

Elora 7 OP Inc.
44 Upjohn Road
Toronto, ON M3B 2W1

File No. 22-084
August 1, 2023

Attention: Bob Forrest

**Subject: Comment Response to Township of Elora
350 Wellington Road 7, Elora, Ontario**

Grounded Engineering Inc. ("Grounded") is pleased to provide you with this Comment Response to Township of Elora for the site known as 350 Wellington Road 7, in Elora, Ontario.

1 Introduction

Banks Groundwater Engineering Limited on behalf of the Township of Elora provided comments dated February 1, 2023 with respect to the First Submission for ZBA. This letter will provide comments with respect to the comments regarding groundwater level monitoring.

The proposed project includes constructing townhomes with up to one basement level with associated infrastructure including services and pavements. The Finished Floor Elevation will vary across the site. The Property is rectangular in shape, with an area of 4.45 hectares. The Property is currently used for agricultural purposes and is occupied by a farm field. The site location is presented in Figure 1.

2 Background Information

The following previous environmental reports were provided as part of the first submission:

- *Grounded Engineering Inc. Hydrogeological Assessment 350 Wellington Road 7, Elora, Ontario, 2022-10-17*

The purpose of the investigation was to provide information regarding the site specific hydrogeological conditions and provide considerations for the development of the property. Specifically, the assessment provided the following:

- Background Information Review: Review of available background geologic and hydrogeological information for the Property and surrounding areas. This included a review of the Ministry of the Environment, Conservation and Parks (MECP) well records, and watershed information by the Grand River Conservation Authority (GRCA)
- Private Well Survey: A well survey was conducted for properties within 500 m of the Property.
- Groundwater Level Monitoring: Groundwater level monitoring was conducted to assess the groundwater table elevations and flow conditions.



- Hydraulic Conductivity Test: In-situ hydraulic conductivity tests were conducted in select monitoring wells to assess hydraulic conductivity of the strata. The underlying soils were assessed to determine potential dewatering requirements.
- Water Balance: A water balance and assessment of infiltration rates for existing (pre-development) and post development conditions was completed to determine the feasibility criteria of the proposed development.

The following summarizes the results of the hydrogeological study:

- The site is characterized by topsoil underlain by disturbed soil consisting of sands and silts with trace to some clay and trace gravel. Beneath this, a sandy silt till was encountered, followed by sands, underlain by a silt to clayey silt till. The sand deposit is of moderate permeability and will provide moderate recharge capability and groundwater movement. The tills and disturbed soil deposits are of moderate to low permeability.
- Groundwater was observed within 0.84 to 3.7 mBGS within all monitoring wells. Seasonal fluctuations of groundwater are expected at the site. Additional groundwater monitoring at the Site will be required to determine seasonal groundwater conditions and confirm groundwater flow direction.
- Based on the low to moderate permeability of the soils, groundwater transmission is expected to be moderate. No area of groundwater discharge such as seepages and springs were noted at the Property during the site inspection.
- The Property lies within a 5-year Wellhead Protection Area according to the Grand River Source Protection Area Assessment Report. The site is within an identified Aquifer Medium Vulnerability Area according to the Grand River Conservation Authority.
- MECP well records for wells completed in the vicinity of the Property show that the primary aquifer used for potable water is within the bedrock. Over 50% of wells were installed within 30 mBGS. Twenty-three (23) wells were installed within the bedrock, to a maximum depth of 134 m below grade.
- Approximately 38% of roof run-off would be required to match pre-development infiltration rates.
- Construction or short-term groundwater control:
 - There is an area in the centre (Blocks 1 to 5, 8, 11, 14 to 18, 20, 29 and 33 to 35) where the groundwater is high and there is an area of disturbed native material which will need to be excavated and backfilled with engineered fill. The excavation will need to extend into the groundwater table and requires short term dewatering
 - Total short-term groundwater takings of approximately 423 L/min are likely.
 - The flow of water from the dewatering system must be treated to meet Provincial Water Quality Standards prior to overland discharge in order to meet regulation requirements.
 - An EASR and municipal discharge permits will be required prior to any discharge into the municipal sewers.
- Long-term groundwater control:



- A permanent dewatering system would be required if the buildings will be drained structures. Total long-term groundwater takings of approximately 11.1 L/min are likely.

