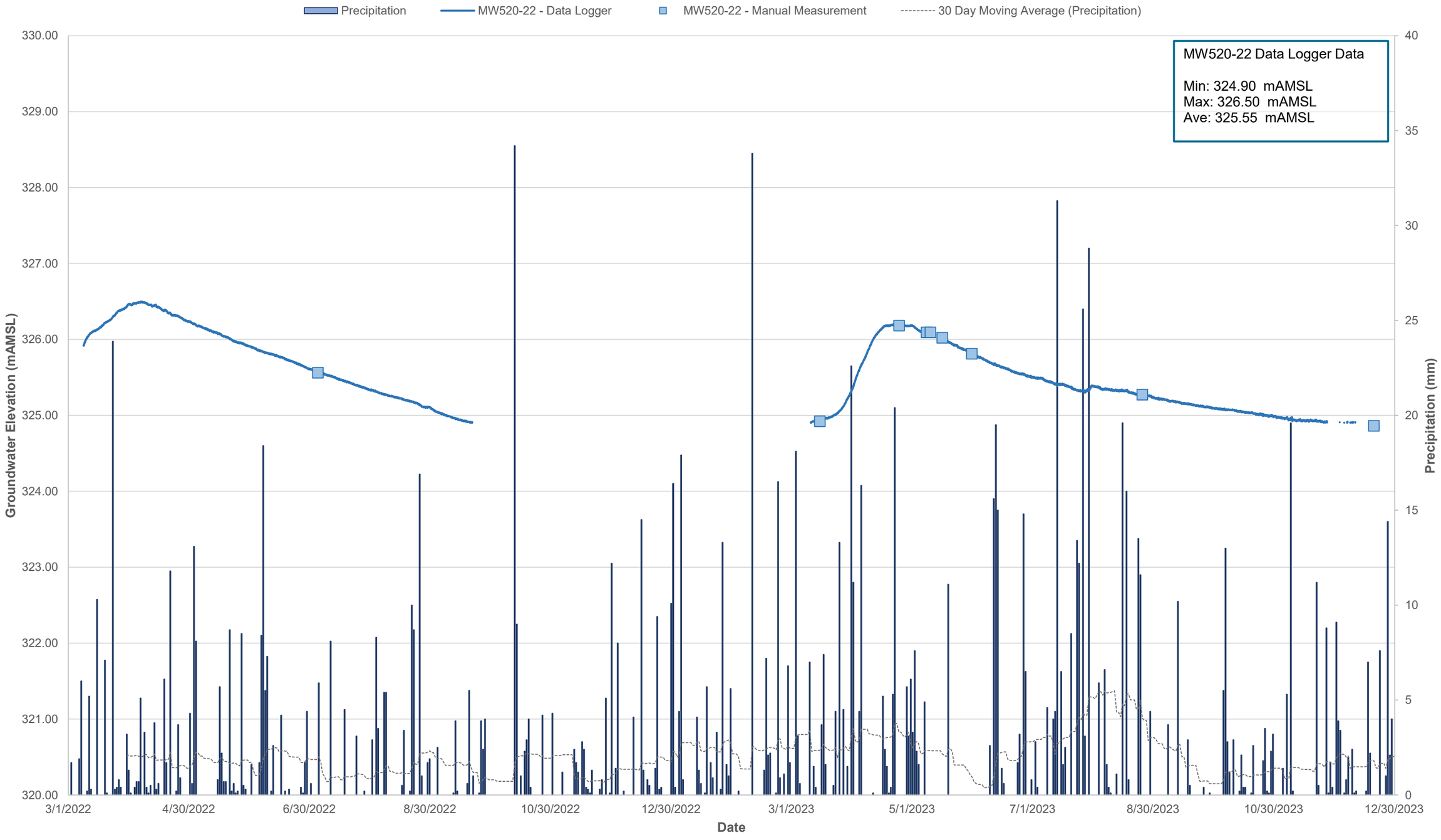
Hydrograph C4: Groundwater Elevations (mAMSL) - MW512-22



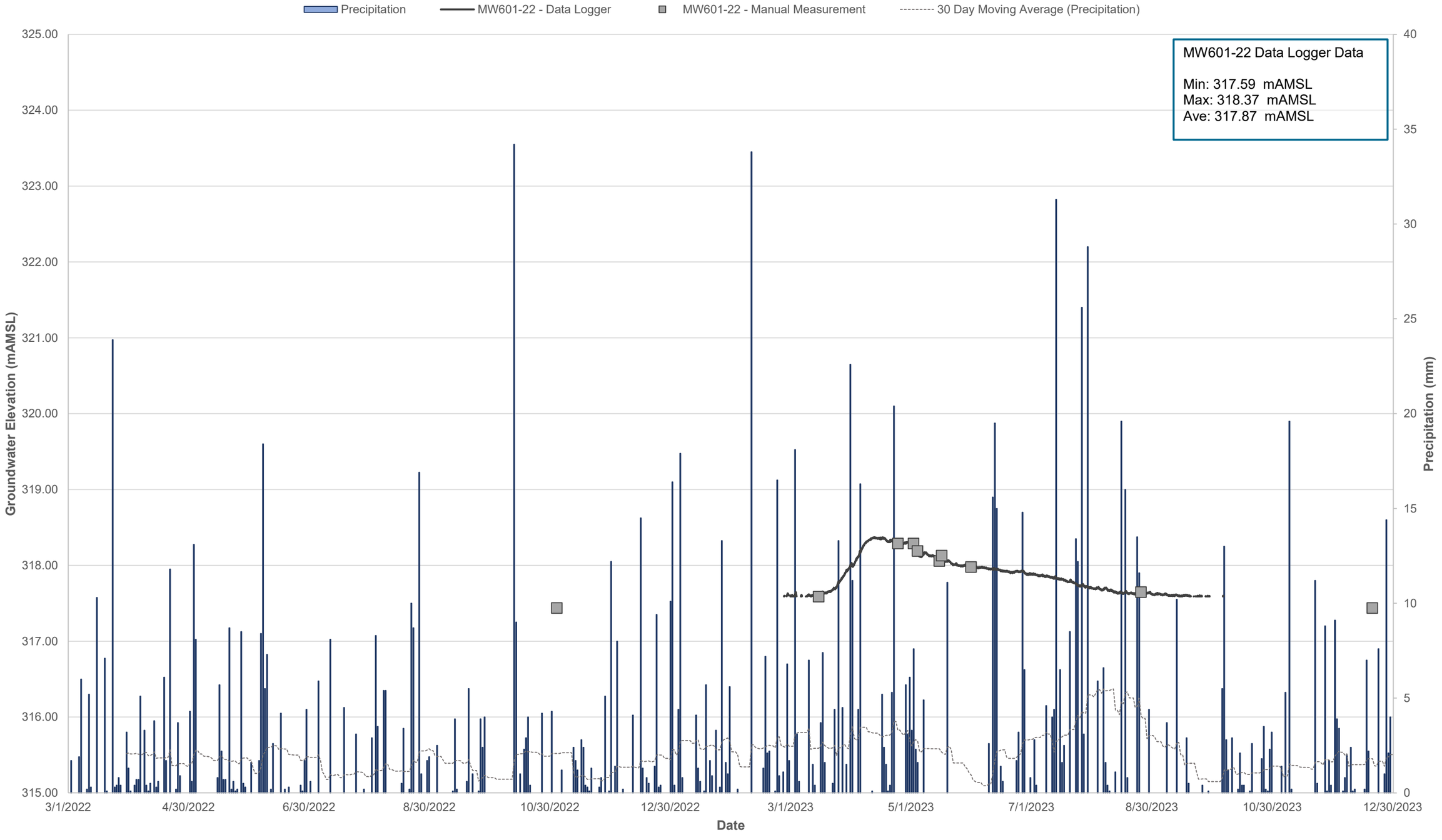
