D-5-4 & D-5-5 INVESTIGATION REPORT

7723 HIGHWAY 89

TOWNSHIP OF ADJALA-TOSORONTIO
COUNTY OF SIMCOE

PREPARED FOR:

PILLA INVESTMENTS INCORPORATED

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4

OCTOBER 2022

CFCA FILE NO. 1101-4125

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev. 0	October 18, 2022	Issued for First Submission

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF FIGURES

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Pilla Investments Inc. to prepare a Hydrogeologic Report to support the Draft Plan of Subdivision for the proposed development located at 7723 Highway 890 in the Township of Adjala-Tosorontio, County of Simcoe. The subject lands are approximately 29.1 ha in size and are located on the south side of Highway 89, west of Concession Road 7. A site location plan is presented on Figure 1. This report has been prepared in conjunction with a Functional Servicing & Preliminary Stormwater Management Report also prepared by Crozier and submitted under a separate cover.

The subject lands (the Site) are located within the Township of Adjala-Tosorontio, County of Simcoe. The Site is currently occupied by an existing rural residential dwelling and agricultural buildings, which are proposed to be removed. The elements envisioned for this development include:

- 22 commercial/industrial lots
- 22 at grade asphalt parking lots
- One site access point on Highway 89, located at 7723 Highway 89
- One site access point on Concession Road 7, approximately 240 meters south of Highway 89

Our review and work plan for this Hydrogeological Report was developed based on the Concept Plan prepared by MHBC, dated March 2022.

We have also reviewed the pertinent background information associated with the Site, including:

- Topographic Survey (J.D. Barnes Ltd March 11, 2021)
- Concept Plan (MHBC Planning, March 2022)

1.1 Land Use

The Site is approximately 29.1 ha and landscaping on the property consists of agricultural land, trees, and grass. The Site is bounded by:

- Highway 89 and existing commercial properties to the North
- Concession Road 7 to the East
- Residential and agricultural lands to the West
- Agricultural lands to the South

The Site is currently zoned as Employment (E1) per the Township of Adjala-Tosorontio Zoning By-law No. 13-14, Schedule 'A', as amended.

The Site is characterized by active agricultural fields, an existing farm dwelling and agricultural structures. The existing farm dwelling, and associated agricultural structures are located along the north property line and are accessible via a gravel driveway access to Highway 89. Refer to Figure 1 for the Site location plan.

2.0 Physical Setting

2.1 Physiography

The Site is located within the physiographic region known as the Peterborough Drumlin Field, near the West Lowland area of the Simcoe Lowlands as shown on Figure 2. The area is characterized as an area of rolling drumlinized till plain. The Simcoe Lowlands physiographic region surround the north and east of the Site, while the Horseshoe Moraines physiographic region surround the area west of the Site.

2.2 Topography and Drainage

No municipal storm sewer servicing or private storm infrastructure exists. The Site is a part of the Nottawasaga Valley Conservation Authority (NVCA) Source Protection Area and the Boyne River subwatershed. South of the Site features a tributary of the Boyne River that flows east to west named Spring Creek. Per the topographic survey, the Site generally drains surface flow from north to south across the property and a 26 m elevation difference is noted across the Site.

3.0 Geology

The bedrock geology and surficial geology of the Site and surrounding area is displayed on Figures 3 and 4.

3.1 Regional

According to Ontario Geological Survey (OGS) mapping, the surficial geology of the Site predominantly consists of glaciolacustrine clay to silty textured till that extends to the western part of the Site with sand to gravel foreshore-basinal deposits running through the eastern portion of the Site. The foreshore-basinal deposits are predominant in the region and extend from the Township of Essa to Barrie. The bedrock in the area is predominantly comprised of shale, limestone, and dolostone of the Georgian Bay Formation.

3.2 Local

Surficial geology mapping for the area indicates that the soils for most of the Site are clay to silt-textured till and coarse-textured glaciolacustrine deposits. These soils are characterized as poorly drained and have high runoff potential.