3 Summary of Additional Groundwater Monitoring

The following summarizes the additional groundwater level monitoring at the site.

- A datalogger was installed in BH12 on March 23, 2023.
- Monthly downloads of the data as well as monthly manual groundwater levels have been obtained since March 23, 2023.
- Groundwater measurements have been obtained and plotted in hydrographs up to June 2023 (Figure 2)
- The data shows that the ground water level declined since March 23, 2023.
- The early spring has been a seasonal high.
- The late spring has been a seasonal low.
- Shallow ground water levels in MW12a respond rapidly to precipitation events.
- Groundwater was observed within 0.84 to 3.7 mBGS within the monitoring wells in between May and September 2022.
- Groundwater was observed within 0.06 to 4.61 mBGS within the monitoring wells between May 2022 and June 2023.
- Seasonal high groundwater levels have been obtained.
- The results of continued groundwater monitoring do not affect the overall conclusions of the hydrogeological assessment report.
- Fully waterproofed structures should be considered to minimize long term groundwater ingress, in areas of the site where the groundwater table was observed to be high.



4 Closure

This report has been prepared for the use of Elora 7 OP Inc. This report is copyright of Grounded Engineering Inc.

We trust that the information contained in this letter is sufficient for your present requirements. If we can be of further assistance, please do not hesitate to contact us.



Professional Engineers
Ontario
Licensed Engineering Technologist
Name: K. L. PICKETT
Number: 100241-239
Licence Category: Environmental Investigation of soil, groundwater,
and related systems in existing Regions of Soil Conditions
All management plans and reports of Professional Engineers of
Ontario are subject to the approval, verification, and
certification of the Association of Professional Engineers of Ontario

Kim Pickett, C.E.T, LET, QP_{ESA}
Intermediate Project Engineer

Bailey Walters, MSc PGeo QP_{ESA/PM}
Senior Geoscientist

FIGURES

Figure 1 – Site Location Plan

Figure 2 – Hydrograph Groundwater Levels

TABLES

Table 1 – Groundwater Level Summary

FIGURES





GROUND
ENGINEERING

1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3
www.groundedeng.ca

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- - - STUDY AREA (250 m RADIUS)
- ⊕ BH WITH MONITORING WELL

