Elora Sands Subdivision

Functional Servicing Report

Project Location:
Township of Centre Wellington, Ontario

Prepared for:
Cachet Developments (Elora) Inc.
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November 4, 2025

MTE File No.: 62018_001

Engineers, Scientists, Surveyors.

Contents

1.0 Introduction 1
1.1 Overview 1
1.2 Background Information 3
1.2.1 Subwatershed Study - Nichol Drain No. 1 3
1.2.2 Development Charges Background Study 3
1.2.3 Other Studies 3
2.0 Existing Conditions 4
2.1 Topographical Information 4
2.2 Geotechnical and Hydrogeological Information 4
2.3 Source Water Protection and GRCA Mapping 5
3.0 Proposed Development 6
3.1 Municipal Right-of-Ways 6
3.2 Irvine Street and Sideroad 15 Urbanization 6
3.3 SR15 Left Turn Lane and Functional Design 7
4.0 Proposed Grading 9
4.1 Grading Considerations 9
4.2 Lot Grading 9
4.3 Groundwater Separation 11
4.4 Floodplain Terracing 11
5.0 Municipal Servicing 12
5.1 Sanitary Servicing 12
5.2 Water Distribution 15
5.3 Storm Drainage 16
6.0 Stormwater management 19
7.0 Utility Servicing 19
8.0 Conclusions 20

Figures

Figure 1.1 – Location Plan 2
Figure 3.1 – Sideroad 15 Left Turn Lane Functional Design 8
Figure 4.1 – Preliminary Road Grade Plan 10
Figure 5.1 – Preliminary Sanitary Servicing Plan 14
Figure 5.2 – Preliminary Watermain Servicing Plan 17
Figure 5.3 – Preliminary Storm Servicing Plan 18

Appendices

Appendix A Draft Plan of Subdivision (MGP)
Appendix B Background Information
Appendix C Development Chagres Background Study Projects
Appendix D Geotechnical and Hydrogeological Investigations
Appendix E Source Water Mapping
Appendix F Road Cross-Sections
Appendix G Sanitary Assessment
Appendix H Storm Sewer Design Sheets

Drawings

Existing Conditions Plan
MTE Drawing No. 62018_001-EC1.1 ..... Encl.

Irvine Street STA 0+000 to 0+414.450
MTE Drawing No. 50250-100-MS2.1 ..... Encl.

Sideroad 15 STA 0+000 to 0+615
MTE Drawing No. 62018_001-PP1.1 ..... Encl.

Sideroad 15 STA 0+615 to 1+225
MTE Drawing No. 62018_001-PP1.2 ..... Encl.

Area Grading Plan
MTE Drawing No. 62018_001-AG1.1 ..... Encl.

U/S Footing to Groundwater Comparison
MTE Drawing No. 62018_001-MS1.1 ..... Encl.

1.0 INTRODUCTION

1.1 Overview

MTE Consultants Inc. (MTE) was retained by Cachet Developments (Elora) Inc. (Cachet) to prepare the following Functional Servicing Report (FSR) in support of a Zoning By-Law Amendment (ZBA) and Draft Plan of Subdivision (DPS) application.

The lands that comprise the ZBA and DPS application are known as the Elora Sands (formerly Gibson Farm). The Elora Sands (referred to hereafter as the Subject Lands) are located at 7581 Sideroad 15, in the Township of Centre Wellington, and are approximately 39.8ha. The Subject Lands are generally bounded by Sideroad 15 to the north, Gerrie Road to the east, the Keating agricultural lands to the south, and Irvine Street to the west. The Nichol Municipal Drain No. 1 (ND) flows generally in an east to west orientation through the northern portion of the Subject Lands. Refer to **Figure 1.1**.

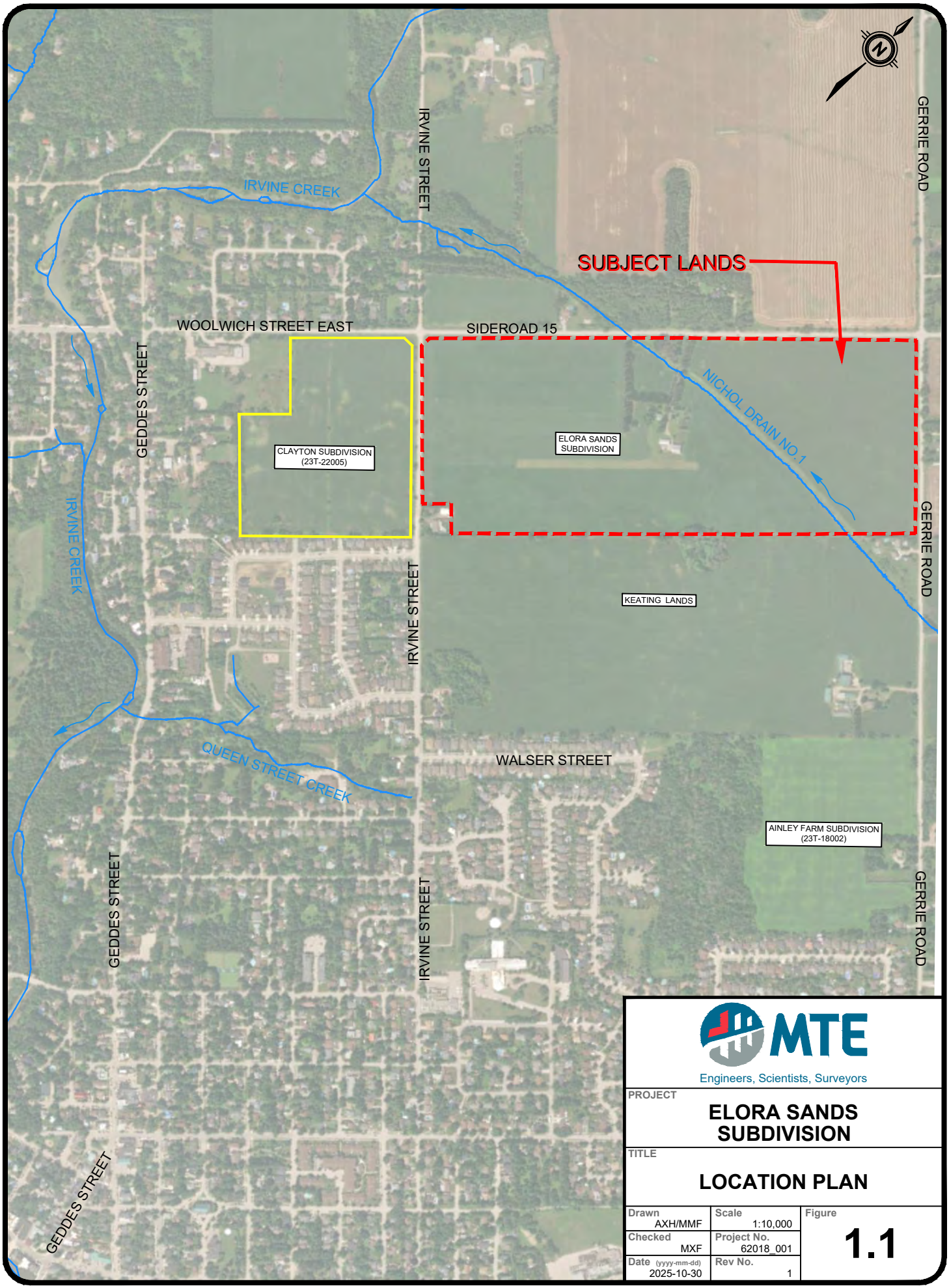
The Subject Lands are currently subject to active official plan amendment (OPA) applications to redesignate the property from 'Prime Agricultural' to 'Primary Urban Centres' and "Core Greenlands' under the County of Wellington (County) Official Plan, and to 'Residential' and 'Core Greenlands' within the 'Modified Urban Boundary' under the Township of Centre Wellington (Township) Official Plans. The OPA applications were acknowledged and deemed complete.

Following the applications for Official Plan Amendments to the Township and County, Cachet is proposing to develop the Subject Lands for residential uses. The proposed development plans include a residential subdivision with a mix of single detached, street-oriented townhouse units, a seniors housing facility, park blocks, a sanitary pumping station block, SWM blocks and municipal rights-of-way. Refer to the Draft Plan of Subdivision prepared by Malone Given Parsons Ltd. (MGP), dated August 27, 2025, in **Appendix A** for more details.

Further west of Irvine Street is the Clayton Subdivision (23T-22005, also owned by Cachet). The Clayton Subdivision was recently Draft Plan Approved at the Ontario Land Tribunal (OLT). The approved Stormwater Management (SWM) strategy for the Clayton Subdivision locates the proposed SWM facility on the Subject Lands with the intention of expansion through the development of the Subject Lands. Refer to the relevant background information for the Clayton Subdivision and the Subject Lands in **Appendix B**.

The purpose of this FSR is to present a servicing strategy for the proposed subdivision Draft Plan which outlines how the subdivision can be developed on full municipal services, including sanitary sewage collection, domestic water, storm drainage and utilities.

This report should be read in conjunction with the *Elora Sands Subdivision - Preliminary Stormwater Management Report* (November 2025) and the *Elora Sands Subdivision - Floodplain Assessment* (November 2025), prepared by MTE.



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PROJECT
ELORA SANDS SUBDIVISION

TITLE
LOCATION PLAN

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Date (yyyy-mm-dd): 2025-10-30	Rev No.: 1	

1.2 Background Information

1.2.1 Subwatershed Study - Nichol Drain No. 1

A subwatershed study for the Nichol Drain (ND) was undertaken by the Township and is detailed in the *Nichol Drain Subwatershed Study* (NDSS) prepared by Aquafor Beech Limited et al. (October 2008). Based on the NDSS, the drainage area of the subwatershed encompasses an area of approximately 767ha, mostly of agricultural lands. The NDSS identified the ND as being a coldwater watercourse downstream of Sideroad 15 (without coldwater fish species) and a warmwater system upstream of Sideroad 15. However, the Grand River Conservation Authority's (GRCA) GRIN mapping shows the entire reach of the ND as being a warmwater system.

The ND is an open channel type municipal drain that starts adjacent to Beatty Line, at its most upstream point. The channel flows west approximately 4km and discharges to Irvine Creek immediately west of Irvine Street, which in-turn discharges to the Grand River just downstream of the Village of Elora.

As part of the Boundary Expansion OPA application, a *Preliminary Stormwater Management Strategy Report* (March 2025) was prepared by MTE that provided a SWM strategy and a subwatershed study update incorporating development of the boundary expansion lands, as the previous NDSS did not contemplate any development beyond developments within Fergus.

The NDSS recommended terracing of the overbanks adjacent to the channel to improve floodplain connectivity. The updates to the floodplain (i.e. terracing) were implemented into the Draft Plan and are documented within the *Elora Sands Subdivision - Floodplain Assessment* (November 2025) prepared by MTE.

1.2.2 Development Charges Background Study

In 2020, Watson & Associated Economists Ltd. were retained by the Township to prepare a Development Charges (DC) Background Study. The study was prepared to analyse and describe the required DC eligible infrastructure required to accommodate future growth of the Township as described within the Official Plan. **Table C.1** in **Appendix C** describes the DC infrastructure projects adjacent to the Subject Lands.

We understand that the Township is in the process of reviewing the DC Background Study in the Fall of 2025. We believe that roadway urbanization improvements outlined in Project 33 should also include new watermains on SR15 (between Irvine Street and Gerrie Road) which were not included in **Table C.1** and are required for the development of the Subject Lands.

1.2.3 Other Studies

The following studies represent background studies completed by the broader study team:

- *Elora Sands - Environmental Impact Study, Beacon Environmental (November 2025).*
- *Proposed Residential Development Clayton and Elora Sands - Supplemental Groundwater Data, Soil-Mat (September 2025).*
- *Nichol Drain - Preliminary Fluvial Geomorphological Assessment, GEO Morphix (October 2025).*
- *Transportation Impact Study, Residential Development Nichol Road 15 & Irvine Street (Paradigm Transportation Solutions Ltd, August 2025).*

2.0 EXISTING CONDITIONS

2.1 Topographical Information

As previously discussed, the subject lands consist of approximately 39.8ha, of which portions of the lands are undevelopable as they are within the ND floodplain. The Subject Lands are generally bounded by Sideroad 15 to the north, Gerrie Road to the east, Keating agricultural lands to the south, and Irvine Street to the west. The Subject Lands are currently used for interim agricultural purposes.

MTE conducted a detailed topographical survey of the subject lands in 2022. The existing topography of the Subject Lands are shown on **MTE Drawing 62018_001-EC1.1**. A topographical survey for the Clayton Subdivision was completed by JD Barnes (formerly Black, Shoemaker, Robinson & Donaldson Limited) in the Fall of 2021, as part of its Draft Plan of Subdivision application.

The Subject Lands generally consist of moderately sloped topography with slopes typically ranging from 1.0% to 16.5%. Existing elevations within the lands range from approximately 400.8m in the ND to 420.5m at the north corner of the property.

A topographical ridge is present near the southwest corner of the Subject Lands, generally parallel to the ND, which extends into the adjacent Keating lands to the south. The ridge has a general elevation of 414.0m to 415.0m within the Subject Lands.

Under pre-development conditions, the lands north of the topographical ridge, approximately 93% of the Subject Lands (37.3ha), have surface runoff draining to the ND, which in-turn drains to Irvine Creek. This is split between the lands north and south of the ND with the lands north of ND draining from north to south; and the lands south of the ND draining from south to north. The remaining 7% of the Subject Lands (2.7ha) located in the southwest corner and south of the ridge, drain towards a wetland located in the southwest corner of the Keating lands, adjacent to Irvine Street. The wetland and Irvine Street drain to the Queen Street Creek which also discharges to Irvine Creek.

2.2 Geotechnical and Hydrogeological Information

In 2021, Soil-Mat Engineers & Consultants Ltd. (Soil-Mat) conducted initial geotechnical and hydrogeological investigations for the Subject Lands and the Clayton Subdivision, with several updates provided since then.

The fieldwork for the investigations included: 15 boreholes for the Subject Lands (of which 9 included a monitoring well), and 13 boreholes for the Clayton Subdivision (of which 10 included monitoring wells). The boreholes were advanced to depths ranging between 2.1m to 8.2m. Based on the results of the detailed investigations, the subsurface stratigraphy for the Subject Lands is generally described as topsoil underlain by sandy silt, silty sand till, and clayey sandy silt till deposits, with generally trace amounts of gravel.

The hydrogeological assessments included groundwater level readings for all monitoring wells based on continuous monitoring, generally measured from October 2021 to May 2023, and from March to May 2025. A groundwater contour plan representative of the seasonal high groundwater levels was also provided. The most recent hydrogeological assessment update based on the latest groundwater monitoring is summarized in the September 2025 report.

Based on the groundwater level readings recorded by Soil-Mat, groundwater levels generally rise and fall with the topography. Groundwater flow is interpreted as having a high point located near the topographical ridge and generally mimics the surface water flow direction.

Based on the findings in the NDSS and the hydrogeological assessment by Soil-Mat, generally, groundwater contributes to the ND as shallow interflow and baseflow.

The relevant geotechnical and hydrogeological reports can be found in **Appendix D**.

2.3 Source Water Protection and GRCA Mapping

The Subject Lands are within a Wellhead Protection Area (WHPA) and a Significant Groundwater Recharge Area-Tier 2 (SGRA) as defined by the Source Water Protection Plan Mapping, as illustrated in **Appendix E**. A majority of the lands have a WHPA classification of WHPA-C, while a very small portion of the Subject Lands in the southwestern corner have a classification of WHPA-B and the eastern portion of the lands have a classification of WHPA-D. The majority of the Subject Lands are within a wellhead vulnerability score of 6 with a very small portion in the southwest corner having a vulnerability score of 8 and the eastern portion of the lands with a vulnerability of 4. There is an existing municipal drinking water supply well located on Aqua Street approximately 900m south of the Subject Lands.

The intrinsic vulnerability for the SGRA is characterised as moderate (generally having a vulnerability score of 4), generally indicative of shallow groundwater flow towards Irvine Creek west of the Subject Lands.

As part of the Hydrogeological Considerations, Terra-Dynamics Inc. conducted a Source Water Protection Due Diligence Review of the Subject Lands and Keating Lands dated March 2025 as part of the boundary expansion OPA application. The management strategies proposed for mitigation of impacts for quality and quantity to WHPAs and SGRAs by Terra-Dynamics aligns with the stormwater management strategies and servicing proposed in this FSR and the Preliminary SWM Report. Refer to **Appendix D and E** for details.

3.0 PROPOSED DEVELOPMENT

The Draft Plan of Subdivision (**Appendix A**) for the residential development comprises the following:

- Residential (single detached and townhouse) lots/blocks;
- Seniors block;
- Three (3) SWM blocks;
- Sanitary Pumping Station (SPS) block;
- Two (2) Park blocks;
- Natural Heritage System; and,
- Municipal Rights-of-Ways.

3.1 Municipal Right-of-Ways

As shown on the Draft Plan, the proposed development is serviced by a network of 18.0m local roads, with planned connections to Irvine Street at one location, SR15 at two locations, and Gerrie Road at one location. Two road connections are provided to the Keating lands, should they be developed in the future. The proposed roads will be constructed to an urban cross-section based on the typical 18.0m cross-section from the Township's 2024 Development Manual, including asphalt pavement, concrete curb and gutters, concrete sidewalks, street illumination, and boulevard landscaping. A portion of Street H is proposed as a modified 16.0m cross-section along the window street adjacent to the existing SR15 rural cross-section.

Refer to **Appendix F** for the proposed typical 18.0m right-of-way cross-section as well as the modified 16.0m right-of-way cross-section.

The geotechnical investigation prepared by Soil-Mat provides a proposed pavement structure as summarized in **Table 3.1** below. The future final design will implement the construction requirements of the Soil-Mat report.

Table 3.1 – Proposed Pavement Structure

Pavement Structure	Depth (mm)
HL3 Surface Course Asphalt	40
HL4 Binder Course Asphalt	60
Granular 'A' Base	150
Granular 'B' Sub-base	450

3.2 Irvine Street and Sideroad 15 Urbanization

As mentioned previously and outlined in the DC background study, SR15 is slated for road improvements. Therefore, through the development of the Subject Lands, it is proposed for SR15 to be re-constructed and upgraded to an urban cross-section on the south side along the frontage to the Subject Lands, while the north side will retain its rural cross-section, with transition grading to tie back into the existing ditch. The cross-section will include a continuation of the 2.7m wide multi-use trail previously proposed on Woolwich Street East along the frontage of the Clayton Subdivison. It should be noted that the proposed boulevard narrows for approximately 50m around the ND culvert due to the existing span length, ensuring proper projection beyond the transition grading down to the ND. The SR15 road profile will be updated to meet the Township's standards and accommodate the proposed grading and SWM strategy.

The SR15 urbanization is proposed between Irvine Street and Street C based on the servicing, grading and SWM strategy for the Subject Lands.

As previously mentioned, Street H at the window street section is proposed as a modified 16.0m cross-section adjacent to the existing rural portion of SR15. The proposed grading along the property line is being designed approximately 0.2m higher than the existing SR15 centreline road grades, with transition grading matching into the existing ditch. These proposed grades will provide a proper elevation at the property line for when SR15 is urbanized in the future.

Irvine Street has previously been proposed to be re-constructed and urbanized on both sides through the approved Clayton Subdivision. It is not identified as a DC eligible project but considering that the DC background study is being reviewed, we believe that it should be included in the DC background study update to connect the improved SR15 with the existing urbanized section at Bricker Avenue. Irvine Street will be a critical road and water/sewer infrastructure connection. Refer to the Irvine Street and SR15 plan and profile drawings **50250-100-MS2.1** and **62018_001-PP1.1 and PP1.2**, respectively, and **Appendix F** for the proposed typical road cross-sections.

3.3 SR15 Left Turn Lane and Functional Design

A Transportation Impact Study (TIS) was completed by Paradigm Transportation Solutions Limited (Paradigm) dated August 2025 to assess the impact of the proposed development on the transportation network. The TIS analyzed the existing traffic conditions as well as forecasts for the 5-year (2035) and 10-year (2040) horizons from the assumed full build-out of the proposed development.

Through the analysis, the TIS recommended that a westbound left-turn lane on SR15 at Street A is warranted with 15m of storage and should be constructed through the development of the Subject Lands. Therefore, a functional road design was prepared for this intersection and left turn lane. Refer to **Figure 3.1**.

The functional design shows that the left turn lane and storage will fit within the existing SR15 right-of-way, and no right-of-way widening is required. Detailed design for the intersection including the left turn lane will be completed during the final design phase of the subdivision.

7550
SIDEROAD 15

SIDEROAD 15

Ex. Bell Ped
Ex. CL Ditch
Ex. RS
Ex. EP
4.25m
3.35m
3.25m
3.35m
45.00m TAPER
Ex. EP
2.7m M.U.T.
Ex. HP

Ex. HP
Ex. RS
Ex. Culvert
Ex. CL Ditch
Ex. CL Ditch
3.35m
3.25m
45.0m TAPER
Ex. EP
4.25m
15.00m STORAGE
Ex. EP
Ex. Mailbox
2.7m M.U.T.
Ex. HP

EX. MAILBOX TO BE RELOCATED

1.5m CSW
STREET A
1.5m CSW

BLOCK 426
SWM

BLOCK 427
SWM

LEGEND

PROPOSED LINE PAINTING

PROPOSED CURB

EXISTING EDGE OF ASPHALT

Plot Date: October 28, 2025 - 3:36 PM

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PROJECT
ELORA SANDS SUBDIVISION

TITLE
SIDEROAD 15 LEFT TURN LANE FUNCTIONAL DESIGN

Drawn	Scale	Figure
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4.0 PROPOSED GRADING

4.1 Grading Considerations

Refer to **Figure 4.1** – Preliminary Road Grade Plan for the Subject Lands.

The following is a list of considerations which influenced and/or governed the proposed grading design of the Subject Lands:

- Match centreline elevations of existing and proposed road grades;
- Match boundary grades around the perimeter of the Subject Lands;
- Match grades at Natural Heritage System (Nichol Drain) floodplain development limits;
- Ensure major storm event overland flows are directed towards the proposed SWMFs;
- Comply with municipal standards for minimum and maximum road and landscaped area grades;
- Ensure adequate cover is provided, where feasible, over municipal services;
- Optimize proposed earthworks to minimize the cut/fill balance for the proposed development to the extent possible at this time; and,
- Maintain 0.30m vertical separation from underside of footing to seasonal high groundwater levels.

4.2 Lot Grading

Preliminary centreline road grades ranging from 0.5% (minimum) to 8% (maximum) were used to complete the concept grading design. The other considerations listed above were incorporated into the overall grading design. Preliminary lot grades range from 2.0% (minimum) to 6.0% (maximum) with a combination of traditional back-to-front drainage, split drainage, lookout, and walkout lots. Preliminary finished grades are designed to optimize the earthmoving (cutting and filling) required for road and lot construction. The preliminary finished grade contours are shown in **Figure 4.1** and more detailed grading is shown on **MTE Drawing 62018_001-AG1.1**.

It should be noted that the grading design for the rear property line of the lots on Street H backing onto Gerrie Road are set approximately 0.2m higher than the existing Gerrie Road centreline road grades, with transition grading matching back into existing. These proposed grades will provide a proper elevation at the property line for when Gerrie Road is urbanized in the future. Under existing conditions, the west ditch of Gerrie Road along the northern portion of the Subject Lands frontage is less defined and most of the drainage flows overland through the Subject Lands. The proposed grading design will therefore better define the existing ditch to capture the municipal road drainage and tie into the ditch downstream at the southern end of the Subject Lands frontage which eventually discharges to the ND.

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WOOLWICH STREET EAST

SIDEROAD 15

SIDEROAD 15

CLAYTON SUBDIVISION

IRVINE STREET

GERRIE ROAD

NICHOL DRAIN

BRICKER AVENUE

SWMF1

SWMF1

SWMF2

STREET A

STREET A

STREET A

STREET A

STREET C

STREET C

STREET D

STREET D

STREET E

STREET E

STREET E

STREET F

STREET F

STREET G

STREET H

STREET H

STREET H

STREET H

STREET J

BLOCK 429
Pumping Station
0.32 ha

BLOCK 423
PARK
.44 ha

BLOCK 434
SENIORS
.37 ha

BLK 432
Future Road
0.06 ha

BLK 433
Future Road
0.06 ha

PERMISSION TO GRADE FROM THE NEIGHBOURING PROPERTY MUST BE SECURED PRIOR TO ANY GRADING

KEATING LANDS

10m WOODLAND BUFFER

WOODLAND LIMIT

LEGEND

- LIMIT OF DEVELOPMENT
- PROPOSED REVISED FLOODPLAIN
- SITE BOUNDARY
- 410.5 — PROPOSED CONTOURS
- 403.0 — GRCA EXISTING CONTOURS
- (224.35) — PROPOSED ELEVATION
- LP — LOW POINT
- HP — HIGH POINT
- OVERLAND FLOW ROUTE (MAJOR STORM)
- EXISTING DIRECTION OF DRAINAGE

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PROJECT
ELORA SANDS SUBDIVISION

TITLE
PRELIMINARY ROAD GRADE PLAN

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Date (yyyy-mm-dd): 2025-10-30	Rev No.: 0	

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4.3 Groundwater Separation

The seasonal high groundwater surface was modeled based on Soil-Mat's hydrogeological assessment with the groundwater contours generally found at an elevation ranging between 401.0m and 417.5m. The preliminary grading design established house grades and underside of footing elevations to generally maintain the minimum required separation of 0.30m above the seasonal high groundwater elevation. The groundwater separation is illustrated in **MTE Drawing 62018_001-MS1.1**. The grading around buildings generally ranges between 411.5m and 420.5m. Proposed underside of footing elevations were assumed to be 2.5m below front of house grade with some walkouts having underside of footing elevations up to 2.7m below the front house grade. As shown on **MTE Drawing 62018_001-MS1.1**, the development generally maintains a separation of between 1m to 8m between underside of footing and seasonal high groundwater elevations which is greater than the minimum required 0.3m separation from the Township's 2024 Development Manual.

Due to grading constraints, the groundwater separation in one small area in the southwest corner of the Subject Lands is less than 0.3m. This area is generally within rights-of-way and in some townhouse lots. Standard townhouse residential construction generally has underside of footings set at 2.2m below finished grade indicative of an 8ft basement whereas our overall analysis considered a 9ft basement (2.5m depth). The grading of these lots may require minimum basement floor elevations and some design enhancements to meet groundwater separation and will be reviewed during detailed design specifying minimum underside of footing elevations if necessary.

4.4 Floodplain Terracing

In conjunction with the NDSS, the ND will be regraded to establish a riparian corridor of 30m on each side of the existing stream channel. The implementation of terracing was recommended to "improve floodplain connectivity" and allow for "the development of natural forms and functions within the corridor". The study recommended beginning the terracing 0.1m above the invert of the channel; however, it was determined that the defined channel will retain its full depth to ensure that most minor storm events are contained within the existing channel. The floodplain is then graded at 1% before tying into the regional floodplain elevation with a 4:1 embankment.

Refer to *Elora Sands Subdivision - Floodplain Assessment* (November 2025) prepared by MTE for more details.

5.0 MUNICIPAL SERVICING

5.1 Sanitary Servicing

The Subject Lands are proposed to be serviced by the existing 200mm diameter sanitary sewer on Irvine Street that is currently stubbed north of Bricker Avenue. This sewer will be extended north on Irvine Street and into the Subject Lands at Street B. The existing Irvine Street sewer flows south towards Colbourne Street, North Queen Street, East Mill Street and eventually discharges into the Elora Wastewater Treatment Plant (WWTP). As documented in the FSR dated March 2025 prepared by MTE in support of the boundary expansion OPA application, the Elora WWTP has capacity for the proposed development.

The Township recently completed a Water and Wastewater Servicing Master (WWSMP) with the final report dated June 30, 2025 prepared by R.V. Anderson Associates Limited (RVA). The WWSMP documented the Township-wide servicing upgrades required to service growth up to 2051 and which confirmed that the Elora WWTP has capacity to service growth beyond 2051. It also documented the average daily wastewater flow (including extraneous inflow and infiltration) per capita at the WWTP of 300L/cap/day, based on monitoring, and which is used to forecast future flows. Accordingly, this was used to determine flows for the proposed development.

A majority of the Subject Lands (lands south of the ND) will be serviced by gravity directly to the existing sanitary sewer. The balance of the Subject Lands (north of the ND) cannot be serviced by gravity and will be serviced by a SPS with a forcemain crossing the ND along SR15 and discharging to the proposed sewers on Street D. Refer to **Figure 5.1** which illustrates a schematic of the internal sanitary sewer layout, concept finished road grades at key points in the sewer network, the gravity catchment area limits for the Irvine Street trunk sewer and the catchment area for the proposed SPS. The sewers generally follow the road grading throughout the site and range in depth between 2.4m and 3.4m with most at a typical depth of 2.8m. The Subject Lands represent a population of approximately 1,710 people resulting in a peaked residential flow of 21.6L/sec (gravity and SPS flow). Refer to the downstream sanitary design sheet in **Appendix G**.

In January 2022, MTE completed a sanitary servicing overview of the Subject Lands which was further refined and documented in the FSR dated March 2025 prepared as part of the boundary expansion OPA application. These reports documented the remaining capacity within the sanitary trunk sewer system for north Elora. The Irvine Street trunk sewer has a remaining capacity of approximately 16.5L/sec without surcharging. The capacity is specifically limited by a few runs of sewer between Walser Street and Marr Drive with as-recorded slopes of 0.27% and 0.33%, respectively, based on Township GIS mapping. The existing sewers south of Walser Street have steeper slopes and therefore provide more capacity. Refer to the figure in **Appendix G** for the plan showing the sanitary trunk sewers in north Elora. Using the WWSMP average daily flow of 300L/cap/day, these limiting sewer slopes allow for a growth population of approximately 1270 people (without surcharging), which represents the entire proposed development south of the ND and a portion of the Subject Lands north of the ND.

The remaining population of approximately 440 people (5.1L/sec of peaked residential flow) can be serviced by the existing Irvine Street trunk sewer with minimal surcharging of these limiting sewers upstream and downstream of the Walser Street intersection. A hydraulic grade line (HGL) analysis concluded that during the theoretical peaked flow (including gravity and SPS flows), the HGL rises approximately 0.14m and 0.26m above the obvert at these locations. Refer to the downstream sanitary design sheet in **Appendix G**. The existing sewer obvert in this location is approximately 3.5m deep and therefore, this surcharging is considered minor.

Considering this minor surcharging only occurs while the gravity and SPS peaked flows discharge simultaneously (which is an unlikely occurrence), storage and operation of the SPS can be modified so that flows are reduced to mitigate surcharging.

Further to this, we continue to recommend that the Township consider a review of and plan for upgrades of the Irvine Street trunk sewer as part of other infrastructure projects already planned by the Township in the near term.

Through the Township's completion of the WWSMP, MTE, on behalf of Cachet, has been involved attending both Public Information Centers (PIC) and providing feedback via formal correspondence. Based on our sanitary servicing overview, we noted and provided feedback that the Colbourne trunk sewer at Irvine Street and along North Queen Street appears to surcharge under theoretical flows under existing conditions. The Township's DC study documents that the Colbourne Street trunk sewer east of Irvine Street is to be upgraded and we understand that this is being completed as part of the Ainley Farm Subdivision. However, no upgrades were proposed for the downstream trunk sewer west of Irvine Street and along North Queen Street. We previously recommended that the Township undertake flow monitoring of the sewers at Irvine Street and Colbourne Street through the WWSMP to confirm the theoretical flows, however, we understand that flow monitoring was not completed.

In 2024, WSP Canada Inc. (WSP), on behalf of the Township, completed the Stormwater Management Master Plan for Centre Wellington (SWM MP) with the final report dated April 9, 2024. The SWM MP documented high priority storm sewer upgrade projects to be completed by the Township. These projects were recommended for implementation within the next 10 years. Two of the identified priority projects are Project 2c which includes upgrading the storm sewers on Irvine Street (between Sophia Street and the Grand River outlet) and Project 2b which includes upgrades on North Queen Street (between David Street and the Grand River outlet). Refer to Figure 9A from the SWM MP in **Appendix G**.

Considering the recommended priority project storm sewer improvements as well as other proposed DC infrastructure projects, we strongly recommend that the Township should plan for upgrading the Irvine Street sanitary trunk sewer to a 250mm-300mm diameter. Specifically, the trunk sewer should be upgraded as part of SWM MP Project 2c. Based on the design lifespan of municipal infrastructure, planning of infrastructure improvements should consider improvements in the fullness of time to maximize the utility of existing infrastructure. Completing sanitary upgrades in conjunction with storm sewer upgrades would allow for efficiency from a construction and economic perspective and should be considered at this time to avoid having to excavate the road again in the near future. When additional capacity in the Irvine Street trunk sewer is required in the future, the portion of the trunk sewer north of Sophia Street up to the existing stub should be upgraded. These sanitary trunk sewer upgrades on Irvine Street should also be added to the upcoming DC study update.

Considering these potential sanitary sewer upgrades that we believe the Township should consider in the near term and to allow for sufficient depth for the proposed development, the existing Irvine Street trunk sewer is proposed to be extended, as a 250mm diameter at a slope of 0.4%, north on Irvine Street and via the proposed development up to the intersection of Street B and Street D. Elsewhere in the subdivision, local sanitary sewers will be 200mm diameter within the Township's typical depth (>2.4m and <5m).

As per the recommendations in Soil-Mat's hydrogeological assessments, any municipal infrastructure, specifically the sanitary sewers, located within groundwater, will incorporate appropriate groundwater cut-off collars. Most of the infrastructure is above the seasonal high groundwater levels with the exception of a small area in the southwest corner which may require cut-off collars which will be confirmed during detailed design.

CAD: P:\62018_001\62018_001-F5.1-SAN.DWG

Plot Date: October 31, 2025 - 10:39 AM

WOOLWICH STREET EAST

SIDEROAD 15

SIDEROAD 15

IRVINE STREET

CLAYTON SUBDIVISION

BRICKER AVENUE

GERRIE ROAD

NICHOL DRAIN

KEATING LANDS

F/G=411.55
SAN OBV.=409.15±
DEPTH=2.40m±

F/G=412.40
SAN OBV.=409.90±
DEPTH=2.50m±

F/G=414.82
SAN OBV.=412.02±
DEPTH=2.80m±

F/G=411.39
SAN OBV.=408.59±
DEPTH=2.80m±

F/G=415.37
SAN OBV.=412.57±
DEPTH=2.80m±

F/G=419.23
SAN OBV.=416.43±
DEPTH=2.80m±

F/G=420.09
SAN OBV.=417.29±
DEPTH=2.80m±

F/G=420.60
SAN OBV.=417.80±
DEPTH=2.80m±

F/G=414.15
SAN OBV.=411.35±
DEPTH=2.80m±

F/G=418.81
SAN OBV.=416.01±
DEPTH=2.80m±

F/G=414.49
SAN OBV.=411.69±
DEPTH=2.80m±

F/G=411.69
SAN OBV.=408.89±
DEPTH=2.80m±

F/G=414.90
SAN OBV.=412.10±
DEPTH=2.80m±

F/G=412.08
SAN OBV.=409.28±
DEPTH=2.80m±

F/G=412.03
SAN OBV.=408.81±
DEPTH=3.22m±

F/G=412.94
SAN OBV.=410.14±
DEPTH=2.80m±

F/G=415.27
SAN OBV.=412.47±
DEPTH=2.80m±

F/G=413.98
SAN OBV.=408.60±
DEPTH=5.38m±

F/G=412.46
SAN OBV.=409.66±
DEPTH=2.90m±

F/G=413.37
SAN OBV.=410.57±
DEPTH=2.80m±

F/G=415.53
SAN OBV.=412.73±
DEPTH=2.80m±

F/G=415.86
SAN OBV.=413.06±
DEPTH=2.80m±

F/G=412.83
SAN OBV.=407.79±
DEPTH=5.08m±

REMOVE EX PLUG AND CONNECT TO SANITARY SEWER INV.=407.54±

F/G=413.67
SAN OBV.=410.87±
DEPTH=2.80m±

F/G=415.24
SAN OBV.=412.44±
DEPTH=2.80m±

F/G=415.74
SAN OBV.=412.94±
DEPTH=2.80m±

F/G=224.47
SAN OBV.=221.80±
DEPTH=2.67m±

101
19.38ha
1100

102
7.11ha
608

BLOCK 424
Park
0.37 ha

BLOCK 429
Pumping Station
0.32 ha

BLOCK 431
SENIORS
1.37 ha

BLOCK 423
PARK
1.44 ha

BLOCK 426
SWM
1.88 ha

BLOCK 427
SWM
1.69 ha

BLOCK 428
SWM
0.96 ha

BLK 432
Future Road
0.06 ha

BLK 433
Future Road
0.06 ha

STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET I
STREET J

15m WOODLAND BUFFER

LEGEND

- PROPOSED REVISED FLOODPLAIN
- SANITARY PUMPING STATION (SPS)
- AREA SERVICED BY SPS
- AREA SERVICED BY GRAVITY
- C/L ROAD GRADE
- SANITARY OBVERT
- SANITARY COVER
- SITE BOUNDARY
- LIMIT OF DEVELOPMENT
- PROPOSED LOCAL GRAVITY SEWER 200mm
- PROPOSED FORCEMAIN
- EXISTING SANITARY SEWER
- PROPOSED TRUNK 250mm SANITARY SEWER @ 0.40%

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS SUBDIVISION

TITLE
PRELIMINARY SANITARY SERVICING PLAN

Drawn	Scale	Figure
KAT/MMF	1:3000	5.1
Checked: AFF	Project No.: 62018_001	
Date (yyyy-mm-dd): 2025-09-15	Rev No.: 0	

5.2 Water Distribution

The Subject Lands are located within the community of Salem, adjacent to several existing and proposed residential subdivisions and rights-of-way with available domestic water supply. As part of the approved Clayton Subdivision, the existing 300mm diameter watermain on Irvine Street is proposed to be extended from the existing stub near Bricker Avenue to SR15 / Woolwich Street East and then west on Woolwich Street East to the western limit of the Clayton Subdivision, providing direct access for the proposed development. Southeast of the Subject Lands, a 300mm diameter watermain was recently extended along Gerrie Road and stubbed north of the proposed Ainley Farm Subdivision.

As outlined in the DC Background Study, the Irvine Street and Woolwich Street East watermain extension projects are DC eligible with anticipated timing for the Irvine Street (2029) and Woolwich Street East (2028). The Township's recently completed WWSMP reviewed these watermain extensions and provided different timing as compared with the DC study (2034-2036). Considering the Clayton Subdivision was recently Draft Plan approved and requires these watermains, the timing of these watermains is not feasible and should be brought on sooner as part of the upcoming DC study update. The watermain extension on Woolwich Street East (as contemplated in the DC Study) extends beyond the limits of the Clayton Subdivision up to James Street connecting to the existing system. The watermain extension on SR15 required for the proposed development in front of the Subject Lands is not listed in the DC study. As documented in the MTE FSR dated March 2025, prepared for the boundary expansion OPA application, two proposed Township domestic water supply wells are proposed to be installed with close proximity to the Subject Lands; Well Area 5 further north along Irvine Street and Well Area 7 along SR15 east of Gerrie Road. Considering this and the SR15 road improvements noted in the DC background study, we believe that the SR15 watermain should be incorporated into the DC study update this fall. We also believe that a connection between the future SR15 watermain and existing stub on Gerrie Road at the Ainley Farm Subdivision should be explored by the Township as a future watermain connection and could be added to the DC update.

Water supply for the proposed development will be provided by three (3) external connections to the proposed/planned municipal water distribution system as follows:

- Connect 1-300mm watermain to the proposed 300mm watermain on Irvine Street.
- Connect 2-300mm watermains to the proposed 300mm watermain on SR15.

A 300mm watermain stub will be provided at Street C east of Street H allowing for a future connection to be made by others to the future watermain extension along Gerrie Road.

To confirm that adequate pressure and flow demands can be satisfactorily met for the Subject Lands, a water distribution analysis will be completed by the Township's Engineer with the Township-wide water model. The analysis should confirm the preliminary pipe sizes for the internal water distribution network which is generally looped following the proposed road allowances. Refer to **Figure 5.2.**

Based on the Township Engineer's analysis, the following conclusions will be confirmed:

- Connections to the proposed/planned municipal watermains (listed above) will adequately service the proposed water distribution network for the proposed development;
- The proposed water distribution network will provide system pressures within the respective pressure guidelines;
- For which lots (if any) pressure reducing valves (PRVs) will be required;

- Under the proposed development conditions, the recommended Fire Underwriters Survey (FUS) fire flows are satisfied at the minimum MOE pressure requirement of 140kPa; and,
- Velocities in the proposed network do not exceed 5.0m/s.

5.3 Storm Drainage

Storm drainage for the Subject Lands will be provided through a combination of minor (storm sewer) and major (overland flow) drainage systems. There are two main storm drainage area boundaries within the Subject Lands, each contributing stormwater flows to separate SWMFs located adjacent to SR15, ultimately discharging to the ND. SWMF1, located south of the ND, consists of two distinct blocks separated by Street A, and connected with an equalization culvert under Street A, thereby functioning as one SWMF.

In addition to the stormwater flows from the Subject Lands, SWMF1 provides stormwater management for the Clayton Subdivision as well as the urbanized Irvine Street and Woolwich Street East. Minor storm drainage from the Subject Lands, Clayton Subdivision and Irvine Street will be combined into a single storm sewer inlet into SWMF1. The structures just upstream of the inlet on Irvine Street will be designed to capture the 100-year design flow to ensure major storm flows from the Clayton Subdivision and Irvine Street enter the SWMF. Minor and Major storm drainage from Woolwich Street East will be captured by a secondary inlet to SWMF1, also designed for the 100-year flow to ensure drainage from the Irvine Street/SR15 intersection enters the SWMF. Refer to the Preliminary Storm Servicing Plan (**Figure 5.3**) for the storm sewer network and the 5-year and 100-year storm sewer design sheets in **Appendix H** for the main storm sewer inlets.

Some segments of SR15, where the proposed grading design permits, are also proposed to be captured by the SWMFs. The remaining portions of SR15 downstream of the SWMFs will be instead captured by separate storm sewer systems where drainage will be treated by an Oil Grit Separator (OGS) prior to discharging directly to the ND. Drainage from Street A along the frontage of SWMF1 will also be captured by the proposed storm sewer system on SR15 as this area cannot be captured by the SWMF due to the transition grading to SR15.

In general, local storm sewers are sized to convey the 5-year storm event utilizing the IDF curve parameters derived from the Fergus Shand Dam data (as required by the Township standards) and will be constructed to typical depths with a minimum of 1.2m, per Township standards. The major overland flow routes will be directed through municipal streets/easements into the SWMFs. As part of the stormwater management strategy documented in the Preliminary SWM Report, roof areas for most units will be directed to lot-level stone infiltration galleries to infiltrate the 25mm storm event with overflow to grade level.

As previously noted in section 4.2, the proposed grading along Gerrie Road creates a roadside ditch that captures the drainage from Gerrie Road. The ditch includes a 375mm diameter culvert to convey the flow beneath the Street C connection, before continuing into the existing ditch in front of the neighbouring residential property and ultimately discharging into the ND.

Under existing conditions, there is an external agricultural drainage area from Keating Lands that drains through the Subject Lands and to the ND. Based on the grading design along the southern property line, a localized low point is created along the property line with the Keating Lands at the Street E stub. A ditch inlet and storm sewer sized for the 100-year storm event is proposed along Park Block 423 to capture this agricultural drainage area and will convey the clean runoff from the Keating Lands to the ND. This represents an interim condition until the Keating Lands develop in the future. Refer to **Figure 5.3** and the design sheet in **Appendix H**.

CAD: P:\P\62018_001\62018_001-F5.2-WM.DWG

Plot Date: November 3, 2025 - 9:22 AM

THE PROPOSED SIDEROAD 15 WATERMAIN IS RECOMMENDED TO BE ADDED TO THE DC STUDY UPDATE

WOOLWICH STREET EAST

SIDEROAD 15

SIDEROAD 15

IRVINE STREET

CLAYTON SUBDIVISION

BRICKER AVENUE

GERRIE ROAD

NICHOL DRAIN

KEATING LANDS

BLOCK 426 SWM 1.88 ha

BLOCK 427 SWM 1.69 ha

BLOCK 428 SWM 0.96 ha

BLOCK 424 Park 0.37 ha

BLOCK 429 Pumping Station 0.32 ha

BLOCK 425 NHS 4.38 ha

BLOCK 423 PARK 1.44 ha

BLOCK 431 SENIORS 1.37 ha

BLOCK 432 Future Road 0.06 ha

BLOCK 433 Future Road 0.06 ha

STREET A

STREET B

STREET C

STREET D

STREET E

STREET F

STREET G

STREET H

STREET I

STREET J

300mmø WTM

200mmø WTM

150mmø WTM

EX.150mmø WTM

EX.300mmø WTM

DRIP WOODLAND BUFFER

WOODLAND LIMIT

LEGEND

- SITE BOUNDARY
- LIMIT OF DEVELOPMENT
- EXISTING 150mmø WTM
- EXISTING 300mmø WTM
- PROPOSED REVISED FLOODPLAIN
- 300mmØ WTM. FUTURE WTM EXTENSION 300mmø (BY OTHERS)
- 150mmØ WTM. PROPOSED 150mmø WTM.
- 200mmØ WTM. PROPOSED 200mmø WTM.
- 300mmØ WTM. PROPOSED 300mmø WTM.
- 300mmØ WTM. PROPOSED 300mmø WTM. (DC ELIGIBLE)

MTE Engineers, Scientists, Surveyors.

PROJECT

ELORA SANDS SUBDIVISION

TITLE

PRELIMINARY WATER DISTRIBUTION PLAN

Drawn	Scale	Figure
KAT/MMF	1:3000	5.2
Checked: AFF	Project No.: 62018_001	
Date (yyyy-mm-dd): 2025-09-19	Rev No.: 0	

CAD: P:\62018_001\62018_001-F5.3-STM.DWG

Plot Date: November 3, 2025 - 9:29 AM

WOOLWICH STREET EAST

SIDEROAD 15

SIDEROAD 15

CLAYTON SUBDIVISION

KEATING LANDS

BRICKER AVENUE

IRVINE STREET

GERRIE ROAD

NICHOL DRAIN

SWMF1
PPE=404.00

SWMF2
PPE=405.00

PROPOSED 18.4m – 375mmø @ 5.38% CULVERT

PERMISSION TO GRADE FROM THE NEIGHBOURING PROPERTY MUST BE SECURED PRIOR TO ANY GRADING

PROPOSED TEMPORARY DITCH INLET AND STORM SEWER TO CAPTURE LOW POINT

1.07ha / 0.70
0.08ha / 0.80
0.57ha / 0.80
0.18ha / 0.80
0.48ha / 0.80
7.07ha / 0.70
11.03ha / 0.70
16.46ha / 0.70
0.77ha / 0.80
10.88ha / 0.20

F/G=406.88 STM OBV.=406.28± DEPTH=0.60m±
F/G=406.80 STM OBV.=405.49± DEPTH=1.31m±
F/G=406.41 STM OBV.=405.21± DEPTH=1.20m±
F/G=405.94 STM OBV.=404.74± DEPTH=1.20m±
F/G=405.61 STM OBV.=404.07± DEPTH=1.54m±
F/G=403.38 STM OBV.=402.7± DEPTH=0.68m±
F/G=403.38 STM OBV.=402.13± DEPTH=1.25m±
F/G=411.53 STM OBV.=406.19± DEPTH=5.34m±
F/G=408.06 STM OBV.=406.86± DEPTH=1.20m±
F/G=415.62 STM OBV.=414.42± DEPTH=1.20m±
F/G=415.65 STM OBV.=414.84± DEPTH=0.81m±
F/G=419.28 STM OBV.=417.78± DEPTH=1.50m±
F/G=420.09 STM OBV.=418.59± DEPTH=1.50m±
F/G=420.57 STM OBV.=419.07± DEPTH=1.50m±
F/G=418.81 STM OBV.=417.31± DEPTH=1.50m±
F/G=406.85 STM OBV.=405.80± DEPTH=1.05m±
F/G=407.30 STM OBV.=406.00± DEPTH=1.30m±
F/G=408.54 STM OBV.=407.34± DEPTH=1.20m±
F/G=411.55 STM OBV.=408.57± DEPTH=2.98m±
F/G=405.37 STM OBV.=404.17± DEPTH=1.20m±
F/G=410.43 STM OBV.=409.87± DEPTH=0.60m±
F/G=412.40 STM OBV.=409.47± DEPTH=2.93m±
F/G=404.03 STM OBV.=402.83± DEPTH=1.20m±
F/G=406.38 STM OBV.=401.57± DEPTH=4.81m±
F/G=414.83 STM OBV.=413.33± DEPTH=1.50m±
F/G=414.49 STM OBV.=412.62± DEPTH=1.87m±
F/G=407.09 STM OBV.=405.10± DEPTH=1.99m±
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F/G=415.19 STM OBV.=413.69± DEPTH=1.50m±
F/G=411.69 STM OBV.=410.19± DEPTH=1.50m±
F/G=414.15 STM OBV.=412.15± DEPTH=1.50m±
F/G=412.03 STM OBV.=410.16m± DEPTH=1.87m±
F/G=412.95 STM OBV.=411.15± DEPTH=1.80m±
F/G=414.90 STM OBV.=413.02 DEPTH=1.88m±
F/G=412.46 STM OBV.=410.61± DEPTH=1.85m±
F/G=415.27 STM OBV.=413.54± DEPTH=1.73m±
F/G=413.37 STM OBV.=411.54± DEPTH=1.83m±
F/G=415.54 STM OBV.=414.04± DEPTH=1.50m±
F/G=415.74 STM OBV.=415.24± DEPTH=1.50±
F/G=412.08 STM OBV.=410.58± DEPTH=1.50m±
F/G=415.86 STM OBV.=414.36± DEPTH=1.50m±
F/G=415.91 STM OBV.=409.72± DEPTH=6.19m±
F/G=413.80 STM OBV.=409.06± DEPTH=4.74m±
F/G=413.81 STM OBV.=411.94± DEPTH=1.87m±
F/G=415.24 STM OBV.=413.49± DEPTH=1.75m±
F/G=410.89 STM OBV.=410.78± DEPTH=0.11m±

525mmø
300mmø
375mmø
825mmø
750mmø
600mmø
1050mmø
1200mmø
OGS1
OGS2
INV.=401.80
INV.=404.50
INV.=404.40
INV.=404.25
INV.=403.25
INV.=404.16
INV.=405.5
INV.=407.60

STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET I
STREET J

BLOCK 424 Park 0.37 ha
BLOCK 425 NHS 4.36 ha
BLOCK 431 SENIORS 1.37 ha
BLOCK 423 PARK 1.44 ha
BLK 432 Future Road 0.06 ha
BLK 433 Future Road 0.06 ha

15m WOODLAND BUFFER

LEGEND

- SITE BOUNDARY
- LIMIT OF DEVELOPMENT
- PROPOSED DRAINAGE AREA
- PROPOSED REVISED FLOODPLAIN
- PROPOSED STORM SEWER
- PROPOSED STORM OUTLET

F/G=414.00 STM OBV.=412.50± DEPTH=1.50m± — C/L ROAD FINISHED GRADE / STORM OBVERT / STORM COVER

11.20ha / 0.20 — DRAINAGE AREA / STORM RUNOFF

MTE Engineers, Scientists, Surveyors.

PROJECT
ELORA SANDS SUBDIVISION

TITLE
PRELIMINARY STORM SERVICING PLAN

Drawn	Scale	Figure
KAT/MMF	1:3000	5.3
Checked	Project No.	
AFF	62018_001	
Date (yyyy-mm-dd)	Rev No.	
2025-09-15	0	

6.0 STORMWATER MANAGEMENT

The proposed SWM strategy includes water quality, quantity, and erosion control within the proposed SWMFs located adjacent to the ND. The SWM strategy for the proposed development is presented in the *Elora Sands Subdivision – Preliminary Stormwater Management Report*, prepared by MTE (November 2025). The following summarizes the key points of the report:

- **Water Quality** – *Enhanced* quality control of stormwater runoff can be provided by the proposed stormwater management strategy through the implementation of SWMFs which include a forebay, and a wet pond cell.
- **Water Quantity** – Quantity control targets for post-development peak flows rates attenuation to pre-development levels that are directed to the Nichol Drain can be achieved in the proposed SWMFs for all storm events up to and including the 100-year event.
- **Instream Erosion Control** – The erosion mitigation assessment completed indicates that instream erosion will not be exacerbated in the receiving Nichol Drain under post-development conditions.
- **Thermal Mitigation** – The SWMFs will be designed with measures to mitigate thermal impacts to the Nichol Drain.
- **Water Balance - Infiltration** – Infiltration (both active and passive) on the Subject Lands will provide an enhancement to the groundwater balance.

Storm drainage for the proposed development will be provided through a combination of minor (storm sewer), and major (overland) drainage systems. The storm sewers are generally designed for the 5-year storm event, with major overland flow routes generally flowing through the proposed road allowance.

7.0 UTILITY SERVICING

It is anticipated that Hydro One (electrical), Bell Canada (telephone), Enbridge (natural gas), and telecommunication (e.g., Rogers Cable, Cogeco and Wightman) can all adequately service the proposed development through the connection to and extension of existing services from Irvine Street, SR15 and Gerrie Road where required.

8.0 CONCLUSIONS

The main findings of this report for the Subject Lands are:

1. The roadworks and lot grading within the proposed development can generally be completed in accordance with the Township's standards.
2. Adequate wastewater capacity exists in the Elora WWTP. The Subject Lands will be serviced by the existing Irvine Street trunk sanitary sewer, which outlets to the Colborne Street trunk sewer. The DC background study planned some upgrades to the Colbourne Street sewer west of Irvine Street. The proposed upgrades should be expanded to include Colbourne Street east or Irvine Street and the North Queen Street sewer.
3. Under the peaked sanitary flow from the proposed development (combined gravity and SPS simultaneous peaked flow) minor surcharging may occur within a few generally flat sections of the Irvine Street sewer at Walser Street. This minor surcharging may be reduced or eliminated by timing the SPS discharge during non-peak periods. The Township should consider including upgrades to the Irvine Street sewer as part of the previously planned storm sewer upgrades and the DC background study update.
4. A number of connection points to the proposed/planned extensions of the municipal watermain system are available to provide water supply for the proposed development. The Township's Engineer to confirm whether adequate pressure and flow is available and the sizing of proposed internal watermains. Watermains will be extended along Irvine Street (as part of the Clayton Subdivision) and SR15. The Township should consider including the SR15 watermain in the upcoming DC study update.
5. Irvine Street is to be re-constructed with an urban cross-section in accordance with the Township's standards as part of the Clayton Subdivision. SR15 is to be re-constructed with half an urban cross-section as required for the grading and stormwater management strategy for the proposed development.
6. Stormwater management for the development will provide the appropriate levels of quality, quantity, erosion, and water balance controls to meet the objectives of the NDSS, as outlined in the *Preliminary Stormwater Management Report*, dated November 2025.
7. The proposed development can be adequately serviced through the extension of existing utilities including hydro, gas, and telecommunications.

All of which is respectfully submitted,

MTE Consultants Inc.

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Jeff Martens, P.Eng.
Vice President
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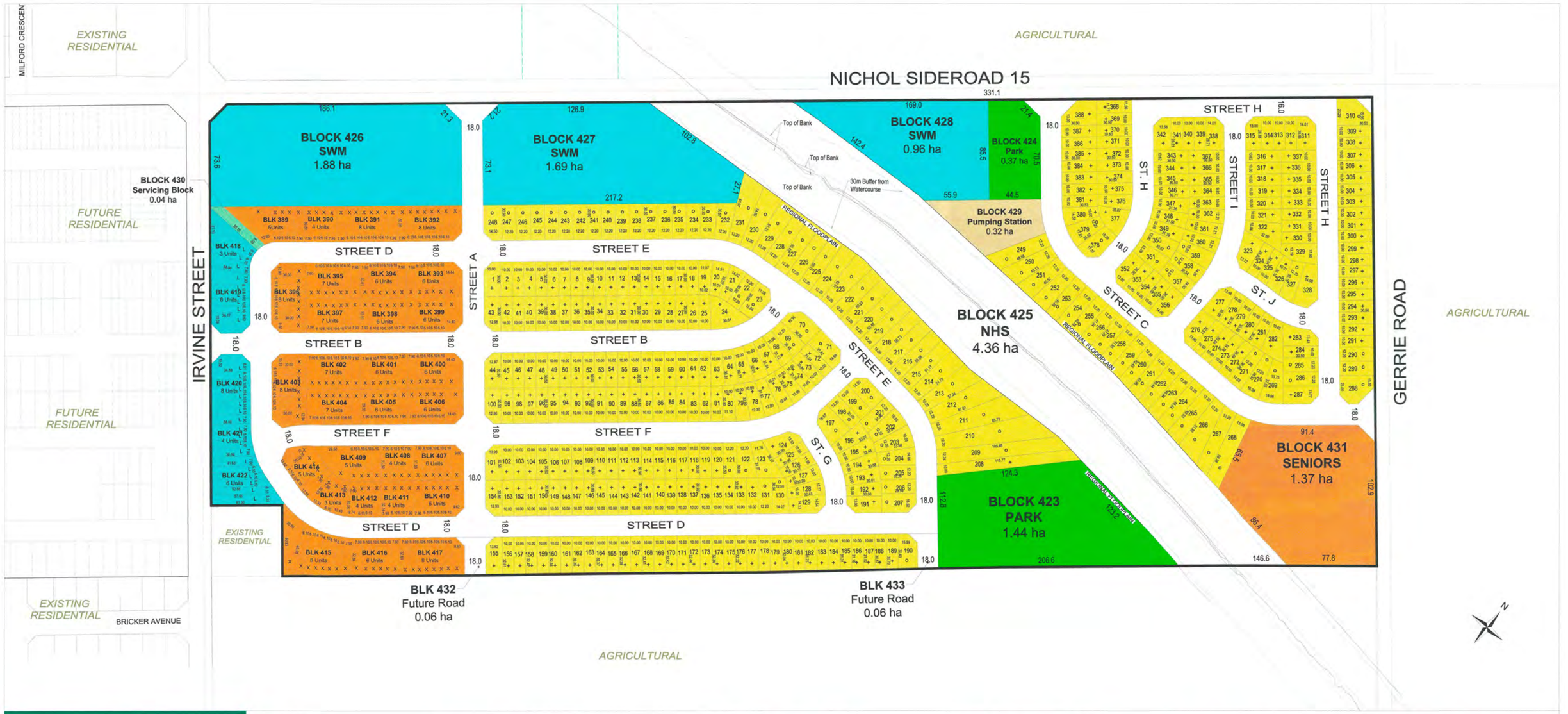
jmartens@mte85.com

https://mte85.sharepoint.com/sites/62018_001/Shared Documents/03- Reports/MTE Reports/FSR/62018-100_rpt_2025-11-04_FSR.docx

Appendix A

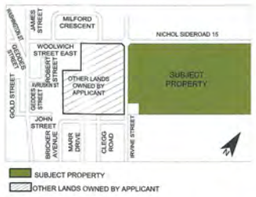
Draft Plan of Subdivision (MGP)



DRAFT PLAN OF SUBDIVISION

Part of Lot 16,
Concession 11
Township of Centre Wellington
Country of Wellington

KEY PLAN



SCHEDULE OF LAND USE

LOT/ BLOCK No.	LAND USE		UNITS	AREA (ha)
1-388	Single Detached	12.2m Lots o 10.0m Lots +	100 288	14.89
389-417	Street Townhouses 6.10m Min.	x	176	3.98
415-422	Rear Access Towns 6.10m Min.	L	27	0.78
423-424	Park			1.81
425	Natural Heritage System			4.36
426-428	Storm Water Management			4.53
429	Pumping Station			0.32
430	Servicing Block			0.04
431	Seniors Block			1.37
432-433	Future Road			0.03
Roads	Streets A-J 18.0m R.O.W.	4013		7.73
Totals		4013	591	39.84

OWNER'S AUTHORIZATION

I hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the Township of Centre Wellington.

CACHET DEVELOPMENTS (ELORA) INC. — September 12, 2025
Date

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the lands to be subdivided as shown on this Plan and their relationship to the adjacent lands are accurately and correctly shown.

SEPT. 12, 2025
Date

ADDITIONAL INFORMATION

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT, CHAPTER P.13(R.S.O. 1990).

(a),(e),(f),(g),(j),(l) - As shown of the Draft Plan.
(b),(c) - As shown on the Draft and Key Plan.
(d) - Land to be used in accordance with the Schedule of Land Use.
(i) - Soil is silt and clay loam.
(h),(k) - Full municipal services to be provided.

Prepared For:

CACHET DEVELOPMENTS (ELORA) INC.

MGP File No.: 22-3192
Date: August 27, 2025

Date	Revision	By

MGP Malone Given Parsons
140 Renfrew Drive, Suite 201 | Markham, ON | L3R 6B3
905 513 0170 | mgp.ca

Appendix B

Background Information

Ontario Land Tribunal
Tribunal ontarien de l'aménagement du territoire

ISSUE DATE: May 22, 2025 **CASE NO(S).:** OLT-24-001157

PROCEEDING COMMENCED UNDER subsection 34(11) of the *Planning Act*, R.S.O. 1990, c. P.13, as amended

Applicant and Appellant:	Cachet Developments (Elora) Inc.
Subject:	Application to amend the Zoning By-law – Refusal or neglect to make a decision
Description:	To permit the development of 152 single-detached dwellings, 117 street townhouse dwellings
Reference Number:	RZ014/22
Property Address:	75 Woolwich Street East
Municipality/UT:	Centre Wellington/ Wellington
OLT Case No.:	OLT-24-001157
OLT Lead Case No.:	OLT-24-001157
OLT Case Name:	Cachet Developments (Elora) Inc. v. Wellington (County)

PROCEEDING COMMENCED UNDER subsection 51(34) of the *Planning Act*, R.S.O. 1990, c. P.13, as amended

Applicant and Appellant:	Cachet Developments (Elora) Inc.
Subject:	Proposed Plan of Subdivision – Failure of Approval Authority to make a decision
Description:	To permit the development of 152 single-detached dwellings, 117 street townhouse dwellings
Reference Number:	23T- 22005
Property Address:	75 Woolwich Street East
Municipality/UT:	Centre Wellington/ Wellington
OLT Case No.:	OLT-24-001158
OLT Lead Case No.:	OLT-24-001157

Heard: May 15, 2025 by video hearing

APPEARANCES:

Parties	**Counsel**
Cachet Developments (Elora) Inc.	Sarah Kagan Ira T. Kagan Kristie Stitt *(in absentia)*
Township of Centre Wellington	Eric Davis
County of Wellington	Peter Pickfield Colin Leger *(in absentia)*
Upper Grand District School Board	Brad Teichman Justine Reyes *(in absentia)*

DECISION DELIVERED BY KURTIS SMITH AND ORDER OF THE TRIBUNAL

INTRODUCTION

[1] Following the First Case Management Conference ("CMC") held on January 24, 2025, the parties reached a full settlement, executing Minutes of Settlement (Exhibit 6). Therefore, the parties requested that this hearing event be converted to an uncontested settlement hearing and release the previously scheduled 10-day merit hearing.

[2] Cachet Developments (Elora) Inc. ("Applicant") proposes to develop the 12.5 hectare ("ha") lands municipally known as 75 Woolwich Street East in the Municipality of Centre Wellington ("Township"), in the County of Wellington ("County"). The Applicant applied for a Zoning Bylaw Amendment ("ZBA") and filed a Draft Plan of Subdivision application ("DPS") in 2022 to facilitate the development, and on November 14, 2024, the Applicant filed appeals of non-decision.

[3] The revised proposed development now sought will see the construction of 269 dwelling units comprised of 152 single detached and 117 townhouse dwellings, a 0.63 ha open space park ("Park"), two walkway blocks, a service block, an overland flow block, and public streets as shown in **Attachment 2**.

[4] The two walkway blocks enable pedestrians to travel to and from the (1) Park to the existing residential development to the south and (2) the adjacent Salem Public School which, is part of the Upper Grand District School Board ("UGDSB").

[5] The Tribunal, based on Matthew Cory's *Curriculum Vitae* and Acknowledgement of Experts Duty, qualified Mr. Cory to provide opinion evidence in the area of land use planning.

EVIDENCE & FINDINGS

[6] Mr. Cory provided the Tribunal with a fulsome written opinion evidence (Exhibit 1) and focused oral evidence at the hearing. His evidence found that the revised proposed development has regard for Provincial Interest under s. 2 of the *Planning Act* ("Act"), is consistent with the Provincial Planning Statement 2024 ("PPS") and conforms with the Wellington County Official Plan ("WCOP") and the Township of Centre Wellington Official Plan ("Township OP"). Furthermore, that the DPS has regard for matters listed in S. 41(24) of the Act and that the conditions of draft plan approval are "typical, standard, and fair" and therefore are appropriate.

[7] The above-mentioned planning documents effecting the ZBA and DPS have several common themes and are implemented by the applications including:

- Appropriate and desirable urban design including window streets and enhanced street presence along Woolwich Street E by providing rear access townhouses.

- Contributes to diversifying the range and mix of housing by providing townhouses and single detached lot size options.

- Supports active transportation through the installation of sidewalks on both sides of the street, walkways that connects to the existing neighbourhood, local public school and proposed Park.

- Optimizes existing municipal infrastructure as the lands are fully serviced and are planned to be developed at a higher density than the surrounding land uses.

- Protects natural features by including an environmental easement along the west side of the Lands to protect the existing tree canopy and providing overflow land blocks to ensure proper lot grading and drainage control plans.

[8] On the uncontested evidence of Mr. Cory the Tribunal finds that the revised ZBA have due regard for matters of Provincial Interest in s. 2 of the Act, is consistent with the PPS, conforms with the WCOP and Township OP and that the conditions of DPS has regard for the criteria of s. 51 (24) of the Act and that the revised conditions are reasonable.

ORDER

[9] **THE TRIBUNAL ORDERS THAT** the Zoning By-law Amendment appeal is allowed in part, and By-law No. 2009-045, as amended, is hereby amended as set out in **Attachment 1** to this Order. The Tribunal authorizes the municipal clerk of the Township of Centre Wellington to assign a number to this by-law for record keeping purposes;

[10] **AND FURTHER THE TRIBUNAL ORDERS THAT** the draft Plan of Subdivision appeal is allowed in part and the draft plan as attached as **Attachment 2** is approved, subject to the fulfillment of the conditions set out in **Attachment 3** to this Order;

[11] **AND THE TRIBUNAL ORDERS THAT** pursuant to subsection 51(56.1) of the Planning Act, the County of Wellington shall have the authority to clear the conditions of draft plan approval and to administer final approval of the plan of subdivision for the purposes of subsection 51(58) of the Act. In the event that there are any difficulties implementing any of the conditions of draft plan approval, or if any changes are required to be made to the draft plan, the Tribunal may be spoken to.

"Kurtis Smith"

KURTIS SMITH
MEMBER

ATTACHMENT 1

The Corporation Of The Township Of Centre Wellington
By-Law 2025 - XX

A by-law to amend the Township of Centre Wellington Zoning By-law 2009-045, as amended, to change the zoning of certain lands from "FD" to "R2.52.5", "R3.52.6", "R3.52.7" and "OS".

WHEREAS the Council of the Corporation of the Township of Centre Wellington deems it desirable to amend By-law No. 2009-045, as amended, pursuant to Section 34 of the Planning Act, R.S.O.1990;

Now therefore the council of the corporation of the Township of Centre Wellington hereby enacts as follows:

1. Schedule "A" Map 52 to By-law No. 2009-045 is hereby amended in accordance with the attached Schedule "A" which forms part of this By-law

2. By adding the following subsection to Section 15 – Exceptions

Exception No.	Zone	Special Provisions
15.52.5	R2.52.5	Notwithstanding any provision in this By-law to the contrary, on lands zoned R2.52.5 the provisions of the R2 zone shall apply except for the following special regulation: a) Minimum Front Yard: 4.5m to habitable portion of the dwelling; 6m to the garage door b) Minimum Exterior Side Yard: 3.5m to habitable portion of the dwelling; 6m to the garage door c) Minimum Rear Yard: 7m d) The driveway width shall not exceed 60% of the lot width to a maximum driveway width of 7.0m e) The outside walls of an attached garage shall not exceed 60% of the lot width

3. By adding the following subsection to Section 15 – Exceptions

Exception No.	Zone	Special Provisions
15.52.6	R3.52.6	Notwithstanding any provision in this By-law to the contrary, on lands zoned R3.52.6 the provisions of the R3 zone shall apply except for the following special regulation: a) Minimum Lot Area: 180m^2 b) Minimum Front Yard: 4.5m to habitable portion of the dwelling; 6m to the garage door c) Minimum Exterior Side Yard: 3.5m to habitable portion of the dwelling; 6m to the garage door d) Minimum Rear Yard: 6.5m e) Maximum number of attached dwelling units in a row: 8 f) Minimum Landscaped Open Space: Not Applicable

4. By adding the following subsection to Section 15 – Exceptions

Exception No.	Zone	Special Provisions
15.52.7	R3.52.7	Notwithstanding any provision in this By-law to the contrary, on lands zoned R3.52.7 the provisions of the R3 zone shall apply except for the following special regulation: a) Minimum Lot Area: 180m^2 b) Minimum Front Yard: 3.5m to habitable portion of the dwelling; 6m to the garage door c) Minimum Exterior Side Yard: 3.5m to habitable portion of the dwelling; 6m to the garage door d) Minimum Rear Yard: 3.0m e) Maximum building height: 3 storeys but not greater than 11.5 metres f) Maximum number of attached dwelling units in a row: 8 g) Minimum Landscaped Open Space: Not Applicable For the purposes of this zone, the front property line shall be deemed to be the property line on the southern part of the lot. The rear property line shall be along Woolwich Street.

5. All other applicable provisions of By-law No. 2009-045 shall continue to apply to the lands affected by this amendment

6. This by-law shall come into effect on the date of final enactment by the Council pursuant to Section 34 of the Planning Act, R.S.O., 1990.

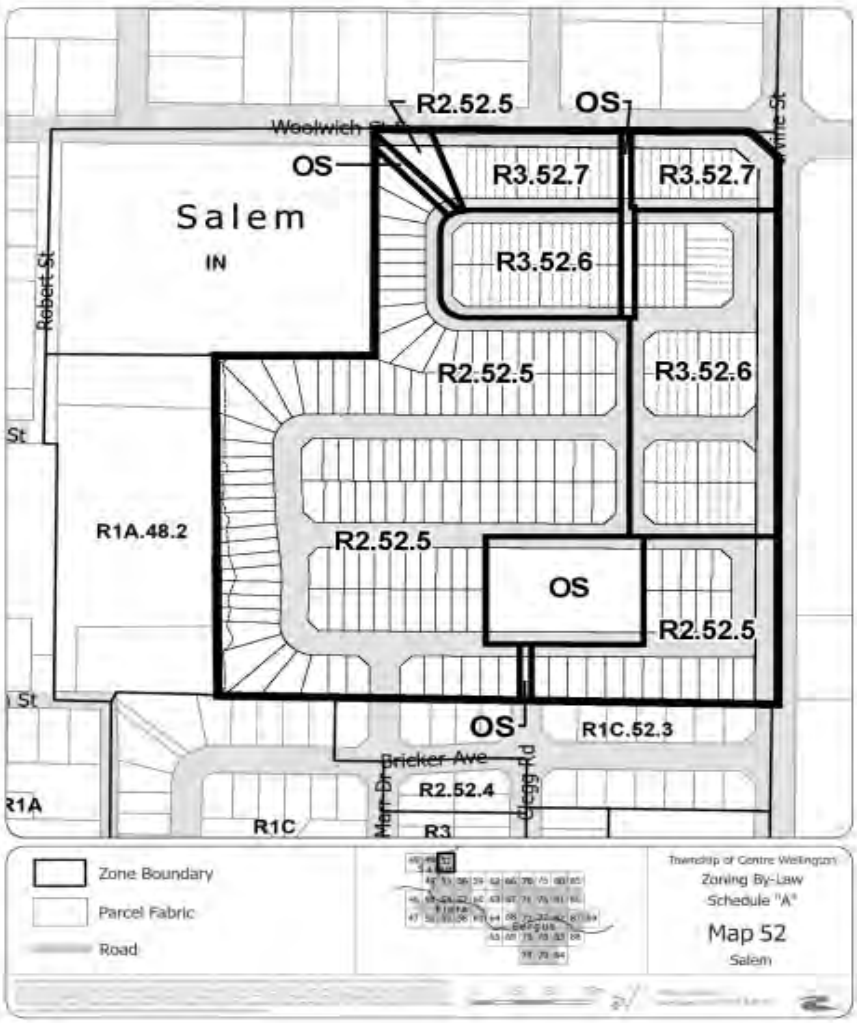
READ A FIRST AND SECOND TIME THIS xxth DAY OF {MONTH}, 2025.

Mayor Shawn Watters	Municipal Clerk – Kerri O'Kane

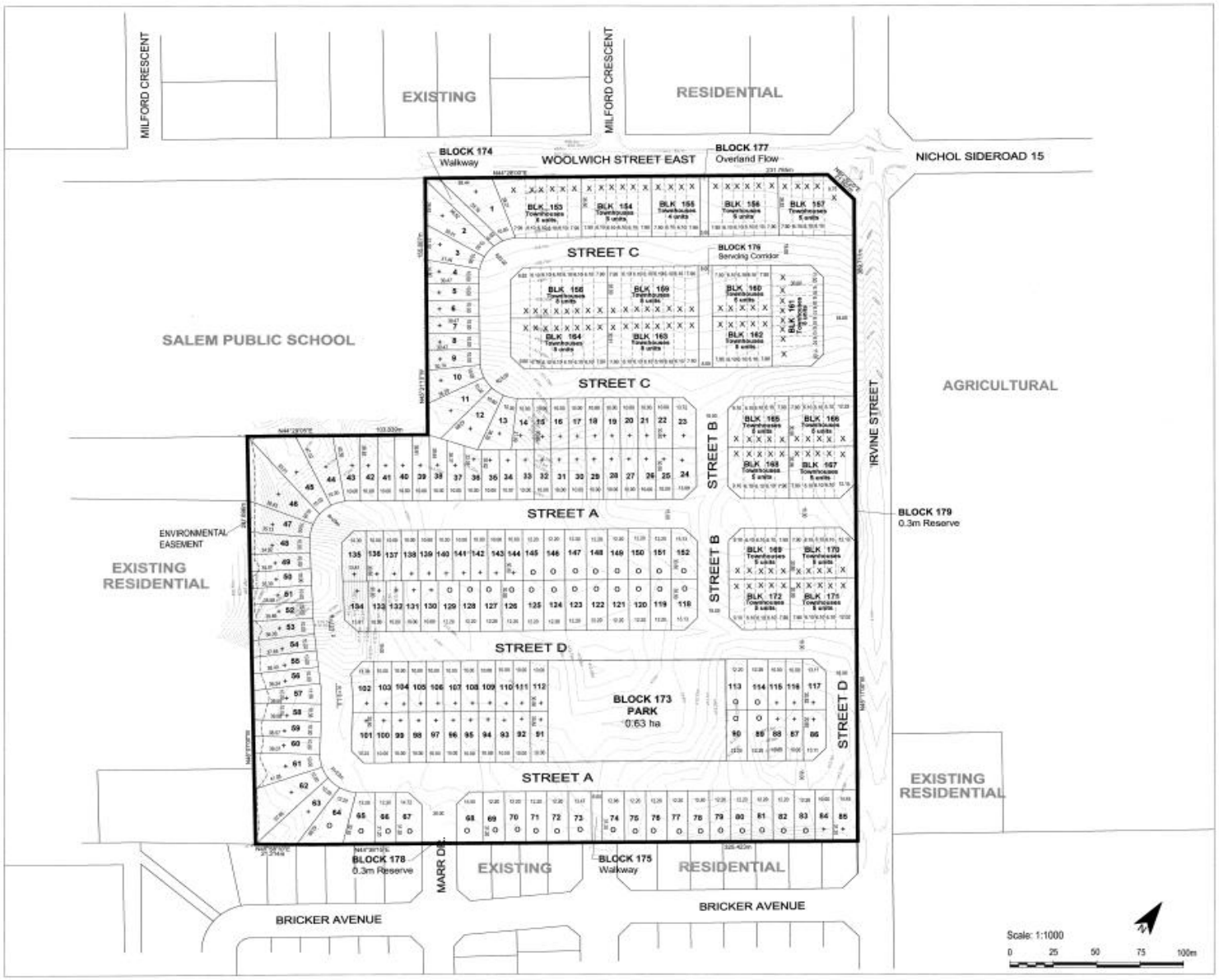
READ A THIRD TIME AND PASSED THIS xxth DAY OF {MONTH}, 2025.

Mayor Shawn Watters	Municipal Clerk – Kerri O'Kane

TOWNSHIP OF CENTRE WELLINGTON
Schedule "A"
BY-LAW NO. 2025-XX
An Amendment to By-law No. 2009-045



ATTACHMENT 2



DRAFT PLAN OF SUBDIVISION

Part of Lot 16,
Concession 11
Township of Centre Wellington
Country of Wellington

KEY PLAN

SUBJECT PROPERTY

SCHEDULE OF LAND USE

LOT/ BLOCK No.	LAND USE		UNITS	AREA (ha)
1-152	Single Detached	12.2m Lots	44	5.76
		10.0m Lots	108	
153-172	Street Townhouses		117	2.85
173	Park			0.63
174-175	Walkways			0.05
176	Service Corridor			0.05
177	Overland Flow			0.02
178-179	0.3m Reserves			0.01
Roads	Marr Dr. 20.0m R.O.W.	30		3.32
	Streets A-D 18.0m R.O.W.	1500		
Totals		1838	269	12.49

OWNER'S AUTHORIZATION

I hereby authorize Malone Given Parsons Ltd. to prepare and submit this Draft Plan of Subdivision to the Township of Centre Wellington.

CACHET DEVELOPMENTS (ELORA) INC. — August 22, 2023
Date

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the lands to be subdivided as shown on this Plan and their relationship to the adjacent lands are accurately and correctly shown.

RAY SIETHOFF, O.L.S.
J.D. BARNES LTD.

May 1, 2025
Date

ADDITIONAL INFORMATION

AS REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT, CHAPTER P.13(R.S.O. 1990).

(a),(e),(f),(g),(j),(l) - As shown of the Draft Plan.
(b),(c) - As shown on the Draft and Key Plan.
(d) - Land to be used in accordance with the Schedule of Land Use.
(i) - Soil is silt and clay loam.
(h),(k) - Full municipal services to be provided.

Prepared For:
CACHET DEVELOPMENTS (ELORA) INC.

MGP File No. 22-3265
Date: March 14, 2025

MGP Malone Given Parsons

ATTACHMENT 3

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

Township of Centre Wellington

1. THAT the plan proposed for registration for any phase within the subdivision shall be reviewed and accepted by the Township of Centre Wellington prior to the County of Wellington's granting final approval.
2. THAT the road allowances included in this draft plan shall be shown and dedicated as public highways.
3. THAT the street(s) shall be named to the satisfaction of the Township of Centre Wellington and such new street names shall not be duplicates of street names elsewhere in the County of Wellington.
4. THAT any dead ends and open sides of road allowances created by this draft plan shall be terminated in 0.3 metre reserves to be conveyed to, and held in trust by the Township of Centre Wellington.
5. THAT prior to final approval by the County of Wellington, the County of Wellington is to be advised by the Township of Centre Wellington that appropriate zoning is in effect for this proposed subdivision.
6. THAT the Owner agrees to satisfy the requirements of the Township of Centre Wellington in reference to parkland dedication by conveying Block 173 at time of registration of the first phase.
7. THAT the Owner agrees in writing to satisfy all the requirements, financial and otherwise, of the Township of Centre Wellington including but not limited to the provision of roads and the installation of services and drainage, the planting and preservation of trees, and the provision of fencing.
8. THAT such easements and/or agreements as may be required for servicing, access, utility or drainage purposes shall be granted to the appropriate authority.
9. THAT the Subdivision Agreement between the Owner and the Township of Centre Wellington contains phasing arrangements acceptable to the Township of Centre Wellington.
10. That the developer shall prepare and implement a construction traffic access and control plan for all phases of servicing and building construction to the satisfaction of the Township. All damage repair or maintenance required to surrounding streets as a result of such traffic shall be at the developer's cost.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

11. THAT the Subdivision Agreement between the Owner and the Township of Centre Wellington be registered against the lands to which it applies, and that a copy of that Subdivision Agreement as registered in the Land Registry Office be filed with the County of Wellington.

12. THAT prior to final approval by the County of Wellington or any construction or grading on the subject property, the Owner or its agent shall submit the following plans or reports to the Township of Centre Wellington for review and approval:

    a) lot grading and drainage control plans that show the limits of all grading, including existing and proposed site grades and drainage;

    b) a storm servicing plan showing the layout of the storm sewer system;

    c) a Final Stormwater Management Report and Plans in accordance with the Stormwater Management Practices Planning and Design Manual (Ministry of the Environment, 2003) and the Nichol Drain No. 1 Subwatershed Study. The report shall identify a stormwater management pond that is appropriately designed to accommodate only the subject development, include an assessment of the impacts on off-site watercourses and municipal drains, and show how the infiltration function will be protected or maintained;

    d) erosion and sedimentation control plans in accordance with the Grand River Conservation Authority's Guidelines for sediment and erosion control which show how exposed soils, sediments, and eroded materials will be retained on site during all phases of construction. Plans should include maintenance requirements for all employed devices;

    e) a Baseline Hydrogeology and Impact Assessment report that provides the following:

        i) An assessment of groundwater level monitoring data from on-site monitoring wells which shall include data collected over four full consecutive seasons. The report shall, based on the observed seasonal fluctuation in groundwater levels, provide a predicted "high" groundwater elevation across the site as well as a recommended high groundwater elevation on a lot by lot basis. The recommended high groundwater elevation for each lot is intended to ensure adequate vertical separation from the underside of the proposed footing elevation to the seasonal high groundwater elevation at a given lot.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

ii) Provision that proposed lot grading plans for the development shall provide a minimum 0.3 m separation on all lots. If the minimum vertical separation cannot be met, foundation excavations are to be inspected by a Geotechnical Engineer prior to footing/foundation construction to confirm soil conditions match expected geotechnical/hydrogeological conditions. Inspection report to be provided to the Township of Centre Wellington Building Department as soon as possible (not later than commencement of framing).

iii) Provision that a geotechnical engineer will observe the open excavation for all buildings prior to backfilling. If layers of high permeability material in excess of 600 mm are encountered in the excavation the basement dewatering system will be designed to accommodate the potential for greater than expected basement dewatering. This system will be designed to suit the maximum basement dewatering rate and will be submitted to the Township for their review and comment.

iv) Shall identify any potential impacts to the quality or quantity of water in existing private wells in proximity to the site that may be impacted by the development; and, if deemed necessary, incorporate a recommended protocol for a private well monitoring and mitigation program to be approved by the Township prior to its implementation.

f) An Environmental Implementation Report or other documentation satisfactory to the Township showing how the recommendations and mitigation measures from the Environmental Impact Study, with any necessary updates, will be implemented and addressed.

13. THAT the Owner in the Subdivision Agreement between the Owner and the Township of Centre Wellington shall agree in writing in a form acceptable to the Township of Centre Wellington:

a) To undertake all works according to the plans and reports approved under condition no. 12 above;

b) To construct, install and maintain erosion and sediment control facilities, satisfactory to the Township's Consulting Engineer, prior to any grading or construction on the subdivision lands in accordance with a plan that has been submitted to and approved by the Township's Consulting Engineer.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

Furthermore, the developer's engineer shall provide a qualified environmental inspector, satisfactory to the Township's Consulting Engineer, to inspect the site during all phases of development and construction including grading, servicing, and building construction. The environmental inspector shall monitor and inspect the erosion and sediment control measures and procedures and compliance with the approved plans on a weekly or more frequent basis if required. The environmental inspector shall report on his or her findings to the Township's Consulting Engineer on a monthly or more frequent basis;

c) To maintain all storm water management facilities in good repair and operating order throughout all phases of construction until final acceptance of services has been granted by the Township of Centre Wellington;

d) To erect a subdivision sign on the property containing the following information:

i) identifying all proposed uses within the draft approved plan of subdivision

ii) identifying off street parking restrictions to be imposed by the Township upon final acceptance of the subdivision

iii) illustrating the location of proposed sidewalks, public walkways, trails, fences and community mailbox locations

14. THAT the Owner enter into a Service Financing Agreement between the Owner and the Township of Centre Wellington which contains provisions satisfactory to the Township of Centre Wellington to ensure the construction and financing of all external services which are necessary to provide appropriate levels of service to this plan of subdivision. Without limiting the generality of the foregoing, such Service Financing Agreement shall require the developer to finance, in whole or in part, the following:

a) Reconstruction of Irvine Street to an urban section on the development frontage (west side only);

b) Reconstruction of Woolwich Street East to an urban section on the development frontage (south side)

c) Construction and maintenance of the proposed external storm water management facilities include all works and facilities and outlet improvements appurtenant thereto, and addressing conveyance of the

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

storm water management works and facilities to the Township upon certification to the satisfaction of the Township

15. THAT the developer pays the cost of supplying and erecting street name and traffic control signs in the subdivision, to the satisfaction of the Township.

16. THAT any domestic wells and boreholes drilled for hydrogeological or geotechnical investigations within the limits of the draft plan of subdivision be properly abandoned in accordance with the Ministry of Environment Regulations and Guidelines to the satisfaction of the Townships' Director of Infrastructure.

17. THAT the developer shall include in the Subdivision Agreement and insert in all agreements of purchase and sale or lease for each dwelling in the subdivision – *"The lands adjacent this subdivision are being utilized for normal agricultural operations that may result in noise, dust, odour and other potential nuisances associated with livestock or agricultural uses. These normal agricultural practices may occasionally affect the living environment of residents in close proximity to agricultural operations."*

18. THAT the Subdivision Agreement between the Owner and the Township of Centre Wellington shall contain provisions whereby the Owner shall make satisfactory arrangements with the appropriate providers for the provision of permanent and/or temporary hydro, telephone, natural gas, and cable television services to this plan.

19. THAT the Owner in the Subdivision Agreement between the Owner and the Township of Centre Wellington shall agree in writing in a form acceptable to the Township of Centre Wellington that the proposed tree removal compensation plantings are incorporated into a Landscape or Planting Plan, in accordance with the findings and recommendations in the Arborist Report. This plan should propose the use of native species suitable to the subject property and surrounding area, whose selection has been informed by the natural inventory work completed on the property.

20. THAT, prior to final approval, additional details of the proposed tree protection fencing (TPF) around Tree Protection Zones (TPZ) be provided with the Tree Inventory and Protection Plan and implement the recommendations in the Arborist Report. TPF should be installed along the limit of grading and limit of construction to protect retained trees, as well as any adjacent natural features. TPF locations should be included in the TIPP and detailed design drawings. It is recommended that the TPF be combined with the Erosion and Sediment Control (ESC) fence where suitable and be comprised of geotextile woven heavy-duty silt fencing with paige-wire backing. The TPF/ESC fencing will ensure that the proposed site grading does not result in erosion or sedimentation impacts to trees or other natural features to be retained. The fencing

should follow the Ontario Provincial Standard for "heavy-duty silt fencing" (OPSD 219.130) and is anticipated to effectively protect trees to be retained throughout the site grading and development period.

Bell Canada/Telecommunication

21. THAT the Owner acknowledges and agrees to convey any easement(s) as deemed necessary by Bell Canada/telecommunication provider to service this new development. The Owner further agrees and acknowledges to convey such easements at no cost to Bell Canada/telecommunication provider.

22. THAT the Owner agrees that should any conflict arise with existing Bell Canada/telecommunication provider facilities where a current and valid easement exists within the subject area, the Owner shall be responsible for the relocation of any such facilities or easements at their own cost.

23. THAT prior to final approval, the Owner/Developer shall provide written confirmation from an authorized service provider that communication/telecommunication facilities will be provided within the proposed development to enable at a minimum the delivery of communication/telecommunication services for emergency management services (i.e. 9-1-1 Emergency) in accordance with CRTC requirements.

Canada Post

24. THAT the owner/developer comply with the following conditions to the satisfaction of Canada Post:

- The owner/developer will consult with Canada Post to determine suitable permanent locations for the placement of Community Mailboxes and to indicate these locations on appropriate servicing plans.

- The Builder/Owner/Developer will confirm to Canada Post that the final secured permanent locations for the Community Mailboxes will not be in conflict with any other utility; including hydro transformers, bell pedestals, cable pedestals, flush to grade communication vaults, landscaping enhancements (tree planting) and bus pads.

- The owner/developer will install concrete pads at each of the Community Mailbox locations as well as any required walkways across the boulevard and any required

curb depressions for wheelchair access as per Canada Post's concrete pad specification drawings.

- The owner/developer will agree to prepare and maintain an area of compacted gravel to Canada Post's specifications to serve as a temporary Community Mailbox location. This location will be in a safe area away from construction activity in order that Community Mailboxes may be installed to service addresses that have occupied prior to the pouring of the permanent mailbox pads. This area will be required to be prepared a minimum of 30 days prior to the date of first occupancy.

- The owner/developer will communicate to Canada Post the excavation date for the first foundation (or first phase) as well as the expected date of first occupancy.

- The owner/developer agrees, prior to offering any of the residential units for sale, to place a "Display Map" on the wall of the sales office in a place readily available to the public which indicates the location of all Canada Post Community Mailbox site locations, as approved by Canada Post and the Township of Centre Wellington.

- The owner/developer agrees to include in all offers of purchase and sale a statement, which advises the prospective new home purchaser that mail delivery will be from a designated Community Mailbox, and to include the exact locations (list of lot #s) of each of these Community Mailbox locations; and further, advise any affected homeowners of any established easements granted to Canada Post.

- The owner/developer will be responsible for officially notifying the purchasers of the exact Community Mailbox locations prior to the closing of any home sales with specific clauses in the Purchase offer, on which the homeowners do a sign off.

Enbridge

25. THAT the owner/developer provide to Enbridge the necessary easements and/or agreements required by Enbridge for the provision of gas services for this project, in a form satisfactory to Enbridge.

Grand River Conservation Authority

26. THAT Prior to any grading or construction on the site and prior to registration of the

plan, the owners or their agents submit the following plans and reports to the satisfaction of the Grand River Conservation Authority:

a) A Final Stormwater Management Report in accordance with the 2003 Ministry of Environment Report entitled, "Stormwater Management Practices Planning and Design Manual" and in keeping with the "Clayton Subdivision" Preliminary Stormwater Management Report (Revised November 2024, MTE Consultants Inc.)

b) Detailed Lot Grading and Drainage Plans showing existing and proposed grades.

c) An Erosion and Siltation Control Plan in accordance with the Grand River Conservation Authority's Guidelines for sediment and erosion control, indicating the means whereby erosion will be minimized and silt maintained on-site throughout all phases of grading and construction.

d) The submission and approval of a Development, Interference with Wetlands and Alterations to Shorelines and Watercourses permit under Ontario Regulation 150/06 for any proposed works within the regulated area.

Wellington Source Water Protection

27. THAT prior to final approval that the following be addressed to the satisfaction of the Township's Risk Management Official:

a) A salt management plan be prepared and required to be implemented during construction;

b) A liquid fuel handling/storage and spill response procedure be prepared and implemented for liquid fuel handling and storage during construction; and

c) Confirmation of any existing or proposed *transport pathways* on the subject property.