Hydrograph C5: Groundwater Elevations (mAMSL) - MW514-22



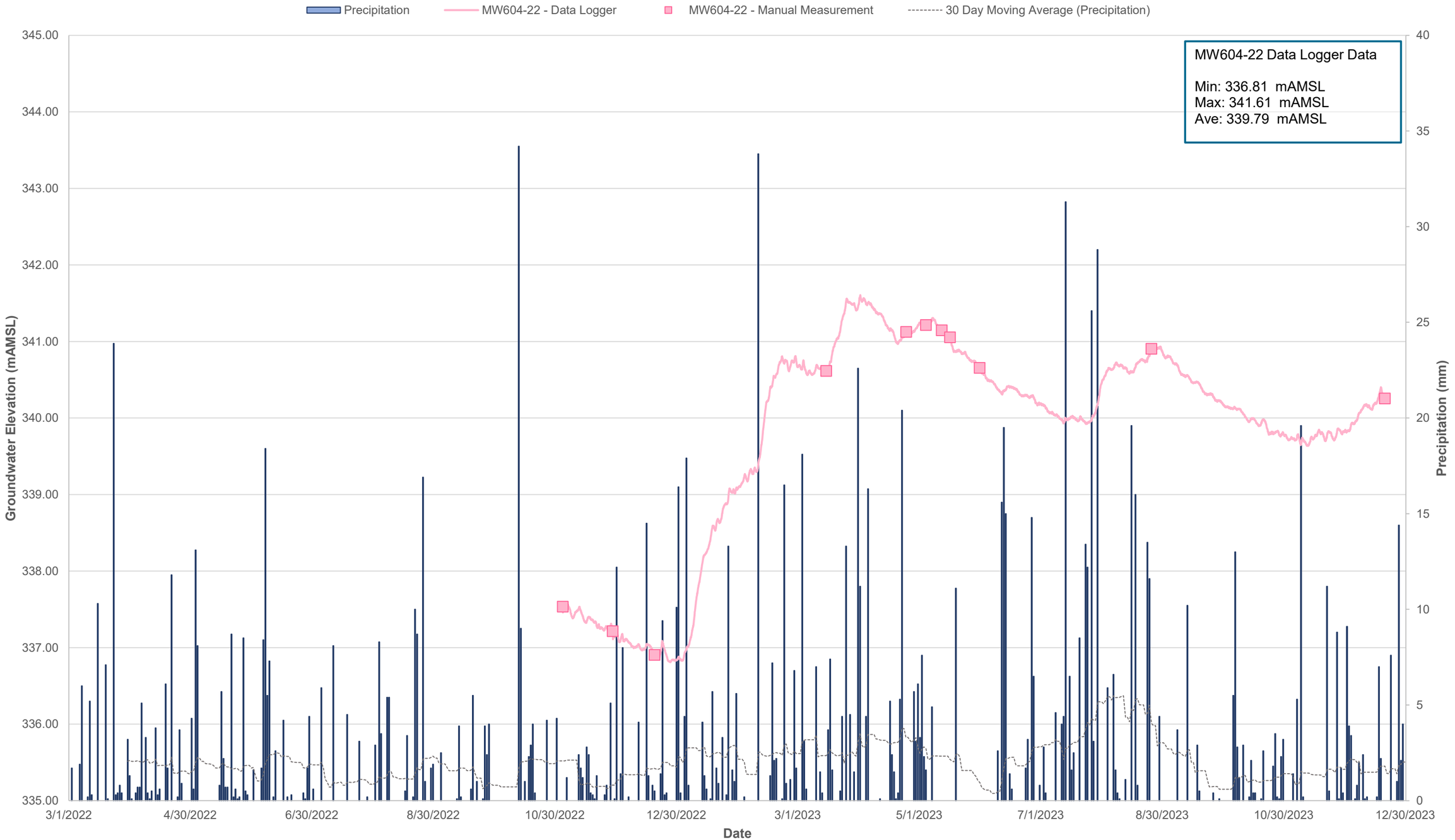
Hydrograph C6: Groundwater