Note

Reference

ArcGIS - My Map

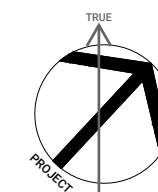
Project

**350 WELLINGTON ROAD
7, ELORA, ONTARIO**

Figure Title

SITE LOCATION PLAN

North



Date

JUNE 2022

Scale

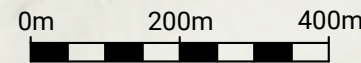
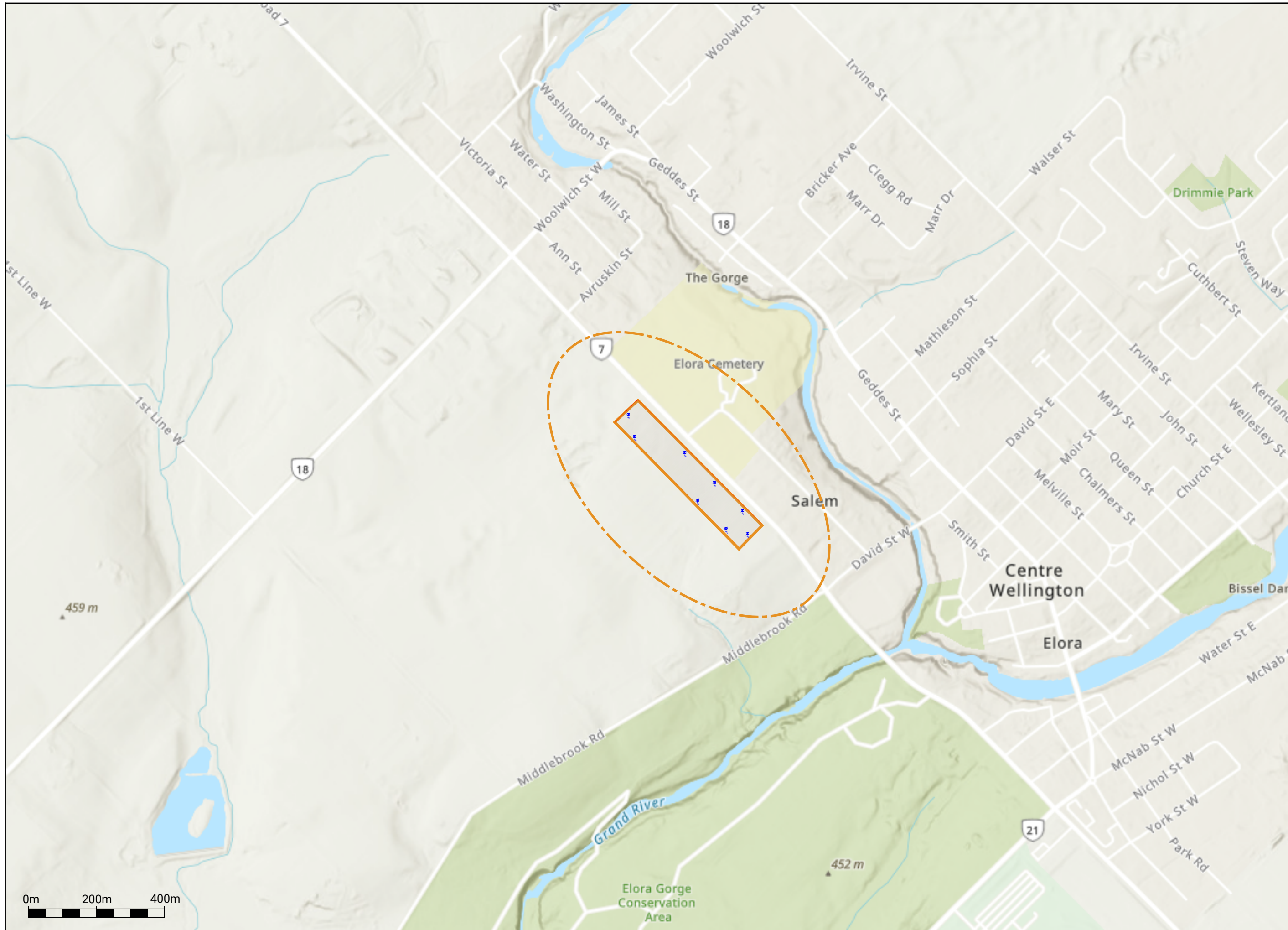
AS INDICATED