Upper Grand District School Board

28. THAT the owner/developer comply with the following conditions to the satisfaction of the Upper Grand District School Board:

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

- That Education Development Charges shall be collected prior to the issuance of a building permit(s).

- That the developer shall agree, upon registration of the plan, to provide the Upper Grand District School Board with a digital file of the plan of subdivision in either ArcGIS (shapefile or geodatabase) format or DXF format using a projected geographic coordinate system, containing the parcel fabric and street network.

- That the developer shall provide safe and appropriate pedestrian connections from the proposed subdivision to the existing school to the satisfaction of the UGDSB and the municipality.

- That, prior to final approval of the plan, the Developer shall provide sidewalk connections from the proposed subdivision to the existing terminus along the school's frontage at no cost to the Upper Grand District School Board.

- That the developer shall agree in the subdivision agreement that adequate sidewalks, lighting and snow removal (on sidewalks and walkways) will be provided to allow children to walk safely to school or to a designated bus pickup point.

- That the developer provide a revised Traffic Report analyzing existing and proposed pedestrian movements and traffic calming measures required for the safety and protection of children prior to granting final approval of the subdivision.

- That the developer and the Upper Grand District School Board reach an agreement regarding the supply and erection of a sign (at the developer's expense and according to the Board's specifications) affixed to the permanent development sign advising prospective residents that students may be directed to schools outside the area.

- That the developer shall provide detailed engineering design for the proposed subdivision development prior to final approval of any phase or stage of the subdivision, to ensure the grading of the lands have no negative impact on the existing school.

- That the Developer agrees in the subdivision agreement that all grading works and surface stabilization on lands adjacent to UGDSB property, and on UGDSB property, is to be completed in the first phase of the subdivision.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

- That prior to final approval of any phase or stage of the subdivision, the developer provides detailed grading and drainage plans to ensure that existing drainage patterns are maintained on UGDSB property and any works related to drainage outlets on the adjacent lands are to be completed in the first phase of the development. If it isn't feasible for permanent infrastructure to be installed, temporary drainage structures are to be provided to UGDSB's satisfaction.

- That the Developer shall agree in the subdivision agreement to install a 1.8 m galvanized chain link fence along the entire perimeter of the Salem Public School site at no cost to the Board.

- That prior to final approval of any phase or stage of the subdivision, the Developer shall enter into an agreement with the Upper Grand District School Board to monitor both quality and water supply volume in the existing Salem Public School well for a period of at least two years after the completion of all construction and remediate any negative impacts at no cost to the Board.

- That prior to final approval of any phase or stage of the subdivision, the Developer shall provide a Tree Management Plan to the satisfaction of the UGDSB.

- That the developer shall agree in the subdivision agreement to advise all purchasers of residential units and/or renters of same, by inserting the following clause in all offers of Purchase and Sale/Lease:

  "*In order to limit liability, public school buses operated by the Service de transport de Wellington-Dufferin Student Transportation Services (STWDSTS), or its assigns or successors, will not travel on privately owned or maintained right-of-ways to pick up students, and potential busing students will be required to meet the bus at a congregated bus pick-up point.*"

- That the developer shall agree in the subdivision agreement to advise all purchasers of residential units and/or renters of same, by inserting the following clause in all offers of Purchase and Sale/Lease, until such time as a permanent school is assigned:

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

"*Whereas the Upper Grand District School Board has designated this subdivision as a Development Area for the purposes of school accommodation, and despite the best efforts of the Upper Grand District School Board, sufficient accommodation may not be available for all anticipated students from the area, you are hereby notified that students may be accommodated in temporary facilities and/or bussed to a school outside the area, and further, that students may in future have to be transferred* to another school."

- That the Developer shall agree in the subdivision agreement to advise all purchasers of the residential units and/or renters of same, by inserting the following clause in all offers of Purchase and Sale/Lease:

"*The Purchasers/Occupants agree and understand that there is an existing elementary school in this area along with outdoor playing and study areas and parking lot and that there may be noise during and outside of the normal school hours throughout the year. Additionally, there may be increased traffic during the pick-up and drop-off times and during school events, outside of normal school hours. By purchasing this real estate, you acknowledge and accept any/all potential conflicts.*"

Wellington Catholic School Board

29. THAT the owner/developer comply with the following conditions to the satisfaction of the Wellington Catholic School Board:

- The Developer and the Wellington Catholic School Board shall reach an agreement regarding the supply and erection of signage, at the developer's expense, affixed to the subdivision sign advising potential Separate School supporters of the location of schools serving the area and the current practice of busing students outside the immediate area should schools in the area be at capacity.

- That prior to the registration of all or any portion of the plan, the Wellington Catholic District School Board shall advise the County in writing how their conditions have been satisfied.

- Education Development Charges shall be collected prior to the issuance of building permits.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

- Circulation of phasing plans, revisions to the number or type of units proposed, or any other substantial changes to the circulated application is requested.

General County Conditions

30. THAT the Owner shall provide to the County of Wellington an AUTOCAD "dwg" digital file of the final plan to be registered.

31. THAT the Owner have prepared by an Ontario Land Surveyor a final plan in accordance with the Surveys Act, and with the Registry Act or the Land Titles Act, as the case may be and have provided that plan (being 2 mylars and 4 white prints) to the Director of Planning and Development for the County of Wellington prior to the lapsing date.

32. THAT the Owner's surveyor shall provide to the County of Wellington a written undertaking to provide to the County of Wellington a mylar, 2 white prints and electronic version of the final plan of subdivision as registered in the Land Titles Office for Wellington (No. 61) should such documents not be forwarded to the County of Wellington by the local Land Registrar's office after registration of the plan.

33. THAT if final approval is not given to this draft plan of subdivision No. 23T-22005 within three years of this draft approval, and if no extensions to draft approval have been granted, draft approval shall lapse. If the Owner wishes to request an extension to draft approval, a written explanation, together with a resolution of support from the Council for the Township of Centre Wellington must be received by the Director of Planning for the County of Wellington prior to the lapsing date of DATE.

34. THAT prior to final approval the County of Wellington is to be advised in writing by the Township of Centre Wellington how conditions 1 to 20 have been satisfied.

35. THAT prior to final approval the County of Wellington is to be advised in writing by Bell/telecommunication provider how conditions 21 to 23 has been satisfied.

36. THAT prior to final approval the County of Wellington is to be advised in writing by Canada Post how condition 24 has been satisfied.

37. THAT prior to final approval the County of Wellington is to be advised in writing by Enbridge Gas how condition 25 has been satisfied.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

38.THAT prior to final approval the County of Wellington is to be advised in writing by Grand River Conservation Authority how condition 26 has been satisfied.

39.THAT prior to final approval the County of Wellington is to be advised in writing by Wellington Source Water Protection how condition 27 has satisfied.

40. THAT prior to final approval the County of Wellington is to be advised in writing by Upper Grand District School Board how conditions 28 has been satisfied.

41.THAT prior to final approval the County of Wellington is to be advised in writing by Wellington Catholic District School Board how conditions 29 has been satisfied.

42.THAT prior to final approval by the County of Wellington, the Owner remit to the County of Wellington the applicable final approval fee which is in effect at the time of presentation of the final plan for final approval.

NOTES to DRAFT APPROVAL

1. It is the applicant's responsibility to fulfill the conditions of draft approval and to ensure that the required clearance letters are forwarded by the appropriate agencies to the County of Wellington.

2. Clearances are required from the following agencies:

   Township of Centre Wellington
   Enbridge Gas
   Bell/Telecommunication Provider
   Upper Grand District School Board
   Grand River Conservation Authority
   Canada Post
   Wellington Source Water Protection
   Wellington Catholic District School Board

   If the agency condition relates to a condition(s) in the subdivision agreement, a copy of the subdivision agreement should be sent to them. This will expedite the clearance of the final plan.

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

3. The costs of any relocations or revisions to Hydro facilities which are necessary to accommodate this subdivision will be borne by the developer.

4. An electrical distribution line operating at below 50,000 volts might be located within the area affected by this development or abutting this development. Section 186 - Proximity - of the Regulations for Construction Projects in the *Occupational Health and Safety Act*, requires that no object be brought closer than 3 metres (10 feet) to the energized conductor. It is the proponent's responsibility to be aware, and to make all personnel on site aware, that all equipment and personnel must come no closer than the distance specified in the Act. They should also be aware that the electrical conductors can raise and lower without warning, depending on the electrical demand placed on the line. Warning signs should be posted on the wood poles supporting the conductors stating "*DANGER - Overhead Electrical Wires*" in all locations where personnel and construction vehicles might come in close proximity to the conductors.

5. The Owner is advised to contact Bell Canada at planninganddevelopment@bell.ca during the detailed utility design stage to confirm the provision of communication/telecommunication infrastructure needed to service the development.

6. It shall be noted that it is the responsibility of the Owner to provide entrance/service duct(s) from Bell Canada's existing network infrastructure to service this development. In the event that not such network infrastructure exists, in accordance with the Bell Canada Act, the Owner may be required to pay for the extension of such network infrastructure.

7. If the Owner elects not to pay for the above noted connection, Bell Canada may decide not to provide service to this development.

8. The final plan approved by the County of Wellington must be registered within 30 days of final approval or the County of Wellington may withdraw its approval under subsection 51(59) of the Planning Act, R.S.O. 1990 as amended.

9. The Developer is hereby advised that prior to commencing any work within the Plan, the Developer must confirm that sufficient wire-line communication/telecommunication infrastructure is currently available within the proposed development to provide communication/ telecommunication service to the proposed development. In the event that such infrastructure is not available, the Developer is hereby advised that the Developer may be required to pay for the connection to and/or extension of the existing communication/telecommunication

OLT Case #OLT-24-001158

Draft Plan – 23T-22005 Clayton Subdivision
County, Township and Agency Draft Conditions

infrastructure, the Developer shall be required to demonstrate to the municipality that sufficient alternative communication/telecommunication facilities are available within the proposed development to enable, at a minimum, the effective delivery of communication/telecommunication services for emergency management services (i.e. 911 Emergency).

10. Payment of clearance letter fees may be required from the clearing agencies before the clearance letter is issued. Please contact the appropriate agency for information in this matter

11. NOTE: Pursuant to the Clean Water Act, a Section 59 Notice and Risk Management Plan are not required for this proposal. If the nature of the development changes, Notices may apply and a Risk Management Plan may be required.

TOWNSHIP OF CENTRE WELLINGTON
NOTICE OF COMPLETE APPLICATION REGARDING
A PROPOSED OFFICIAL PLAN AMENDMENT

TAKE NOTICE that the Township of Centre Wellington has received a complete application for approval of an official plan amendment pursuant to Section 17 of the Planning Act, R.S.O. 1990. The Township's file number for this application is **OP003-2025.** The subject land is known municipally as 6574 Gerrie Road and 7581 Sideroad 15 in Elora as shown on the key map below.

Purpose and Effect
The purpose of the proposed official plan amendment is to bring land into the Elora/Salem Urban Centre and redesignate the lands to Residential and Core Greenlands. The effect of the amendment is to redesignate the lands for future residential development.

A related application has been filed to the County of Wellington at amend the County Official Plan (**File OP-2025-06**)

Notice of Passing
If you wish to be notified of the decision of the Township of Centre Wellington in respect of the proposed official plan amendment, you must make a written request to the Clerk of the Township of Centre Wellington, 1 MacDonald Square, Elora, Ontario, N0B 1S0.

If the official plan amendment is adopted, it will be forwarded to the County of Wellington for approval. If you wish to be notified of the decision of the Corporation of the County of Wellington in respect of the proposed official plan amendment, you must make a written request to the Director, Planning and Development Department, County of Wellington, 74 Woolwich Street, Guelph, Ontario, N1H 3T9.

Appeal Rights
TAKE NOTICE that if a person or public body would otherwise have an ability to appeal the decision of the County of Wellington to the Ontario Land Tribunal (OLT) but the person or public body does not make oral submissions at a public meeting or make written submissions to the Township of Centre Wellington before the official plan amendment is adopted, the person or public body is not entitled to appeal the decision.

AND TAKE NOTICE that if a person or public body does not make oral submissions at a public meeting, or make written submissions to the Township of Centre Wellington before the proposed official plan amendment is adopted, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Land Tribunal (OLT) unless, in the opinion of the Tribunal, there are reasonable grounds to add the person or pubic body as a party.

Additional Information
For more information about this matter, including information about preserving your appeal rights, contact Chantalle Pellizzari, Supervisor of Development Administration at the contact information provided below.

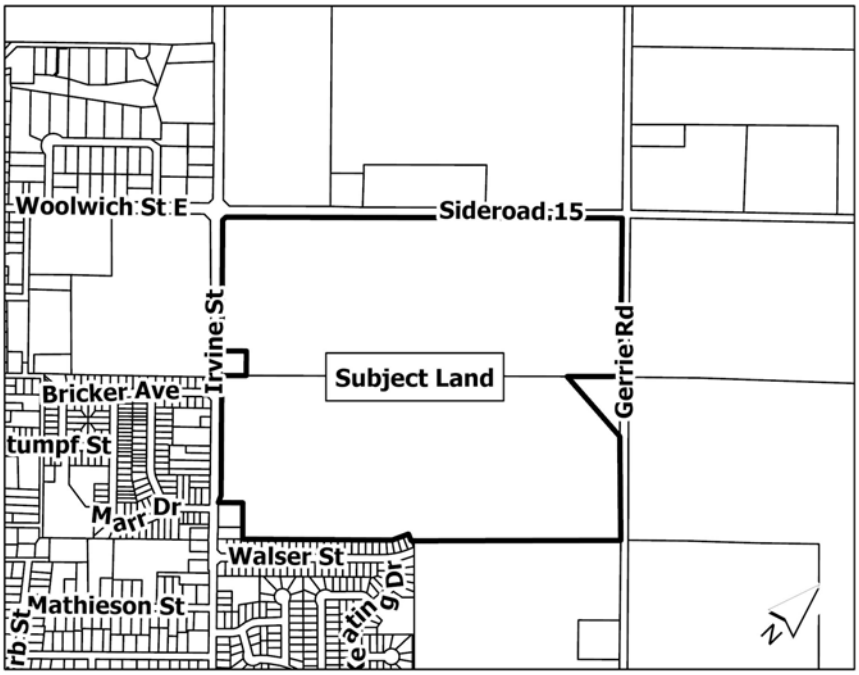
- By Phone at 519-846-9691 x241
- By Email at cpellizzari@centrewellington.ca

Comments on this application should be submitted by **May 30, 2025** and can be submitted to the Municipal Clerk (contact information below).

Details of this application can be viewed on the Township website at:
https://www.centrewellington.ca/currentapplications/

Notice of Collection of Personal Information
Personal information is being collected in order to gather feedback and communicate with interested parties regarding this development proposal. Information provided or presented at a public meeting is considered a public record and may be posted on the City's website or made public upon request.

This information is collected under the authority of the Planning Act, R.S.O. 1990, c. P.13. Questions about this collection should be directed to the Clerk's Office at 519-846-9691 or clerks@centrewellington.ca



Dated at the Township of Centre Wellington this 29th day of April, 2025.

Kerri O'Kane, Municipal Clerk
Township of Centre Wellington
1 MacDonald Square
Elora, Ontario
N0B 1S0
Phone: (519) 846-9691
Fax: (519) 846-2074
Email: kokane@centrewellington.ca

Appendix C

Development Chagres Background Study Projects

Table C.1 – Infrastructure Costs Included in Development Charges Calculation

Project No.	Increased Service Needs Attributable to Anticipated Development	Timing (Year)	Gross Capital Cost Estimate (2020$)	Comments
Roads				
1	Sideroad 15, Beatty Line N to Highway 6	2021-2023	1,950,000	Sideroad 15 improvements to connect to Highway 6
15	Sideroad 15, Gerrie Road to Beatty Line N	2024-2031	3,990,000	Sideroad 15 improvements to connect to Beatty Line and Project 1 Highway 6
16	Sideroad 15, James Street to Irvine Street	2024-2031	1,120,000	Sideroad 15 improvements from James Street to Irvine Street
33	Sideroad 15, Gerrie Road to Irvine Street	2024-2031	2,050,000	Sideroad 15 improvements to connect James through to Highway 6
17	Walser Street Ext E, Walser Street to Gerrie Road	2024-2031	1,560,000	Roadway improvements within Ainley subdivision with road stubs to the Subject Lands
19	Gerrie Road, Sideroad 15 to Walser Street Ext East	2024-2031	1,350,000	Roadway improvements adjacent to the Ainley subdivision
27	Gerrie Road, Walser Street Ext E to Colborne Street	2024-2031	1,220,000	Roadway improvements adjacent to the Subject Lands
68	Gerrie Road and Colborne Street	2024-2031	350,000	Intersection improvements south of the Subject Lands
New	Intersection improvements at Irvine Street Sideroad 15			Works contemplated to accommodate Clayton subdivision
New	Intersection improvements at Gerrie Road and Sideroad 15			Works contemplated to accommodate the Subject Lands
Wastewater – Sewers				
1	Colborne Sanitary Upsizing – Wilson to Irvine	2024	170,200	Trunk sewer improvements on Colborne near intersection of Irvine. Project should be extended to include Queen Street North trunk.
Water Facilities				
4	Replacement of F2 Well with additional capacity expanded	2022	1,795,000	
5	Replacement and expansion of F5 Well	2022	863,000	
1	New Well - Area #3	2023-2026	4,734,000	
2	New Well - Area #5	2028-2030	4,710,000	Well field immediately north of the Subject Lands
6	New Well - Area 7	2032-2040	3,608,000	
7	New Well - Area 8	2020-2037	6,721,000	
Water Distribution				
1	Gerrie Watermain Extension - Colborne to ER10 (North Limit)	2024	614,000	Watermain extension to Ainley subdivision northern limit and the southern limit of the Subject Lands.
2	Irvine Watermain Extension – Bricker to SR 15	2029	798,000	Watermain extension immediately adjacent to the Subject Lands on Irvine Street.
12	Woolwich Watermain Extension - Irvine to James	2028	436,000	Watermain extension immediately adjacent to the Clayton subdivision and a key supply at the northwest corner of the Subject Lands.
19	Irvine Watermain Extension - Woolwich to Well Area 5	2030	2,534,000	North connection to expanded water supply at Well 5
20	Sideroad 10(11) Watermain Extension - Irvine to Well Area 5	2030	691,000	Watermain extension along Irvine Street from Sideroad 15 then extending ~ 1km north to well area 5. Key water supply for the Subject Lands.
28	SDRD 15 Watermain Extension - Beatty Line to Well Area 7	2039	145,000	Future water supply for further growth and expansion.
Future	Sideroad 15 watermain from Gerrie Road to Beatty Line			Key connection for watermain transmission.

Appendix D

Geotechnical and Hydrogeological Investigations

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951A-G October 14, 2021

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

PRELIMINARY GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
7581 SIDEROAD 15
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your authorisation and subsequent discussions with Mr. Michael DeBiasio, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has completed the fieldwork, laboratory testing, and report preparation in connection with the above noted project. The scope of work was completed in general accordance with our proposal P301951, dated July 1, 2021, later revised and confirmed through email communication on August 3, 2021. This report should be read in conjunction with the formal report for the Clayton Lands to the west SM 301951B-G, dated October 5, 2021. Our comments and recommendations based on our findings at the seven [7] borehole locations are presented in the following paragraphs.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development consisting of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services, located at 7581 Sideroad 15 [Gibson Farms] in Elora, Ontario. The purpose of this preliminary geotechnical investigation work was to assess the subsurface soil and groundwater conditions, and to provide our comments and recommendations with respect to the design and construction of the proposed development, from a geotechnical point of view.

SOIL-MAT ENGINEERS was provided with a sub-watershed study that encompasses the surrounding area – including the subject site – prepared by Aquafor Beech Limited, dated February 2008. The results of this investigation have been considered in preparation of this geotechnical report.

This report is based on the above summarised project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, this office must be consulted to review the new design with respect to the results of this investigation. It is noted that SOIL-MAT ENGINEERS has also conducted Phase One and Two Environmental Site Assessments (ESAs) for the subject site, which have been reported under a separate cover.

2. PROCEDURE

A total of seven [7] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment on August 5 and 6, 2021 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 2.1 and 5.2 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses.

Upon completion of drilling, a groundwater monitoring well was installed at Borehole No. 4 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 metres. The monitoring well was encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite ‘hole plug’ to the surface and fitted with a protective steel ‘stick up’ casing. The remaining boreholes were backfilled in general accordance with

Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade.

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at the borehole locations has been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 1 to 7, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is currently an undeveloped agricultural property located at 7581 Sideroad 15 in Elora, Ontario. There is a single-family dwelling and an existing barn structure near the middle of the site, setback approximately 200 metres from Sideroad 15. The parcel is bordered to the south by an existing agricultural field, to the east by Gerrie Road, to the north by Sideroad 15, and to the west by Irvine Street, assuming a north-south orientation of Irvine Street. The field is bisected by a tributary of the Irvine Creek – a ditch-like drainage feature – at the north eastern portion of the site. West of the tributary, the two parcels generally slope down to the north, with a relief of approximately 6 metres, as measured across the boreholes. The grade is relatively flat and even with Gerrie Road on the east side of the tributary descending towards the creek with an approximate relief of 15 metres measured across the boreholes.

The subsurface conditions encountered at the borehole locations are summarised as follows:

Topsoil

A surficial veneer of topsoil approximately 150 to 250 millimetres in thickness was encountered at all borehole locations. It is noted that the depth of topsoil may vary across the site and from the depths encountered at the borehole locations. It is also noted that the term 'topsoil' has been used from a geotechnical point of view, and does not necessarily reflect its nutrient content or ability to support plant life. Given the property has been historically used for agricultural purposes the upper levels of the soils would be expected to have a reworked nature resulting in more variable depths of topsoil over the site. As such, it is recommended that a conservative approach be taken when estimating topsoil quantities across the site for stripping, i.e. account for slightly greater stripping depth than those specifically noted at the borehole locations.

Sandy Silt/Clayey Silt

Native sandy silt/clayey silt was encountered beneath the topsoil in the majority of the boreholes, and beneath a sand deposit in Borehole Nos. 3 and 6. The fine-grained granular to slightly cohesive soils were brown in colour, transitioning to grey below about 2.5 metres in Borehole No. 2, with trace to some clay and gravel, with a notable increasing clay content with depth in some of the boreholes. The native sandy silt/clayey silt soils were generally noted to have a reworked or weathered appearance in the upper levels, and were generally noted to have a loose to compact state. The sandy silt/clayey silt deposit was present to depths of approximately 1.1 to 1.9 metres in Borehole Nos. 1 and 4, and was proven to termination at depths of approximately 2.1 to 3.7 metres below the existing ground surface in Borehole Nos. 2, 3, 5, 6, and 7.

Sand

A native sand deposit was encountered beneath the topsoil in Borehole Nos. 3 and 6, and beneath the sandy silt/clayey silt layer in Borehole Nos. 1 and 4. The fine to medium grained soils were brown in colour, with a noted to transition to grey at a depth of approximately 4.8 metres in Borehole No. 4, contained trace amounts of clay, silt, and gravel, and was generally in a compact to dense state. The native sand soils were proven to a depth of approximately 1.5 and 1.8 metres within Borehole Nos. 3 and 6, and proven to termination at depths of between approximately 3.6 and 5.2 metres below the existing ground surface in Borehole Nos. 1 and 4.

Grain Size Analyses

Grain size analyses were conducted on three [3] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH3 SS3	1.5 m	22	44	28	6	10^{-7}	<10
BH4 SS5	3.0 m	2	7	80	11	10^{-2}	150 to 300
BH6 SS5	3.0 m	11	44	36	9	10^{-6}	10 to 15

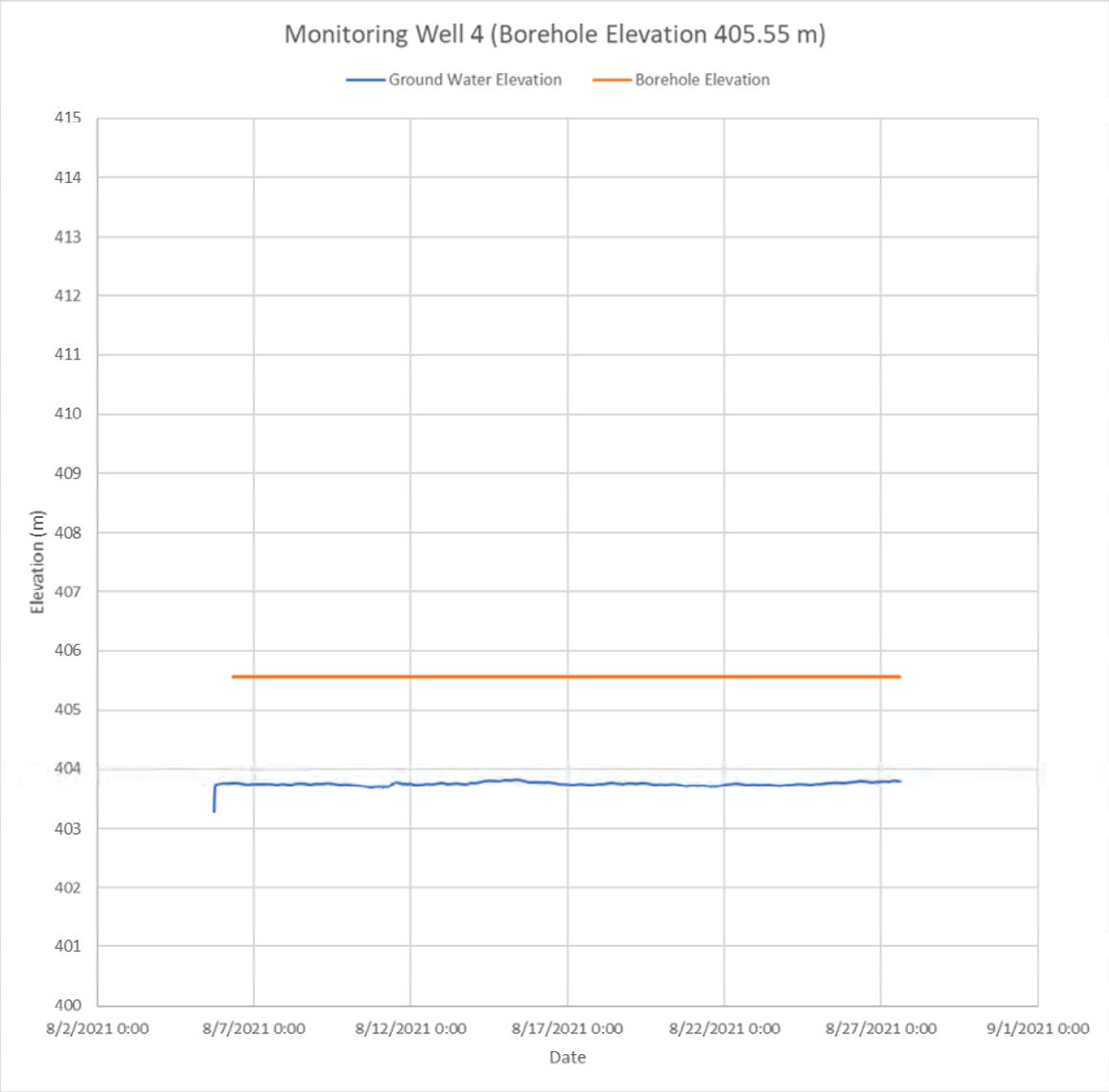
The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines at depth. The sandy silt/clayey silt in the upper levels would generally behave as a low permeable material, but would not be considered as an impermeable material, and would be highly frost susceptible. The underlying sand deposit is highly permeable, relatively free draining.

A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Groundwater Observations

Borehole No. 6 was noted to have 'caved' to a depth of approximately 2.4 metres and 'wet' at a depth of approximately 2.0 metres, while Borehole No. 4 was noted to be open and 'wet' at a depth of 2.7 metres upon completion. Borehole Nos. 1 was noted to have cave to a depth of 1.5 metres, and dry upon completion. The remainder of the boreholes were noted as being open and 'dry' [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, a monitoring well was installed at Borehole No. 4, to allow for future measurements of the static groundwater level. Furthermore, it is noted that 3 additional monitoring wells were installed on the abutting parcel of land to the west, the work of which was completed in concert with the fieldwork on the Gibson Farm lands. A data logger was installed in Borehole No. 4 to allow for continuous monitoring of the groundwater level between August 6 and August 27, 2021, the readings of which have been illustrated in the following graph:


Monitoring Well 4 (Borehole Elevation 405.55 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
406
405
404
403
402
401
400
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date

In addition to this, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on August 6 and August 27, 2021 and have been summarized in the following chart:

TABLE B
SUMMARY OF GROUNDWATER LEVELS

Monitoring Well	Ground Surface Elevation [m]	August 6, 2021		August 27, 2021	
		Groundwater Depth [m]	Groundwater Elevation [m]	Groundwater Depth [m]	Groundwater Elevation [m]
MW4	405.55	2.74	402.81	1.75	403.80

The groundwater level observed at this monitoring well location, as well as the monitoring wells installed on the adjacent property [summarised in our geotechnical report SM 301951B-G under a separate cover] indicate a groundwater level on the order of approximately 2 to 7 metres below the existing grade, at an elevation of roughly 403.8 to 410.5 metres, varying with the physical topography, and shallower closer the tributary. As noted above this estimate is based on the groundwater data collected from Borehole No. 4, as well as the monitoring wells installed on the Clayton Lands to the west. There is an evident drop in the groundwater level from southwest to northeast, generally following the topography towards the Irvine Creek Tributary. It is noted that the groundwater level would be expected to fluctuate seasonally. It is also noted that the observed groundwater levels may be influenced by more localised shallower 'perched' deposits in more permeable seams within the sandy silt/clayey silt. Further long-term monitoring may allow for a more accurate estimate of the static groundwater level, including more data during the 'wet' and 'dry' seasons.

As noted above, SOIL-MAT ENGINEERS was also provided a sub-watershed study by Aquafor Beech, which included a number of monitoring wells to the east to monitor the groundwater elevations. The conditions and groundwater levels described in this geotechnical report are consistent with those encountered during our fieldwork as described above.

General Soil Conditions

As noted above the subsurface conditions are generally characterized as sandy silt/clayey silt deposit in the upper levels, underlain by a permeably cohesionless sand deposit. The grain size analyses indicate the sandy silt/clayey silt soils to have 10 to 20 percent clay content, lending a slightly cohesive characteristic. The sandy silt/clayey silt soils are relatively consistent in terms of its constituents but are noted to contain an increasing clay content with depth in some of the boreholes, as noted above. Where the material transitions into a sand the native soils are generally fine in gradation in the upper levels, becoming medium to coarse with depth. As demonstrated above the subsurface conditions exhibit a relatively inconsistent layered structure across the large area, but can be generally distinguished by a layer of slightly cohesive sandy silt overlying a cohesionless sand. The conditions will be best assessed during excavations on an area-by-area basis. As such it may also be prudent to advance a series of test excavations in the area of proposed deeper excavations and/or stormwater management ponds to confirm soil composition and groundwater conditions in the area of deep excavations.

4. EXCAVATIONS

Excavations for the installation of foundations and underground services are anticipated to extend to depths of up to approximately 2 to 5 metres below the existing grade. Excavations through the native sandy silt/clayey silt and sand soils, as well as any engineered fill placed as part of site grading works, should be relatively straightforward, with the sides remaining stable for short construction periods at inclinations of up to 45 degrees to the horizontal, and possibly steeper depending on moisture condition and clay content. Where wet or more permeable seams are encountered, during periods of extended precipitation, or where excavations extend below the static groundwater level, the sides of excavations should be expected to ‘slough in’ to as flat as 3 horizontal to 1 vertical, or flatter.

Nevertheless, all excavations must comply with the current Occupational Health and Safety Act and Regulations for Construction Projects. The native sandy silt/clayey silt and sand soils would generally be considered a Type 2 or 3 soil, depending on the moisture content and relative compact to dense condition, as outlined in the Ontario Health and Safety Act III – Excavations. Excavation slopes steeper than those required in the Safety Act must be supported and a senior geotechnical engineer from this office should monitor the work.

As noted above, the groundwater level varies between depths of approximately 2 to 7 metres below the existing grade, roughly elevation 403.8 to 410.5 metres. The majority of excavations are anticipated to be above the groundwater level. Nevertheless, some infiltration of water from more permeable seams and surface runoff into the open excavations should be anticipated. Such infiltration should be readily controlled using typical construction dewatering methods. 'Perched' deposits of water may be encountered within more permeable pockets, which may require greater initial dewatering efforts and instability in the excavations, especially during the 'wet' times of the year. Where excavations extend to greater depths, to and below the groundwater level, especially within the sand deposit, the rate of infiltration will be much greater and additional pumping or more sophisticated dewatering methods should be anticipated. In this regard, ongoing monitoring of the groundwater levels, and careful review of the design servicing elevations, is recommended. As noted above, the advancement of test excavations in the area of proposed deep services and stormwater management ponds would allow for a first hand look at how groundwater levels may affect such excavations. More water should be expected when connections are made to existing services. Surface water should be directed away from the excavations.

The base of the excavations in the native soils, above the groundwater level, encountered in the boreholes should generally remain firm and stable. Where excavations extend to greater depths, to or below the groundwater level, or where 'perched' water is encountered, some base instability should be expected, especially during 'wet' times of the year. This will be especially likely in the high silt content sandy silt/clayey silt soils. Areas of base instability may be stabilised with the placement of additional bedding or ballast stone, the use of coarser stone material, etc. The appropriate measures are best assessed based on the actual conditions at the time of construction. With a firm and stable base condition, stabilised where warranted, standard pipe bedding material as specified by the Ontario Provincial Standard Specification [OPSS] or County of Wellington should be satisfactory. The bedding should be well compacted to provide sufficient support to the pipes and components (i.e. valve chambers, manholes etc.), and to minimize settlements of the roadway above the service trenches. Special attention should be paid to compaction under the pipe haunches.

We recommend that the invert elevations of any storm sewer pipes for rear yard catch basins be located above the proposed underside of footing elevations of adjacent residential structures, or that the trench excavations should be filled with 5 MPa 'lean mix' concrete product to the proposed underside of footing level where the excavations

extend below an imaginary 10 horizontal to 7 vertical line extending outwards and down from a point 0.3 metres beyond the proposed townhouse foundations.

Any utility poles, light poles, etc. located within 3 metres of the top of an excavation slope should be braced to ensure their stability. Likewise, temporary support might be required for other existing above and below ground structures, including existing underground services, roadways, etc. depending on their proximity to the trench excavations.

5. BACKFILL CONSIDERATIONS

The excavated material will consist primarily of the sandy silt/clayey silt and sand soils encountered in the boreholes as described above. These soils are generally considered suitable for use as engineered fill, trench backfill, etc., provided that they are free of organics, construction debris, or other deleterious material, and that its moisture content can be controlled to within 3 per cent of its standard Proctor optimum moisture content.

It is noted that the sandy silt/clayey silt soils encountered are not considered to be free draining and should not be used where this characteristic is necessary. It is also noted that these fine grained granular soils will present difficulties in achieving effective compaction when they become 'wet' of optimum, and where access with compaction equipment is restricted. The sandy silt/clayey silt soils encountered are generally considered to be near to slightly 'dry' of their standard Proctor optimum moisture content, with some noted 'wet' seams. Some moisture conditioning will be required depending upon the weather conditions at the time of construction. It is noted that these silty soils will become nearly impossible to compact when wet of its optimum moisture content. Any material that becomes wet to saturated should be spread out to allow to dry, or removed and discarded, or utilised in non-settlement sensitive areas. The sand soils are generally well draining, and tend to be near optimum moisture content. At depth, approaching or below the water level, the sand soils will be expected to be saturated, requiring time to drain excess moisture or other drying efforts in order to achieve effective compaction.

We note that where backfill material is placed near or slightly above its optimum moisture content, the potential for long term settlements due to the ingress of groundwater and collapse of the fill structure is reduced. Correspondingly, the shear strength of the 'wet' backfill material is also lowered, thereby reducing its ability to support construction traffic and therefore impacting roadway construction. If the soil is

well dry of its optimum value, it will appear to be very strong when compacted, but will tend to settle with time as the moisture content in the fill increases to equilibrium condition. The fine grained to cohesive soils encountered may require high compaction energy to achieve acceptable densities if the moisture content is not close to its standard Proctor optimum value. It is therefore very important that the moisture content of the backfill soils be within 3 per cent of its standard Proctor optimum moisture content during placement and compaction to minimise long term subsidence [settlement] of the fill mass. Any imported fill required in service trenches or to raise the subgrade elevation should have its moisture content within 3 per cent of its optimum moisture content and meet the necessary environmental guidelines.

A representative of SOIL-MAT should be present on-site during the backfilling and compaction operations to confirm the uniform compaction of the backfill material to project specification requirements. Close supervision is prudent in areas that are not readily accessible to compaction equipment, for instance near the end of compaction 'runs'. Backfill within service trenches, areas to be paved, etc., should be placed in loose lifts not exceeding 300 millimetres in thickness and compacted to a minimum of 95 per cent of its standard Proctor maximum dry density [SPMDD], and to 100 per cent of its SPMDD in the upper 1 metre below the design subgrade level. All structural fill should be compacted to 100 per cent of its SPMDD. The appropriate compaction equipment should be employed based on soil type, i.e. pad-toe for cohesive soils and smooth drum/vibratory plate for granular soils. A method should be developed to assess compaction efficiency employing the on-site compaction equipment and backfill materials during construction.

6. MANHOLES, CATCH BASINS AND THRUST BLOCKS

Properly prepared bearing surfaces for manholes, valve chambers, etc. in the native competent soils, stabilised where required, will be practically non-yielding under the anticipated loads. Proper preparation of the founding soils will tend to accentuate the protrusion of these structures above the pavement surface if compaction of the fill around these structures is not adequate, causing settlement of the surrounding paved surfaces. Conversely, the pavement surfaces may rise above the valve chambers and around manholes under frost action. To alleviate the potential for these types of differential movements, free-draining, non-frost susceptible material should be employed as backfill around the structures located within the paved roadway limits, and compacted to 100 per cent of its standard Proctor maximum dry density. A geofabric separator

should be provided between the free draining material and the on-site silt soils to prevent the intrusion of fines.

The thrust blocks in the native soils or engineered fill may be conservatively sized as recommended by the applicable Ontario Provincial Standard Specification conservatively using a horizontal allowable bearing pressure of up to 150 kPa [~2,000 psf]. Any backfill required behind the blocks should be a well-graded granular product and should be compacted to 100 per cent of its standard Proctor maximum dry density.

7. PAVEMENT STRUCTURE DESIGN CONSIDERATIONS

All areas to be paved must be cleared of all organic and otherwise unsuitable materials, and the exposed subgrade proof rolled with 3 to 4 passes of a loaded tandem-axle truck in the presence of a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., immediately prior to the placement of the sub-base material. Any areas of distress revealed by this or other means should be subexcavated and replaced with suitable backfill material. Where the subgrade condition is poorer it may be necessary to implement more aggressive stabilisation methods, such as the use of coarse aggregate [50-millimetre clear stone, 'rip rap', etc.] 'punched' into the soft areas.

Good drainage provisions will optimise the long-term performance of the pavement structure. The subgrade must be properly crowned and shaped to promote drainage to the subdrain system. Subdrains should be installed to intercept excess subsurface water and to prevent softening of the subgrade material. Surface water should not be allowed to pond adjacent to the outer limits of the paved areas.

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. SOIL-MAT should be given the opportunity to review the final pavement structure design and subdrain scheme prior to construction to ensure that they are consistent with the recommendations of this report.

If construction is conducted under adverse weather conditions, additional subgrade preparation may be required. During wet weather conditions, such as during the fall and spring months, it should be anticipated that additional subgrade preparation will be required, such as additional depth of Ontario Provincial Standard Specification [OPSS] Granular 'B', Type II (crushed limestone bedrock) sub-base material. It is also important

that the sub-base and base granular layers of the pavement structure be placed as soon as possible after exposure, preparation and approval of the subgrade level.

The roadways through the residential subdivision would be required to adequately support cars, trucks and intermittent delivery and garbage trucks. A typical generic pavement structure would consist of 350 millimetres of OPSS Granular 'B', Type II (crushed bedrock) sub-base course, 150 millimetres of OPSS Granular 'A' base course, 60 millimetres of HL8 or HL4 binder course asphaltic concrete, and 40 millimetres of HL3 surface course asphaltic concrete. Where a pit run, Granular B Type I, aggregate is utilised in the granular base, it should be increased to a minimum thickness of 450 millimetres. It is our opinion that this design is suitable for use on a residential roadway section, provided that the subgrade has been prepared as specified and is good and firm before the sub-base course material is placed. Notwithstanding, the pavement structure should conform to the relevant County of Wellington requirements where they are to be assumed by the County. If the subgrade is soft, remedial measures as discussed above may have to be implemented and/or the sub-base thickness may have to be increased. The granular sub-base and base courses and asphaltic concrete layers should be compacted to OPSS or County of Wellington requirements. A program of in-place density testing must be carried out to monitor that compaction requirements are being met. We note that this pavement structure is not to be considered as a construction roadway design.

To minimise segregation of the finished asphalt mat, the asphalt temperature must be maintained uniform throughout the mat during placement and compaction. All too often, significant temperature gradients exist in the delivered and placed asphalt with the cooler portions of the mat resisting compaction and presenting a honeycomb surface. As the spreader moves forward, a responsible member of the paving crew should monitor the pavement surface, to ensure a smooth uniform surface. The contractor can mitigate the surface segregation by 'back-casting' or scattering shovels of the full mix material over the segregated areas and raking out the coarse particles during compaction operations. Of course, the above assumes that the asphalt mix is sufficiently hot to allow the 'back-casting' to be performed.

Asphalt paving of driveways should be consistent with the general recommendations provided above. Proper preparation of the subgrade soils is essential to good long-term performance of the pavement. Likewise, sufficient depth and compaction of granular base materials and adequate drainage will be important in achieving good long-term performance, i.e. preventing/limiting premature cracking, subgrade failure, rutting, etc. A typical recommended light duty pavement structure for residential driveways would

consist of a minimum of 200 millimetres of OPSS Granular 'A' base course, compacted to 100 percent standard Proctor maximum dry density, followed by a minimum of 50 millimetres of HL3 or HL3F asphaltic concrete, compacted to a minimum of 92 per cent of their Marshall maximum relative density [MRD].

8. HOUSE AND TOWNHOUSE CONSTRUCTION

The native soils encountered at the borehole locations are considered capable of supporting the loads associated with typical residential dwelling and townhouse structures on conventional spread footings, below any fill, organic, or otherwise unsuitable materials. Bearing pressures of up to 150 kPa [~3,000 psf] SLS and 225 kPa [~4,500 psf] ULS may be considered in the competent native soils. In areas where 'wet' seams are present, or the native soils present in less compact condition, reduced bearing values of 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] are recommended. The founding surfaces must be hand cleaned of any loose or disturbed material, along with any ponded water, immediately prior to placement of foundation concrete.

In the event that site grading works result in engineered fill below founding elevations, the general recommendations presented in the Backfill Considerations above should be strictly adhered to, with compaction to 100 percent standard Proctor maximum dry density, verified by monitoring and testing by a representative of SOIL-MAT ENGINEERS present on a full time basis. If there is a short fall in the volume of fill required, then the source of imported fill should be reviewed for gradation, Proctor value, compatibility with existing fill, environmental characteristics and be approved by this office prior to use. The design bearing capacity for footings within the engineered fill should be limited to 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] ULS.

The support conditions afforded by the native soils and/or engineered fill are generally not uniform across the building footprint, nor are the loads on the various foundation elements. As such it is recommended that consideration be given to the provision of nominal reinforcement in the footings and foundation walls to account for variable support and loading conditions. The use of nominal reinforcement is considered good construction practice as it will act to reduce the potential for cracking in the foundation walls due to minor settlements, heaving, shrinkage, etc. and will assist in resisting the pressures generated against the foundation walls by the backfill. Such nominal reinforcement is an economical approach to the reduction and prevention of costly foundation repairs after completion and later in the life of the buildings. This

reinforcement would typically consist of two continuous 15M steel bars placed in the footings [directly below the foundation wall], and similarly two steel bars placed approximately 300 millimeters from the top of the foundation walls at a minimum, depending on ground conditions exposed during construction. These reinforcement bars would be bent to reinforce all corners and under basement windows, and be provided with sufficient overlap at staggered splice locations. At 'steps' in the foundations and at window locations, the reinforcing steel should transition diagonally, rather than at 90 degrees, to maintain the continuous tensile capacity of the reinforcement. Where footings are founded on, or partially on, engineered fill the above provision for nominal reinforcement would be required.

All basement foundation walls should be suitably damp proofed, including the provision of a 'dimple board' type drainage product, and provided with a perimeter drainage tile system outlet to a gravity sewer connection or positive sump pit a minimum of 150 millimetres below the basement floor slab. The clear stone material surrounding the weeping tile should be encased with a geotextile material to prevent the migration of fines from the foundation wall backfill into the clear stone product. In the event that sump pit systems are required we would recommend that the sump pump system should be constructed with an 'oversized' reservoir and a 'back-flow' prevention valve so that the sump pump will not cycle repeatedly within short time periods.

All footings exposed to the environment must be provided with a minimum of 1.2 meters of earth or equivalent insulation to protect against frost penetration. This frost protection would also be required if construction were undertaken during the winter months. All footings must be proportioned to satisfy the requirements of the Ontario Provincial Building Code.

It is imperative that a soils engineer be retained from this office to provide geotechnical engineering services during the excavation and foundation construction phases of the project. This is to observe compliance with the design concepts and recommendations outlined in this report, and to allow changes to be made in the event that subsurface conditions differ from the conditions identified at the borehole locations.

9. PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development will consist of single family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend to up to approximately 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, however further groundwater monitoring may be conducted to more accurately assess the static groundwater level.

The short term excavations for the proposed servicing are generally anticipated to extend into the sandy silt/clayey silt and sand soils to depths above the static groundwater level. Such excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. During wet times of year, some instability of the excavations may be experienced. The rate of dewatering would be expected to be below 50,000 L/day, and certainly below 400,000 L/day, such that an EASR or PTTW should not be required. Where deeper excavations are identified to be required, extending below the static groundwater level, the need for temporary dewatering controls during construction should be more closely evaluated. Depending on the proposed depths of excavations for the proposed footings and site services, the rate of dewatering could approach or be greater than 50,000 L/day, potentially requiring an EASR. As such, once available, the site servicing and grading plans detailing depths of construction should be forwarded onto our office for further review and comments.

The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions. As such, the provision of clay ‘cut-offs’ within trench backfill is not expected to be required.

Excavations for the proposed basement levels should be well above the groundwater level, and so would not be expected to require significant ongoing groundwater control, other than typical perimeter weeping tile and sump pump as noted above.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such is in 'dry' ponds, infiltration galleries, etc.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, and further detailed hydrogeological assessment is not considered warranted at this time. As the detailed design of the proposed development proceeds, this office should be consulted to review the hydrogeological conditions and assess the potential for concern, or need for additional study.

10. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

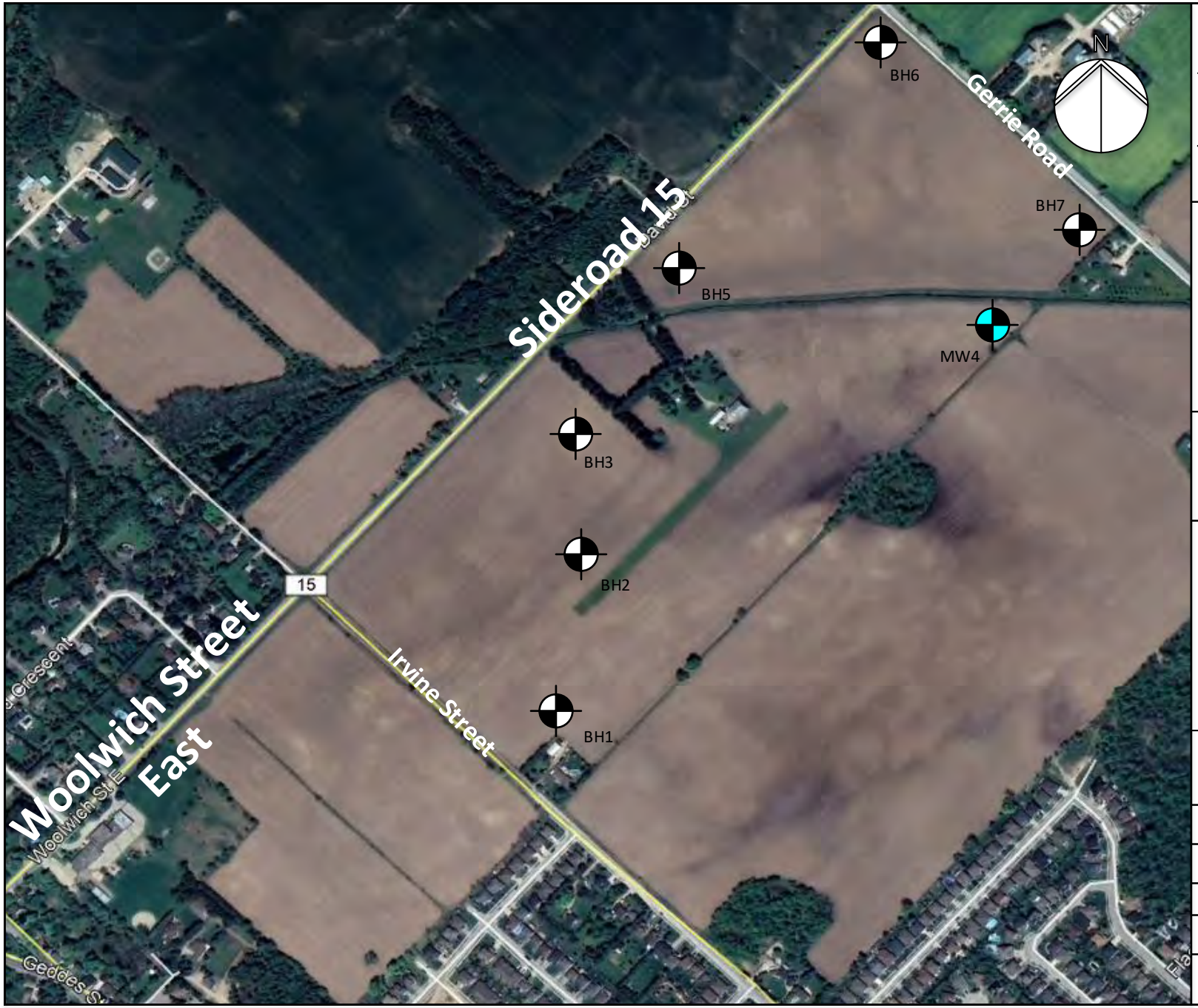
Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng.
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Log of Borehole Nos. 1 to 7, inclusive
Grain Size Analyses
Drawing No. 2, Recommended Design Requirements for Basement Construction

Distribution: Cachet Developments [pdf]



LEGEND

Borehole Location
BH#

Monitoring Well Location
MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951A-G.

2. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Sideroad 15
Elora, Ontario

Borehole Location Plan

Project No. SM 301591A-G

Date: September 2021

Drawn: SW | Checked: KR

SM 301591A-G Borehole Location Plan

Drawing No. 1

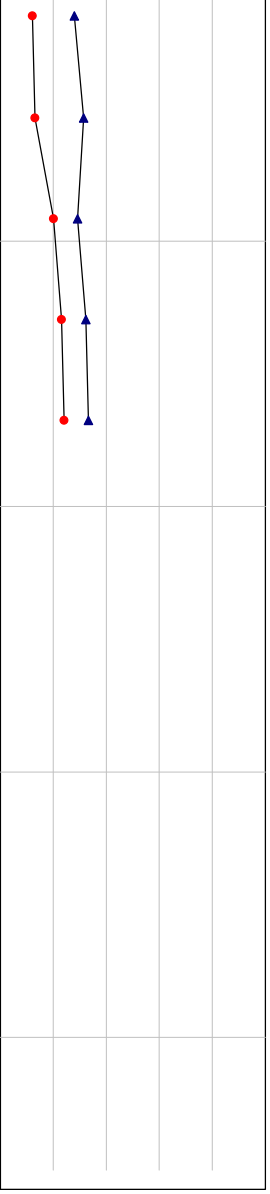
Log of Borehole No. 1

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838268
E: 545454

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		413.05		Ground Surface								
0	0	412.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	4 5 7 6	12			
3	1	411.90		**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, compact.		SS	2	6 7 6 6	13			
6	2			**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, compact.		SS	3	5 8 12 14	20			
9	3					SS	4	12 10 13 10	23			
11		409.40				SS	5	6 11 13 15	24			
12	4			End of Borehole								

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



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as dry and caved to a depth of 1.5 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 2

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838469
E: 545516

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	415.00	Ground Surface								
0 / 0	414.80	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2 4 4 5	8			
3 / 1		**Sandy Silt** Brown, reworked in upper levels, trace clay, silt, and gravel, loose.		SS	2	4 3 6 8	9			
6 / 2	413.50	**Clayey Silt** Brown, trace to some sand and gravel, stiff to very stiff.		SS	3	6 6 6 7	12		3.5	
8 /	412.50	Transition to grey.		SS	4	3 7 6 7	13		4.0	
11 / 3				SS	5	9 7 15 18	22		>4.5	
12 /	411.30	End of Borehole								
13 / 4										
16 / 5										
20 / 6										
23 / 7										
26 / 8										
29 / 9										

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.7 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 3

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838652
E: 545505

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		409.93		Ground Surface									
0	0			**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	4 6 10 8	16				
3	1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, compact.		SS	2	6 10 10 7	20				
6	2	408.10 407.80		**Sandy Silt** Brown, trace to some gravel and clay, compact.		SS	3	6 8 10 11	18				
				End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 2.1 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 4

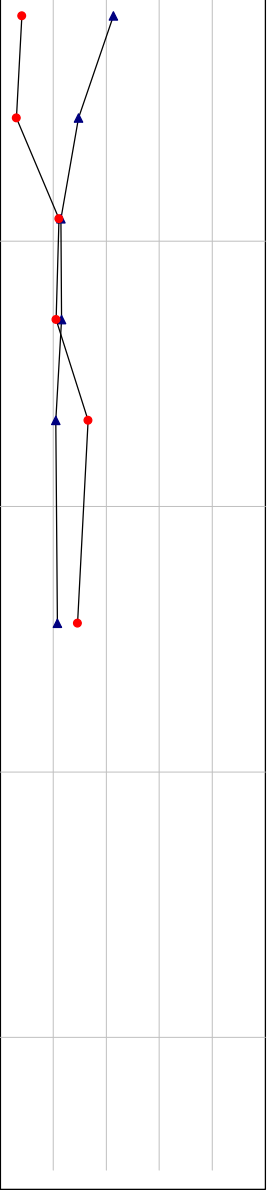
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838792
E: 546044

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		405.55		Ground Surface								
0	0	405.35		**Topsoil** Approximatelty 200 millimetres of topsoil.								
1				**Sandy Silt** Brown, trace to some clay, trace gravel, reworked in upper levels, loose.		SS	1	2 3 5 6	8			
2												
3	1					SS	2	4 3 3 5	6			
4												
5												
6		403.70		**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, wet, compact to dense.		SS	3	8 10 12 15	22			
7	2											
8						SS	4	8 10 11 10	21			
9												
10	3					SS	5	8 10 23 30	33			
11												
12												
13	4											
14												
15		400.70										
16	5	400.40		Transition to grey.		SS	6	3 11 18 23	29			
17				End of Borehole								
18												
19												
20	6											
21												
22												
23	7											
24												
25												
26	8											
27												
28												
29	9											

Moisture Content w% (10 20 30 40)

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



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 5, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 2.74 metres below ground surface.

August 27, 2021 - 1.75 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 5, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 5

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838939
E: 545636

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		412.10		Ground Surface									
0	0	411.90		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	2 4 5 7	9				
3	1			**Sandy Silt** Brown, reworked in upper levels, trace to some clay, increasing clay content with depth, occasional gravel, loose to compact.		SS	2	1 3 3 5	6				
6	2	410.00				SS	3	3 5 7 9	12				
7				End of Borehole									
10	3												
13	4												
16	5												
20	6												
23	7												
26	8												
29	9												

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 2.1 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 6

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839162
E: 545871

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	420.91		Ground Surface								
0 / 0	420.70		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	4 4 4 4	8			
3 / 1	419.40		**Sand** Brown, reworked in upper levels, trace rootlets, loose to compact.		SS	2	3 5 6 6	11			
6 / 2			**Sandy Silt** Brown, trace clay, increasing clay content with depth, loose to compact.		SS	3	5 6 6 7	12			
9 / 3					SS	4	3 4 4 4	8			
11 / 3	417.30				SS	5	5 11 10 15	21			
12 / 4			End of Borehole								

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as wet at depth of 2.0 metres, and caved to a depth of 2.4 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 7

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838910
E: 546126

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.39	Ground Surface								
0 / 0	408.10	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	3 5 6 7	11			
3 / 1	406.90	**Sandy Silt** Brown, trace rootlets, trace clay, reworked in upper levels, increasing clay content with depth, compact.		SS	2	10 8 10 10	18			
7 / 2		**Clayey Silt** Brown, trace to some sand and gravel, stiff to hard.		SS	3	3 5 6 6	11		2.0	
10 / 3				SS	4	5 7 10 18	17		2.5	
11 / 3	404.70			SS	5	24 36 50/5"	100		>4.5	
12 / 4		End of Borehole								

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.0 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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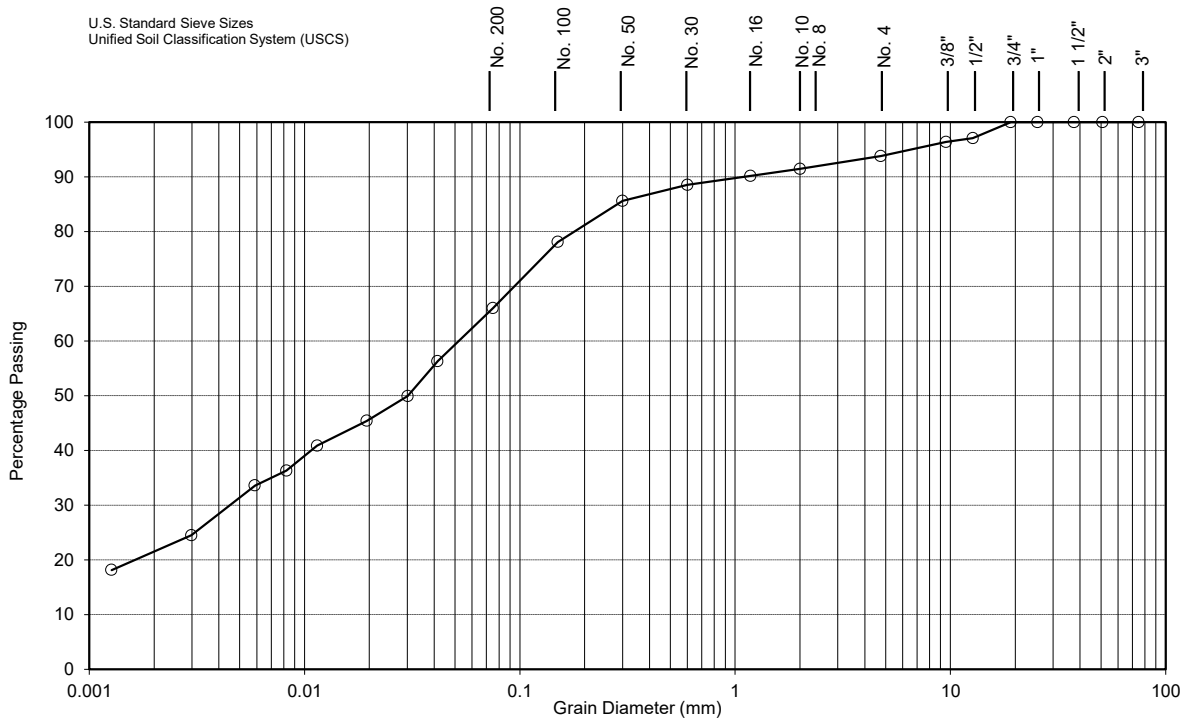
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

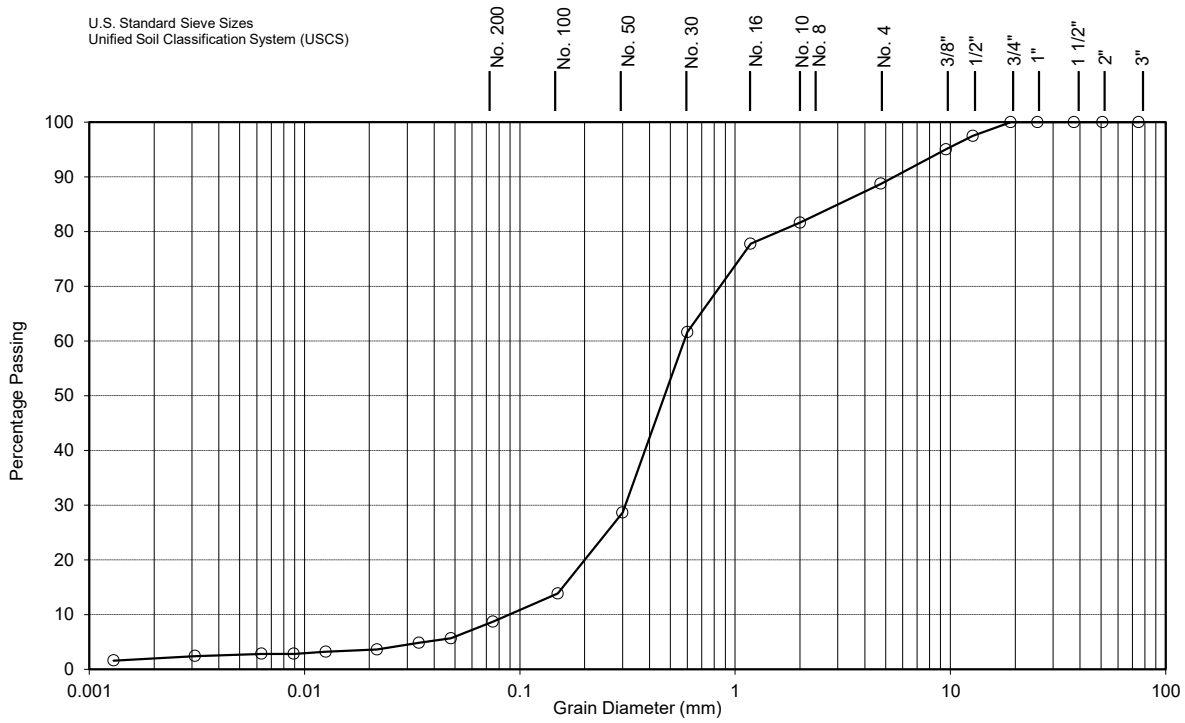
Lab No.:	**21-335**	Notes: Depth: 5'			
Sample No.:	**3**				
Borehole No.:	**3**				
CLAY [%]:	**22**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**44**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**28**				
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0005**	Coefficient of Uniformity C_U:	**102.0**	Coefficient of Curvature C_C:	**0.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

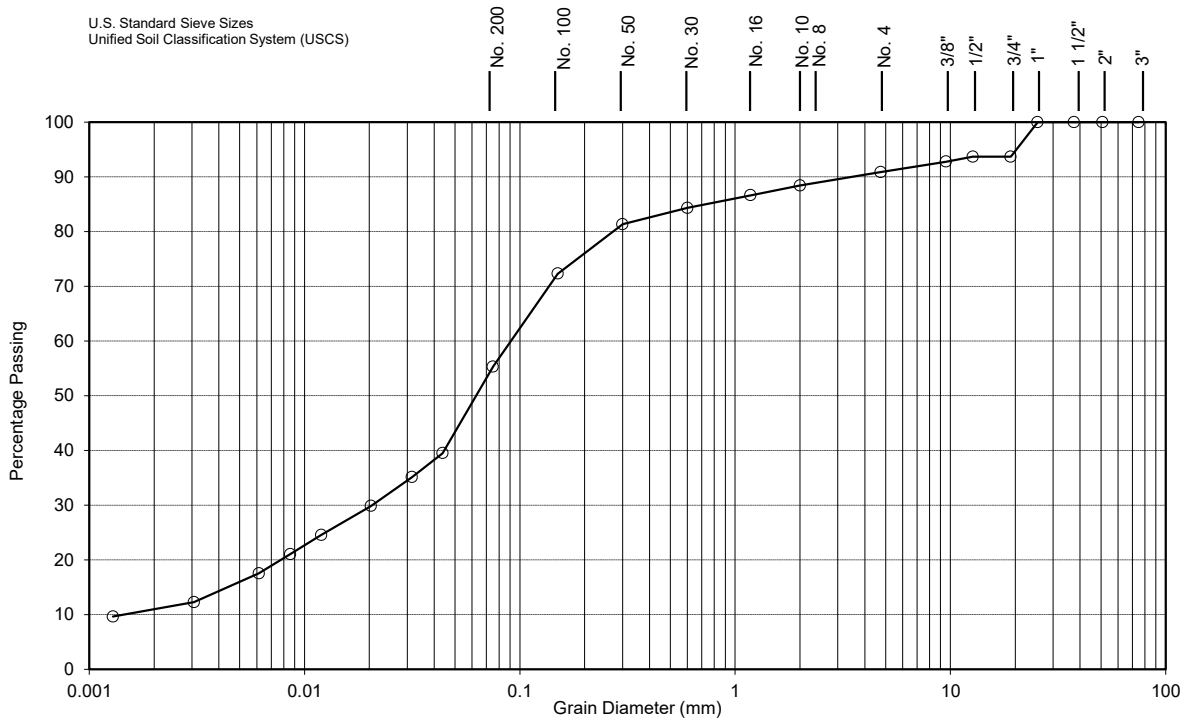
Lab No.:	**21-340**	Notes: Depth: 10'			
Sample No.:	**5**				
Borehole No.:	**4**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ some Gravel and traces of Silt and Clay**		
SILT [%]:	**7**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**80**				
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.090**	Coefficient of Uniformity C_U:	**6.6**	Coefficient of Curvature C_C:	**1.8**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



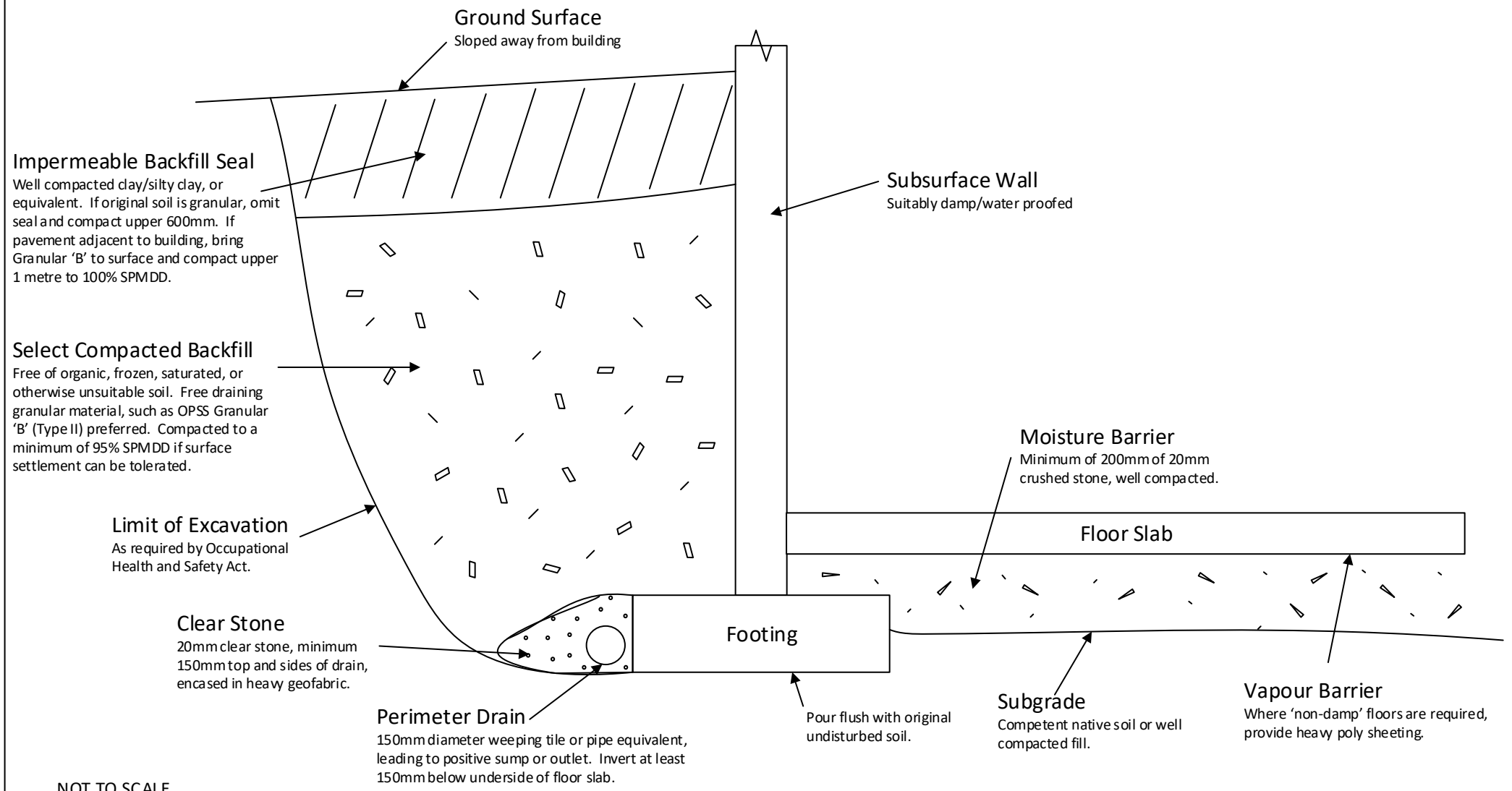
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**21-336**	Notes: Depth: 10'			
Sample No.:	**5**				
Borehole No.:	**6**				
CLAY [%]:	**11**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**			
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**			
SAND [%]:	**36**				
GRAVEL [%]:	**9**	Estimated Infiltration Rate [mm/hr] :	**10 to 15**	Estimated Permeability, k [cm/s]	**10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0015**	Coefficient of Uniformity C_U:	**60.0**	Coefficient of Curvature C_C:	**3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**



NOT TO SCALE

Soil-Mat

Soil-Mat Engineers & Consultants Ltd.

Project No.:	SM 301951-G
Date:	September 2021

Typical Design Requirements
Drainage and Backfill for Basement Walls

Drawing No. 2

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

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Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951B-G October 14, 2021

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

PRELIMINARY GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
75 WOOLWICH STREET EAST
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your authorisation and subsequent discussions with Mr. Michael DeBiasio, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has completed the fieldwork, laboratory testing, and report preparation in connection with the above noted project. The scope of work was completed in general accordance with our proposal P301951, dated July 1, 2021, later revised and confirmed through email communication on August 3, 2021. This report should be read in conjunction with the formal report for the Gibson Farms to the east SM 301951A-G, dated October 5, 2021. Our comments and recommendations based on our findings at the four [4] borehole locations are presented in the following paragraphs.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development consisting of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services, located at 75 Woolwich Street East [Clayton Lands] in Elora, Ontario. The purpose of this preliminary geotechnical investigation work was to assess the subsurface soil and groundwater conditions, and to provide our comments and recommendations with respect to the design and construction of the proposed development, from a geotechnical point of view.

SOIL-MAT ENGINEERS was provided with a sub-watershed study that encompasses the surrounding area – including the subject site – prepared by Aquafor Beech Limited, dated February 2008. The results of this investigation have been considered in preparation of this geotechnical report.

This report is based on the above summarised project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, this office must be consulted to review the new design with respect to the results of this investigation. It is noted that SOIL-MAT ENGINEERS has also conducted Phase One and Two Environmental Site Assessments (ESAs) for the subject site, which have been reported under a separate cover.

2. PROCEDURE

A total of four [4] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment on August 6, 2021 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 3.6 and 7.6 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses.

Upon completion of drilling, groundwater monitoring wells were installed at Borehole Nos. 1, 2, and 4 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 to 3.0 metres. The monitoring well was encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite ‘hole plug’ to the surface and fitted with a protective steel ‘stick up’ casing. The remaining boreholes were backfilled in

general accordance with Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade.

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at the borehole locations has been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 1 to 4, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is currently an undeveloped agricultural property located at Woolwich Street East in Elora, Ontario. The parcel is bordered to the east by Irvine Street, to the south by Bricker Avenue, to the west by residential dwellings and a public school, and to the north by Woolwich Street East. The grade is relatively flat and even at the south portion of the site, sloping gently up towards the north, before quickly descending to the north towards Woolwich Street East with an approximate relief of 6 metres measured across the boreholes.

The subsurface conditions encountered at the borehole locations are summarised as follows:

Topsoil

A surficial veneer of topsoil approximately 100 to 250 millimetres in thickness was encountered at all borehole locations. It is noted that the depth of topsoil may vary across the site and from the depths encountered at the borehole locations. It is also noted that the term ‘topsoil’ has been used from a geotechnical point of view, and does

not necessarily reflect its nutrient content or ability to support plant life. Given the property has been historically used for agricultural purposes the upper levels of the soils would be expected to have a reworked nature resulting in more variable depths of topsoil over the site. As such, it is recommended that a conservative approach be taken when estimating topsoil quantities across the site for stripping, i.e. account for slightly greater stripping depth than those specifically noted at the borehole locations.

Sandy Silt/Clayey Silt

Native sandy silt/clayey silt was encountered beneath the topsoil in Borehole Nos. 1, 2, and 3. The fine-grained granular to slightly cohesive soils were brown in colour, with trace to some clay and gravel, with a notable increasing clay content with depth in some of the boreholes. The native sandy silt/clayey silt soils were generally noted to have a reworked or weathered appearance in the upper levels, and were generally noted to have a compact state. The sandy silt/clayey silt deposit was present to depths of approximately 0.9 to 2.2 metres in Borehole Nos. 2 and 3, and proven to termination within Borehole No. 1 at a depth of approximately 6.1 metres below the existing ground surface.

Sand

A native sand deposit was encountered beneath the topsoil in Borehole No. 4, and beneath the sandy silt/clayey silt layer in Borehole Nos. 2 and 3. The fine to medium grained soils were brown in colour, contained trace amounts of clay, silt, and gravel, and was generally in a loose to compact state. The native sand soils were proven to termination at depths of approximately 3.6 and 7.6 metres below the existing ground surface.

Grain Size Analyses

Grain size analyses were conducted on three [3] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH2 SS6	4.6 m	2	6	91	1	10^{-2}	150 to 300
BH3 SS3	1.5 m	14	45	34	7	10^{-6}	<10
BH4 SS4	2.3 m	2	9	89	0	10^{-3} to 10^{-2}	100 to 150

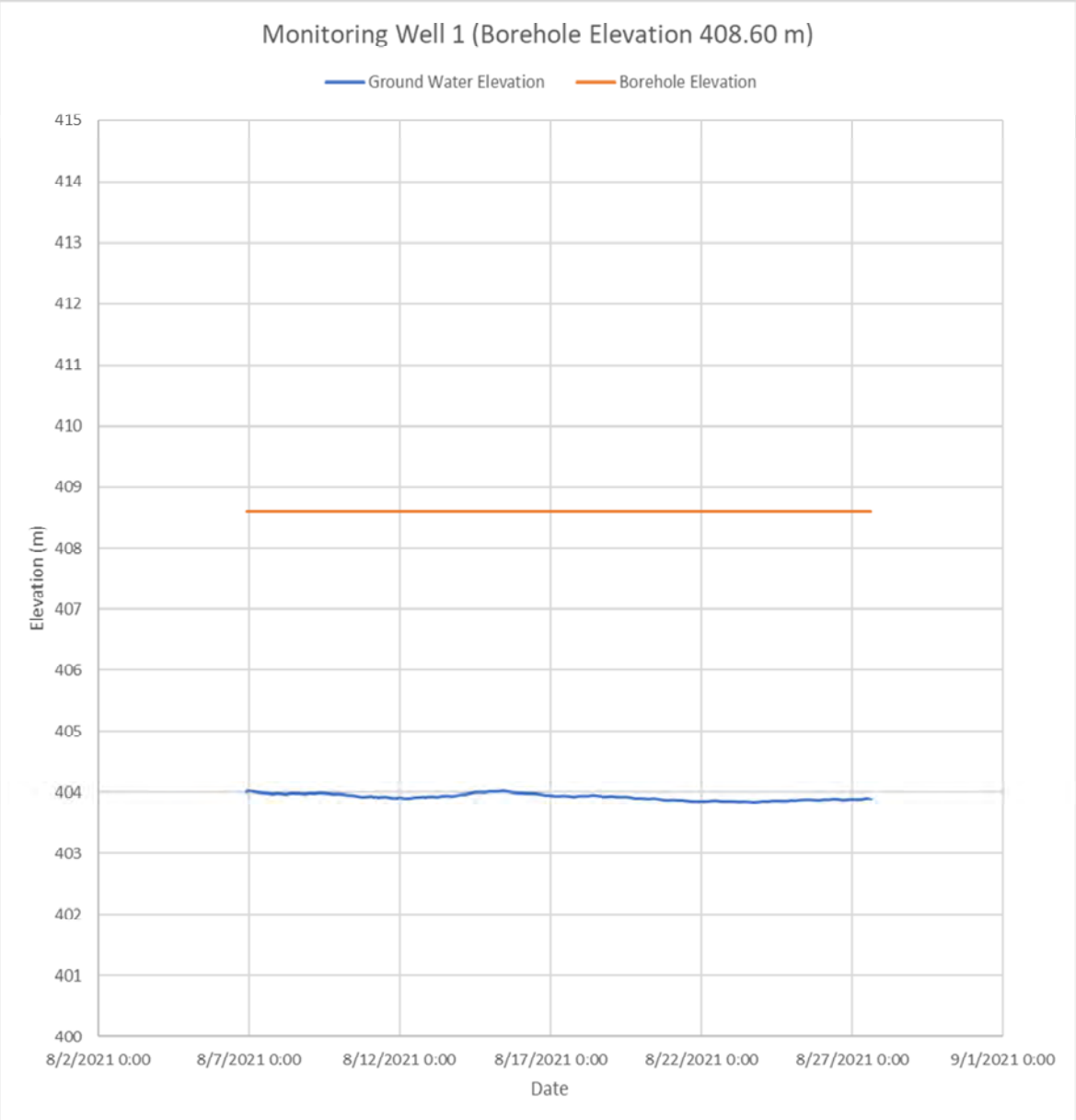
The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines at depth. The sandy silt/clayey silt in the upper levels would generally behave as a low permeable material, but would not be considered as an impermeable material, and would be highly frost susceptible. The underlying sand deposit is highly permeable, relatively free draining.

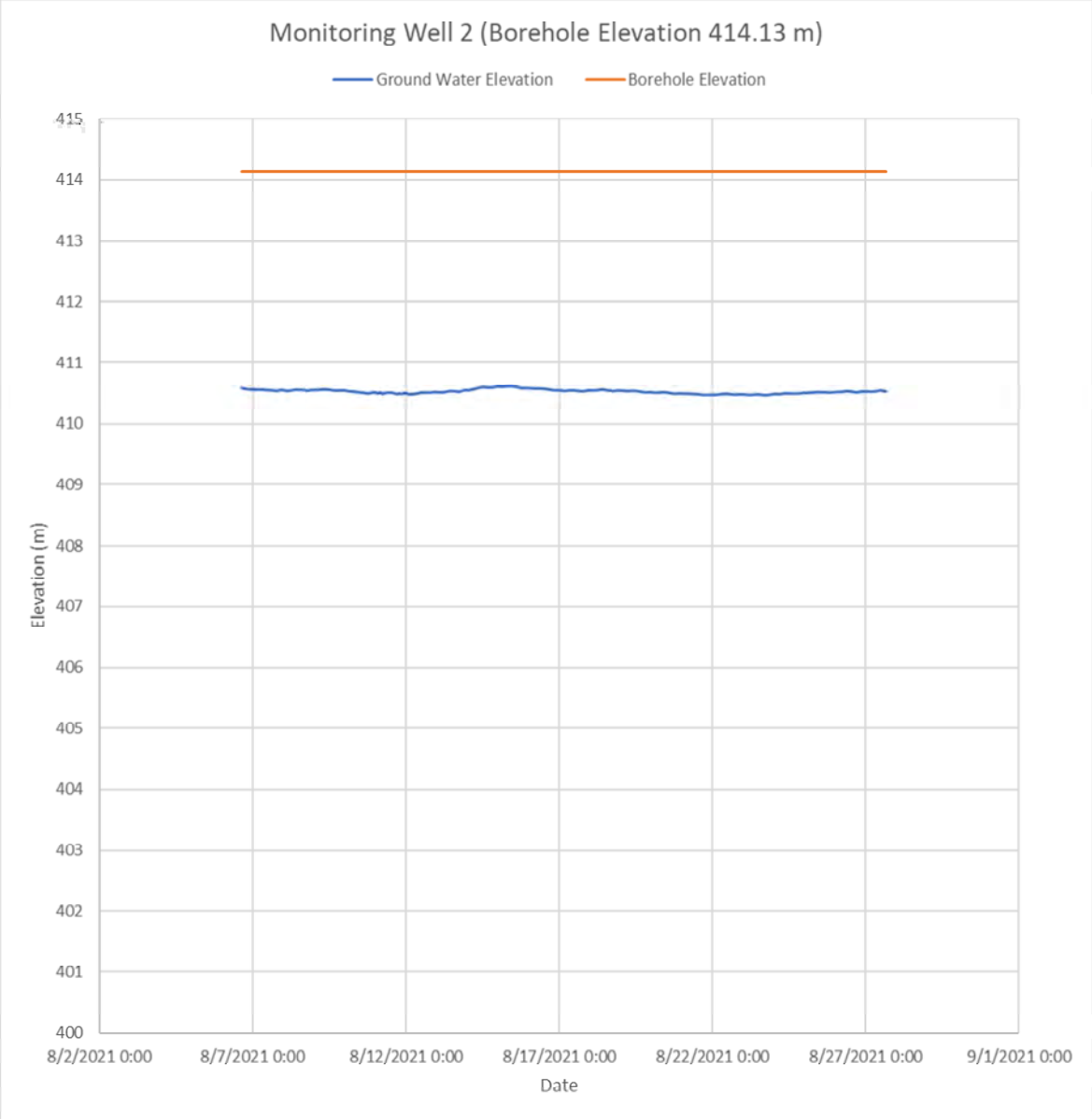
A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Groundwater Observations

Borehole No. 2 was noted to have ‘caved’ to a depth of approximately 3.8 metres and ‘wet’ at a depth of approximately 3.6 metres, while Borehole No. 4 was noted to be open and ‘wet’ at a depth of 7.0 metres upon completion. Borehole Nos. 3 was noted to have cave to a depth of 2.7 metres, and dry upon completion. Borehole No. 1 was noted as being open and ‘dry’ [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, a monitoring well was installed at Borehole Nos. 1, 2, and 4, to allow for future measurements of the static groundwater level. Furthermore, it is noted that an additional monitoring well was installed on the abutting parcel of land to the east, the work of which was completed in concert with the fieldwork on the Clayton Lands. A data logger was installed in Borehole Nos. 1 and 2 to allow for continuous monitoring of the groundwater level between August 6 and August 27, 2021, the readings of which have been illustrated in the following graphs:




Monitoring Well 2 (Borehole Elevation 414.13 m)
Ground Water Elevation
Borehole Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
406
405
404
403
402
401
400
8/2/2021 0:00
8/7/2021 0:00
8/12/2021 0:00
8/17/2021 0:00
8/22/2021 0:00
8/27/2021 0:00
9/1/2021 0:00
Date

In addition to this, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on August 6 and August 27, 2021 and have been summarized in the following chart:

TABLE B
SUMMARY OF GROUNDWATER LEVELS

Monitoring Well	Ground Surface Elevation [m]	August 6, 2021		August 27, 2021	
		Groundwater Depth [m]	Groundwater Elevation [m]	Groundwater Depth [m]	Groundwater Elevation [m]
MW1	408.60	4.78	403.82	4.71	403.89
MW2	414.13	3.58	410.55	3.61	410.52
MW4	414.87	6.78	408.09	6.96	407.91

The groundwater levels observed at these monitoring well locations, as well as the monitoring well installed at the adjacent property [summarised in our geotechnical report SM 301951A-G under a separate cover] indicate a stabilized groundwater level on the order of approximately 2 to 7 metres below the existing grade, at an elevation of roughly 403.8 to 410.5 metres, varying with the physical topography. This data is based on the groundwater data collected from Borehole Nos. 1, 2, and 4, as well as the monitoring well installed on the Gibson Farm land to the east. It is noted that the groundwater level would be expected to fluctuate seasonally. It is also noted that the observed groundwater levels may be influenced by more localised shallower 'perched' deposits in more permeable seams within the sandy silt/clayey silt. Further long-term monitoring may allow for a more accurate estimate of the static groundwater level, including more data during the 'wet' and 'dry' seasons.

As noted above, SOIL-MAT ENGINEERS was also provided a sub-watershed study by Aquafor Beech, which included a number of monitoring wells to the east to monitor the groundwater elevations. The conditions and groundwater levels described in this geotechnical report are consistent with those encountered during our fieldwork as described above.

General Soil Conditions

As noted above the subsurface conditions are generally characterized as sandy silt/clayey silt deposit in the upper levels, underlain by a permeably cohesionless sand deposit. The grain size analyses indicate the sandy silt/clayey silt soils to have 10 to 20 percent clay content, lending a slightly cohesive characteristic. The sandy silt/clayey silt soils are relatively consistent in terms of its constituents but are noted to contain an increasing clay content with depth in some of the boreholes, as noted above. Where the material transitions into a sand the native soils are generally fine in gradation in the upper levels, becoming medium to coarse with depth. As demonstrated above the subsurface conditions exhibit a relatively inconsistent layered structure across the large area, but can be generally distinguished by a layer of slightly cohesive sandy silt overlying a cohesionless sand. The conditions will be best assessed during excavations on an area-by-area basis. As such it may also be prudent to advance a series of test excavations in the area of proposed deeper excavations and/or stormwater management ponds to confirm soil composition and groundwater conditions in the area of deep excavations.

4. EXCAVATIONS

Excavations for the installation of foundations and underground services are anticipated to extend to depths of up to approximately 2 to 5 metres below the existing grade. Excavations through the native sandy silt/clayey silt and sand soils, as well as any engineered fill placed as part of site grading works, should be relatively straightforward, with the sides remaining stable for short construction periods at inclinations of up to 45 degrees to the horizontal, and possibly steeper depending on moisture condition and clay content. Where wet or more permeable seams are encountered, during periods of extended precipitation, or where excavations extend below the static groundwater level, the sides of excavations should be expected to ‘slough in’ to as flat as 3 horizontal to 1 vertical, or flatter.

Nevertheless, all excavations must comply with the current Occupational Health and Safety Act and Regulations for Construction Projects. The native sandy silt/clayey silt and sand soils would generally be considered a Type 2 or 3 soil, depending on the moisture content and relative compact to dense condition, as outlined in the Ontario Health and Safety Act III – Excavations. Excavation slopes steeper than those required in the Safety Act must be supported and a senior geotechnical engineer from this office should monitor the work.

As noted above, the groundwater level varies between depths of approximately 2 to 7 metres below the existing grade, roughly elevation 403.8 to 410.5 metres. The majority of excavations are anticipated to be above the groundwater level. Nevertheless, some infiltration of water from more permeable seams and surface runoff into the open excavations should be anticipated. Such infiltration should be readily controlled using typical construction dewatering methods. 'Perched' deposits of water may be encountered within more permeable pockets, which may require greater initial dewatering efforts and instability in the excavations, especially during the 'wet' times of the year. Where excavations extend to greater depths, to and below the groundwater level, especially within the sand deposit, the rate of infiltration will be much greater and additional pumping or more sophisticated dewatering methods should be anticipated. In this regard, ongoing monitoring of the groundwater levels, and careful review of the design servicing elevations, is recommended. As noted above, the advancement of test excavations in the area of proposed deep services and stormwater management ponds would allow for a first hand look at how groundwater levels may affect such excavations. More water should be expected when connections are made to existing services. Surface water should be directed away from the excavations.

The base of the excavations in the native soils, above the groundwater level, encountered in the boreholes should generally remain firm and stable. Where excavations extend to greater depths, to or below the groundwater level, or where 'perched' water is encountered, some base instability should be expected, especially during 'wet' times of the year. This will be especially likely in the high silt content sandy silt/clayey silt soils. Areas of base instability may be stabilised with the placement of additional bedding or ballast stone, the use of coarser stone material, etc. The appropriate measures are best assessed based on the actual conditions at the time of construction. With a firm and stable base condition, stabilised where warranted, standard pipe bedding material as specified by the Ontario Provincial Standard Specification [OPSS] or County of Wellington should be satisfactory. The bedding should be well compacted to provide sufficient support to the pipes and components (i.e. valve chambers, manholes etc.), and to minimize settlements of the roadway above the service trenches. Special attention should be paid to compaction under the pipe haunches.

We recommend that the invert elevations of any storm sewer pipes for rear yard catch basins be located above the proposed underside of footing elevations of adjacent residential structures, or that the trench excavations should be filled with 5 MPa 'lean mix' concrete product to the proposed underside of footing level where the excavations

extend below an imaginary 10 horizontal to 7 vertical line extending outwards and down from a point 0.3 metres beyond the proposed townhouse foundations.

Any utility poles, light poles, etc. located within 3 metres of the top of an excavation slope should be braced to ensure their stability. Likewise, temporary support might be required for other existing above and below ground structures, including existing underground services, roadways, etc. depending on their proximity to the trench excavations.

5. BACKFILL CONSIDERATIONS

The excavated material will consist primarily of the sandy silt/clayey silt and sand soils encountered in the boreholes as described above. These soils are generally considered suitable for use as engineered fill, trench backfill, etc., provided that they are free of organics, construction debris, or other deleterious material, and that its moisture content can be controlled to within 3 per cent of its standard Proctor optimum moisture content.

It is noted that the sandy silt/clayey silt soils encountered are not considered to be free draining and should not be used where this characteristic is necessary. It is also noted that these fine grained granular soils will present difficulties in achieving effective compaction when they become 'wet' of optimum, and where access with compaction equipment is restricted. The sandy silt/clayey silt soils encountered are generally considered to be near to slightly 'dry' of their standard Proctor optimum moisture content, with some noted 'wet' seams. Some moisture conditioning will be required depending upon the weather conditions at the time of construction. It is noted that these silty soils will become nearly impossible to compact when wet of its optimum moisture content. Any material that becomes wet to saturated should be spread out to allow to dry, or removed and discarded, or utilised in non-settlement sensitive areas. The sand soils are generally well draining, and tend to be near optimum moisture content. At depth, approaching or below the water level, the sand soils will be expected to be saturated, requiring time to drain excess moisture or other drying efforts in order to achieve effective compaction.

We note that where backfill material is placed near or slightly above its optimum moisture content, the potential for long term settlements due to the ingress of groundwater and collapse of the fill structure is reduced. Correspondingly, the shear strength of the 'wet' backfill material is also lowered, thereby reducing its ability to support construction traffic and therefore impacting roadway construction. If the soil is

well dry of its optimum value, it will appear to be very strong when compacted, but will tend to settle with time as the moisture content in the fill increases to equilibrium condition. The fine grained to cohesive soils encountered may require high compaction energy to achieve acceptable densities if the moisture content is not close to its standard Proctor optimum value. It is therefore very important that the moisture content of the backfill soils be within 3 per cent of its standard Proctor optimum moisture content during placement and compaction to minimise long term subsidence [settlement] of the fill mass. Any imported fill required in service trenches or to raise the subgrade elevation should have its moisture content within 3 per cent of its optimum moisture content and meet the necessary environmental guidelines.