Elevations (mAMSL) - MW520-22



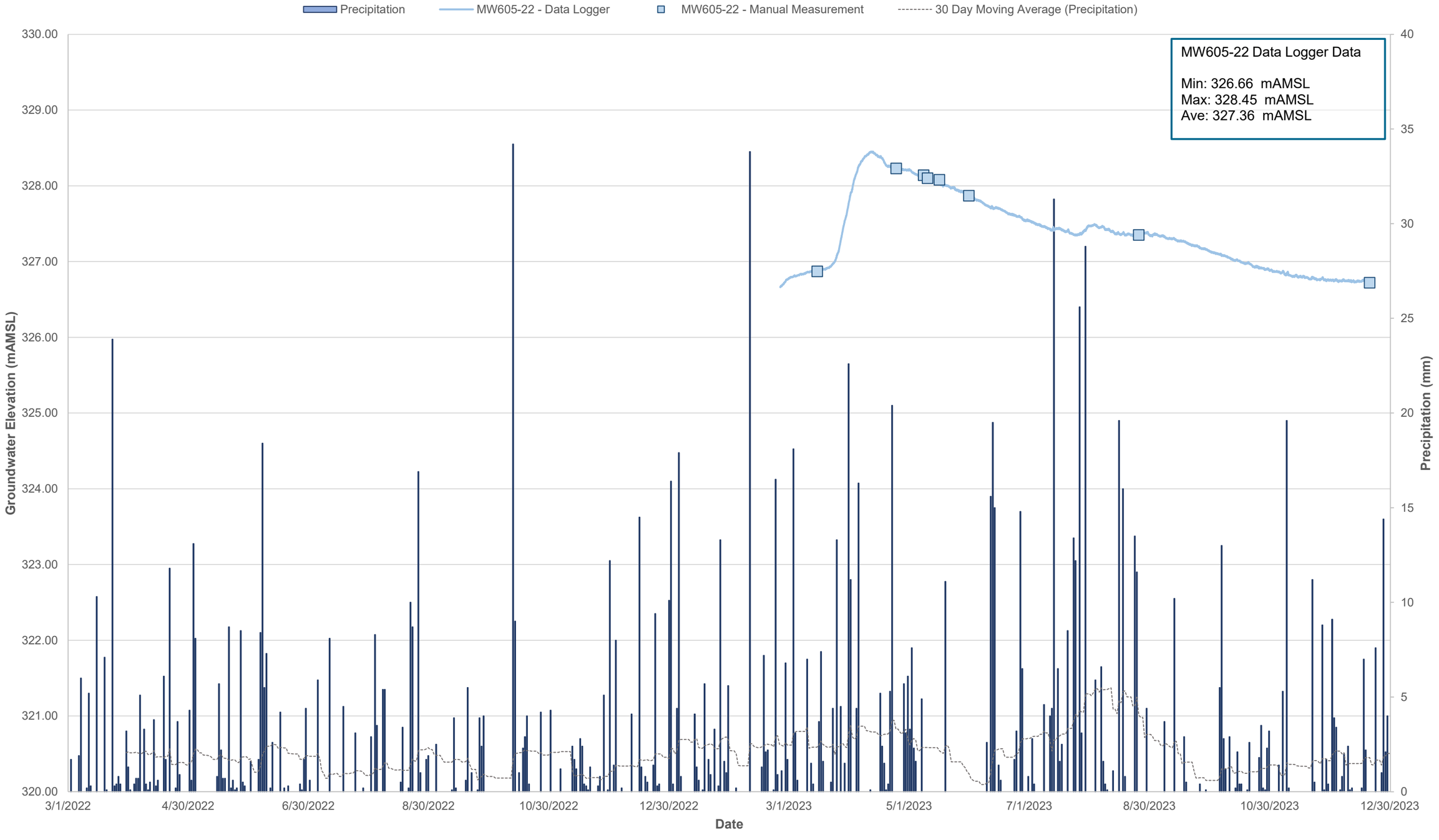
Hydrograph C7: Groundwater Elevations (mAMSL) - MW601-22