Job No

22-084

Figure No

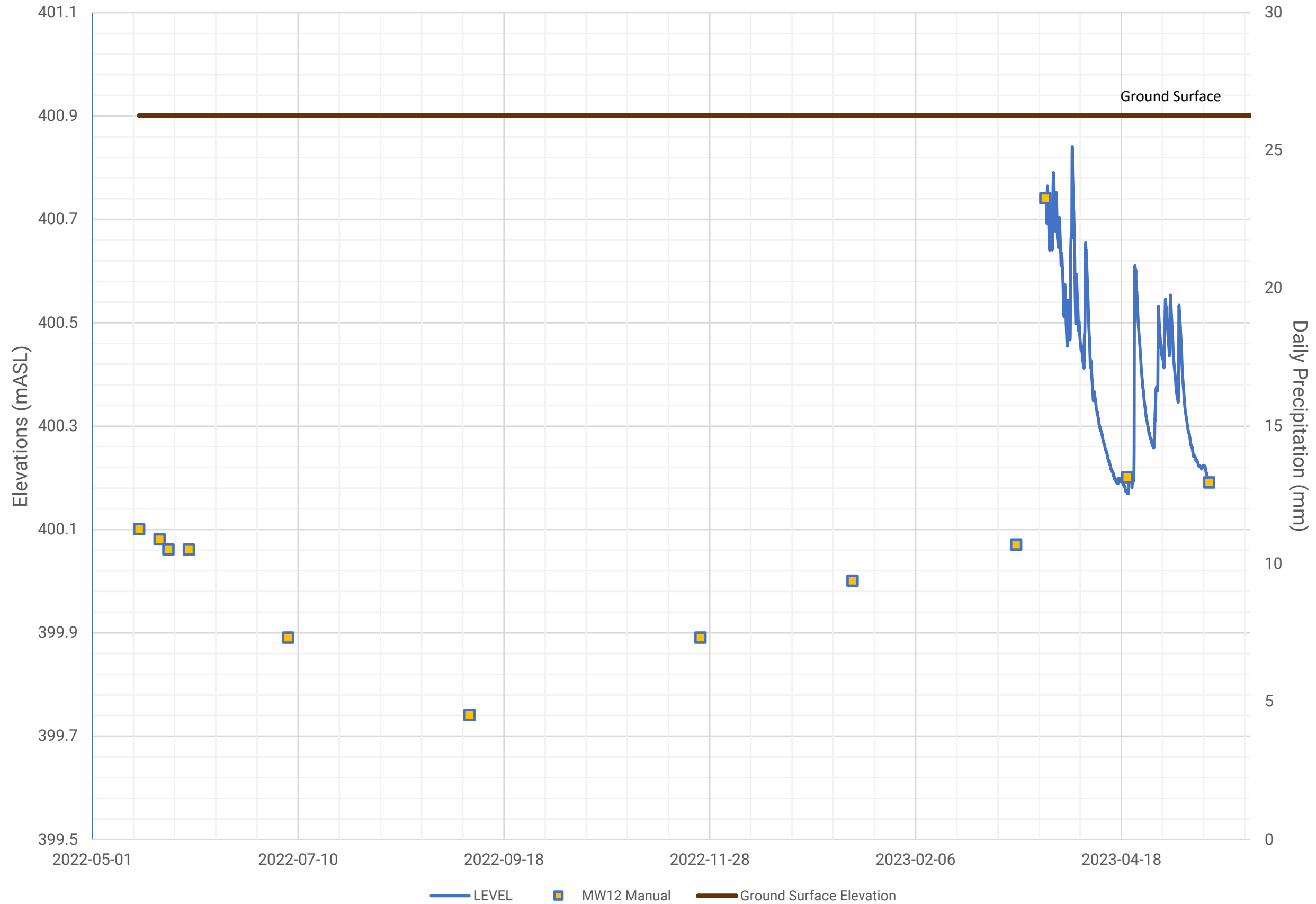
FIGURE 1



459 m

452 m

Ground Water Hydrograph - MW12a



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www.groundedeng.ca

LEGEND

Note

Reference

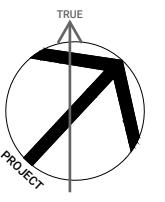
Project

**350 WELLINGTON ROAD
7, ELORA, ONTARIO**

Figure Title

**HYDROGRAPH
SPRING 2023**

North



Date

JULY 2023

Scale

Job No

22-084

Figure No

FIGURE 2

TABLES



**TABLE 1
GROUNDWATER LEVEL MONITORING SUMMARY
350 Wellington Road 7
Elora, ON
22-084**

Well ID	Ground Surface Elevation (masl)	Screen Interval (mbgs)	Screen Interval (masl)	Soil Strata	Grounded Engineering									
					Tuesday, May 17, 2022		Tuesday, May 24, 2022		Friday, May 27, 2022		Friday, June 3, 2022		Thursday, July 7, 2022	
					(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)
BH2	404.3	4.6 - 7.6	399.8 - 396.7	SN	1.86	402.5	1.90	402.4	1.89	402.4	1.98	402.4	2.19	402.1
BH3	402.0	4.6 - 7.6	397.5 - 394.4	SL-SN to SN-SL-TL	1.31	400.7	0.78	401.2	0.83	401.2	0.84	401.2	1.03	401.0
BH4	401.2	4.6 - 7.6	396.6 - 393.5	SN-SL-TL	3.01	398.2	2.94	398.2	2.95	398.2	3.03	398.1	3.23	397.9
BH5	406.9	6.1 - 9.1	400.8 - 397.7	SN	3.70	403.2	3.73	403.1	3.73	403.1	3.70	403.2	3.87	403.0
BH9	400.6	4.6 - 7.6	396.0 - 393.0	SN-CL-SL-TL	2.59	398.0	2.64	398.0	2.66	398.0	2.75	397.9	2.95	397.7
BH10	406.7	10.7 - 13.7	396.0 - 393.0	SN to CL-SL-TL	3.68	403.0	3.71	403.0	3.69	403.0	3.67	403.0	3.86	402.8
BH12	400.9	4.6 - 7.6	396.3 - 393.3	SN to CL-SL-TL	0.80	400.1	0.82	400.1	0.84	400.1	0.84	400.1	1.01	399.9
BH13	400.5	4.6 - 7.6	395.9 - 392.9	SN-SL-TL to CL-SL-TL	2.61	397.9	2.62	397.9	2.64	397.9	2.75	397.8	2.92	397.6

mbgs = metres below existing ground surface

masl = metres above sea level

* = unstabilized groundwater level

TABLE 1
GROUNDWATER LEVEL MONITORING SUMMARY
 350 Wellington Road 7
 Elora, ON
 22-084