A representative of SOIL-MAT should be present on-site during the backfilling and compaction operations to confirm the uniform compaction of the backfill material to project specification requirements. Close supervision is prudent in areas that are not readily accessible to compaction equipment, for instance near the end of compaction 'runs'. Backfill within service trenches, areas to be paved, etc., should be placed in loose lifts not exceeding 300 millimetres in thickness and compacted to a minimum of 95 per cent of its standard Proctor maximum dry density [SPMDD], and to 100 per cent of its SPMDD in the upper 1 metre below the design subgrade level. All structural fill should be compacted to 100 per cent of its SPMDD. The appropriate compaction equipment should be employed based on soil type, i.e. pad-toe for cohesive soils and smooth drum/vibratory plate for granular soils. A method should be developed to assess compaction efficiency employing the on-site compaction equipment and backfill materials during construction.

6. MANHOLES, CATCH BASINS AND THRUST BLOCKS

Properly prepared bearing surfaces for manholes, valve chambers, etc. in the native competent soils, stabilised where required, will be practically non-yielding under the anticipated loads. Proper preparation of the founding soils will tend to accentuate the protrusion of these structures above the pavement surface if compaction of the fill around these structures is not adequate, causing settlement of the surrounding paved surfaces. Conversely, the pavement surfaces may rise above the valve chambers and around manholes under frost action. To alleviate the potential for these types of differential movements, free-draining, non-frost susceptible material should be employed as backfill around the structures located within the paved roadway limits, and compacted to 100 per cent of its standard Proctor maximum dry density. A geofabric separator

should be provided between the free draining material and the on-site silt soils to prevent the intrusion of fines.

The thrust blocks in the native soils or engineered fill may be conservatively sized as recommended by the applicable Ontario Provincial Standard Specification conservatively using a horizontal allowable bearing pressure of up to 150 kPa [~2,000 psf]. Any backfill required behind the blocks should be a well-graded granular product and should be compacted to 100 per cent of its standard Proctor maximum dry density.

7. PAVEMENT STRUCTURE DESIGN CONSIDERATIONS

All areas to be paved must be cleared of all organic and otherwise unsuitable materials, and the exposed subgrade proof rolled with 3 to 4 passes of a loaded tandem-axle truck in the presence of a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., immediately prior to the placement of the sub-base material. Any areas of distress revealed by this or other means should be subexcavated and replaced with suitable backfill material. Where the subgrade condition is poorer it may be necessary to implement more aggressive stabilisation methods, such as the use of coarse aggregate [50-millimetre clear stone, 'rip rap', etc.] 'punched' into the soft areas.

Good drainage provisions will optimise the long-term performance of the pavement structure. The subgrade must be properly crowned and shaped to promote drainage to the subdrain system. Subdrains should be installed to intercept excess subsurface water and to prevent softening of the subgrade material. Surface water should not be allowed to pond adjacent to the outer limits of the paved areas.

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. SOIL-MAT should be given the opportunity to review the final pavement structure design and subdrain scheme prior to construction to ensure that they are consistent with the recommendations of this report.

If construction is conducted under adverse weather conditions, additional subgrade preparation may be required. During wet weather conditions, such as during the fall and spring months, it should be anticipated that additional subgrade preparation will be required, such as additional depth of Ontario Provincial Standard Specification [OPSS] Granular 'B', Type II (crushed limestone bedrock) sub-base material. It is also important

that the sub-base and base granular layers of the pavement structure be placed as soon as possible after exposure, preparation and approval of the subgrade level.

The roadways through the residential subdivision would be required to adequately support cars, trucks and intermittent delivery and garbage trucks. A typical generic pavement structure would consist of 350 millimetres of OPSS Granular 'B', Type II (crushed bedrock) sub-base course, 150 millimetres of OPSS Granular 'A' base course, 60 millimetres of HL8 or HL4 binder course asphaltic concrete, and 40 millimetres of HL3 surface course asphaltic concrete. Where a pit run, Granular B Type I, aggregate is utilised in the granular base, it should be increased to a minimum thickness of 450 millimetres. It is our opinion that this design is suitable for use on a residential roadway section, provided that the subgrade has been prepared as specified and is good and firm before the sub-base course material is placed. Notwithstanding, the pavement structure should conform to the relevant County of Wellington requirements where they are to be assumed by the County. If the subgrade is soft, remedial measures as discussed above may have to be implemented and/or the sub-base thickness may have to be increased. The granular sub-base and base courses and asphaltic concrete layers should be compacted to OPSS or County of Wellington requirements. A program of in-place density testing must be carried out to monitor that compaction requirements are being met. We note that this pavement structure is not to be considered as a construction roadway design.

To minimise segregation of the finished asphalt mat, the asphalt temperature must be maintained uniform throughout the mat during placement and compaction. All too often, significant temperature gradients exist in the delivered and placed asphalt with the cooler portions of the mat resisting compaction and presenting a honeycomb surface. As the spreader moves forward, a responsible member of the paving crew should monitor the pavement surface, to ensure a smooth uniform surface. The contractor can mitigate the surface segregation by 'back-casting' or scattering shovels of the full mix material over the segregated areas and raking out the coarse particles during compaction operations. Of course, the above assumes that the asphalt mix is sufficiently hot to allow the 'back-casting' to be performed.

Asphalt paving of driveways should be consistent with the general recommendations provided above. Proper preparation of the subgrade soils is essential to good long-term performance of the pavement. Likewise, sufficient depth and compaction of granular base materials and adequate drainage will be important in achieving good long-term performance, i.e. preventing/limiting premature cracking, subgrade failure, rutting, etc. A typical recommended light duty pavement structure for residential driveways would

consist of a minimum of 200 millimetres of OPSS Granular 'A' base course, compacted to 100 percent standard Proctor maximum dry density, followed by a minimum of 50 millimetres of HL3 or HL3F asphaltic concrete, compacted to a minimum of 92 per cent of their Marshall maximum relative density [MRD].

8. HOUSE AND TOWNHOUSE CONSTRUCTION

The native soils encountered at the borehole locations are considered capable of supporting the loads associated with typical residential dwelling and townhouse structures on conventional spread footings, below any fill, organic, or otherwise unsuitable materials. Bearing pressures of up to 150 kPa [~3,000 psf] SLS and 225 kPa [~4,500 psf] ULS may be considered in the competent native soils. In areas where 'wet' seams are present, or the native soils present in less compact condition, reduced bearing values of 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] are recommended. The founding surfaces must be hand cleaned of any loose or disturbed material, along with any ponded water, immediately prior to placement of foundation concrete.

In the event that site grading works result in engineered fill below founding elevations, the general recommendations presented in the Backfill Considerations above should be strictly adhered to, with compaction to 100 percent standard Proctor maximum dry density, verified by monitoring and testing by a representative of SOIL-MAT ENGINEERS present on a full time basis. If there is a short fall in the volume of fill required, then the source of imported fill should be reviewed for gradation, Proctor value, compatibility with existing fill, environmental characteristics and be approved by this office prior to use. The design bearing capacity for footings within the engineered fill should be limited to 100 kPa [~2,000 psf] SLS and 150 kPa [~3,000 psf] ULS.

The support conditions afforded by the native soils and/or engineered fill are generally not uniform across the building footprint, nor are the loads on the various foundation elements. As such it is recommended that consideration be given to the provision of nominal reinforcement in the footings and foundation walls to account for variable support and loading conditions. The use of nominal reinforcement is considered good construction practice as it will act to reduce the potential for cracking in the foundation walls due to minor settlements, heaving, shrinkage, etc. and will assist in resisting the pressures generated against the foundation walls by the backfill. Such nominal reinforcement is an economical approach to the reduction and prevention of costly foundation repairs after completion and later in the life of the buildings. This

reinforcement would typically consist of two continuous 15M steel bars placed in the footings [directly below the foundation wall], and similarly two steel bars placed approximately 300 millimeters from the top of the foundation walls at a minimum, depending on ground conditions exposed during construction. These reinforcement bars would be bent to reinforce all corners and under basement windows, and be provided with sufficient overlap at staggered splice locations. At 'steps' in the foundations and at window locations, the reinforcing steel should transition diagonally, rather than at 90 degrees, to maintain the continuous tensile capacity of the reinforcement. Where footings are founded on, or partially on, engineered fill the above provision for nominal reinforcement would be required.

All basement foundation walls should be suitably damp proofed, including the provision of a 'dimple board' type drainage product, and provided with a perimeter drainage tile system outlet to a gravity sewer connection or positive sump pit a minimum of 150 millimetres below the basement floor slab. The clear stone material surrounding the weeping tile should be encased with a geotextile material to prevent the migration of fines from the foundation wall backfill into the clear stone product. In the event that sump pit systems are required we would recommend that the sump pump system should be constructed with an 'oversized' reservoir and a 'back-flow' prevention valve so that the sump pump will not cycle repeatedly within short time periods.

All footings exposed to the environment must be provided with a minimum of 1.2 meters of earth or equivalent insulation to protect against frost penetration. This frost protection would also be required if construction were undertaken during the winter months. All footings must be proportioned to satisfy the requirements of the Ontario Provincial Building Code.

It is imperative that a soils engineer be retained from this office to provide geotechnical engineering services during the excavation and foundation construction phases of the project. This is to observe compliance with the design concepts and recommendations outlined in this report, and to allow changes to be made in the event that subsurface conditions differ from the conditions identified at the borehole locations.

9. PRELIMINARY HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development will consist of single family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend up to approximately 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, however further groundwater monitoring may be conducted to more accurately assess the static groundwater level.

The short term excavations for the proposed servicing are generally anticipated to extend into the sandy silt/clayey silt and sand soils to depths above the static groundwater level. Depths of excavations should be confirmed via a preliminary site servicing and grading plan, which should be forwarded onto our office for further review and comments. Such excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. During wet times of year, some instability of the excavations may be experienced. The rate of dewatering would be expected to be below 50,000 L/day, and certainly below 400,000 L/day, such that an EASR or PTTW should not be required. Where deeper excavations are identified to be required, extending below the static groundwater level, the need for temporary dewatering controls during construction should be more closely evaluated. Depending on the proposed depths of excavations for the proposed footings and site services, the rate of dewatering could approach or be greater than 50,000 L/day, potentially requiring an EASR. As such, once available, the site servicing and grading plans detailing depths of construction should be forwarded onto our office for further review and comments.

The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions. As such, the provision of clay ‘cut-offs’ within trench backfill is not expected to be required.

Excavations for the proposed basement levels should be well above the groundwater level, and so would not be expected to require significant ongoing groundwater control,

other than typical perimeter weeping tile and sump pump as noted above. This should be confirmed once our office has had a chance to review the site servicing and grading plans.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such is in 'dry' ponds, infiltration galleries, etc.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, and further detailed hydrogeological assessment is not considered warranted at this time. As the detailed design of the proposed development proceeds, this office should be consulted to review the hydrogeological conditions and assess the potential for concern, or need for additional study.

10. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng.
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Log of Borehole Nos. 1 to 4, inclusive
Grain Size Analyses
Drawing No. 2, Recommended Design Requirements for Basement Construction

Distribution: Cachet Developments [pdf]

LEGEND

Borehole Location
BH#

Monitoring Well Location
MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301951B-G.

2. Borehole locations are approximate.

SOIL-MAT
ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
75 Woolwich Street East
Elora, Ontario

Borehole Location Plan

Project No. SM 301591B-G

Date: October 2021

Drawn: SW | Checked: KR

SM 301591B-G Borehole Location Plan

Drawing No. 1

Log of Borehole No. 1

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838437
E: 545149

Depth (ft)	Depth (m)	Elevation (m)	Description	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	SAMPLE PP (kgf/cm2)	SAMPLE U.Wt.(kN/m3)
0	0	408.60	Ground Surface							
20	6	402.50	End of Borehole							

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 6.10 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. No soil samples were retrieved. The following free groundwater level readings have been measured:

August 6, 2021 - 4.78 metres below ground surface.

August 27, 2021 - 4.71 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 2

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838180
E: 545422

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	414.13	Ground Surface								
0 / 0	413.90	**Topsoil** Approximately 250 millimetres of topsoil.								
3 / 1	413.20	**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, loose to compact.		SS	1	4 5 7 8	12			
				SS	2	2 3 6 5	9			
		Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, loose to compact.		SS	3	3 9 12 14	21			
				SS	4	7 8 11 10	19			
				SS	5	6 9 11 17	20			
16 / 5	408.90	End of Borehole		SS	6	7 5 4 9	9			

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 3.8 metres and 'wet' at a depth of 3.6 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 3.58 metres below ground surface.

August 27, 2021 - 3.61 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 3

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837942
E: 545194

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
ft m	412.55	Ground Surface								
0 0		**Topsoil** Approximately 100 millimetres of topsoil.		SS	1	5 5 7 8	12			
1		**Sandy Silt** Brown, trace to some gravel and clay, reworked in upper levels, compact.		AS	2	6 5 3 3	8			
2 1				SS	3	5 6 6 6	12			
7 2	410.30									
8		**Sand** Brown, trace clay, silt, and gravel, medium gradation, loose.		SS	4	2 3 3 2	6			
10 3				SS	5	2 1 1 2	2			
12	408.90									
13 4		End of Borehole								

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.
2. Borehole was recorded dry and caved to a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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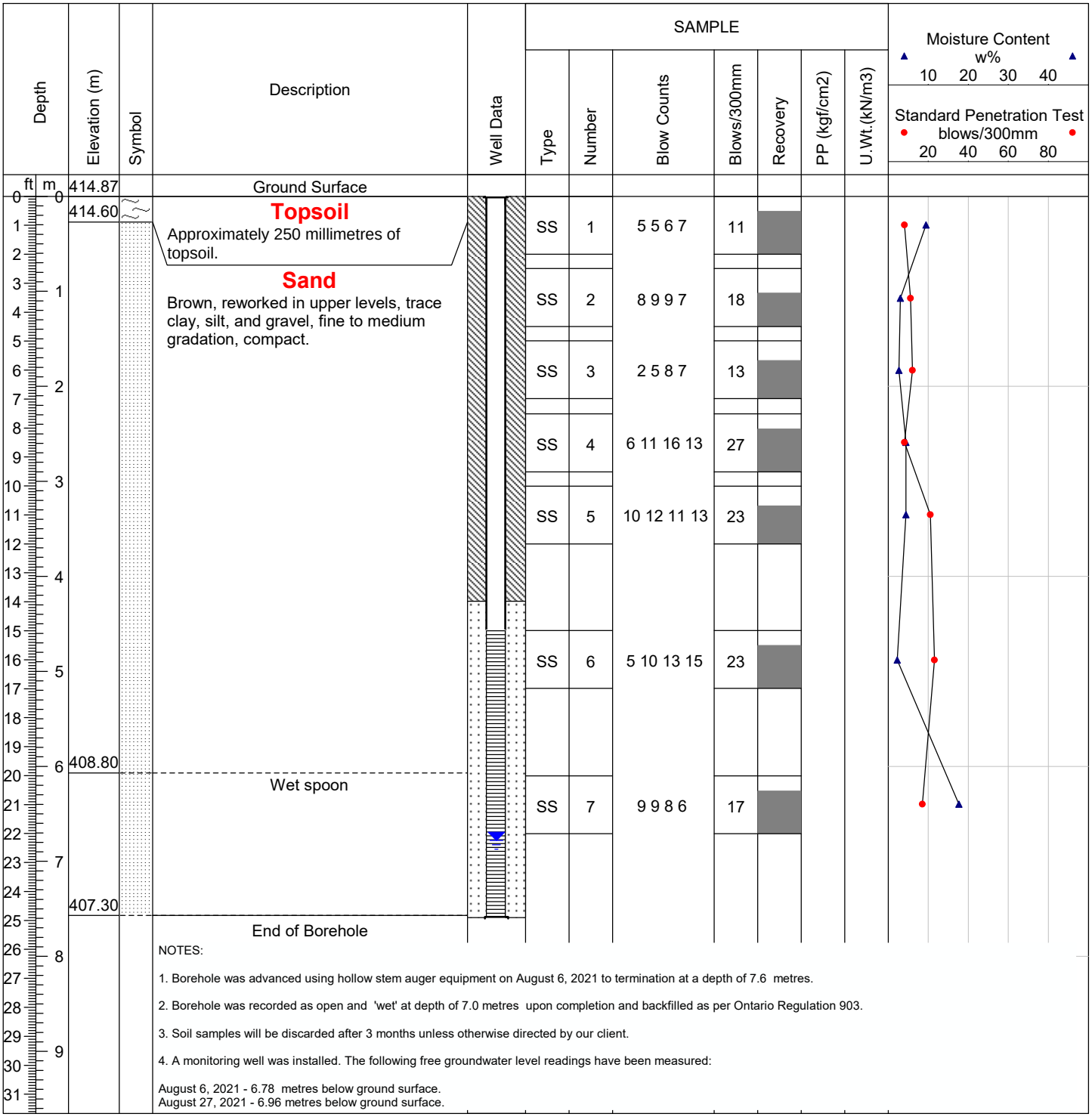
Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 4

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838174
E: 545084

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.87	Ground Surface							
0	0	414.60	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, fine to medium gradation, compact.	SS	1	5 5 6 7	11			
2										
3	1			SS	2	8 9 9 7	18			
4										
5				SS	3	2 5 8 7	13			
6	2									
7										
8				SS	4	6 11 16 13	27			
9										
10	3			SS	5	10 12 11 13	23			
11										
12										
13	4									
14										
15										
16				SS	6	5 10 13 15	23			
17	5									
18										
19										
20	6	408.80	Wet spoon							
21				SS	7	9 9 8 6	17			
22										
23	7									
24		407.30								
25			End of Borehole							
26	8									
27										
28										
29										
30	9									
31										



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 7.6 metres.
2. Borehole was recorded as open and 'wet' at depth of 7.0 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 6.78 metres below ground surface.
August 27, 2021 - 6.96 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

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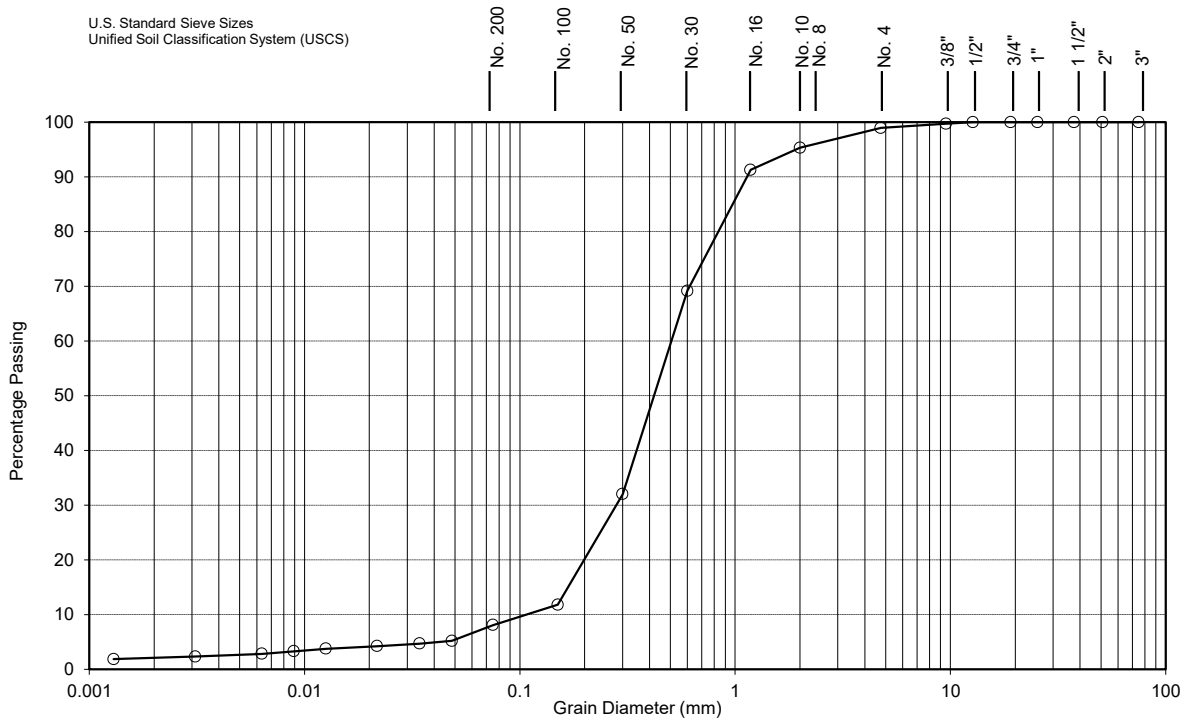
Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

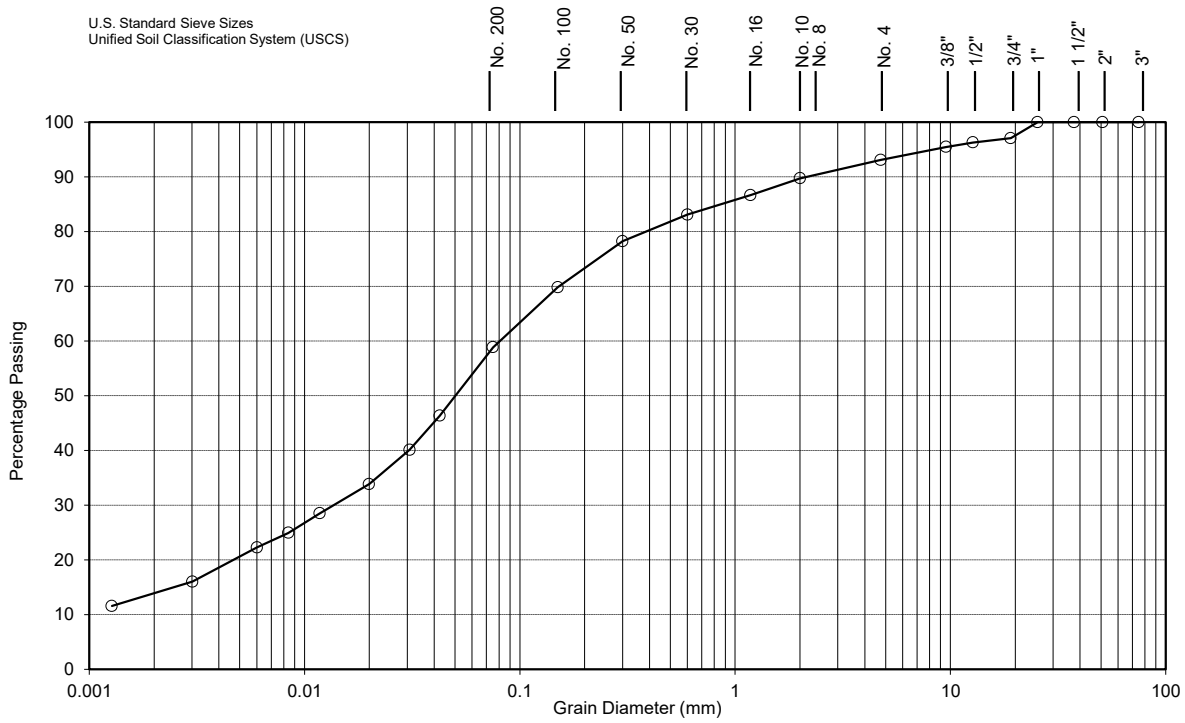
Lab No.:	**21-339**	Notes: Depth: 15'			
Sample No.:	**6**				
Borehole No.:	**2**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt, Clay and Gravel**		
SILT [%]:	**6**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**91**				
GRAVEL [%]:	**1**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.10**	Coefficient of Uniformity C_U:	**5.1**	Coefficient of Curvature C_C:	**1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

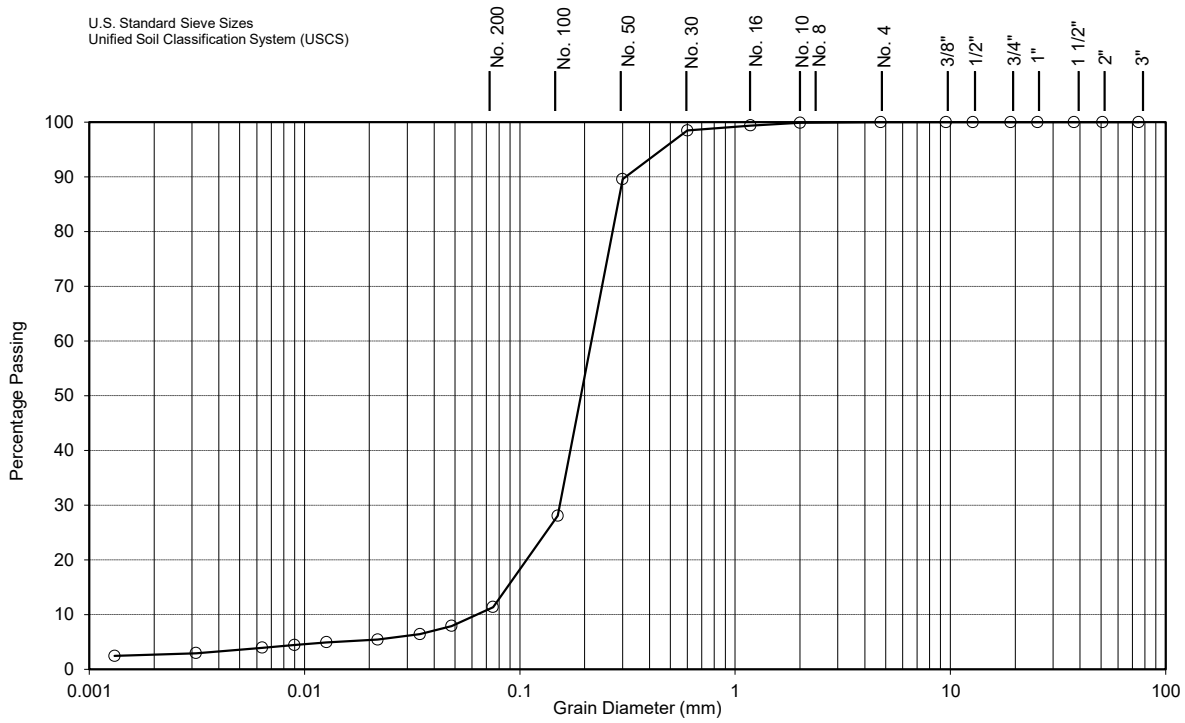
Lab No.:	**21-338**	Notes: Depth: 5'			
Sample No.:	**3**				
Borehole No.:	**3**				
CLAY [%]:	**14**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**45**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**34**				
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-6}**
D_{10} (Effective Diam. in mm):	**0.00100**	Coefficient of Uniformity C_U:	**80.0**	Coefficient of Curvature C_C:	**2.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



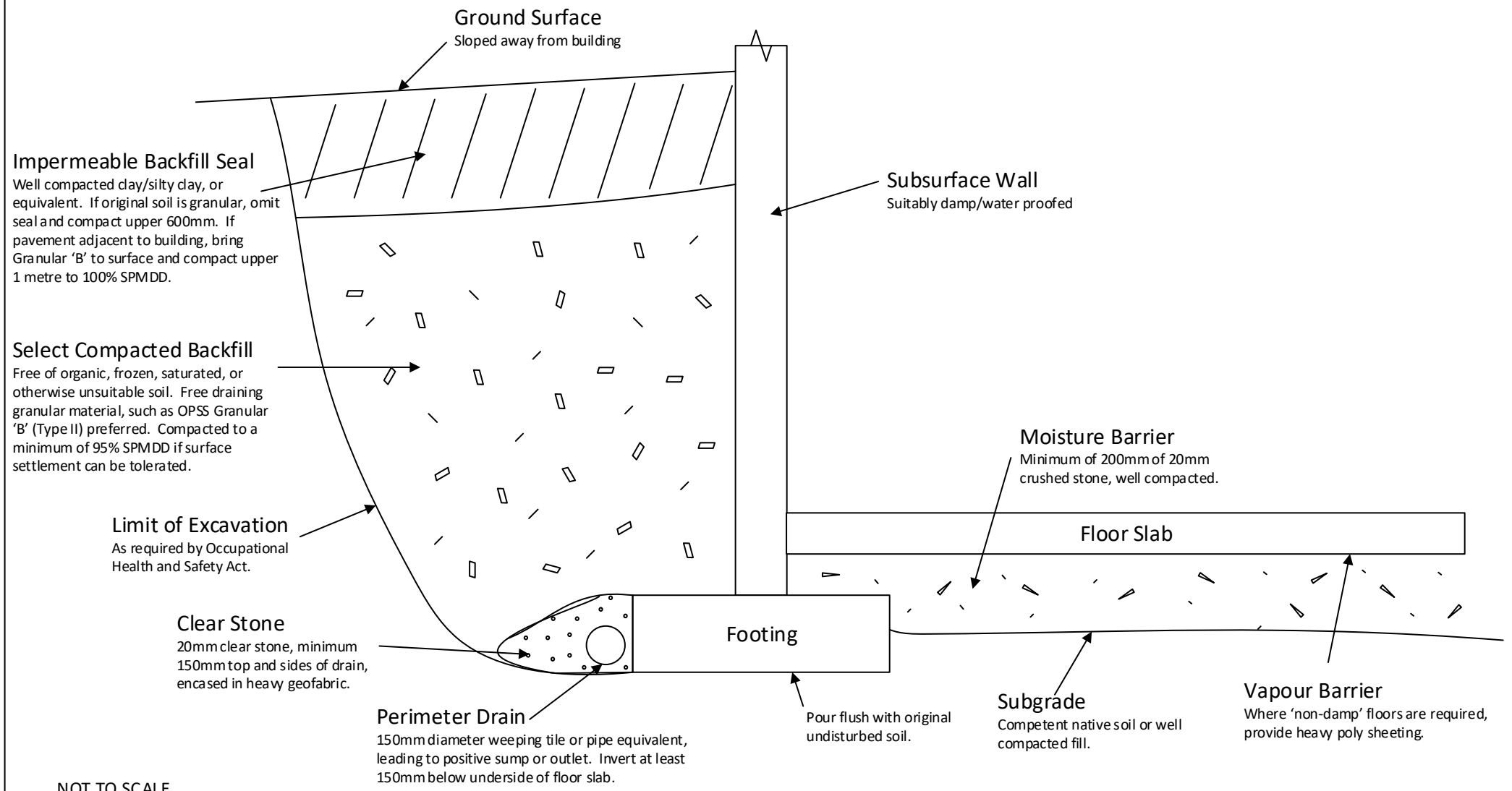
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**21-337**	Notes: Depth: 7.5'			
Sample No.:	**4**				
Borehole No.:	**4**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt and Clay**		
SILT [%]:	**9**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**89**				
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**100 to 150**	Estimated Permeability, k [cm/s]	**10^{-3} to 10^{-2}**
D_{10} (Effective Diam. in mm):	**0.0600**	Coefficient of Uniformity C_U:	**3.7**	Coefficient of Curvature C_C:	**1.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**



NOT TO SCALE

Soil-Mat

Soil-Mat Engineers & Consultants Ltd.

Project No.:	SM 301951-G
Date:	September 2021

Typical Design Requirements
Drainage and Backfill for Basement Walls

Drawing No. 2

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 800.243.1922

PROJECT NO.: SM 301951-G July 20, 2022

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Marcus Gagliardi
Development Planner

DRAFT HYDROGEOLOGICAL ASSESSMENT
PROPOSED RESIDENTIAL DEVELOPMENT
CLAYTON AND ELORA SANDS
ELORA, ONTARIO

Dear Mr. Gagliardi,

Further to your recent correspondence and discussions, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has prepared the following hydrogeological assessment based on the updated groundwater information to date. These comments are further to our Preliminary Geotechnical and Hydrogeological Investigation reports for the subject lands [SM 301951A-G and SM 301951B-G, dated October 14, 2021 and March 11, 2022], and recent discussions with the design team. As such, this hydrogeological report should be read in conjunction with our previous reports stated above. It is also noted that this report marks the completion of all of the proposed drilling fieldwork, and as such a new borehole numbering system has been implemented.

1. INTRODUCTION

We understand that the project will involve the construction of a residential development on the Clayton Lands located at 75 Woolwich Street East [Clayton Lands] in Elora, Ontario, along with potential future development on the Elora Sands [Elora Sands] to the east. The development details are to be established, but are anticipated to consist of single-family dwellings and townhouses along asphalt paved roadways, including the installation of associated underground municipal services. The purpose of this hydrogeological assessment is to provide additional and more detailed information and comments to support the assessment of site servicing options for the proposed development, from a geotechnical point of view.

2. PROCEDURE

Ten [10] and fifteen [15] sampled boreholes were advanced on the Clayton and Elora Sands respectively, totalling twenty-five [25] boreholes at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan. The boreholes were advanced using continuous flight power auger equipment between August 5, 2021 and April 18, 2022 under the direction and supervision of a staff member of SOIL-MAT ENGINEERS & CONSULTANTS LTD., to termination at depths of between approximately 2.1 and 8.2 metres below the existing ground surface.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on all soil samples recovered from the borings. Selected samples were also subjected to laboratory grain size analyses to allow for an estimate of the hydraulic conductivity of the subsurface soils. It is noted that slug testing will be performed on a number of the monitoring wells to get a more accurate in-situ measurement of the hydraulic conductivity, results of which will be summarised in a subsequent supplemental report.

Upon completion of drilling, groundwater monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, and 401 to allow for the future monitoring of the groundwater level. The monitoring well consisted of 50-millimetre PVC pipe screened in the lower 1.5 to 3.0 metres. The monitoring wells were encased in well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite 'hole plug' to the surface and fitted with a protective steel 'stick up' casing. The remaining boreholes were backfilled in general accordance with Ontario Regulation 903, and the ground surface was reinstated even with the surrounding grade. The depths screening intervals for each monitoring well has been summarized below.

Monitoring Well ID	Depth (m)	Screening Interval (m)
MW004	4.6	3.0 – 4.6
MW101	6.1	4.6 – 6.1
MW102	4.6	3.8 – 4.6
MW104	7.6	4.6 – 7.6
MW201	4.6	3.8 – 4.6
MW201A	3.0	2.2 – 3.0
MW202	6.1	4.6 – 6.1

Monitoring Well ID	Depth (m)	Screening Interval (m)
MW203	6.1	4.6 – 6.1
MW204	4.6	3.0 – 4.6
MW205	4.6	3.0 – 4.6
MW206	7.6	6.1 – 7.6
MW301	7.6	6.1 – 7.6
MW302	7.6	6.1 – 7.6
MW303	7.6	6.1 – 7.6
MW304	6.1	4.6 – 6.1
MW305	3.0	2.3 – 3.0
MW401	6.1	4.6 – 6.1

The boreholes were located in the field by representatives of SOIL-MAT ENGINEERS, based on accessibility over the site, clearance of underground utilities, and the drawing that was forwarded to our office. Best efforts were made to minimize crop damage by locating the majority of the boreholes to the perimeter of the fields. The ground surface elevation at all of the borehole locations with the exception of Borehole Nos. 301 through 307 have been referenced to a geodetic benchmark, described as North American 1983 CSRS, as per the survey plan completed by POI Aerial, dated August 10, 2021, which was provided to our office. The ground surface elevations at Borehole Nos. 301 through 307 have been linearly interpolated based on the topographic survey provided by BSR&D (Reference No. 21-14-573-00-topo) dated January 4, 2022 which was provided to our office. Once a complete topographic survey has been completed with up-to-date geodetic elevations of Borehole Nos. 301 through 307, this report will be updated.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 001 to 007, 101 to 104, 201 to 206, 301 to 307, and 401, inclusive, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed at the exact depths of geological change.

2. SUBSURFACE CONDITIONS

The subsurface are presented in detail in our referenced Preliminary Geotechnical Investigation report. To summarize, the soil conditions encountered on the Elora Sands generally consisted of a sandy silt/silty sand deposit in the upper levels with some areas and layers of clayey sandy silt till with depth. The soils encountered on the perimeter of the site were highly variable, often encountering layered deposits of clayey sandy silt till

or sand. Occasional deposits of gravelly sand were encountered within some of the boreholes. As such, the presence of permeable granular deposits or 'veins' should be expected across the site. In areas where the presence of a predominately clayey material is expected or would be beneficial, such as in the area of the proposed SWM pond, it may be prudent to advance a series of test excavations to confirm the condition of the subsurface soils including composition, groundwater conditions, suitability for use as an impermeable SWM pond liner, etc.

The Clayton Lands was generally characterised by an upper layer consisting of a clayey sandy silt till underlain by a sand deposit that extended to deep depths. Some isolated areas were encountered that contained a more impermeable clayey sandy silt till. Representative geological cross sections are illustrated in Drawing Nos. 3, 4 and 5, attached.

A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicate the subsurface soils to be in areas noting to consist of stone-poor sandy silt to silty sand-textured till, ice-contact stratified deposits of sand and gravel, with minor silt and clay, as well as river deposits of coarse gravel. These conditions are consistent with the observations during drilling.

Grain size analyses were conducted on sixteen [16] selected samples of the native soils recovered from the boreholes. The results of this grain size testing can be found appended to the end of this report, and are summarized as follows:

TABLE A
GRAIN SIZE ANALYSES

Elora Sands							
Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH003 SS3	1.5 m	22	44	28	6	10^{-7}	<10
BH004 SS5	3.0 m	2	7	80	11	10^{-2}	150 to 300
BH006 SS5	3.0 m	11	44	36	9	10^{-6}	10 to 15
BH201 SS2	1.5 m	5	17	76	2	10^{-4}	50
BH202 SS2	1.5 m	30	38	26	0	10^{-8}	<10
BH202 SS5	6.1 m	10	51	39	0	10^{-6}	10 to 15
BH203 SS2	1.5 m	3	17	37	43	10^{-4}	50 to 60
BH203 SS5	6.1 m	3	8	87	2	10^{-3}	125 to 150
BH204 SS2	1.5 m	16	34	30	20	10^{-7}	10
BH205 SS3	3.0 m	2	4	94	0	10^{-3}	150 to 300

Clayton Lands							
Sample ID	Depth	% Clay	% Silt	% Sand	% Gravel	Hydraulic Conductivity, k [cm/s]	Estimated Infiltration Rate, [mm/hr]
BH102 SS6	4.6 m	2	6	91	1	10^{-2}	150 to 300
BH103 SS3	1.5 m	14	45	34	7	10^{-6}	10
BH104 SS4	2.3 m	2	9	89	0	10^{-3} to 10^{-2}	100 to 150
BH302 SS2	1.5 m	2	3	95	0	10^{-2}	150 to 300
BH304 SS2	1.5 m	16	40	33	11	10^{-7}	10
BH305 SS2	1.5 m	7	16	77	0	10^{-4}	50 to 60

The field and laboratory testing demonstrate the native soils to generally consist of a sandy silt/clayey silt with some clay and traces of gravel in the upper levels, transitioning to a highly permeable sand with traces of clay, silt, and gravel at depth. According to the Unified Soil Classification System (USCS), the soils are classified as M.L. – inorganic silts and very fine sands, clayey silts with slight plasticity in the upper levels overlying S.P. – poorly graded sands, with little to no fines to S.M. – Sand-silt mixtures at depth.

The clay and silt soils would generally behave as a cohesive material with slight to medium plasticity, and low hydraulic conductivity, on the order of 10^{-6} to 10^{-7} cm/sec, and would be of low permeability to effectively impermeable. The on-site clayey soils would generally be considered suitable for use as an impermeable clay liner for the stormwater management (SWM) pond, however should be confirmed with more specific testing and assessment, and would require selecting sorting to separate out from more sandy deposits. Further testing should be conducted within the area of the proposed stormwater management pond [SWM] in order to confirm the suitability of the clayey material for use as an impermeable liner.

The sand deposit would tend to yield a highly permeable characteristic. Provided that the low impact development (LID) stormwater management systems are located within the highly permeable sand deposits, the hydraulic conductivity for this material would be on the order of 10^{-2} to 10^{-4} cm/sec yielding infiltrations rates in the range of 50 to 300 mm/hr. LID systems such as rear yard catch basins, infiltration swales, etc. will be highly effective within the permeable sand soils and will be able to help with natural groundwater recharge as well as maintain pre and post development runoff volumes, specifically on the Clayton Lands. As noted previously, slug testing is slated to be performed within a number of the monitoring wells across the site to yield a more accurate estimate of the hydraulic conductivity of the native soils. Once available,

information on the location of these LID systems should be forwarded to our office in order to target specific areas with the slug testing.

Groundwater Observations

Borehole Nos. 006, 102, and 004 were noted to have 'caved' to depths of between approximately 2.4 to 3.8 metres and 'wet' at depths of between approximately 2.0 to 3.4 metres, while Borehole No. 104 was noted to be open and 'wet' at a depth of 7.0 metres upon completion. Borehole Nos. 103 and 001 were noted to have cave to depths of 2.7 and 1.5 metres, respectively, and dry upon completion. The remainder of the boreholes were noted as being open and 'dry' [i.e. no free groundwater present] upon completion of drilling. It is noted that insufficient time would have passed for the static groundwater level to stabilise in the open boreholes.

As noted above, monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, and 401, to allow for future measurements of the static groundwater level. A data logger was in each of the monitoring wells to allow for continuous monitoring of the groundwater level between August 2021 to June 2022, the readings of which have been illustrated in graphs which can be found appended to the end of this report.

In addition, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on various dates, ranging from August 2021 to June 2022. These have been summarized in the following charts:

TABLE B
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA SANDS)

Borehole No. 004 (Ground Surface Elevation of 405.55 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	2.74	402.8
August 27, 2021	1.75	403.8
February 23, 2022	1.33	404.2
April 22, 2022	1.47	404.1
June 1, 2022	1.78	403.8

Borehole No. 201 (Ground Surface Elevation of 404.80 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.69	402.1
April 22, 2022	1.88	402.9
June 1, 2022	2.44	402.4

Borehole No. 201A (Ground Surface Elevation of 404.75 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.8
April 22, 2022	2.05	402.7
June 1, 2022	2.43	402.3

Borehole No. 202 (Ground Surface Elevation of 406.59 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	5.5	401.1
April 22, 2022	4.76	401.8
June 1, 2022	5.43	401.2

Borehole No. 203 (Ground Surface Elevation of 407.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.0
April 22, 2022	5.90	401.2
June 1, 2022	5.91	401.2

Borehole No. 204 (Ground Surface Elevation of 409.56 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.81	406.7
April 22, 2022	1.16	408.4
June 1, 2022	1.53	408.0

Borehole No. 205 (Ground Surface Elevation of 412.99 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.56	410.4
April 22, 2022	2.25	410.7
June 1, 2022	2.39	410.6

Borehole No. 206 (Ground Surface Elevation of 412.88 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	6.83	406.1
April 22, 2022	4.60	408.3
June 1, 2022	4.66	408.2

Borehole No. 401 (Ground Surface Elevation of 420.91 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
April 22, 2022	2.29	418.6
June 1, 2022	2.39	418.5

TABLE C
SUMMARY OF MANUAL GROUNDWATER READINGS (CLAYTON LANDS)

Borehole No. 101 (Ground Surface Elevation of 408.60 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	4.78	403.8
August 27, 2021	4.71	403.9
October 14, 2021	4.33	404.3
February 23, 2022	4.31	404.3
April 22, 2022	4.07	404.5
June 1, 2022	4.15	404.5

Borehole No. 102 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	3.58	410.6
August 27, 2021	3.61	410.5
October 14, 2021	3.62	410.5
February 23, 2022	3.50	410.6
April 22, 2022	2.89	411.2
June 1, 2022	3.05	411.1

Borehole No. 103 (Ground Surface Elevation of 414.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	6.78	408.1
August 27, 2021	6.96	407.9
October 14, 2021	7.09	407.8
February 23, 2022	6.83	408.0
April 22, 2022	6.13	408.7
June 1, 2022	6.28	408.6

Borehole No. 301 (Ground Surface Elevation of 412.75 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.29	406.5
April 22, 2022	5.65	407.1
June 1, 2022	5.71	407.0

Borehole No. 302 (Ground Surface Elevation of 413.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.62	406.4
April 22, 2022	6.06	406.9
June 1, 2022	6.12	406.9

Borehole No. 303 (Ground Surface Elevation of 414.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	5.40	408.6
April 22, 2022	6.04	407.9
June 1, 2022	6.11	407.9

Borehole No. 304 (Ground Surface Elevation of 407.90 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	2.87	405.0
April 22, 2022	2.60	405.3
June 1, 2022	2.96	404.9

Borehole No. 305 (Ground Surface Elevation of 408.60 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	Dry	<405.6
April 22, 2022	Dry	<405.6
June 1, 2022	Dry	<405.6

*Ground surface elevations have been interpolated based on contours from current topographic survey

The available data to date presented above illustrates a variable groundwater level, ranging from about 3 to 6 metres (elevations of between 407 to 411 metres) below the existing ground surface at Borehole Nos. 102, 104, 301, 302, and 303, at the southern half of the Clayton Lands, with the highest groundwater levels during the wet spring months. The groundwater drops to the southwest and to the north, as illustrated on Drawing No. 2, Groundwater Contour Map. The groundwater level drops to ranges of between 3 to 4 metres (elevations of between 404.5 to 405.3 metres) below the existing ground surface at the northern limits of the Clayton Lands. Based on the visual data displayed within the groundwater graphs, the data indicates a relatively stable groundwater level with small fluctuations between the 'wet' and 'dry' months of the year. This can be attributed to highly permeable fine to coarse grained sand and silty sand deposits within the southern half of the Clayton lands. The groundwater level within Borehole No. 304 was noted to be higher in comparison to the other wells, however may be more susceptible to precipitation, resulting in 'perched deposits' of water within the

more permeable above the clayey soils. The groundwater was noted to be deepest on the southern portion of the Clayton Lands, where the soil conditions at the borehole conditions generally indicated more permeable sandy soils until termination. The groundwater was shallowest at the northern portion of the Clayton lands, generally following the physical topography. Where encountered within the boreholes, the clayey deposits would tend to 'trap' the water within the low permeable layer and present a high groundwater condition than would otherwise be found within areas of permeable sandy soils. The manual readings gathered in April 2022 would be considered representative of a seasonal 'high'

The groundwater data gathered on the Elora Sands to date indicate a groundwater level on the order of 1.2 to 4.6 metres (elevations of between 408.5 to 410.7 metres) below the existing ground surface at Borehole Nos. 204, 205, and 206, predominantly located south of the landing strip within the farmer's field. The groundwater drops to the east towards a tributary of the Irvine Creek [also identified as Nichol Drain] with a groundwater elevation of between 402.8 to 404.2 metres measured manually periodically within Borehole No. 004 from August 2021 to June 2022. The groundwater level drops to the north as well towards Nichol Road 15 and where the storm water management pond is proposed. The groundwater level at this location is noted to be stabilizing at an elevation of between roughly 401 to 403 metres. The magnitude of fluctuations demonstrated within these areas are on the order of approximately 2 metres, according to the groundwater data graphs and may be attributed to the soil conditions, which is noted to be more layered.

It is also noted that the groundwater levels and elevations would tend to vary with the elevation changes across the site, which varies significantly. As such, it would be prudent to advance a series of test pits or additional boreholes across the site, specifically in the areas of notably higher groundwater levels and areas of large excavations for deeper services or pumping stations, in order to assess first hand how the groundwater will affect the excavations during site earthworks and servicing.

The direction of groundwater flow has been inferred from these groundwater levels, and has been illustrated on the groundwater contour map Drawing No. 2, Groundwater Contour Map. The direction of groundwater is locally flowing towards the Irvine Creek to the north and west on the Clayton Lands. The groundwater is flowing towards the tributary of the Irvine Creek [Nichol Drain] on the east side of the Elora Sands and to the north towards the Irvine Creek on the west side of the site. As such, the shallow groundwater is contributing to the base flow to the Nichol Drain. Best efforts should be exercised to maintain the overall natural drainage as part of the site grading, stormwater management plan and water balance across the site.

The subsurface soil and groundwater conditions described above are illustrated in the attached geological cross sections, Drawing Nos. 3, 4 and 5.

3. HYDROGEOLOGICAL SETTING AND WATER WELL STUDY

A review of available information, including water well records within an approximate 250 metre radius, was undertaken to inform the hydrogeological setting of the subject lands.

3.1.1 METHODS

Information was compiled for this hydrogeological assessment from sources including:

- Topographic, Bedrock Geology, and Soils maps.
- Ministry of Environment, Conservation and Parks [MOE] Water Well Records.
- Site visit of the property and review of adjacent lands.
- Site specific geotechnical investigation program involving a series of boreholes.

3.1.2 LIMITATIONS AND CONDITIONS

Information for this study was compiled from geological maps and well records for water wells drilled in the study area. Water well locations are approximated in well records using the UTM coordinate system and in some instances may be in error by more than 50 metres. Potential for mapping error therefore exists in correlation of well registration numbers with street addresses. Soils and bedrock descriptions in the well records are limited and generalized regarding formation lithology. Stratigraphic interpretation in this report is based on information from water well records, topographic maps, Paleozoic Geology maps of the area, and geotechnical investigations performed by SOIL-MAT ENGINEERS in the area.

3.2.1 GEOLOGY – OVERBURDEN SOIL

Local soils identified in the Ministry of Northern Development and Mine's "Quaternary Geology of Ontario, Southern Sheet Map M2556" are described predominantly as a silt to sandy silt 'till'. This is consistent with our geotechnical investigation, which found the overburden soils to consist primarily of sandy silt with some areas of sand with trace silt. Grain size analyses of representative soil samples yielded clay content in the range of 2 to 22 percent, silt content of 6 to 45 percent, sand content of 28 to 91 percent, and gravel content of 0 to 11 percent.

3.2.2 GEOLOGY – BEDROCK

Bedrock in the in the vicinity of the Site is recorded from the Ministry of Northern Development and Mine's "Bedrock Geology of Ontario, Southern Sheet Map M2344," as Limestone and Dolostone of the Guelph Formation. The depth to bedrock, as reported

in MOE water well records for wells in the proximity of the Site, is on the order of approximately 0.3 to 22.6 metres below ground surface.

3.2.3 GROUNDWATER CONDITIONS

The referenced geotechnical investigation for the site provides an estimate of the static groundwater level at approximately 2 to 7 metres below the existing grade. This is consistent with our experience on other nearby development projects. It is noted that the groundwater conditions within the overburden soils would be influenced by prevailing weather conditions and would experience seasonal fluctuation.

3.2.4 WATER WELL INVENTORY

MOE water well records revealed forty-four [44] wells located within an approximate 250 metre radius of the limits of the Site. The location of these available well records is illustrated in the attached Drawing No. 3. The water well records [https://www.ontario.ca/environment-and-energy/map-well-records] locations are approximated in well records using the UTM co-ordinate system and in some instances may be in error by more than 50 metres. Potential for mapping error therefore exists in correlation of well registration numbers with street addresses. Soils and bedrock descriptions in the well records are limited and generalized regarding formation lithology.

It is understood that the existing residential properties to the west and north are privately serviced with water wells or cisterns and septic systems, with the existing residential properties to the south and east are serviced with municipal water, storm and sanitary sewers.

The data contained in the water well records suggests that there are two [2] predominant aquifers in the Study Area, one which is considered a confined aquifer within the limestone bedrock at an estimated depth between 17.7 to 79.0 m bgs, with an average static water level of 11.3m. The other is an unconfined aquifer within the sandy silt, situated at an estimated depth between 2 and 7 m bgs. Data contained in MOE Water Well Records for forty-four [44] water wells within the *Study Area* are presented for statistical observations in Table A below.

The information gathered from the records indicates the following:

- Ground water was encountered as shallow as 17.7 metres below ground surface [“m bgs”] and as deep as 79.0 m bgs, with an average depth of 52.5 m bgs during the well drilling.
- Static water levels varied from 0.3 to 41.2 m bgs, with an average static level of 11.3 m bgs, and;
- The Pressure Head varied from 13.4 to 71.0 metres with an average of 41.2 metres.
- Recommended available pumping rates ranging between 3.5 and 25 gpm.
- The water bearing formation lithology reported in the majority of the wells was within the limestone bedrock.

Table 1: Water Well Records – Statistical Observations

Part Lots 15-17 **Total wells =**

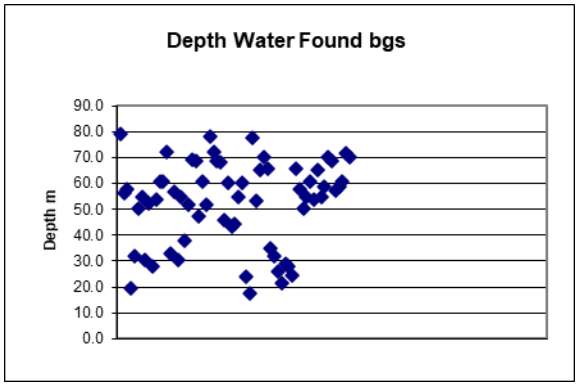
Concessions 8-10 **44**

Surface Elevation		Depth found bgs		Elevation found		Static depth bgs		Static Elevation		Pressure Head
fasl	masl	fasl	masl	fasl	masl	ft	m	fasl	masl	m
1380	420.7	*259*	79.0	*1121*	341.8	*26*	7.9	*1354*	412.8	71.0
1380	420.7	*184*	56.1	*1196*	364.6	*65*	19.8	*1315*	400.9	36.3
1358	414.0	*189*	57.6	*1169*	356.4	*20*	6.1	*1338*	407.9	51.5
1355	413.1	*64*	19.5	*1291*	393.6	*5*	1.5	*1350*	411.6	18.0
1350	411.6	*104*	31.7	*1246*	379.9	*23*	7.0	*1327*	404.6	24.7
1320	402.4	*165*	50.3	*1155*	352.1	*57*	17.4	*1263*	385.1	32.9
1300	396.3	*180*	54.9	*1120*	341.5	*47*	14.3	*1253*	382.0	40.5
1300	396.3	*100*	30.5	*1200*	365.9	*30*	9.1	*1270*	387.2	21.3
1300	396.3	*172*	52.4	*1128*	343.9	*53*	16.2	*1247*	380.2	36.3
1298	395.7	*91*	27.7	*1207*	368.0	*30*	9.1	*1268*	386.6	18.6
1305	397.9	*176*	53.7	*1129*	344.2	*30*	9.1	*1275*	388.7	44.5
1314	400.6	*200*	61.0	*1114*	339.6	*35*	10.7	*1279*	389.9	50.3
1314	400.6	*200*	61.0	*1114*	339.6	*135*	41.2	*1179*	359.5	19.8
1314	400.6	*237*	72.3	*1077*	328.4	*55*	16.8	*1259*	383.8	55.5
1315	400.9	*108*	32.9	*1207*	368.0	*36*	11.0	*1279*	389.9	22.0
1300	396.3	*186*	56.7	*1114*	339.6	*48*	14.6	*1252*	381.7	42.1
1290	393.3	*100*	30.5	*1190*	362.8	*35*	10.7	*1255*	382.6	19.8
1295	394.8	*180*	54.9	*1115*	339.9	*60*	18.3	*1235*	376.5	36.6
1300	396.3	*125*	38.1	*1175*	358.2	*20*	6.1	*1280*	390.2	32.0
1325	404.0	*170*	51.8	*1155*	352.1	*30*	9.1	*1295*	394.8	42.7
1335	407.0	*227*	69.2	*1108*	337.8	*50*	15.2	*1285*	391.8	54.0
1335	407.0	*226*	68.9	*1109*	338.1	*44*	13.4	*1291*	393.6	55.5
1335	407.0	*155*	47.3	*1180*	359.8	*66*	20.1	*1269*	386.9	27.1
1335	407.0	*200*	61.0	*1135*	346.0	*45*	13.7	*1290*	393.3	47.3
1330	405.5	*170*	51.8	*1160*	353.7	*46*	14.0	*1284*	391.5	37.8
1330	405.5	*257*	78.4	*1073*	327.1	*73*	22.3	*1257*	383.2	56.1
1330	405.5	*237*	72.3	*1093*	333.2	*33*	10.1	*1297*	395.4	62.2
1325	404.0	*225*	68.6	*1100*	335.4	*89*	27.1	*1236*	376.8	41.5
1325	404.0	*223*	68.0	*1102*	336.0	*61*	18.6	*1264*	385.4	49.4
1325	404.0	*150*	45.7	*1175*	358.2	*27*	8.2	*1298*	395.7	37.5
1325	404.0	*198*	60.4	*1127*	343.6	*47*	14.3	*1278*	389.6	46.0
1325	404.0	*142*	43.3	*1183*	360.7	*38*	11.6	*1287*	392.4	31.7
1350	411.6	*145*	44.2	*1205*	367.4	*39*	11.9	*1311*	399.7	32.3
1345	410.1	*180*	54.9	*1165*	355.2	*57*	17.4	*1288*	392.7	37.5
1345	410.1	*198*	60.4	*1147*	349.7	*53*	16.2	*1292*	393.9	44.2
1340	408.5	*78*	23.8	*1262*	384.8	*4*	1.2	*1336*	407.3	22.6
1325	404.0	*58*	17.7	*1267*	386.3	*1*	0.3	*1324*	403.7	17.4
1325	404.0	*255*	77.7	*1070*	326.2	*23*	7.0	*1302*	397.0	70.7

1315	400.9	*175*	53.4	*1140*	347.6	*24*	7.3	*1291*	393.6	46.0
1320	402.4	*214*	65.2	*1106*	337.2	*19*	5.8	*1301*	396.6	59.5
1310	399.4	*230*	70.1	*1080*	329.3	*15*	4.6	*1295*	394.8	65.5
1305	397.9	*215*	65.5	*1090*	332.3	*22*	6.7	*1283*	391.2	58.8
1305	397.9	*114*	34.8	*1191*	363.1	*1*	0.3	*1304*	397.6	34.5
1310	399.4	*105*	32.0	*1205*	367.4	*23*	7.0	*1287*	392.4	25.0
1305	397.9	*85*	25.9	*1220*	372.0	*6*	1.8	*1299*	396.0	24.1
1310	399.4	*70*	21.3	*1240*	378.0	*26*	7.9	*1284*	391.5	13.4
1310	399.4	*95*	29.0	*1215*	370.4	*22*	6.7	*1288*	392.7	22.3
1315	400.9	*91*	27.7	*1224*	373.2	*14*	4.3	*1301*	396.6	23.5
1315	400.9	*81*	24.7	*1234*	376.2	*35*	10.7	*1280*	390.2	14.0
1315	400.9	*215*	65.5	*1100*	335.4	*24*	7.3	*1291*	393.6	58.2
1310	399.4	*190*	57.9	*1120*	341.5	*30*	9.1	*1280*	390.2	48.8
1305	397.9	*165*	50.3	*1140*	347.6	*24*	7.3	*1281*	390.5	43.0
1310	399.4	*179*	54.6	*1131*	344.8	*20*	6.1	*1290*	393.3	48.5
1320	402.4	*200*	61.0	*1120*	341.5	*34*	10.4	*1286*	392.1	50.6
1320	402.4	*176*	53.7	*1144*	348.8	*30*	9.1	*1290*	393.3	44.5
1320	402.4	*214*	65.2	*1106*	337.2	*43*	13.1	*1277*	389.3	52.1
1315	400.9	*180*	54.9	*1135*	346.0	*38*	11.6	*1277*	389.3	43.3
1305	397.9	*193*	58.8	*1112*	339.0	*40*	12.2	*1265*	385.7	46.6
1305	397.9	*230*	70.1	*1075*	327.7	*39*	11.9	*1266*	386.0	58.2
1315	400.9	*225*	68.6	*1090*	332.3	*34*	10.4	*1281*	390.5	58.2
1305	397.9	*188*	57.3	*1117*	340.5	*26*	7.9	*1279*	389.9	49.4
1310	399.4	*192*	58.5	*1118*	340.9	*30*	9.1	*1280*	390.2	49.4
1310	399.4	*200*	61.0	*1110*	338.4	*77*	23.5	*1233*	375.9	37.5
1325	404.0	*235*	71.6	*1090*	332.3	*35*	10.7	*1290*	393.3	61.0
1325	404.0	*230*	70.1	*1095*	333.8	*44*	13.4	*1281*	390.5	56.7
		Avg.=	*52.5*	Avg.=	*350.1*	Avg.=	*11.3*	Avg.=	*391.3*	*41.2*
		SdevP=	*16.2*	SdevP=	*16.3*	SdevP=	*6.6*	SdevP=	*8.4*	*14.6*

Water bearing formation

Formation	#	%
Overburden	0	0
Bedrock	44	100



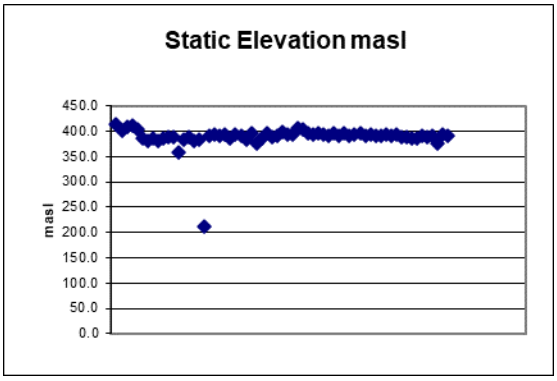


Table D – MOE Water Well Record Statistical Observations

The term aquifer here generally refers to a geologic unit(s) or formation permeable enough to yield economic quantities of water to wells. The term aquitard refers to a geologic unit(s) or formation with insufficient permeability to supply production wells. Aquifers and aquitards are interpreted here based on statistical observation of data contained in the MOE water well records. Hydrographs of water levels are normally not kept for private wells, therefore historical fluctuations in water levels are not known.

3.3 HYDROGEOLOGICAL SETTING

Based on the available information the following comments can be made:

- There are two [2] predominant aquifers in the Study Area, one which is considered a confined aquifer within the limestone bedrock at an estimated depth between 17.7 to 79.0 m bgs, with an average static water level of 11.3m. The other is an unconfined aquifer within the sandy silt, situated at an estimated depth between 2 and 7 m bgs.;
- In each case the aquifer within the limestone bedrock exhibited a positive pressure head [i.e., the static water level is above the elevation where the groundwater was encountered] in each well record, indicating the aquifer was under confined artesian conditions with respect to the confining layer.
- Pressure head (hydraulic head above aquifer) ranged from 13.4 to 71.0 metres with an average of 41.2 metres;
- Recommended available pumping rates ranging between 3.5 and 25 gpm.

Given the above, any active potable water wells in the area would be at greater depths as drilled bedrock wells. Such wells would be drawing water from within the limestone bedrock aquifer. The overburden soils consist of primarily sand and silty sands, with less permeable clayey silt. The shallow groundwater condition on the site is typical of an unconfined near surface aquifer, which would be influenced by seasonal weather conditions, drainage, and the presence of variable more permeable seams in the overburden soils.

4. EARTHWORKS AND SITE GRADING OPERATIONS

Based on the provided preliminary grading plan forwarded to our office by MTE (Project No. 50250-100, F16-FG.dwg) dated April 7, 2022 some cut and fill on the order of 2 to 4 metres will take place. Despite the moderate cut and fill operations, the preliminary grading plan has taken into consideration the groundwater elevations across this parcel of land, such that fill operations will take place on the northern portion of the site where groundwater was noted to be highest and cut operations in the middle and south portions of the site, where groundwater was observed to be deepest. It would be expected that natural surface drainage would result in pooling of water in low spots across the site, which are noted to be within the areas of fill. The predominantly sandy soils on the Clayton Lands will promote natural infiltration and will make site servicing easier, provided that contractors work their way from the low end of the site to the high end of the site.

At this time a preliminary site servicing and grading plan for the Elora Sands has not been provided to our office, as the potential development of those lands is a future

consideration. However, the existing topography of this parcel of land contains larger undulations and changes in elevations. Therefore, it is anticipated that the cut and fill operations for this parcel of land will require more significant regrading. It is recommended that the cut/fill operations be handled in a similar manner as the Clayton Lands, such that fill operations take place where groundwater is shallowest at the northern portion of the site and cut operations take place where the deepest groundwater was encountered at the southern end of the site. As noted above, the Elora Sands generally consists of sandy silt/silty sand within the upper levels, transitioning to a clayey sandy silt with depth, however is more variable at times with clayey or gravelly deposits. As such, 'perched' water deposits within the permeable seams may yield 'wet' excavated material. Contractors should anticipate difficulties with base stabilisation and engineered fill works when work is conducted during the 'wet' times of the year. It is recommended that where possible, earthworks be conducted during the dry summer months. Where engineered fill occurs during the 'wet' times of the year, considerable delays and challenges in achieving effective compaction associated with wet soil conditions may be incurred and should be anticipated. It may be necessary to spread a thin lift of wet backfill to 'air dry' for several days or more if engineered fill is undertaken during the 'wet' times of the year.

5. HYDROGEOLOGICAL CONSIDERATIONS

As noted above, it is understood that the development is anticipated to consist of single-family dwellings and townhouse blocks, including the installation of associated underground municipal services along asphalt paved roadways. Excavations for the proposed development services are expected to extend to depths of up to approximately to 2 to 5 metres below the existing ground surface, while excavations for foundations would be expected to extend up to approximately 1.5 to 2 metres. Measurements of the groundwater level at the monitoring well locations indicate a groundwater level on the order of approximately 2 to 7 metres below the existing ground surface, generally 3.5 to 7 metres over the Clayton lands presently proposed for development. The groundwater level is shallower to the east, approaching the Irvine Creek tributary [Nichol Drain], generally following the drop in topography toward the creek. As the conditions consisted mostly of the permeable sand on the Clayton Lands, the groundwater level between the 'wet' and 'dry' seasons of the year was relatively consistent with little to no fluctuation. These conditions, with relatively permeable soil conditions at depth, and groundwater at sufficient depth, are well suited to proposed development. The generally permeable condition of the native sand deposit present over the site will generally allow for natural drainage and movement of groundwater. As such, it is not considered likely that service trenches would present any conflict or impact to the natural groundwater conditions.

The exception might be deeper trunk sewers, which would warrant closer assessment as the detailed design proceeds.

Shallower groundwater was observed on the Elora Sands at the northern portion of the site where more clayey and gravelly deposits were encountered, as noted above. These deposits are likely to trap and create a 'perched' water condition which may exacerbate the infiltration of groundwater into open excavations, however would likely be able to be handled with conventional dewatering methods and techniques. Furthermore, the fluctuations in groundwater level were higher on the Elora Sands as the soils conditions encountered within the boreholes consisted of more clayey deposits.

The short-term excavations for the proposed servicing are generally anticipated to extend through the permeable sandy soils and into the clayey sandy silt till where deeper excavations are required. Where the site calls for the placement of engineered fill, raising the grade, it would create an even larger separation between the groundwater table and the proposed servicing and foundation construction. Excavations would be expected to be subject to relatively minor groundwater infiltration, such that it should be possibly to adequately control such infiltration using conventional construction dewatering techniques such as pumping from sumps in the base of the excavation. However, during wet times of year and in deeper excavations, some instability of the excavations should be expected. In the event that deeper excavations are required below the groundwater level or where more permeable sand and gravel seams are encountered, a greater rate of infiltration should be anticipated, requiring multiple pumps and possibly more sophisticated dewatering techniques for deeper excavations.

The rate of dewatering would be a function of the time of year, depth of excavation, length of trench opened by the contractor, etc. In most cases it is expected to be below 50,000 L/day, though for deeper excavations may be as much as up to 400,000 L/day. Where dewatering rates of greater than 50,000 L/day are anticipated it would be necessary to file an EASR notice for construction dewatering. However, it is not anticipated that dewatering would be greater than 400,000 L/day, and so the need for a permit to take water [PTTW] is not expected. As noted above, the advancement of a number of test pits, would be prudent to assist in refining the anticipated construction dewatering requirements as the design of the site grading and servicing proceeds.

The layering of sandy and clayey soils encountered specifically on the Elora Sands would allow for some natural drainage and movement of groundwater, however given the high silt content this should not be solely relied upon. As such, excavations may have the potential to intercept shallow groundwater on parts of the site and thus create a "French Drain" within the bedding material, with possible affect to the groundwater.

Consequently, if groundwater is encountered during digging of the service trenches, measures may need to be implemented to mitigate/eliminate groundwater interference. These would include clay cut-offs within the service trench fill encasing the pipe/service. Such clay cut-offs should be installed in accordance with OPSD 80.095, using a suitable clay soil or alternatively a blend of 1 part bentonite chips to 3 parts OPSS Granular A, or suitably clayey soil encountered on site. The need for such measures is best assessed as the detailed design proceeds, and in the field during construction. Regardless, any such locally lowering of the groundwater associated with site servicing would be limited to the near surface soils, and would not be expected to significantly impact the regional groundwater conditions.

Excavations for the proposed basement levels should be well above the groundwater level, pending review of the final site grading plans and foundation depths, along with more detailed assessment such as test pits in the area of observed shallow groundwater levels. With proper consideration to the site grading and design founding elevations, it is not anticipated that foundation excavations would require ongoing groundwater control, other than typical perimeter weeping tile and sump pumps.

The final grading of the site should appropriately consider the groundwater levels in order to minimise or avoid conflict or impact to the groundwater during pre and post construction. In this regard the grading and storm water management plan should accommodate surface runoff that follows the existing overall drainage patterns as much as possible.

It is also noted that the use of Low Impact Design [LID] methods as part of the stormwater management for the proposed development would be viable for much of the site and should be considered. The permeable sand deposit predominantly on the Clayton Lands, above the groundwater level, would afford an opportunity for natural infiltration of surface runoff, such as in 'dry' ponds, infiltration galleries, rear yard infiltration swales or galleries, etc. As noted above, the sand deposit would have hydraulic conductivity on the order of 10^{-2} to 10^{-3} cm/sec, correlating to design infiltration rates on the order of 100 to 300 mm/hr. The use of infiltration systems could be readily utilised for lot level infiltration of rain water from downspouts, and also within the overall SWM plan. The soil conditions on the Elora Sands are more variable and contain more clayey deposits which are considered to have a low permeability characteristic. Preliminary grain size analyses on the clayey sandy silt till indicate a hydraulic conductivity on the order of 10^{-6} to 10^{-8} cm/sec, correlating to design infiltration rates on the order of less than 10 to 15 mm/hr. As such, LID systems aren't recommended where areas of clayey sandy silt till are encountered [generally the lower areas of the site, towards the tributary to Irvine Creek] but should be considered in areas consisting

of the more permeable sandy deposits [generally the higher portions of the site, to the south]. This would be better addressed during the detailed design process, supported with the advancement of test pits at specific locations proposed for LID measures. It is noted that single well response testing will be performed in a number of the monitoring wells installed which will allow for a more accurate estimate of the hydraulic conductivity for the various soil layers.

Based on our observations and details of the proposed development, it is not anticipated that the proposed construction will have an adverse impact on the groundwater condition in the area, provided the comments and recommendations provided in this report are adhered to. There is not expected to be a significant or long-term impact on the development, such as ongoing dewatering, etc., provided the above discussion and recommendations are considered in the site grading, servicing and stormwater design.

As outlined above, the hydrogeological setting of the site is such that potable wells in the area would be drawing from a deep confined bedrock aquifer, and would be largely unaffected by potential construction activities encountering the shallow near surface groundwater regime. Construction of the proposed development would involve relatively shallow excavations only, with limited interaction with the shallow groundwater regime, and would not have an impact on deeper supply aquifers. As such, there would be no anticipated negative impact from the proposed development on nearby potable wells, including municipal supply wells. Further, as the proposed development would be provided with municipal water supply, there would be no impact to potential supply aquifers or associated water wells in the area, if any.

It is noted that the subject lands are within a Wellhead Protection Area (WHPA). However, based on the comments noted above, there will be no anticipated negative impact with respect to the deep bedrock aquifer serving as the potable supply source for private and municipal potable wells within the area.

6. STORMWATER MANAGEMENT (SWM) POND DESIGN CONSIDERATIONS

As noted above, the static groundwater level at the northern portion of the Elora Sands is on the order of 0.5 to 4.5 metres below the existing ground surface, at a relative elevation of roughly 403 to 401 metres, based on the available groundwater data to date. The groundwater charts for the monitoring wells at these locations have illustrated the large fluctuations that are experienced during the ‘wet’ and ‘dry’ seasons of the year. At this time the design details of the proposed SWM pond proposed at the north edge of the Elora Sands are not known, however it is anticipated that the pool will have a

permanent pool elevation near the observed groundwater level, and the use of an impermeable liner would be expected to be required.

In general, where the permanent pool elevation is below the static groundwater elevation, it will be necessary to provide a low permeability layer over the base of the pond to resist the infiltration of natural groundwater, and of sufficient weight to resist the hydrostatic uplift pressures. Conversely, where the permanent pool elevation is above the static groundwater level, a low permeability liner will be required to prevent the exfiltration of water out of the pond. This could be accomplished through the use of a compacted clay liner, or with a weighed down proprietary liner system, etc. The weight of the liner system would have to exceed the uplift pressure of the ground water during the most severe periods of the year, likely when maximum storage is required. In approximate terms for example, one metre of clay liner, or equivalent, would be required for about every two meters of water storage below static ground water level, i.e., when the water level in the pond is 2 metres below the static ground water table, the clay liner would have to be at least one metre thick; if 3 metres below the static level, then 1.5 metres thick, etc.

Where the permanent pool elevation is below the static groundwater elevation, it will be necessary to provide a low permeability layer over the base of the pond to resist the infiltration of natural groundwater, and of sufficient weight to resist the hydrostatic uplift pressures. Conversely, where the permanent pool elevation is above the static groundwater level, a low permeability liner will be required to prevent the exfiltration of water out of the pond. This could be accomplished through the use of a compacted clay liner, or with a weighed down proprietary liner system, etc. The weight of the liner system would have to exceed the uplift pressure of the ground water during the most severe periods of the year, likely when maximum storage is required. In approximate terms for example, one metre of clay liner, or equivalent, would be required for about every two meters of water storage below static ground water level, i.e., when the water level in the pond is 2 metres below the static ground water table, the clay liner would have to be at least one metre thick; if 3 metres below the static level, then 1.5 metres thick, etc. It is recommended that best efforts be made to design the static pool elevation close to the static groundwater elevation so that the natural seasonal fluctuations of the groundwater elevation dictate the permanent pool elevation. This would eliminate the need to construct a weighted liner to resist the hydrostatic uplift pressures of the static groundwater elevation. That being said, this would only work if the former solution could be achieved whilst attaining the required water storage volume for the development.

An impermeable compacted clay liner would consist of a sufficiently plastic clay soil, with a recommended minimum clay content of 20 per cent and plasticity index of 7. Based on the current laboratory testing of the native soils, the majority of the clayey silt soils are generally suitable for use as an impermeable liner for the proposed SWM ponds, however any sandy deposits or silt material encountered should be selectively sorted and separated from its distinctly different counterpart to avoid use of the more permeable material. As such, during site grading and servicing activities, it would be prudent to stockpile such clayey soil near the area of the proposed SWM pond for use as such an impermeable liner. Additional testing may then be conducted on the stockpiled material, to confirm its suitability for use as an impermeable clay liner.

As noted above, the clayey soils encountered might be suitable for use as an impermeable clay liner but would require additional testing on at the specific location of the SWM pond. The base of the SWM pond may be prepared by scarifying or 'discing' in the upper perhaps 0.3 to 0.5 metres to destroy any natural layering structure, moisture conditioned to within -2 to +4 per cent of its optimum moisture content, and recompacted in place, however the soils present at the proposed base of the SWM pond should be confirmed. In the event that an imported clayey soil is required for use as an impermeable liner, the clay liner should be placed in nominal lifts of 300 millimetres, sufficiently worked and moisture conditions as noted above, and compacted to 95 per cent of its SPMDD. It is noted as well, regardless of the provision of an impermeable liner, the sides of the pond should be well worked or scarified to destroy any natural layers or seams, specifically any more permeable sandy or gravely seams. Where such layers are encountered, a layer of available on-site clayey soil should be placed and compacted, as outlined above, to restrict the natural infiltration of groundwater into the pond through these more permeable horizontal seams.

Alternatively, weighed down proprietary liners could be considered, however the suppliers of such materials (such as Layfield, Terrafix, Suprema) would have to be consulted for recommendations on the appropriate product and installation methods for the site conditions. Such artificial liners would not require compaction efforts and could be weighed down with practically any available soil or granular material.

Interior pond slopes beneath the permanent pool elevation should be limited to inclinations no steeper than 4 horizontal to 1 vertical, with interior slopes above permanent pool elevation and exterior slopes no steeper than 3 horizontal to 1 vertical. Should steeper slopes be required, it will be necessary to provide some form of stabilisation such as the placement of coarse 'rip rap' stone, or proprietary product such as Turfstone or Cable-Crete, or construction as a reinforced earth embankment. It is recommended that all interior pond slopes be provided with at least some form of

nominal stabilisation/protection to control loss erosion/loss of ground. Above the pond level this may consist of appropriate vegetation.

Material utilised in construction of pond slopes must be free of significant organic deposits, construction debris, or any other deleterious materials which would affect stability of the pond walls. Our office should be retained to review any imported material to the site, as well as to provide quality control services during construction.

It is also noted that appropriate care and effort will be required by the contractor around inlet and outlet structures to ensure the impermeable liner is continuous and avoid the potential of 'piping'. In this regard the clay liner should be completely constructed prior to the installation of inlet/outlet structures. A bentonite clay material could be utilised within the fill around any structures to provide a continuous impermeable seal.

7. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Scott Wylie, B.Eng., EIT.

Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Drawing No. 2, Groundwater Contour Map
Drawing No. 3, Water Well Records
Drawing Nos. 4, 5 and 6, Geologic Cross Sections
Log of Borehole Nos. 001 to 007, 101 to 104, 201 to 206, 301 to 307 and 401, inclusive
Grain Size Analyses

Distribution: Cachet Developments [pdf]

LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Borehole Location Plan

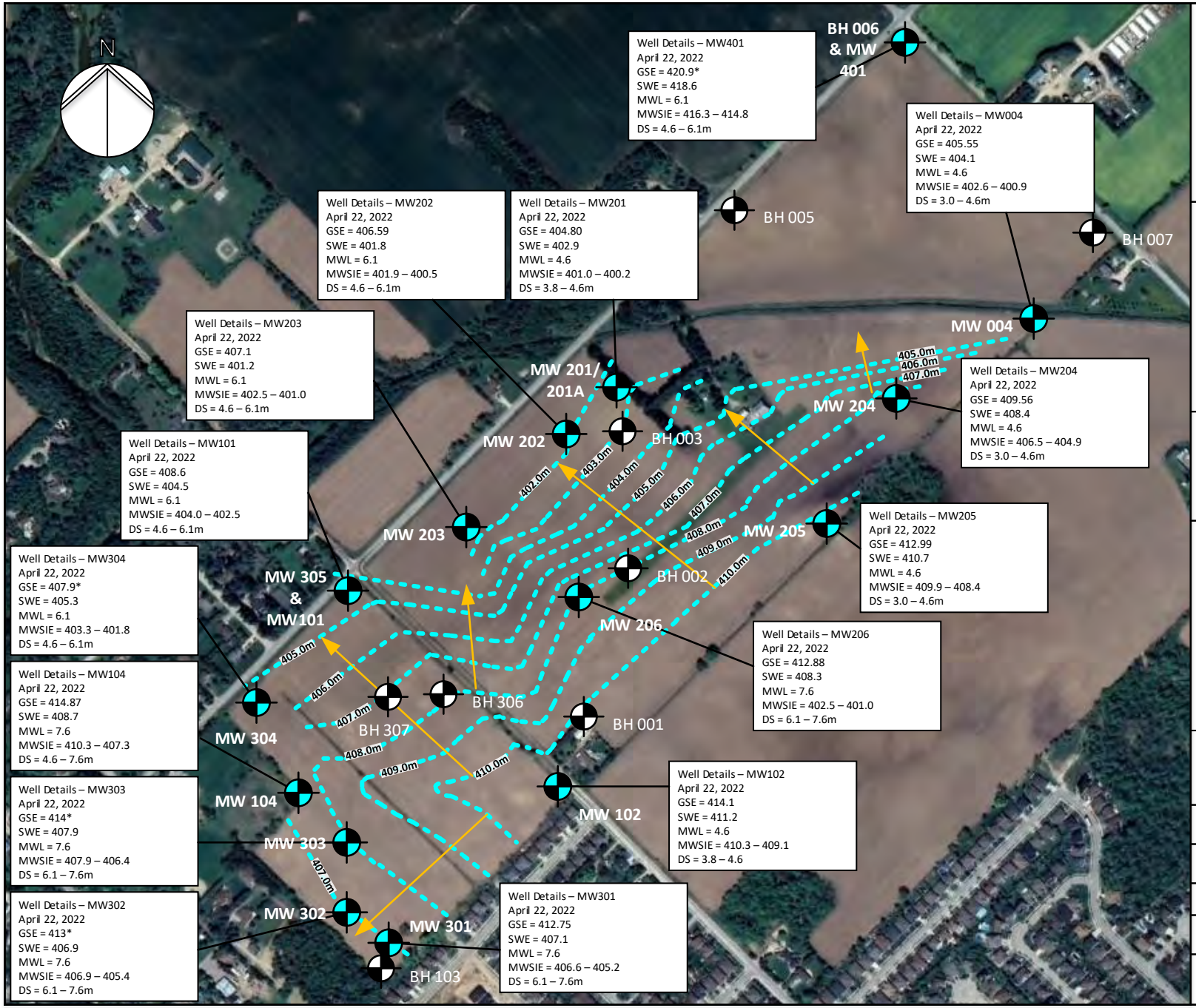
Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Borehole Location Plan

Drawing No. 1



LEGEND

Monitoring Well Location

MW#

GSE = Monitoring Well Ground Surface Elevation
SWE = Static Water Elevation [taken on April 22, 2022]
MWL = Monitoring Well Length
MWSIE = Monitoring Well Screen Interval Elevation
DS = Depth of Screen

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

*GSE interpolated between contour lines from topographic survey

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Groundwater Contour Map

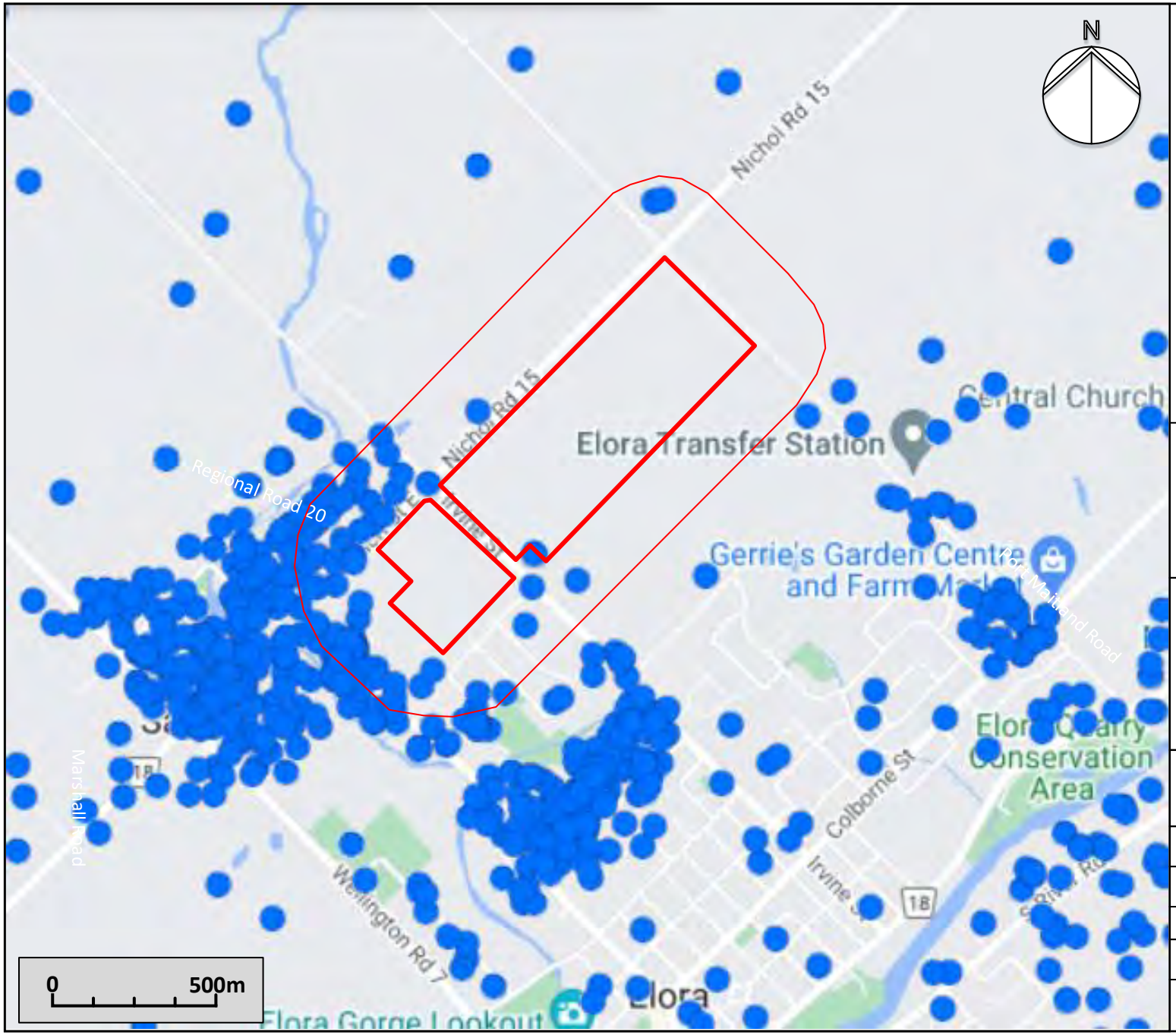
Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Groundwater Contour Map

Drawing No. 2



LEGEND

= Site

= Well Record

= Study Area

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Groundwater Well Survey
Proposed Residential Development
Nichol & Clayton Lands
Elora, Ontario

Ministry of the Environment
Water Well Records Plots

Project No. SM 302951-E

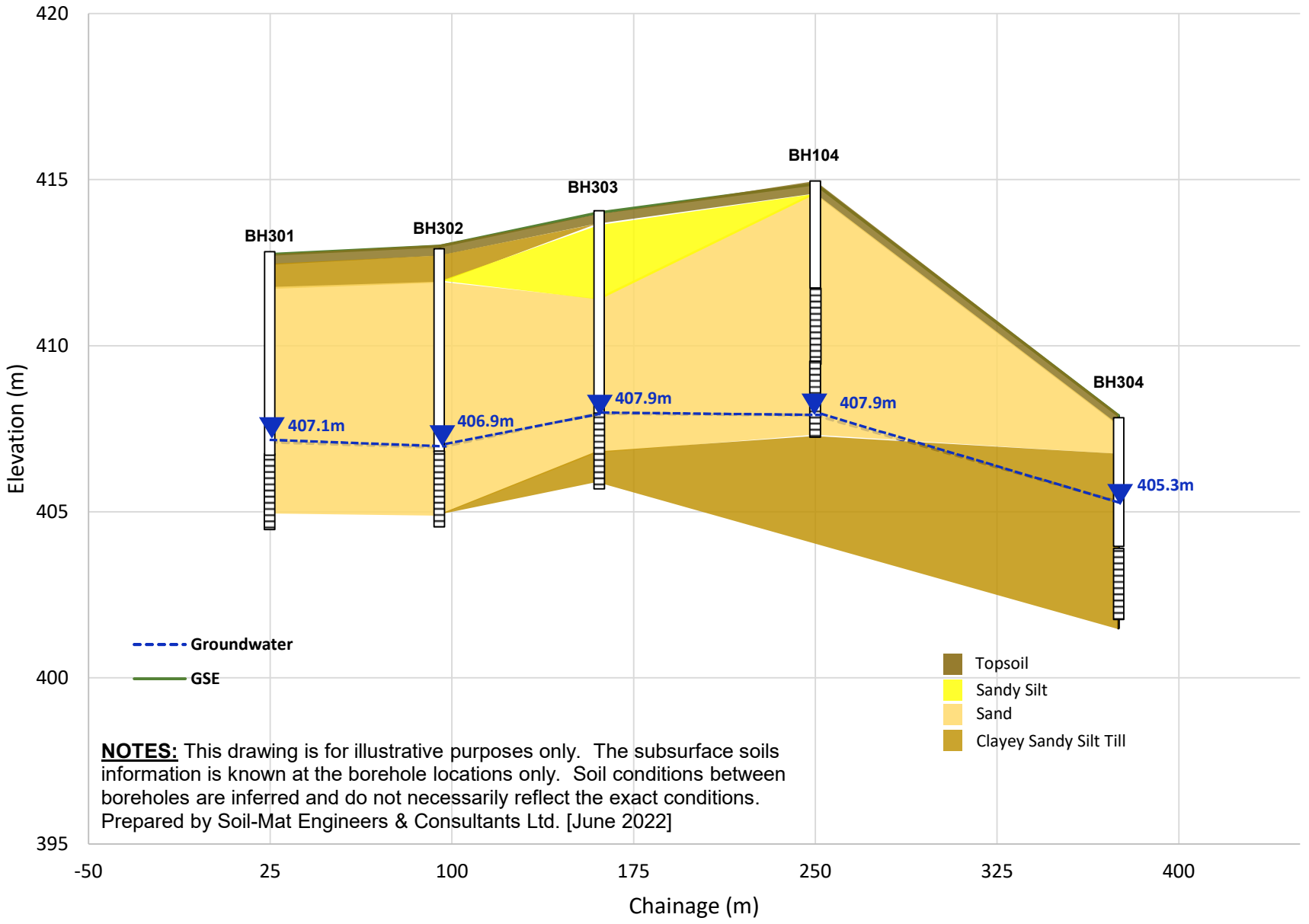
Date: July 2022

Drawn: PM | Checked: IS

SM 302951-E Water Well Records

Drawing No. 3

Geological Cross Section A-A

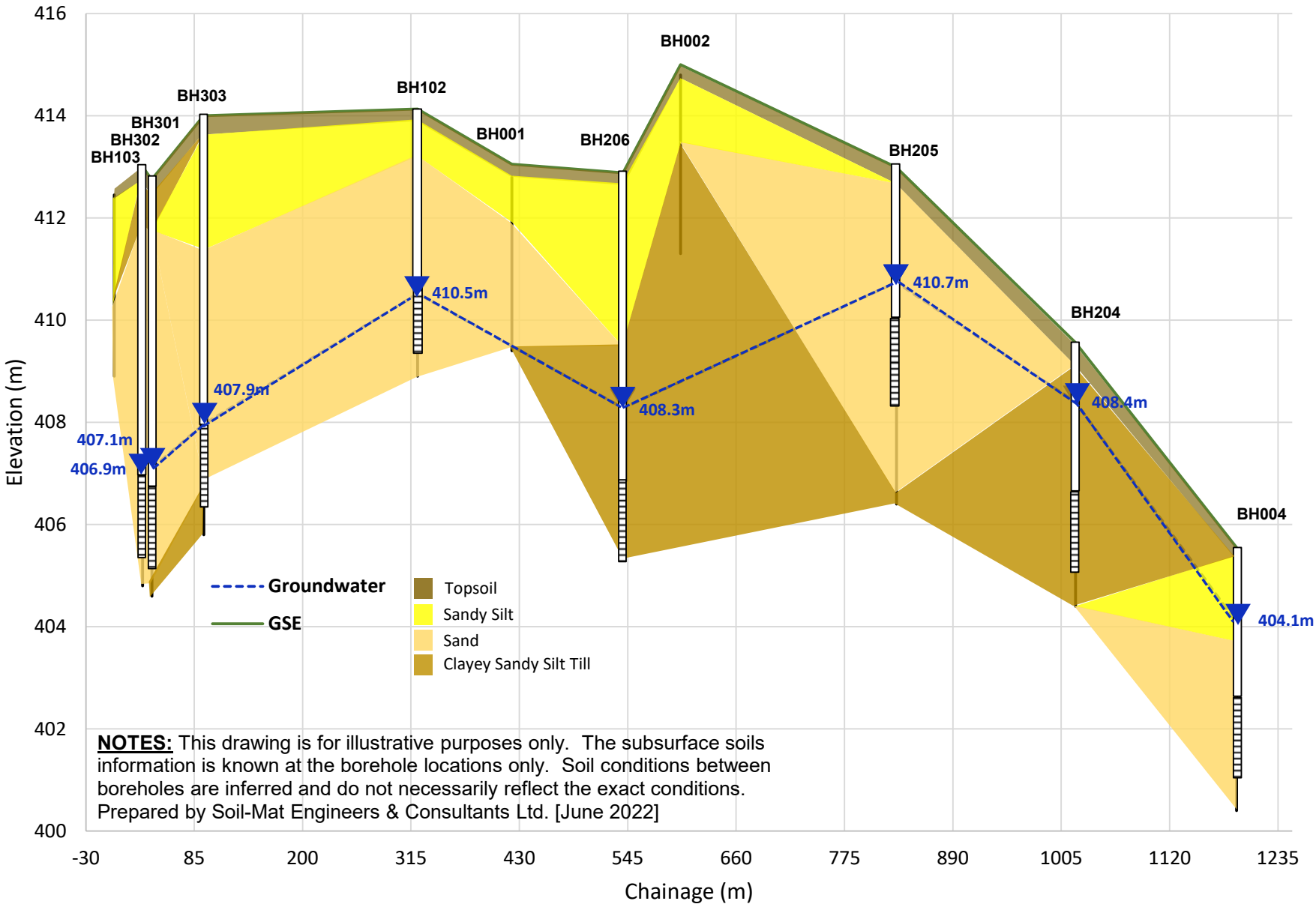


NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [June 2022]

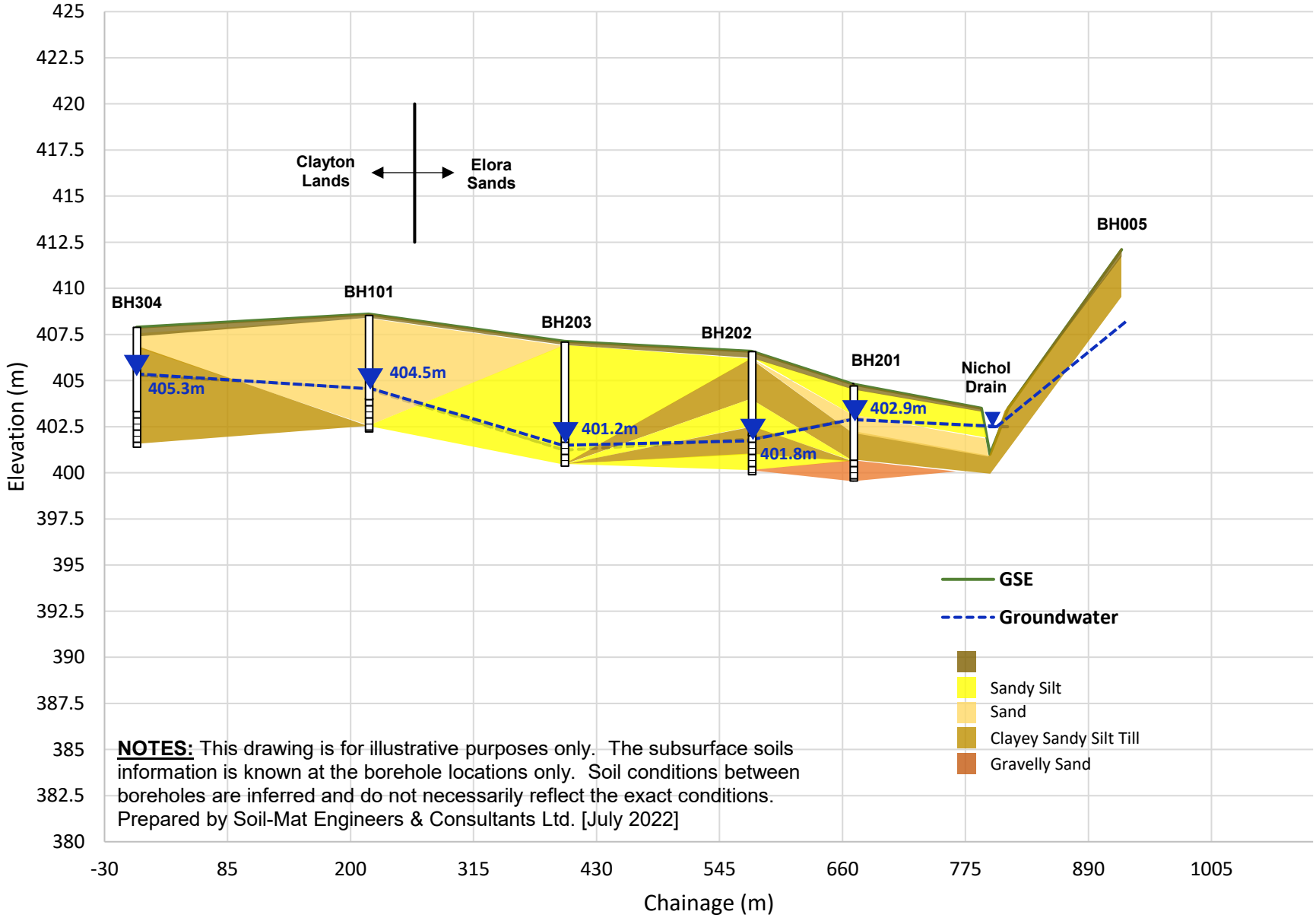
Drawing No. 4

Project No. SM 301951-G

Geological Cross Section B-B



Geological Cross Section C-C



NOTES: This drawing is for illustrative purposes only. The subsurface soils information is known at the borehole locations only. Soil conditions between boreholes are inferred and do not necessarily reflect the exact conditions.
Prepared by Soil-Mat Engineers & Consultants Ltd. [July 2022]

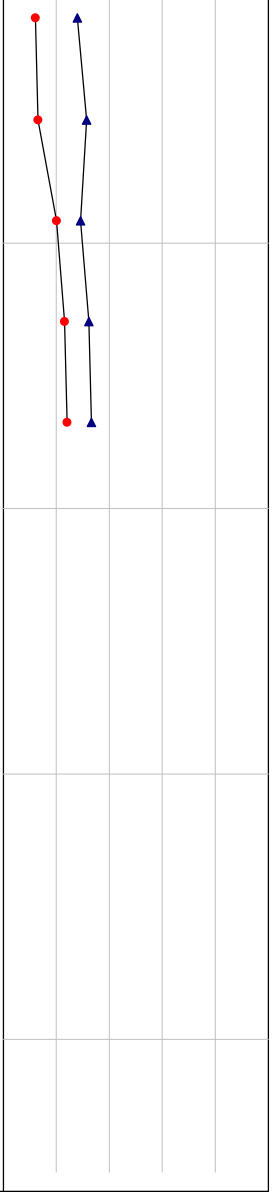
Log of Borehole No. 001

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838268
E: 545454

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	413.05		Ground Surface								
0 / 0	412.80		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	4 5 7 6	12			
3 / 1	411.90		**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, compact.		SS	2	6 7 6 6	13			
			Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, compact.		SS	3	5 8 12 14	20			
					SS	4	12 10 13 10	23			
11 / 3	409.40				SS	5	6 11 13 15	24			
12 / 4			End of Borehole								

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



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as dry and caved to a depth of 1.5 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 002

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838469
E: 545516

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	415.00	Ground Surface								
0 / 0	414.80	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2 4 4 5	8			
3 / 1	413.50	**Sandy Silt** Brown, reworked in upper levels, trace clay, silt, and gravel, loose.		SS	2	4 3 6 8	9			
6 / 2	412.50	**Clayey Sandy Silt Till** Brown, trace to some gravel, stiff to very stiff.		SS	3	6 6 6 7	12		3.5	
9 / 3		Transition to grey.		SS	4	3 7 6 7	13		4.0	
11 / 3	411.30			SS	5	9 7 15 18	22		>4.5	
12 / 4		End of Borehole								

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.7 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Sheet: 1 of 1

Log of Borehole No. 003

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838652
E: 545505

Depth (ft)	Depth (m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
		409.93		Ground Surface									
0	0			**Topsoil** Approximately 150 millimetres of topsoil.		SS	1	4 6 10 8	16				
3	1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, compact.		SS	2	6 10 10 7	20				
6		408.10				SS	3	6 8 10 11	18				
7	2	407.80		**Clayey Sandy Silt Till** Brown, trace to some gravel, compact.									
				End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 2.1 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 004

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838792
E: 546044

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		405.55	Ground Surface							
0	0	405.35	**Topsoil** Approximatelty 200 millimetres of topsoil.							
1			**Sandy Silt** Brown, trace to some clay, trace gravel, reworked in upper levels, loose.	SS	1	2 3 5 6	8			
2										
3	1			SS	2	4 3 3 5	6			
4										
5										
6		403.70	**Sand** Brown, trace clay, silt, and gravel, medium to coarse gradation, wet, compact to dense.	SS	3	8 10 12 15	22			
7	2									
8				SS	4	8 10 11 10	21			
9										
10	3			SS	5	8 10 23 30	33			
11										
12										
13	4									
14										
15		400.70								
16	5	400.40	Transition to grey.	SS	6	3 11 18 23	29			
17			End of Borehole							
18										
19										
20	6									
21										
22										
23	7									
24										
25										
26	8									
27										
28										
29	9									

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 5, 2021 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 2.74 metres below ground surface.