Crozier and Walker Drilling completed a soils investigation on June 7 and June 8, 2021, during the installation of monitoring wells (Figure 5). The following soil profile was noted on the Site:

- 0.0 mbgs to 0.61 mbgs of brown, dry, loose sandy silt with organics and trace clay
- 0.61 mbgs to 1.22 mbgs brown, moist, dense silty clay with trace sand
- 1.22 mbgs to 4.27 mbgs brown to grey, wet silty clay to clay silt till with trace sand and trace clay
- 4.27 mbgs to 6.10 mbgs brown, wet sand with trace cobbles

The field observations of the soil profile above are consistent with OGS mapping. Further discussion of the 2021 Monitoring Well program is detailed in Section 5.0. As part of the D-5-5 and D-5-4 requirements, five (5) test water supply wells were completed by Franklin Drilling Services Inc. from June 2021 to August 2021.

The water well records indicate the following general soil profile was encountered:

- 0.0 mbgs to 0.3 mbgs topsoil
- 0.3 mbgs to 8.0 mbgs brown clay with stones
- 8.0 mbgs to 13.0 mbgs brown sand and silt
- 13.0 mbgs to 26.0 mbgs grey clay with stones
- 26.0 mbgs to 47.0 mbgs brown sand with gravel
- 47.0 mbgs to 57.0 mbgs brown clay
- 57.0 mbgs to 79.0 mbgs grey clay
- 79.0 mbgs to 92.0 mbgs brown sand

Further details of the 2021 Test Well Program are detailed in Section 5.0.

4.0 Hydrogeology

4.1 Hydrostratigraphy

The hydrostratigraphic framework of the Alliston area has been outlined in the NVCA Groundwater Monitoring Network Review and Assessment. Table 1 below summarizes the hydrostratigraphy of the study area and the subject property.

Table 1: Hydrostratigraphy of the NVCA Watershed

Layer	Name	Function	Material	Thickness (m)	Water Supply
Youngest – 1	Upper Confining Layer	Aquitard	Till		
2	Aquifer 1 (A1)	Aquifer	Sand and gravel	10 – 50	Domestic
3	Confining Layer 1 (C1)	Aquitard	Clay and silt		
4	Aquifer 2 (A2)	Aquifer	Interbedded sand and silt/clay	25 – 100	Domestic
5	Confining Layer 2 (C2)	Aquitard	Silty sand to sandy silt till		
6	Aquifer 3 (A3)	Aquifer	Sand and gravel	35 – 70	Alliston
7	Confining Layer 3 (C3)	Aquitard	Silt and clay		
8	Aquifer 4 (A4)	Aquifer	Sand and gravel	3 - 30	Alliston
Oldest – 9	Top of Bedrock				

In the Nottawasaga Valley Watershed, regional groundwater flow in the deep and shallow aquifers generally follows topography and surface water drainage eastward towards Boyne River and its tributaries and Cooks Bay.

In general, there are four (4) major aquifer units in the general area of the Site: A1, A2, A3, and A4. A1 and A2 generally supply domestic water supply and are commonly unconfined. Only in a few areas is A1 confined by till. A3 and A4 are confined in nature and are connected in some areas. The Town of Alliston Municipal wells are screened within this aquifer.

4.2 Background Water Quantity

A review of the Ministry of Environment, Conservation and Parks (MECP) Well Record Database revealed a total of 156 well records within 1 km of the subject property (Figure 6), with one (1) well record mapped within the Site boundaries. A summary table of the well records is included in Appendix A. In general, a review of the identified well records is summarized below:

- Of the 156 well records identified, 95 are domestic supply, 25 are monitoring wells or test holes, 7 are commercial supply and 4 wells are for livestock or farm water supply. The remaining wells were identified as abandonment records or were unidentified.
- Many of the wells are screened within overburden material, with only 2 completed in the shale bedrock. These wells report the overburden thickness in the area is approximately 80 mbgs to 100 mbgs.
- The water supply wells in the area are screened within sand to gravel overburden material and are completed to an average depth of approximately 30 mbgs.
- Static water levels range from 36.6 mbgs to 1.5 m above ground surface (mags). Only 9 wells are reported to have water levels at or above ground surface and are screened within a confined sand and gravel aquifer between 25 mbgs to 40 mbgs.
- The domestic water supply and commercial water supply wells in the area have a reported average well yield of 36.5 liters per minute (LPM).
- Well ID 5738137 is mapped within the subject property boundary. The well is a 152 mm steel cased domestic water supply well and is screened within a confined sand and gravel aquifer from 57.3 mbgs to 58.5 mbgs.
- An 8-hour pumping test was completed on Well ID 5738137 in 2003. The static water level was measured at 24.4 mbgs and the pumping water level was measured at a level 53.3 mbgs. The reported well yield of this well is 22.7 LPM or 5 gallons per minute (GPM).
- Well ID 7293607 is interpreted to be the water supply well for the Home Hardware adjacent to the subject property. This well is constructed within a confined sand and gravel aquifer from 30.5 mbgs to 32.9 mbgs and has a reported yield of 37.8 LPM or 10 GPM.

4.3 Background Water Quality

Regional groundwater quality monitoring is conducted by the NVCA using the Provincial Groundwater Monitoring Network (PGMN) wells. Groundwater samples are collected and analyzed for general chemical parameters, biological parameters, metals, and nutrients. Two (2) PGMN wells are located near the subject property, W281-1 and W231-1. No exceedances of the measured parameters for the groundwater samples from the nearby wells were noted in the Nottawasaga Valley Source Protection Area Approved Assessment Report. The completed analysis of the Alliston Water Works wells notes that the groundwater in the area occasionally exceeds aesthetic and operational guidelines from Ontario Drinking Water Quality Standards (ODWQS) including hardness, iron, aluminum, and organic nitrogen and are considered to be naturally occurring. The assessment report notes that coliforms have been detected in raw water in municipal groundwater supply wells.

Groundwater sampling was completed by Crozier across the subject property to determine local background groundwater quality and complete the D-5-5 test well requirements. Discussion of the groundwater sampling is continued in Section 5.3 and Section 6.3.

5.0 Field Work

5.1 Well Construction

From June 7 to June 8, 2021, Crozier supervised the installation of five (5) groundwater monitoring wells and five (5) test water supply wells on the subject property as shown on Figure 5.

The monitoring well locations were selected to determine seasonal high groundwater elevation and flow direction across the Site. Table 2 below details the monitoring wells on the Site.

Table 2: 2021 Monitoring Well Details

Monitoring Well	Total Depth (m)	Screened Interval (m)	Material
MW21-1	6.10	3.05 – 6.10	Brown, medium, saturated sand; trace gravel
MW21-2	6.10	3.05 – 6.10	Grey, dry, clay till with gravel and trace sand
MW21-3	6.10	3.05 – 6.10	Brownish grey, low moisture, silty clay till with gravel and trace sand
MW21-4	6.10	3.05 – 6.10	Grey, wet silt till with gravel, trace clay and sand to grey, low moisture clayey silt till with gravel and trace sand
MW21-5	6.10	3.05 – 6.10	Grey, low moisture, silty clay till with gravel and trace sand

All monitoring wells constructed as part of the 2021 program were installed with as 50 mm diameter Schedule 40 PVC monitor wells with #10 slot PVC screens. The sand packs were designed and placed such that the sand pack was contained within the unit being monitored and hydraulically isolated from overlying stratigraphic units via the placement of a bentonite seal. Monitoring well logs have been included in Appendix B.

During the period of June to August 2021, five (5) test water supply wells were completed by Franklin Drilling Services Inc. to support the D-5-5 analysis for the proposed development. The locations for the test wells were evenly distributed across the subject property to create a dense network and were completed to different depths. The depth of the test well was determined during drilling and decided based on the anticipated well yield of the intercepted aquifer. All locations are shown on Figure 5 and test well records are included in Appendix C. The test well construction details are displayed in Table 3 below.