Well ID	Ground Surface Elevation (masl)	Screen Interval (mbgs)	Screen Interval (masl)	Soil Strata	Grounded Engineering									
					Wednesday, September 7, 2022		Friday, November 25, 2022		Monday, January 16, 2023		Monday, March 13, 2023		Thursday, May 18, 2023	
					(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)
BH2	404.3	4.6 - 7.6	399.8 - 396.7	SN	2.48	401.9	2.78	401.6	2.56	401.8	2.48	401.9	1.91	402.4
BH3	402.0	4.6 - 7.6	397.5 - 394.4	SL-SN to SN-SL-TL	1.33	400.7	1.40	400.6	1.16	400.9	0.96	401.1	0.67	401.4
BH4	401.2	4.6 - 7.6	396.6 - 393.5	SN-SL-TL	3.37	397.8	3.42	397.7	3.05	398.1	2.81	398.4	2.56	398.6
BH5	406.9	6.1 - 9.1	400.8 - 397.7	SN	4.21	402.6	4.56	402.3	4.61	402.2	4.45	402.4	3.72	403.1
BH9	400.6	4.6 - 7.6	396.0 - 393.0	SN-CL-SL-TL	3.15	397.5	3.28	397.3	2.86	397.8	2.62	398.0	2.30	398.3
BH10	406.7	10.7 - 13.7	396.0 - 393.0	SN to CL-SL-TL	4.18	402.5	4.53	402.2	4.63	402.1	4.43	402.3	3.72	403.0
BH12	400.9	4.6 - 7.6	396.3 - 393.3	SN to CL-SL-TL	1.16	399.7	1.01	399.9	0.90	400.0	0.83	400.1	0.71	400.2
BH13	400.5	4.6 - 7.6	395.9 - 392.9	SN-SL-TL to CL-SL-TL	3.11	397.4	3.19	397.3	2.38	398.1	2.65	397.9	2.35	398.2

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TABLE 1
GROUNDWATER LEVEL MONITORING SUMMARY
 350 Wellington Road 7
 Elora, ON
 22-084

Well ID	Ground Surface Elevation (masl)	Screen Interval (mbgs)	Screen Interval (masl)	Soil Strata	Grounded Engineering		Minimum Elev. (Lowest)		Maximum Elev. (Highest)		Seasonal Fluctuation (±m)
					Thursday, June 22, 2023		(mbgs)	(masl)	(mbgs)	(masl)	
					(mbgs)	(masl)					
BH2	404.3	4.6 - 7.6	399.8 - 396.7	SN	2.04	402.3	2.78	401.6	1.86	402.48	0.46
BH3	402.0	4.6 - 7.6	397.5 - 394.4	SL-SN to SN-SL-TL	0.86	401.2	1.40	400.6	0.67	401.36	0.37
BH4	401.2	4.6 - 7.6	396.6 - 393.5	SN-SL-TL	2.92	398.2	3.42	397.7	2.56	398.60	0.43
BH5	406.9	6.1 - 9.1	400.8 - 397.7	SN	3.77	403.1	4.61	402.2	3.70	403.16	0.46
BH9	400.6	4.6 - 7.6	396.0 - 393.0	SN-CL-SL-TL	2.42	398.2	3.28	397.3	2.30	398.31	0.49
BH10	406.7	10.7 - 13.7	396.0 - 393.0	SN to CL-SL-TL	3.76	402.9	4.63	402.1	3.67	403.02	0.48
BH12	400.9	4.6 - 7.6	396.3 - 393.3	SN to CL-SL-TL	0.80	400.1	1.16	399.7	0.71	400.19	0.23
BH13	400.5	4.6 - 7.6	395.9 - 392.9	SN-SL-TL to CL-SL-TL	2.73	397.8	3.19	397.3	2.35	398.17	0.42

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