August 27, 2021 - 1.75 metres below ground surface.

February 23, 2021 - 1.33 metres below ground surface.

April 22, 2022 - 1.47 metres below ground surface.

June 1, 2022 - 1.78 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 5, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Sheet: 1 of 1

Log of Borehole No. 005

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838939
E: 545636

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	412.10		Ground Surface									
0 / 0	411.90		**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	2 4 5 7	9				
3 / 1			**Clayey Sandy Silt Till** Brown, reworked in upper levels, trace to some gravel, increasing clay content with depth, loose to compact.		SS	2	1 3 3 5	6				
6 / 2	410.00				SS	3	3 5 7 9	12				
7 / 2			End of Borehole									

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 2.1 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
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Sheet: 1 of 1

Log of Borehole No. 006

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839162
E: 545871

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
ft / m	420.91	Ground Surface								
0 / 0	420.70	**Topsoil** Approximately 200 millimetres of topsoil.		SS	1	4 4 4 4	8			
3 / 1	419.40	**Sand** Brown, reworked in upper levels, trace rootlets, loose to compact.		SS	2	3 5 6 6	11			
6 / 2		**Clayey Sandy Silt Till** Brown, trace gravel, increasing clay content with depth, loose to compact.		SS	3	5 6 6 7	12			
9 / 3				SS	4	3 4 4 4	8			
11 / 3	417.30			SS	5	5 11 10 15	21			
12 / 4		End of Borehole								

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded as wet at depth of 2.0 metres, and caved to a depth of 2.4 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

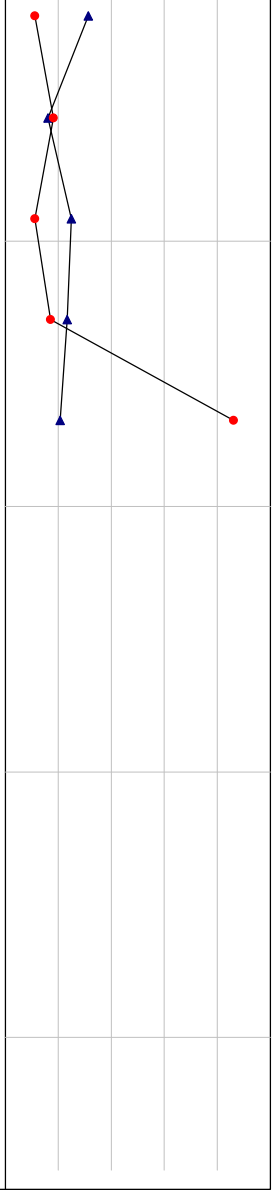
Log of Borehole No. 007

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838910
E: 546126

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.39		Ground Surface								
0 / 0	408.10		**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	3 5 6 7	11			
3 / 1	406.90		**Sandy Silt** Brown, trace rootlets, trace clay, reworked in upper levels, increasing clay content with depth, compact.		SS	2	10 8 10 10	18			
6 / 2			**Clayey Sandy Silt Till** Brown, trace to some gravel, stiff to hard.		SS	3	3 5 6 6	11		2.0	
9 / 3					SS	4	5 7 10 18	17		2.5	
11 / 3	404.70				SS	5	24 36 50/5"	100		>4.5	
12 / 4			End of Borehole								

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



NOTES:

1. Borehole was advanced using solid stem auger equipment on August 5, 2021 to termination at a depth of 3.0 metres.

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

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

Drill Method: Solid Stem Augers
Drill Date: August 5, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
Field Logged by: EC
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Sheet: 1 of 1

Log of Borehole No. 101

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838437
E: 545149

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE: Type	SAMPLE: Number	SAMPLE: Blow Counts	SAMPLE: Blows/300mm	SAMPLE: Recovery	SAMPLE: PP (kgf/cm2)	SAMPLE: U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 / 0	408.60	Ground Surface									
0 / 0	408.30	**Topsoil** — Approximately 250 millimetres of topsoil.									
1 / 0		**Sand** — Brown, trace gravel.									
6 / 2											
13 / 4											
18 / 5	403.10	Transition to grey in colour									
20 / 6	402.50	End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 6.10 metres.
2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. No soil samples were retrieved. The following free groundwater level readings have been measured:

August 6, 2021 - 4.78 metres below ground surface.

August 27, 2021 - 4.71 metres below ground surface.

October 14, 2021 - 4.33 metres below ground surface.

February 23, 2022 - 4.31 metres below ground surface.

April 22, 2022 - 4.07 metres below ground surface.

June 1, 2022 - 4.15 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
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Datum: Geodetic
Field Logged by: EC
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 102

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838180
E: 545422

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	414.13	Ground Surface								
0 / 0	413.90	**Topsoil** 250 millimetres of topsoil.								
3 / 1	413.20	**Sandy Silt** Brown, trace clay, trace gravel, reworked in upper levels, loose to compact.		SS	1	4 5 7 8	12			
				SS	2	2 3 6 5	9			
		Sand Brown, trace clay, silt, and gravel, medium to coarse gradation, loose to compact.		SS	3	3 9 12 14	21			
				SS	4	7 8 11 10	19			
				SS	5	6 9 11 17	20			
16 / 5	408.90	End of Borehole		SS	6	7 5 4 9	9			

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 5.2 metres.
2. Borehole was recorded as caved to a depth of 3.8 metres and 'wet' at a depth of 3.6 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 3.58 metres below ground surface.

August 27, 2021 - 3.61 metres below ground surface.

October 14, 2021 - 3.62 metres below ground surface.

February 23, 2021 - 3.5 metres below ground surface.

April 22, 2022 - 2.89 metres below ground surface.

June 1, 2022 - 3.05 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
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Datum: Geodetic
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Sheet: 1 of 1

Log of Borehole No. 103

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837942
E: 545194

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.55	Ground Surface								
0	0		**Topsoil** Approximately 100 millimetres of topsoil.		SS	1	5 5 7 8	12			
1			**Sandy Silt** Brown, trace to some gravel and clay, reworked in upper levels, compact.		AS	2	6 5 3 3	8			
2	1				SS	3	5 6 6 6	12			
3		410.30	**Sand** Brown, trace clay, silt, and gravel, medium gradation, loose.		SS	4	2 3 3 2	6			
4	2				SS	5	2 1 1 2	2			
5		408.90	End of Borehole								
6	3										
7											
8	4										
9											
10	5										
11											
12	6										
13											
14	7										
15											
16	8										
17											
18	9										
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using solid stem auger equipment on August 6, 2021 to termination at a depth of 3.6 metres.

2. Borehole was recorded dry and caved to a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

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

Drill Method: Solid Stem Augers
Drill Date: August 6, 2021
Hole Size: 150 millimetres
Drilling Contractor: Altech

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Datum: Geodetic
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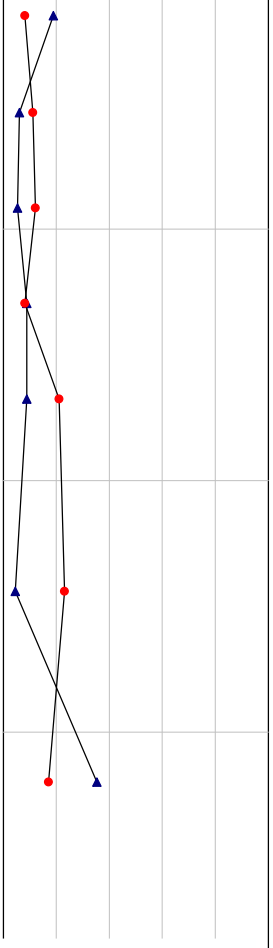
Log of Borehole No. 104

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838174
E: 545084

Depth (ft)	Depth (m)	Elevation (m)	Description	Sample Type	Sample Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		414.87	Ground Surface							
0	0	414.60	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sand** Brown, reworked in upper levels, trace clay, silt, and gravel, fine to medium gradation, compact.	SS	1	5 5 6 7	11			
2										
3	1			SS	2	8 9 9 7	18			
4										
5				SS	3	2 5 8 7	13			
6	2									
7				SS	4	6 11 16 13	27			
8										
9				SS	5	10 12 11 13	23			
10	3									
11										
12										
13	4									
14										
15										
16				SS	6	5 10 13 15	23			
17	5									
18										
19										
20	6	408.80	Wet spoon							
21				SS	7	9 9 8 6	17			
22										
23	7									
24		407.30								
25			End of Borehole							
26	8									
27										
28										
29										
30	9									
31										



NOTES:

1. Borehole was advanced using hollow stem auger equipment on August 6, 2021 to termination at a depth of 7.6 metres.

2. Borehole was recorded as open and 'wet' at depth of 7.0 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

August 6, 2021 - 6.78 metres below ground surface.

August 27, 2021 - 6.96 metres below ground surface.

October 14, 2021 - 7.09 metres below ground surface.

February 23, 2022 - 6.83 metres below ground surface.

April 22, 2022 - 6.13 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: August 6, 2021
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 201

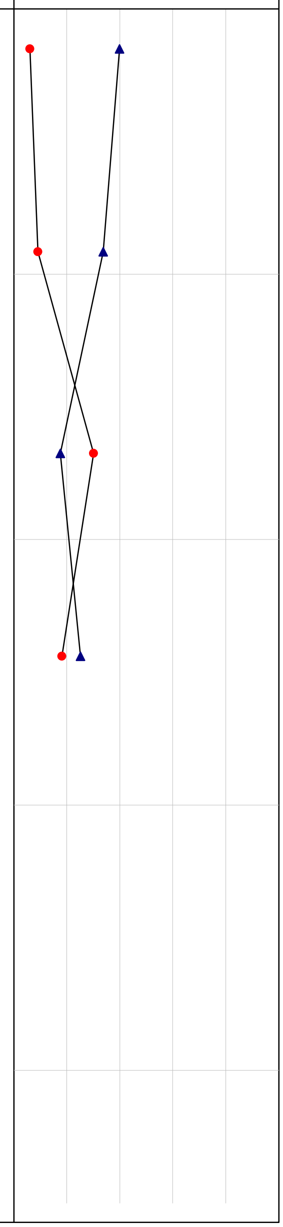
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838708
E: 545501

Depth (m)	Elevation (m)	Description
0	404.80	Ground Surface
0 – 0.45	404.35	**Topsoil** Approximately 450 millimetres of topsoil.
0.45 – 1.70	403.10	**Sandy Silt/Silty Sand** Brown, trace to some clay and gravel, loose.
1.70 – 2.60	402.20	**Sand** Brown, loose.
2.60 – 4.10	400.70	**Clayey Sandy Silt Till** Brown, some gravel, ocasional cobbles, compact to dense
4.10 – 5.20	399.60	**Gravely Sand** Brown, trace silt, compact.
		End of Borehole

Type	Number	Blow Counts	Blows/300mm
SS	1	5,3,3,3	6
SS	2	2,4,5,6	9
SS	3	6,12,18,20	30
SS	4	10,9,9,13	18

Column headings: Depth (ft, m); Elevation (m); Symbol; Description; Well Data; SAMPLE: Type, Number, Blow Counts, Blows/300mm, Recovery, PP (kgf/cm2), U.Wt.(kN/m3); Moisture Content w% (10, 20, 30, 40); Standard Penetration Test blows/300mm (20, 40, 60, 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 16, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 3.0 metres and 'wet' at a depth of 2.7 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 2.69 metres below ground surface.

April 22, 2022 - 1.88 metres below ground surface.

June 1, 2022 - 2.44 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 201A

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838708
E: 545501

Depth (ft / m)	Elevation (m)	Symbol	Description	Well Data	SAMPLE: Type	SAMPLE: Number	SAMPLE: Blow Counts	SAMPLE: Blows/300mm	SAMPLE: Recovery	SAMPLE: PP (kgf/cm2)	SAMPLE: U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
0 ft / 0 m	404.75		Ground Surface									
10 ft / 3 m	401.70		End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 16, 2026 to termination at a depth of 3.1 metres.

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

3. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - dry

April 22, 2022 - 2.05 metres below ground surface.

June 1, 2022 - 2.43 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 202

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838647
E: 545436

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	406.59	Ground Surface							
0 / 0	406.14	**Topsoil** Approximately 450 millimetres of topsoil.	SS	1	2,2,3,2	5			
1 / 0		**Clayey Sandy Silt Till** Brown, some gravel, compact.							
6 / 2			SS	2	4,7,9,12	16			
8 / 2	404.00	**Sandy Silt** Brown, dense.							
10 / 3			SS	3	21,19,18,24	37			
13 / 4	402.50	**Clayey Sandy Silt Till** Brown, some gravel and sand, very dense dense							
16 / 5			SS	4	10,24,50/4	100			
18 / 5	401.00	**Sandy Silt** Brown, very dense.							
20 / 6	400.20		SS	5	34,50/4	100			
21 / 6		End of Borehole							

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 17, 2022 to termination at a depth of 6.4 metres.

2. Borehole was recorded as open and 'wet' at a depth of 0 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 5.5 metres below ground surface.

April 22, 2022 - 4.76 meters below ground surface.

June 1, 2022 - 5.43 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 17, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 203

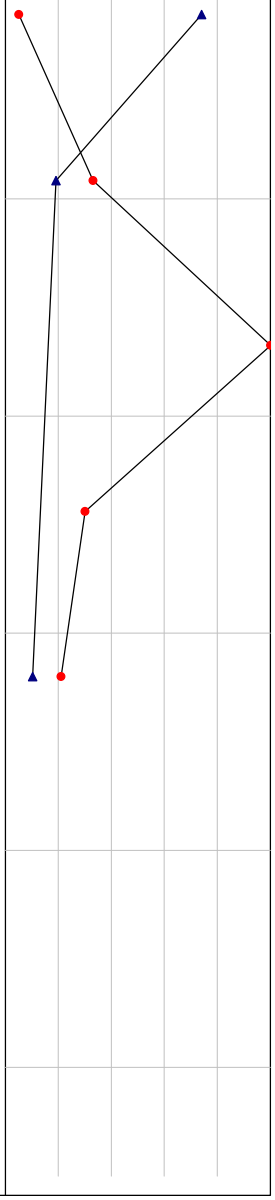
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838523
E: 545307

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		407.13	Ground Surface							
0	0	406.88	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sandy Silt** Brown, trace to some gravel, frequent cobbles, loose to very dense.	SS	1	9,3,2,1	5			
2										
3	1			SS	2	8,16,17,27	33			
4										
5										
6	2			SS	3	50/6	100			
7										
8										
9	3			SS	4	36,15,15,8	30			
10										
11										
12	4			SS	5	7,9,12,14	21			
13										
14										
15	5									
16										
17										
18	6									
19										
20										
21		400.40	End of Borehole							
22	7									
23										
24										
25										
26	8									
27										
28										
29	9									
30										
31										
32										
33	10									
34										
35										
36	11									

Moisture Content w%: 10 20 30 40

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



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 17, 2022 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 0 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - dry

April 22, 2022 - 5.9 metres below ground surface.

June 1, 2022 - 5.91 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 16, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 204

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838693
E: 545861

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	409.56	Ground Surface								
0 / 0	409.16	**Topsoil** Approximately 400 millimetres of topsoil.								
1 / 0		**Clayey Sandy Silt Till** Brown, trace to some gravel, compact to dense.		SS	1	9,4,4,4	8			
2 / 1										
3 / 1				SS	2	4,5,7,17	12			
4 / 1										
5 / 2				SS	3	5,7,20,29	27			
6 / 2										
7 / 3				SS	4	15,21,22,36	43			
8 / 3	404.40	End of Borehole								
9 / 4		NOTES: 1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 5.2 metres. 2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client. 4. A monitoring well was installed. The following free groundwater level readings have been measured: February 17, 2022 - 2.81 metres below ground surface. April 22, 2022 - 1.16 metres below ground surface. June 1, 2022 - 1.53 metres below ground surface.								
10 / 5										
11 / 6										
12 / 7										
13 / 8										
14 / 9										
15 / 10										
16 / 11										
17 / 12										
18 / 13										
19 / 14										
20 / 15										
21 / 16										
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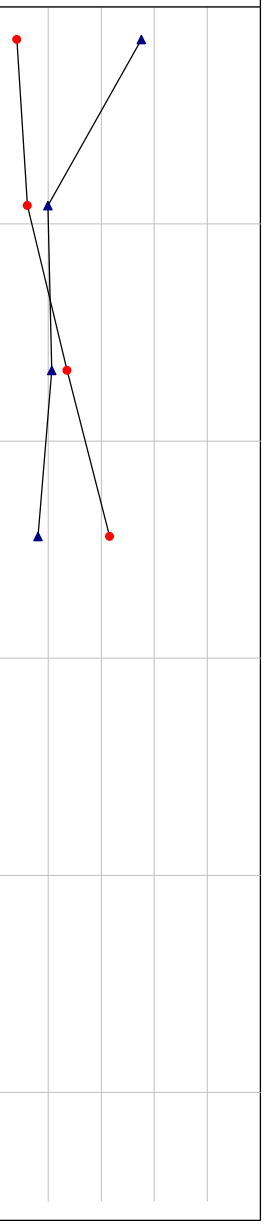
23 / 18										
24 / 19										
25 / 20										
26 / 21										
27 / 22										
28 / 23										
29 / 24										
30 / 25										
31 / 26										
32 / 27										
33 / 28										
34 / 29										
35 / 30										
36 / 31										

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



Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 205

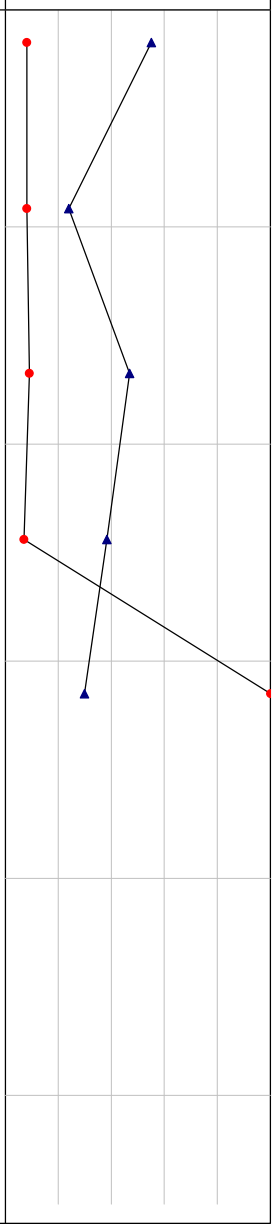
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838523
E: 545777

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.99	Ground Surface							
0	0	412.74	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Sand** Brown, loose.	SS	1	6,5,3,2	8			
2	1			SS	2	4,4,4,4	8			
3										
4										
5										
6	2			SS	3	4,4,5,6	9			
7										
8										
9										
10	3			SS	4	3,3,4,6	7			
11										
12										
13	4									
14										
15										
16										
17	5									
18										
19										
20										
21	6	406.60 406.40	**Clayey Sandy Silt Till** Brown, trace to some gravel, very dense.	SS	5	5,4,50/5	100			
22										
23			End of Borehole							
24	7									
25										
26										
27	8									
28										
29										
30	9									
31										
32										
33	10									
34										
35										
36	11									

Moisture Content w% (10 20 30 40)

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



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 6.6 metres.

2. Borehole was recorded as 'dry' and caved to a depth of 4.8 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 2.56 metres below ground surface.

April 22, 2022 - 2.25 metres below ground surface.

June 1, 2022 - 2.39 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 206

Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Road, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838460
E: 545394

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	412.88	Ground Surface							
0 / 0	412.58	**Topsoil** Approximately 300 millimetres of topsoil.							
3 / 1		**Sandy Silt** Brown, trace to some clay and gravel, compact.	SS	1	11,11,5,2	16			
6 / 2			SS	2	7,7,8,9	15			
10 / 3	409.50	**Clayey Sandy Silt Till** Brown, trace to some gravel, compact to dense.	SS	3	3,4,10,12	14			
16 / 5			SS	4	10,15,24,30	39			
25 / 7	405.30	End of Borehole							

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 18, 2022 to termination at a depth of 7.6 metres.

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

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 17, 2022 - 6.83 metres below ground surface.

April 22, 2022 - 4.6 metres below ground surface.

June 1, 2022 - 4.66 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 18, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 301

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4837975
E: 545199

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		412.75	Ground Surface							
0	0	412.50	**Topsoil** Approximately 250 millimetres of topsoil.							
3	1	411.70	**Clayey Sandy Silt Till** Brown, trace gravel, loose .	SS	1	2,1,3,4	4			
			Sand Brown, loose to compact.	SS	2	1,3,6,9	9			
	3			SS	3	7,7,6,9	13			
	4			SS	4	8,9,13,15	22			
	6			SS	5	6,7,10,13	17			
25	7	404.90								
26	8	404.60	**Clayey Sandy Silt Till** Brown, trace gravel, dense to very dense.	SS	6	3,13,32,42	45			

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 6.3 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 6.29 metres below ground surface.

April 22, 2022 - 5.65 metres below ground surface.

June 1, 2022 - 5.71 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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Log of Borehole No. 302

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838015
E: 545142

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	413.00	Ground Surface							
0 / 0	412.75	**Topsoil** Approximately 250 millimetres of topsoil.							
3 / 1	411.90	**Clayey Sandy Silt Till** Brown, trace gravel, loose .	SS	1	2,2,4,9	6			
		Sand Brown, loose to compact.	SS	2	2,4,6,8	10			
			SS	3	5,7,8,15	15			
			SS	4	5,8,9,11	17			
			SS	5	10,10,11,15	21			
26 / 8	404.80		SS	6	5,8,10,8	18			
		End of Borehole							

Well Data

Moisture Content w% (10 20 30 40)

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 6.6 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 6.62 metres below ground surface.

April 22, 2022 - 6.06 metres below ground surface.

June 1, 2022 - 6.12 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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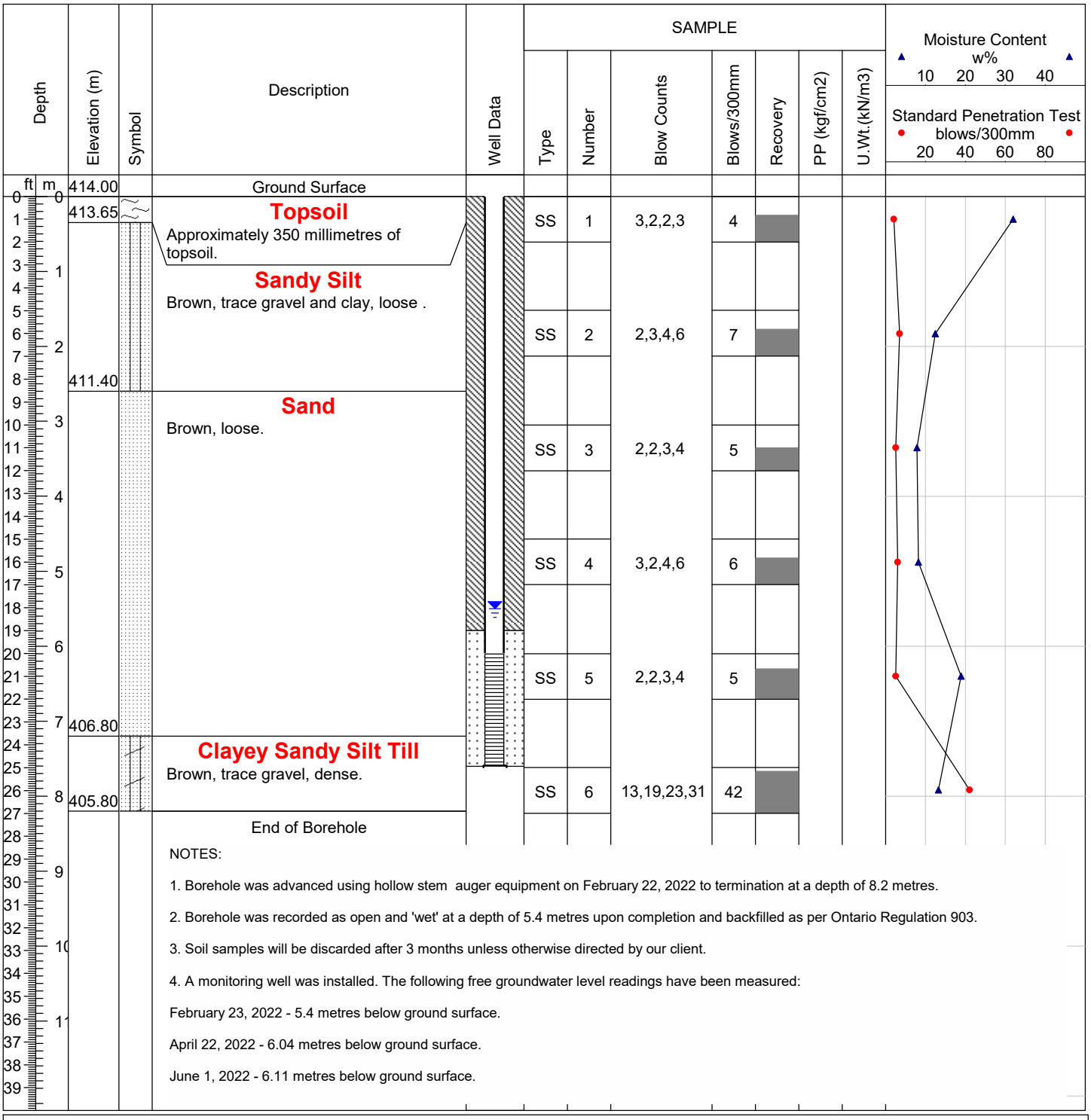
Log of Borehole No. 303

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838108
E: 545144



NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 22, 2022 to termination at a depth of 8.2 metres.
2. Borehole was recorded as open and 'wet' at a depth of 5.4 metres upon completion and backfilled as per Ontario Regulation 903.
3. Soil samples will be discarded after 3 months unless otherwise directed by our client.
4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 5.4 metres below ground surface.

April 22, 2022 - 6.04 metres below ground surface.

June 1, 2022 - 6.11 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 22, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
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Datum: Geodetic
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Log of Borehole No. 304

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4538292
E: 545023

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		407.90	Ground Surface							
0	0	407.65	**Topsoil** Approximately 250 millimetres of topsoil.							
3	1	406.80	**Sand** Brown, trace gravel, loose .	SS	1	3,2,3,7	5			
6	2		**Clayey Sandy Silt Till** Brown, trace gravel, loose to very dense.	SS	2	1,2,6,6	8			
10	3			SS	3	10,14,22,33	36			
16	5			SS	4	5,9,19,32	28			
20	6	401.50		SS	5	38,50/5	100			
23	7		End of Borehole							

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 23, 2022 to termination at a depth of 6.4 metres.

2. Borehole was recorded as open and 'wet' at a depth of 2.8 metres upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - 2.87 metres below ground surface.

April 22, 2022 - 2.6 metres below ground surface.

June 1, 2022 - 2.96 metres below ground surface.

Drill Method: Hollow Stem Augers
Drill Date: February 23, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
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E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 305

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838438
E: 545144

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	408.60	Ground Surface							
0 / 0	408.35	**Topsoil** Approximately 250 millimetres of topsoil.	AS	1					
1 / 0		**Sand** Brown, trace gravel, loose to very loose.							
5 / 1			SS	2	2,3,4,4	7			
10 / 3			SS	3	2,1,1,5	2			
12 / 4	404.90	End of Borehole							

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

NOTES:

1. Borehole was advanced using hollow stem auger equipment on February 23, 2022 to termination at a depth of 3.6 metres.

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

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

February 23, 2022 - dry

April 22, 2022 - dry

June 1, 2022 - dry

Drill Method: Hollow Stem Augers
Drill Date: February 23, 2022
Hole Size: 200 millimetres
Drilling Contractor: Altech

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130 Lancing Drive, Hamilton, ON L8W 3A1
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Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

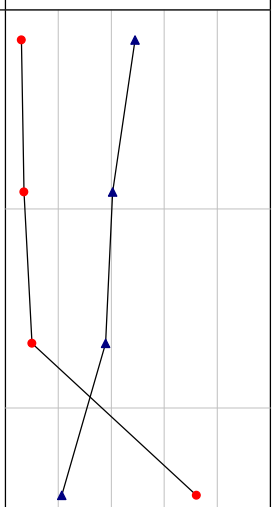
Log of Borehole No. 306

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4838305
E: 545271

Depth (ft)	Depth (m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0	0	412.85	Ground Surface								
0	0	412.60	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	2,2,4,5	6			
3	1		**Sand** Brown, trace gravel, loose.		SS	2	3,2,5,6	7			
10	3	409.40			SS	3	3,3,7,15	10			
12	4		**Clayey Sandy Silt Till** Brown, some gravel, very dense		SS	4	20,34,38,50/4	72			
16	5	407.70	End of Borehole								

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



NOTES:

1. Borehole was advanced using solid stem auger equipment on February 23, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as caved to a depth of 2.4 metres and dry upon completion and backfilled as per Ontario Regulation 903

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

Drill Method: Solid Stem Augers
Drill Date: February 23, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

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130 Lancing Drive, Hamilton, ON L8W 3A1
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Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 307

Project No: SM 301951B-G
Project: Proposed Residential Development
Location: 75 Woolwich Street East, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 3838296
E: 545199

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	411.12	Ground Surface								
0 / 0	410.87	**Topsoil** Approximately 250 millimetres of topsoil.		SS	1	1,2,2,3	4			
		Clayey Sandy Silt Till Brown, some gravel, compact.								
6 / 2				SS	2	5,7,10,12	17			
10 / 3				SS	3	9,10,15,19	25			
16 / 5	405.90			SS	4	6,11,12,41	23			
		End of Borehole								

NOTES:

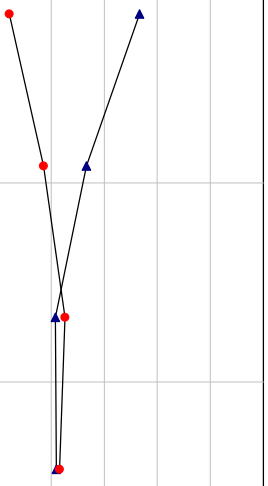
1. Borehole was advanced using solid stem auger equipment on February 23, 2022 to termination at a depth of 5.2 metres.

2. Borehole was recorded as open and 'wet' at a depth of 4.3 metres below the existing grade upon completion and backfilled as per Ontario Regulation 903.

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

Moisture Content w% (10 20 30 40)

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



Drill Method: Solid Stem Augers
Drill Date: February 23, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Log of Borehole No. 401

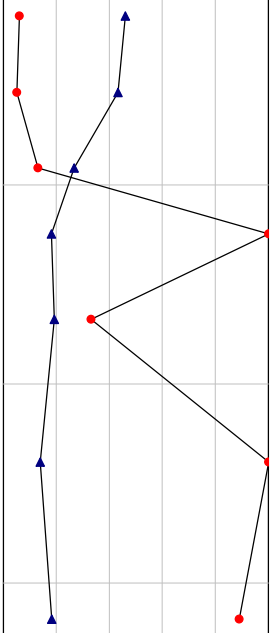
Project No: SM 301951-G
Project: Proposed Residential Development
Location: 7581 Nichol Rd, Elora
Client: Cachet Development

Project Manager: Ian Shaw, P. Eng
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4839146
E: 545881

Depth (ft)	Depth (m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
		420.91	Ground Surface							
0	0	420.66	**Topsoil** Approximately 250 millimetres of topsoil.							
1			**Silty Sand** Brown, trace to some gravel and clay, loose to compact.	SS	1	2,2,4,4	6			
2				SS	2	1,2,3,5	5			
3	1									
4				SS	3	1,4,9,7	13			
5		419.10	**Clayey Sandy Silt Till** Brown, trace to some sand and gravel, compact to very dense	SS	4	6,15,50/4	100			
6	2			SS	5	6,17,16,24	33			
7										
8				SS	6	10,35,50/5	100			
9	3									
10										
11				SS	7	27,46,43, 50/3	89			
12	4									
13										
14										
15										
16	5									
17										
18										
19										
20	6									
21		414.20								
22			End of Borehole							
23	7									
24										
25										
26										
27	8									
28										
29										
30										
31	9									
32										
33	10									
34										
35										
36	11									
37										
38										
39										

Moisture Content w% (10 20 30 40)

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



NOTES:

1. Borehole was advanced using solid stem auger equipment on April 18, 2022 to termination at a depth of 6.7 metres.

2. Borehole was recorded as open and 'wet' at a depth of 4.7 metres below the existing grade upon completion and backfilled as per Ontario Regulation 903.

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

4. A monitoring well was installed. The following free groundwater level readings have been measured:

April 22, 2022 - 2.29 metres below ground surface.

June 1, 2022 - 2.39 metres below ground surface.

Drill Method: Solid Stem Augers
Drill Date: April 18, 2022
Hole Size: 150 millimetres
Drilling Contractor: Altech

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
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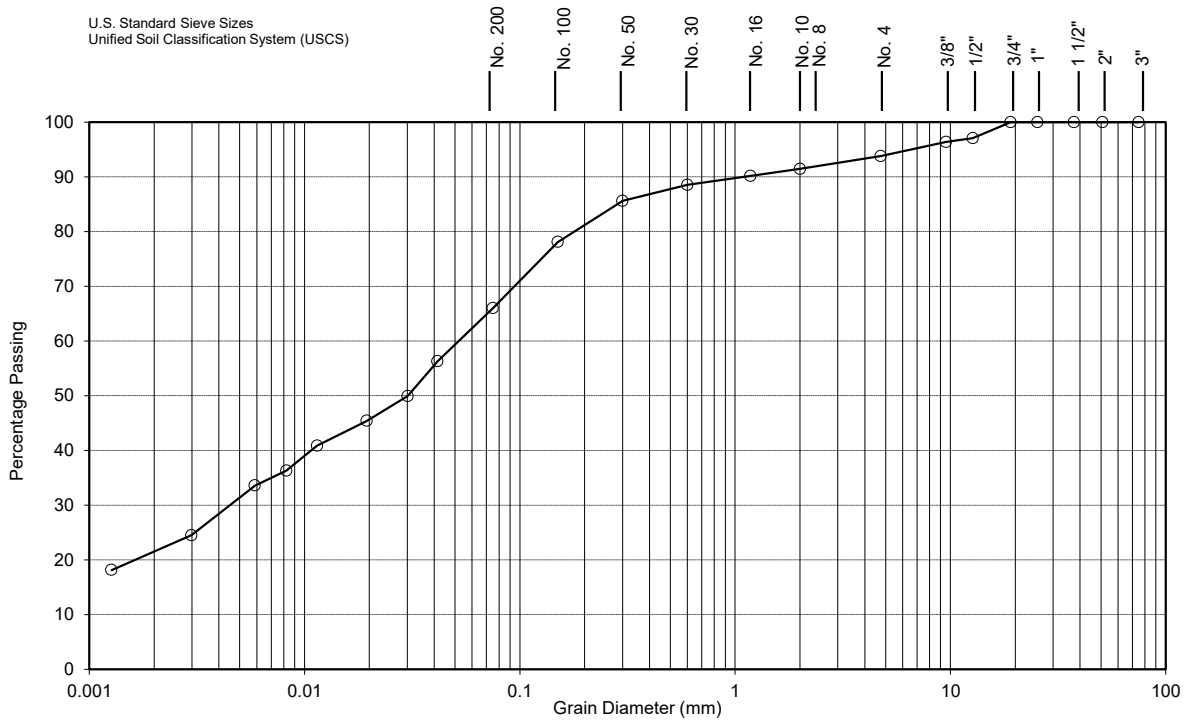
Datum: Geodetic
Field Logged by: KJR
Checked by: SW
Sheet: 1 of 1

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**21-335**	Notes: Depth: 5'			
Borehole No.:	**003**				
Sample No.:	**3**				
CLAY [%]:	**22**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**44**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**28**				
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0005**	Coefficient of Uniformity C_U:	**102.0**	Coefficient of Curvature C_C:	**0.8**

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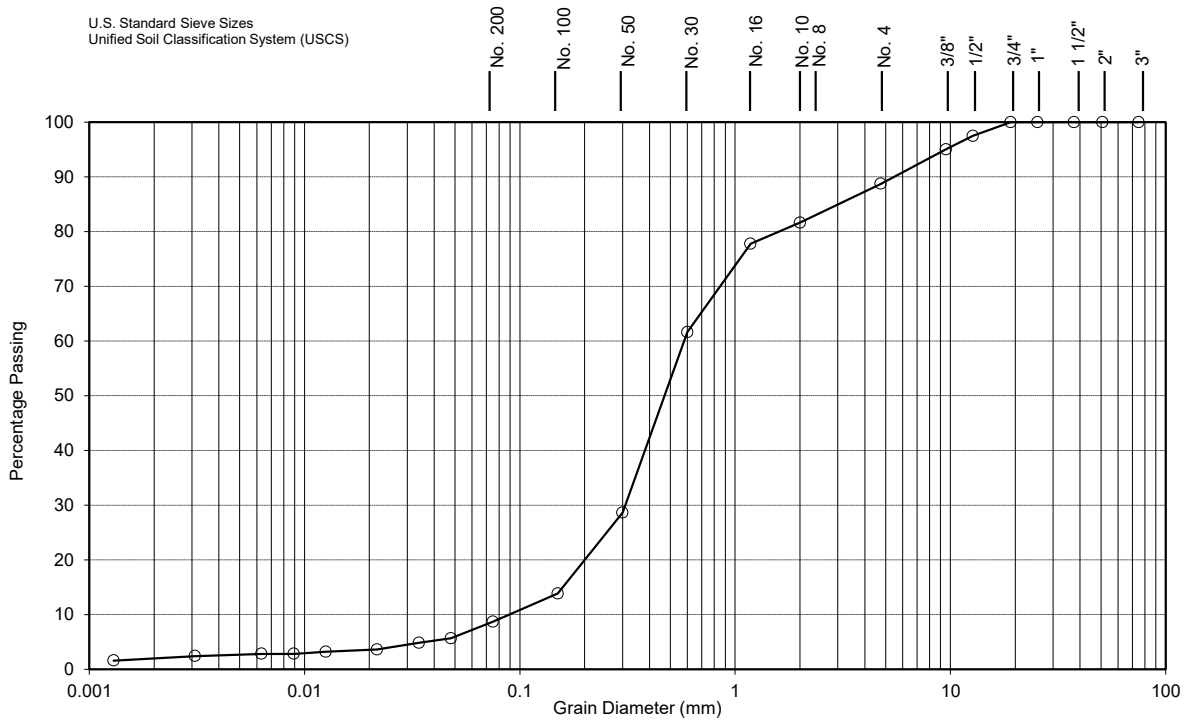
7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 1**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**21-340**	Notes: Depth: 10'			
Borehole No.:	**004**				
Sample No.:	**5**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ some Gravel and traces of Silt and Clay**		
SILT [%]:	**7**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**80**				
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.090**	Coefficient of Uniformity C_U:	**6.6**	Coefficient of Curvature C_C:	**1.8**

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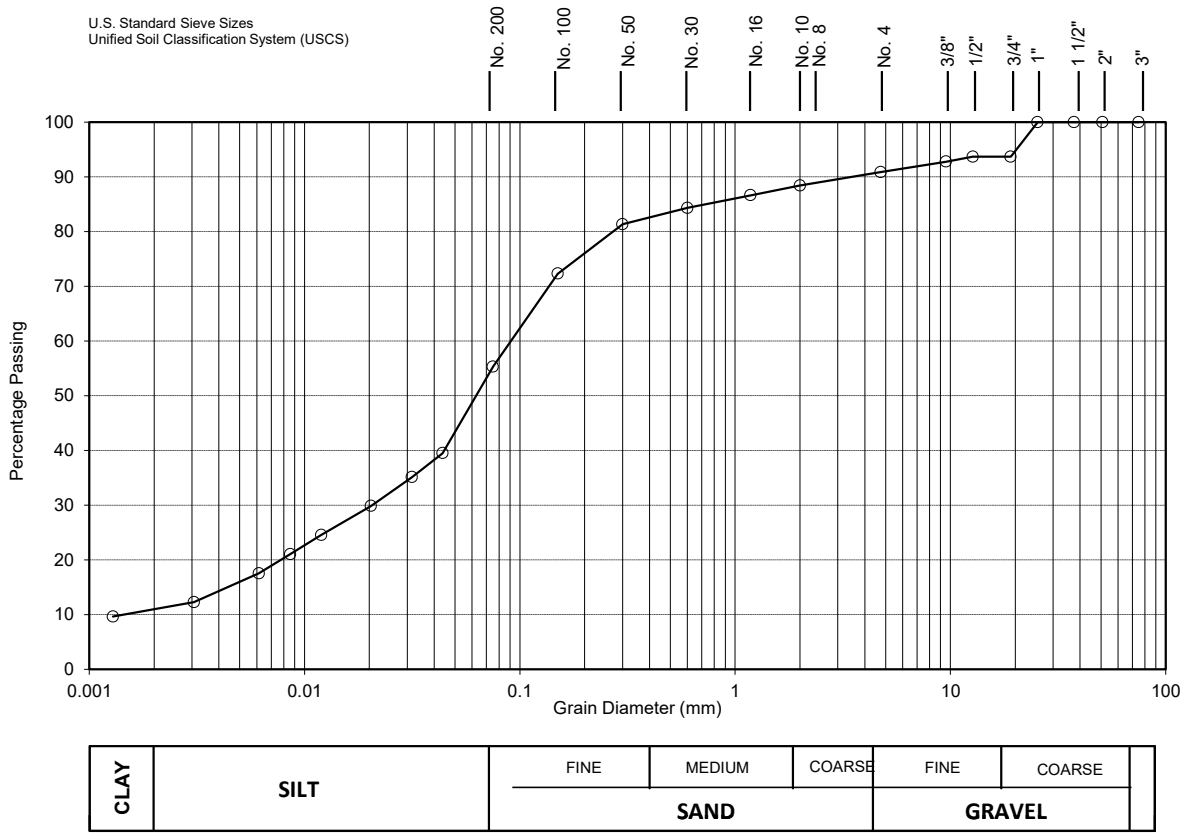
7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 2**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



Lab No.:	**21-336**	Notes: Depth: 10'	
Borehole No.:	**006**		
Sample No.:	**5**		
CLAY [%]:	**11**	Soil Description: **Brown Sandy Silt w/ some Clay and trace Gravel**	
SILT [%]:	**44**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**	
SAND [%]:	**36**		
GRAVEL [%]:	**9**	Estimated Infiltration Rate [mm/hr] : **10 to 15**	Estimated Permeability, k [cm/s] **10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0015**	Coefficient of Uniformity C_U: **60.0**	Coefficient of Curvature C_C: **3.3**

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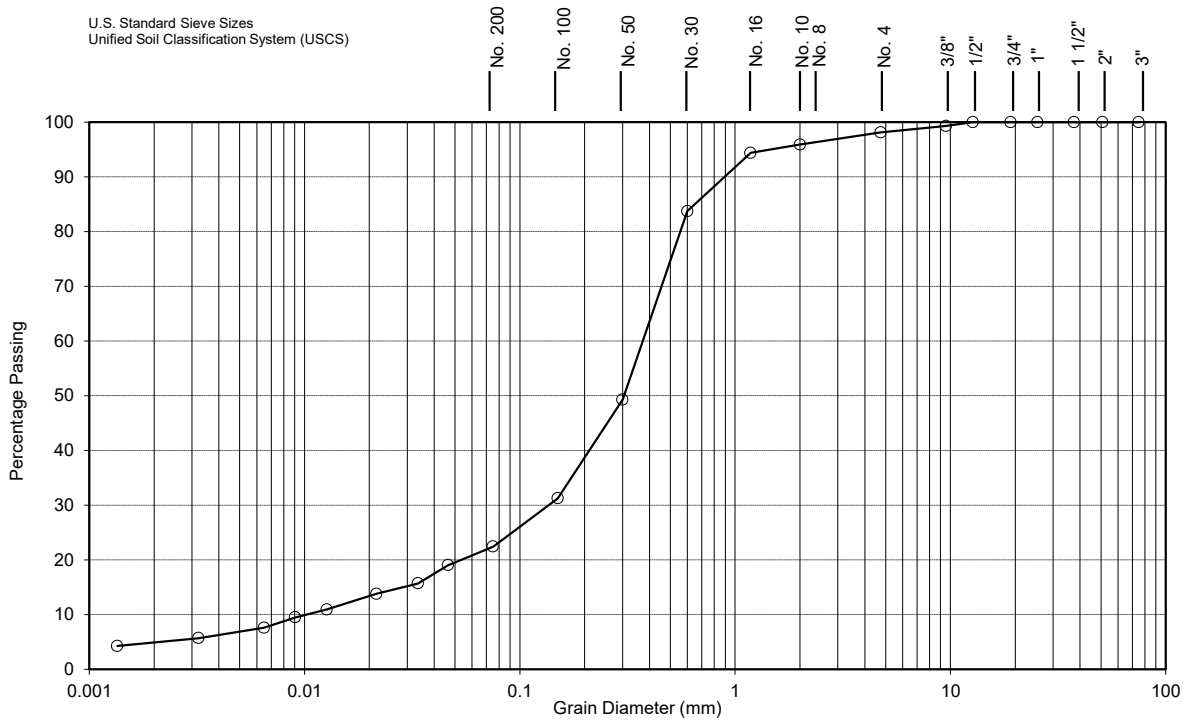
7581 Sideroad 15, Elora ON

August 2021	**Grain Size Analysis No. 3**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**22-088**	Notes: Depth: 5'			
Borehole No.:	**201**				
Sample No.:	**2**				
CLAY [%]:	**5**	Soil Description:	**Brown Sand w/ Some Silt and traces of Clay and Gravel**		
SILT [%]:	**17**		**S.M. - Silty sands, sand-silt mixtures**		
SAND [%]:	**76**				
GRAVEL [%]:	**2**	Estimated Infiltration Rate [mm/hr] :	**50**	Estimated Permeability, k [cm/s]	**10^{-4}**
D_{10} (Effective Diam. in mm):	**0.0001**	Coefficient of Uniformity C_U:	**40.0**	Coefficient of Curvature C_C:	**5.4**

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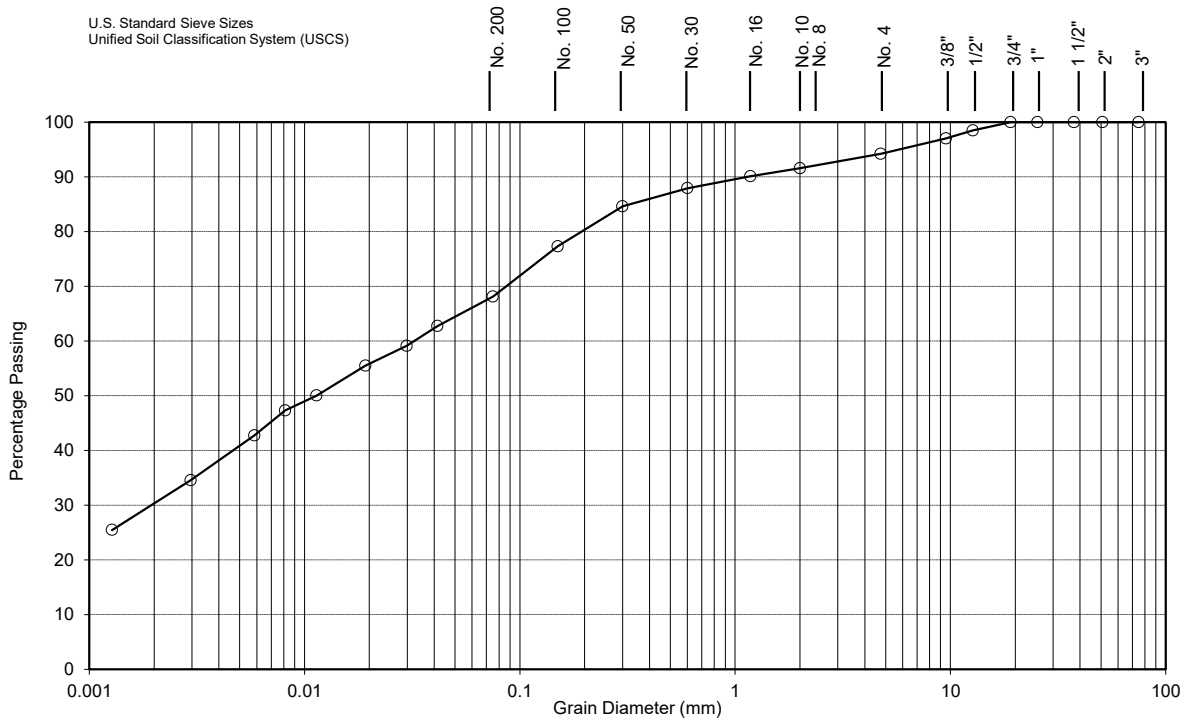
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 4**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**22-089**	Notes: Depth: 5'			
Borehole No.:	**202**				
Sample No.:	**2**				
CLAY [%]:	**30**	Soil Description:	**Brown Clayey Sandy Silt w/ a trace of Gravel**		
SILT [%]:	**38**		**M.L - Clayey silts with slight plasticity, silty or clayey fine sands,**		
SAND [%]:	**26**		**inorganic silts and very fine sands**		
GRAVEL [%]:	**6**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]	**10^{-8}**
D_{10} (Effective Diam. in mm):	**0.0004**	Coefficient of Uniformity C_U:	**80.0**	Coefficient of Curvature C_C:	**0.3**

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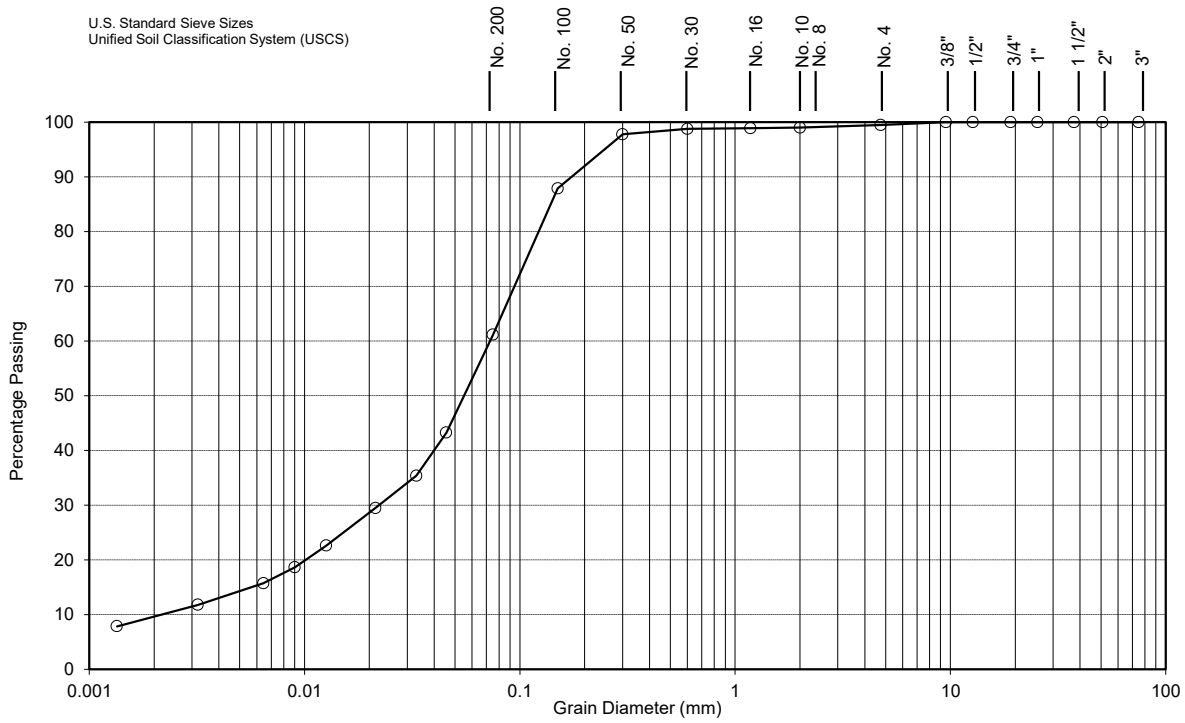
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 5**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**22-090**	Notes: Depth: 20'			
Borehole No.:	**202**				
Sample No.:	**5**				
CLAY [%]:	**10**	Soil Description:	**Light Brown Silt and Sand w/ some Clay**		
SILT [%]:	**51**		**M.L. - Inorganic silts and very fine sands**		
SAND [%]:	**39**				
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**10 to 15**	Estimated Permeability, k [cm/s]	**10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0022**	Coefficient of Uniformity C_U:	**33.2**	Coefficient of Curvature C_C:	**3.0**

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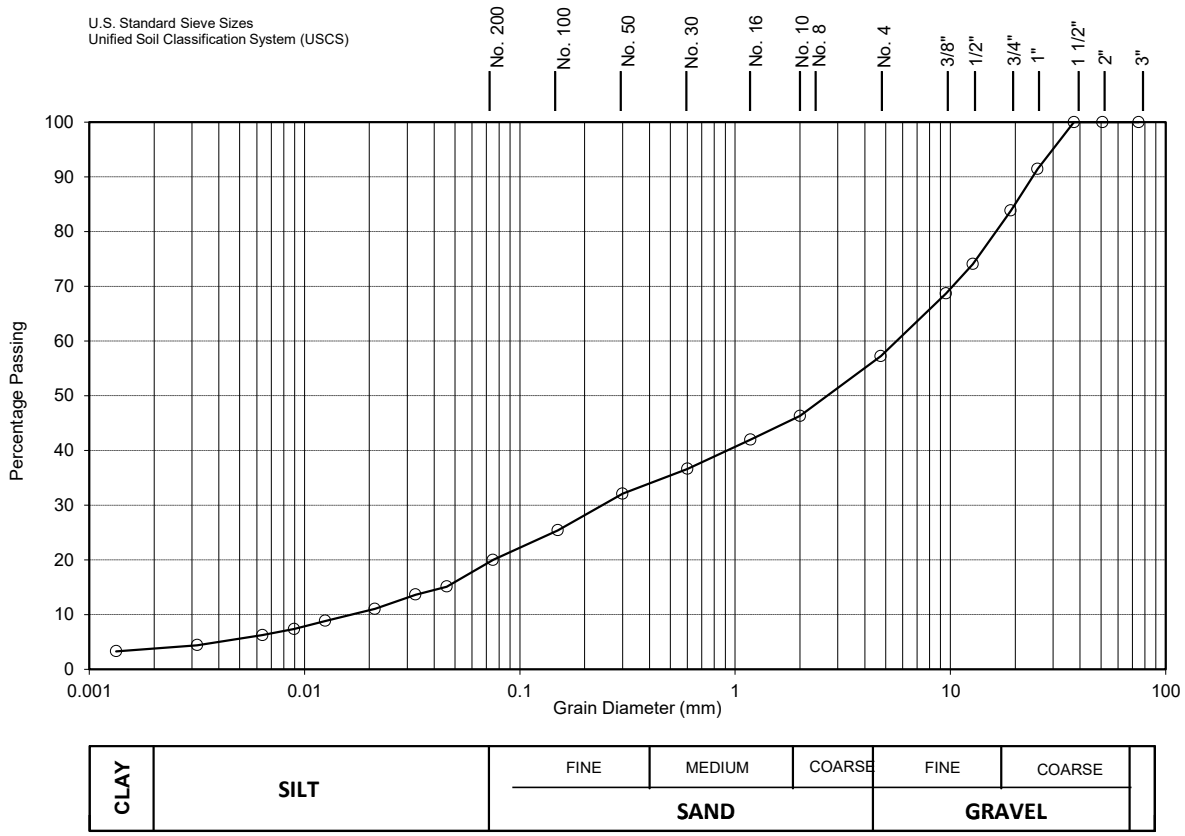
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 6**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



Lab No.:	**22-091**	Notes: Depth: 5'			
Borehole No.:	**203**				
Sample No.:	**2**				
CLAY [%]:	**3**	Soil Description:	**Brown Gravel and Sand w/ some Silt and a trace of Clay**		
SILT [%]:	**17**		**G.M. - Gravel-sand-silt mixtures, silty gravels**		
SAND [%]:	**37**				
GRAVEL [%]:	**43**	Estimated Infiltration Rate [mm/hr] :	**50 to 60**	Estimated Permeability, k [cm/s]	**10^{-4}**
D_{10} (Effective Diam. in mm):	**0.017**	Coefficient of Uniformity C_U:	**335.3**	Coefficient of Curvature C_C:	**0.6**

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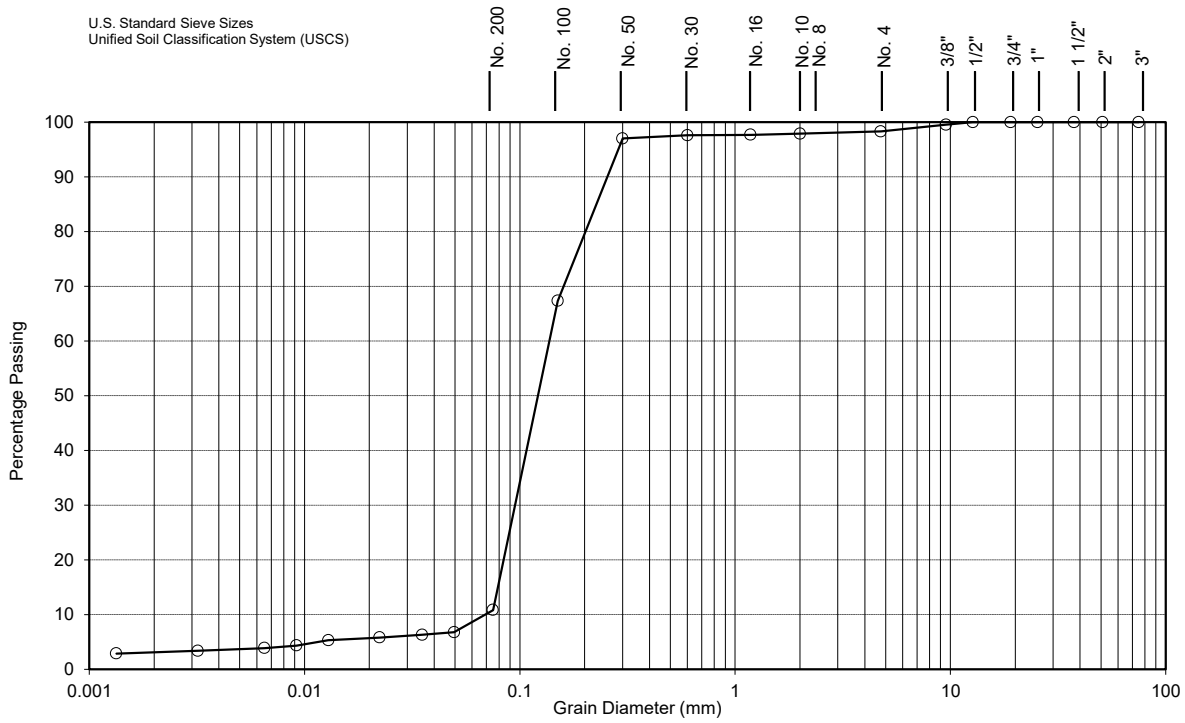
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 7**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**22-092**	Notes: Depth: 20'			
Borehole No.:	**203**				
Sample No.:	**5**				
CLAY [%]:	**3**	Soil Description:	**Brown Sand w/ traces of Silt, Clay and Gravel**		
SILT [%]:	**8**		**S.P. - Poorly graded sands**		
SAND [%]:	**87**				
GRAVEL [%]:	**2**	Estimated Infiltration Rate [mm/hr] :	**125 to 150**	Estimated Permeability, k [cm/s]	**10^{-3}**
D_{10} (Effective Diam. in mm):	**0.07**	Coefficient of Uniformity C_U:	**2.1**	Coefficient of Curvature C_C:	**0.9**

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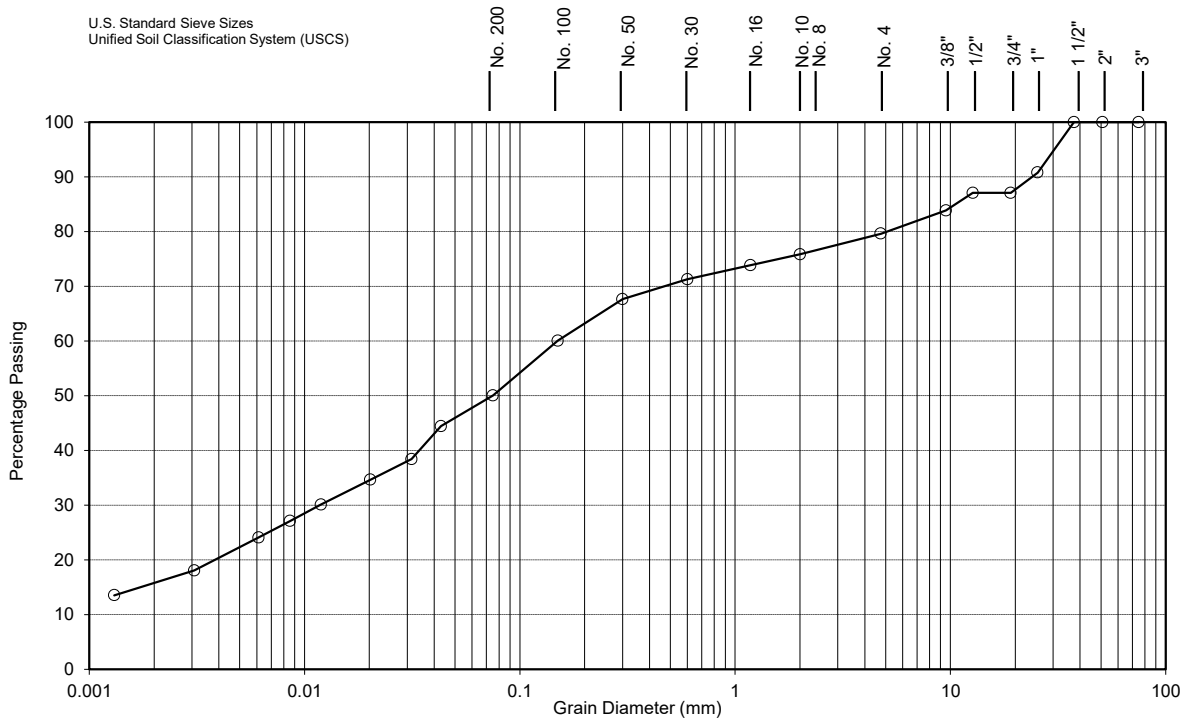
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 8**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

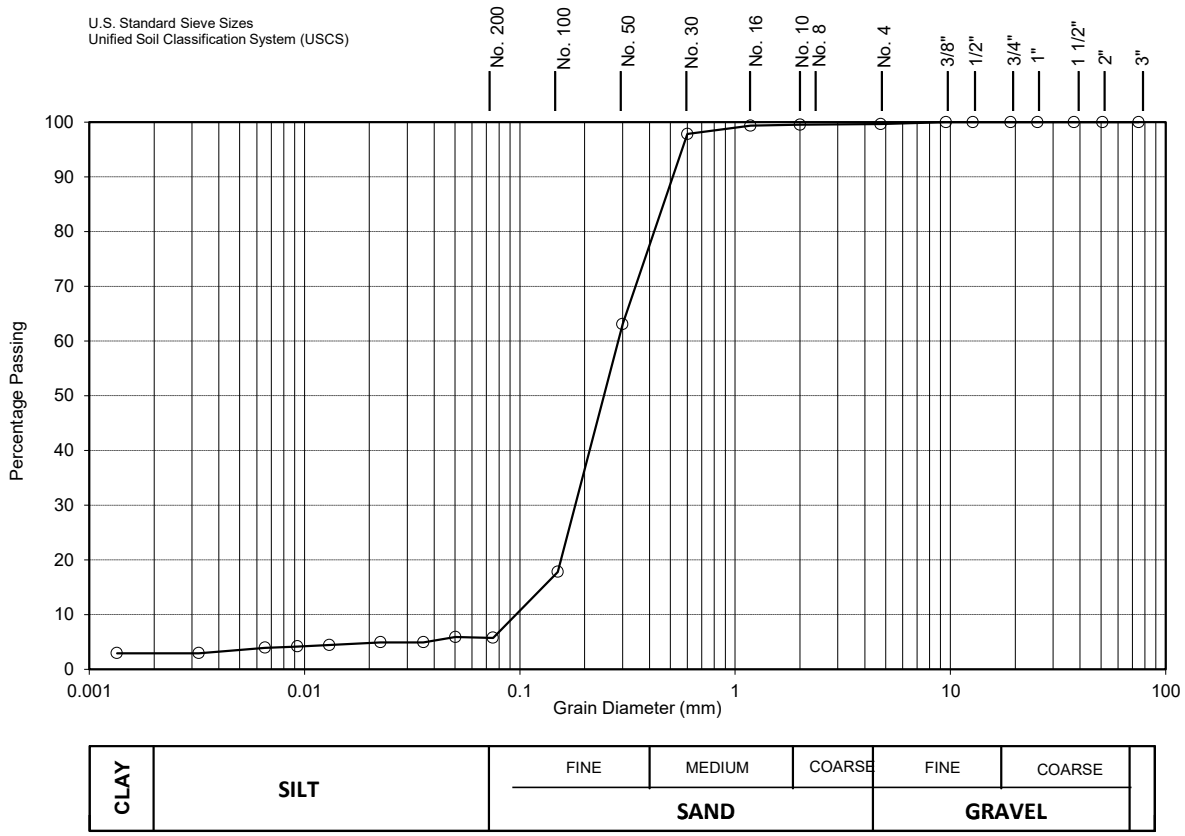
Lab No.:	**22-094**	Notes: Depth: 5'			
Borehole No.:	**204**				
Sample No.:	**2**				
CLAY [%]:	**16**	Soil Description:	**Brown Sandy Gravelly Silt w/ some Clay**		
SILT [%]:	**34**		**M.L. - Silty or clayey fine sands**		
SAND [%]:	**30**				
GRAVEL [%]:	**20**	Estimated Infiltration Rate [mm/hr] :	**10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.00085**	Coefficient of Uniformity C_U:	**188.2**	Coefficient of Curvature C_C:	**1.2**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 9**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



Lab No.:	**22-093**	Notes: Depth: 10'	
Borehole No.:	**205**		
Sample No.:	**3**		
CLAY [%]:	**2**	Soil Description: **Brown Sand w/ traces of Silt and Clay**	
SILT [%]:	**4**	**S.P. - Poorly graded sands**	
SAND [%]:	**94**		
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] : **150 to 300**	Estimated Permeability, k [cm/s] **10^{-3}**
D_{10} (Effective Diam. in mm):	**0.095**	Coefficient of Uniformity C_U: **3.1**	Coefficient of Curvature C_C: **1.2**

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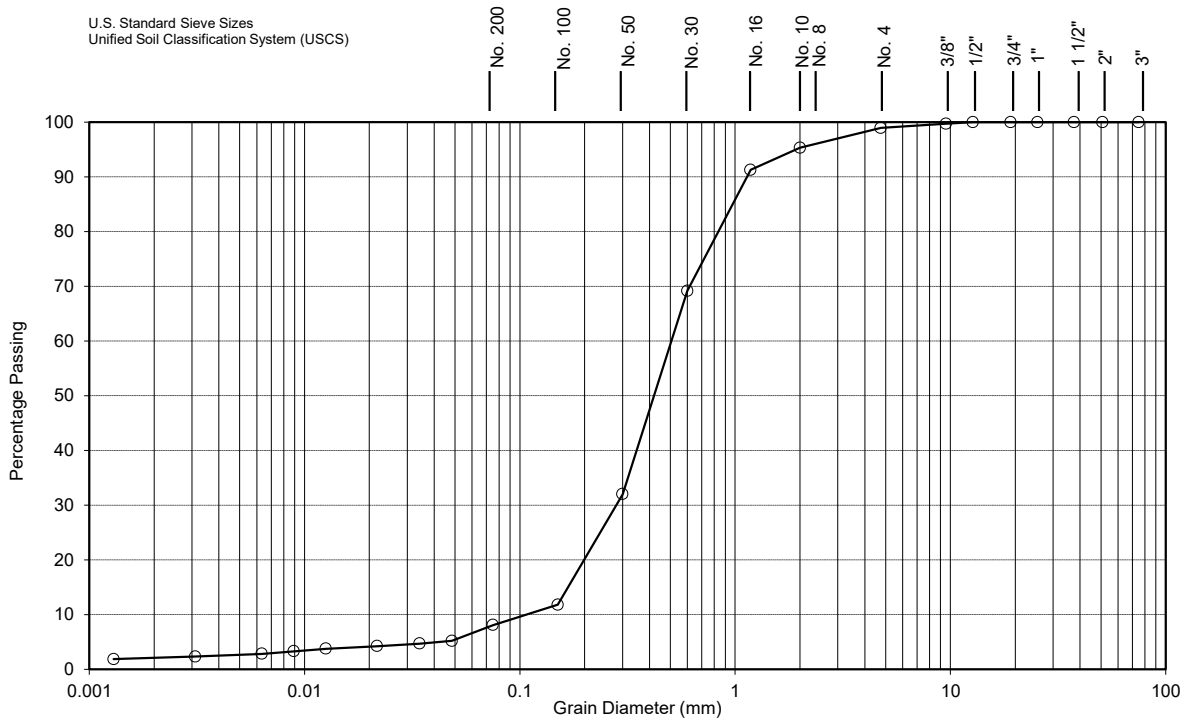
7581 Nichol Road 15, Elora ON

March 2022	**Grain Size Analysis No. 10**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

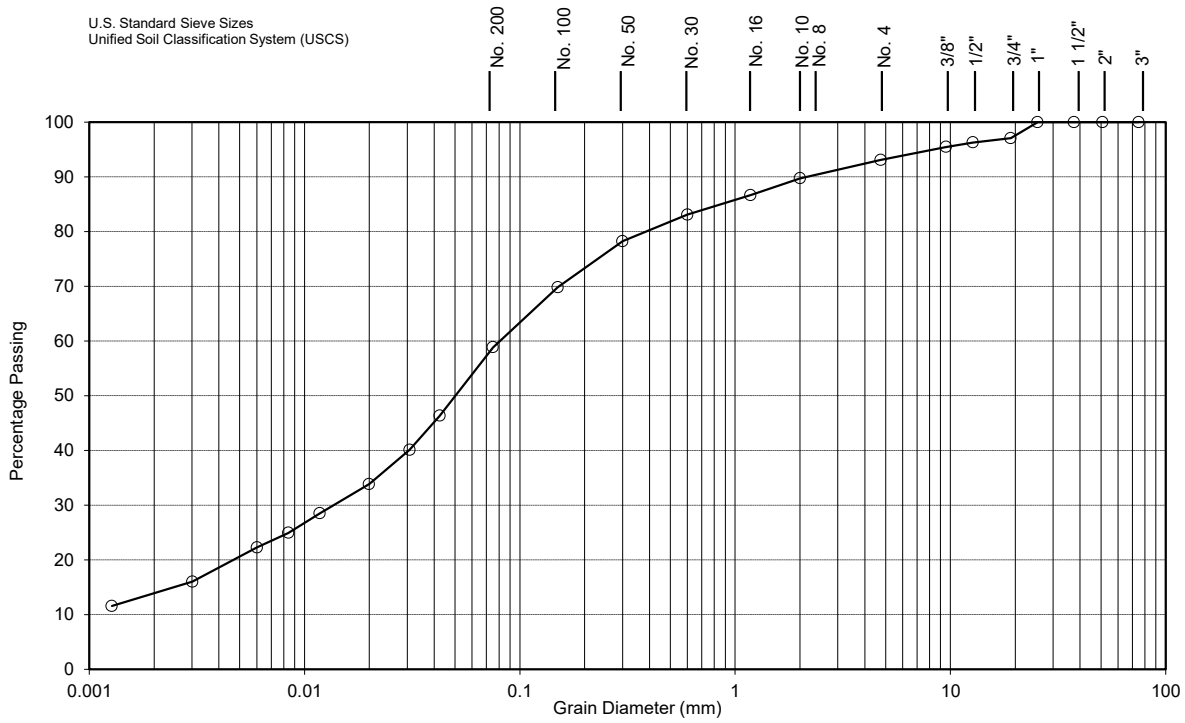
Lab No.:	**21-339**	Notes: Depth: 15'			
Borehole No.:	**102**				
Sample No.:	**6**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt, Clay and Gravel**		
SILT [%]:	**6**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**91**				
GRAVEL [%]:	**1**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.10**	Coefficient of Uniformity C_U:	**5.1**	Coefficient of Curvature C_C:	**1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 11**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

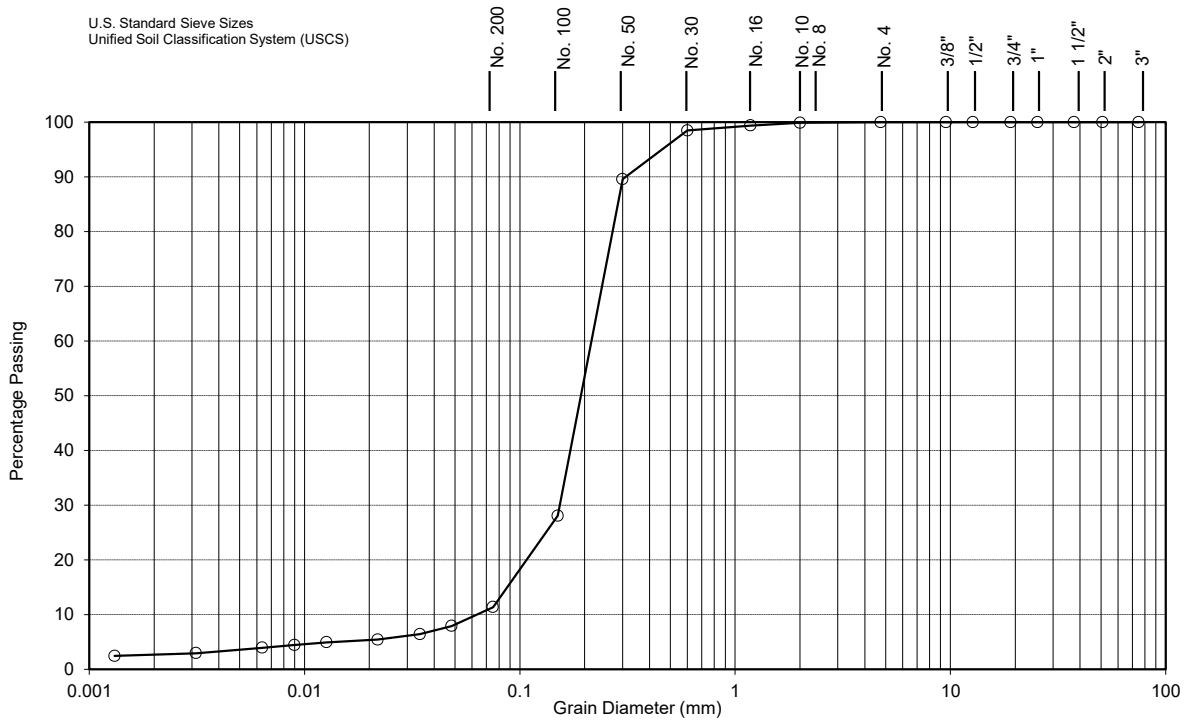
Lab No.:	**21-338**	Notes: Depth: 5'			
Borehole No.:	**103**				
Sample No.:	**3**				
CLAY [%]:	**14**	Soil Description:	**Brown Sandy Silt w/ some Clay and trace Gravel**		
SILT [%]:	**45**		**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity**		
SAND [%]:	**34**				
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] :	**10**	Estimated Permeability, k [cm/s]	**10^{-6}**
D_{10} (Effective Diam. in mm):	**0.00100**	Coefficient of Uniformity C_U:	**80.0**	Coefficient of Curvature C_C:	**2.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 12**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

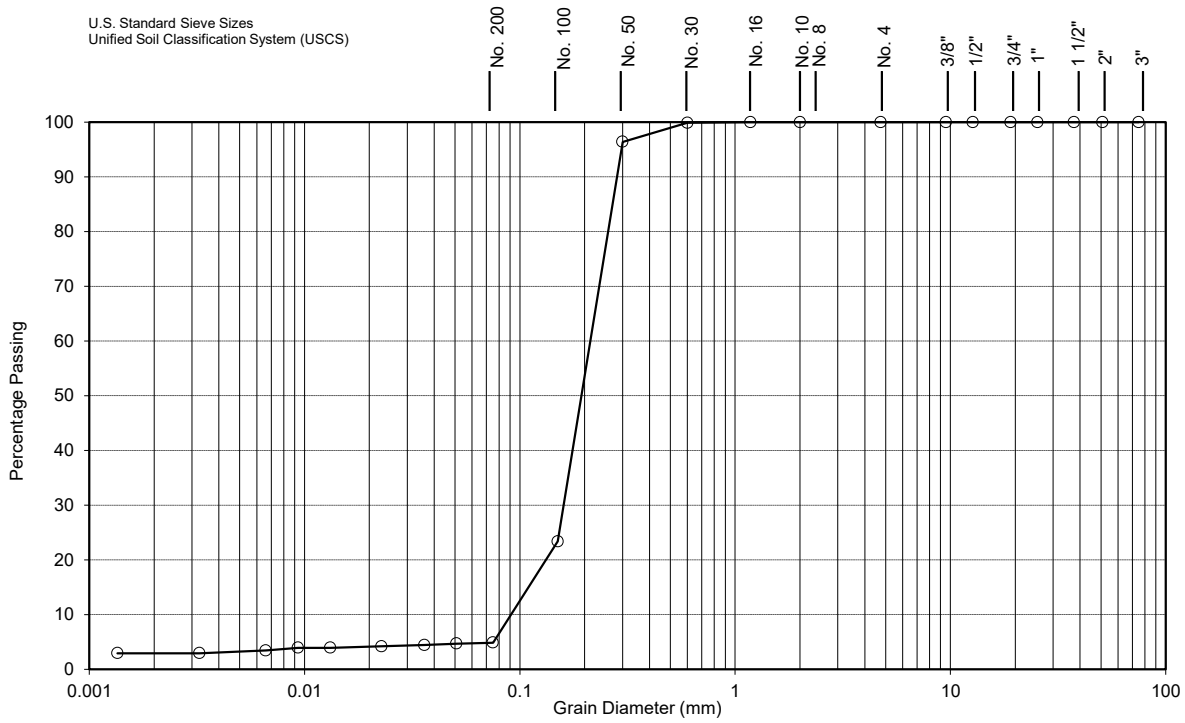
Lab No.:	**21-337**	Notes: Depth: 7.5'			
Borehole No.:	**104**				
Sample No.:	**4**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt and Clay**		
SILT [%]:	**9**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**89**				
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**100 to 150**	Estimated Permeability, k [cm/s]	**10^{-3} to 10^{-2}**
D_{10} (Effective Diam. in mm):	**0.0600**	Coefficient of Uniformity C_U:	**3.7**	Coefficient of Curvature C_C:	**1.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

August 2021	**Grain Size Analysis No. 13**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

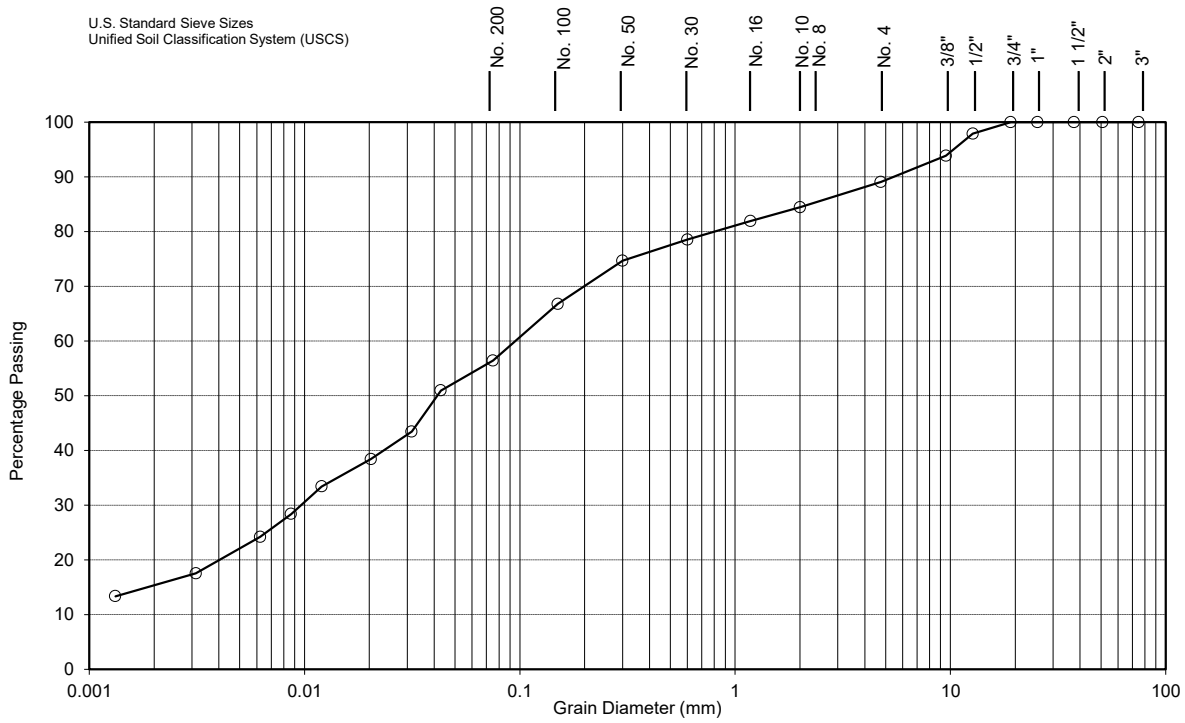
Lab No.:	**22-096**	Notes: Depth: 5'			
Borehole No.:	**302**				
Sample No.:	**2**				
CLAY [%]:	**2**	Soil Description:	**Brown Sand w/ traces of Silt and Clay**		
SILT [%]:	**3**		**S.P. - Poorly graded sands, little or no fines**		
SAND [%]:	**95**				
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**150 to 300**	Estimated Permeability, k [cm/s]	**10^{-2}**
D_{10} (Effective Diam. in mm):	**0.09**	Coefficient of Uniformity C_U:	**2.3**	Coefficient of Curvature C_C:	**1.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 14**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

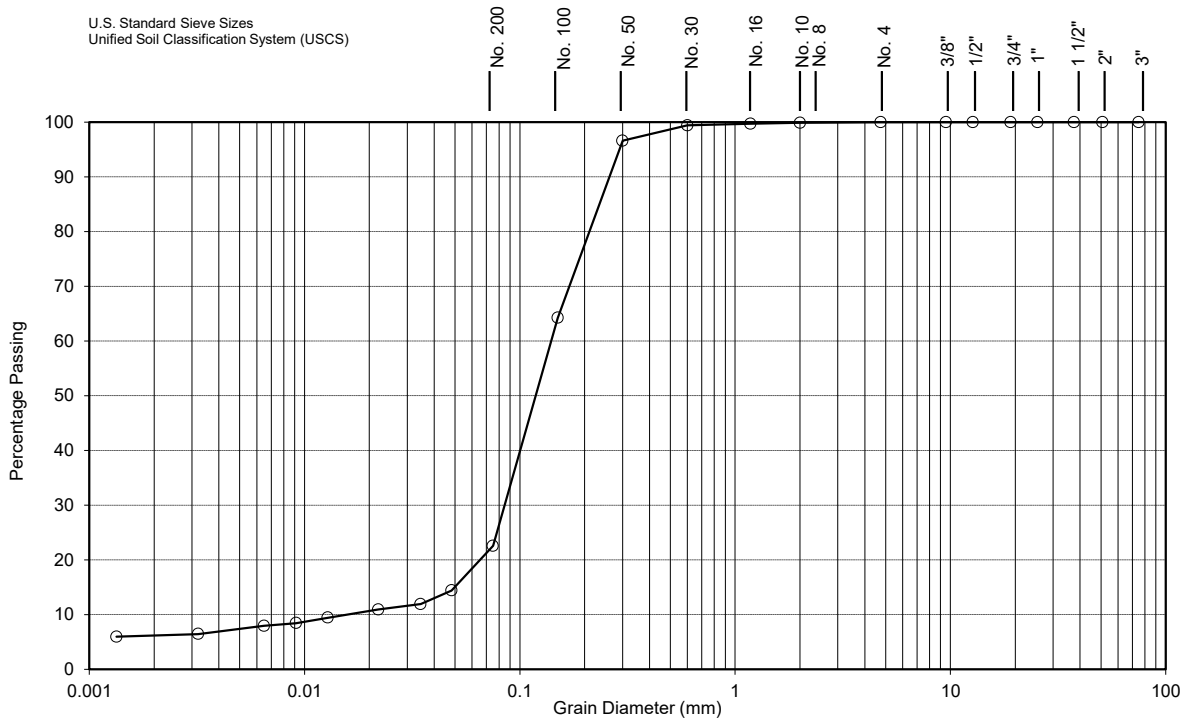
Lab No.:	**22-097**	Notes: Depth: 5'			
Borehole No.:	**304**				
Sample No.:	**2**				
CLAY [%]:	**16**	Soil Description: **Brown Sandy Silt w/ some Clay and Gravel**			
SILT [%]:	**40**	**M.L. - Inorganic silts and very fine sands, silty or clayey fine sands, clayey silts with slight plasticity to S.M. - Sand-silt mixtures**			
SAND [%]:	**33**				
GRAVEL [%]:	**11**	Estimated Infiltration Rate [mm/hr] :	**10**	Estimated Permeability, k [cm/s]	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0009**	Coefficient of Uniformity C_U:	**103.3**	Coefficient of Curvature C_C:	**1.1**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 15**	**Project No.: SM 301951-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

Lab No.:	**22-098**	Notes: Depth: 5'			
Borehole No.:	**305**				
Sample No.:	**2**				
CLAY [%]:	**7**	Soil Description:	**Brown Sand w/ some Silt and a trace of Clay**		
SILT [%]:	**16**		**S.M. - Sand-silt mixtures, silty sands**		
SAND [%]:	**77**				
GRAVEL [%]:	**0**	Estimated Infiltration Rate [mm/hr] :	**50 to 60**	Estimated Permeability, k [cm/s]	**10^{-4}**
D_{10} (Effective Diam. in mm):	**0.015**	Coefficient of Uniformity C_U:	**10.0**	Coefficient of Curvature C_C:	**3.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

75 Woolwich Street East, Elora ON

March 2022	**Grain Size Analysis No. 16**	**Project No.: SM 301951-T**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

401 Grays Road · Hamilton, ON · L8E 2Z3

www.soil-mat.ca info@soil-mat.ca 905.318.7440 905.318.7455

PROJECT NO.: SM 241154-G September 22, 2025

CACHET DEVELOPMENTS
361 CONNIE CRESCENT, SUITE 200
Concord, Ontario
L4K 5R2

Attention: Brendan Walton, P. Eng.
Engineering Manager, Land Development

SUPPLEMENTAL GROUNDWATER DATA
PROPOSED RESIDENTIAL DEVELOPMENT
CLAYTON AND ELORA SANDS
ELORA, ONTARIO

Dear Mr. Walton,

Further to the recent request and correspondence with MTE Consultants, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has prepared the following brief updated groundwater level summary based on information collected between February 24, 2025 to May 13, 2025. This information is further to our preliminary hydrogeological assessment reports for the development lands [SM 301951-G, dated June 17, July 20, 2022 and August 19, 2024], and should be referenced in conjunction with those reports.