Table 3: 2021 Test Well Details

Monitoring Well	**Total Depth** (m)	**Screened Interval** (m)	**Stick Up** (m)	**Static Level**[1] (mbgs)	**Material**
TW21-1	30.78	22.30 – 30.78	0.45	6.30	Brown sand and gravel
TW21-2	47.85	46.63 – 47.85	0.50	10.97	Brown sand and gravel
TW21-3	34.44	32.91 – 34.44	0.45	15.54	Grey sand and gravel
TW21-4	90.22	89.00 – 90.22	0.50	21.24	Brown sand
TW21-5	72.84	71.62 – 72.84	0.50	12.61	Brown sand

1. Static water level measured from top of casing to the measured water level on the date of pumping the specified well.

Well water records for test wells TW21-1 to TW21-5 are included in Appendix C.

5.2 Groundwater Level Monitoring

Following the installation and development of the wells, Crozier installed data loggers into each of the five monitoring wells to assess the seasonally high groundwater level through the spring months. The data loggers were programmed to collect water levels on an hourly basis. Manual water level readings were also obtained on several occasions to confirm the accuracy of the values recorded by the data loggers.

5.3 Groundwater Quality Sampling

Groundwater samples were collected from all monitoring wells and test wells on the subject property. Three rounds of groundwater sampling have been completed at the time of this report. Sampling of the monitoring wells was completed using purging methods with Waterra Tubing and three (3) well volumes were removed from each well prior to sampling and in-between samples. Test wells were sampled using a Grundfos Redi-Flo2- 2” Environmental Sampling Pump. Three (3) well volumes were removed prior to and in-between samples.

The first two sets of groundwater samples were submitted to AGAT Laboratories for analysis for the following parameters:

- E. Coli and Total Coliforms
- Anions including fluoride, chloride, nitrate, nitrite, bromide, sulphate and phosphate
- Cations including total calcium, magnesium, potassium and sodium
- Total metals

The third set of groundwater samples were analyzed for E. Coli, Total Coliforms, nitrate, and nitrite. Groundwater sampling results are attached in Appendix D.

5.4 Hydraulic Testing

Pumping testing was carried out at TW21-1 to TW21-5 between June 11, 2021 to September 6, 2021. The pumping tests consisted of a pumping phase of 180 minutes using a submersible pump and a recovery phase of 180 minutes. The pumping rates were determined for each well by the Well Contractor depending on the estimated well yield. Water levels were measured at different time intervals throughout the testing period using a manual tape measure. Table 4 below displays the pumping rates used for each test well.

Table 4: Test Well Pumping Rates

Monitoring Well	**Pumping Rate** (LPM)[1]	**Depth of Pump** (mbgs)
TW21-1	22.73	22.86
TW21-2	22.73	45.11
TW21-3	13.63	30.48
TW21-4	22.73	- [2]
TW21-5	22.73	42.67

1. LPM - Litres per Minute.
2. Not reported in the well test data sheet.

Pumping test results are presented in Appendix E.

6.0 Results

6.1 Groundwater Levels

Manual groundwater level measurements at the monitoring well locations were taken from June 2021 to October 2021. Note groundwater monitoring is ongoing and will continue until at least Spring 2022. The results of the water level monitoring are included in Table 5.

Table 5: Water Level Monitoring Results

Well	**Ground Elevation**[1] (masl)	**June 8, 2021**		**June 24, 2021**		**October 5, 2021**		**March 24, 2022**	
		Water Level (mbgs)	**Elevation** (masl)	**Water Level** (mbgs)	**Elevation** (masl)	**Water Level** (mbgs)	**Elevation** (masl)	**Water Level** (mbgs)	**Elevation** (masl)
MW21-1	226.75	2.53	224.22	3.03	223.72	2.31	224.44	1.43	225.32
MW21-2	234.25	DRY	DRY	4.64	229.61	2.06	232.19	1.20	233.05
MW21-3	236.83	DRY	DRY	5.34	231.49	3.06	233.77	1.36	235.47
MW21-4	247.04	1.12	245.92	1.23	245.81	1.85	245.19	1.01	246.03
MW21-5	238.96	DRY	DRY	1.89	237.07	1.97	236.99	1.29	237.67