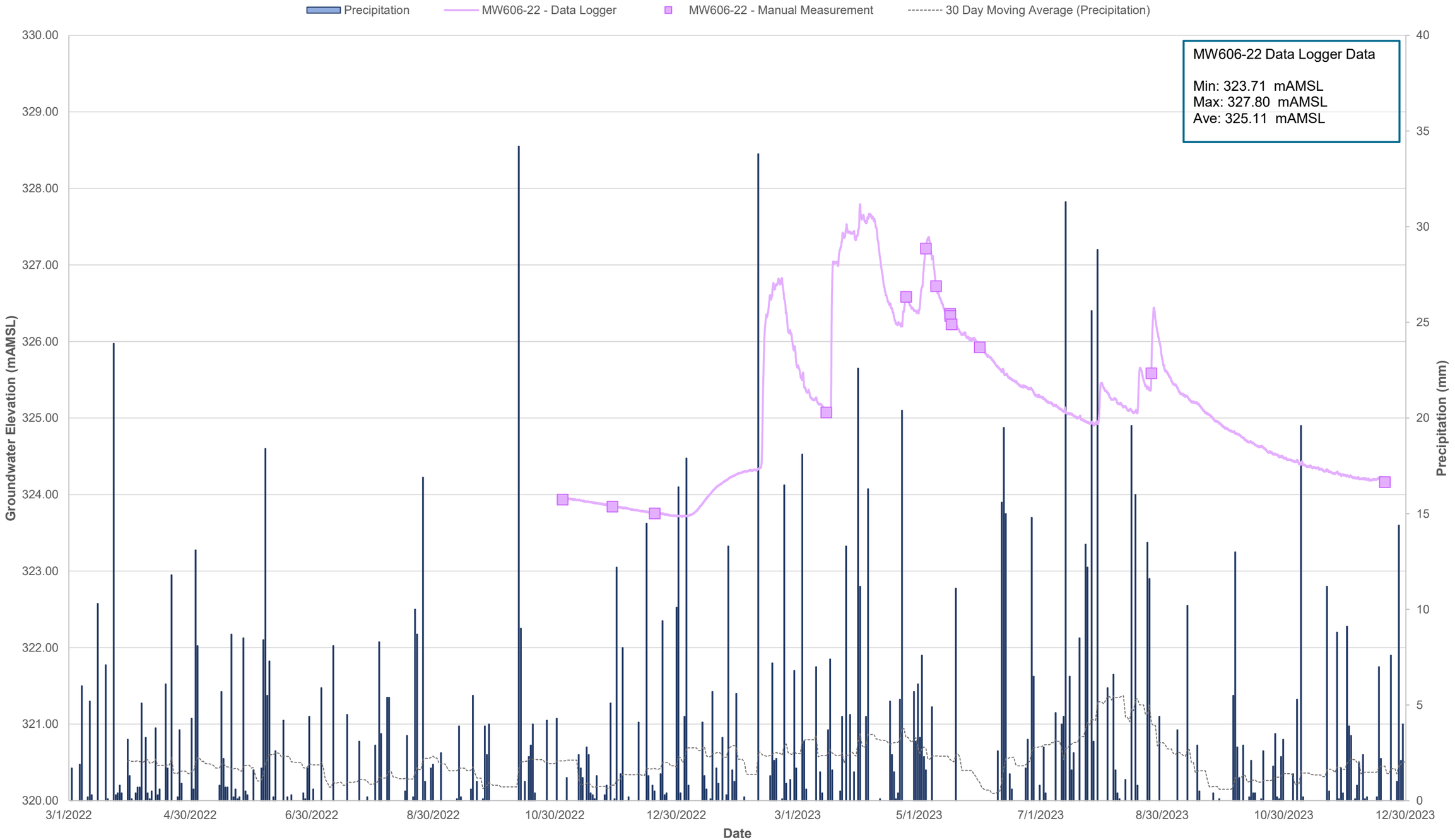
Hydrograph C8: Groundwater Elevations (mAMSL) - MW604-22



Hydrograph C9: Groundwater Elevations (mAMSL) - MW605-22



Hydrograph C10: Groundwater Elevations (mAMSL) - MW606-22



Hydrograph C11: Groundwater Elevations (mAMSL) - MW607-22