Groundwater Observations

Monitoring wells were installed at Borehole Nos. 004, 101, 102, 104, 201, 201A, 202, 203, 204, 205, 206, 301 through 305, 401, 501 and 502 to allow for future measurements of the static groundwater level. Monitoring data up to May 2023 was presented in the prior referenced reports. A data logger was maintained in each of the monitoring wells to allow for further continuous monitoring of the groundwater level between March 2025 to May 2025, the readings of which have been illustrated in graphs which can be found appended to the end of this report. It is noted ground water monitoring is ongoing through the summer and fall of 2025.

In addition, manual monitoring well readings were also taken from all of the installed monitoring well locations across the site on various dates, ranging from February to May 2025. These have been summarized in the following charts. As well, the detailed plots of continuous groundwater levels for each monitoring well are appended.

TABLE A
SUMMARY OF MANUAL GROUNDWATER READINGS (ELORA SANDS)

Borehole No. 004 (Ground Surface Elevation of 404.68 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	2.74	401.9
August 27, 2021	1.75	402.9
February 23, 2022	1.33	403.4
April 22, 2022	1.47	403.2
June 1, 2022	1.78	402.9
May 3, 2023	1.20	403.5
May 13, 2025	1.77	402.9

Borehole No. 201 (Ground Surface Elevation of 404.80 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.69	402.1
April 22, 2022	1.88	402.9
June 1, 2022	2.44	402.4
May 3, 2023	1.88	402.9
May 13, 2025	2.13	402.7

Borehole No. 201A (Ground Surface Elevation of 404.75 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.8
April 22, 2022	2.05	402.7
June 1, 2022	2.43	402.3
May 3, 2023	1.71	403.1

Borehole No. 202 (Ground Surface Elevation of 406.59 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	5.5	401.1
April 22, 2022	4.76	401.8
June 1, 2022	5.43	401.2
May 3, 2023	4.51	402.1
May 13, 2025	5.17	401.4

Borehole No. 203 (Ground Surface Elevation of 407.13 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	Dry	<401.0
April 22, 2022	5.90	401.2

June 1, 2022	5.91	401.2
May 3, 2023	Dry	<401.0
May 13, 2025	5.91	401.2

Borehole No. 204 (Ground Surface Elevation of 409.56 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.81	406.7
April 22, 2022	1.16	408.4
June 1, 2022	1.53	408.0
May 3, 2023	1.20	408.4
May 13, 2025	1.59	408.0

Borehole No. 205 (Ground Surface Elevation of 412.99 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	2.56	410.4
April 22, 2022	2.25	410.7
June 1, 2022	2.39	410.6
May 3, 2023	2.34	410.6
May 13, 2025	2.32	410.7

Borehole No. 206 (Ground Surface Elevation of 412.88 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 17, 2022	6.83	406.1
April 22, 2022	4.60	408.3
June 1, 2022	4.66	408.2
May 3, 2023	4.76	408.1
May 13, 2025	4.55	408.3

Borehole No. 401 (Ground Surface Elevation of 419.77 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
April 22, 2022	2.29	417.5
June 1, 2022	2.39	417.4
May 3, 2023	2.31	417.5
May 13, 2025	2.44	417.3

TABLE B
SUMMARY OF MANUAL GROUNDWATER READINGS (CLAYTON LANDS)

Borehole No. 101 (Ground Surface Elevation of 407.50 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	4.78	402.7
August 27, 2021	4.71	402.8
October 14, 2021	4.33	403.2
February 23, 2022	4.31	403.2
April 22, 2022	4.07	403.4
June 1, 2022	4.15	403.3
May 3, 2023	4.06	403.4
May 13, 2025	4.12	403.4

Borehole No. 102 (Ground Surface Elevation of 413.0 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	3.58	409.4
August 27, 2021	3.61	409.4
October 14, 2021	3.62	409.4
February 23, 2022	3.50	409.5
April 22, 2022	2.89	410.1
June 1, 2022	3.05	409.9
May 3, 2023	3.00	410.0
May 13, 2025	2.82	410.2

Borehole No. 104 (Ground Surface Elevation of 414.2 metres)		
	Groundwater Depth (m)	Groundwater Elevation (m)
August 6, 2021	6.78	407.4
August 27, 2021	6.96	407.2
October 14, 2021	7.09	407.1
February 23, 2022	6.83	407.3
April 22, 2022	6.13	408.1
June 1, 2022	6.28	407.9
May 3, 2023	6.56	407.6
May 13, 2025	6.24	407.9

Borehole No. 301 (Ground Surface Elevation of 412.81 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.29	406.5
April 22, 2022	5.65	407.1

June 1, 2022	5.71	407.0
May 3, 2023	5.85	406.9
May 13, 2025	5.59	407.2

Borehole No. 302 (Ground Surface Elevation of 413.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	6.62	406.4
April 22, 2022	6.06	406.9
June 1, 2022	6.12	406.9
May 3, 2023	6.35	406.7
May 13, 2025	6.03	407.0

Borehole No. 303 (Ground Surface Elevation of 414.00 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	5.40	408.6
April 22, 2022	6.04	407.9
June 1, 2022	6.11	407.9
May 3, 2023	6.41	407.6
May 13, 2025	5.98	408.0

Borehole No. 304 (Ground Surface Elevation of 407.90 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	2.87	405.0
April 22, 2022	2.60	405.3
June 1, 2022	2.96	404.9
May 3, 2023	2.42	405.5
May 13, 2025	2.72	405.2

Borehole No. 305 (Ground Surface Elevation of 407.48 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
February 23, 2022	Dry	<404.6
April 22, 2022	Dry	<404.6
June 1, 2022	Dry	<404.6
May 3, 2023	Dry	<404.6
May 13, 2025	Dry	<404.6

Borehole No. 501 (Ground Surface Elevation of 412.80 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
May 13, 2025	3.78	409.0

Borehole No. 502 (Ground Surface Elevation of 413.60 metres)*		
	Groundwater Depth (m)	Groundwater Elevation (m)
May 13, 2025	3.27	410.3

*Ground surface elevations have been interpolated based on contours from current topographic survey

The water level readings are noted to be reasonably consistent between May 2023 and May 2025, indicative of the seasonal high groundwater levels. As such the previously prepared groundwater contour plan for the site would be considered valid. This has been appended for reference.

As noted above, continuous collection of groundwater data in each of the monitoring wells is ongoing. This information will be updated in late 2025, or sooner as may be warranted.

We trust that this brief supplemental information is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

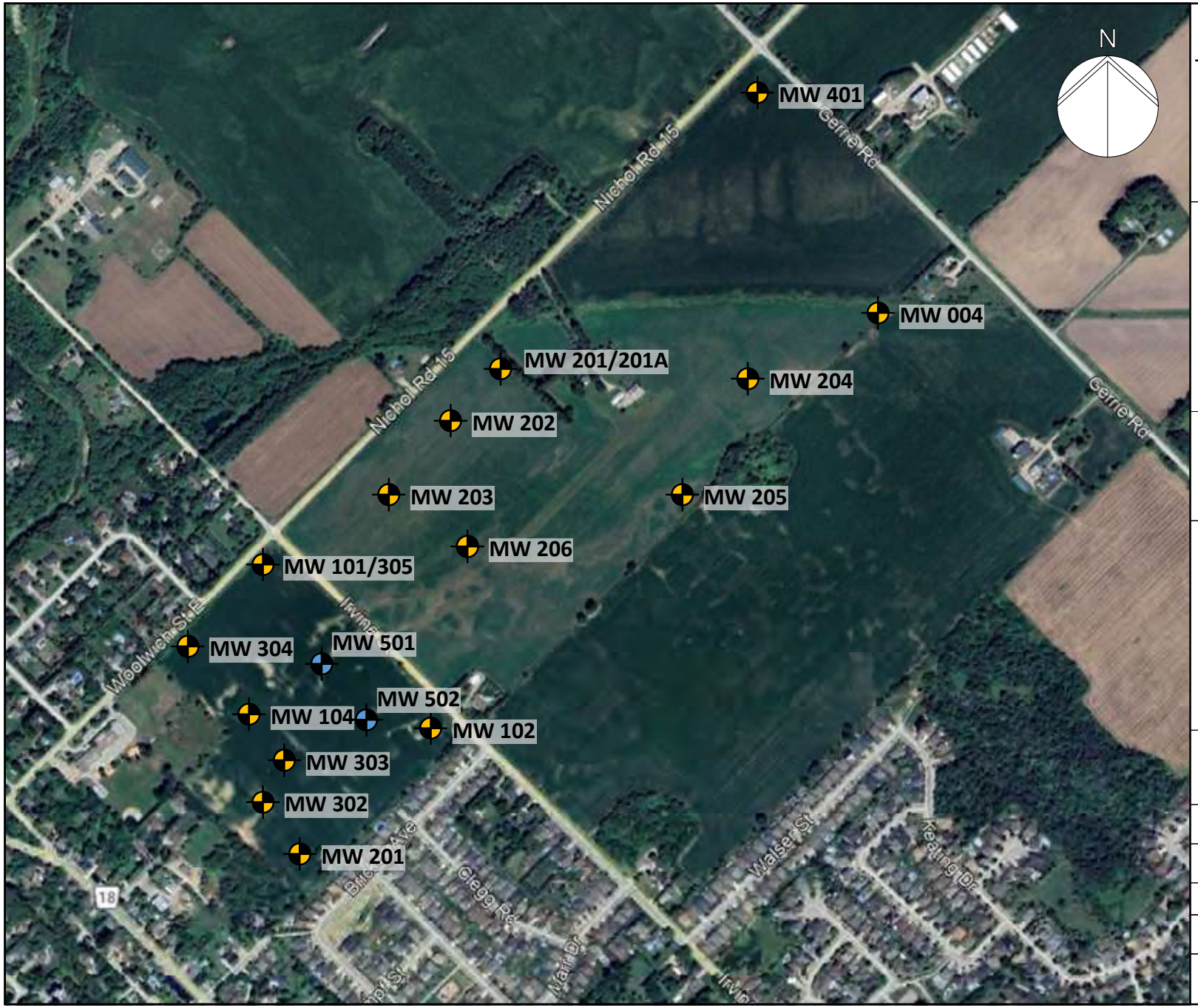
Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Kevin Reid, P. Eng.
Project Engineer

Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Drawing No. 2, Groundwater Contour Plan
Drawing No. 3A-C, Groundwater Contour Plans
Groundwater Monitoring Well Plots

Distribution: Cachet Developments [pdf]



LEGEND

BH/MW# Borehole Location

MW# Previous Monitoring Well

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Borehole locations are approximate.

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ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
Elora Sands/Clayton Lands
Elora, Ontario

Proposed Borehole Location Plan

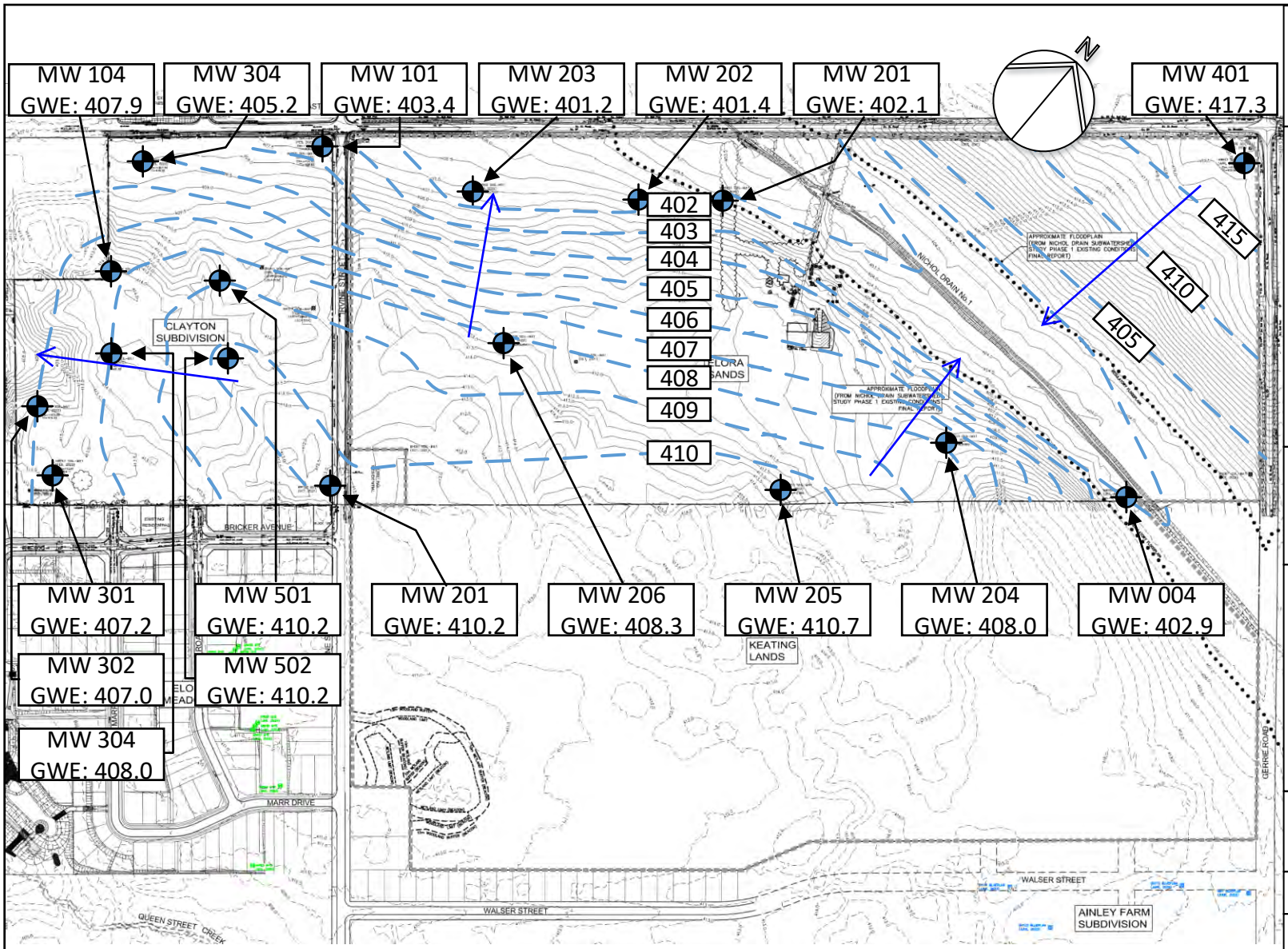
Project No. SM 241154-G

Date: August, 2025

Drawn: MG

Checked: IS

Drawing No. 1



LEGEND

Soil-Mat Monitoring Well Location

MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Drawing Ref: Existing Conditions Plan, MTE, Drawing No. EC2.1, dated January 29, 2025

3. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Clayton Lands
Elora, Ontario

Groundwater Contour Map

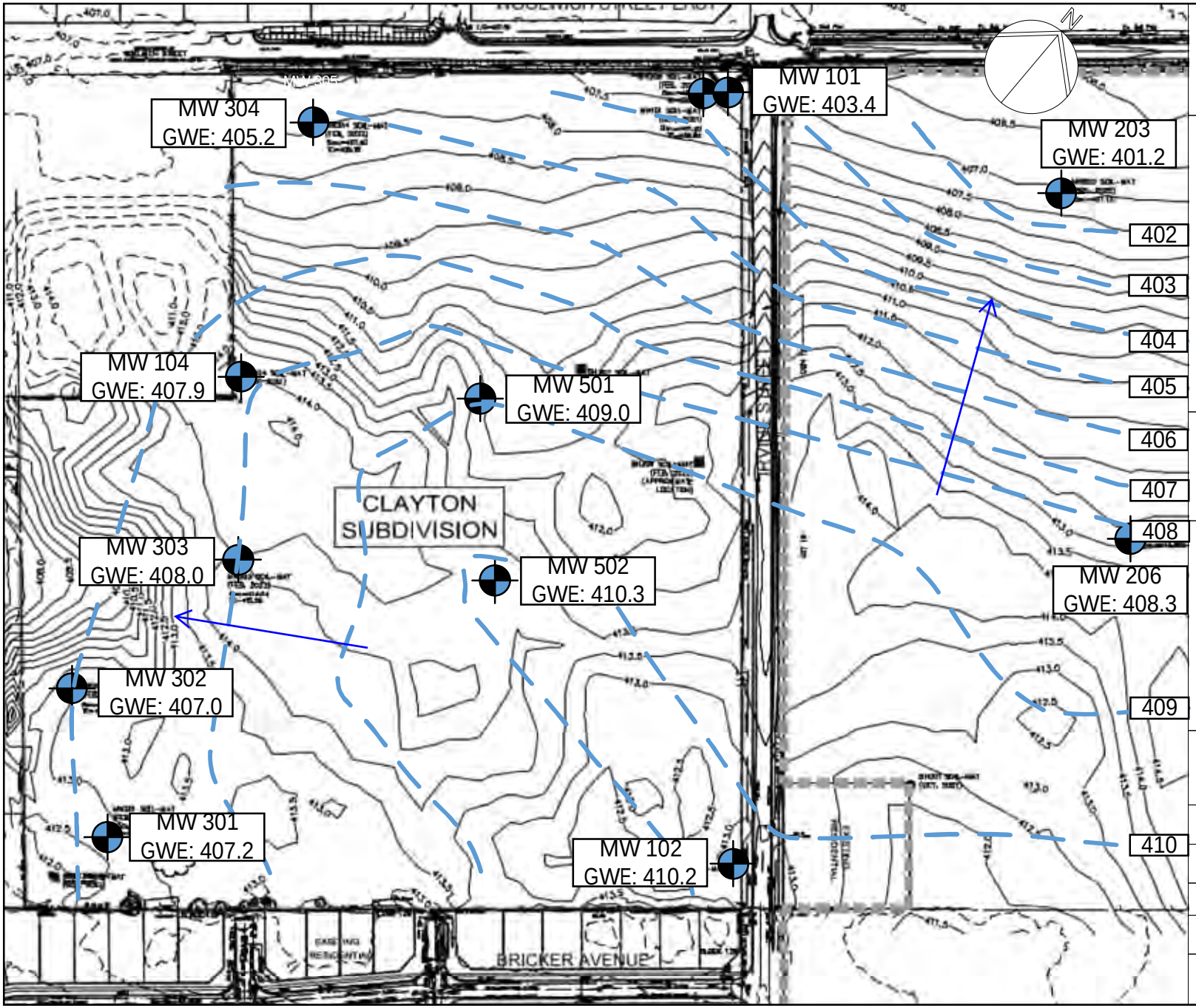
Project No. SM 241154-G

Date: September 2025

Drawn: KJR | Checked: IS

SM 241154-G Groundwater Contour Map

Drawing No. 2



LEGEND

Soil-Mat Monitoring Well Location

MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Drawing Ref: Existing Conditions Plan, MTE, Drawing No. EC2.1, dated January 29, 2025

3. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Clayton Lands
Elora, Ontario

Groundwater Contour Map

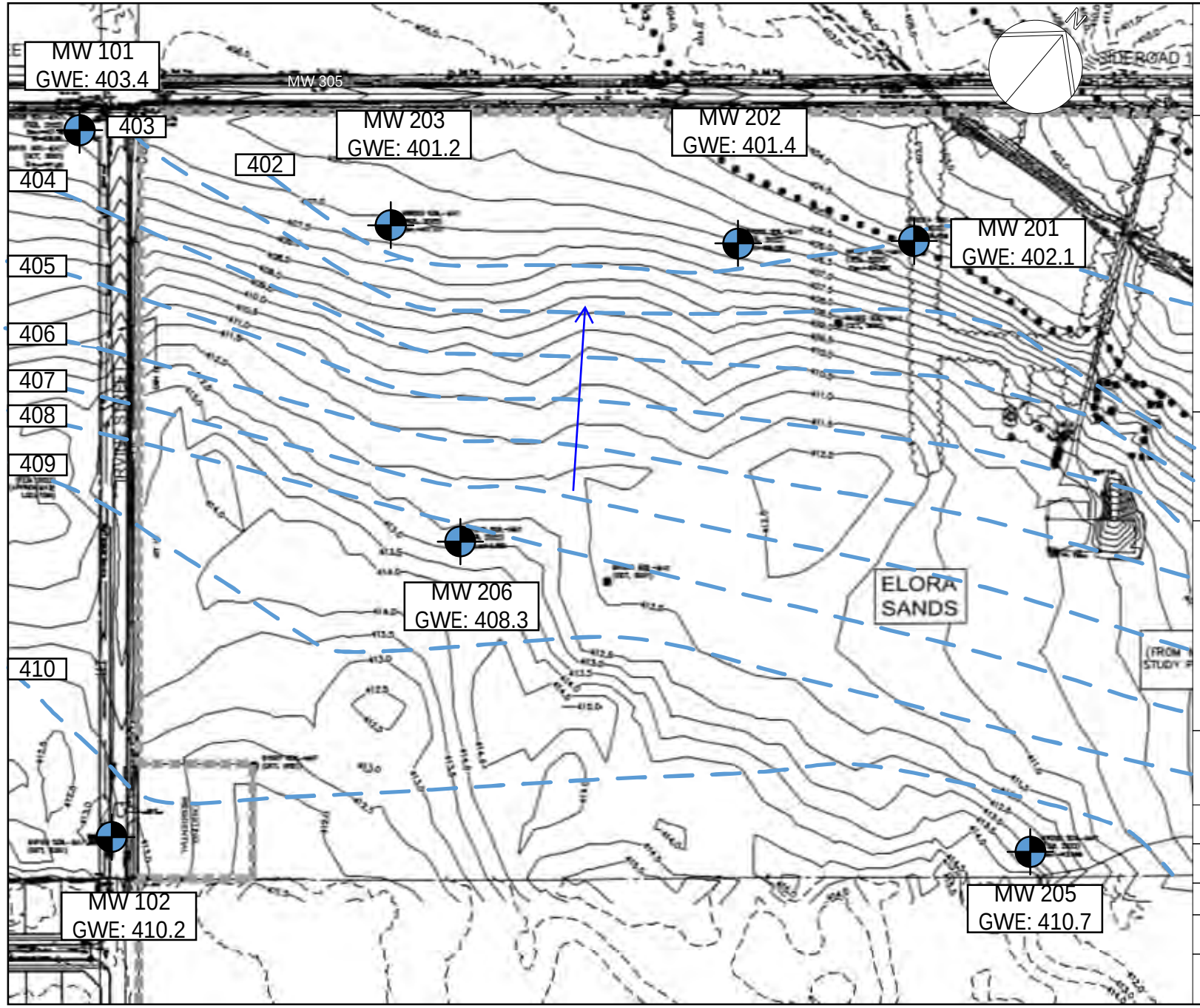
Project No. SM 241154-G

Date: September 2025

Drawn: KJR | Checked: IS

SM 241154-G Groundwater Contour Map

Drawing No. 3A



LEGEND

Soil-Mat Monitoring Well Location

MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Drawing Ref: Existing Conditions Plan, MTE, Drawing No. EC2.1, dated January 29, 2025

3. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Clayton Lands
Elora, Ontario

Groundwater Contour Map

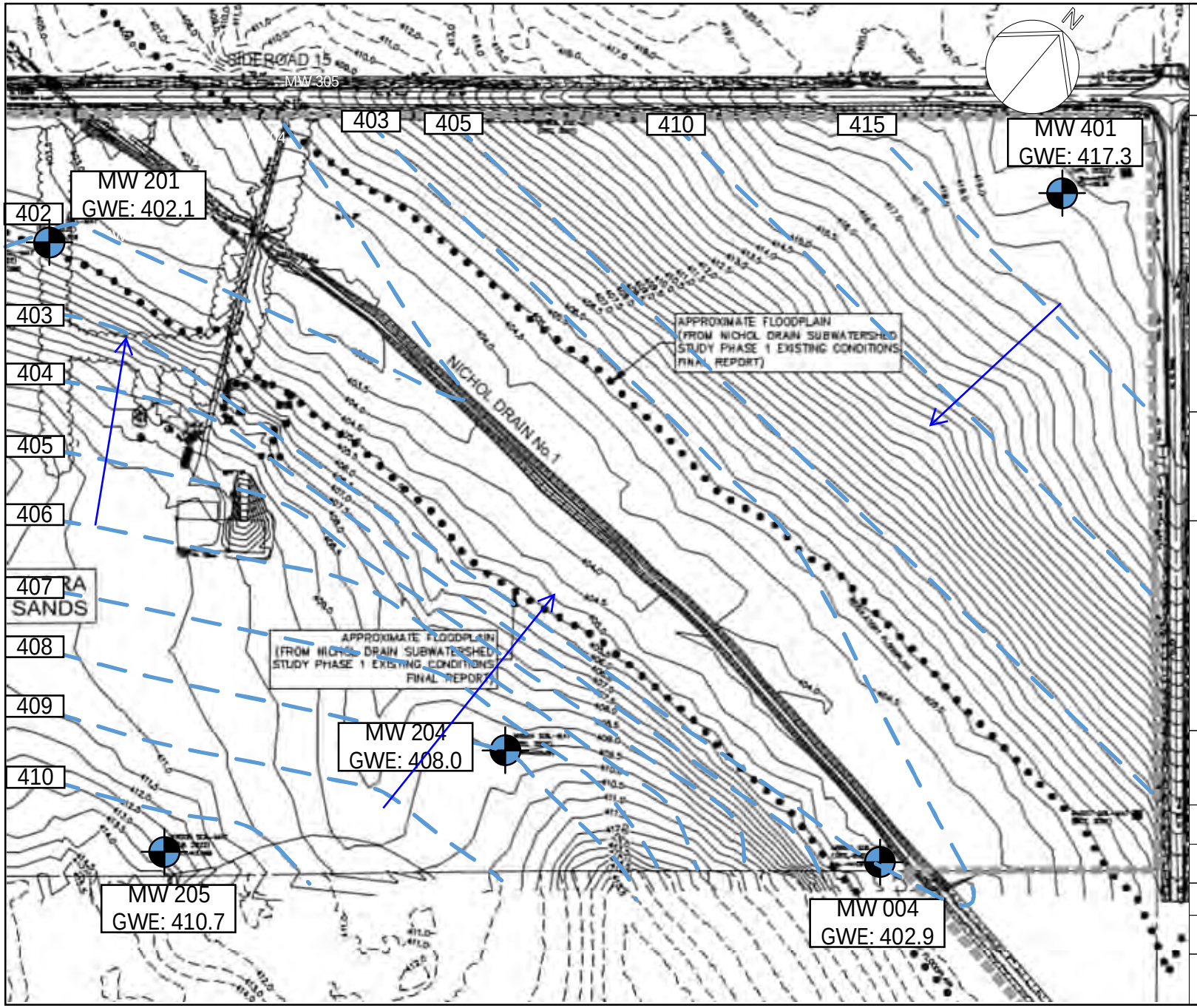
Project No. SM 241154-G

Date: September 2025

Drawn: KJR | Checked: IS

SM 241154-G Groundwater Contour Map

Drawing No. 3B



LEGEND

Soil-Mat Monitoring Well Location

MW#

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 241154-G.

2. Drawing Ref: Existing Conditions Plan, MTE, Drawing No. EC2.1, dated January 29, 2025

3. Borehole locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Hydrogeological Considerations
Clayton Lands and Elora Sands
Elora, Ontario

Groundwater Contour Map

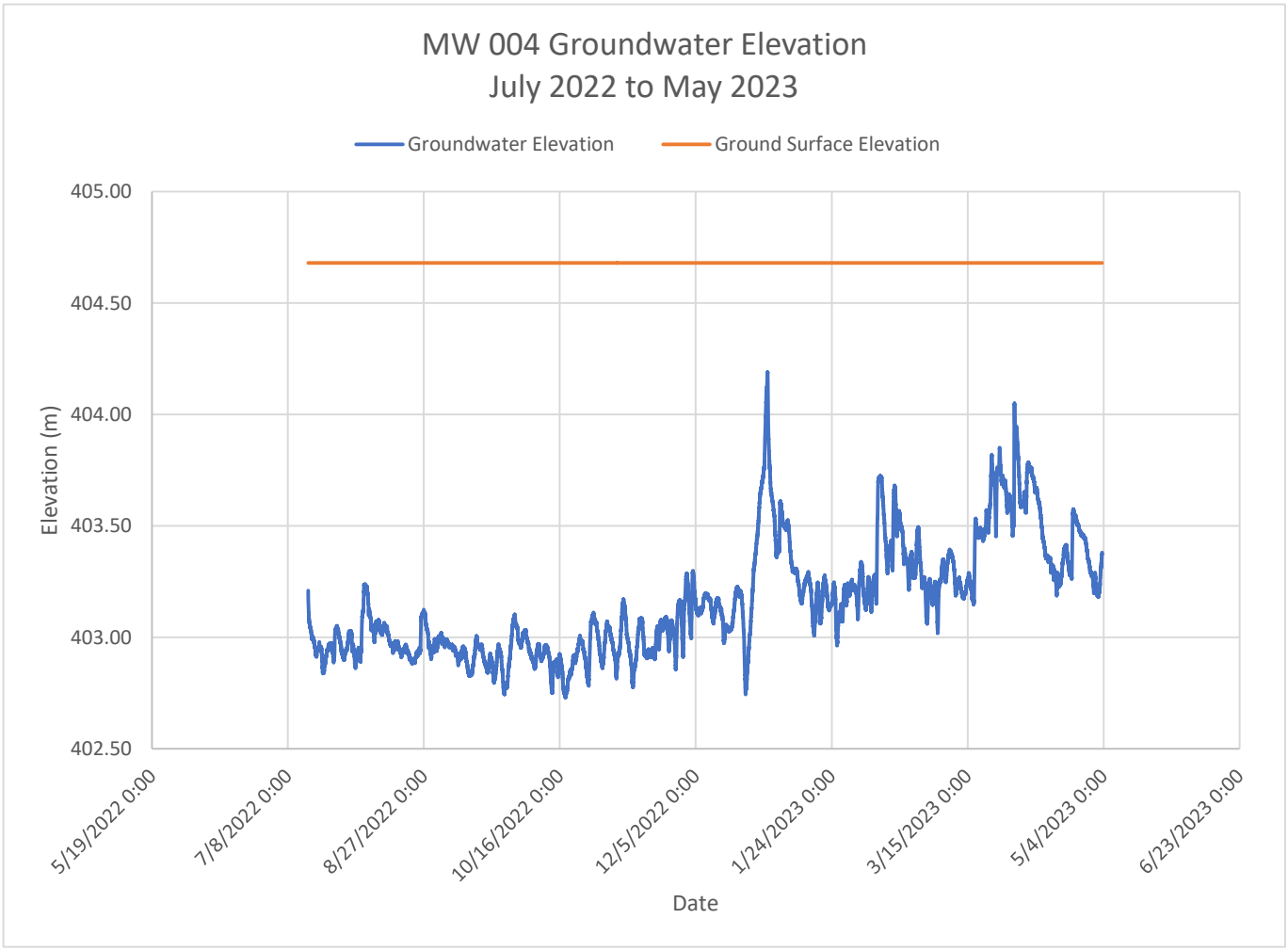
Project No. SM 241154-G

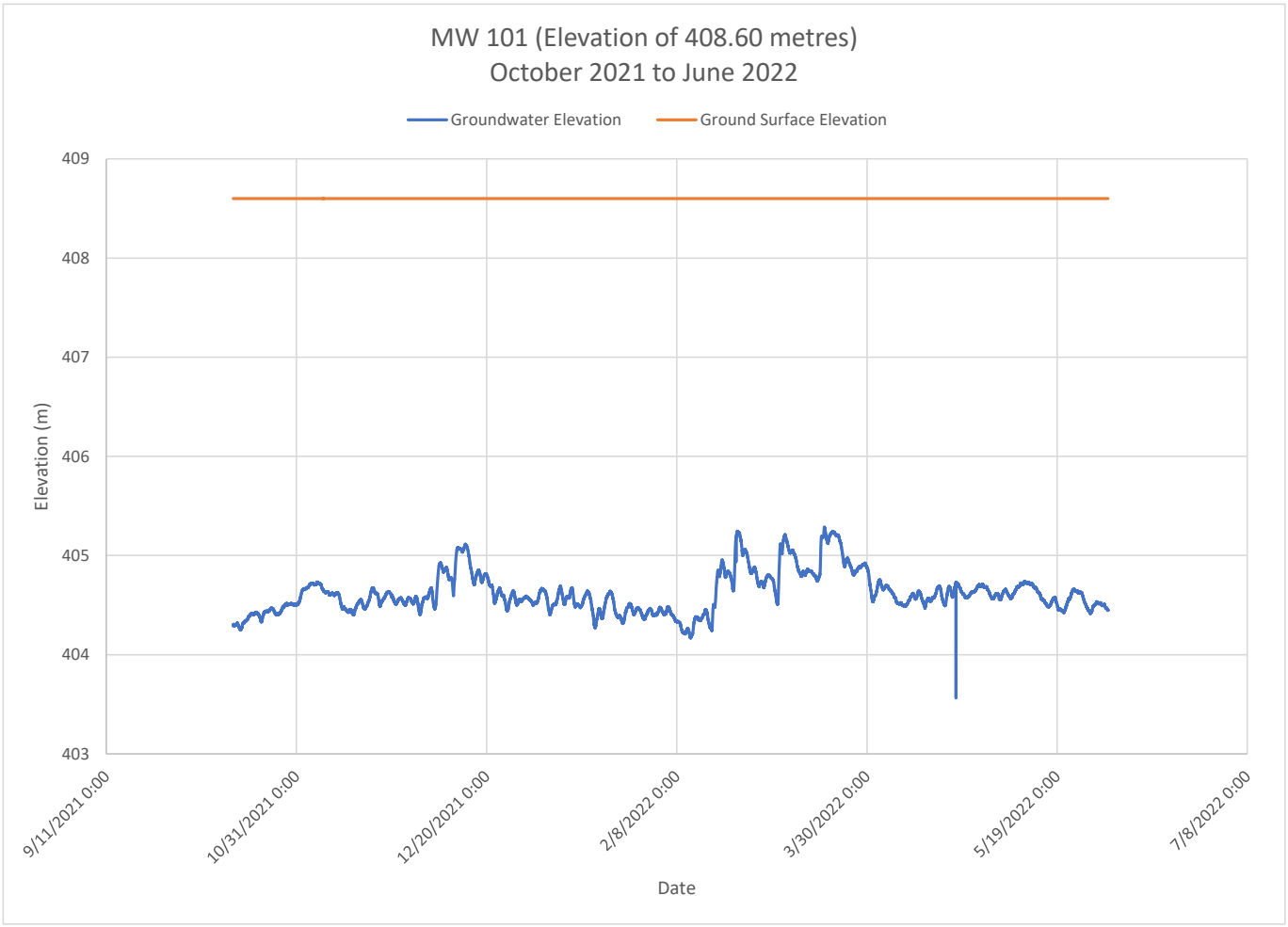
Date: September 2025

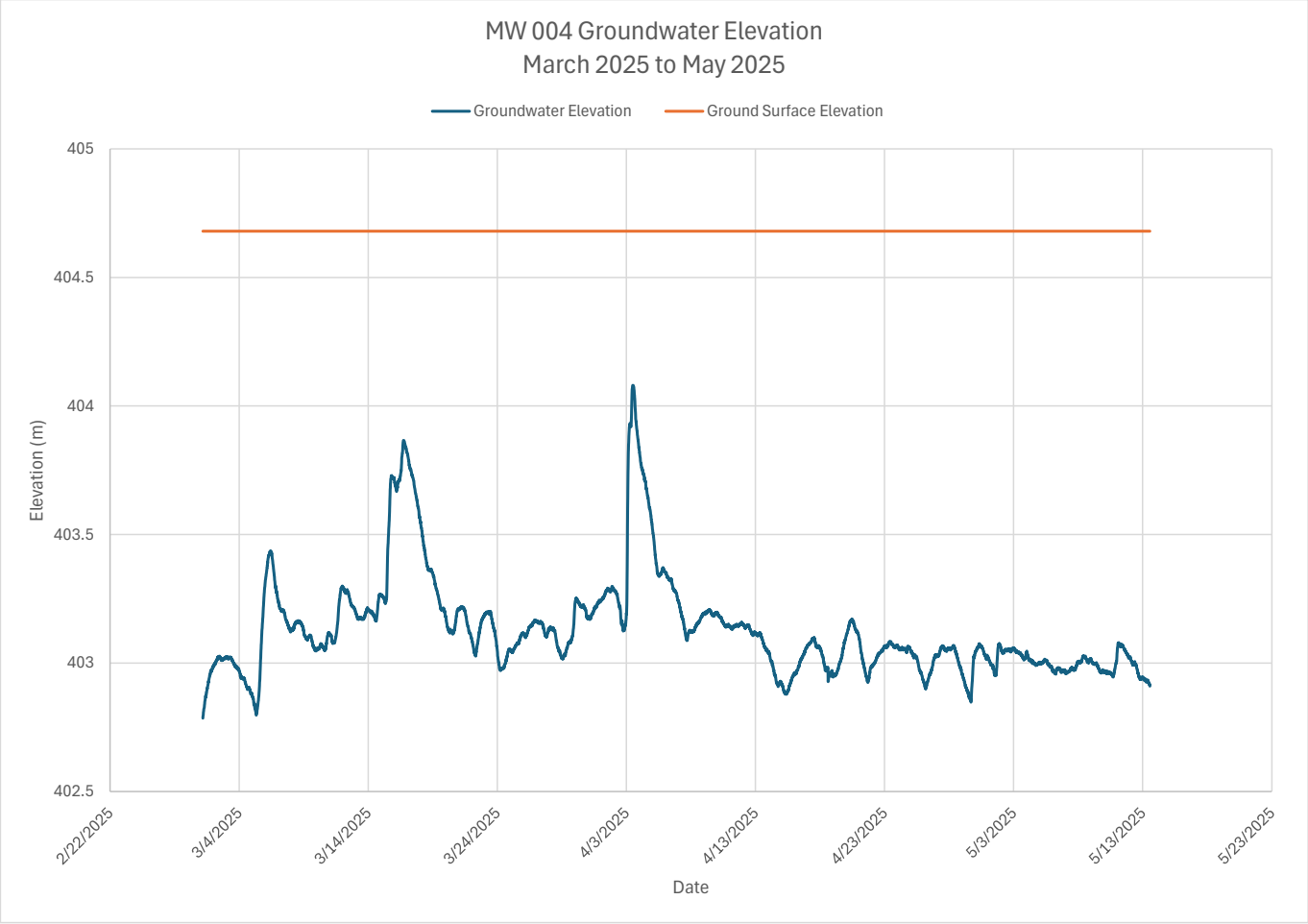
Drawn: KJR | Checked: IS

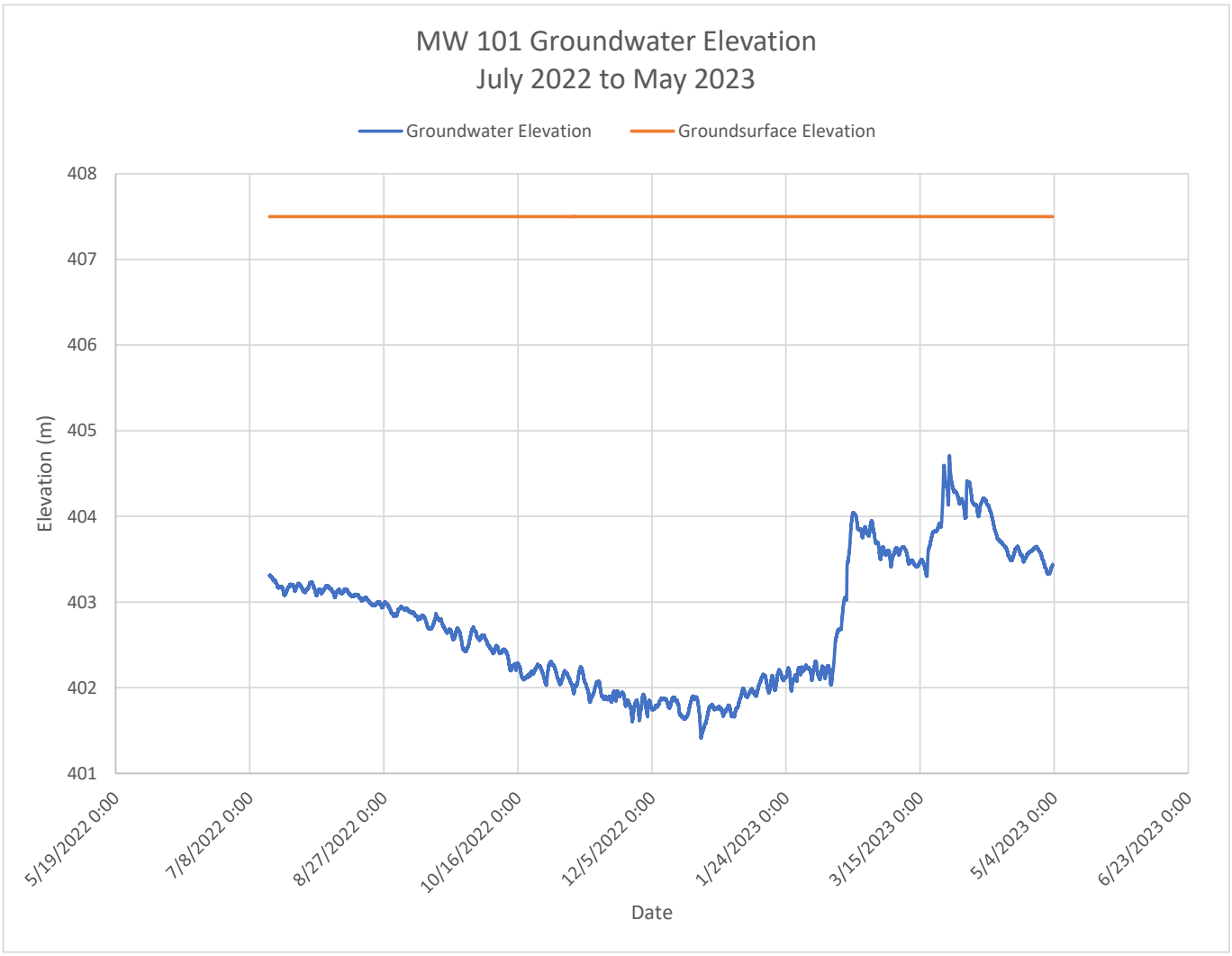
SM 241154-G Groundwater Contour Map

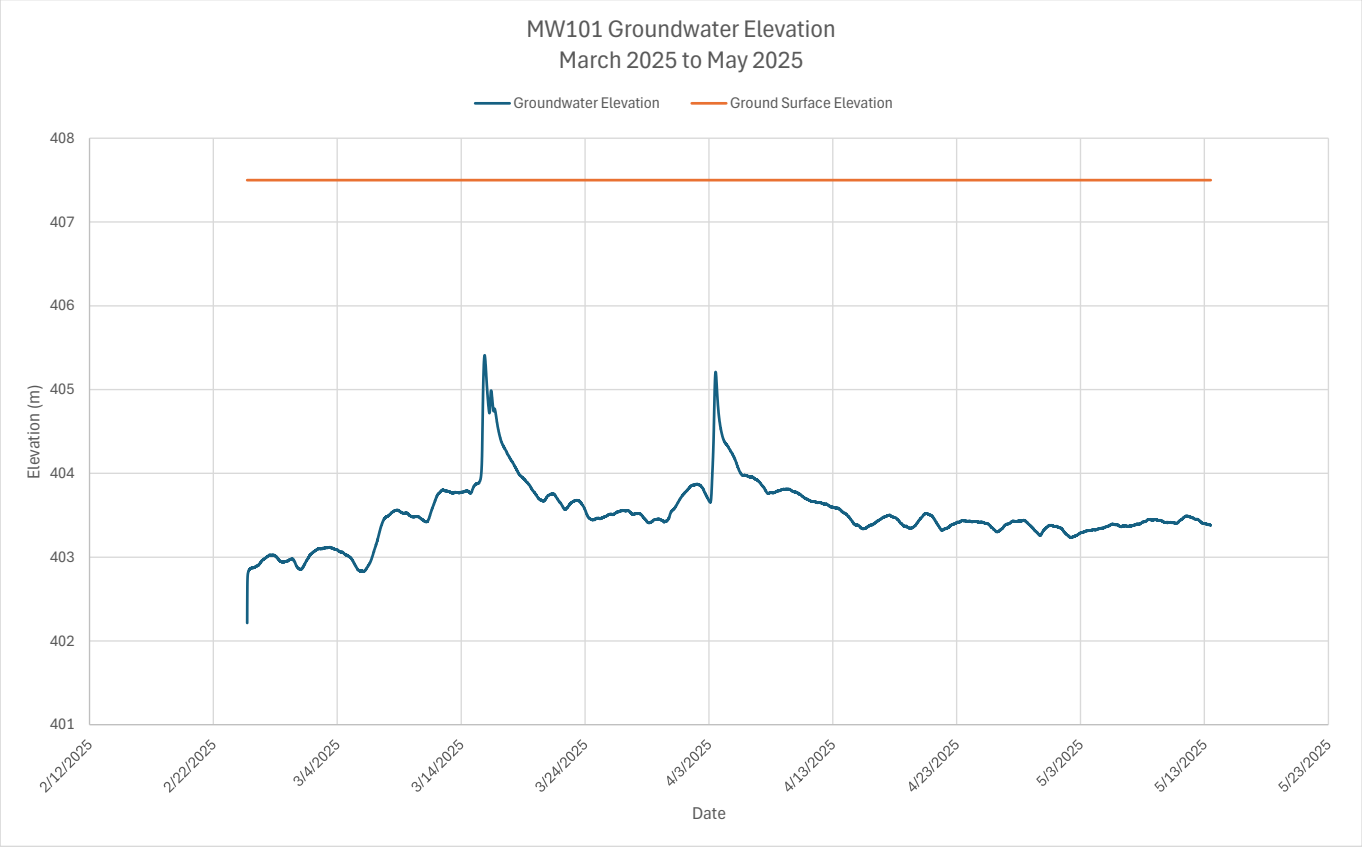
Drawing No. 3C

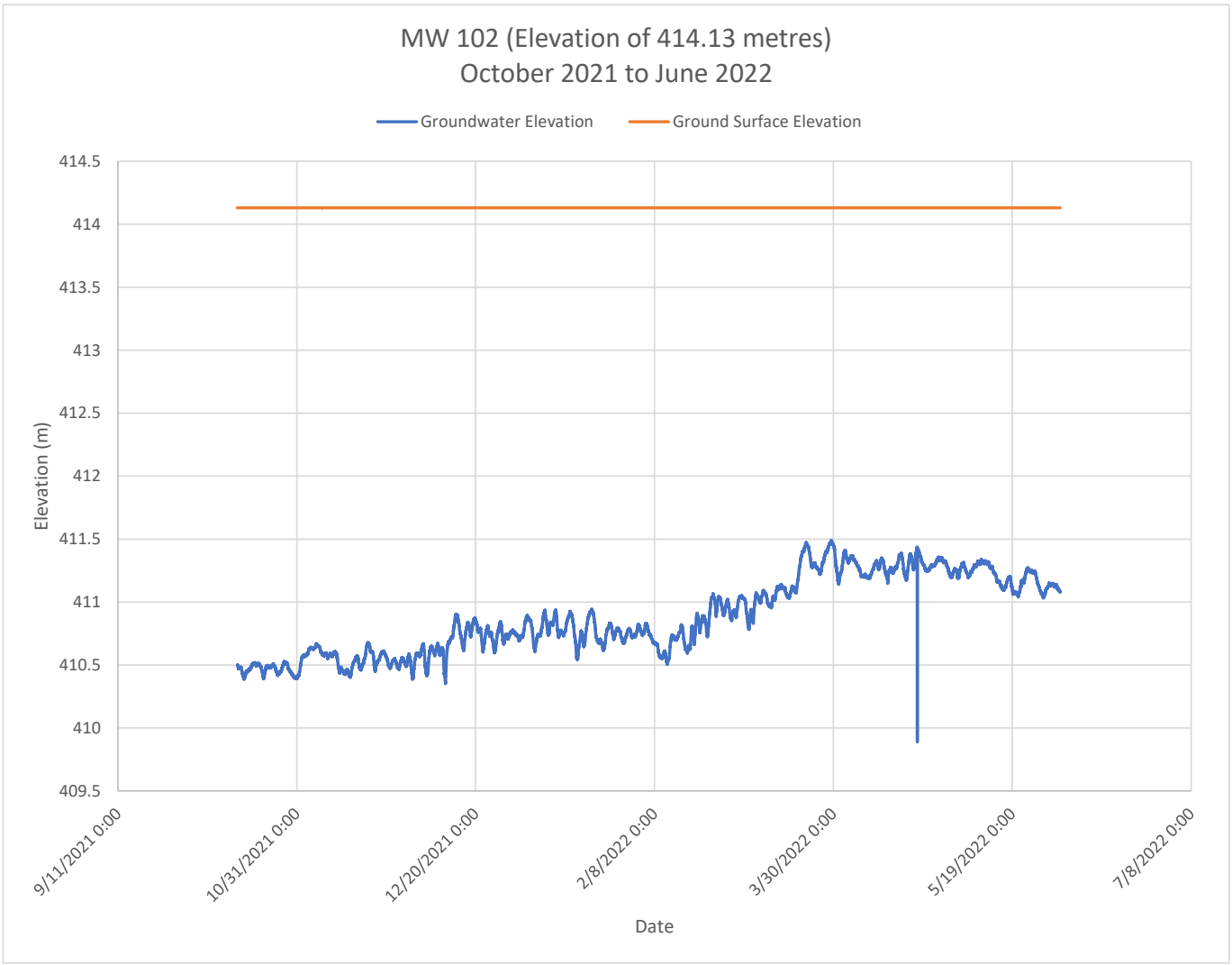

MW 004 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
405.00
404.50
404.00
403.50
403.00
402.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

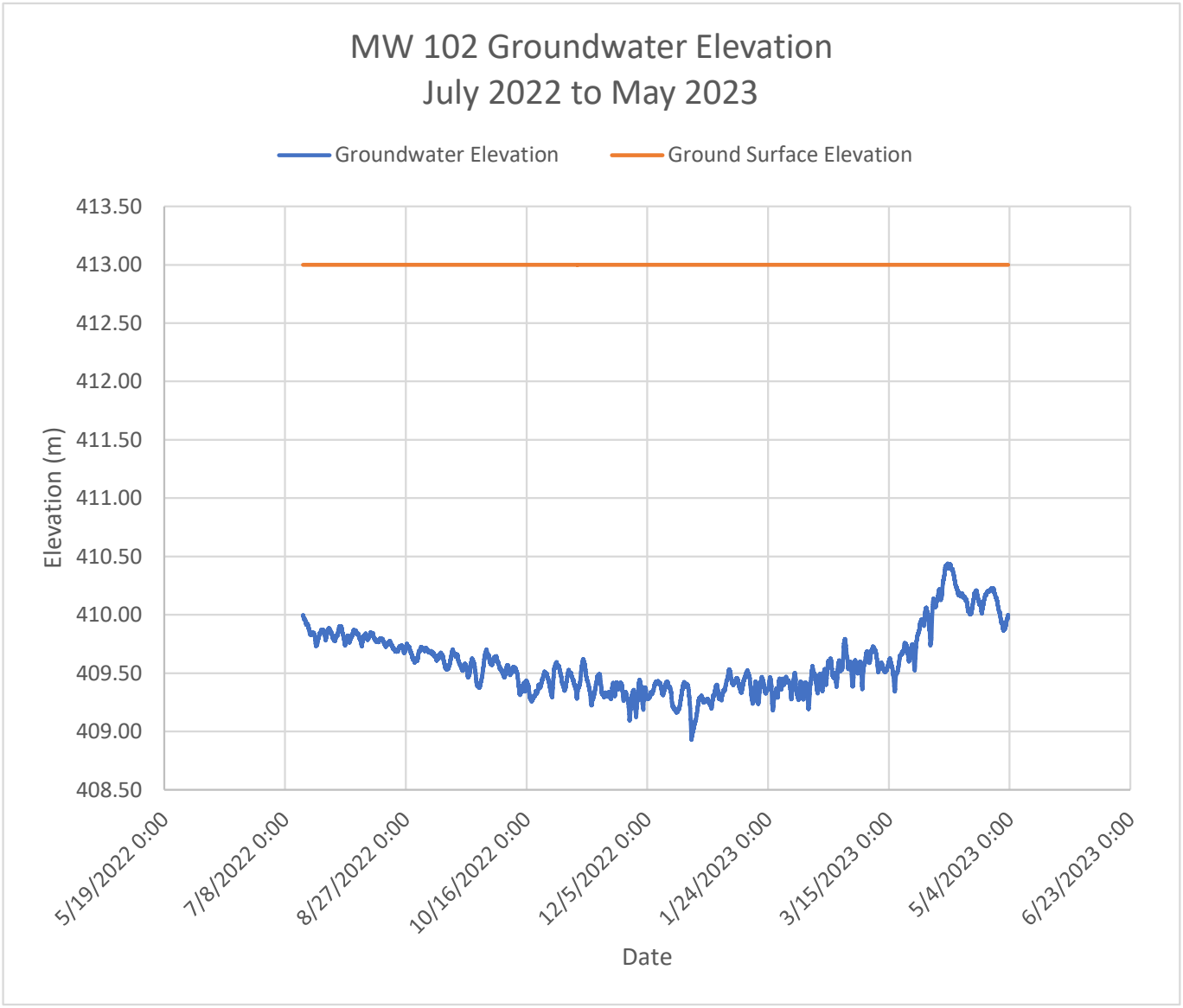

MW 101 (Elevation of 408.60 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
409
408
407
406
405
404
403
Elevation (m)
9/11/2021 0:00
10/31/2021 0:00
12/20/2021 0:00
2/8/2022 0:00
3/30/2022 0:00
5/19/2022 0:00
7/8/2022 0:00
Date

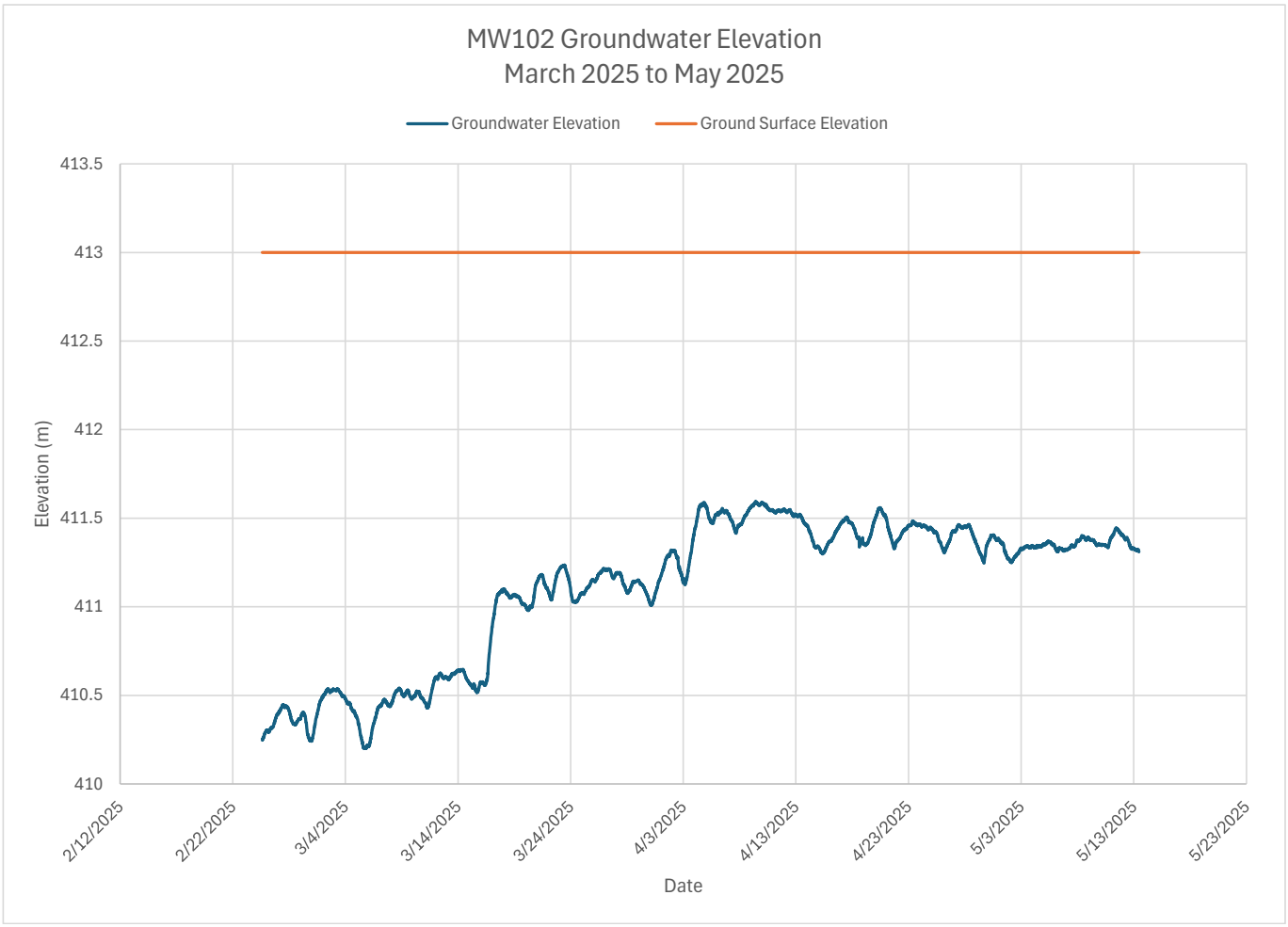

MW 004 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
405
404.5
404
403.5
403
402.5
Elevation (m)
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

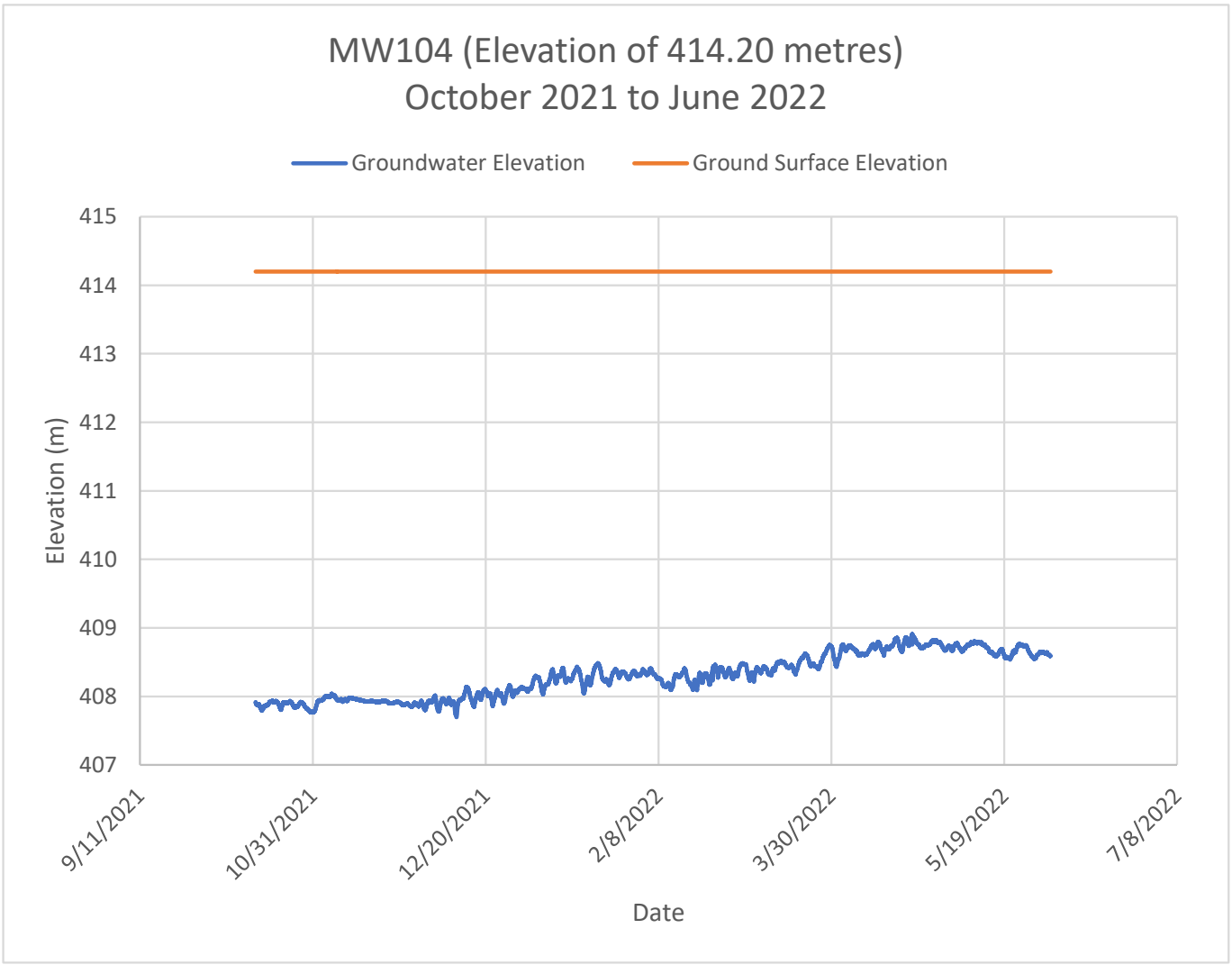

MW 101 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Groundsurface Elevation
408
407
406
405
404
403
402
401
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

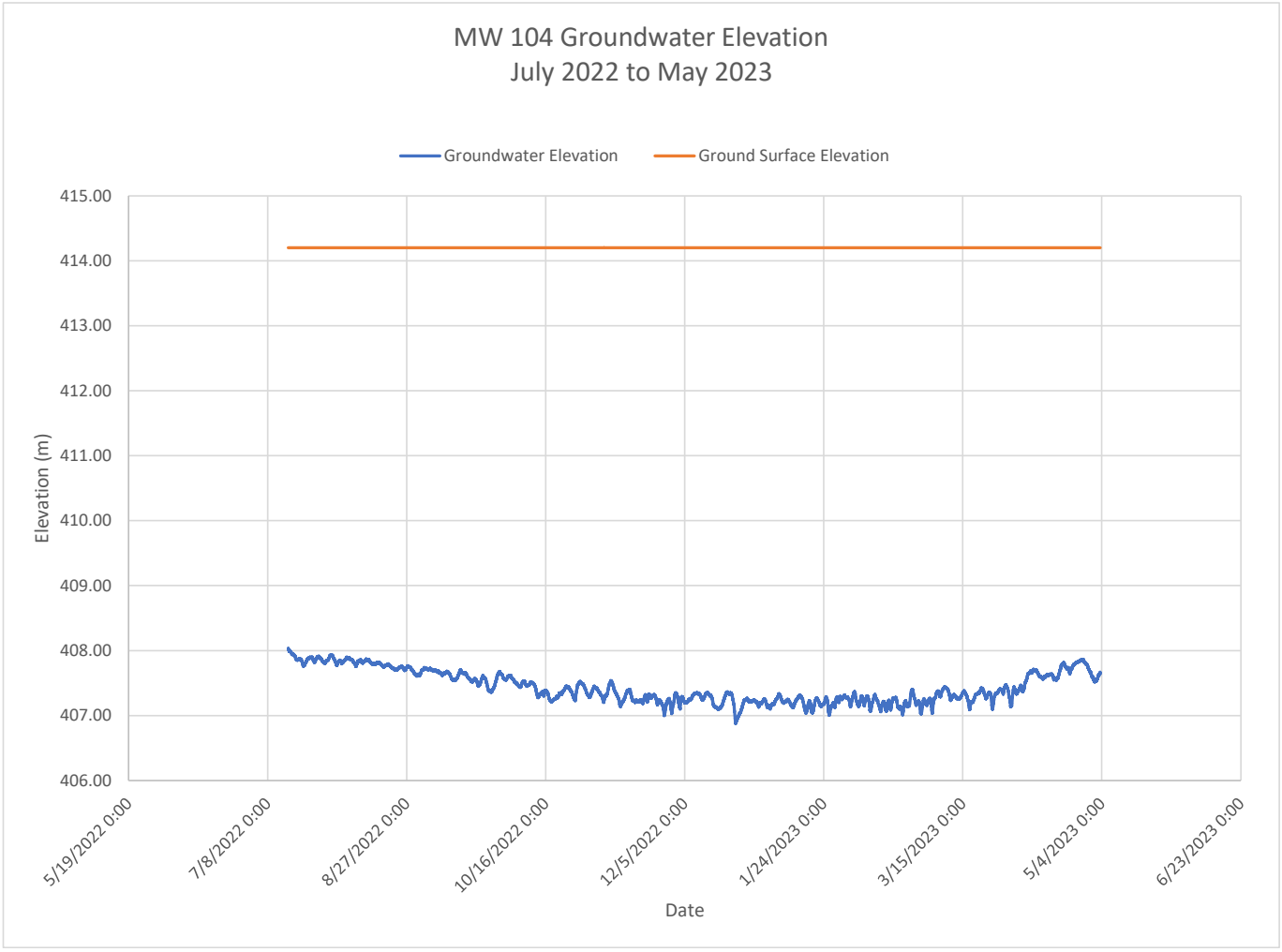

MW101 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
408
407
406
405
404
403
402
401
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

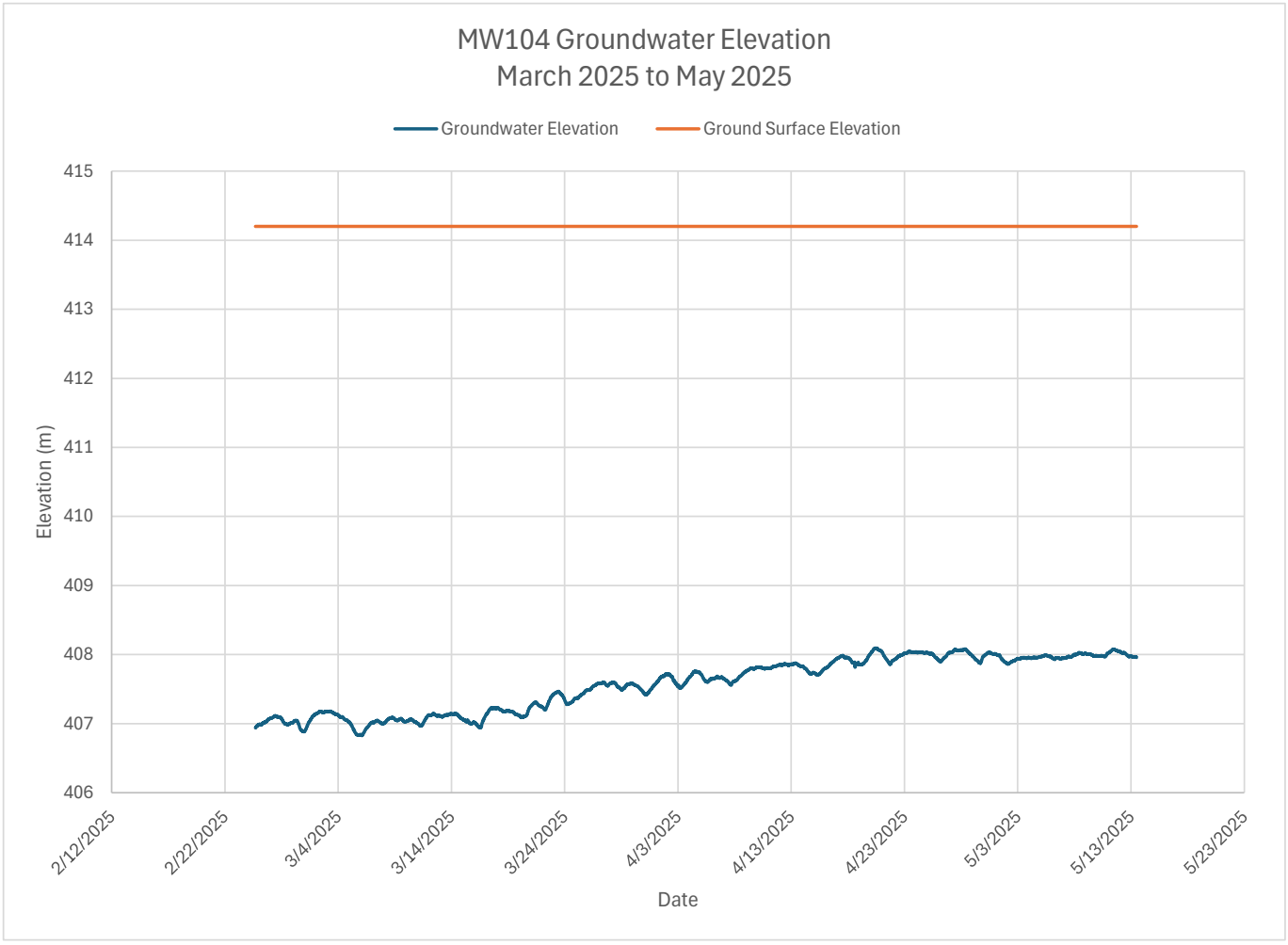

MW 102 (Elevation of 414.13 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
414.5
414
413.5
413
412.5
412
411.5
411
410.5
410
409.5
Elevation (m)
9/11/2021 0:00
10/31/2021 0:00
12/20/2021 0:00
2/8/2022 0:00
3/30/2022 0:00
5/19/2022 0:00
7/8/2022 0:00
Date

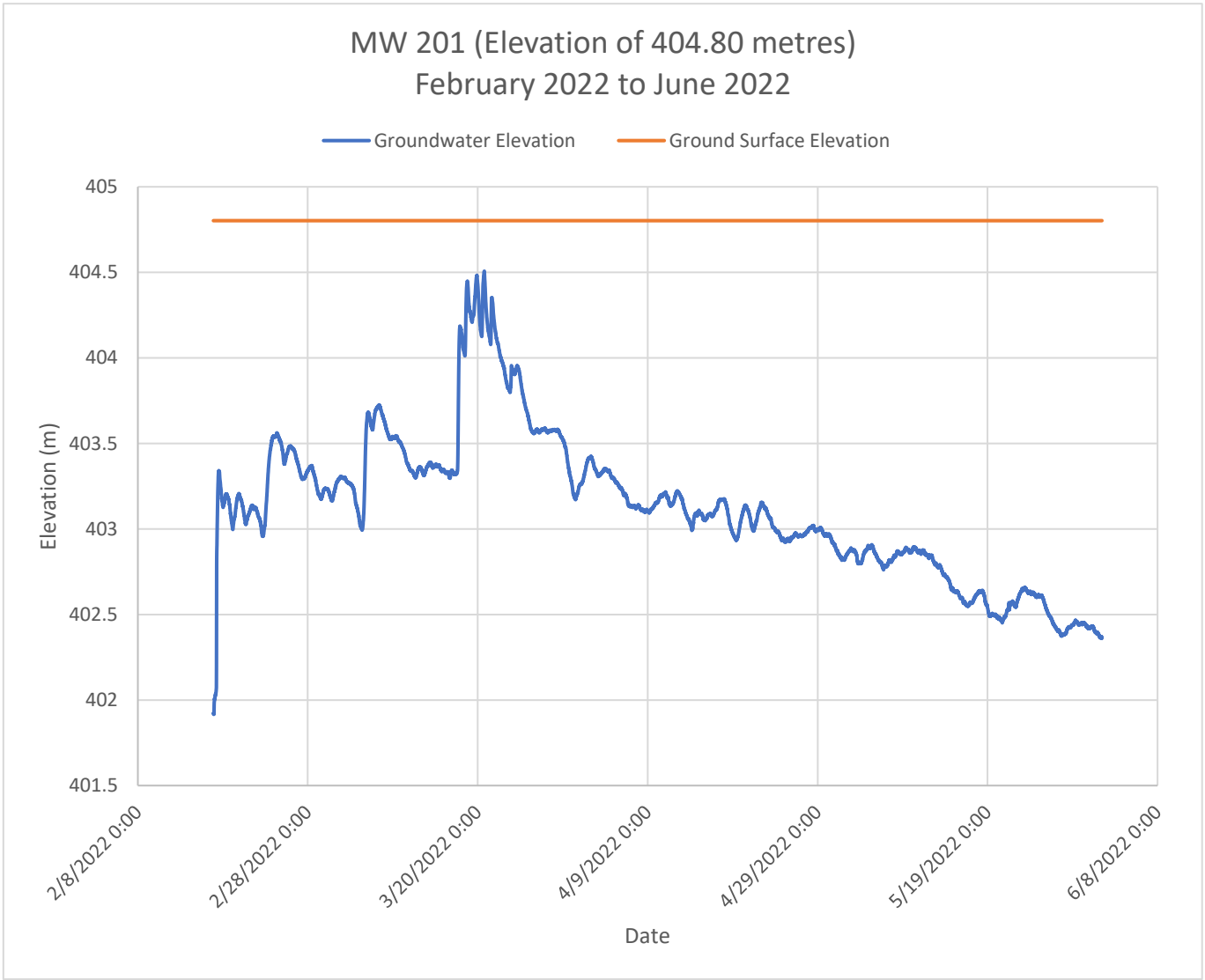

MW 102 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
413.50
413.00
412.50
412.00
411.50
411.00
410.50
410.00
409.50
409.00
408.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

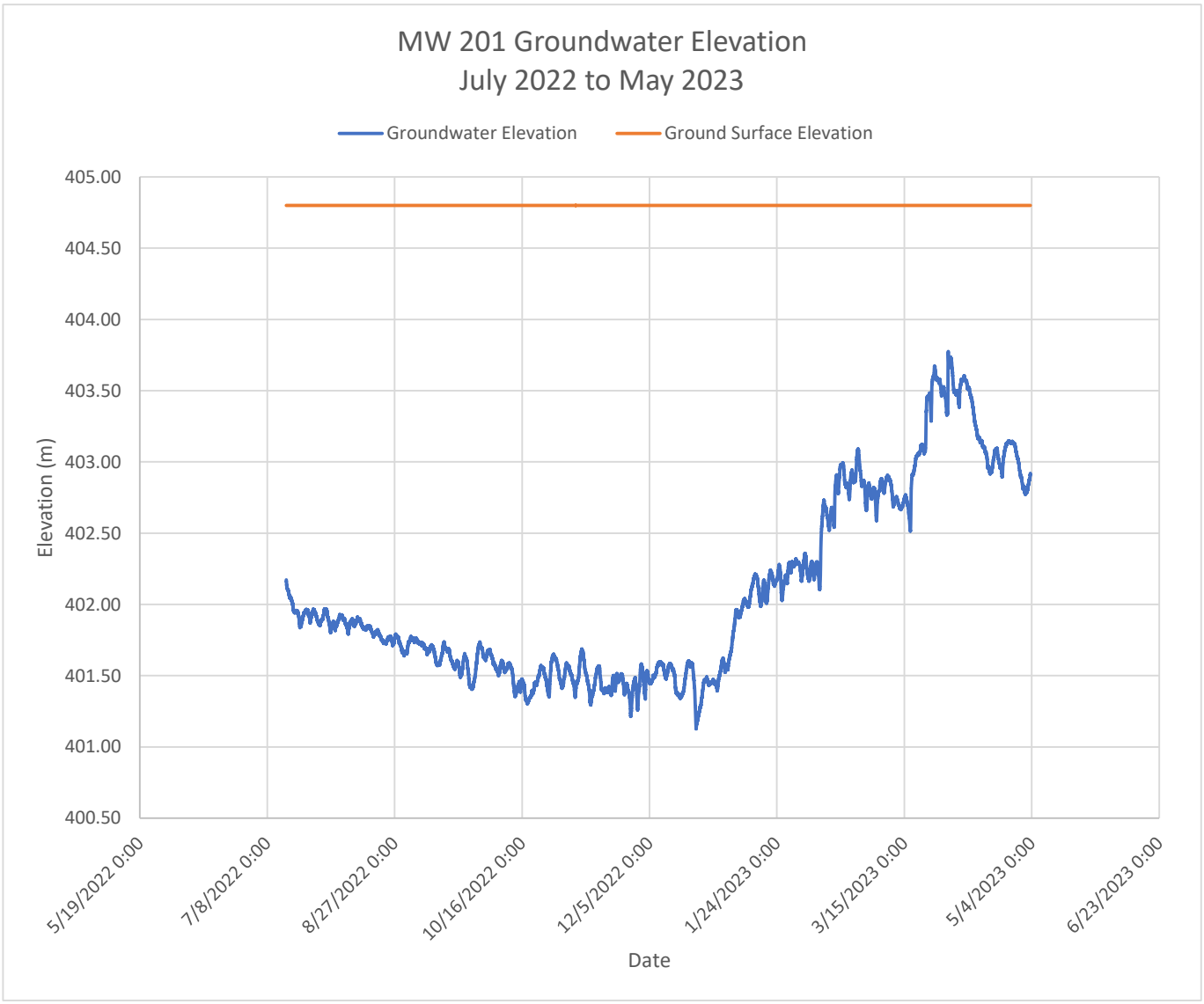

MW102 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
413.5
413
412.5
412
411.5
411
410.5
410
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

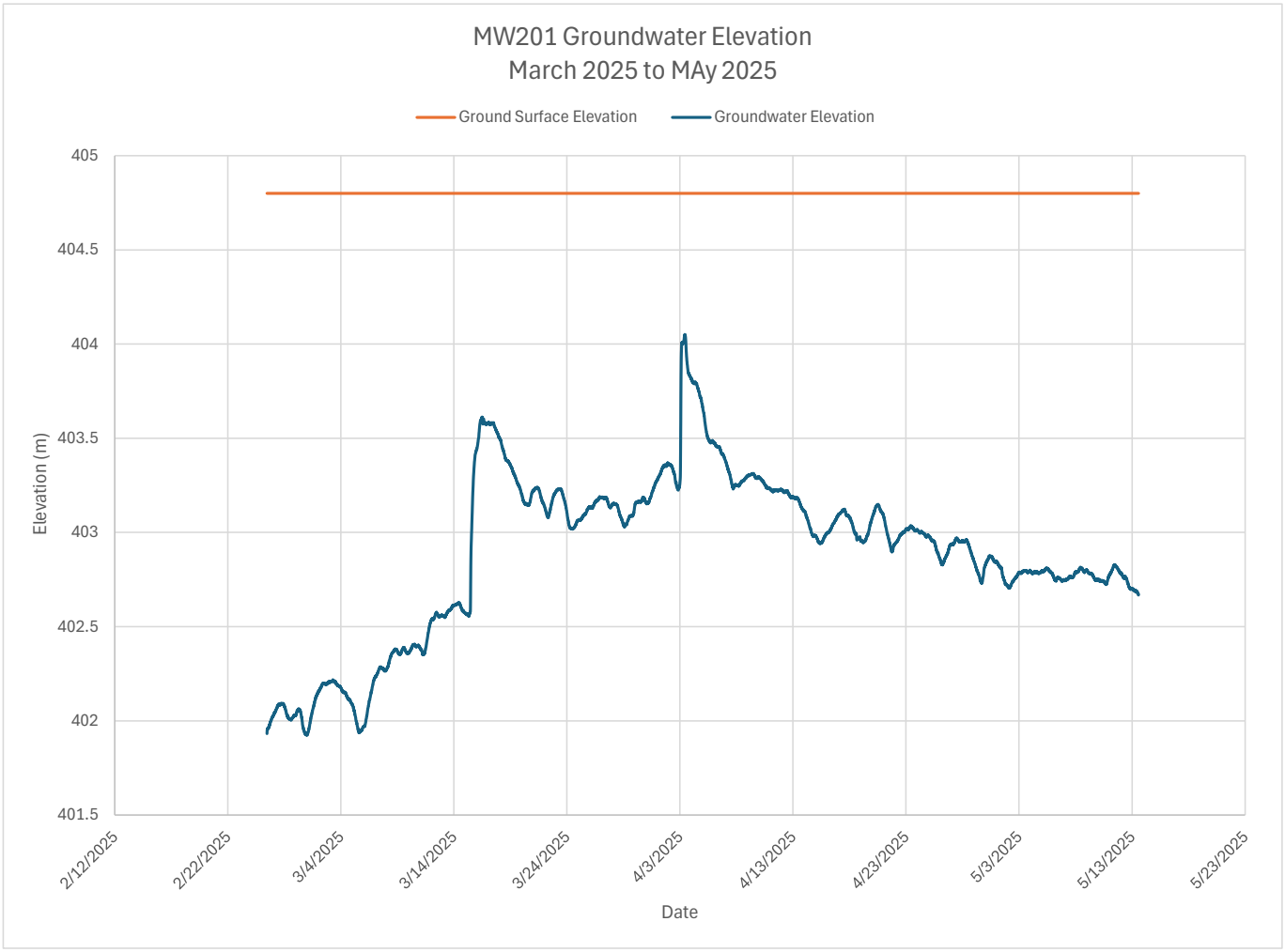

MW104 (Elevation of 414.20 metres)
October 2021 to June 2022
Groundwater Elevation
Ground Surface Elevation
415
414
413
412
411
410
409
408
407
Elevation (m)
9/11/2021
10/31/2021
12/20/2021
2/8/2022
3/30/2022
5/19/2022
7/8/2022
Date

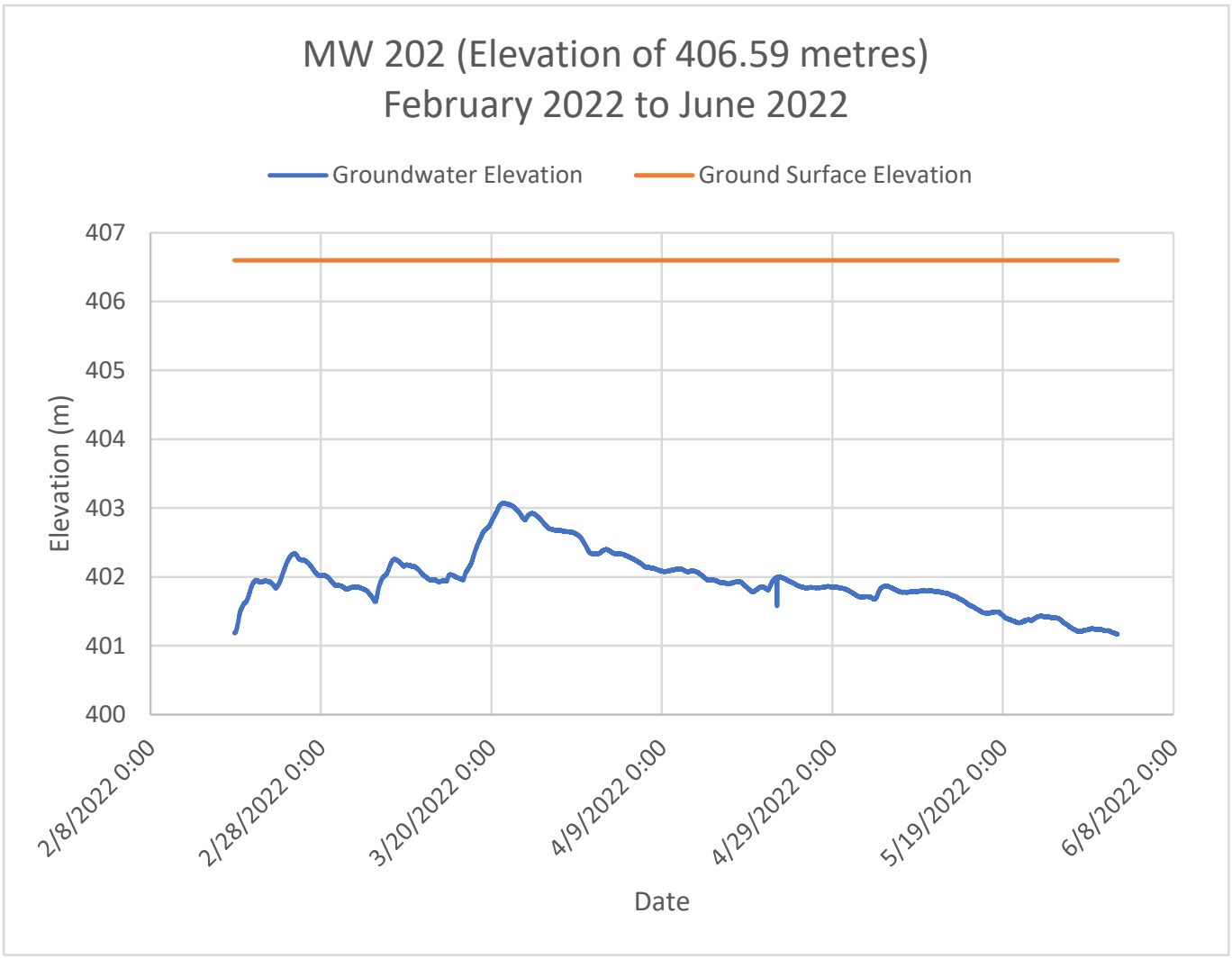

MW 104 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
415.00
414.00
413.00
412.00
411.00
410.00
409.00
408.00
407.00
406.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