1. Estimated from Topographic Survey prepared by J.D. Barnes Ltd. dated March 10, 2021.

Manual water level readings were recorded in the wells by the Crozier staff on the dates presented in Table 5. In addition, data loggers were installed in each of the monitoring wells on June 24, 2021. On

March 24, 2022, the logger from MW21-5 was removed and replaced due to a logger reading error. The loggers record water levels in the well on an hourly basis to capture fluctuations in water levels that may occur during spring melt events and storm events. The results of the continuous water level monitoring are presented as hydrographs and attached in Appendix F. Please note the data from the level logger at MW21-5 was unable to be downloaded at the time of preparation of this report due to a logger reading error.

In general, water levels in all monitoring wells decreased from June to October 2021 and have been steadily increasing since October 2021. However, in MW21-2 and MW21-3 water levels have increased since installation. MW21-3 is located next to the existing farmhouse and could be installed in reworked material from the building of Highway 89 and therefore the water levels in the monitoring well are likely easily influenced by seasonal events. MW21-2 is in the centre of the field and could have also been installed in reworked material due to agricultural uses. Minor fluctuations are noted in all water level hydrographs. These fluctuations were consistent for each hydrograph and are likely due to daily barometric pressure fluctuations rather than the result of melt or rain events. Larger spikes in the hydrographs appear to be due to precipitation events.

The groundwater elevation across the subject property from northwest to southeast ranged from 246.03 masl to 225.32 masl from the period between June 2021 to March 2022. Therefore, groundwater is interpreted to flow from northwest to southeast across the Site. Water was encountered during drilling at approximately 2 mbgs – 3 mbgs within sandy seams in grey clay till material. The manual levels in March 2022 are interpreted to be near seasonally high-water levels. Therefore, seasonally high-water levels across the Site range from approximately 1 mbgs to 1.45 mbgs from northwest to southeast. Groundwater monitoring will continue until the end of at least Spring 2022 to confirm March 2022 levels.

6.2 Groundwater Quantity

As described in Section 5.4, six (6) hour pumping tests were completed for each of the five (5) test wells. The pumping test results, and test curves are displayed in Appendix G.

Future use of the proposed development is determined to be light industrial and office space. For the development, using the OBC Table 8.2.1.3.B the proposed sewage flows are determined to be 3,750 L/day per lot. Therefore, the total sewage flows and therefore the water demand for the 22-lots will be 86,250 L/day. However, based on the recommendations of section 4.3.2 in the MECP procedure D-5-5, the minimum flow rate for each test well is 13.7 L/min. Therefore, over a six (6) hour period, the minimum volume needed to satisfy D-5-5 is 4,932 L per test well. Each well must also recover within 95% of the static water level prior to pumping within 24-hours of pumping.

Sections 6.2.1 to 6.2.6 summarize and discuss the results of each pumping test.

6.2.1 <u>TW21-1</u>

TW21-1 was pumped at a rate of 22.73 lpm and the pump was set to a depth of 22.86 mbtoc. Prior to pumping, the static water level was reported to be 6.30 mbtoc. As shown in the pump test curve in Appendix G, the water level steadily declined through the 6 hours of pumping to a final water level of 6.85 mbtoc for a total drawdown of 0.55 m. Given that the top of the well screen is located at a depth of approximately 22.30 m bgs, this leaves over 15.5 m of available drawdown. After the recovery phase of the pumping test, the water level was reported to be 6.58 mbgs or approximately 96% of the original static water level.

6.2.2 TW21-2

TW21-2 was pumped at a rate of 22.73 lpm and the pump was set to a depth of 45.11 mbtoc.