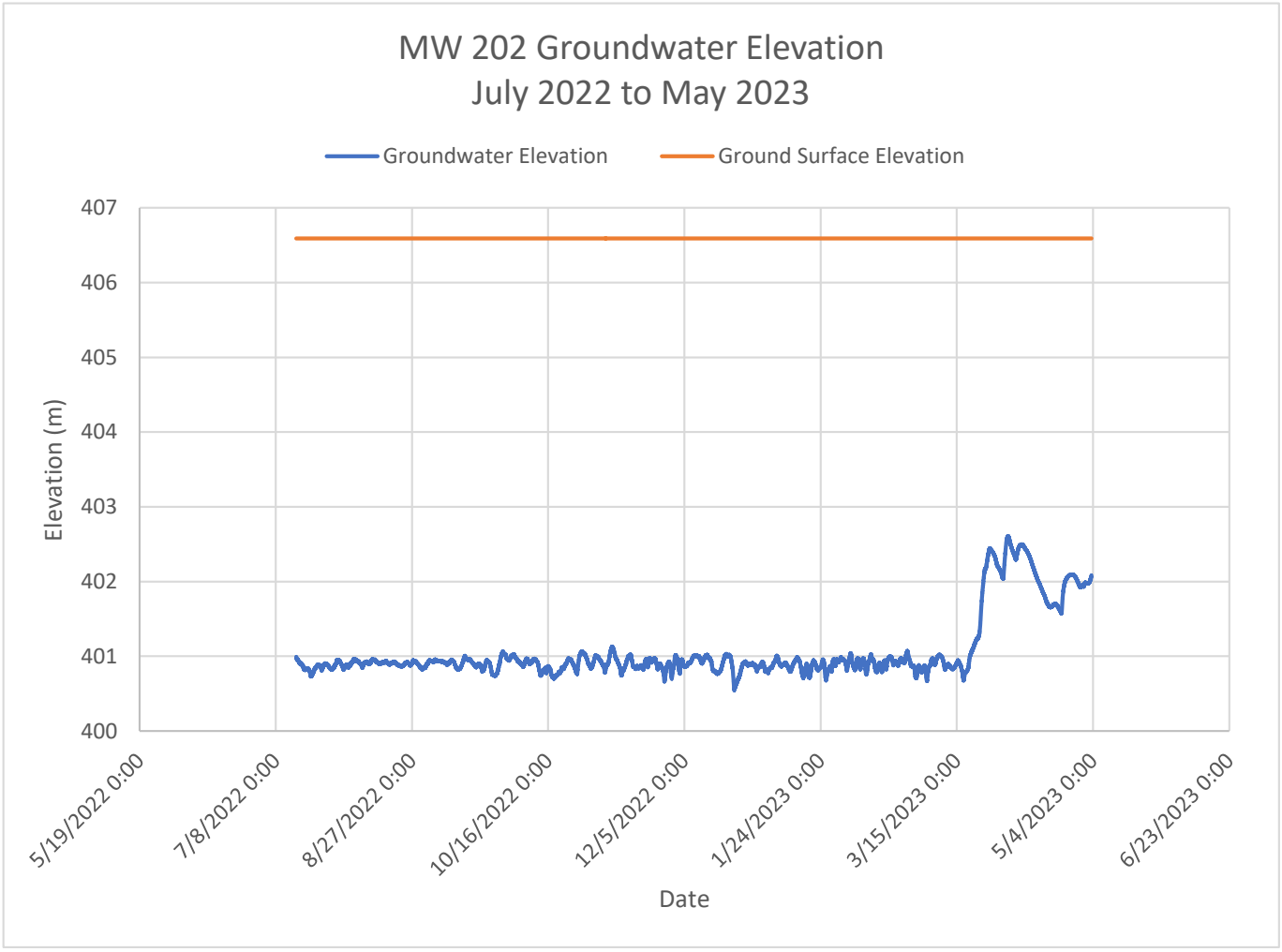

MW104 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
415
414
413
412
411
410
409
408
407
406
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

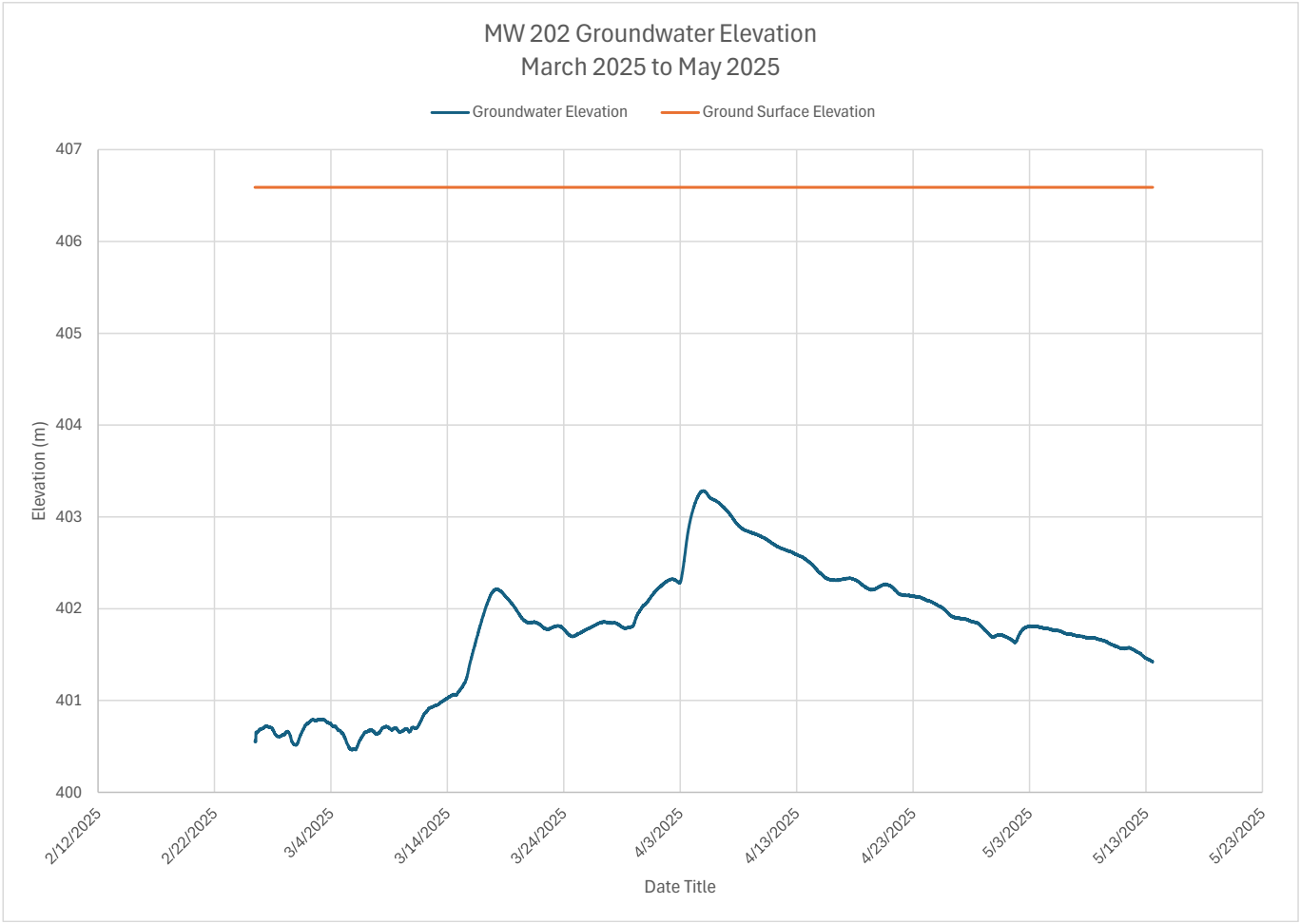

MW 201 (Elevation of 404.80 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
405
404.5
404
403.5
403
402.5
402
401.5
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

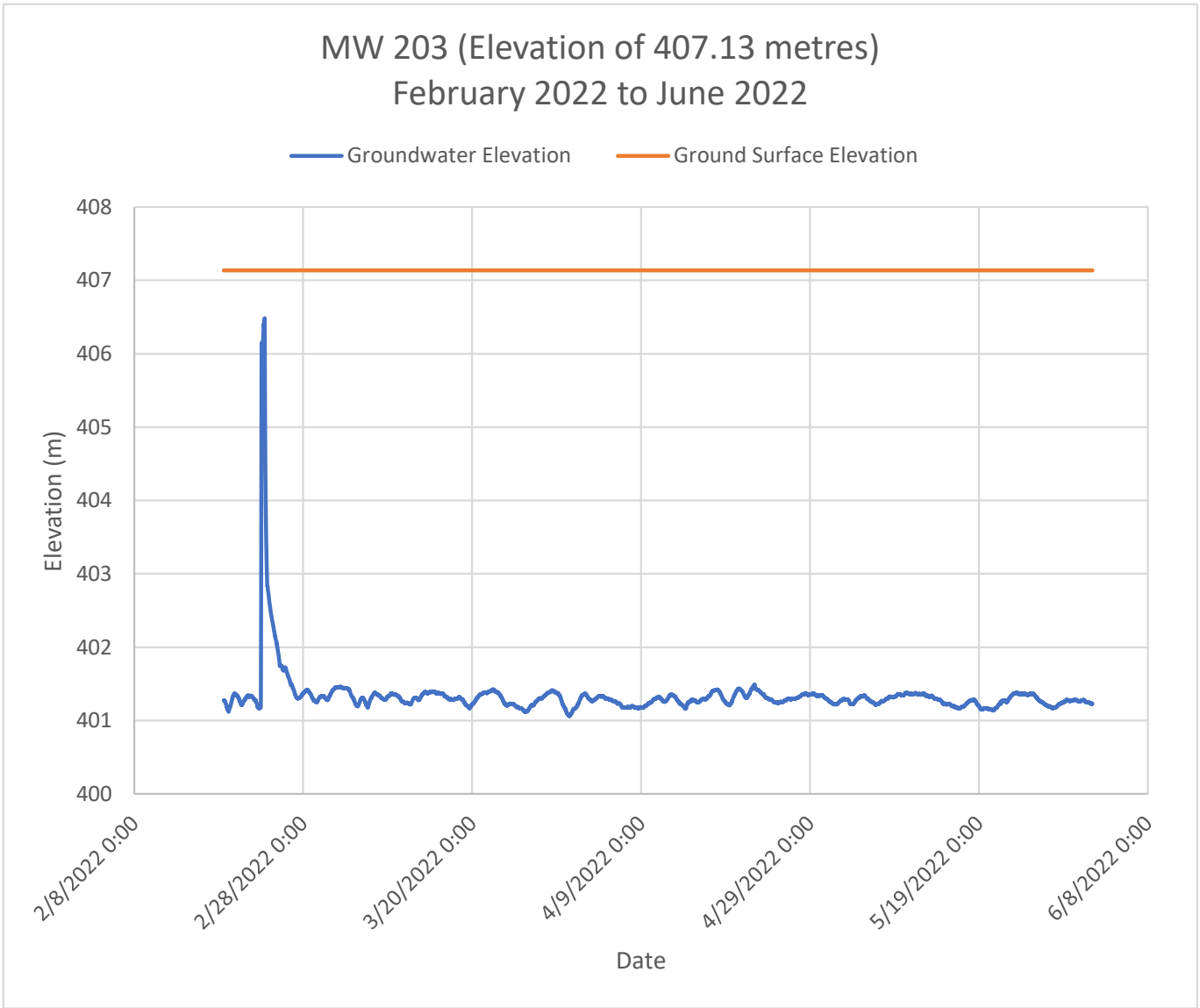

MW 201 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
405.00
404.50
404.00
403.50
403.00
402.50
402.00
401.50
401.00
400.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

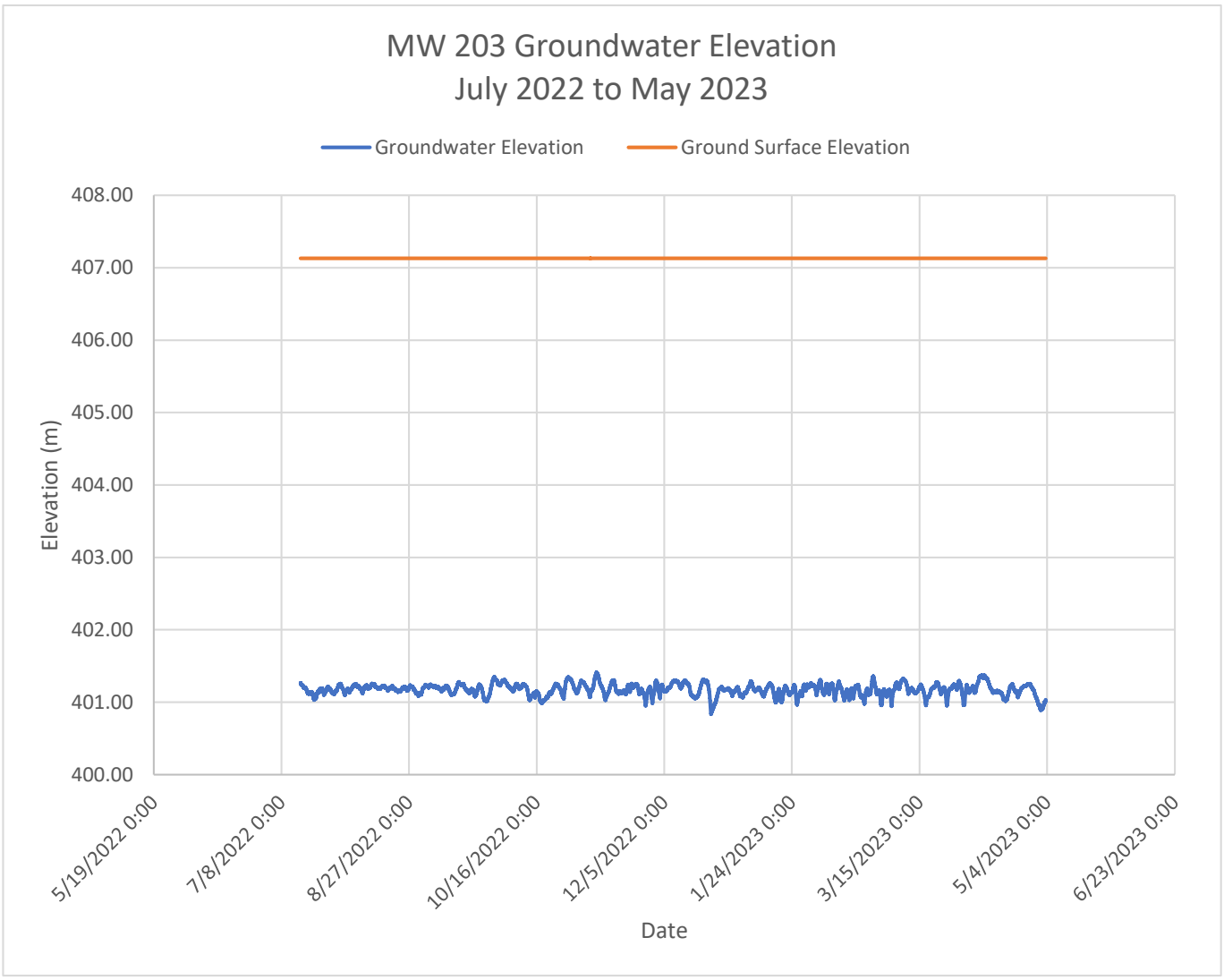

MW201 Groundwater Elevation
March 2025 to MAy 2025
Ground Surface Elevation
Groundwater Elevation
405
404.5
404
403.5
403
402.5
402
401.5
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

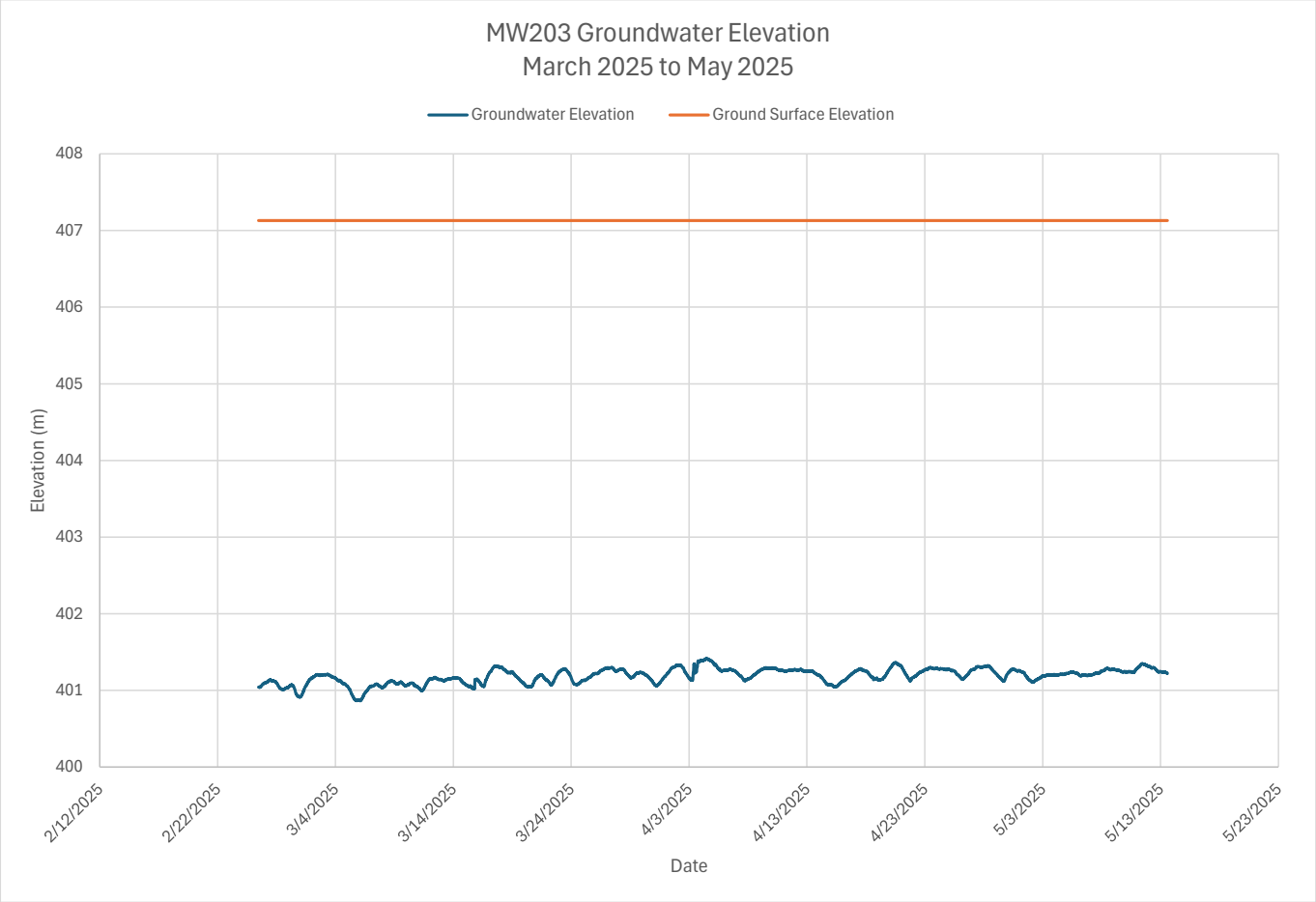

MW 202 (Elevation of 406.59 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
407
406
405
404
403
402
401
400
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

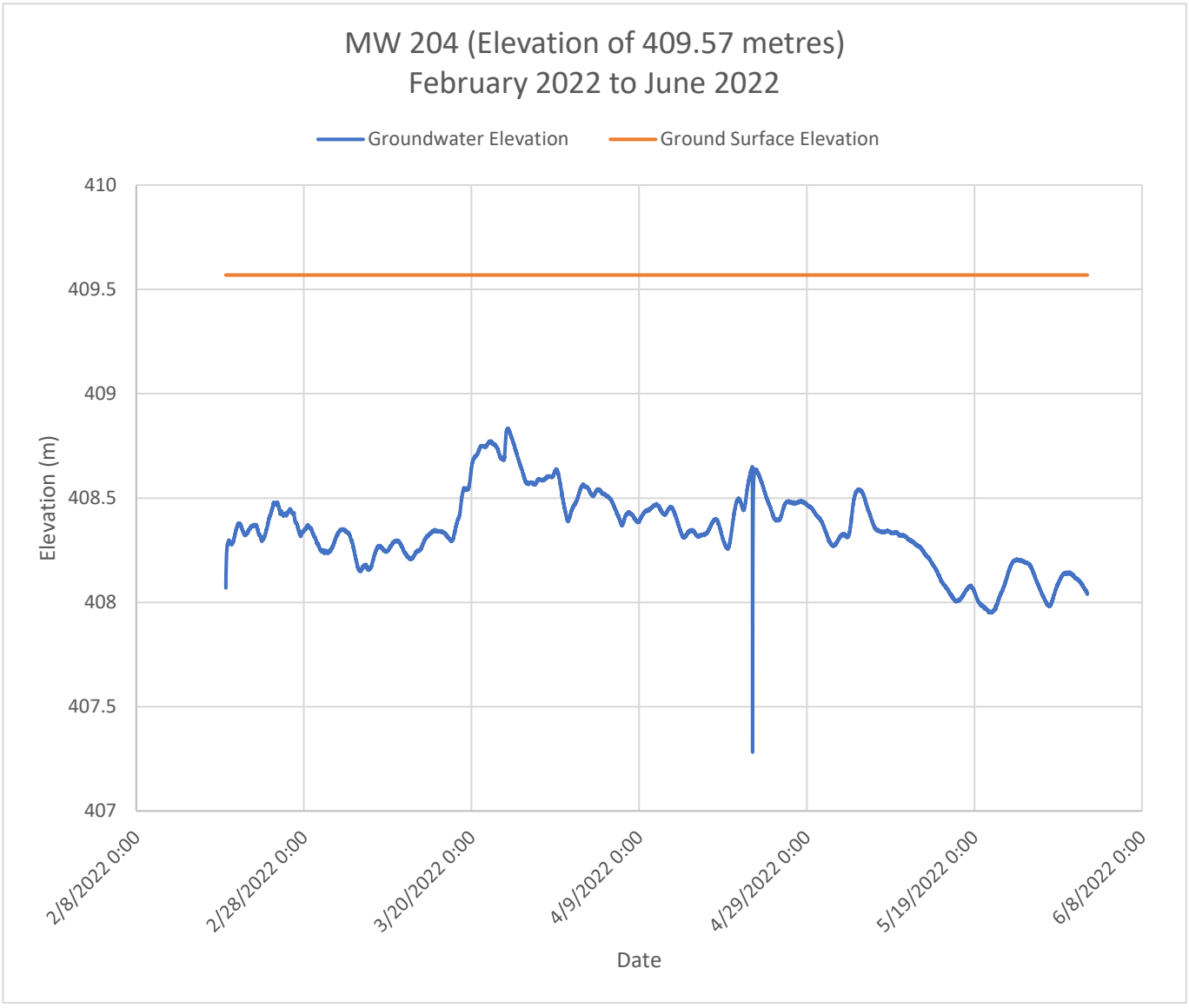

MW 202 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
407
406
405
404
403
402
401
400
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

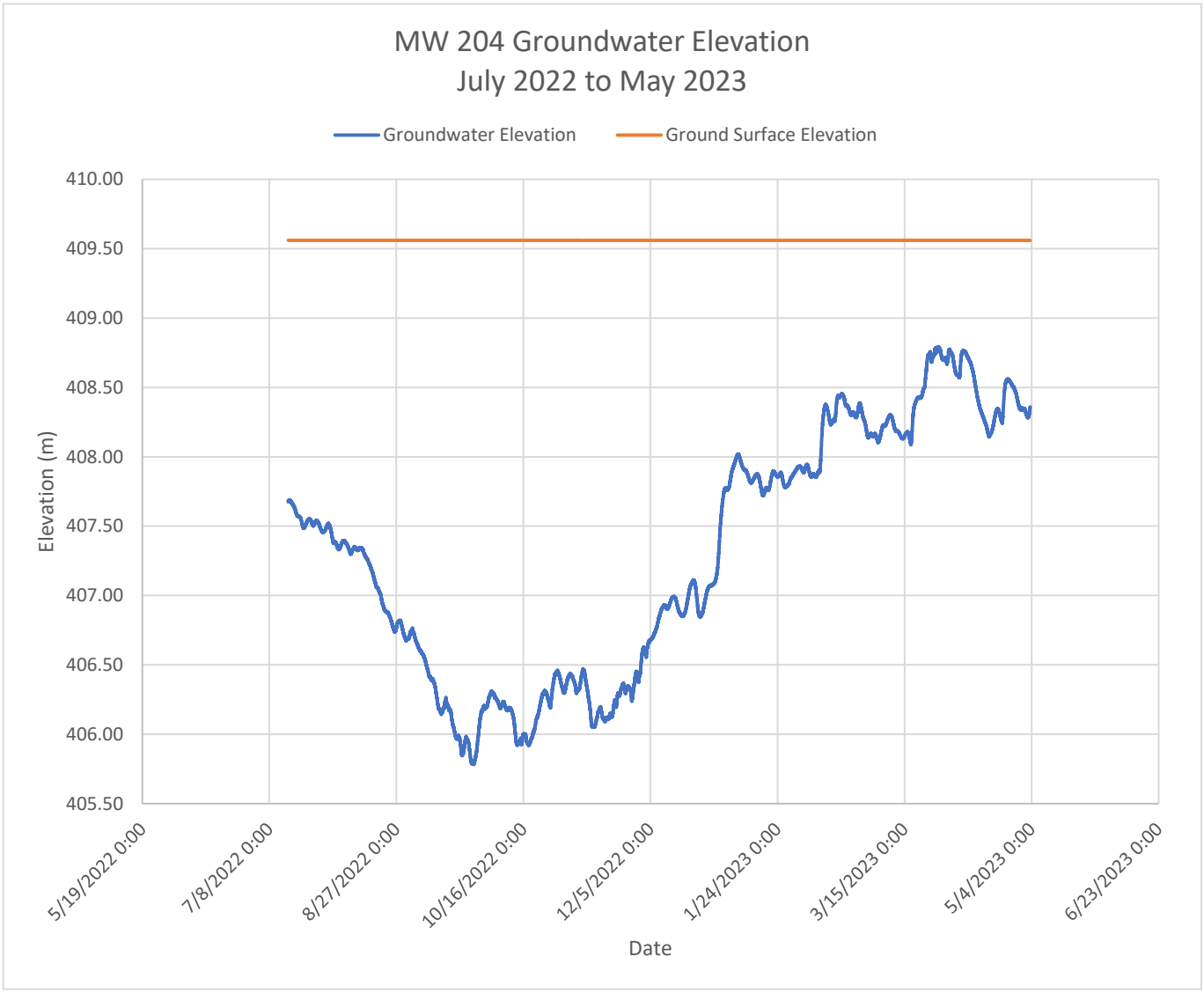

MW 202 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
407
406
405
404
403
402
401
400
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date Title

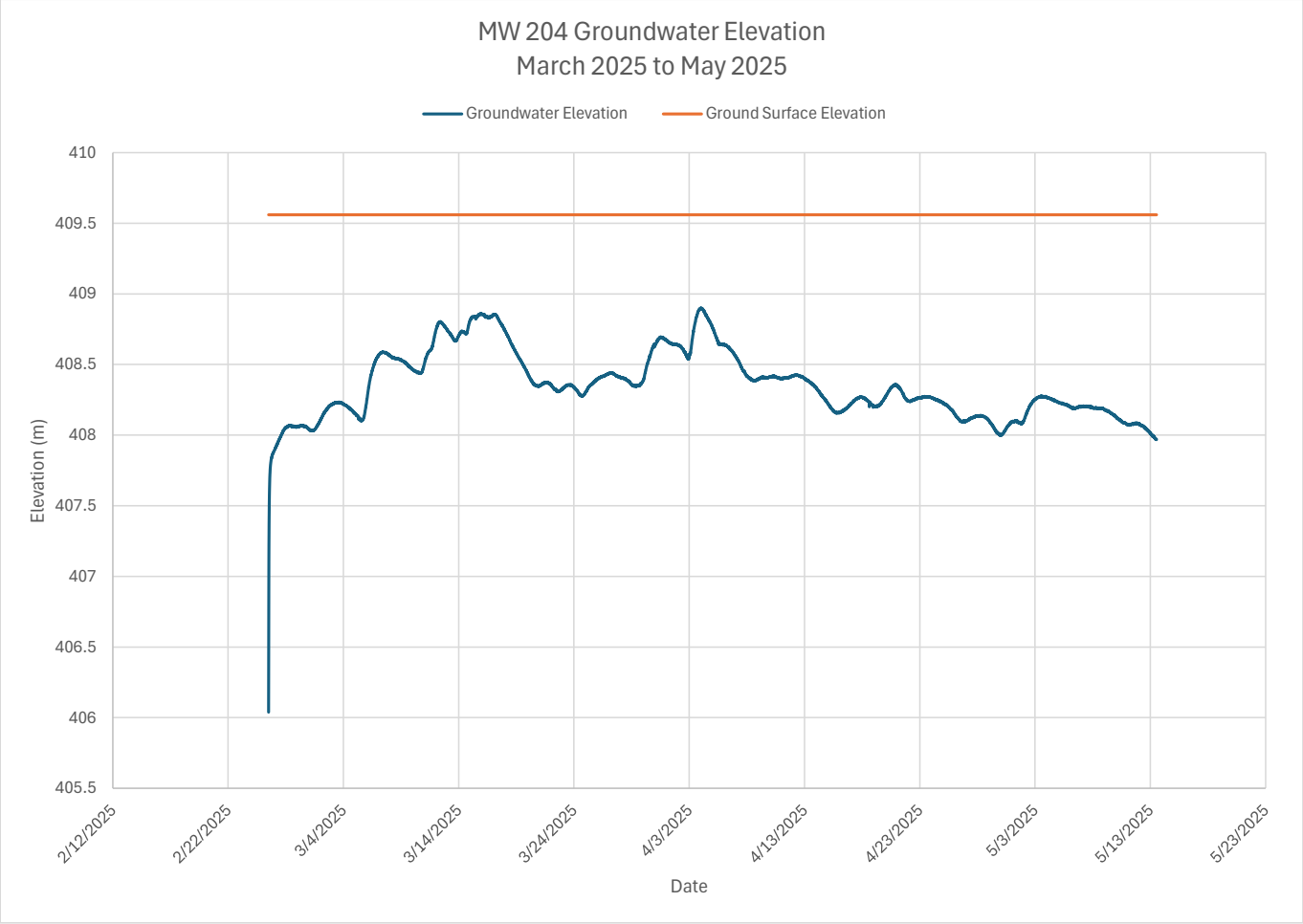

MW 203 (Elevation of 407.13 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
408
407
406
405
404
403
402
401
400
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

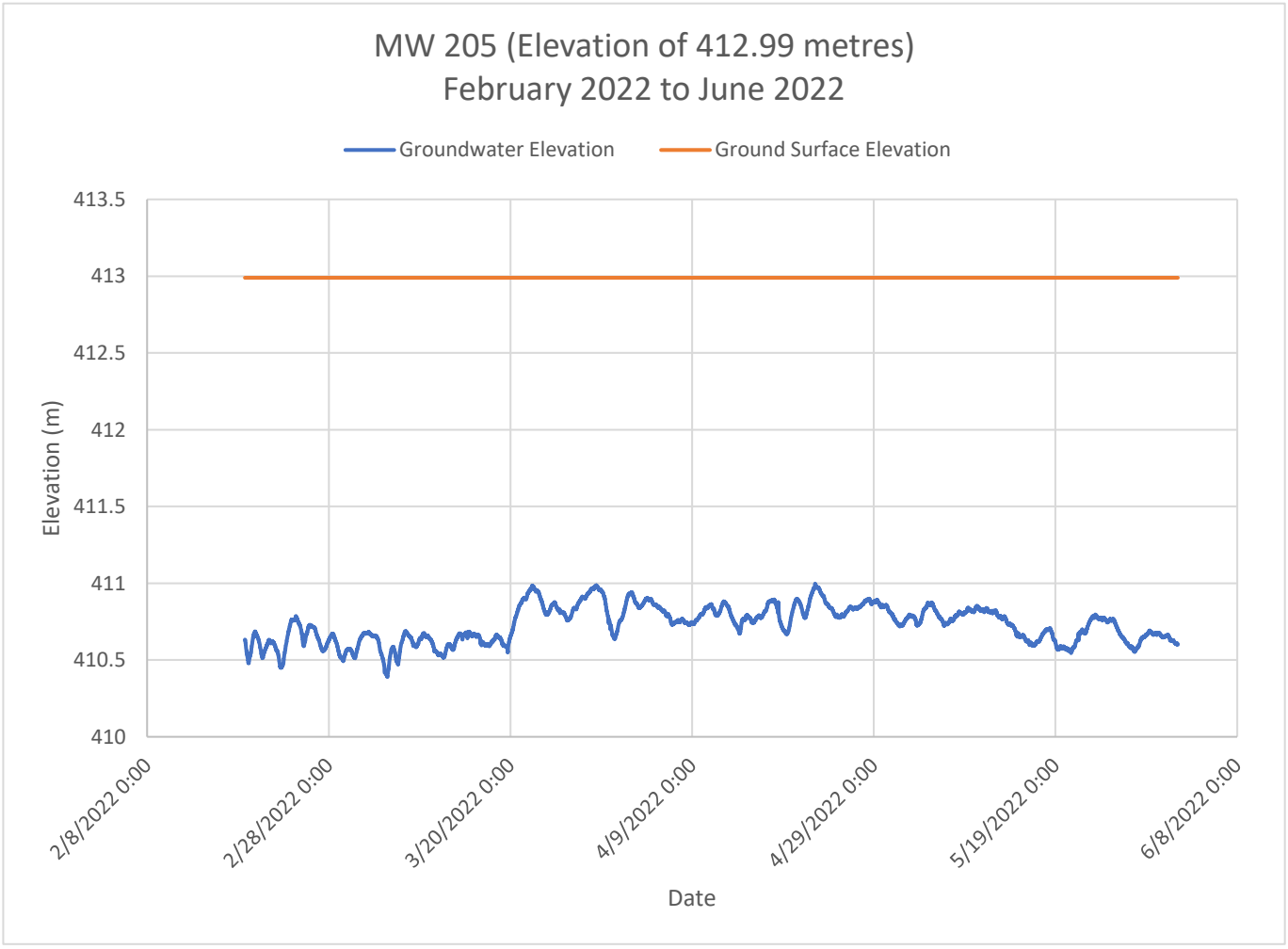

MW 203 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
408.00
407.00
406.00
405.00
404.00
403.00
402.00
401.00
400.00
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

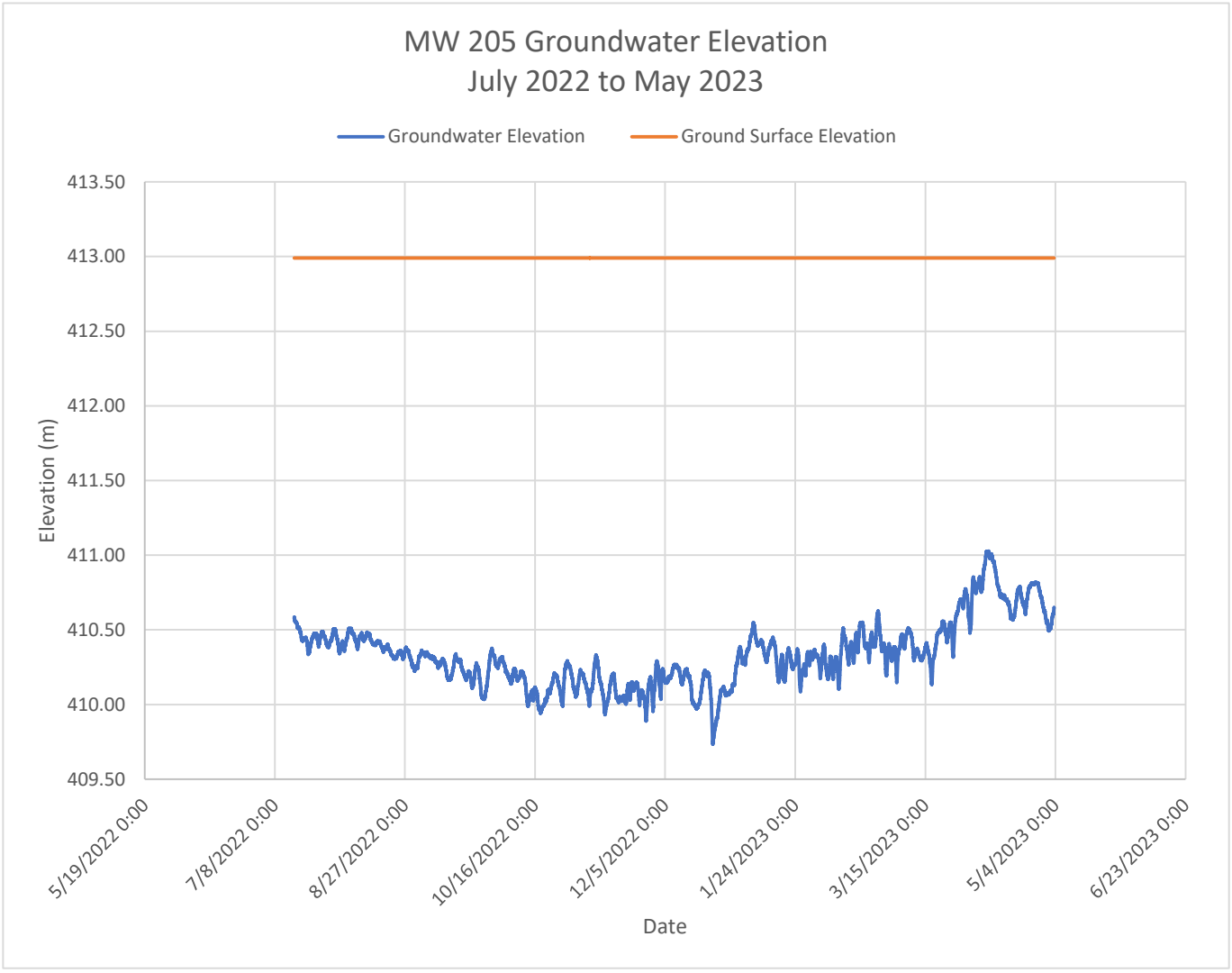

MW203 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
408
407
406
405
404
403
402
401
400
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

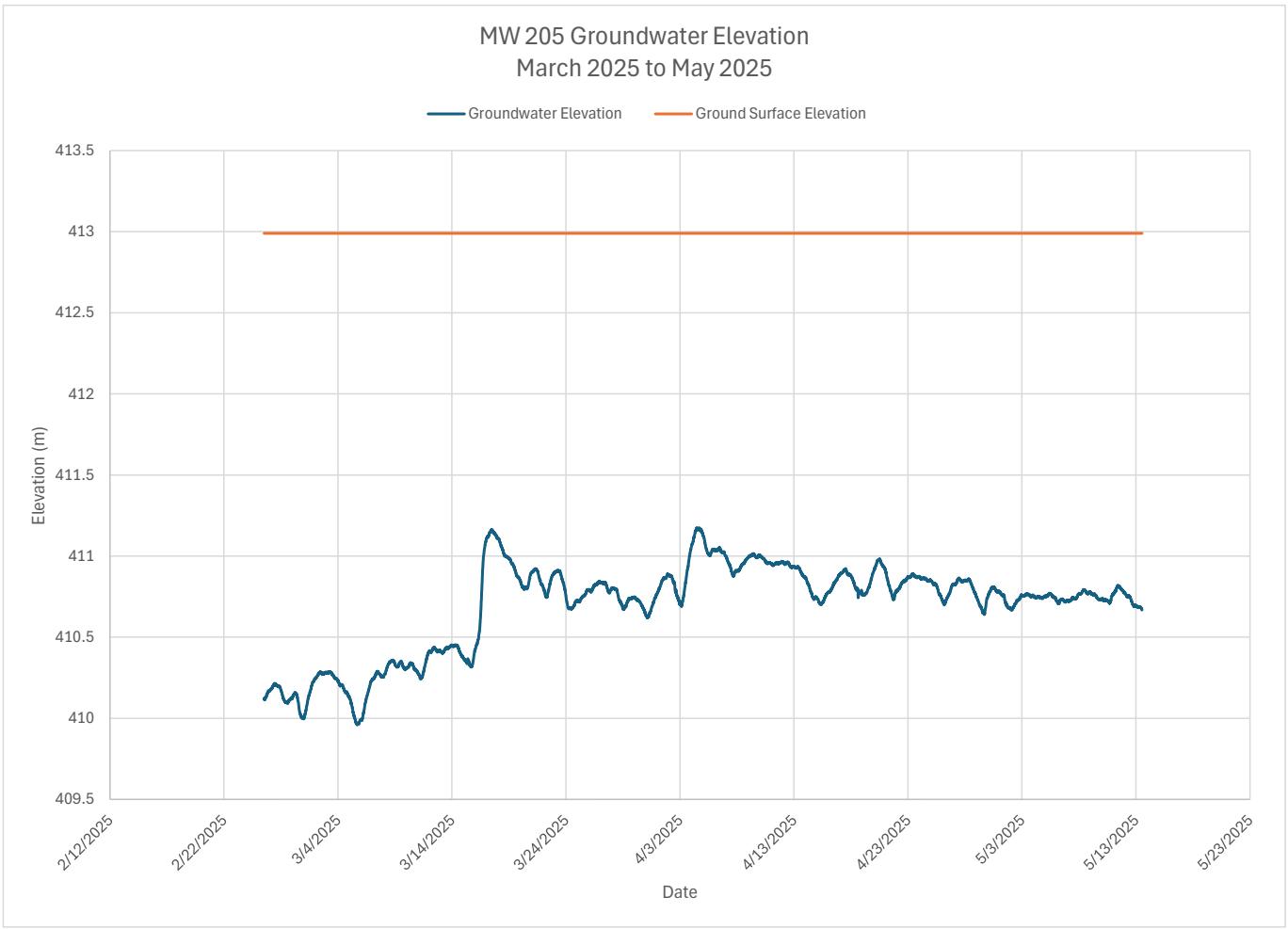

MW 204 (Elevation of 409.57 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
410
409.5
409
408.5
408
407.5
407
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

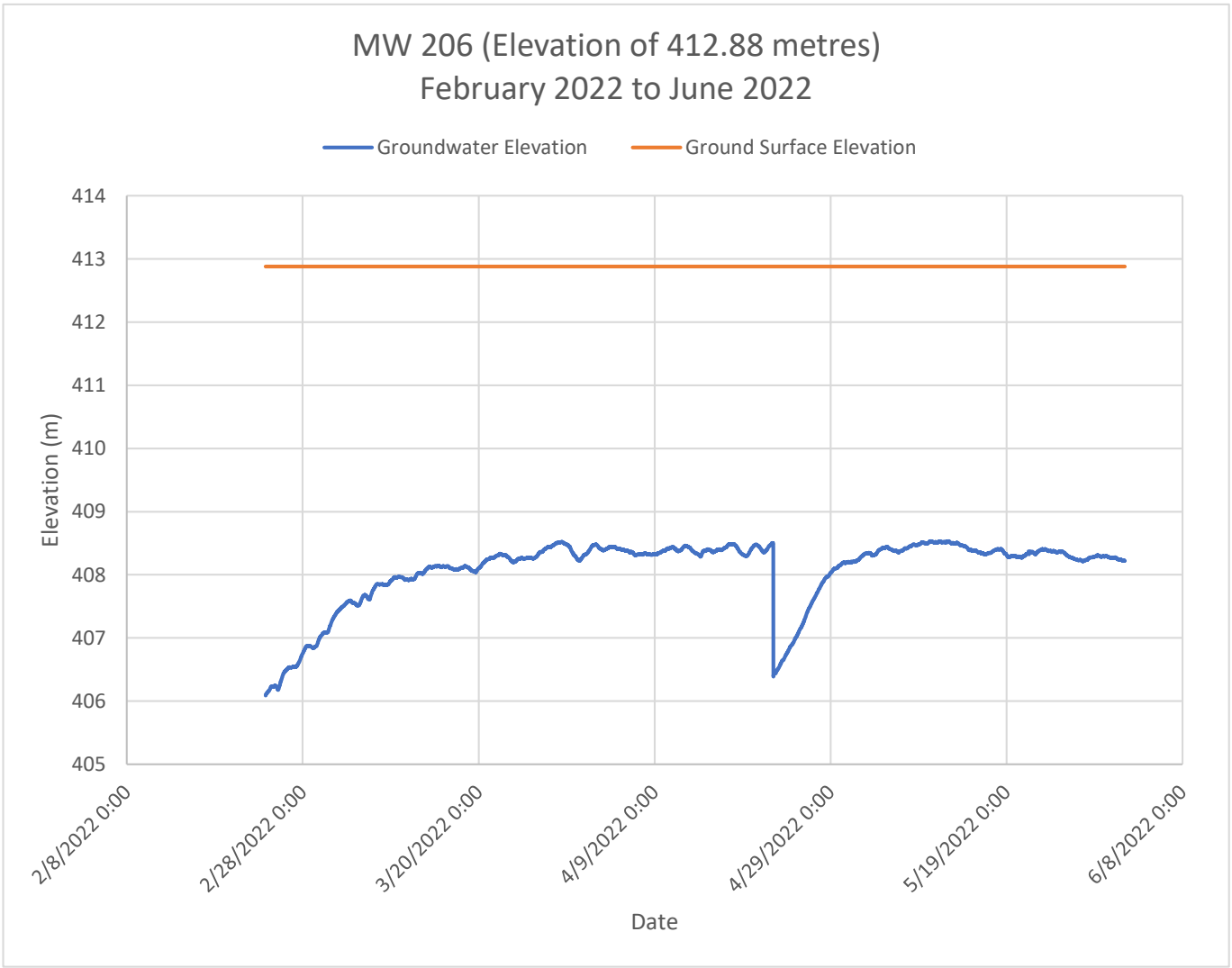

MW 204 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
410.00
409.50
409.00
408.50
408.00
407.50
407.00
406.50
406.00
405.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

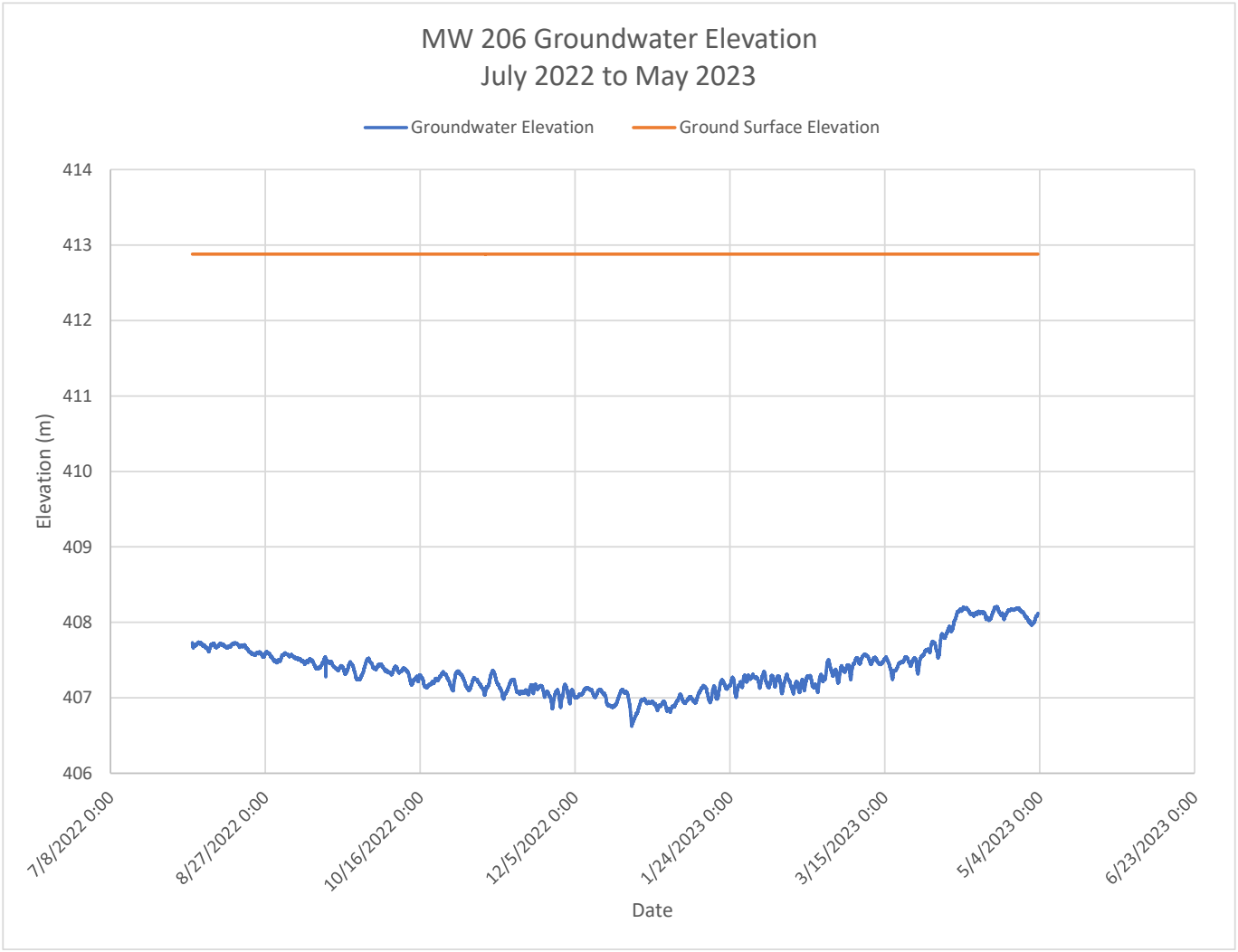

MW 204 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
410
409.5
409
408.5
408
407.5
407
406.5
406
405.5
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

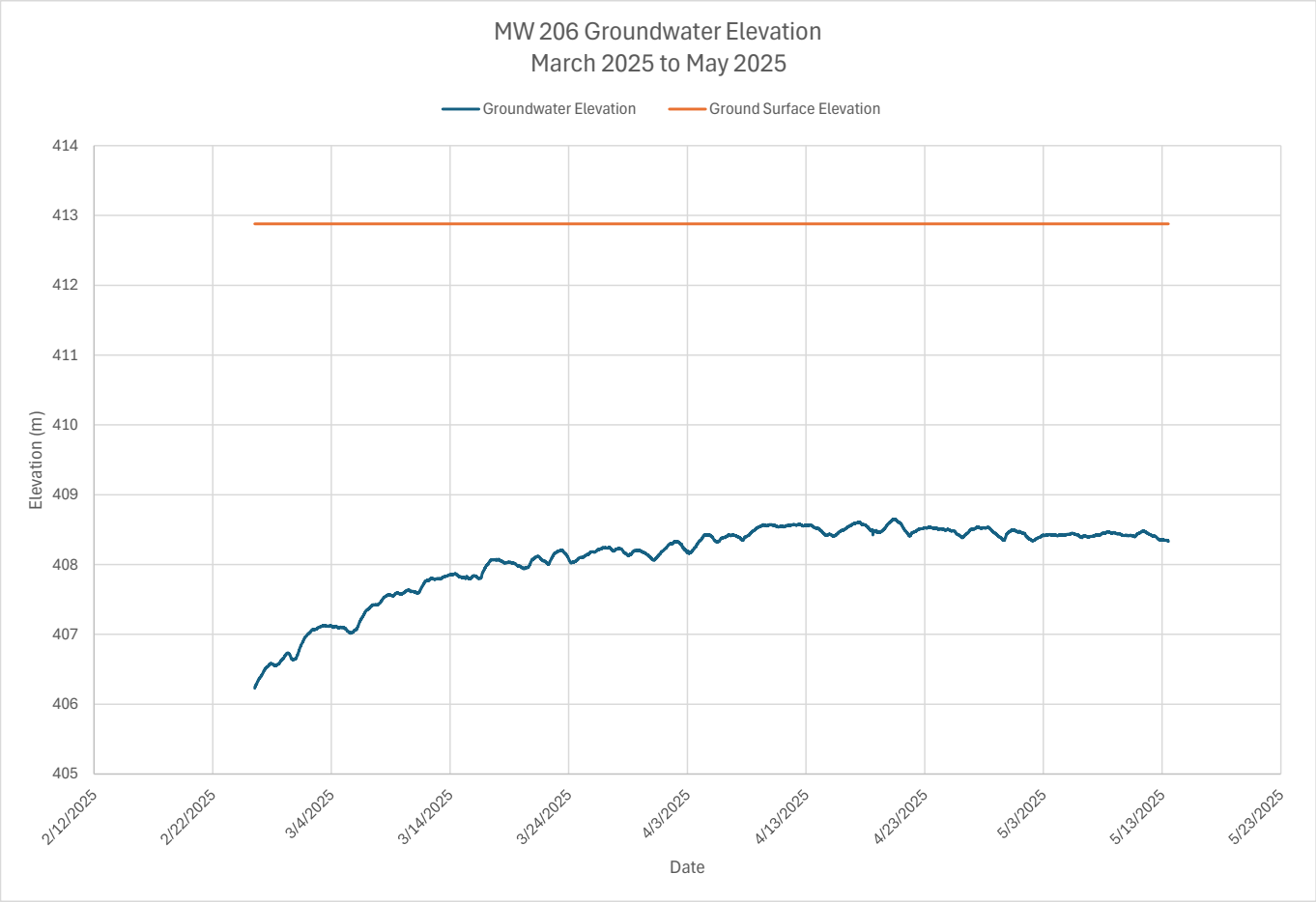

MW 205 (Elevation of 412.99 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
413.5
413
412.5
412
411.5
411
410.5
410
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date

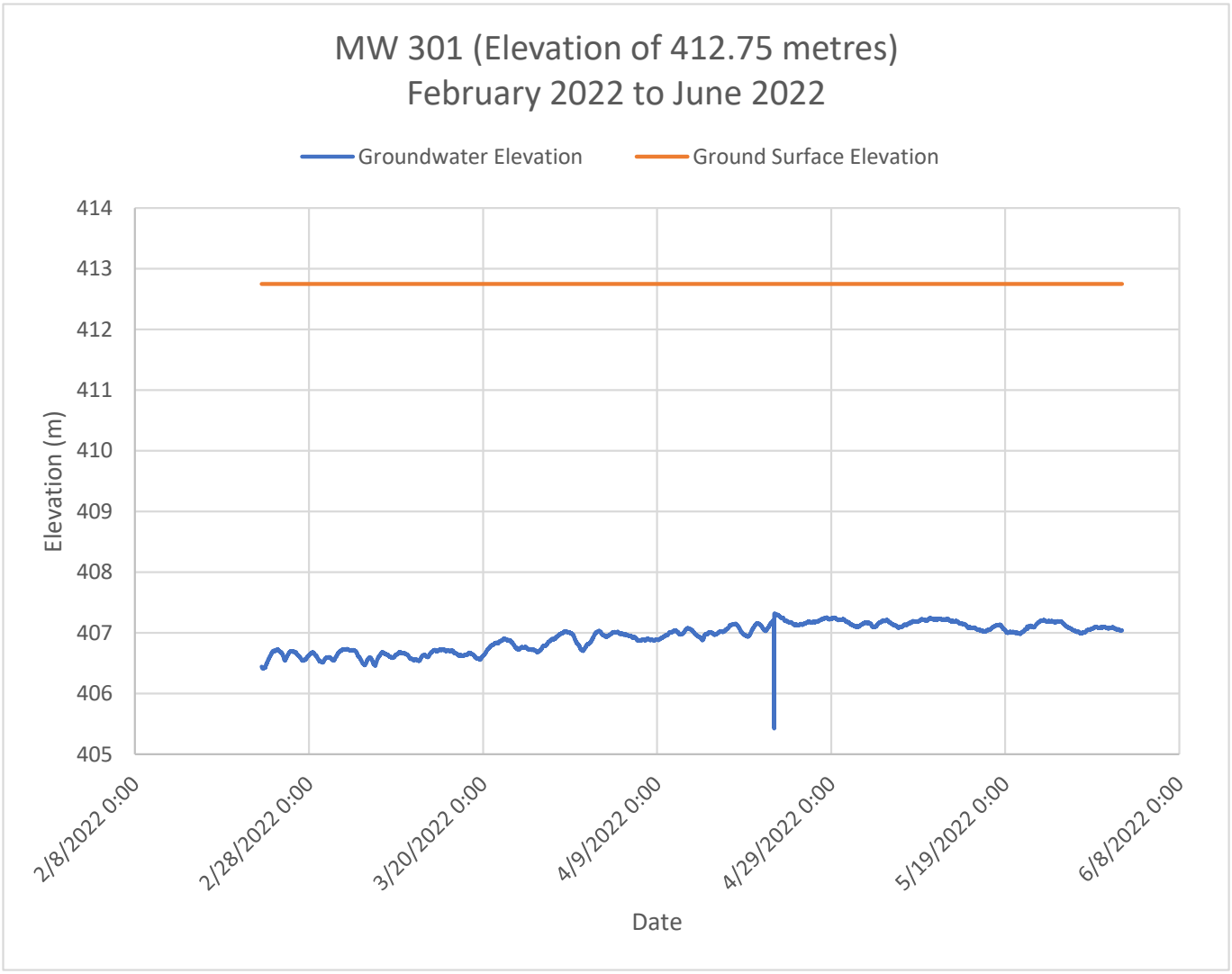

MW 205 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
413.50
413.00
412.50
412.00
411.50
411.00
410.50
410.00
409.50
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date

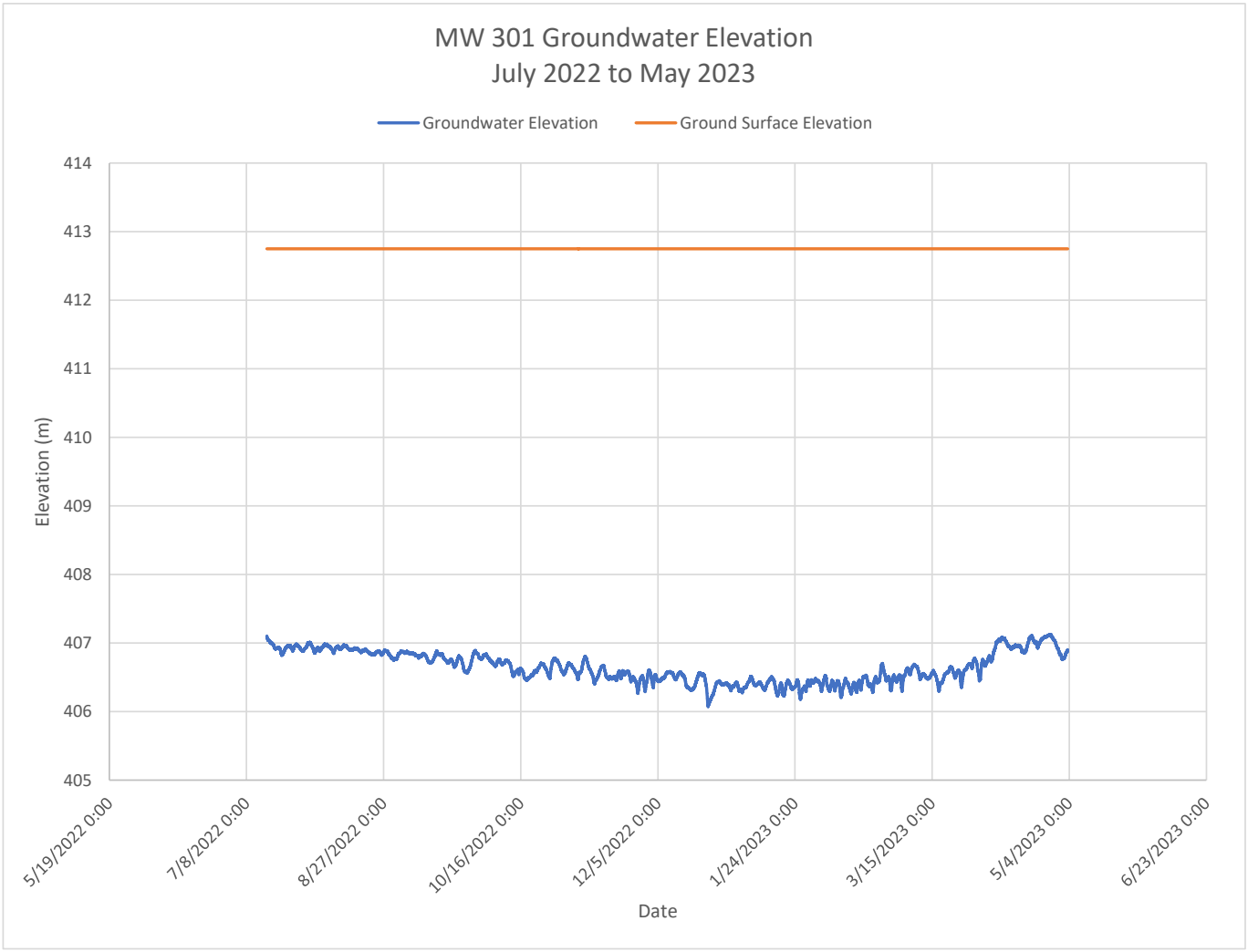

MW 205 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
413.5
413
412.5
412
411.5
411
410.5
410
409.5
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date

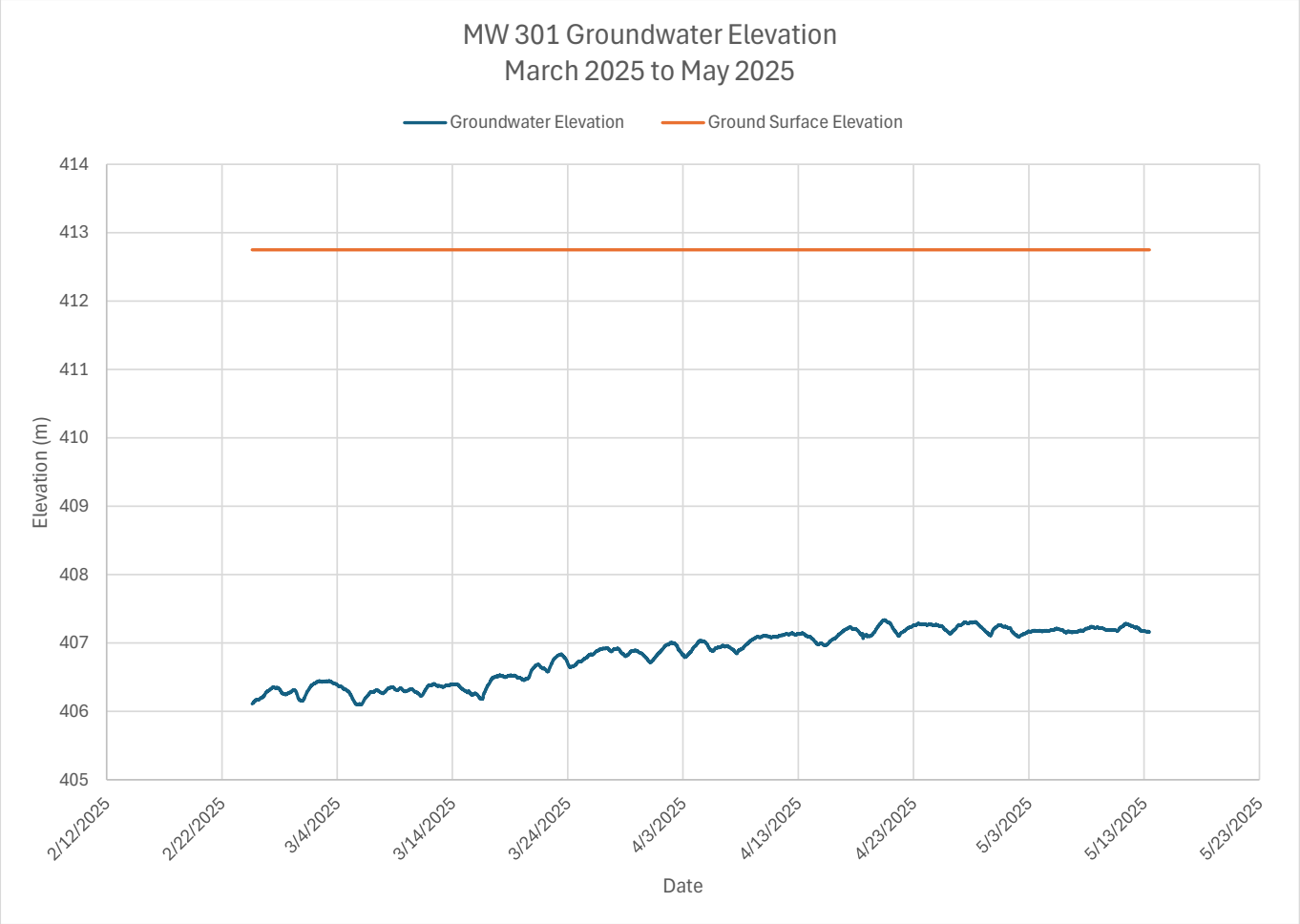

MW 206 (Elevation of 412.88 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date


MW 206 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
Elevation (m)
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date


MW 206 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
4/3/2025
4/13/2025
4/23/2025
5/3/2025
5/13/2025
5/23/2025
Date


MW 301 (Elevation of 412.75 metres)
February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
2/8/2022 0:00
2/28/2022 0:00
3/20/2022 0:00
4/9/2022 0:00
4/29/2022 0:00
5/19/2022 0:00
6/8/2022 0:00
Date


MW 301 Groundwater Elevation
July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
409
408
407
406
405
Elevation (m)
5/19/2022 0:00
7/8/2022 0:00
8/27/2022 0:00
10/16/2022 0:00
12/5/2022 0:00
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date


MW 301 Groundwater Elevation
March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
414
413
412
411
410
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Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
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4/23/2025
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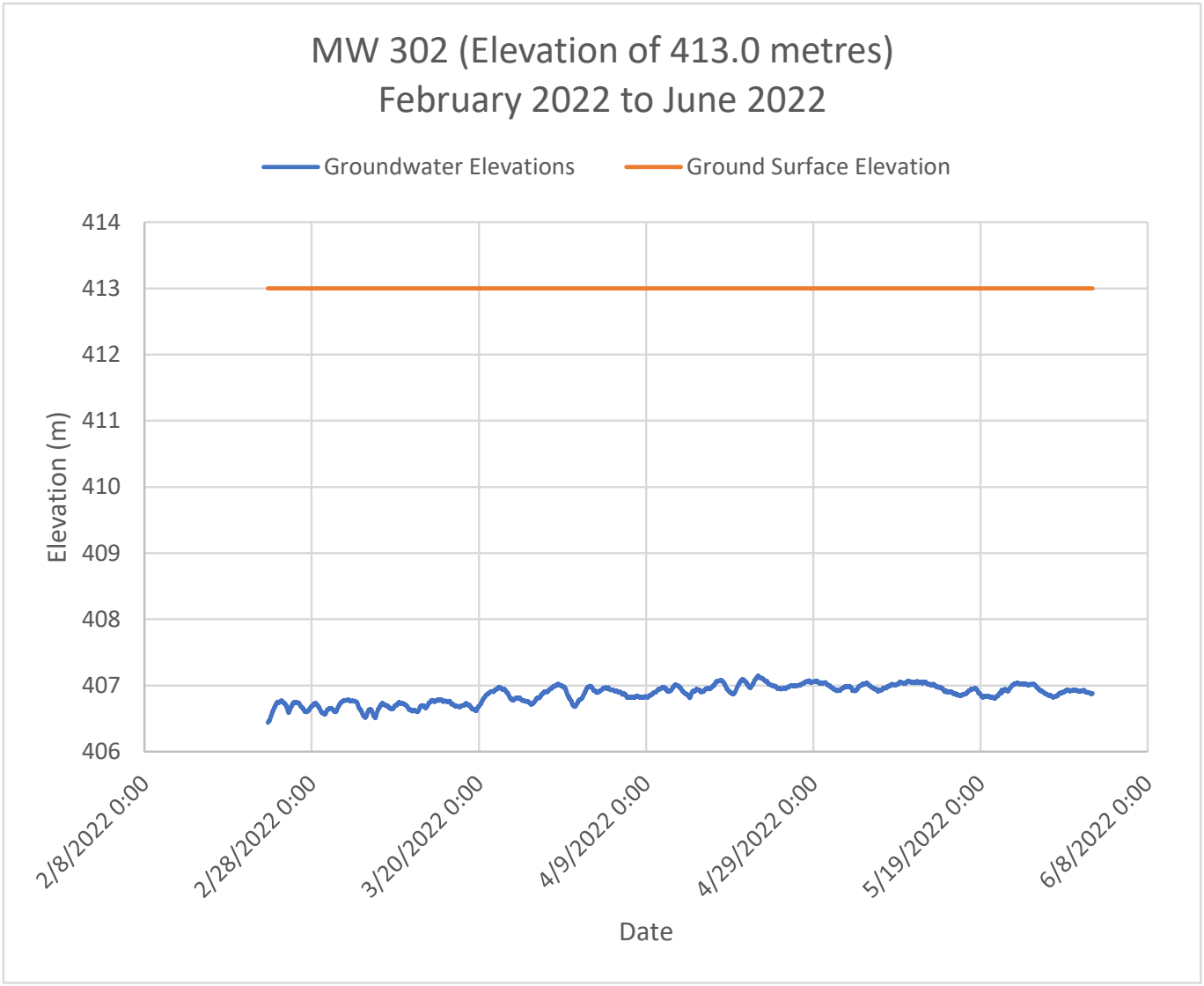
5/13/2025
5/23/2025
Date


MW 302 (Elevation of 413.0 metres)
February 2022 to June 2022
Groundwater Elevations
Ground Surface Elevation
414
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Elevation (m)
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2/28/2022 0:00
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4/29/2022 0:00
5/19/2022 0:00
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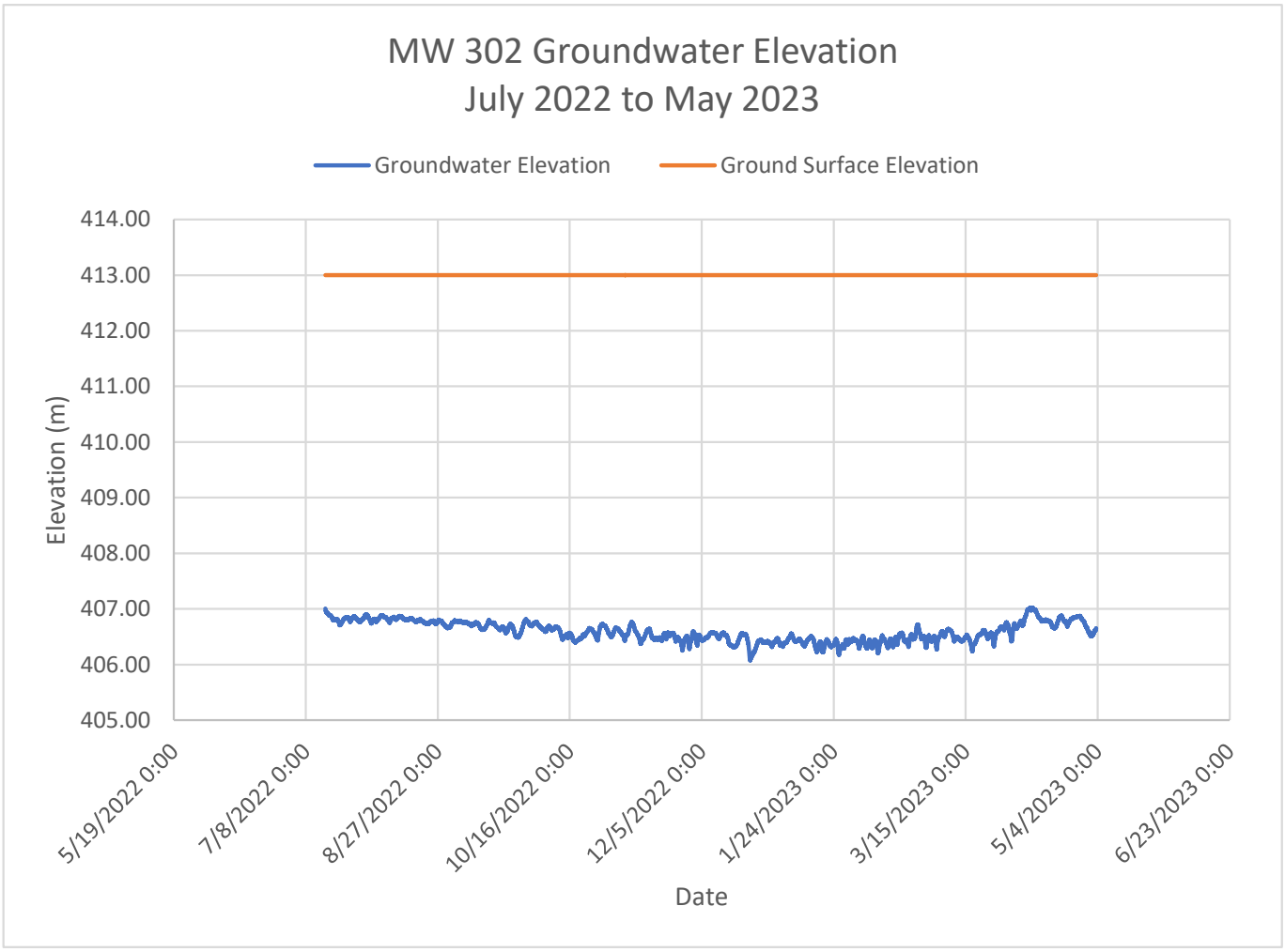
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July 2022 to May 2023
Groundwater Elevation
Ground Surface Elevation
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Elevation (m)
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8/27/2022 0:00
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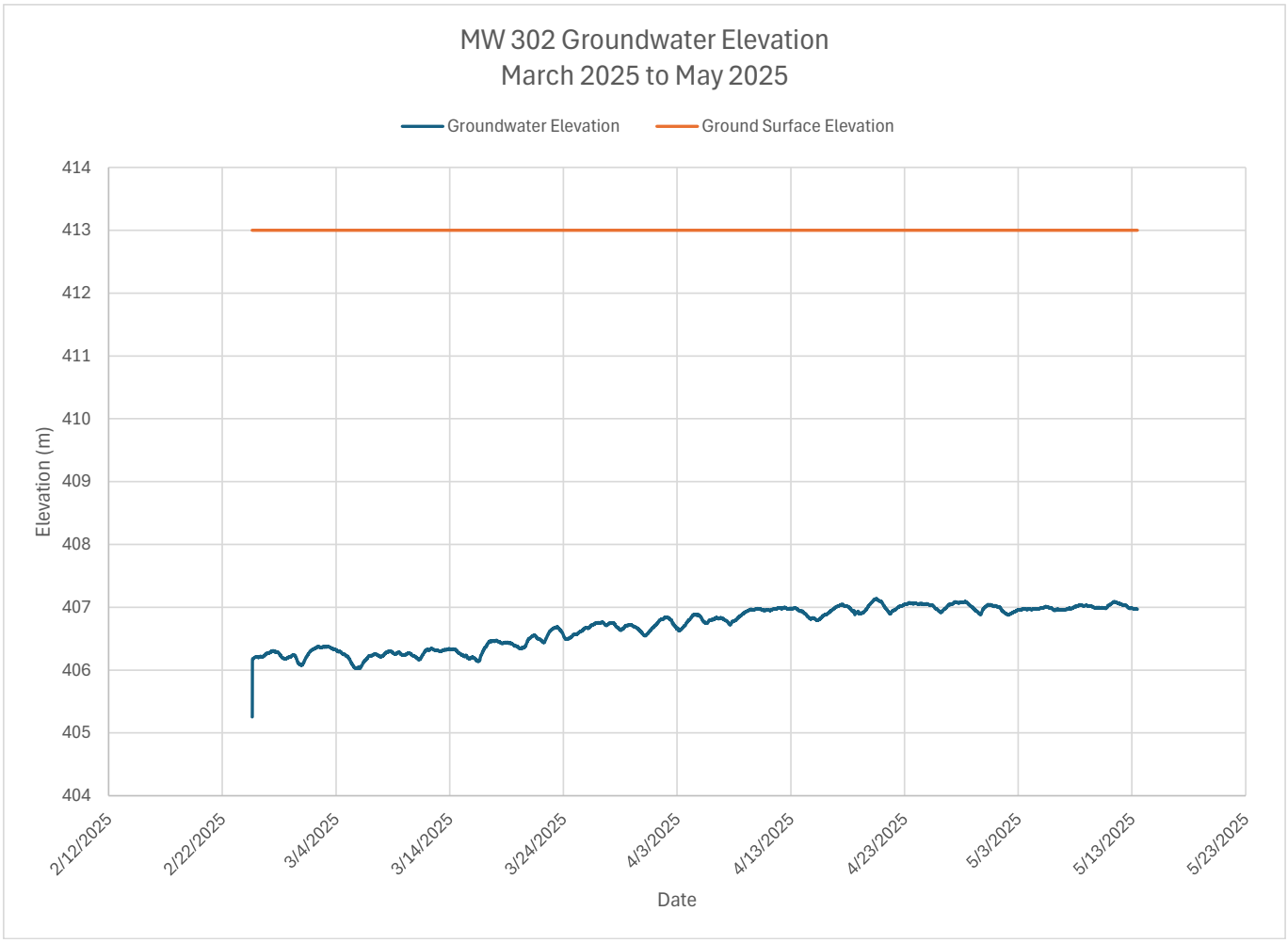
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date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March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
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Elevation (m)
2/12/2025
2/22/2025
3/4/2025
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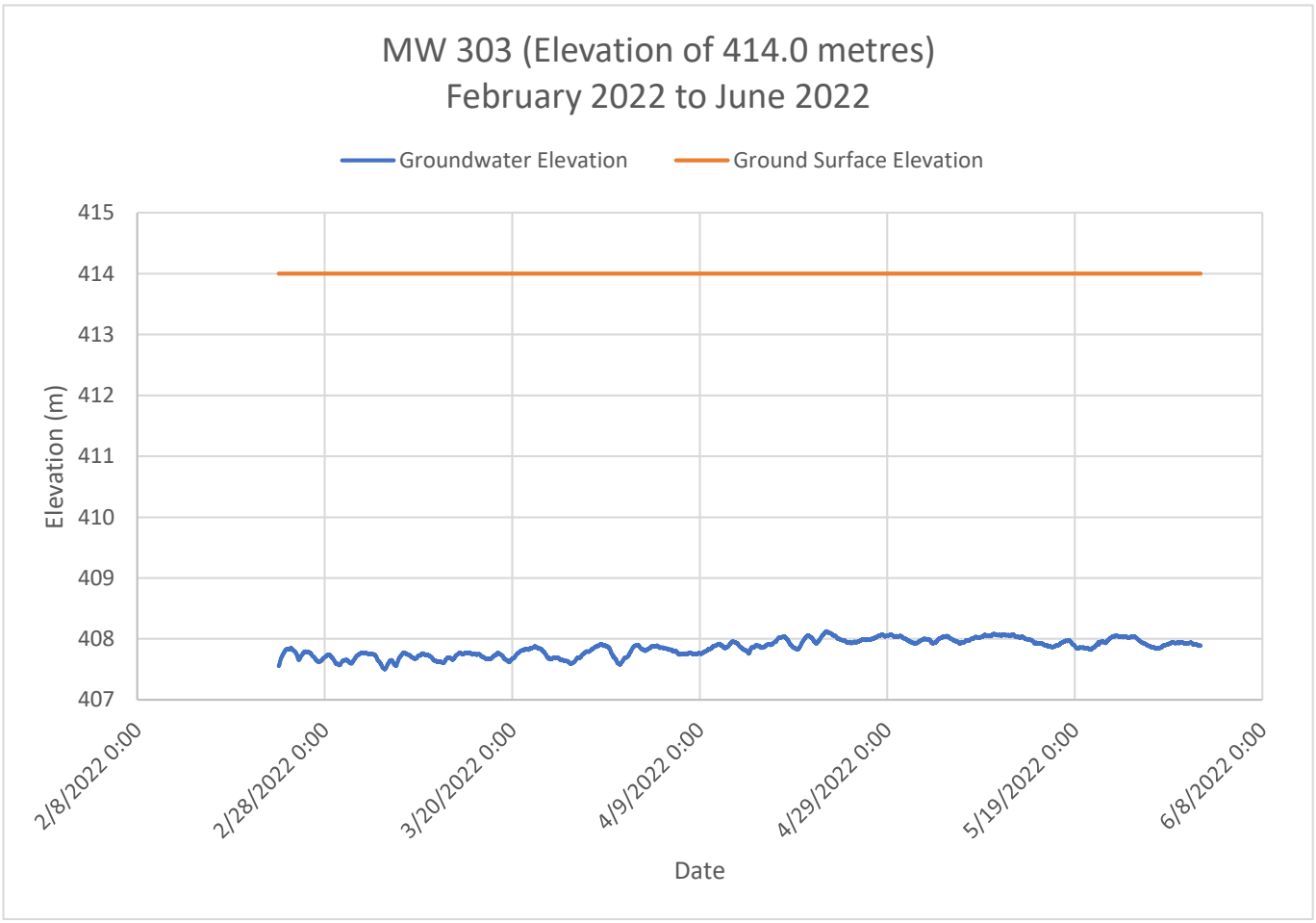
Date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February 2022 to June 2022
Groundwater Elevation
Ground Surface Elevation
Elevation (m)
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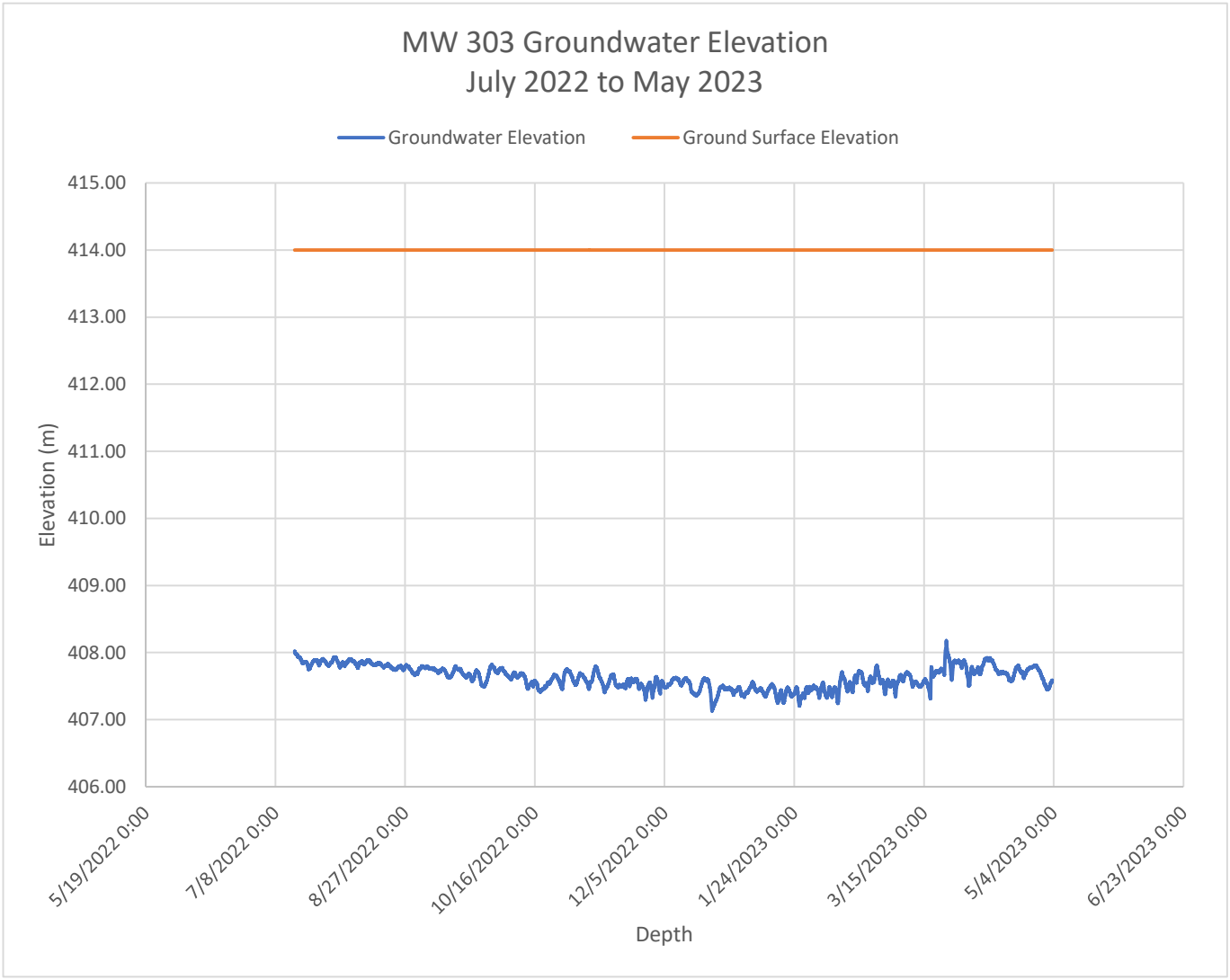
5/19/2022 0:00
6/8/2022 0:00
Date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Elevation (m)
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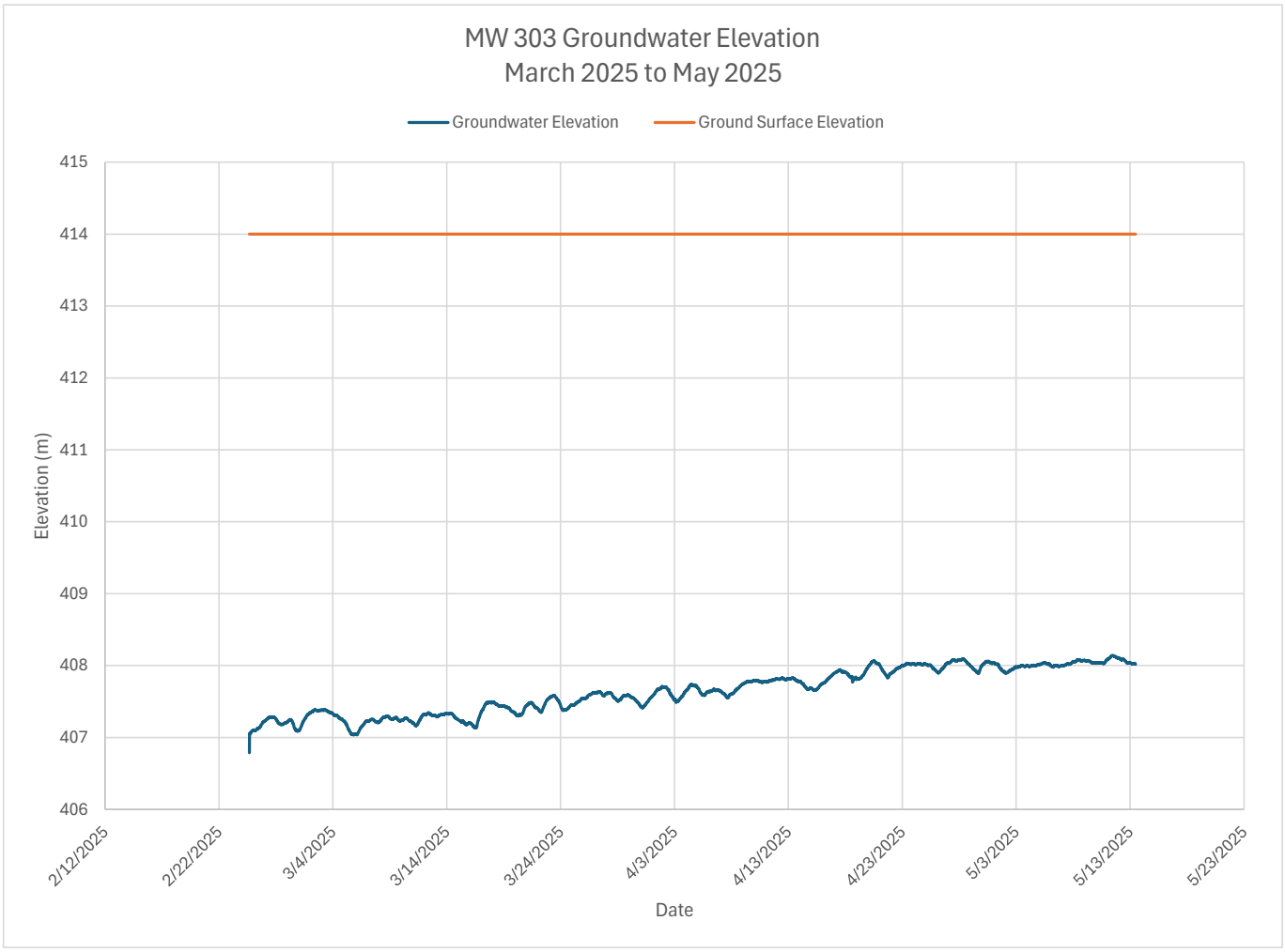
6/23/2023 0:00
Depth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March 2025 to May 2025
Groundwater Elevation
Ground Surface Elevation
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Elevation (m)
2/12/2025
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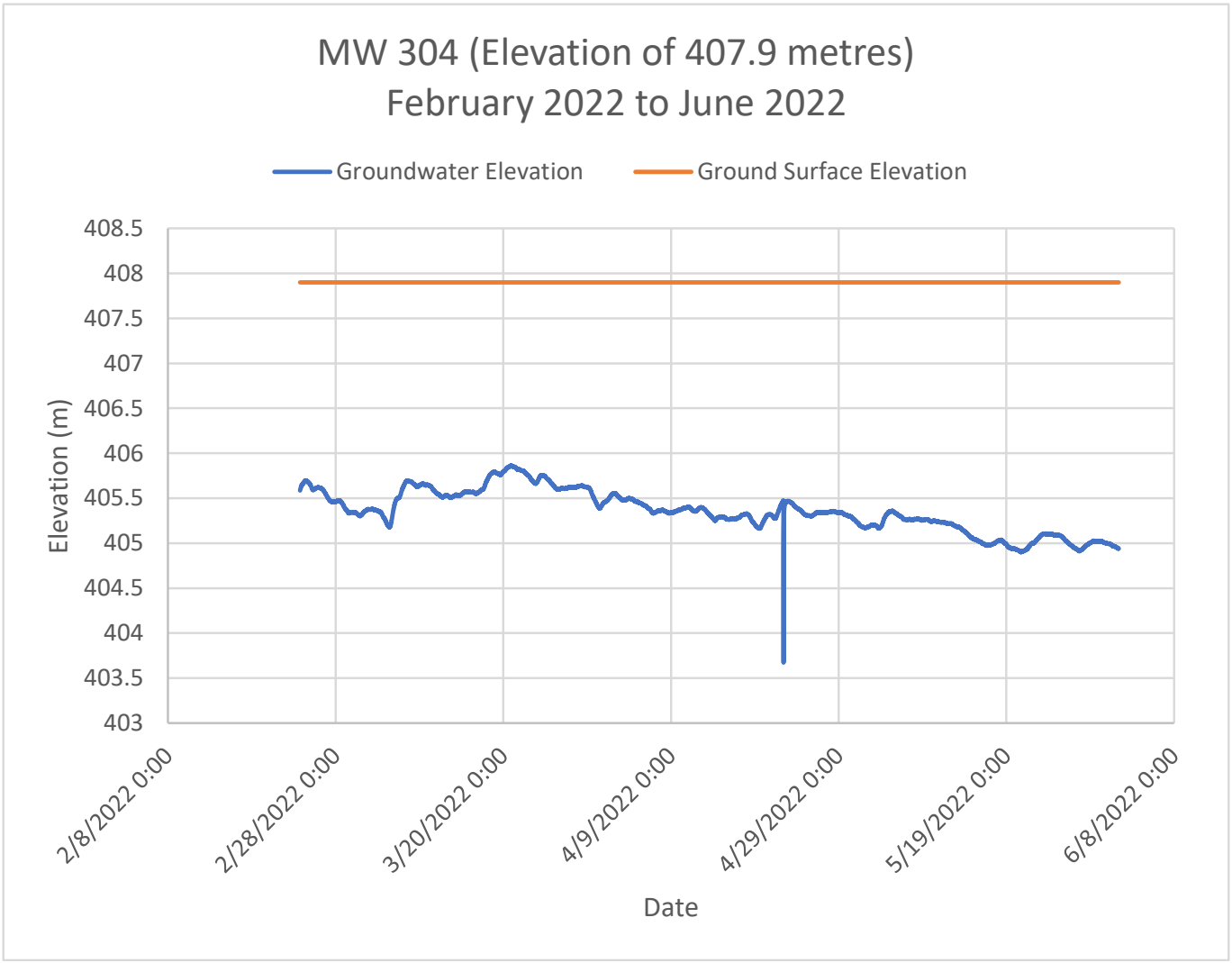
Date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Elevation (m)
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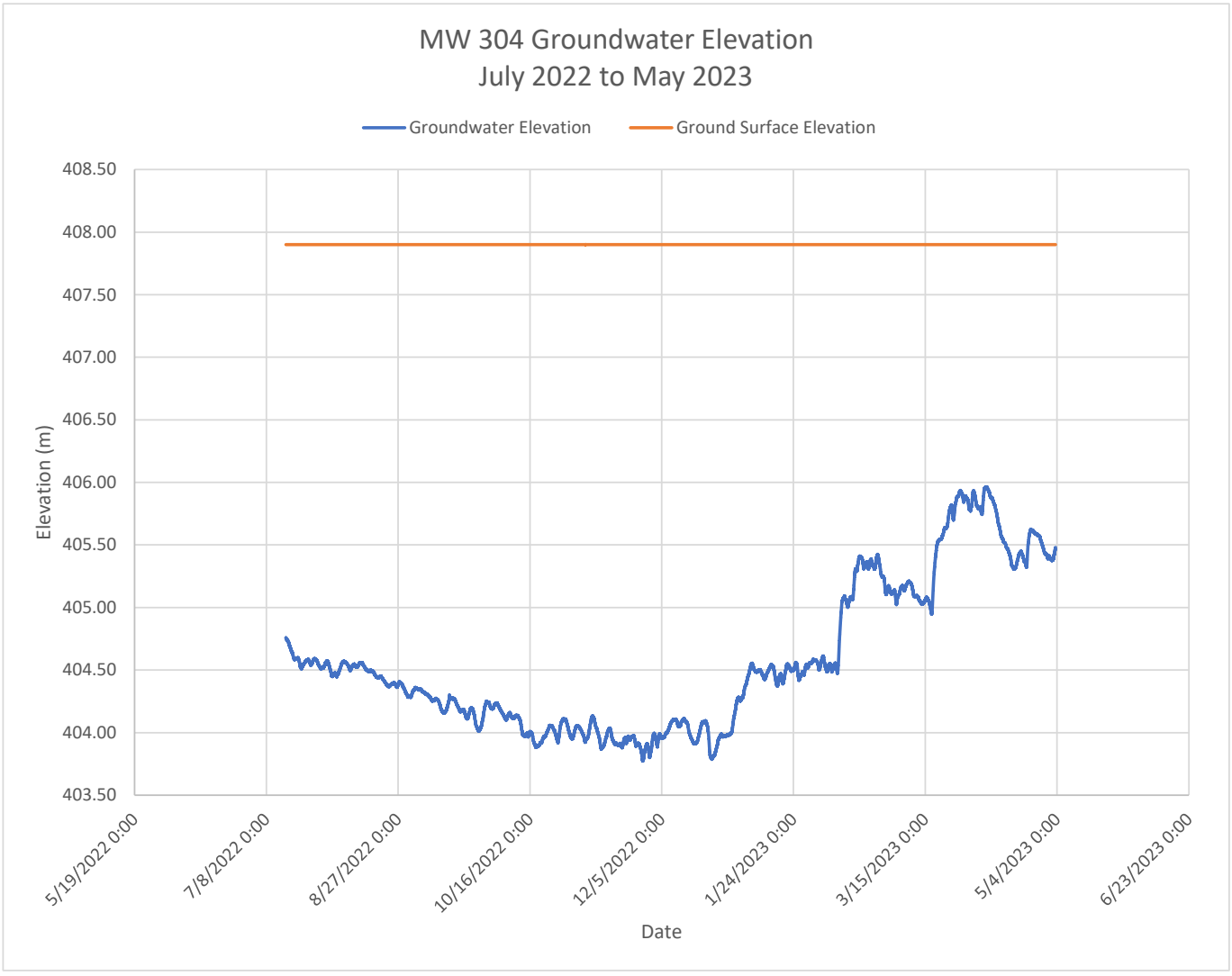
Date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Groundwater Elevation
Ground Surface Elevation
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Elevation (m)
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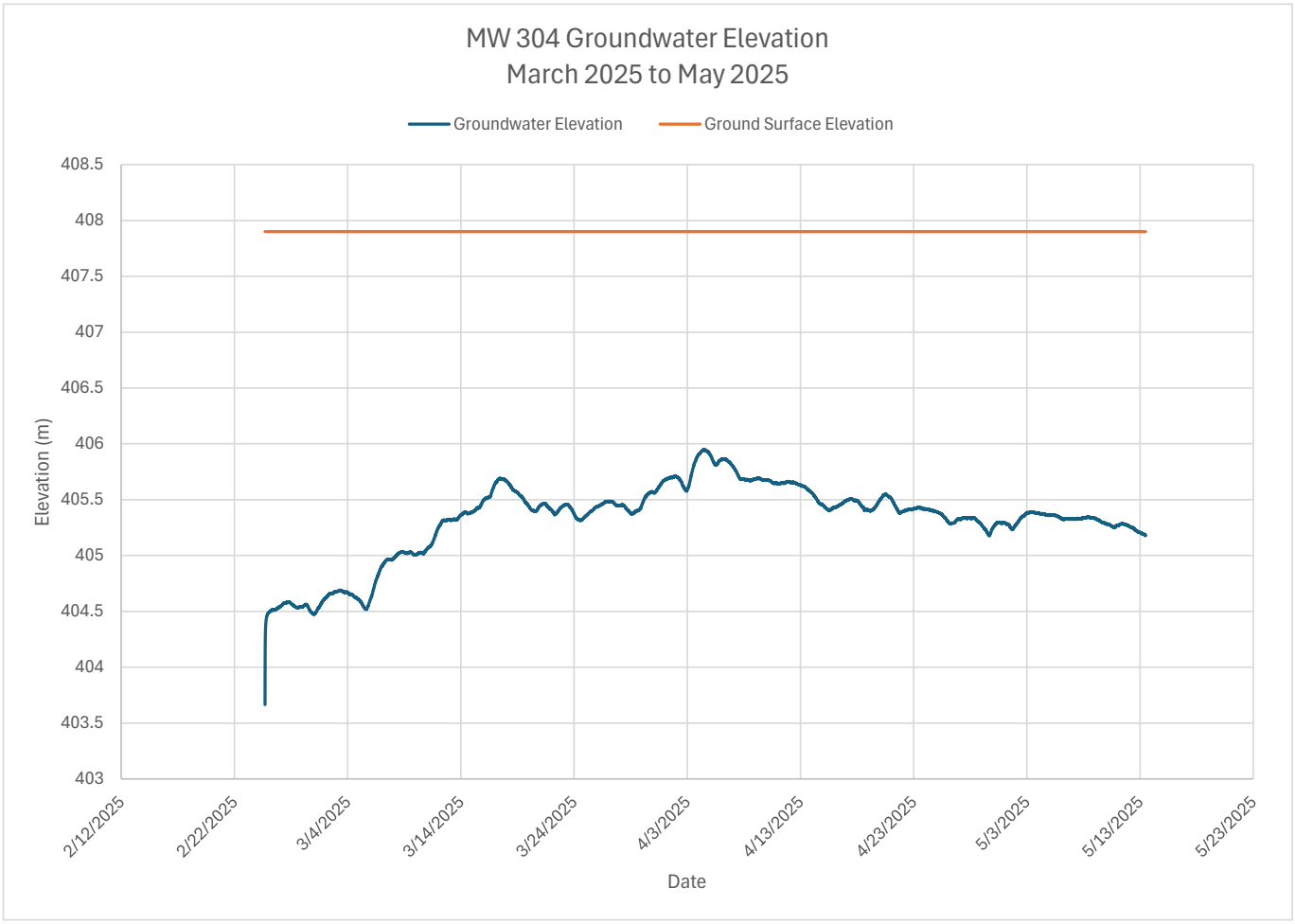
Date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Groundwater Elevation
Ground Surface Elevation
Elevation (m)
408.5
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2/12/2025
2/22/2025
3/4/2025
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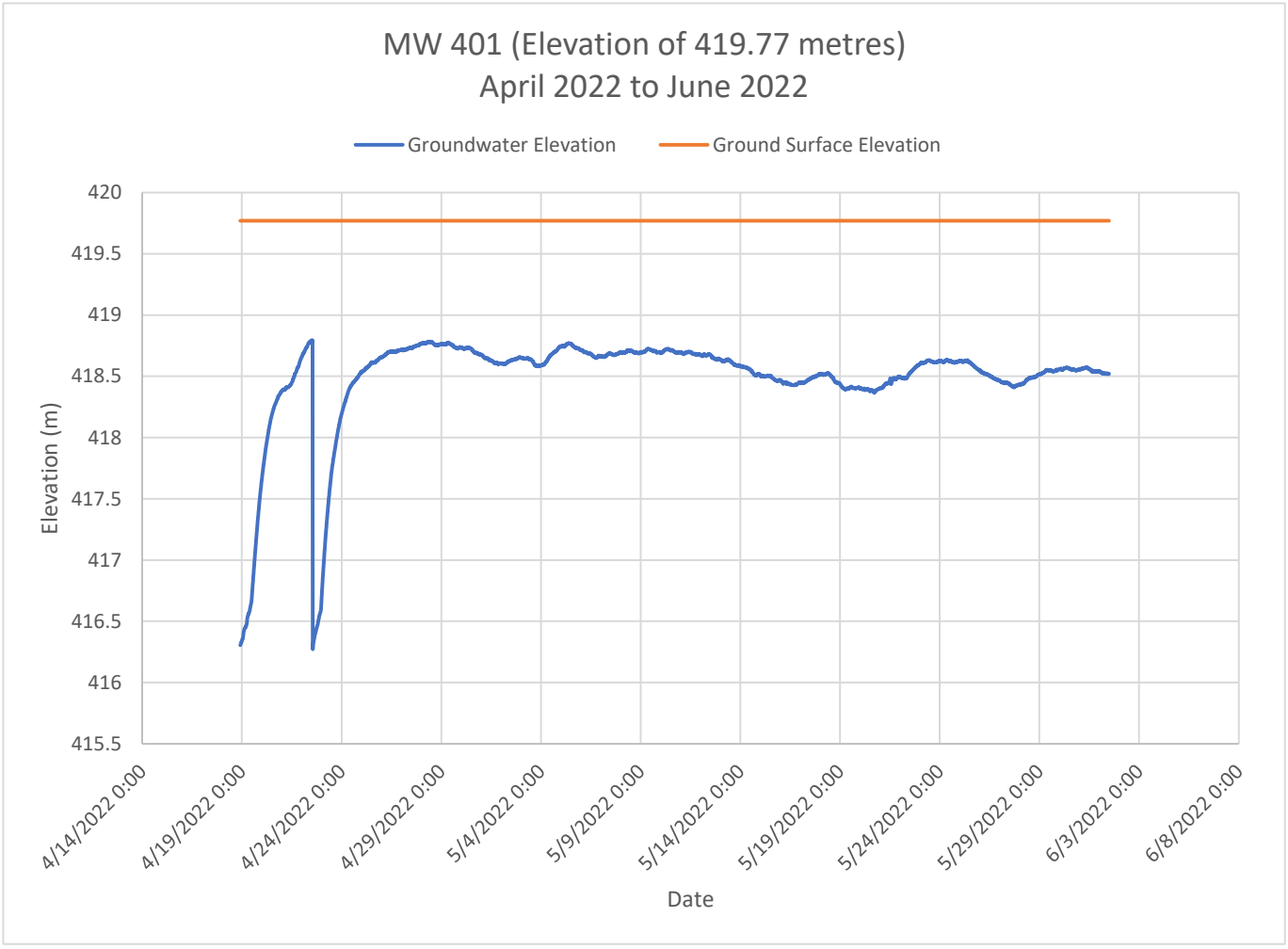
5/23/2025
Date