Prior to pumping, the static water level was reported to be 10.97 mbtoc. As shown in the pump test curve in Appendix G, the water level dropped steadily through the first 5 hours of pumping and then reached a point of equilibrium at a pumping level of 38.95 mbtoc. Given that the top of the well screen is located at a depth of 46.63 mbgs, this leaves in excess of 7.5 m of available drawdown at TW21-2. After the recovery phase of the pumping test, the water level was reported to be 15.81 mbgs or approximately 69% of the original static water level.

6.2.3 TW21-3

TW21-3 was pumped at a rate of 13.63 lpm and the pump was set to a depth of 30.48 mbtoc.

Prior to pumping, the static water level was reported to be 15.54 mbtoc. As shown in the pump test curve in Appendix G, the water level steadily declined through the hour pumping test duration to a final water level of 19.07 mbtoc. Extrapolating the curve out to 1-year of continuous pumping at the test rate and given that the top of the well screen is located at a depth of 32.91 mbgs, this leaves approximately 12.91 m of available drawdown at this well location. After the recovery phase of the pumping test, the water level was reported to be 15.54 mbgs or approximately 100% of the original static water level.

6.2.4 TW21-4

TW21-4 was pumped at a rate of 22.73 lpm and the pump was set to a depth of 42.67 mbtoc.

Prior to pumping, the static water level was reported to be 12.61 mbtoc. As shown in the pump test curve in Appendix G, the water level steadily declined throughout the first 20 minutes of pumping and then reached an equilibrium state and remained constant for the duration of the 6-hour pumping test at a level of 16.81 mbtoc. Given that the top of the screen is located approximately 89.00 mbgs, this leaves approximately 74.00 m of available drawdown at this well location. After the recovery phase of the pumping test, the water level was reported to be 12.61 mbgs or approximately 100% of the original static water level.

6.2.5 TW21-5

TW21-5 was pumped at a rate of 22.73 lpm and the pump was set to a depth of 30.48 mbtoc.

Prior to pumping, the static water level was reported to be 21.24 mbgs. As shown in the pump test curve in Appendix G, the water level dropped 0.01 m between 0 and 1 minute of pumping and then remained constant for the remainder of the 6-hour pumping test at a level of 21.25 mbtoc. Given that the top of the well screen is located at a depth of 71.62 mbgs, there would be approximately 50.0 m of available drawdown remaining at this well after 1-year of continuous pumping at the test rate. After the recovery phase of the pumping test, the water level was reported to be 21.24 mbgs or approximately 100% of the original static water level.

6.2.6 Groundwater Quantity Discussion

Appendix G presents the pumping test curves on a logarithmic scale for all five (5) test wells for the period of the pumping test. The slope of the curve for each well was forecasted to a period of approximately 1-year to determine the available drawdown and the long-term pumping response of the aquifer. The results of the analysis are presented in Table 6 below.

Table 6: Summary of Pumping Test Analysis

Well	TW21-1	TW21-2	TW21-3	TW21-4	TW21-5
Depth (m)	30.78	47.85	34.44	90.22	72.84
Pumping Rate (lpm)	22.73	22.73	13.63	22.73	22.73
Pump Depth (mbgs)	22.86	45.11	30.48	-[1]	42.67
Material[2]	Sand, gravel	Sand, gravel	Sand, gravel	Sand	Sand
Screened Interval (mbgs)	22.30 – 30.78	46.63 – 47.85	32.91 – 34.44	89.00 – 90.22	71.62 – 72.84
Available Drawdown at 1-year (m)	15.10	7.50	12.91	74.00	50.08

1. Not reported on water well record.
2. As reported in water well record tag number A309223, A335252, A299793, A299789, A299790.

Overall, four (4) of five (5) wells were tested at a rate greater than the minimum MECP D.5.5. requirement of 13.7 L/min, at a rate of 22.73 L/min. Test well TW21-3 was tested at a rate of 13.63 L/min, just under the minimum flow requirement. Forecasted for a period of one year, test wells, TW21-1, TW21-3, TW21-4 and TW21-5 were estimated to have an available drawdown of greater than 7.5 mbgs.