MW 401 (Elevation of 419.77 metres)
April 2022 to June 2022
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Ground Surface Elevation
420
419.5
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418.5
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416
415.5
Elevation (m)
4/14/2022 0:00
4/19/2022 0:00
4/24/2022 0:00
4/29/2022 0:00
5/4/2022 0:00
5/9/2022 0:00
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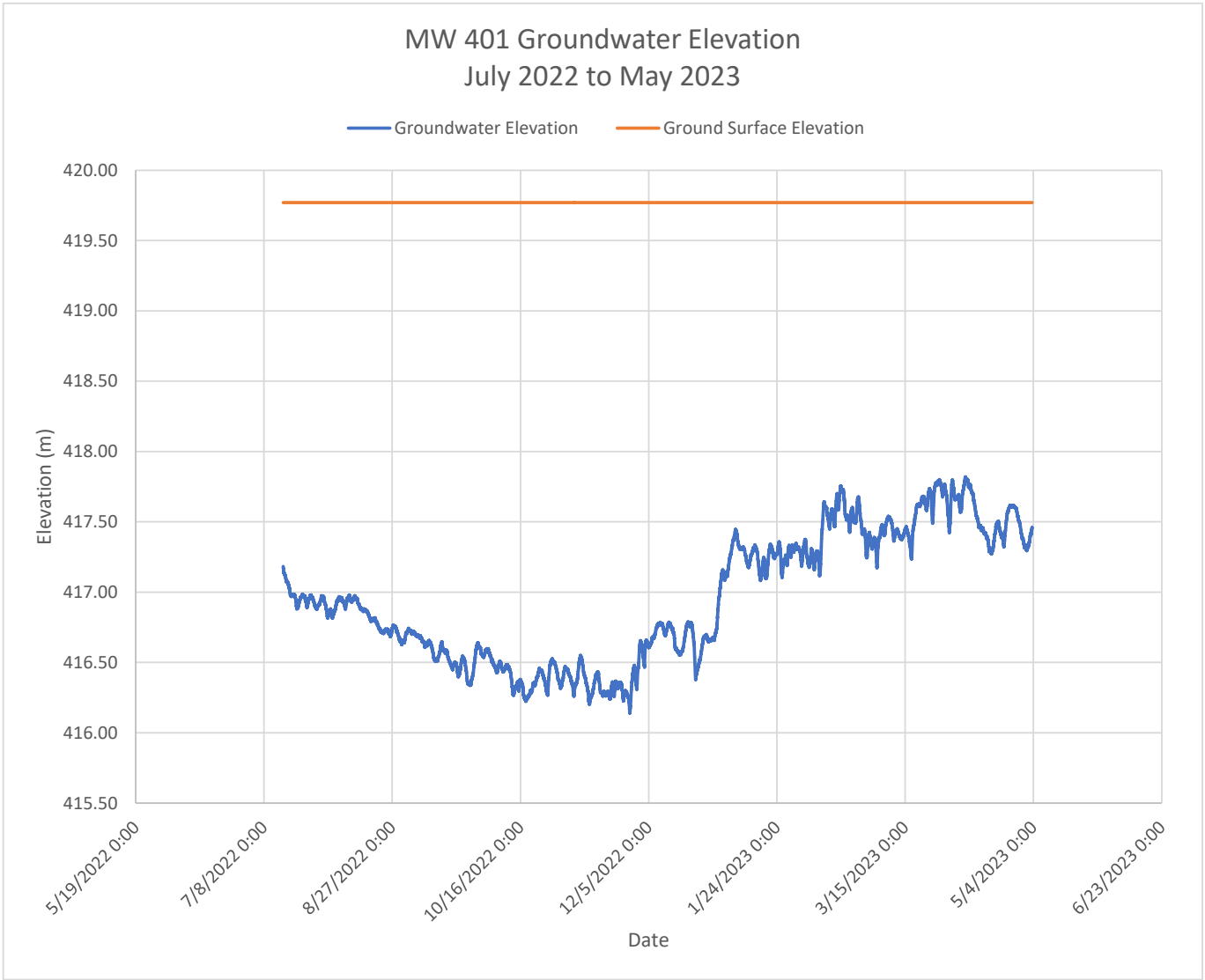
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Groundwater Elevation
Ground Surface Elevation
420.00
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416.50
416.00
415.50
Elevation (m)
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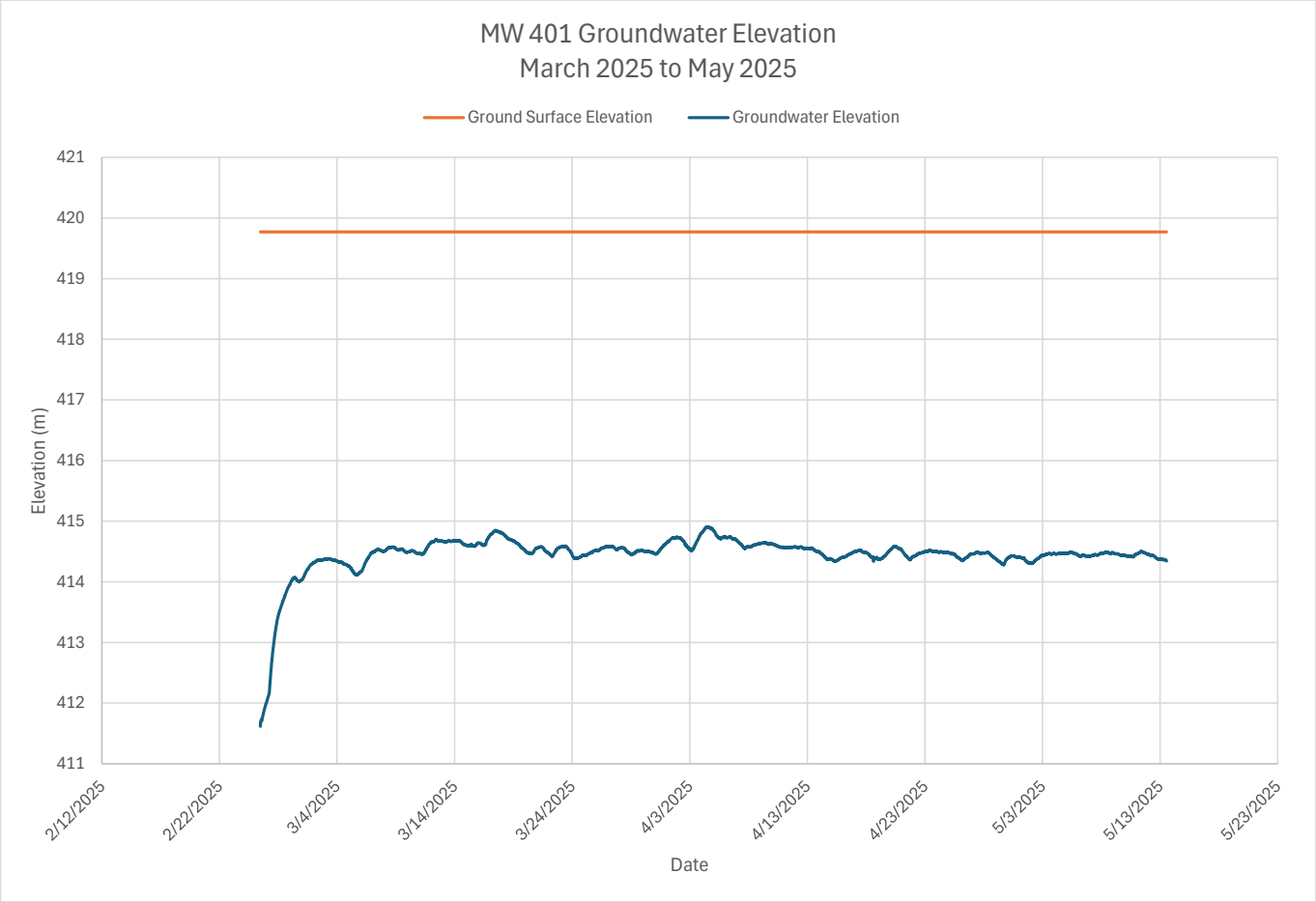
1/24/2023 0:00
3/15/2023 0:00
5/4/2023 0:00
6/23/2023 0:00
Date


MW 401 Groundwater Elevation
March 2025 to May 2025
Ground Surface Elevation
Groundwater Elevation
421
420
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418
417
416
415
414
413
412
411
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
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4/13/2025
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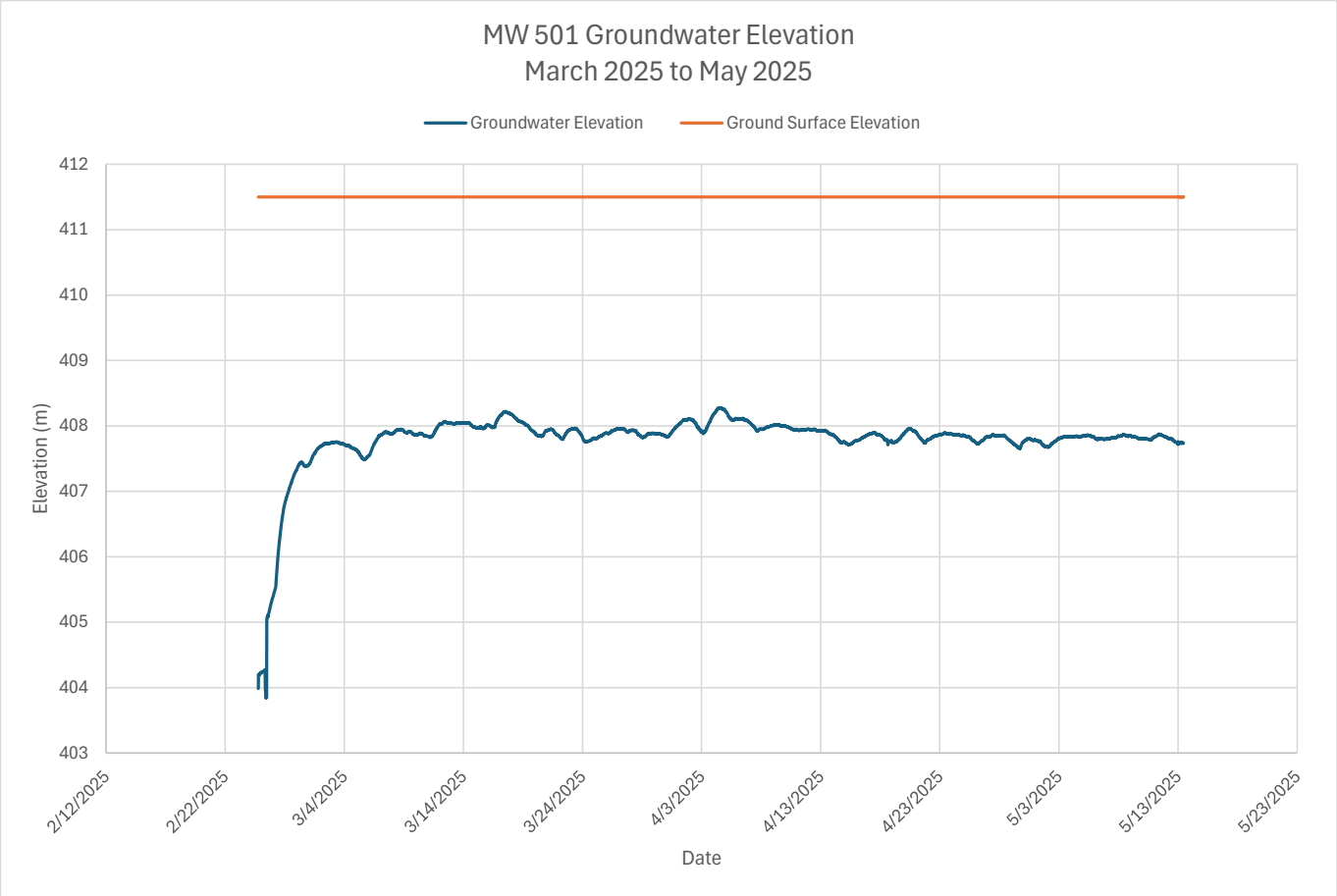
5/23/2025
Date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Ground Surface Elevation
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411
410
409
408
407
406
405
404
403
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
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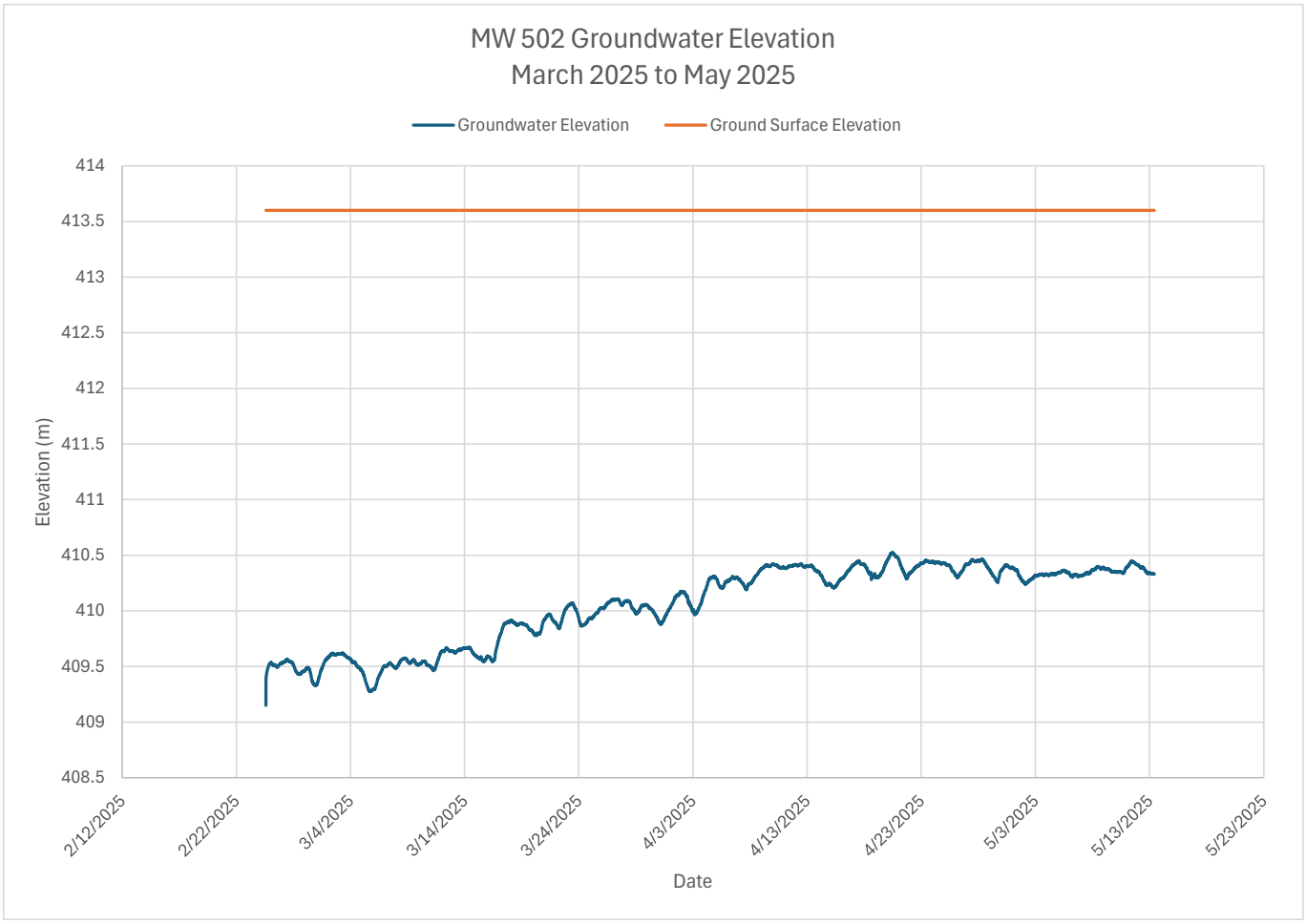
5/23/2025
Date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Ground Surface Elevation
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413.5
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410.5
410
409.5
409
408.5
Elevation (m)
2/12/2025
2/22/2025
3/4/2025
3/14/2025
3/24/2025
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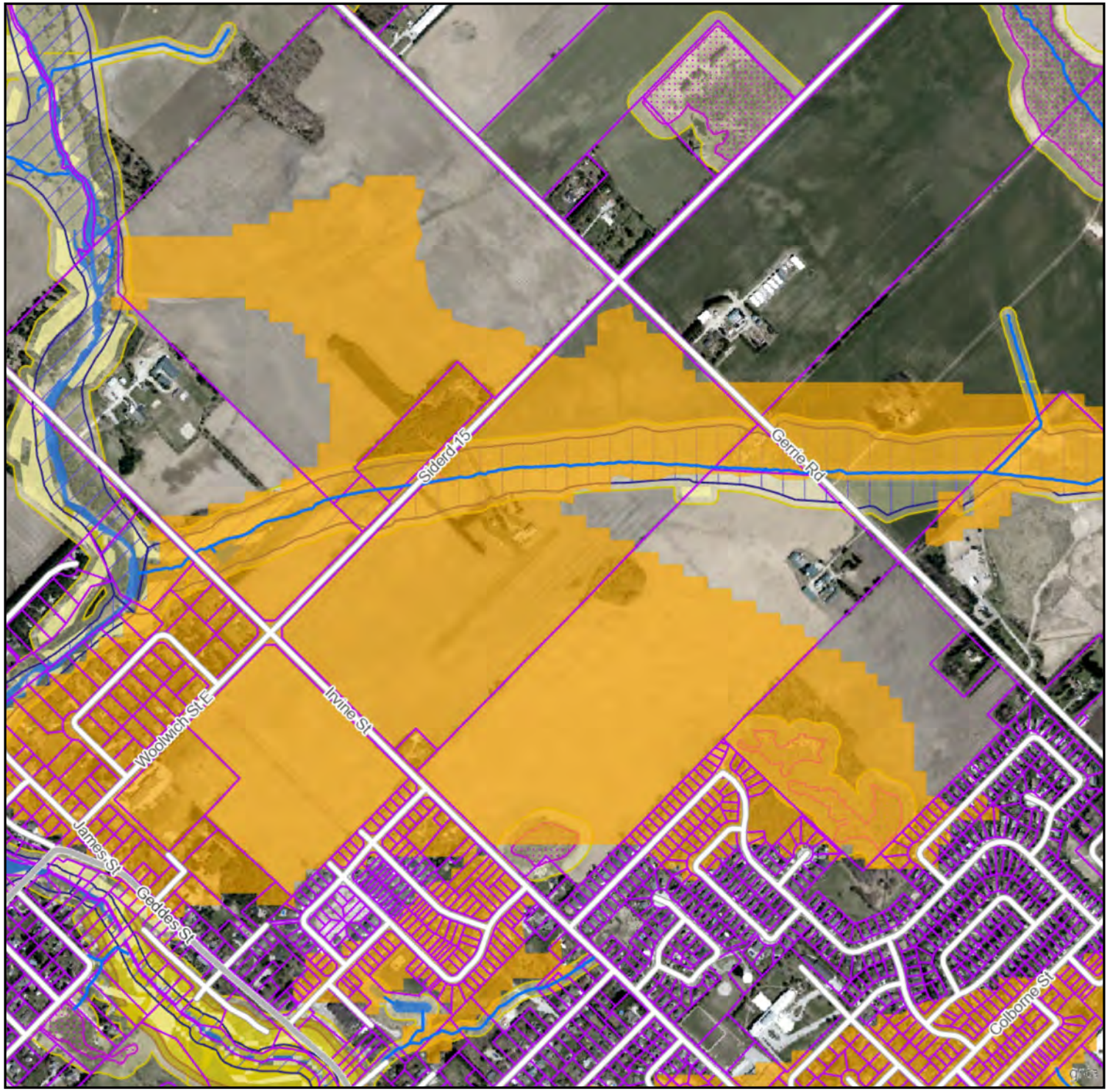
5/23/2025
Date

Appendix E

Source Water Mapping



Grand River Conservation Authority

Date: Sep 30, 2025

Elora Sands - SGRA Mapping

Legend

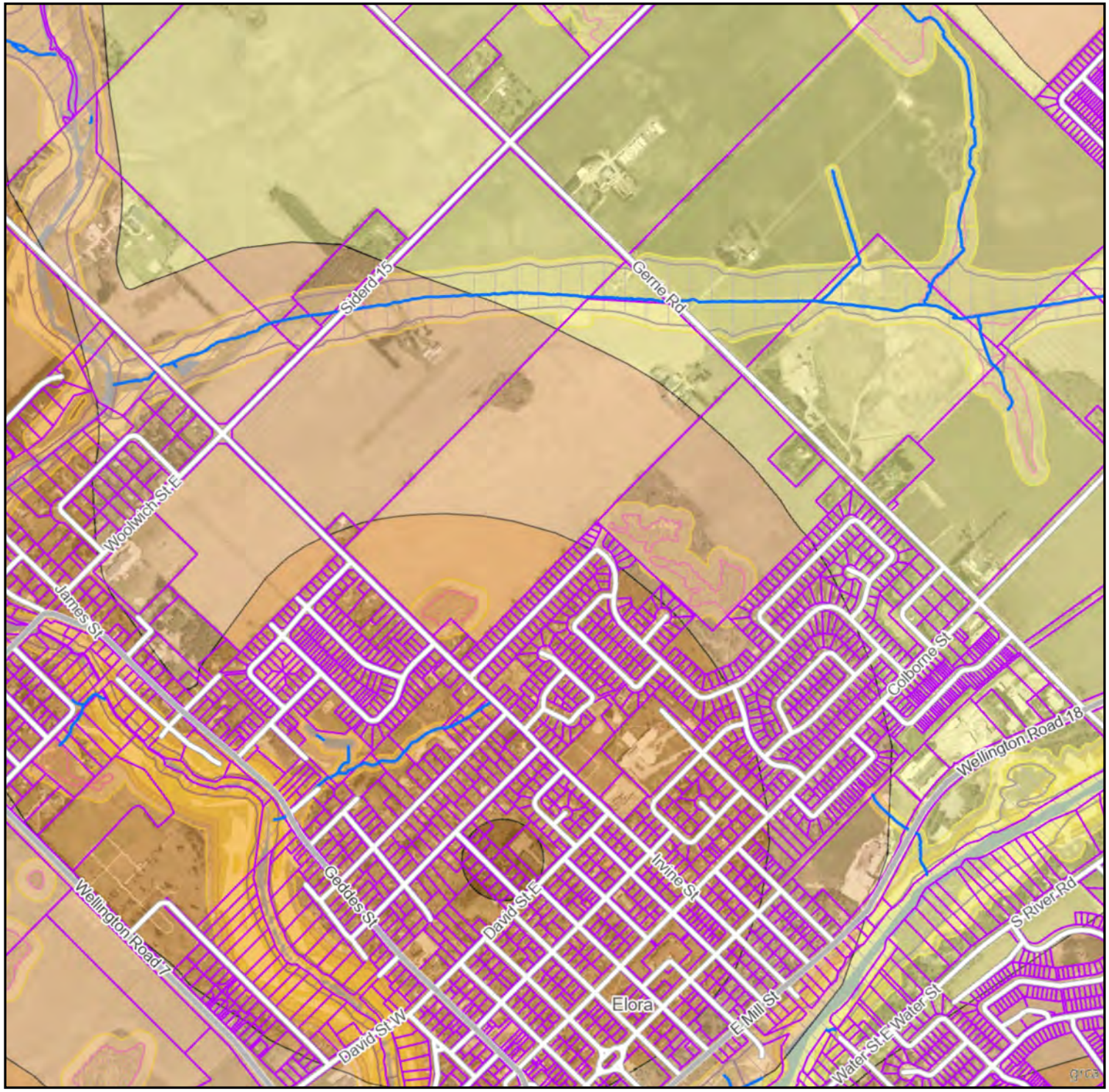
- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Signif. GW Recharge - Tier 2 (GRCA)

Scale 1:11,453

NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545736.98, 4838644.97 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)



Map Centre (X,Y): 545978.84, 4838187.14 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)

Grand River Conservation Authority

Date: Oct 29, 2025

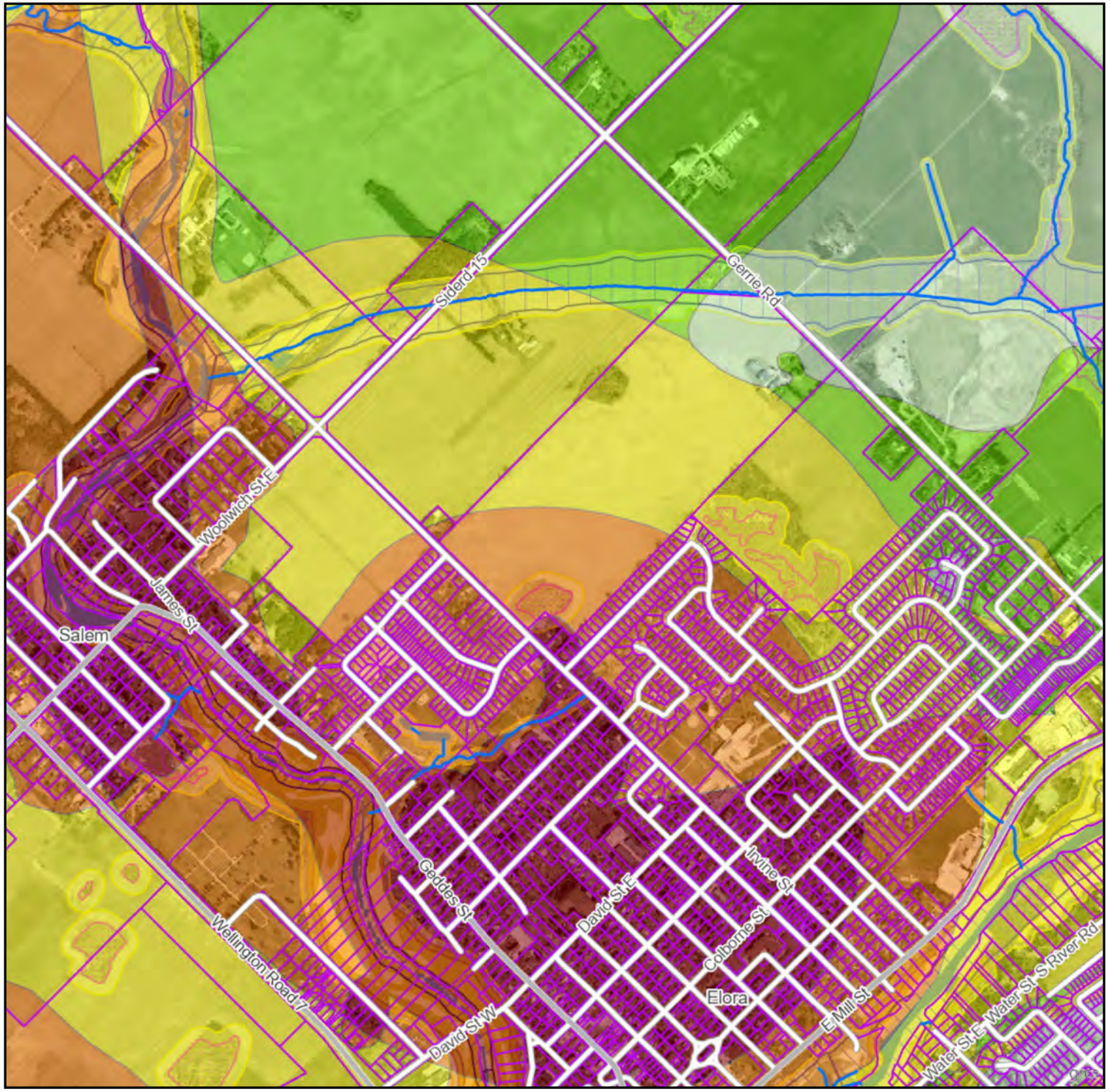
Elora Sands - WHPA Mapping

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- WHPA-Wellhead Protection Area (GRCA)
  - WHPA-A
  - WHPA-B
  - WHPA-C
  - WHPA-D

Scale 1:13,850

NAD83 UTM zone 17 (EPSG:26917)



Grand River Conservation Authority

Date: Oct 29, 2025

Elora Sands - WHPA Vulnerability

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- WHPA Vulnerability (GRCA)
  - 10
  - 8
  - 6
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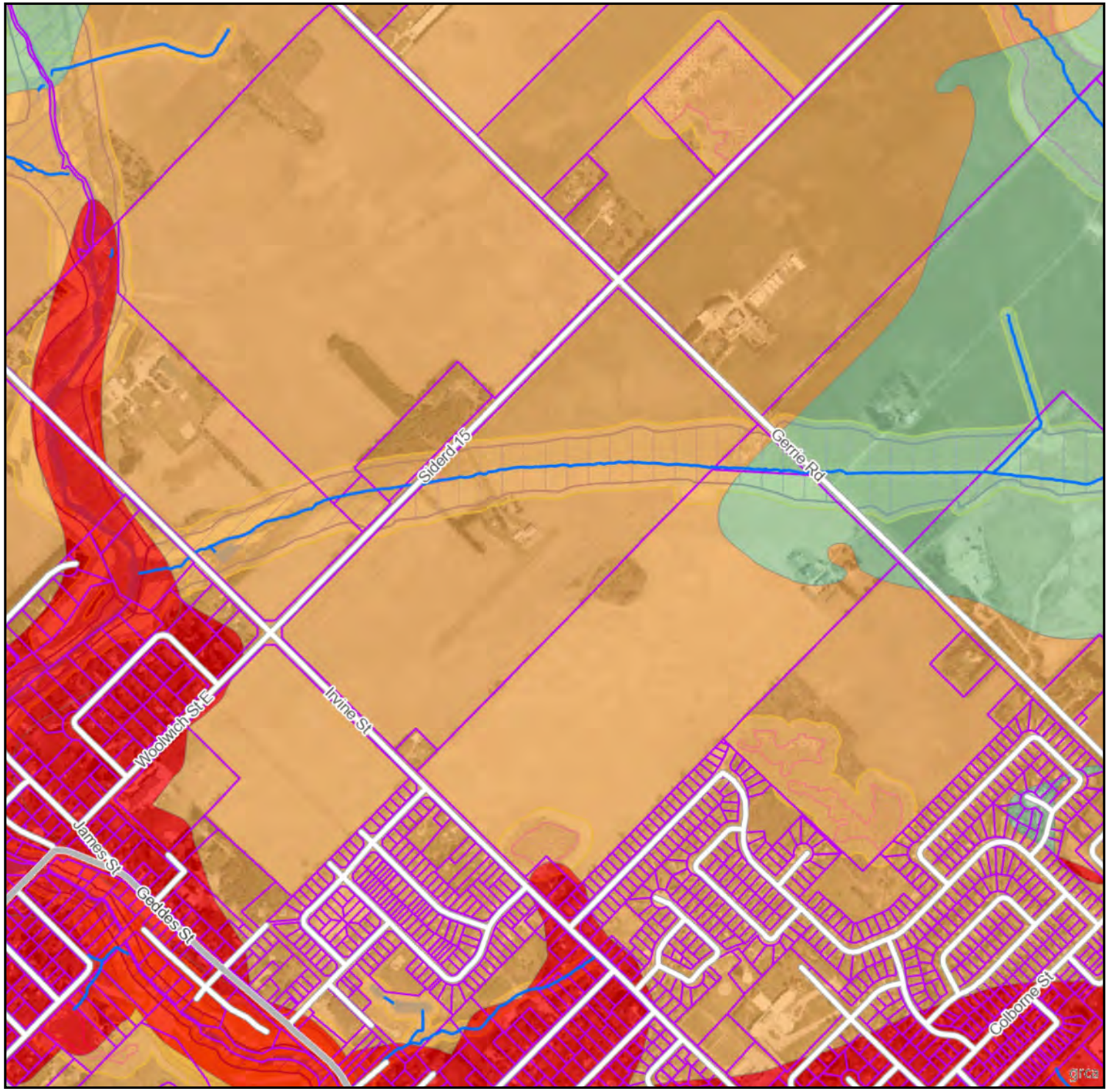
  - 2

Scale 1:13,850

NAD83 UTM zone 17 (EPSG:26917)



Grand River Conservation Authority

Date: Sep 30, 2025

Elora Sands - Intrinsic Vulnerability

Legend

- Regulation Limit (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
- Floodplain - Special Policy Area (GRCA)
- Slope Erosion (GRCA)
  - Steep
  - Oversteep
  - Toe
- Slope Valley (GRCA)
  - Steep
  - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Intrinsic Vulnerability (GRCA)
  - H
  - M
  - L

Scale 1:11,453

NAD83 UTM zone 17 (EPSG:26917)

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

March 6, 2025

Cachet Developments
c/o Brendan Walton, P.Eng.
361 Connie Crescent, Suite 200
Concord, ON L4K 5R2

Re: Source Water Protection Due Diligence Review, Elora Sands, 7581 Sideroad 15 (SR15), and Keating Lands (Part of Lot 17, Concession 12), Salem (Elora), ON

Dear Mr. Walton,

1.0 Introduction, Purpose and Background Information

Terra-Dynamics Inc. (Terra-Dynamics) respectfully submits this source water protection due diligence review of the 39.2 hectares of the Elora Sands property at 7581 Sideroad 15 (SR15), and the 38.7 hectares of the adjacent Keating Lands, Part of Lot 17, Concession 12, Elora (Salem), Township of Centre Wellington, County of Wellington, Ontario (Site). It is our understanding that residential development is proposed for the Site and will be serviced by municipal water and sewage (Malone Given Parsons Ltd., 2024).

The purpose of this Source Water Protection due diligence review is to advise Cachet Developments of future site development limitations with respect to addressing source water protection policies or/and related requirements. It is our understanding that the lands have been historically used for agriculture, e.g. corn, soybeans and pasture and corn.

The Site is currently outside of the existing Settlement Area boundary outlined in the Centre Wellington Official Plan, but it is our understanding that an application may be made to bring the Site into the Settlement Area.

2.0 Scope of Work

A background review of available information was completed that included, but was not limited to:

1. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps, including mapping of tile drainage, municipal drains and soil types.

2. Ontario Geological Survey (OGS) surficial geology and Aggregate Resources Inventory.

3. Consultant reports (e.g. Soil-Mat, Beacon, MTE, Waterloo Geoscience and GM Blue Plan);

4. Ministry of the Environment, Conservation and Parks, Source Protection Information Atlas.

5. Grand River Source Water Protection Area Source Water Protection datasets and reporting, including vulnerable area mapping (e.g. wellhead protection areas and significant groundwater recharge areas.

6. Liaison with Wellington Source Water Protection (Funk, 2025); and

7. Wellington County Official Plan (2024) and Centre Wellington Official Plan (2005).

3.0 Physical Setting Summary

3.1 Surficial Geology

The surficial geology of the Site has been regionally mapped as primarily gravel (59%) and sand (21%) with some sandy silt to silty sand diamicton (20%) (i.e. till) (Ontario Geological Survey (OGS), 2003). The OGS have also mapped much of the Site as a '*selected sand and gravel resource area of primary significance*' with 7 to 14 metres thickness coarse aggregate based upon water well data (OGS, 1999). This significance is recognized in the Centre Wellington Official Plan in Schedule C - Sand and Gravel Resources (Township of Centre Wellington, 2005). However the regional characterization appears to largely over-estimate the amount of high-permeable materials on-site, this is discussed below.

3.1.1 Elora Sands Property

The surficial geology of the Elora Sands property has been regionally mapped as primarily gravel (49%) and sand (38%) with some sandy silt to silty sand diamicton (13%) (i.e. till) (OGS, 2003). However, Site level borehole investigations of the Elora Sands property by Soil-Mat Engineers & Consultants Ltd. (2022) have proven that the regional mapping does not reflect actual site conditions. For example, the fourteen (14) boreholes completed at the Elora Sands property have delineated no gravel at-surface, and the areas of sand (~33% of the Site) are generally limited to between 1 and 2 metres thick in the northwest (i.e. BH006 and MW401 with sand thicknesses of 1.3 m and 1.6 m, respectively), and central portions of the Site (i.e. BH003 and MW201 with sand thicknesses of 1.7 m and 2.2 m, respectively), although at MW205 the sand thickness was 6.1 m (Drawing No.1, Soil-Mat, 2022).

3.1.1 Keating Lands

A borehole investigation southeast of the Keating Lands also suggests much less permeable/high recharge materials than regionally mapped (GM Blue Plan Engineering, 2023).

3.2 Groundwater Recharge

Groundwater recharge rates have been recently modelled as part of the Centre Wellington Tier Three Water Budget Risk Assessment – Risk Assessment Report (Matrix Solutions Inc., 2020) (Map 1, Figure 5). The modelled groundwater recharge rates are largely a reflection of the regional surficial geological mapping, with 60% of the Site modelled as between 300 and 500 mm/year or greater, i.e. equivalent to coarse sand or gravel (MECP, 1995).

These modelled values appear to include over-estimates for recharge at the Site, as much lower permeability soils have been identified based upon the borehole investigations completed by Soil-Mat Engineers & Consultants Ltd (2022). For example, in the central portion of the Elora Sands at borehole BH003 and MW202, clayey to sandy silt soils were identified (e.g. calculated infiltration rates of <10 mm/hour) and none of the regionally mapped gravel was identified (Drawing No. 1). High infiltration rates have been calculated for some boreholes, e.g. 201, 203 and 205 (50 mm/hour or greater).

3.3 Surface Water

The watercourse crossing the Site, the Nichol Drain (or Municipal Drain No.1), was classified by the Department of Fisheries and Oceans (DFO) in 2022 as "Type E", permanent flow, with a 'Spring' season restricted timing window (OMAFRA, 2025, Map 2). The Site north of the drain is mapped as tile-drained, likely installed about 1 metre below ground surface (OMAFRA, 2007), and tile outlets to the drain were observed by Beacon Environmental (2025). Past research suggests tile-drainage may capture between 10 and 15% of infiltration (Mulhern, 2008). The Nichol Drain outlets to Irvine Creek west of the Site.

Beacon Environmental have indicated the "*Nichol Drain should be considered to have coldwater fishery potential and be classified as a coldwater stream for construction and stormwater management perspective. Watercress was visible during the Beacon investigation, supporting this designation*" (Beacon Environmental, 2025). The drain at the Site has been previously mapped by the GRCA as a groundwater discharge area (GRCA, 2024) since the regional water table is higher in elevation than the drain. Groundwater levels at MW004 appear to support the local water table being higher in elevation than the drain (Drawing No.1).

The GRCA have regionally mapped the Site as about 75% within the Nichol Drain catchment and 25% towards the Queen Street Tributary with a small portion along the eastern boundary towards the southeast (GRCA, 2017). The subcatchment divides have been refined via a Site topographic survey to show a slightly larger area draining towards the Queen Street Tributary and not towards the southeast, under-predevelopment conditions (MTE, 2025).

3.4 Southwest Unevaluated Wetland – Keating Lands

The Ministry of Natural Resources and Forestry (MNRF) and GRCA have regionally mapped a 0.78 ha unevaluated wetland in the southern part of the Site adjacent Irvine Street. This wetland vegetation is presented as part of the Core Greenlands within the Wellington County Official Plan (2024). This wetland vegetation has not been staked with the GRCA, but is scheduled for staking in 2025.

Beacon Environmental have identified the wetland vegetation as consisting of primarily Willow Mineral Thicket Swamp and Red-osier Mineral Thicket Swamp, with some Fresh-Moist Lowland Deciduous Forest adjacent and an inclusion of Mineral Shallow Marsh within the swamp with standing water (Beacon Environmental, 2025).

This unevaluated wetland is located on the margin of regionally mapped gravel and sandy silt/silty sand till (OGS, 2003). Geology from nearby Elora Meadows boreholes MW18 and MW19 recorded sand on silty sand till with groundwater levels as high as within 1 m of surface (Waterloo Geoscience, 2005). It is possible the wetland is an area of slower groundwater recharge as GRCA has regionally mapped a weak

downwards vertical gradient (GRCA, 2024). The wetland vegetation does not appear to have a connection to a watercourse, i.e. it may be supplied water by only precipitation and overland runoff.

3.5 Township of Centre Wellington Well Supply Municipal Well E1

Elora municipal well E1 is located 535 m south-southeast of the Site and 860 m south-southeast of the Elora Sands property (Map 3, Figure 8, Matrix Solutions Inc., 2017). This well is constructed to take water from the bedrock aquifer and is 130 metres deep with casing to 19.8 metres below ground surface (Map 4, Figure 13, Matrix Solutions Inc., 2017). The well produced on average 47% of the Elora municipal supply in 2018 (Matrix Solutions Inc., 2020).

The bedrock aquifer beneath the Site has been most recently regionally mapped as having primarily low vulnerability (vulnerability scores of 2, 4 and 6), with a portion of the southern area of the Site mapped as 8 (medium vulnerability score), and a very small portion mapped as 10 (high) (Map 5, Figure 6-29, Grand River Source Protection Committee, 2022a, and Map 5b, MECP, 2025).

4.0 Source Water Protection

The Site is within the Grand River Source Protection Area. The Grand River Source Protection Committee was responsible for mapping four types of vulnerable areas within the Grand River Source Protection Area: (i) wellhead protection areas, (ii) intake protection zones, (iii) highly vulnerable aquifers and (iv) significant groundwater recharge areas. Two of these types of vulnerable areas are mapped at the Site: (1) wellhead protection areas and (2) significant groundwater recharges areas (MECP, 2025).

Wellhead protection areas (WHPAs) can include different zones for water quality protection of a groundwater supply. These different zones are based largely upon the expected travel time of contaminants to the water supply after they enter the aquifer (Table 1, Figure 1 – Illustration of WHPA Zones, MECP, 2006). These zones were mapped using a groundwater flow model to include both areas upgradient of the well as well as cross- and down-gradient as the well captures water from these areas.

Table 1 –Water Quality Well Head Protection Areas (WHPA) Details (MECP, 2006)

WHPA	Description
A	100 m radius
B	2 year Time of Travel
C	2 to 5 year Time of Travel
D	5 to 25 year Time of Travel

WHPAs can also include areas for water quantity protection, called WHPA Q1 and/or Q2. WHPA-Q1 is delineated based upon a combination of the cone of influence of each pumping well and WHPA-Q2 for land areas where reductions in recharge have the potential to have a measurable impact on the municipal wells (Matrix Solutions Inc., 2020).

Significant groundwater recharge areas (SGRAs) were also mapped at the Site, as areas regionally having groundwater recharge 15% above the average watershed rate. The average watershed recharge rate was calculated as 176 mm/year, for an SGRA criterion of greater than 202 mm/year (GRCA, 2023). This mapping was completed as part of the Tier 2 Water Budget Assessment derived from previous GRCA

Hydrologic Response Unit modelling using the Guelph-All-Weather-Storm-Event-Runoff (GAWSER) model which used regional surficial geologic mapping (GRCA, 2023). However, as mentioned in Section 3.2, an analysis of local borehole results is expected to reduce the amount of SGRAs at the Site.

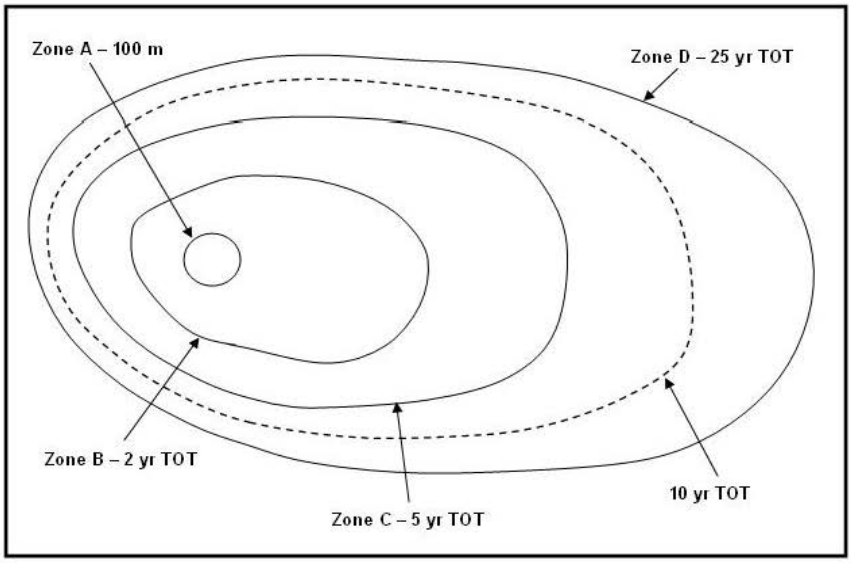


Figure 1 – Illustration of WHPA Zones (MECP, 2006)

4.1 Wellhead Protection Areas

A series of WHPAs for the nearby municipal well E1 extend onto the Site (Map 6, Figure 7.1, Grand River Source Protection Committee, 2022b). The areal coverage and location of these WHPAs is approximated below (Tables 2a and 2b).

A WHPA-Q was also delineated for the Centre Wellington municipal groundwater supplies (Map 7, Figure 11, Matrix Solutions Inc., 2020) as "*the combined area that is the cone of influence of the well… plus the whole of the cones of influence of all other wells… that intersect that area…the WHPA-Q1 and WHPA-Q2 are coincident*" (Matrix Solutions Inc., 2020).

Significant water quality threat policies exist for the WHPA-B and WHPA-C areas that must be conformed to, or complied with (Section 4.3), e.g. regarding dense non-aqueous phase liquids (DNAPLs). Examples of DNAPLs include metal degreasers, paint removers and brake fluid. However, the current Grand River Source Protection Plan does not include policies for moderate and low threats.

With respect to significant water quantity threats, all "…*future areas of recharge reduction (due to land use development within this policy area)* (i.e. WHPA-Q) *are classified as Significant water quantity threats …*" (Matrix Solutions Inc., 2020). This preliminary designation was because "…*the potential impact of stormwater management measures and low impact development techniques was not considered when estimating recharge reductions on future land development areas*" (Matrix Solutions Inc., 2020). For example, southwest lands at 75 Woolwich Street East (Elora, Ontario), were mapped as a '*Groundwater Recharge Reduction Threat*" (Map 7, Figure 11, Matrix Solutions Inc., 2020).

Table 2a – Site WHPA Summary Details (Grand River Source Protection Committee, 2022b)

WHPA	Area (hectares)	Percent of Site	On-site Location	Vulnerability Score	Significant Threat Policy Categories
B	<0.1	<0.2%	Southern	10	Waste Disposal, Sewage Systems, Agricultural Source Material, Non-Agricultural Source Material, Commercial Fertilizer, Pesticide, Road Salt, Storage of Snow, Fuel, DNAPLs, Organic Solvents, Aircraft De-icing, Livestock Area, Oil Pipelines
	10.9	14%	Southern	8	Waste Disposal, Sewage Systems DNAPLs
C	47	60%	Central	6/4/2	DNAPLs
D	20	26%	North/ Northeast	4/2	None
Q1/Q2	Entire Site	100%	NA	NA	To be confirmed

Table 2b – Elora Sands WHPA Summary Details (Grand River Source Protection Committee, 2022b)

WHPA	Area (hectares)	Percent of Site	On-site Location	Vulnerability Score	Significant Threat Policy Categories
B	0.03	<0.1%	South	8	Waste Disposal, Sewage Systems DNAPLs
C	26.5	68%	Southwest	6	DNAPLs
D	12.7	32%	Northeast	4	None
Q1/Q2	Entire Site	100%	NA	NA	To be confirmed

4.2 Significant Groundwater Recharge Areas (SGRAs) Mapping

SGRAs have been regionally mapped to cover about 83% of the Site (Map 8, MECP, 2025). However, this is based upon modelled recharge rates that used regional surficial geologic mapping that appears to over-estimate SGRAs at the Site (Section 3.1). AquaResource Inc. (2009) acknowledge the limitation of regional SGRA modelling and provide the following regarding the SGRA mapping:

> "*Caution also applies to the use of SGRAs, which are delineated using regional estimates of recharge… For use at a site-specific scale, they should be refined to take into account a more detailed hydrogeological characterization.*"

4.3 Source Water Protection Policies

Significant Threat Source Protection Plan policies for consideration include water quality and water quantity. Acronyms used in this section include: WC – Wellington County, CW – Centre Wellington, MC – Must Conform, CWA – Clean Water Act, LID – Low Impact Development and ICA – Issue Contributing Area, TCE – trichloroethylene and EPA – Environmental Protection Act.

The Significant Water Quality Threat policies are presented from greatest to least areal coverage of the Site, i.e. (i) WHPA-C, (ii) WHPA-B vulnerability score of 8, and (iii) WHPA-B vulnerability score of 10.

4.3.1 Significant Water Quality Threats (WHPA-C and WHPA-B vulnerability score of 8)

Within the area of the Site mapped as WHPA-C (or ~60% of the Site), one significant water quality threat may apply, WC-CW-16.3, this policy is listed below (Table 3) (Grand River Source Protection Committee, 2022b). This policy is not expected to exert a constraint on residential development of the Site, as it is intended to inform industrial, commercial, institutional or agricultural activities with respect to the handling and storage of a DNAPL. However, this is expected to be reviewed by the Risk Management Official to determine if a Risk Management Plan is required, and in some cases an Education and Outreach Program for residents will be required.

Table 3 – Relevant DNAPL Policy (Grand River Source Protection Committee, 2022b**)**

Policy	Text
WC-CW-16.3	To ensure any Future handling and storage of a dense non-aqueous phase liquid (DNAPL) for industrial, commercial, institutional or agricultural purposes within a WHPA-B, C or TCE ICA, never becomes a significant drinking water threat, where this activity would be a significant drinking water threat, this activity shall be designated for the purpose of Section 58 of the CWA and a Risk Management Plan shall be required where the following apply: a. Any quantity of DNAPL in a WHPA-B with a vulnerability score of 10, including within an ICA for trichloroethylene; or b. Any quantity of the following chlorinated solvents in a WHPA-B or WHPA-C, with a vulnerability score < 10, including within an ICA for TCE, or within a WHPA-D in an ICA for TCE: • Dioxane-1,4 • Tetrachloroethylene (PCE), TCE or another DNAPL that could degrade to TCE • Vinyl chloride or another DNAPL that could degrade to vinyl chloride; or c. 25 Litres or greater of Poly Aromatic Hydrocarbons (PAHs) in a WHPA-B or WHPA-C, with a vulnerability score < 10, including within an ICA for TCE, or within a WHPA-D in an ICA for TCE.

Within the area of the Site mapped as WHPA-B vulnerability score 8 (approximately 14%), three significant water quality threats may apply, WC-CW-16.3 (already discussed above) as well as policies WC-MC-2.3 and WC-MC-3.4, and these two additional policies are listed below (Table 4). It is not expected that these policies will exert constraints on residential development of the Site as neither a waste management disposal site (WC-MC-2.3) nor a sewage treatment plant (WC-MC-3.4) are proposed.

Table 4 – Waste Disposal and Sewage System Relevant Policies
(Grand River Source Protection Committee, 2022b**)**

Policy	Text
WC-MC-2.3	To ensure the establishment, operation or maintenance of a Future waste disposal site within the meaning of Part V of the *EPA* that is subject to an Environmental Compliance Approval, never becomes a significant drinking water threat, where this activity would be a significant drinking water threat, the MECP shall prohibit these activities within the Environmental Compliance Approvals process.

Policy	Text
WC-MC-3.4	To ensure the establishment of Future sewage treatment plants with effluent and/or bypass discharge or Future sewage treatment plants with sewage storage tanks never becomes a significant drinking water threat, where these activities would be a significant drinking water threat, the MECP shall prohibit these activities within the Environmental Compliance Approvals process. This policy does not apply to the expansion, modification, optimization, re-rating, operation, maintenance or replacement of Existing sewage treatment plants.

Each Significant Water Quality Threat Source Protection Plan policy has a legal effect, and these are listed below in Table 5.

Table 5 – Legal Effect of Water Quality Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Legal Effect
WC-CW-16.3	Section 58 (Risk Management Plans) of the Clean Water Act
WC-MC-2.3	Affects EPA and Ontario Water Resources Act Prescribed Instrument Decisions (e.g. Stormwater management ECA approvals)
WC-MC-3.4	

4.3.2 Significant Water Quantity Threats (WHPA-B vulnerability score of 10)

Within the area of the Site mapped as WHPA-B and a vulnerability score of 10 (or <0.2% of the Site, Map 5b), there are many significant water quality threat policies listed for consideration however many will not require consideration (Grand River Source Protection Committee, 2022b).

For example, the current development plan proposes a southernmost stormwater management facility that covers the WHPA-B with a vulnerability score of 10. Consequently, additional groundwater protection measures will be required by the MECP for the Environmental Compliance Approval (Policy WC-MC-3.7), as well as some Risk Management Plan component (Policy WC-CW-3.8), however these policies do not appear to include prohibition. Also, additional groundwater protection measures will be required for any sanitary sewers in this area by the MECP (WC-MC-3.5), however this policy also does not appear to include prohibition of sanitary sewers and the current design does not appear to have any in this area (MTE, 2025).

The policies discussed in Section 4.3.1 also apply to the small area of WHPA-B with a vulnerability score of 10.

There are also a number of other policies that may apply to this small area regarding road salt, snow storage and fuel storage and handling, e.g. during the construction phase. However, these 'threats' are likely to be managed as part of the stormwater ECA for the built-out development.

However, many of the policies are not expected to affect the proposed development because the water quality threats will not be occurring, e.g. waste disposal sites, sewage holding tanks, sewage treatment plant discharge, industrial effluent, application of agricultural source material, storage of agricultural source material, application of non-agricultural source material, handling and storage of non-agricultural source materials, application of commercial fertilizer to land, handling and storage of commercial fertilizer, application of pesticide, handling and storage of pesticides, the handling and storage of an

organic solvent. de-icing aircraft chemical runoff, livestock grazing/animal yards and a liquid hydrocarbon pipeline.

4.3.3 Significant Water Quantity Threats

There are three Significant Water Quantity Source Protection Plan policies that apply to residential development of the Site: (i) WC-MC-23.2, (ii) WC-MC-23.3 and (iii) WC-MC-23.5. These are listed below from the Source Protection Plan in Table 6.

Table 6 – Relevant Water Quantity Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Text
Common introductory text	To ensure that any Recharge Reducing Activity never becomes a significant drinking water threat, where this activity would be a significant drinking water threat as prescribed by the CWA
WC-MC-23.2	…the MECP should, during any pre-submission consultation for Environmental Compliance Approvals for Stormwater Management Facilities and / or Sewage Works, encourage design and implementation measures for the maintenance of groundwater recharge functions including but not limited to LID, minimizing impervious surfaces, and lot level infiltration. The MECP shall issue Environmental Compliance Approvals for Stormwater Management Facilities and / or Sewage Works that, where appropriate, incorporate conditions that address groundwater recharge considerations. In addition, the MECP, where appropriate, shall consider incorporating conditions in the Environmental Compliance Approvals to address the proper functioning of groundwater recharge measures including, but not limited to, conditions requiring or related to operations, inspection and maintenance of the Stormwater Management Facilities and / or Sewage Works, groundwater or surface water monitoring related to groundwater recharge, and documentation including manuals and maintenance records. For Stormwater Management Facilities and / or Sewage Works located within the WHPA-Q in a Chloride, Sodium or Nitrate ICA, the MECP shall consider conditions that require best management practices that address how recharge will be maintained and water quality will be protected from application and storage of winter maintenance materials including Salt.
WC-MC-23.3	… the County, as the Planning Approval Authority, in consultation with the Municipalities, shall only approve settlement area expansions within a WHPA-Q as part of a municipal comprehensive review or as otherwise provided by the Provincial Growth Plan for the Greater Golden Horseshoe, where it can be adequately demonstrated that recharge functions can be maintained or improved on lands designated as Significant Groundwater Recharge Areas within a WHPA-Q.
WC-MC-23.5	… the Planning Approval Authority shall require that all site plan, subdivision and vacant land condominium applications to facilitate Major Development for new residential, commercial, industrial and institutional uses provide a water balance assessment for the proposed development which addresses each of the following requirements:

Policy	Text
	a. maintain pre-development recharge to the greatest extent feasible through best management practices such as LID, minimizing impervious surfaces, and lot level infiltration; b. where pre-development recharge cannot be maintained on site, implement and maximize off-site recharge enhancement (within the same WHPA-Q) to compensate for any predicted loss of recharge from the development; and c. within a WHPA-Q in a Chloride, Sodium or Nitrate ICA, the water balance assessment must consider water quality when recommending best management practices and address how recharge will be maintained and water quality will be protected including consideration of how water quality will be protected from application and storage of winter maintenance materials including Salt. The Planning Approval Authority shall use its discretion to implement the requirements of this policy to the extent feasible and practicable given the nature of the proposed development, specific circumstances of a site and off-site recharge opportunities.

However, as the Site is not located in a Chloride, Sodium or Nitrate ICA, consequently those portions of these policies should not apply.

Each Significant Water Quantity Threat Source Protection Plan policy has a legal effect, and these are listed below in Table 7.

Table 7 – Legal Effect of Water Quantity Policies (Grand River Source Protection Committee, 2022b**)**

Policy	Legal Effect
WC-MC-23.2	Affects EPA and Ontario Water Resources Act Prescribed Instrument Decisions (e.g. Stormwater management ECA approvals)
WC-MC-23.3	Affects decisions under the Planning Act and Condominium Act and Imposes obligation on Municipality and Source Protection Authority
WC-MC-23.5	

5.0 Discussion

For expansion of the Settlement Area (and subsequent development of the Site), it will be required to adequately demonstrate that "*recharge functions can be maintained or improved on lands designated as Significant Groundwater Recharge Areas within a WHPA-Q*" (Policy WC-MC-23.3). However, as mentioned in Section 4.2, the amount of SGRAs at the Site may be reduced upon further analysis.

The demonstration of maintenance, or improvement of recharge, is expected to be accomplished through a water balance assessment (and Stormwater Management Plan) that maintains "…*pre-development recharge to the greatest extent feasible through best management practices such as LID, minimizing impervious surfaces, and lot level infiltration*…" (Policy WC-MC-23.5).

However, it is expected that Site development will also require maintenance of baseflow to the Nichol Drain including ecological function with respect to temperature control (CVC, 2012). This may require additional monitoring of the Nichol Drain.

In a somewhat similar proposed residential development that we assisted with, pre-development recharge was primarily maintained through a below grade infiltration facility to allow for centralized infiltration.

Source Protection Plan policies to prevent significant water quality threats are not anticipated to prohibit the development plan but will require some additional coordination to address potential concerns with the MECP and the Source Water Protection Risk Management Officer.

The unevaluated wetland at the southern end of the Site is presumed to be maintained by a combination of precipitation and runoff, however site characterization would be required to confirm, e.g. wetland hydroperiod monitoring, borehole, monitoring well and measurement of the vertical groundwater gradient.

6.0 Conclusions and Recommendations

The following conclusions are provided:

1. Site boreholes have identified less permeable at-surface soils than regionally mapped and used for regional water budget modelling.

2. Recently modelled GRCA Tier 3 Water Budget recharge rates appear to over-estimate actual Site recharge, and historic GRCA Tier 2 Water Budget recharge rates appear to over-estimate the amount of Significant Groundwater Recharge Areas at the Site.

3. The Site primarily drains to the Nichol Drain, which has permanent flow, a coldwater thermal classification and indicators of groundwater discharge.

4. Tile-drainage is mapped in the northeast portion of the Site with some discharge to the Nichol Drain. This tile-drainage may have a role in sustaining the drain flow and temperature regime.

5. The bedrock aquifer beneath the Site has been primarily mapped as having low vulnerability with a portion of the Site mapped as medium and a very small portion mapped as highly vulnerable.

6. The Site overlies Wellhead Protection Areas (WHPAs) for Municipal Well E1 located about 535 m south-southeast. The WHPAs include both quality protection zones (WHPA-B, WHPA-C and WHPA-D) and a quantity protection zone (WHPA-Q, entire Site).

7. Significant Groundwater Recharge Areas (SGRAs) have been regionally mapped over 83% of the Site and are expected to decline in extent following analyses of local geologic conditions.

8. The Site is considered a significant water quantity threat to the municipal groundwater supplies if groundwater recharge is reduced.

9. Source Water Protection Water Quality Threat Policies are not expected to prevent residential development of the Site, however additional coordination with the MECP and the Source Water Protection Risk Management Officer will be required, e.g. with respect to the southernmost stormwater management facility.

10. Source Water Protection Water Quantity Threat Policies are expected to require post-development groundwater recharge at the Site to equal or exceed pre-development groundwater recharge rates. It is expected that the water management approach will require maintenance of groundwater discharge to the drain including coldwater temperature.

11. The unevaluated wetland may be maintained by a combination of precipitation and runoff but field characterization and analyses would be required to confirm.

The following recommendations are provided:

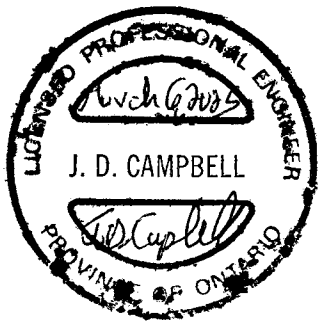
1. Project budgeting for residential development of the Site should include consideration for (a) further Site characterization (e.g. Nichol drain flow, level and temperature monitoring and Unevaluated wetland staff gauge, borehole and monitoring well), (b) analyses of local geologic conditions and GRCA modelling to complete the water balance assessment and refined SGRA mapping, and (c) design of Site infiltration measures.

2. Pre-consultation should be completed with the local government agencies (Wellington County, Centre Wellington, Grand River Conservation Authority and Wellington Source Water Protection) in order to scope the level of assessment required.

We trust this information is sufficient for your present needs. Please do not hesitate to contact us if you have any questions.

Yours truly,

TERRA-DYNAMICS INC.



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

Attachments
Drawing No.1 – Elora Sands Borehole Location Plan
Map 1 – Land Use Change and Future Recharge
Map 2 – OMAFRA Municipal Drain and Tile-Drainage

Map 3 – Surficial Geology
Map 4 – Local Elora Cross Section C-C'
Map 5 – Centre Wellington Wellhead Protection Area Final Vulnerability
Map 5b – Bedrock Aquifer Vulnerability
Map 6 – County of Wellington, Centre Wellington Wells, Significant Drinking Water Threat Applicability
Map 7 – Water Quantity Threats
Map 8 – Significant Groundwater Recharge Areas

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LEGEND

- Borehole Location — BH#
- Monitoring Well Location — MW#
- Geological Cross Section Location

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 301591-G.

2. Borehole and monitoring well locations are approximate.

SOIL-MAT

ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Development
7581 Nichol Road 15
Elora, Ontario

Borehole Location Plan

Project No. SM 301591-G

Date: June 2022

Drawn: SW | Checked: IS

SM 301591-G Borehole Location Plan

Drawing No. 1

Easting (m)

541500 543000 544500 546000 547500 549000 550500 552000 553500

Northing (m)

4843500 4842000 4840500 4839000 4837500 4836000 4834500

TOWNSHIP OF MAPLETON

TOWNSHIP OF CENTRE WELLINGTON

SITE

F1 F2 F4 F5 F6 F7

E1 E3 E4

Fergus

Salem

Elora

Belwood Reservoir

Grand River

Irvine Creek

Carroll Creek

Swan Creek

Sideroad 5

Sideroad 10

Sideroad 15

Sideroad 18

Sideroad 19

Sideroad 4

Sideroad 6 North

2nd Line

4th Line

6th Line

Wellington 29 Road

Townline Eramosa Garafraxa

Wellington 7 Road

6

N

Land Use Change
Municipal Boundary
Water Body
Watercourse
Highway
Road
Municipal Well

Future Groundwater Recharge (mm/yr)

0
0 < ... <= 75
75 <...<= 125
125 < ...<= 200
200 < ... <= 300
300 < ... <= 400
400 < ... <= 500
> 500

Map 1

1:45,000 metres

500 0 500 1,000

NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget Assessment - Risk Assessment Report

Land Use Change and Future Recharge

Date:	Project:	Submitter:	Reviewer:
October 2019	23876	J. Melchin	D. Van Vliet

Figure 5

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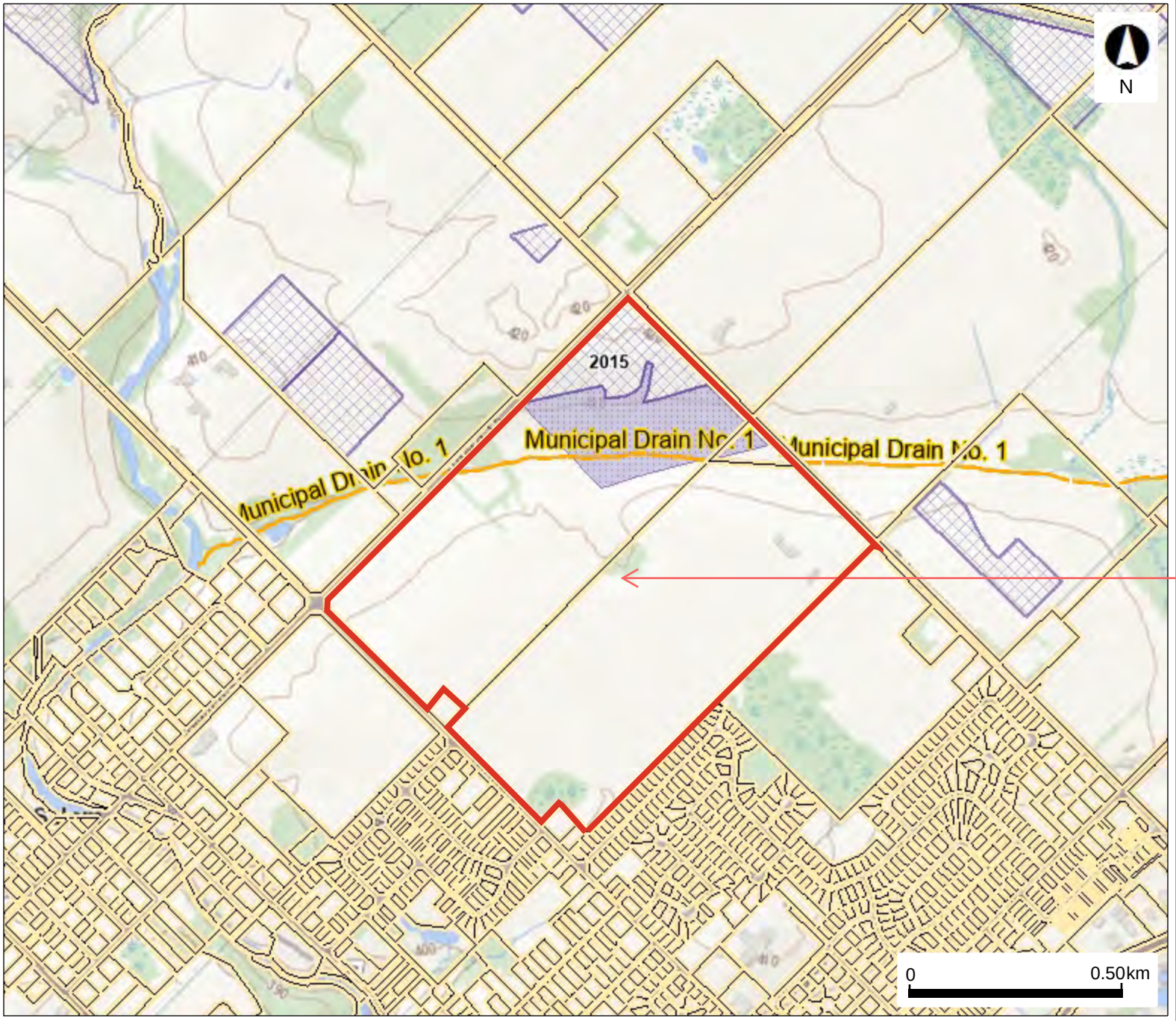
OMAFRA Municipal Drain and Tile-Drainage



Legend

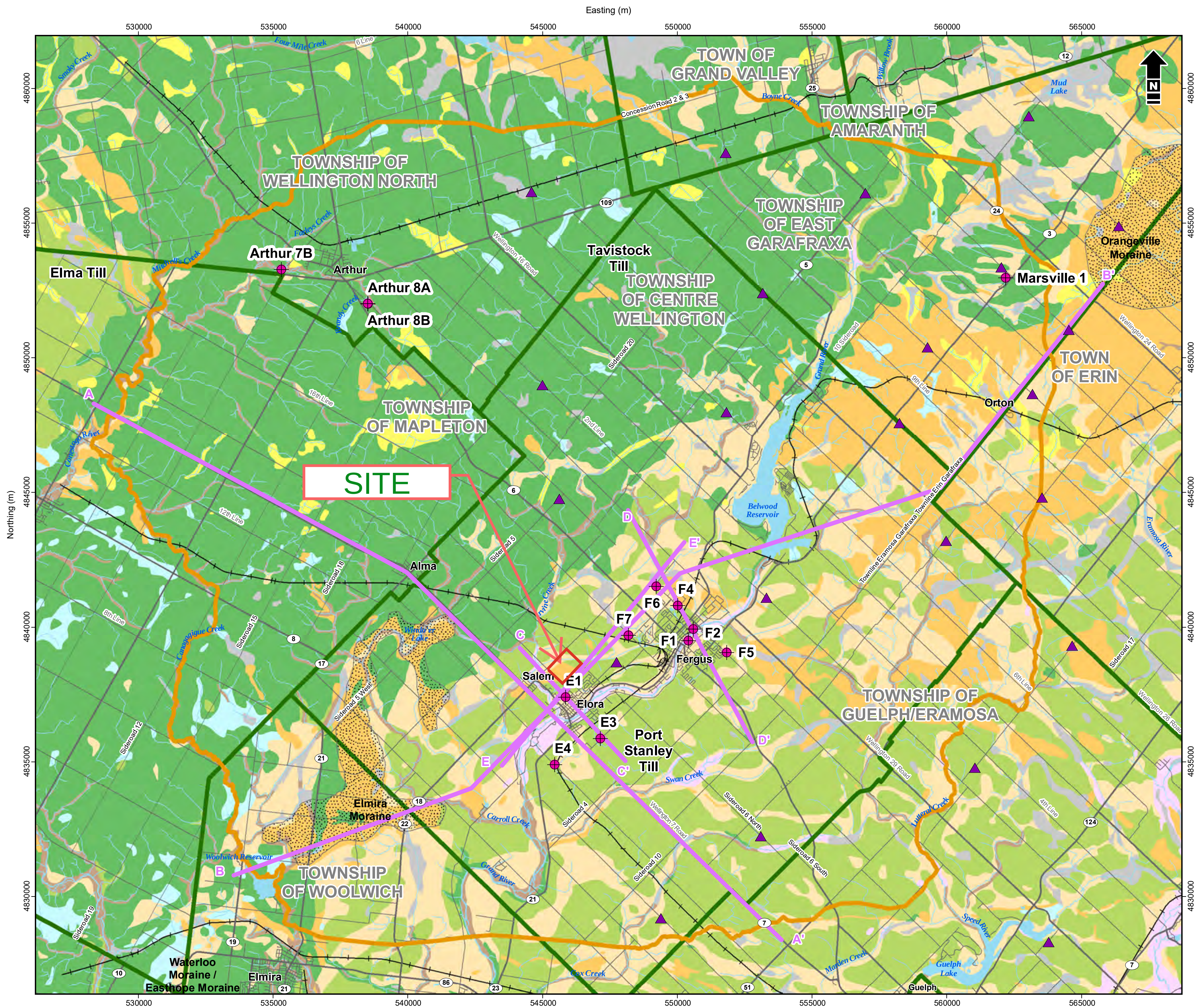
- Assessment Parcel
- Constructed Drains
  - Open or Unknown
  - Closed/Tiled
- Agricultural Tile Drainage
  - Random
  - Systematic

Map 2

SITE

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Agribusiness (OMAFA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Map Created: 2/6/2025
Map Center: 43.6998 N, -80.43191 W



Study Area
Moraine
Municipal Boundary
Water Body
Watercourse
Highway
Road
Railroad Trail
Conceptual Cross Section Location
Municipal Well
High Quality Overburden Well

Surficial Geology

- 3: Paleozoic bedrock
- 5b: Stone-poor, carbonate-derived silty to sandy till
- 5d: Glaciolacustrine-derived silty to clayey till
- 6: Ice-contact stratified deposits
- 7: Glaciofluvial deposits
- 7a: Sandy deposits
- 7b: Gravelly deposits
- 8a: Massive-well laminated
- 9c: Foreshore-basinal deposits
- 19: Modern alluvial deposits
- 20: Organic deposits

Map 3

Reference: Data obtained from Grand River Conservation Authority (2017) and GeoBase® used under license. Municipal boundaries obtained from Ontario Ministy of Municipal Affairs and Housing.
Surficial Geology from the Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV.
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1:145,000
1,400 0 1,400 2,800 m
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget and Local Area Risk Assessment

Surficial Geology

Date:	Project:	Technical:	Reviewer:	Drawn:
24 Nov 2017	23876	J. Melchin	P. Meyer	C. Curry

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Figure 8

Map 4

Irvine Creek | MILLFORD CRES | WOOLWICH ST E | MATHIESON ST | C-C' | SOPHIA ST | E-E' | DAVID ST E | MOIR ST | COLBORNE ST | CHURCH ST E | MILL ST E | Grand River | WATER ST E | MCNAB ST E | YORK ST E | HALLS DR | 1ST LINE

SITE

Municipal Well E1

C (N) — C' (S)

6705138 (263.8) | 6710107 (57.7) | 6710818 (51.5) | 6709795 (10.9) | 6709734 (32.1) | 6709830 (5.1) | 6709735 (292.0) | MW2-11 (264.9) | 6711919 (32.4) | E1 (48.7) | 6710701 (66.5) | 6700128 (164.5) | 6700126 (168.9) | 6700137 (275.7) | 6703463 (369.9) | MW1-12 (375.0) | E3 (115.6) | 6710773 (41.3) | 6705103 (182.6)

Guelph Formation

Goat Island Fm – Ancaster Mbr

Goat Island Fm – Niagara Falls Mbr

Gasport Formation

Lions Head Formation

Cabot Head Fm

Irondequoit, Rockway, and Merriton Fms (IRM)

Older Paleozoic Rocks

Elevation (m asl): 420, 400, 380, 360, 340, 320, 300, 280, 260, 240, 220

Distance (m): 0, 1000, 2000, 3000, 4000, 5000

LEGEND

- Road
- Drainage
- Observed Water Level
- Profile
- Top of Bedrock
- Screened Interval

Borehole Lithology

- Topsoil, fill
- Organic deposits
- Clay, silty clay
- Silt, clayey silt, sandy silt
- Clay to clayey silt till
- Silt to sandy silt till
- Sandy till
- Sand, silty sand
- Gravelly sand, gravel
- Limestone, Dolostone
- Shale

Interpreted Unit

- Grand River Outwash (AFA2)
- Tavistock, Port Stanley Till (ATB1)
- Moraine Aquifer (AFB1)
- Maryhill/ Catfish Creek Drift (ATB3, ATC1, AFC1, ATC2)
- Pre-Catfish Aquifer (AFD1)
- Canning Drift Aquitard (ATE1)
- Pre-Canning Aquifer (AFF1)
- PreCanning Aquitard (ATG1)

NOTE: Water levels for domestic wells are levels contained within the WWIS. Water levels for high quality wells are from recent, higher quality transient water level observations.

Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget and Local Area Risk Assessment

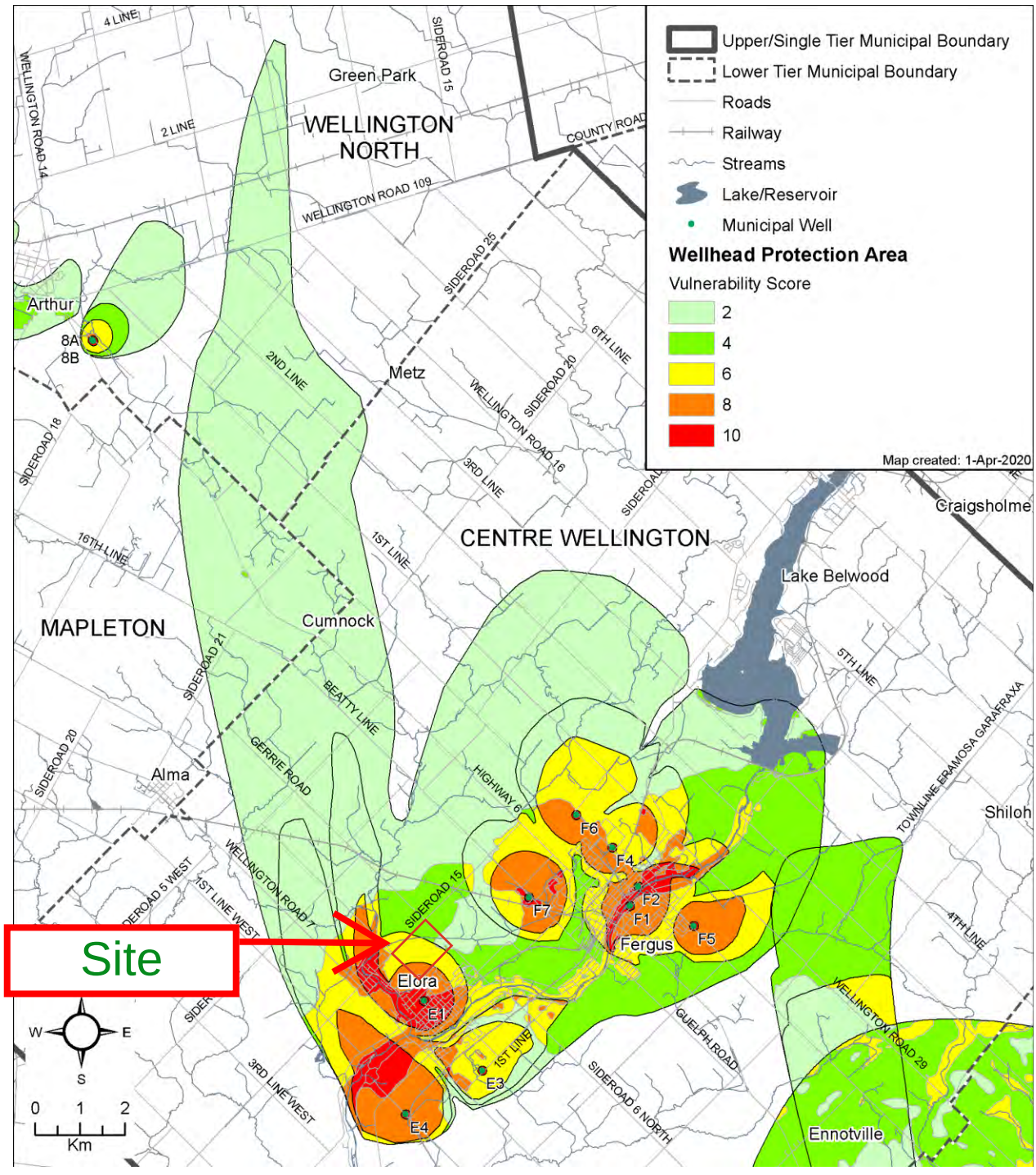
Local Elora Cross Section C-C'

Date:	Project:	Technical:	Reviewer:	Drawn:
08 Nov 2017	23876	J. Melchin	P. Meyer	C.Curry

Figure 13

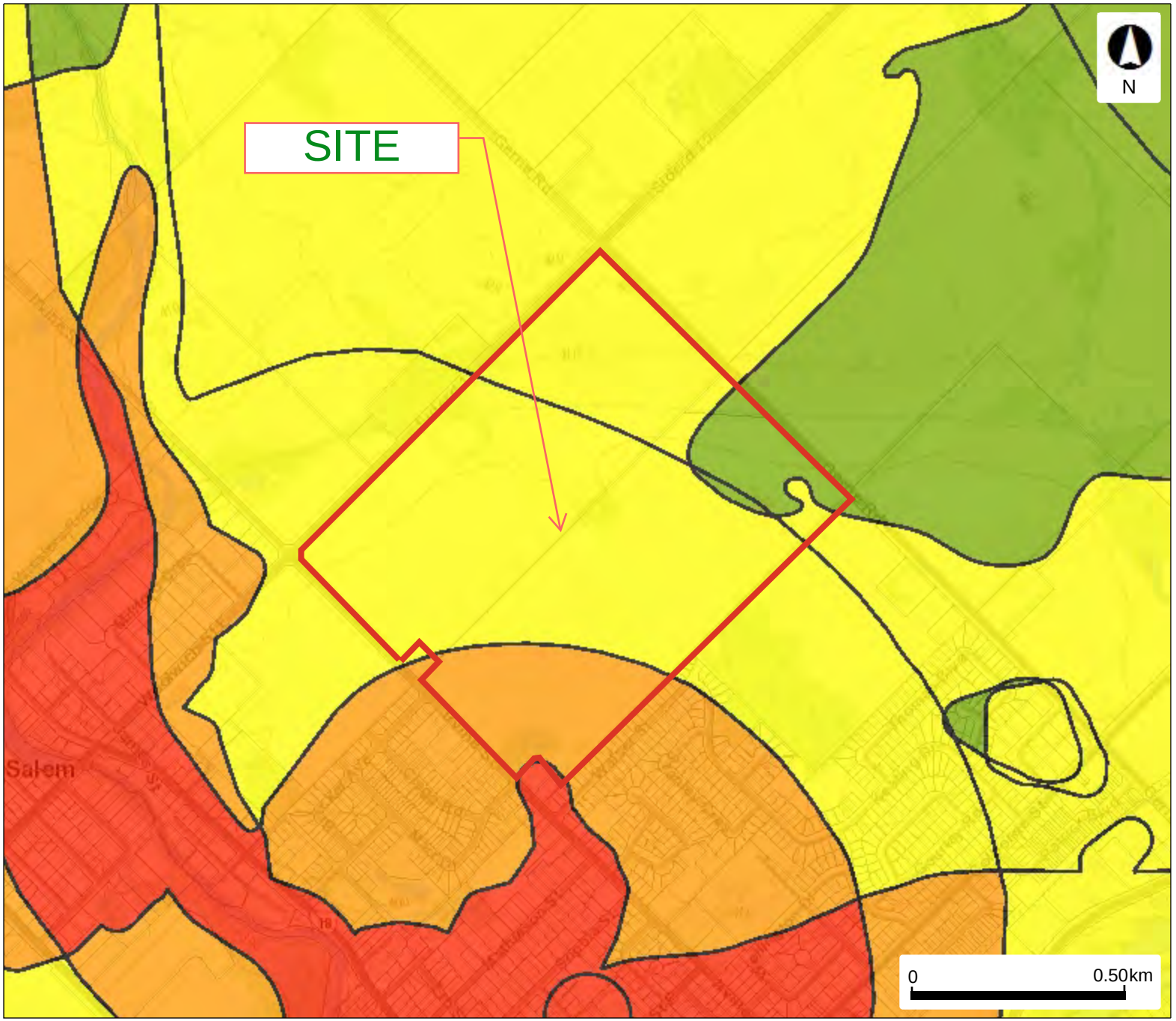
I:\GrandRiverCA\23876\Figures\Tables\T3\2017\Report\CharacterizationReport\Figure-13-Local_Elora_Cross_Section_C-C.mxd

Map 6-29: Centre Wellington Wellhead Protection Area Final Vulnerability



Map 5

MECP Bedrock Groundwater Vulnerability



Legend

Vulnerable Scoring Area - Groundwater

- 2
- 4
- 6
- 8
- 10

Assessment Parcel

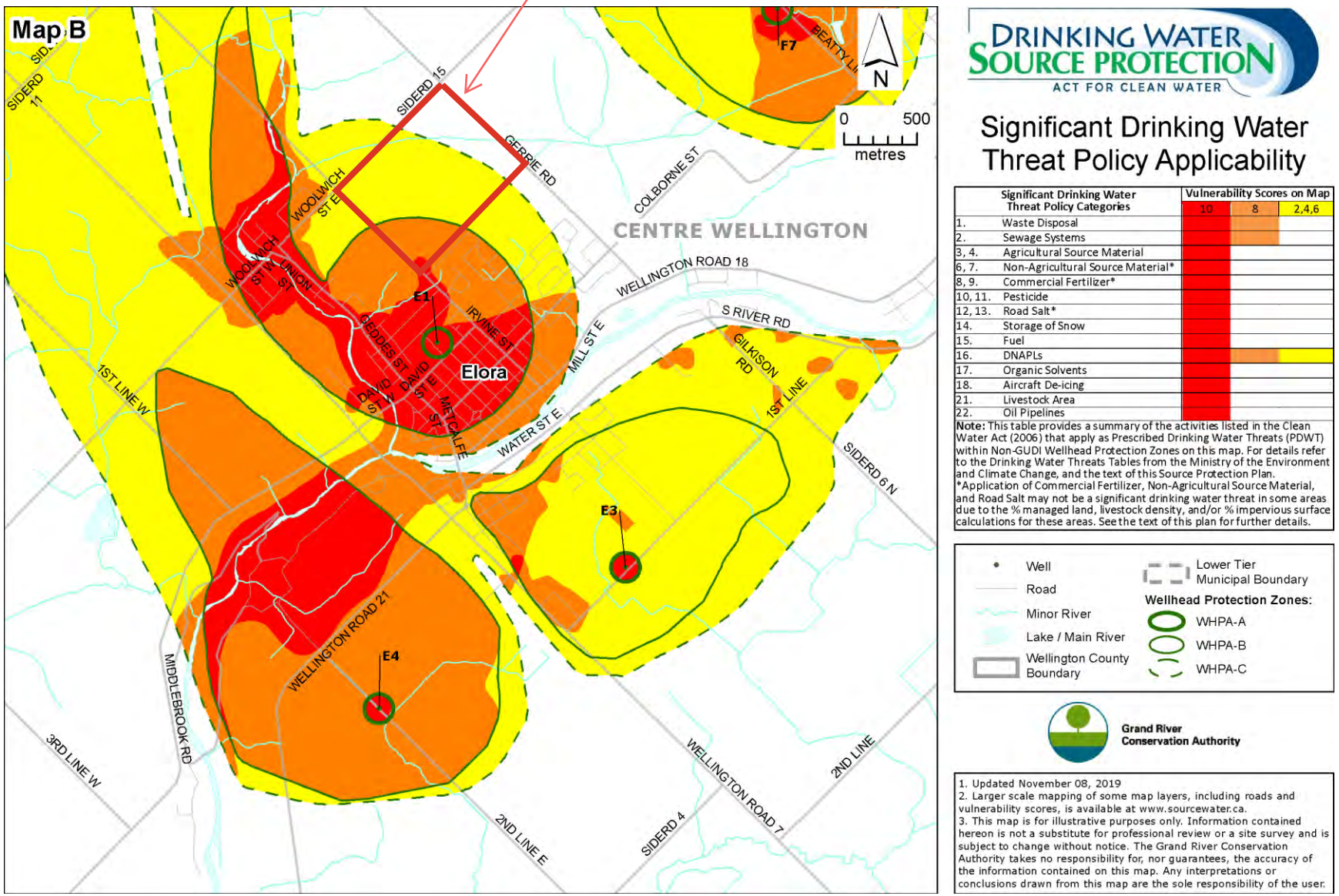
Map 5b

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Environment, Conservation and Parks (MECP) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Ontario

Map Created: 2/27/2025
Map Center: 43.69877 N, -80.43112 W

7.12 Schedule F: County of Wellington, Centre Wellington Well, Map B



DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Significant Drinking Water Threat Policy Applicability

Significant Drinking Water Threat Policy Categories		Vulnerability Scores on Map		
		10	8	2,4,6
1.	Waste Disposal			
2.	Sewage Systems			
3, 4.	Agricultural Source Material			
6, 7.	Non-Agricultural Source Material*			
8, 9.	Commercial Fertilizer*			
10, 11.	Pesticide			
12, 13.	Road Salt*			
14.	Storage of Snow			
15.	Fuel			
16.	DNAPLs			
17.	Organic Solvents			
18.	Aircraft De-icing			
21.	Livestock Area			
22.	Oil Pipelines			

Note: This table provides a summary of the activities listed in the Clean Water Act (2006) that apply as Prescribed Drinking Water Threats (PDWT) within Non-GUDI Wellhead Protection Zones on this map. For details refer to the Drinking Water Threats Tables from the Ministry of the Environment and Climate Change, and the text of this Source Protection Plan.
*Application of Commercial Fertilizer, Non-Agricultural Source Material, and Road Salt may not be a significant drinking water threat in some areas due to the % managed land, livestock density, and/or % impervious surface calculations for these areas. See the text of this plan for further details.

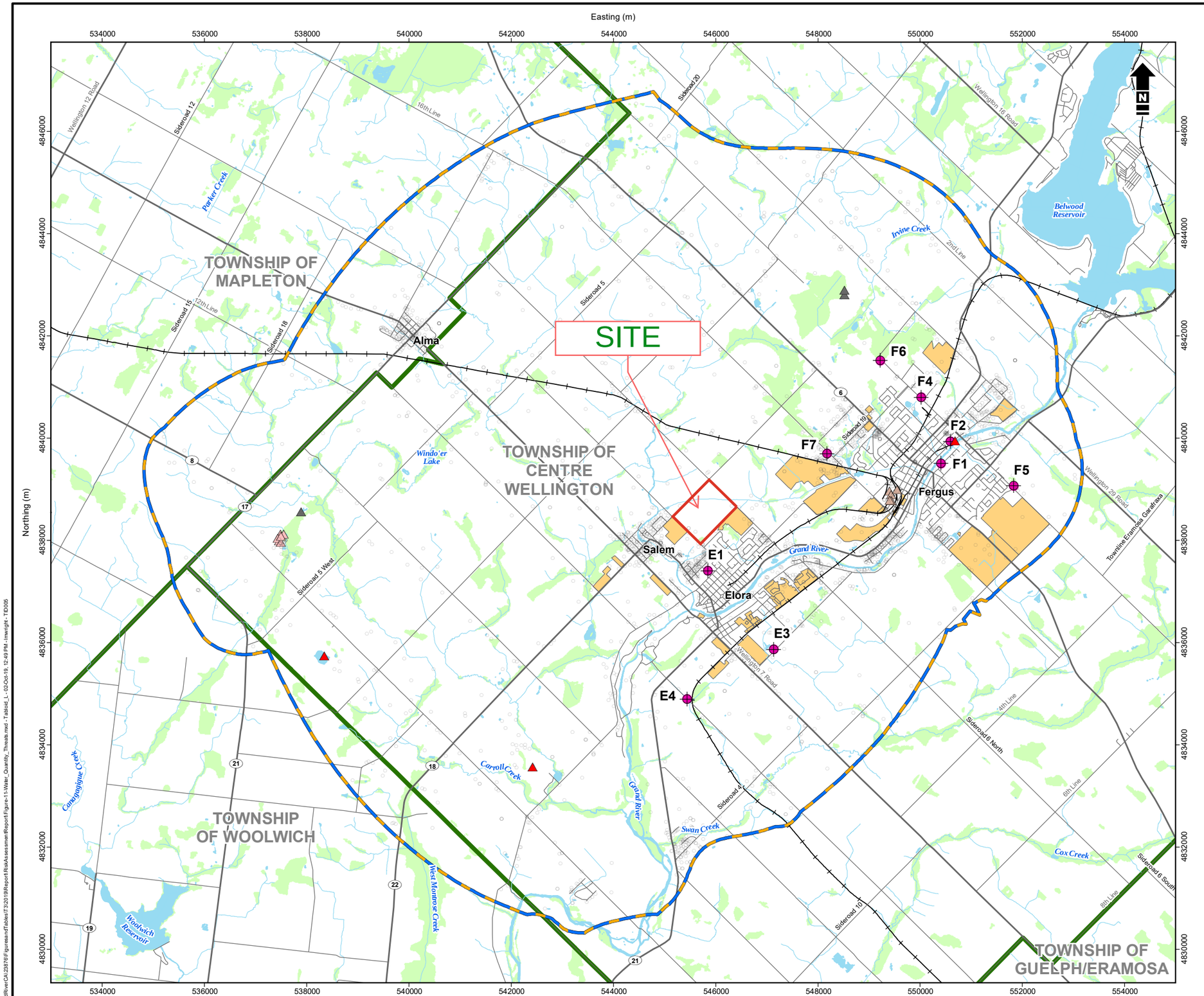
- Well
- Road
- Minor River
- Lake / Main River
- Wellington County Boundary
- Lower Tier Municipal Boundary

Wellhead Protection Zones:
- WHPA-A
- WHPA-B
- WHPA-C

Grand River Conservation Authority

1. Updated November 08, 2019
2. Larger scale mapping of some map layers, including roads and vulnerability scores, is available at www.sourcewater.ca.
3. This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

Map 6



WHPA-Q1/WHPA-Q2/Groundwater Vulnerable Area
Municipal Boundary
Groundwater Recharge Reduction Threat
Wetland
Water Body
Watercourse
Highway
Road
Railroad Trail
Municipal Well
Non-Permitted Consumptive Water Taking Threat

Permitted Consumptive Water Taking Threat

Commercial
Industrial
Miscellaneous
Remediation

Map 7

Note: the Risk Level assignment to the Groundwater Vulnerable Area does not imply that an individual groundwater taking or recharge reduction activity within that area will threaten the reliability of the municipal water supply.

1:75,000 metres
750 0 750 1,500
NAD 1983 UTM Zone 17N

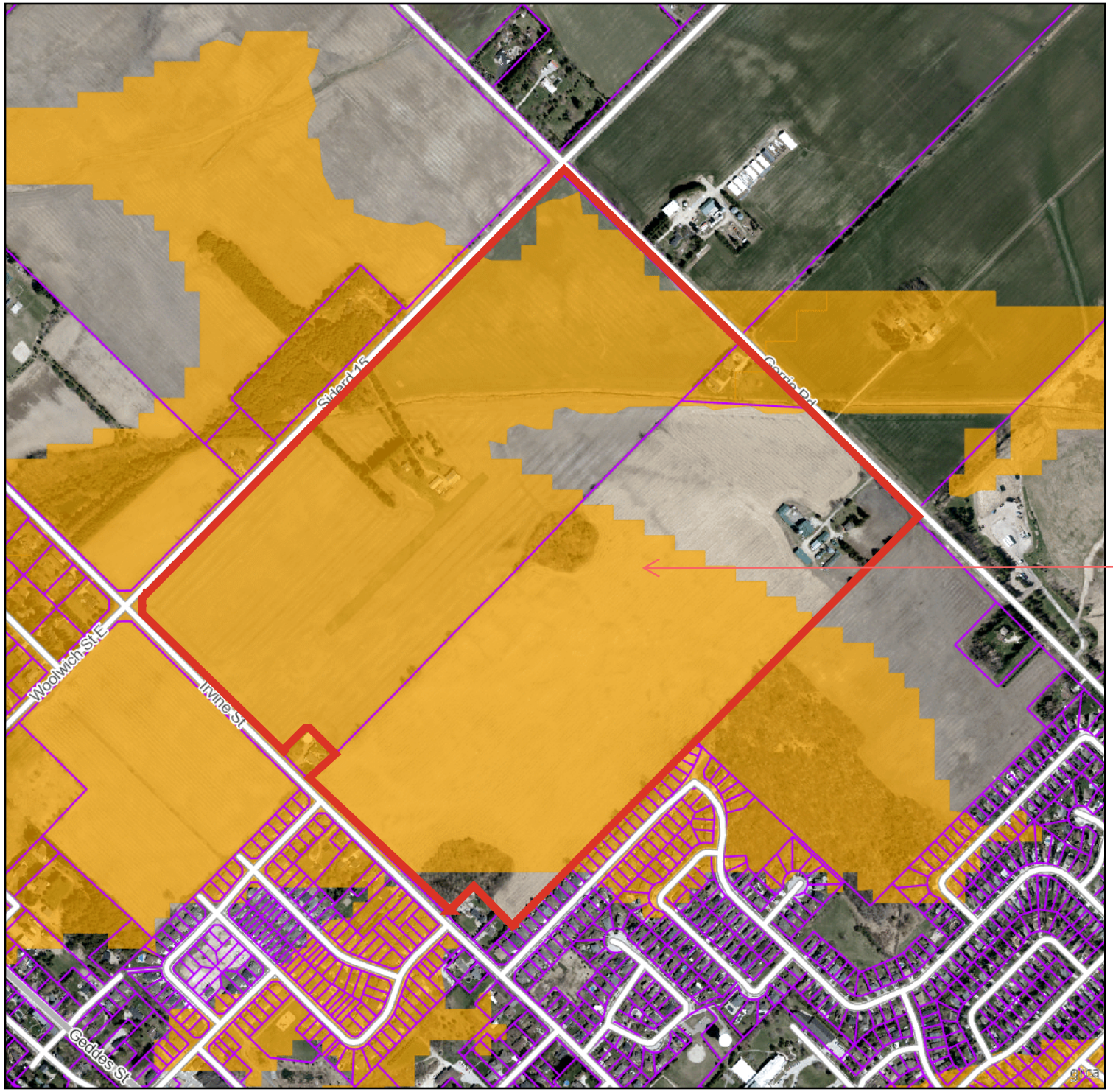
Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Grand River Conservation Authority
Centre Wellington Tier Three Water Budget Assessment - Risk Assessment Report

Water Quantity Threats

Date:	Project:	Submitter:	Reviewer:
October 2019	23876	J. Melchin	D. Van Vliet

Figure 11



Grand River Conservation Authority

Date: Mar 06, 2025

Significant Groundwater Recharge Area

Legend

- Parcel - Assessment (MPAC/MNRF)
- Signif. GW Recharge - Tier 2 (GRCA)

Map 8

SITE

Scale 1:9,106

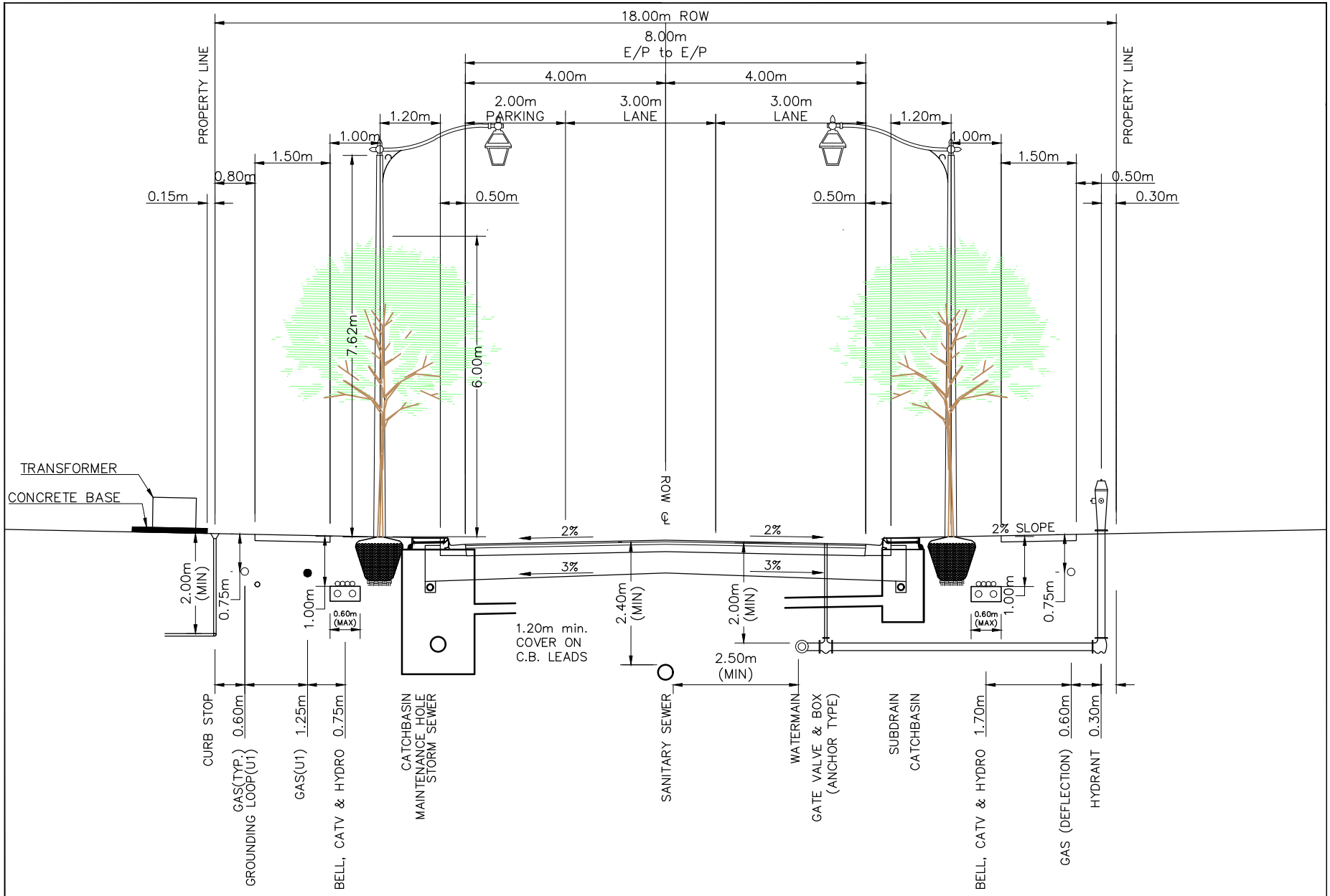
NAD83 UTM zone 17 (EPSG:26917)

Map Centre (X,Y): 545855.94, 4838565.21 | Map Link

This map is not to be used for navigation | 2020 Ortho (ON)

Appendix F

Road Cross-Sections



Note:
1. TRANSFORMER TO BE PLACED AS PER TWSP STANDARD U1.
2. STREET LIGHT AND SIDEWALK REQUIRED ON ONE SIDE ONLY.
3. TREE PLANTING ON BOTH SIDES

No	DATE	REVISION
1	AUG 2017	FOR CIRCULATION
1	JULY 2017	DRAFT FOR REVIEW

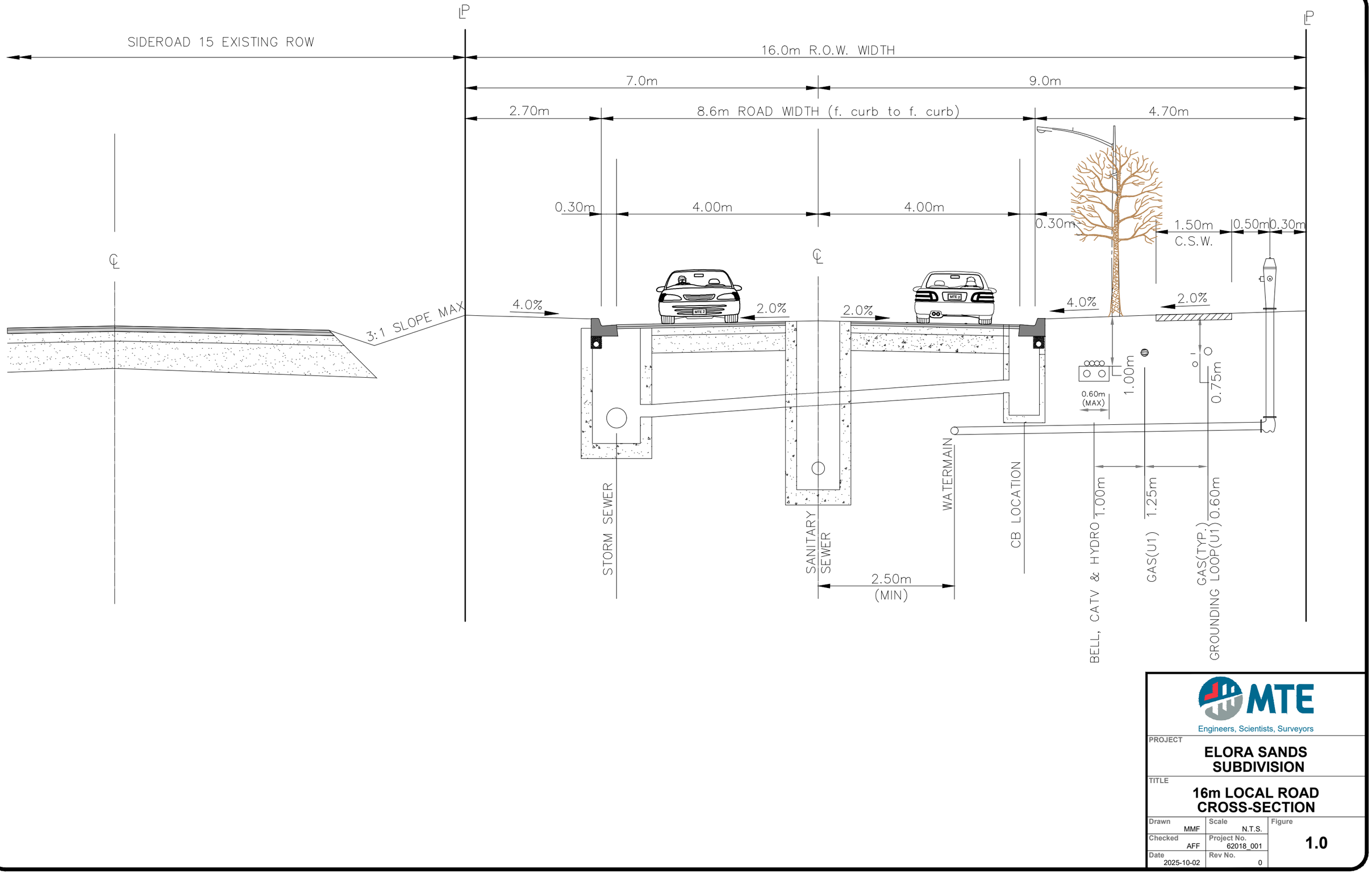
LOCAL STREET - 18m ROW
STANDARD CROSS SECTION

TOWNSHIP OF CENTRE WELLINGTON
1 MACDONALD SQUARE
ELORA, ONTARIO N0B 1S0

Centre Wellington

SCALE
1:100

STANDARD NUMBER **R5(1)**



CAD: P:\P\62018_001\62018-F24 CROSS-SECTION.DWG

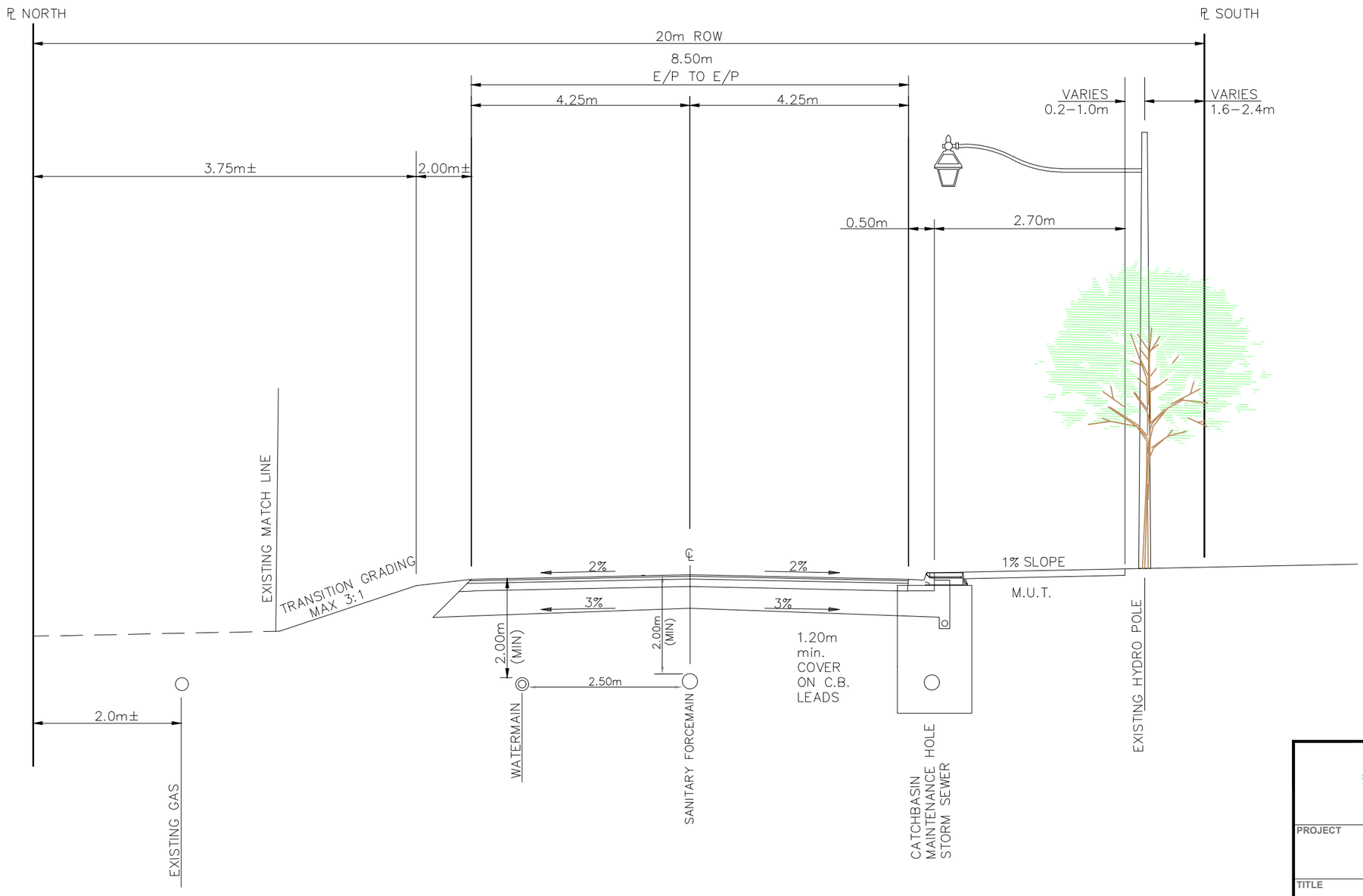
Plot Date: November 3, 2025 – 10:58 AM

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS SUBDIVISION

TITLE
16m LOCAL ROAD CROSS-SECTION

Drawn	Scale	Figure
MMF	N.T.S.	**1.0**
Checked: AFF	Project No.: 62018_001	
Date: 2025-10-02	Rev No.: 0	

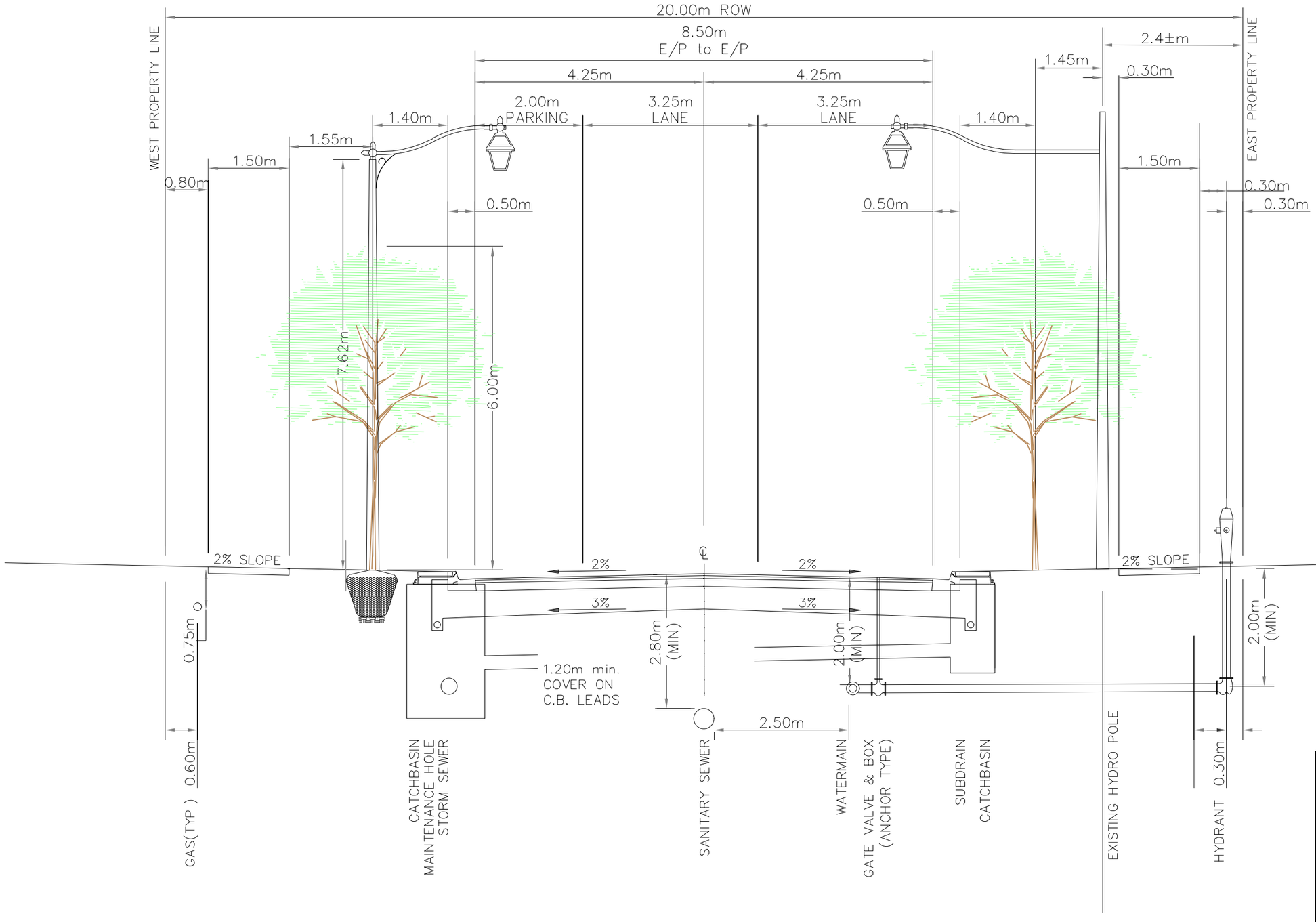


MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS SUBDIVISION

TITLE
SIDEROAD 15 CROSS-SECTION

Drawn	Scale	Figure
MMF	N.T.S.	**2.0**
Checked: AFF	Project No.: 62018_001	
Date: 2025-10-02	Rev No.: 0	



Engineers, Scientists, Surveyors

PROJECT

CLAYTON SUBDIVISION

TITLE

IRVINE STREET TYPICAL CROSS-SECTION

Drawn	Scale	Figure
ACH	N.T.S.	**Figure 2**
Checked: AFF	Project No.: 50250-100	
Date: 2023-07-11	Rev No.: 0	

Appendix G

Sanitary Assessment

NOTES
1. LOAD = 29.5 L/s
FULL FLOW CAP = 24.1 L/s
MAX. CAP = 26.5 L/s
UPGRADE REQUIRED

SALEM LOW PRESSURE SYSTEM ESTIMATED CONTINUOUS FLOW 3.0 l/s

DAVID STREET PUMPING STATION ESTIMATED CONTINUOUS FLOW 0.8 l/s

SEE NOTE 1.

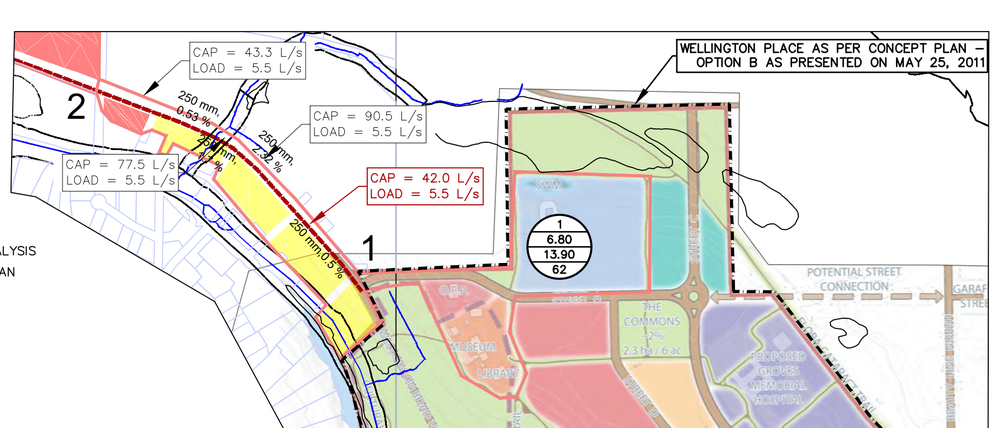
CONTINUED ON INSERT BELOW

LEGEND

- 300 mm, 2.46% — EXISTING SANITARY SEWER TRUNK
- EXISTING SANITARY SEWER PIPE AND MANHOLE
- FUTURE CONNECTION AS DESCRIBED IN AINLEY FSR
- DRAINAGE AREA
- 101 / 8.78 / 10.35 / 103 — ID No. / RESIDENTIAL AREA (Ha) / NON-RESIDENTIAL AREA (Ha) / POPULATION
- REGULATION AREA LIMIT
- FLOODLINE LIMIT
- PUMPING STATION
- WASTEWATER TREATMENT PLAN
- 2 — JUNCTION NUMBER
- CAP = 39.9 L/s / LOAD = 28.4 L/s — CAPACITY AND FLOW LOAD OF PIPE SECTION RED COLOUR MEANS LOWEST CAPACITY WITHIN JUNCTIONS
- UPGRADE REQUIRED

LAND-USE FOR SANITARY ANALYSIS BASED ON ELORA OFFICIAL PLAN

- RESIDENTIAL
- MULTI-RESIDENTIAL
- COMMERCIAL
- INSTITUTIONAL
- OPEN SPACE
- SUBJECT LANDS



INSERT
SCALE 1:10000

OVERALL PLAN
SCALE 1:4000

PRELIMINARY

0 50 100 150 200 250m

MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS SUBDIVSION

TITLE
EXISTING CONDITIONS SANITARY ASSESSMENT

Drawn	Scale	Figure
ACH	1:4,000	5.1
Checked	Project No.	
MXF	62018_001	
Date (yyyy-mm-dd)	Rev No.	
2025-01-31	0	

OVERALL PLAN

SCALE 1:4000

PRELIMINARY

Sources: May include data from the Grand River Conservation Authority, County of Wellington, Teranet (2004) and © 2021 of the Queens Printer For Ontario.

Data provided herein is derived from sources with varying levels of accuracy and currency.

This is not a survey product.

0 50 100 150 200 250m

LEGEND

- 300 mm, 2.46% — EXISTING SANITARY SEWER TRUNK
- EXISTING SANITARY SEWER PIPE AND MANHOLE
- DRAINAGE AREA
- 101 / 8.78 / 10.35 / 103 — ID No. / RESIDENTIAL AREA (Ha) / NON-RESIDENTIAL AREA (Ha) / POPULATION
- FUTURE DRAINAGE AREA
- 100 / 30 / 1390 — ID No. / AREA (Ha) / POPULATION
- REGULATION AREA LIMIT
- FLOODLINE LIMIT
- PUMPING STATION
- WASTEWATER TREATMENT PLAN
- × EXISTING GROUND ELEVATION
- OG=415.0 / SAN OBV.=408.8± / DEPTH=6.2m± — ESTIMATED SANITARY CONNECTION CONDITIONS
- 2 — JUNCTION NUMBER
- CAP = 39.9 L/s / LOAD = 28.4 L/s — CAPACITY AND FLOW LOAD WITHIN JUNCTIONS
- PROPOSED FORCEMAIN
- PROPOSED SANITARY SEWER
- UPGRADE ALREADY IN PROGRESS (SHOWING ASSUMED UPGRADED SIZE AND CAPACITY)
- UPGRADE REQUIRED (SHOWING UPGRADED SIZE AND CAPACITY)

LAND-USE FOR SANITARY ANALYSIS BASED ON ELORA OFFICIAL PLAN

- RESIDENTIAL
- MULTI-RESIDENTIAL
- COMMERCIAL
- INSTITUTIONAL
- OPEN SPACE
- SUBJECT LANDS

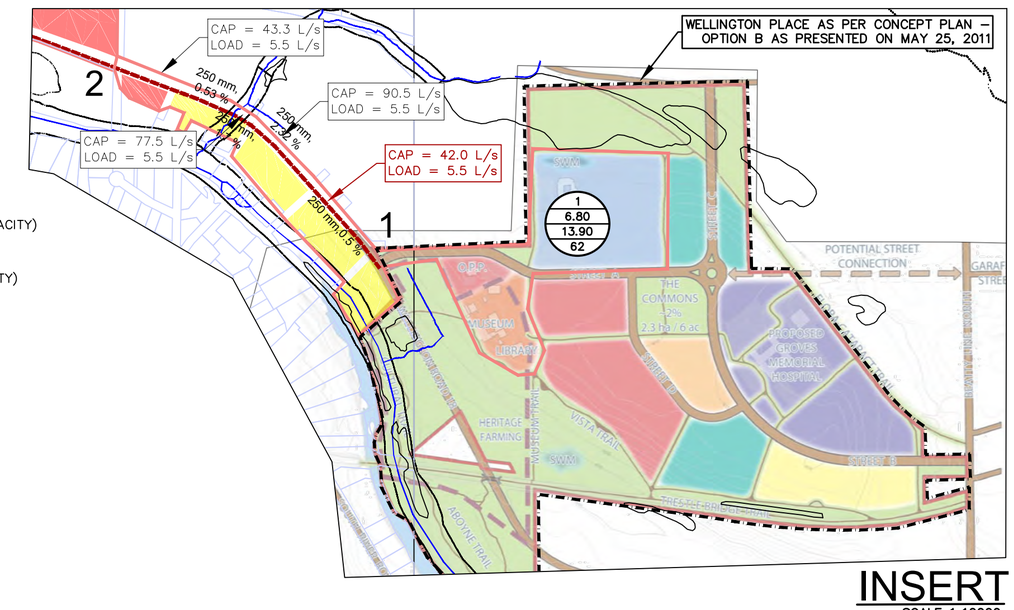
NOTE:
LOAD = 127.4 L/s
FULL FLOW CAP = 123.9 L/s
MAX. CAP = 136.3 L/s
AT CAPACITY, NO UPGRADE REQUIRED

SALEM LOW PRESSURE SYSTEM ESTIMATED CONTINUOUS FLOW 3.0 l/S

DAVID STREET PUMPING STATION ESTIMATED CONTINUOUS FLOW 0.8 l/S

INSERT

SCALE 1:10000



MTE
Engineers, Scientists, Surveyors

PROJECT
ELORA SANDS SUBDIVISION

TITLE
ULTIMATE CONDITIONS SANITARY ASSESSMENT

Drawn	Scale	Figure
ACH/MMF	1:4,000	5.2
Checked: MXF	Project No.: 62018_001	
Date (yyyy-mm-dd): 2025-01-31	Rev No.: 0	

Plot Date: November 3, 2025 – 11:06 AM

CAD: P:\P\62018_001\62018_001-F5.2-ALT1.DWG

Elora Sands Subdivision
Elora, Ontario

Project Number: 62018-001
Date: November 3, 2025
Design By: MXF
Checked By: JEM
File: Q:\62018_001\SAN\62018-001 Sanitary Sewer Trunks Capacity Analysis_v7_AFF_MXF_2025-09-25.xls

SANITARY SEWER TRUNK CAPACITY
UTLIMATE CONDITIONS
TOWNSHIP OF CENTRE WELLINGTON
Ultimate Conditions with 300L/c/d residential daily flow

Drainage Area Plan No: Figure 5.2

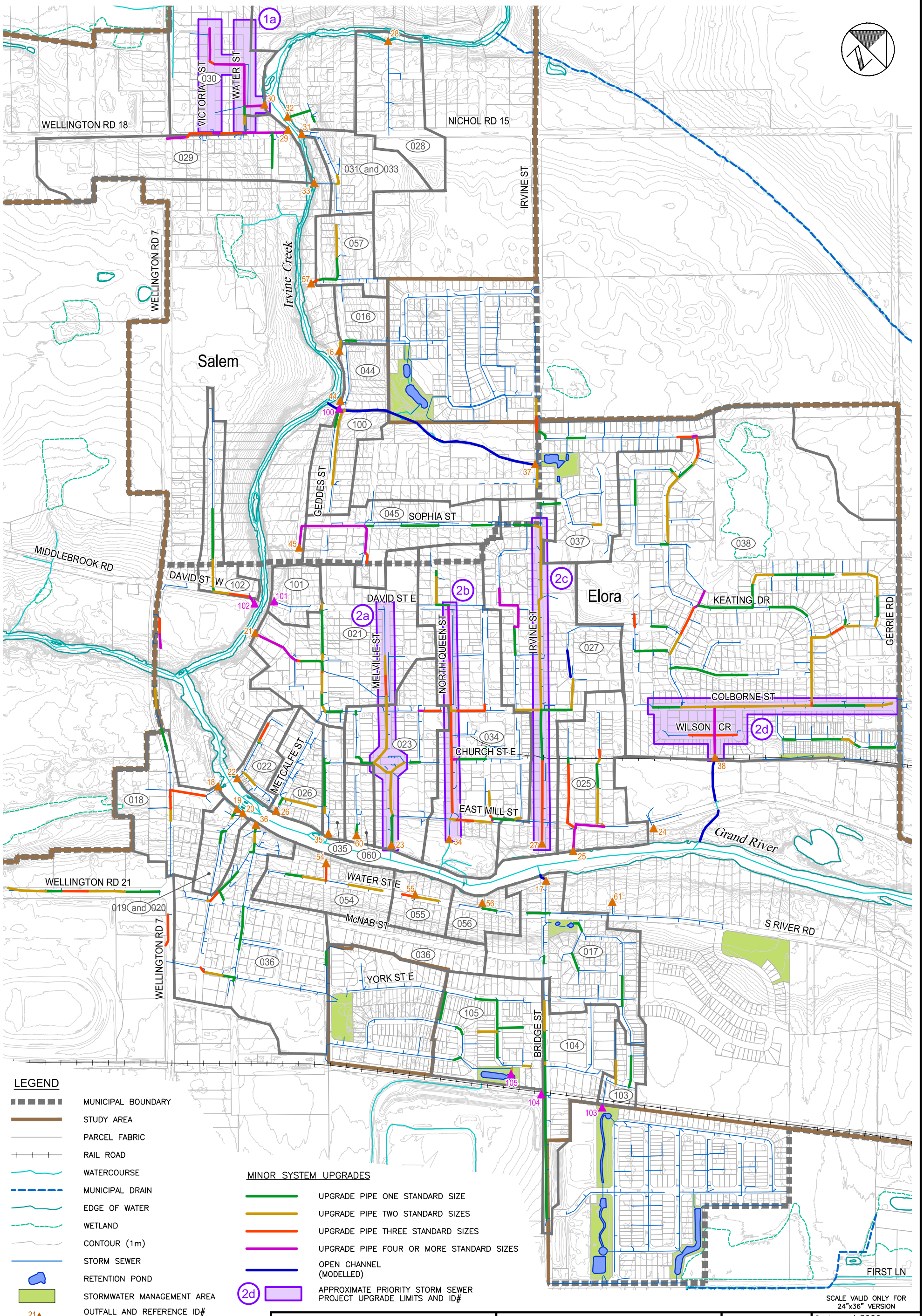
Design Parameters

Average Daily Flow

Residential	0.00347	L/s/c
Commercial	1.16	L/s/ha
Industrial	0.50	L/s/ha
Inst. / School	0.25	L/s/ha

Mannings "*n*" 0.013
Min. Velocity 0.8 m/sec
Max. Velocity 3.0 m/sec
Residential Harmon Peaking Factor (F) $F = 1 + 14/(4 + P^{0.5})$
Commercial Peaking Factor = 2.5
Infiltration 0.00 L/s/ha

LOCATION				RESIDENTIAL AREAS AND POPULATION							SCHOOL, INSTITUTIONAL			COMMERCIAL			INDUSTRIAL				INFILTRATION			DESIGN						
											HECTARES AND FLOW OF EACH ZONING																			
											0.25 *L/s/ha*			1.16 *L/s/ha*			0.50 *L/s/ha*												
STREET	JUNCTION		AREA NO.	AREA	No. UNITS 2.80 PPU	No. UNITS @ 2.00 PPU	POPUL.	CUMUL POPUL.	PEAK FACTOR "F"	PEAK RES. FLOW	AREA	CUMUL AREA	PEAK FLOW	AREA	CUMUL AREA	PEAK FLOW	AREA	CUMUL AREA	PEAK FLOW	TOTALS-C-I FLOW	AREA	CUMUL AREA	INFIL FLOW	TOTAL VOLUME FLOW	SLOPE	PIPE SIZE	CAPACITY	MAX. CAPACITY	FULL FLOW VELOCITY	AVAIL. CAPACITY
	From	To		*ha*			*1000s*	*1000s*		*L/sec*	*ha*	*ha*	*L/sec*	*ha*	*ha*	*L/sec*	*ha*	*ha*	*L/sec*	*L/sec*	*ha*	*ha*	*L/sec*	*L/sec*	*%*	*mm*	*L/sec.*	*L/sec.*	*m/s*	*L/sec*
Princess Street																														
Clayton Farms		41	50	11.72	152	119	0.664	0.664	3.91	9.0		0.00	0.0		0.00	0.0		0.00	0.00	0.00	11.72	11.72	0.0	9.0						
Elora Meadows	41	42	51	15.28	167		0.468	1.131	3.76	14.8		0.00	0.0		0.00	0.0		0.00	0.00	0.00	15.28	27.00	0.0	14.8	0.23	200	15.7		0.501	0.9
Erb, Mathieson and Sophia Street	42	43	52	17.99	78		0.218	1.350	3.71	17.4		0.00	0.0		0.00	0.0		0.00	0.00	0.00	17.99	44.99	0.0	17.4	0.40	200	20.7		0.660	3.3
Salem LPS continuous flow		43								3.0																				
David Street PS continuous flow		43								0.8																				
Princess Street	43	4					0.000	1.350	3.71	21.2		0.00	0.0		0.00	0.0		0.00	0.00	0.00	0.00	44.99	0.0	21.2	0.28	201	17.6		0.555	-3.6
Irvine Street							Senior units @1.6 ppu																						
Elora Sands #1			101	19.38	248	203	1.100	1.100	3.77	14.4		0.00	0.0		0.00	0.0		0.00	0.00	0.00	19.38	19.4	0.0	14.4	0.40	200	20.7		0.660	6.3
Elora Sands #2			102	7.11	140	135	0.608	0.608	3.93	8.3		0.00	0.0		0.00	0.0		0.00	0.00	0.00	7.11	26.5	0.0	8.3	0.40	200	20.7		0.660	12.4
North of Walser	31	32	30	3.36	17		0.048	1.756	3.63	22.1		0.00	0.0		0.00	0.0		0.00	0.00	0.00	3.36	29.9	0.0	22.1	0.27	200	17.0		0.542	-5.1
																								HGL ANALYSIS						
																								22.1	0.46	200	22.2		0.708	0.1
																								HGL depth above pipe obvert			**0.141**	m		
Ainley #1		33	31	2.65	36	58	0.217	0.217	4.14	3.1		0.00	0.0		0.00	0.0		0.00	0.00	0.00	2.65	2.65	0.0	3.1						
Walser	33	32	32	4.25	49		0.137	0.354	4.05	5.0		0.00	0.0		0.00	0.0		0.00	0.00	0.00	4.25	6.90	0.0	5.0	0.45	200	22.0		0.700	17.0
Daniel Cres	32	34	33	4.53	47		0.132	2.242	3.55	27.6		0.00	0.0		0.00	0.0		0.00	0.00	0.00	4.53	41.28	0.0	27.6	0.49	200	22.9		0.731	-4.7
																								HGL ANALYSIS						
																								27.6	0.71	200	27.6		0.880	0.0
																								HGL depth above pipe obvert			**0.258**	m		
North of Colborne	34	14	34	2.24	23		0.064	2.306	3.54	28.3	0.71	0.71	0.2		0.00	0.0		0.00	0.00	0.18	2.95	44.23	0.0	28.5	1.02	200	33.1		1.054	4.6
Steven Way																														
Ainley #2	21	22	22	6.05	81	62	0.351	0.351	4.05	4.9		0.00	0.0		0.00	0.0		0.000	0.00	0.00	6.05	6.05	0.0	4.9	0.35	300	57.2		0.809	52.2
North of Steven Way		23	21	9.56	100		0.280	0.280	4.09	4.0		0.00	0.0		0.00	0.0		0.00	0.00	0.00	9.56	9.56	0.0	4.0						
Thomas Bv North	22	23	23	7.13	71		0.199	0.550	3.95	7.5		0.00	0.0		0.00	0.0		0.00	0.00	0.00	7.13	13.18	0.0	7.5	0.35	300	57.2		0.809	49.6
Steven Way	23	13	24	7.64	81		0.227	1.056	3.78	13.9		0.00	0.0		0.00	0.0		0.00	0.00	0.00	7.64	30.38	0.0	13.9	0.52	250	42.9		0.874	29.0
Colborne Street																														
East of Keating	11	12	10	6.53	28	50	0.178	0.178	4.17	2.6		0.00	0.0		0.00	0.0		0.00	0.00	0.00	6.53	6.53	0.0	2.6	0.50	200	23.2		0.738	20.6
Keating Drive		12	11	5.86	56		0.157	0.157	4.18	2.3		0.00	0.0		0.00	0.0		0.00	0.00	0.00	5.86	5.86	0.0	2.3						
from Keating to Steven	12	13	12	5.81	33	71	0.234	0.570	3.94	7.8		0.00	0.0		0.00	0.0		0.00	0.00	0.00	5.81	18.20	0.0	7.8	0.35	200	19.4		0.618	11.6
from Steven to Irvine (DC Upgrade)	13	14	25	9.13	58	32	0.226	1.852	3.61	23.2	3.09	3.09	0.8		0.00	0.0		0.00	0.00	0.77	12.22	60.80	0.0	24.0	0.65	300	77.9		1.103	53.9
from Irvine to Queen	14	15	35	11.27	83	97	0.426	4.585	3.28	52.2		3.80	1.0		0.00	0.0		0.00	0.00	0.95	11.27	116.30	0.0	53.2	1.26	300	108.5		1.536	55.3
Queen Street	15	3	36	4.16	16	68	0.181	4.766	3.26	54.0		3.80	1.0		0.00	0.0		0.00	0.00	0.95	4.16	120.46	0.0	55.0	0.54	300	71.0		1.005	16.1
Mill Street																														
Wellington Place and Mill Street	1	2	1	6.80	22		0.062	0.062	4.30	0.9	13.4	13.40	3.4	0.50	0.50	1.5		0.00	0.00	4.80	20.70	20.70	0.0	5.7	0.50	250	42.0		0.857	36.3
Gerrie to Queen	2	3	2	18.86	123	48	0.440	0.502	3.97	6.9	4.90	18.30	4.6	5.85	6.35	18.4		0.00	0.00	22.99	29.61	50.31	0.0	29.9	0.43	250	39.0		0.794	9.1
Queen to Princess	3	4	40	13.53	89	6	0.261	5.529	3.20	61.5	1.01	23.11	5.8		6.35	18.4		0.00	0.00	24.19	14.54	185.31	0.0	85.7	0.81	305	90.9		1.245	0.0
Princess to Metcalfe	4	5	60	14.26	50		0.140	7.018	3.11	75.7	0.78	23.89	6.0	8.74	15.09	43.8		0.00	0.00	49.73	23.78	254.08	0.0	125.4	0.50	375	123.9	136.3	1.123	0.0



LEGEND

- MUNICIPAL BOUNDARY
- STUDY AREA
- PARCEL FABRIC
- RAIL ROAD
- WATERCOURSE
- MUNICIPAL DRAIN
- EDGE OF WATER
- WETLAND
- CONTOUR (1m)
- STORM SEWER
- RETENTION POND
- STORMWATER MANAGEMENT AREA
- 21 OUTFALL AND REFERENCE ID# (TOWNSHIP GIS)
- 110 OUTFALL AND REFERENCE ID# (ADDITIONAL IDENTFIED BY WSP)
- (105) NETWORK BOUNDARY AND REFERENCE ID#

MINOR SYSTEM UPGRADES

- UPGRADE PIPE ONE STANDARD SIZE
- UPGRADE PIPE TWO STANDARD SIZES
- UPGRADE PIPE THREE STANDARD SIZES
- UPGRADE PIPE FOUR OR MORE STANDARD SIZES
- OPEN CHANNEL (MODELLED)
- (2d) APPROXIMATE PRIORITY STORM SEWER PROJECT UPGRADE LIMITS AND ID#

SCALE VALID ONLY FOR 24"x36" VERSION

CENTRE WELLINGTON STORMWATER MASTER PLAN

TOWNSHIP OF CENTRE WELLINGTON

5 YEAR STORM EVENT MINOR SYSTEM UPGRADES (ELORA / SALEM)

wsp

Scale 1:5000 (0 50 100 200)

Consultant File No. WW22011069

Figure No. 9A

Last Saved: 2024-02-26 Last Saved By: wds_richard.bartolo Plotted: 2024-03-05 Plotted By: wds_richard.bartolo Path: D:\PROJECT\2022\WW22011069 - Wellington SWM MP\14 CAD\CIV\WKS\WR\PROJ\2024-02\Fig9A MinSysUPG-5Yr-EX(Elora).dwg

Appendix H

Storm Sewer Design Sheets

Elora Sands Subdivision
Township of
Centre Wellington, Ontario

Project Number: 62018-001
Date: October 31, 2024
Design By: AFF
Checked By: MXF
File: Q:\62018_001\STM\Copy of 62018-100 Clayton to Elora Sands_Preliminary_AFF.xlsx

5-Year Storm

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Drainage Area Plan No:

Design Parameters

5 YEAR STORM

Q=kAIR, k=0.00278
Intensity (I) = $a/(tc+b)^c$
a = 545
b = 0.0206
c = 0.686

Manning's "n" 0.013
Min. Velocity 0.800 m/s
Max. Velocity 6.000 m/s

LOCATION				STORMWATER FLOW								DESIGN						
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	ACTUAL VELOCITY	PIPE FULL
				ha				*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*m/s*	*%*
CLAYTON																		
CLAYTON SUBDIVISION			43	11.03	0.70	7.721	7.721	17.203 *17.230*	0.027	77.3	1660.1	1050	8.6	3.60	5181.2	5.98	5.32	32.04
IRVINE STREET																		
TO SWMF1 HW 101																		
IRVINE			43	0.77	0.80	0.616	0.616	11.709 *12.105*	0.395	100.7	172.4	375	75.0	4.00	350.7	3.17	3.16	49.16
IRVINE		43	44	0.00	0.80	0.000	8.337	17.230	0.026	77.3	1790.6	1050	8.5	3.60	5181.2	5.98	5.43	34.56
IRVINE		44	SWM MH3	0.00	0.80	0.000	8.337	17.256 *17.256*	0.043	77.2	1788.8	1050	13.9	3.60	5181.2	5.98	5.43	34.52
ELORA SANDS																		
Area to SWMF1 HW101																		
SWM ACCESS BLOCK 430			SWM MH1	16.46	0.70	11.522	11.522	16.769	0.150	78.7	2521.1	1050	52.5	3.40	5035.2	5.81	5.82	50.07
SWM BLOCK 426		SWM MH1	SWM MH2	0.00	0.70	0.000	11.522	16.919	0.014	78.2	2505.7	1050	4.9	3.40	5035.2	5.81	5.8	49.76
SWM BLOCK 426		SWM MH2	SWM MH3	0.00	0.70	0.000	11.522	16.919 *17.043*	0.124	78.2	2504.3	1050	43.2	3.40	5035.2	5.81	5.8	49.74
SWM BLOCK 426		SWM MH3	**HW 101**	0.00	0.70	0.000	19.859	17.256 *17.266*	0.010	77.2	4260.9	1200	3.4	2.50	6164.4	5.45	5.88	69.12
WOOLWICH STREET																		
TO SWMF1 HW102																		
WOOLWICH STREET EAST			**HW 102**	1.07	0.70	0.762	0.762	13.939 *14.137*	0.198	89.3	189.2	525	26.5	1.50	526.7	2.43	2.23	35.93

LOCATION				STORMWATER FLOW								DESIGN						
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	ACTUAL VELOCITY	PIPE FULL
				ha				*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*m/s*	*%*
SIDEROAD 15 **TO SWMF1 HW103**																		
SIDEROAD 15			**HW103**	0.08	0.80	0.064	0.064	10.000 *10.150*	0.150	112.1	20.0	300	14.0	2.80	161.8	2.29	1.55	12.33
SIDEROAD 15 **TO OGS 1**																		
SIDEROAD 15			**OGS 1**	0.57	0.80	0.456	0.456	12.279 *12.342*	0.063	97.4	123.5	375	6.5	1.00	175.3	1.59	1.72	70.45
SIDEROAD 15 **TO OGS 2**																		
SIDEROAD 15			**OGS 2**	0.18	0.80	0.144	0.144	10.580 *10.793*	0.213	107.9	43.2	300	12.0	0.40	61.2	0.87	0.94	70.63
ELORA SANDS **Area to SWMF2 HW201**																		
SWM BLOCK 428			**HW201**	7.07	0.70	4.949	4.949	15.831 *15.947*	0.116	81.9	1126.4	825	22.3	1.20	1572.4	2.94	3.20	71.64
SIDEROAD 15 **TO SWMF2 HW202**																		
SIDEROAD 15			**HW202**	0.48	0.80	0.384	0.384	11.037 *11.299*	0.262	104.8	111.9	375	20.0	0.50	124.0	1.12	1.27	90.26
KEATINGS DITCH INLET **To Nichol Drain HW300**																		
KEATING LANDS			**HW300**	10.88	0.20	2.176	2.176	19.096 *19.758*	0.661	100-YR 117.0	707.5	750	80.0	0.50	787.2	1.78	2.02	89.87

Elora Sands Subdivision
Township of
Centre Wellington, Ontario

100-Year Storm

STORM SEWER DESIGN SHEET

ENGINEERING AND PUBLIC WORKS

Project Number:	62018-001
Date:	October 31, 2024
Design By:	AFF
Checked By:	MXF
File:	Q:\62018_001\STM\Copy of 62018-100 Clayton to Elora Sands_Preliminary_AFF.xlsx

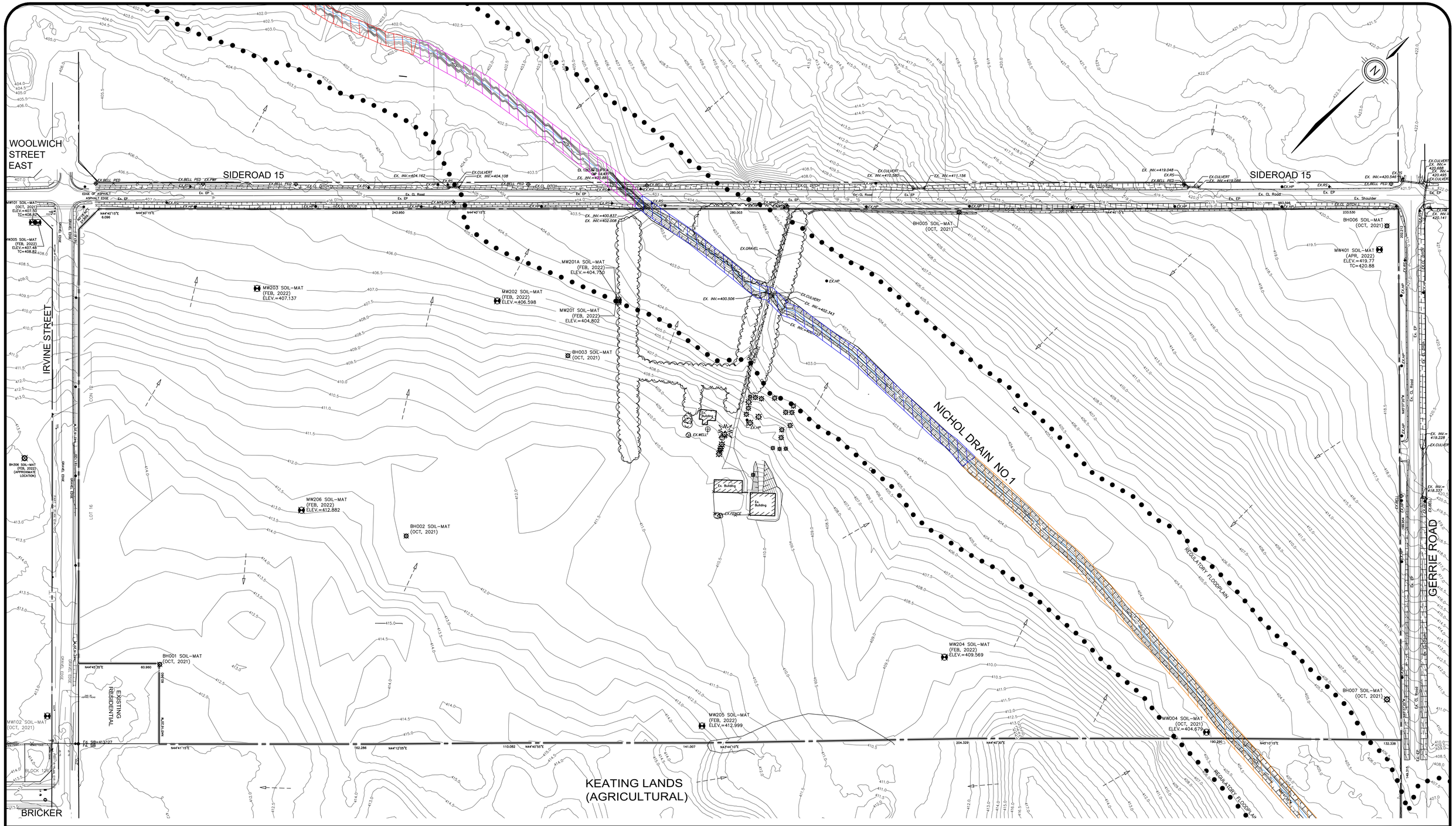
Drainage Area Plan No:

Design Parameters

Q=kAIR, k=0.00278		Manning's "n"	0.013	
Intensity (I) = a/(tc+b)^c		Min. Velocity	0.800	m/s
a =	545	Max. Velocity	6.000	m/s
b =	0.0206			
c =	0.686			

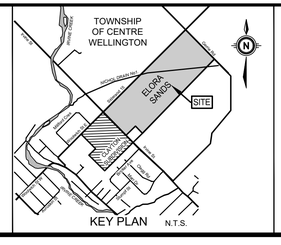
LOCATION				STORMWATER FLOW								DESIGN						
STREET	AREA NUMBER	MANHOLE LOCATION FROM MH	MANHOLE LOCATION TO MH	AREA (A)	RUNOFF COEFF. (C)	A x C	CUMUL. A x C	CONCENTRATION TIME TOTAL	CONCENTRATION TIME IN PIPE	RAIN INTENSITY (I)	FLOW (Q)	PIPE SIZE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	ACTUAL VELOCITY	PIPE FULL
				ha				*min*	*min*	*mm/hr*	*L/s*	*mm*	*m*	*%*	*L/s*	*m/s*	*m/s*	*%*
CLAYTON																		
CLAYTON SUBDIVISION			43	11.03	0.70	7.721	7.721	17.203	0.027	77.3	1660.1	1050	8.6	3.60	5181.2	5.98	5.32	32.04
								17.230										
IRVINE STREET																		
TO SWMF1 HW 101																		
IRVINE			43	0.77	0.80	0.616	0.616	11.709	0.395	100.7	172.4	375	75.0	4.00	350.7	3.17	3.16	49.16
								12.105										
										100-YR								
IRVINE		43	44	0.00	0.80	0.000	8.337	17.230	0.023	125.6	2910.1	1050	8.5	3.60	5181.2	5.98	6.16	56.17
IRVINE		44	SWM MH3	0.00	0.80	0.000	8.337	17.253	0.038	125.4	2907.4	1050	13.9	3.60	5181.2	5.98	6.15	56.11
								17.253			*100-YR flow							
ELORA SANDS																		
Area to SWMF1 HW101																		
SWM ACCESS BLOCK 430			SWM MH1	16.46	0.70	11.522	11.522	16.769	0.150	78.7	2521.1	1050	52.5	3.40	5035.2	5.81	5.82	50.07
SWM BLOCK 426		SWM MH1	SWM MH2	0.00	0.70	0.00	11.522	16.919	0.014	78.2	2505.7	1050	4.9	3.40	5035.2	5.81	5.81	49.76
SWM BLOCK 426		SWM MH2	SWM MH3	0.00	0.70	0.00	11.522	16.934	0.124	78.2	2504.3	1050	43.2	3.40	5035.2	5.81	5.81	49.74
								17.058										
											100-YR							
SWM BLOCK 426		SWM MH3	**HW 101**	0.00	0.70	0.000	11.522	17.253	0.020	77.2	5379.8	1200	7.3	2.50	6164.4	5.45	6.14	87.27
								17.273			*5YR Elora Sands flow + 100YR Clayton/Irvine flow							
WOOLWICH STREET																		
TO SWMF1 HW102																		
										100-YR								
WOOLWICH STREET EAST			**HW 102**	1.07	0.70	0.762	0.762	13.927	0.175	145.4	308.0	525	26.5	1.50	526.7	2.43	2.53	58.48
								14.101			*100-YR flow							

Drawings



LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS (410.0)
- EXISTING FENCE
- EXISTING DRIPLINE
- EXISTING EMBANKMENT (SLOPE AS NOTED) (TOP) (BOTTOM)
- APPROXIMATE FLOODPLAIN LIMIT (FROM NDSS)
- EXISTING DIRECTION OF DRAINAGE/SWALE
- MW SOIL–MAT (FEB,2022) Elev.=407.34 TC=408.26 — EXISTING MONITORING WELL
- BH SOIL–MAT (OCT, 2021) — EXISTING BOREHOLE
- REACH 1a
- REACH 1b
- REACH 2a
- REACH 2b



NOTE TO CONTRACTOR :

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THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

TOWNSHIP OF CENTRE WELLINGTON

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

GEODETIC BM ELEV. = 387.982m
ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT
ELORA SANDS DEVELOPMENT INC.
2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT
ELORA SANDS SUBDIVISION

DRAWING
EXISTING CONDITIONS PLAN

MTE Engineers, Scientists, Surveyors.

Design By: KAT	Project Manager: M.FELINCZAK
Drawn By: MMF	Project No.: 62018_001
Checked By: GMK	Drawing No.: EC1.1
Date (yyyy-mm-dd): 2025-08-19	
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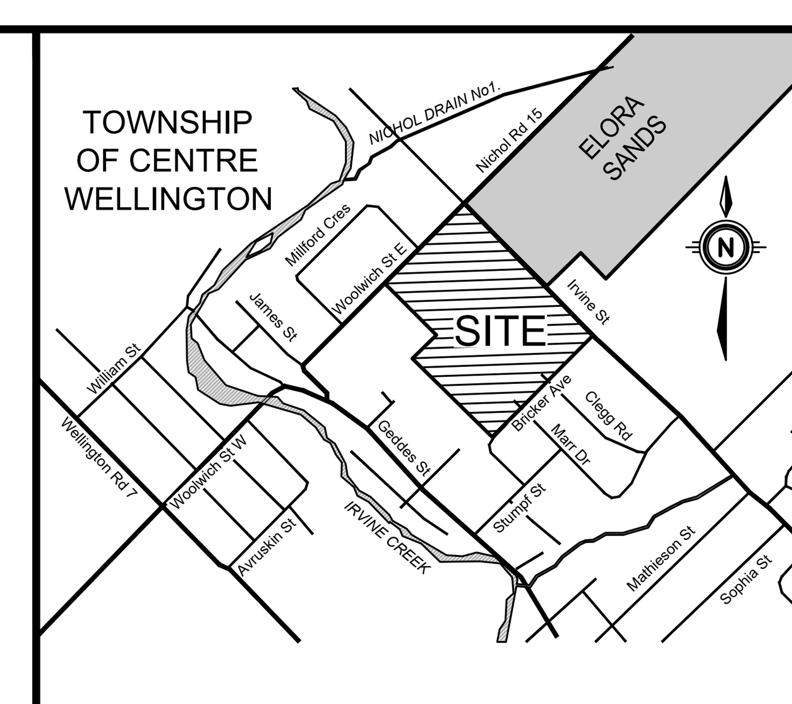

KEY PLAN N.T.S.

TOWNSHIP OF CENTRE WELLINGTON

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

GEODETIC BM ELEV. = 387.982m
ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT
CACHET DEVELOPMENTS INC.
361 Connie Crescent, Suite 200 Concord, Vaughan

PROJECT
CLAYTON SUBDIVISION
ELORA ONTARIO

DRAWING
IRVINE STREET
STA 0+000 TO STA 0+414.450

MTE
Engineers, Scientists, Surveyors
519-743-6500

Project Manager: S. PETERSON	Project No.: 50250-100
Design By: MXF	Checked By: JEM
Drawn By: ACH	Checked By: MXF
Surveyed By: MTE	Drawing No.: MS2.1
Date: Jun.13/22	
Scale: H-1:750 V-1:75	Sheet of

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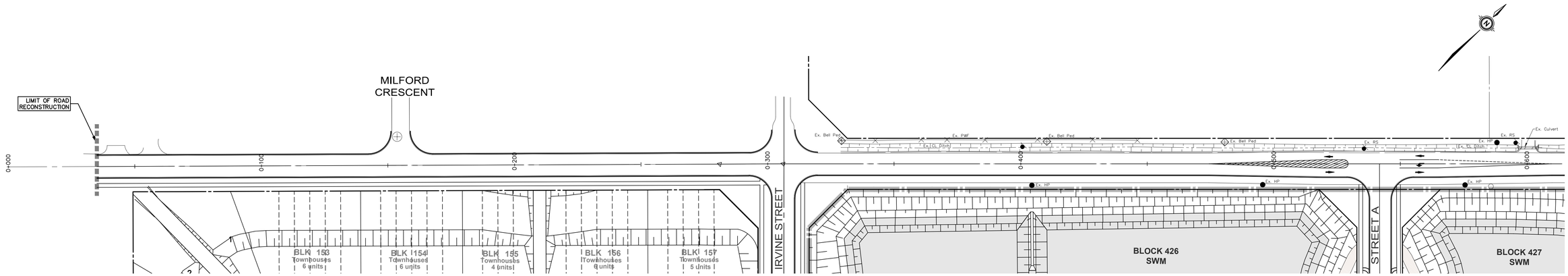
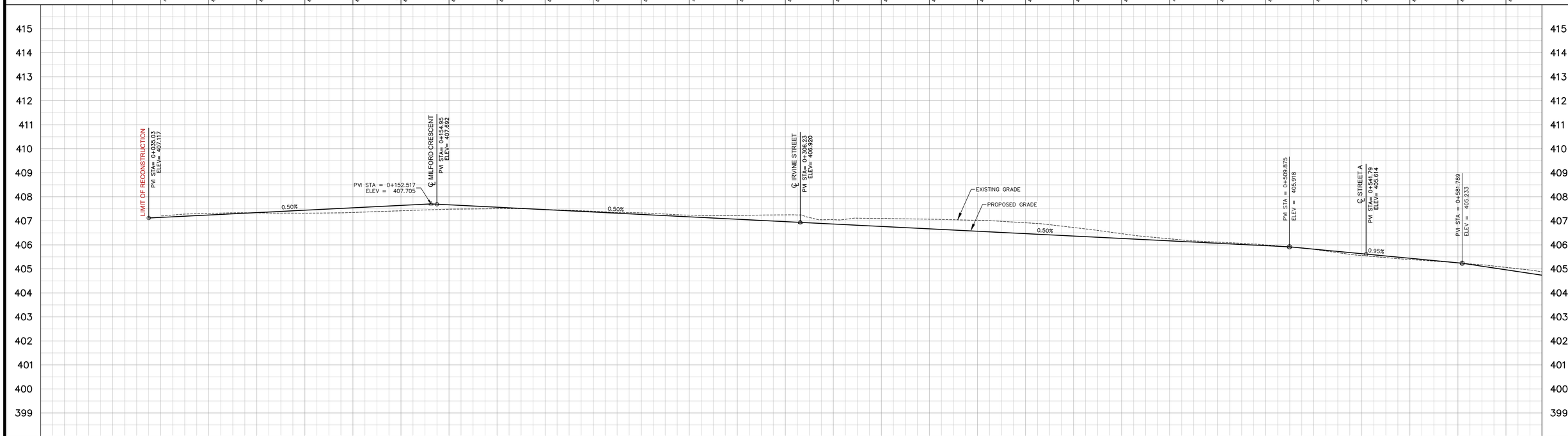


WOOLWICH STREET EAST

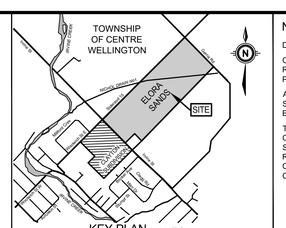
SIDEROAD 15

CHAINAGE	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+600
PROPOSED ℄ ROAD ELEVATIONS			407.14	407.24	407.34	407.44	407.54	407.64	407.67	407.57	407.47	407.37	407.27	407.17	407.07	406.97	406.87	406.77	406.67	406.57	406.47	406.37	406.27	406.17	406.07	405.97	405.82	405.63	405.44	405.25	404.96



STM. SEWER INVERT

SAN. SEWER INVERT



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TOWNSHIP OF CENTRE WELLINGTON

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

GEODETIC BM ELEV. = 387.982m

ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT

ELORA SANDS DEVELOPMENT INC.

2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT

ELORA SANDS SUBDIVISION

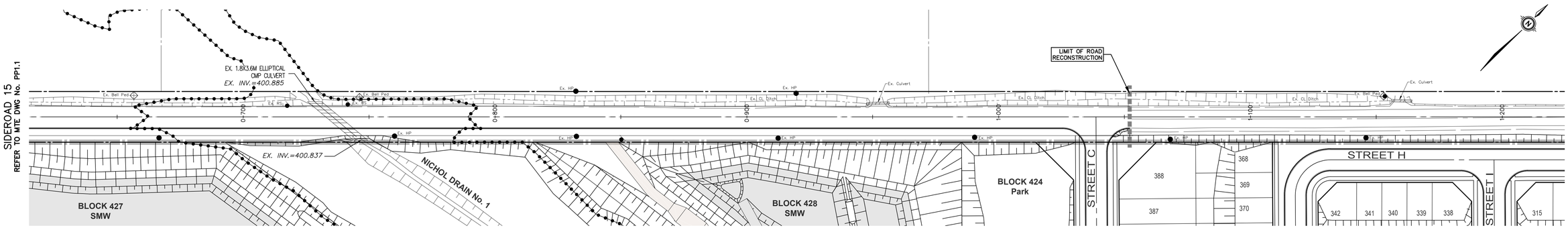
DRAWING

SIDEROAD 15

STA 0+000 TO 0+615

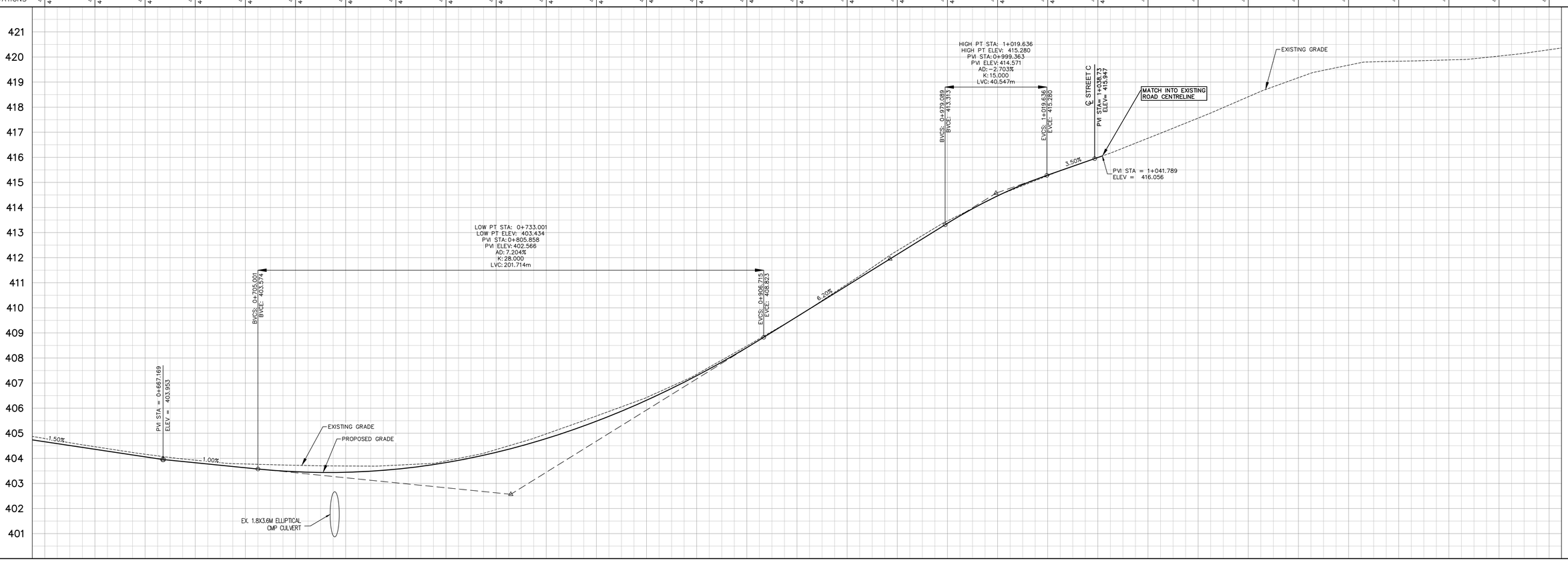
MTE Engineers, Scientists, Surveyors.

Design By: AFF	Project Manager: M.FELINCZAK
Drawn By: TJD/KAT	Project No.: 62018_001
Checked By: VAL	Drawing No.: PP1.1
Date (yyyy-mm-dd): 2025-08-26	
SCALE: H-1:750 V-1:75	

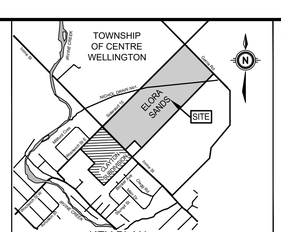


SIDEROAD 15

CHAINAGE	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220
PROPOSED ℄ ROAD ELEVATIONS	404.8	404.66	404.5	404.36	404.2	404.06	403.9	403.82	403.8	403.62	403.7	403.46	403.7	403.44	403.7	403.56	403.9	403.83	404.3	404.24	405.0	404.79	405.7	405.48	406.4	406.31	407.4	407.29	408.5	408.41	409.6	409.65	410.9	410.89	412.3	412.13	413.5	413.37	414.5	414.46	415.3	415.29	416.0	415.99	416.8	417.6	418.4	419.2	419.7	419.8	419.9	420.0	420.3



STM. SEWER INVERT																															
SAN. SEWER INVERT																															



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TOWNSHIP OF CENTRE WELLINGTON

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.			
3.			
2.			
1.			

GEODETIC BM ELEV. = 387.982m
ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT
ELORA SANDS DEVELOPMENT INC.
2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT
ELORA SANDS SUBDIVISION

DRAWING
SIDEROAD 15
STA 0+615 TO 1+225

MTE Engineers, Scientists, Surveyors.

Design By: AFF	Project Manager: M.FELINCZAK
Drawn By: TJD/KAT	Project No.: 62018_001
Checked By: VAL	Drawing No.: PP1.2
Date (yyyy-mm-dd): 2025-08-26	
SCALE: H-1:750 V-1:75	

MTE File Path: P:\P62018_001\62018_001-AG1

November 3, 2025 - 11:05:07 AM - Plotted By: Kenneth A. Taylor

SIDEROAD 15

SIDEROAD 15

BLOCK 426
SWM
1.88 ha

BLOCK 427
SWM
1.69 ha

BLOCK 428
SWM
0.96 ha

BLOCK 424
Park
0.37 ha

BLOCK 429
Pumping Station
0.32 ha

BLOCK 425
NHS
4.36 ha

BLOCK 431
SENIORS
1.37 ha

BLOCK 423
PARK
1.44 ha

BLOCK 432
Future Road
0.06 ha

BLOCK 433
Future Road
0.06 ha

BLK 389 (5 Units)
BLK 390 (4 Units)
BLK 391 (8 Units)
BLK 392 (6 Units)
BLK 393 (6 Units)
BLK 394 (6 Units)
BLK 395 (7 Units)
BLK 396 (8 Units)
BLK 397 (7 Units)
BLK 398 (6 Units)
BLK 399 (6 Units)
BLK 400 (6 Units)
BLK 401 (6 Units)
BLK 402 (7 Units)
BLK 403 (8 Units)
BLK 404 (7 Units)
BLK 405 (6 Units)
BLK 406 (6 Units)
BLK 407 (8 Units)
BLK 408 (4 Units)
BLK 409 (5 Units)
BLK 410 (6 Units)
BLK 411 (4 Units)
BLK 412 (4 Units)
BLK 413 (3 Units)
BLK 414 (5 Units)
BLK 415 (8 Units)
BLK 416 (6 Units)
BLK 417 (8 Units)
BLK 418 (3 Units)
BLK 419 (6 Units)
BLK 420 (8 Units)
BLK 421 (4 Units)
BLK 422 (4 Units)

STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
STREET I
ST J

IRVINE STREET
GERRIE ROAD

NICHOL DRAIN NO.1

18.4m-375mm ø @ 5.38% CULVERT

PERMISSION TO GRADE FROM THE NEIGHBOURING PROPERTY MUST BE SECURED PRIOR TO ANY GRADING

BLOCK 425
NHS
FLOODPLAIN
PROPOSED GRADE
30m
30m
1.0%
1.0%
4:1
4:1
4:1
4:1
CL NICHOL DRAIN
EXISTING GRADE

TYPICAL FLOODPLAIN CROSS-SECTION
SCALE H-1:500 V-1:250

LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS
- GRCA CONTOURS
- PROPOSED CONTOURS
- EXISTING DRIPLINE
- FLOODPLAIN LIMIT
- DRAINAGE SPLIT (RIDGE)
- (413.83) PROPOSED GRADE
- 1.0% DIRECTION OF DRAINAGE
- OVERLAND FLOW ROUTE (MAJOR STORM)
- (TOP) 3:1 (BOTTOM) EMBANKMENT (SLOPE AS NOTED)

KEY PLAN N.T.S.
TOWNSHIP OF CENTRE WELLINGTON
ELORA SANDS
SITE

NOTE TO CONTRACTOR :

DO NOT SCALE DRAWINGS.

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

No.	REVISION	BY	YYYY-MM-DD
1.			

TOWNSHIP OF CENTRE WELLINGTON

GEODETIC BM ELEV. = 387.982m
ELORA POST OFFICE, BOLT IN FRONT WALL, IN LINTEL OF CENTRE BASEMENT WINDOW. (HISTORICAL NUMBER 16U117E)

SITE BENCHMARK ELEV. = m

CLIENT
ELORA SANDS DEVELOPMENT INC.
2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT
ELORA SANDS SUBDIVISION

DRAWING
AREA GRADING PLAN

MTE Engineers, Scientists, Surveyors.

Design By: AXF	Project Manager: M.FELINCZAK
Drawn By: ACH	Project No.: 62018_001
Checked By: X.XXX	Drawing No.: AG1.1
Date (yyyy-mm-dd): 2025-10-17	
SCALE: 1:1250	Sheet of

NOTE:
COMPARISON FOR SWMF1 IS BETWEEN PERMANENT POOL ELEVATION (404.0m) TO GROUNDWATER LEVEL. OUTSIDE OF PERMANENT POOL LIMITS, FINISHED GRADE IS USED.

NOTE:
COMPARISON FOR SWMF2 IS BETWEEN PERMANENT POOL ELEVATION (405.0m) TO GROUNDWATER LEVEL. OUTSIDE OF PERMANENT POOL LIMITS, FINISHED GRADE IS USED.

SIDEROAD 15

IRVINE STREET

GERRIE ROAD

NICHOL DRAIN No.1

BLOCK 426 SWM 1.88 ha

BLOCK 427 SWM 1.69 ha

BLOCK 428 SWM 0.98 ha

BLOCK 424 Park 0.37 ha

BLOCK 429 Pumping Station 0.32 ha

BLOCK 425 NHS 4.36 ha

BLOCK 423 PARK 1.44 ha

BLOCK 431 SENIORS 7.37 ha

BLK 432 Future Road 0.06 ha

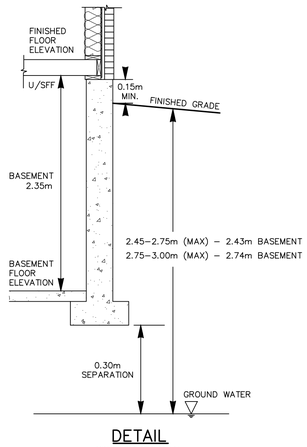
BLK 433 Future Road 0.06 ha

STREET A
STREET B
STREET C
STREET D
STREET E
STREET F
STREET G
STREET H
ST. I
ST. J

BLK 389 5 Units
BLK 390 4 Units
BLK 391 8 Units
BLK 392 6 Units
BLK 393 6 Units
BLK 394 6 Units
BLK 395 7 Units
BLK 396 8 Units
BLK 397 7 Units
BLK 398 6 Units
BLK 399 6 Units
BLK 400 6 Units
BLK 401 6 Units
BLK 402 7 Units
BLK 403 8 Units
BLK 404 7 Units
BLK 405 6 Units
BLK 406 6 Units
BLK 407 6 Units
BLK 408 4 Units
BLK 409 5 Units
BLK 410 6 Units
BLK 411 4 Units
BLK 412 4 Units
BLK 413 3 Units
BLK 414 5 Units
BLK 415 6 Units
BLK 416 6 Units
BLK 417 8 Units
BLK 418 3 Units
BLK 419 8 Units
BLK 420 6 Units
BLK 421 4 Units
BLK 422 6 Units

NOTE:

1. NOT APPLICABLE ON; STREETS, PARK BLOCKS, SWM BLOCK.



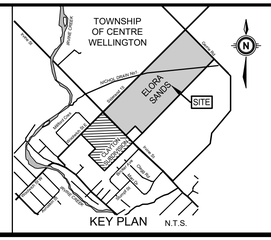
DETAIL
SINGLE RESIDENTIAL
N.T.S.

LEGEND:

312.0 SEASONAL HIGH GROUNDWATER CONTOURS

5.20 DEPTH TO GROUNDWATER

NOTE:
DEPTHS TO BE READ AS DISTANCE FROM GROUNDWATER SEPARATION LIMIT BELOW FOOTINGS TO SEASONAL HIGH GROUNDWATER ELEVATIONS. (E.G. IF DEPTH IS > 0 GROUNDWATER IS > 0.30m BELOW UNDERSIDE OF FOOTING)



KEY PLAN N.T.S.

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No.	REVISION	BY	YYYY-MM-DD
1.			

TOWNSHIP OF CENTRE WELLINGTON

GEODETIC BM ELEV. = 387.982m
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SITE BENCHMARK ELEV. = m

CLIENT
ELORA SANDS DEVELOPMENT INC.
2555 Meadowpine Blvd. Unit 3 Mississauga Ont.

PROJECT
ELORA SANDS SUBDIVISION

DRAWING
U/S FOOTING TO GROUNDWATER COMPARISON

MTE Engineers, Scientists, Surveyors.

Design By: AFF	Project Manager: M.FELINCZAK
Drawn By: KAT	Project No.: 62018_001
Checked By: VAL	Drawing No.: MS1.1
Date (yyyy-mm-dd): 2025-09-24	
SCALE: 1:1250	Sheet of