Based on the water well records and OGS mapping, the water bearing sand and gravel units occur as early as 26 mbgs. Additional sand and gravel units occur deeper, separated by silt and clay material. The wells screened within both the shallow units (>30 mbgs) and the deeper units (>50 mbgs) meet the water quantity requirements stated in MECP Procedure D-5-5.

Therefore, all wells satisfy the MECP Procedure D-5-5 requirements for water quantity.

6.3 Groundwater Quality

All test wells and monitoring wells on Site were sampled for chemical, physical, and bacteriological parameters and submitted to a licensed third-party laboratory for analysis on three (3) separate occasions. The first water quality samples were collected on July 30, 2021. Groundwater samples were taken from monitoring wells MW21-1 to MW21-5. The second water quality sampling event occurred on September 7, 2021, and test wells TW21-1 to TW21-5 were sampled. To confirm the first two sets of sampling results, all test wells and MW21-1 and MW21-2 were resampled for bacteriological parameters and nitrate and nitrate concentrations on October 7, 2021. Sampling methods are further discussed in Section 5.3.

The certificates of analysis for both sampling visits and overall sampling results are presented in Appendix H. All water quality results were compared to the Groundwater Quality Parameter Tables listed in the MECP's D-5-5 Private Wells: Water Supply Assessment guidance document.

Based on the first and second rounds of sampling, the following exceedances were noted:

- Total coliforms in all monitoring wells ranging from 700 CFU/100 mL to 3100 CFU/100 mL
- Total coliforms in all test wells ranging from 2 CFU/100 mL to 1500 CFU/100 mL
- Sodium in all test wells
- Chloride in MW21-4
- Aluminum in MW21-1 and TW21-5
- Iron in MW21-1, TW21-1, TW21-4 and TW21-5
- Manganese in all monitoring wells and all test wells except for TW21-3
- E. Coli in TW21-2

Based on the results of the first and second round of sampling, all test wells were resampled to confirm the elevated biological parameters across the Site. Monitoring wells MW21-1 and MW21-2 were also resampled for nitrate and nitrite as the concentrations at these locations were much higher than the concentrations in MW21-3 – MW21-5.

Following the third round of sampling, TW21-1, TW21-2, TW21-3, MW21-1 and MW21-2 still exceeded the MECP standards for total coliforms of 0 colony forming units per 100 mL. Since E. Coli was undetectable in all samples, it is unlikely that fecal pollution from an onsite sewage system has occurred. Although all test wells and monitoring wells were purged for a minimum of three well volumes prior to sampling and three well volumes in between sampling, the total coliforms were still present in the groundwater samples. It is possible that since the water in the deeper test wells were stagnant for a few weeks to months since drilled, bacteria formed in the casing storage water. It is recommended that the test wells be shock chlorinated and resampled for biological indicators to determine if further treatment units will be required for the future water supply well.

It should be noted that historical microbiological water quality data collected from the Township of Adjala-Tosorontio Water Supply System indicated that some samples tested positive for total coliforms but negative for E. Coli.

6.3.1 Groundwater Quality Discussion

Overall, except for Total Coliforms, TW21-1 to TW21-5 display reasonably good water quality and meet all health-related quality criteria of D-5-5 and ODWQS. It is recommended that the future water supply wells be subjected to routine water sampling on at least an annual basis by the well owner. Sampling materials are generally available for free from the local health unit. Routine sampling will assist owners in identifying potential well contamination and maintaining potable water quality.

6.4 Source Protection Considerations

A review of the Ministry of Environment, Conservation and Parks (MECP) Source Protection Information Atlas reveals the subject property is located within the Nottawasaga Valley and is regulated by the policies outlined in the South Georgian Bay Lake Simcoe Source Protection Plan (SGBLS SPA).

Source Protection Information mapping notes that the subject property is not located within a Wellhead Protection Area (WHPA), Intake Protection Zone (IPZ), Significant Groundwater Recharge

Area (SGRA) and Highly Vulnerable Aquifer (HVA). Therefore, no legally binding policies are identified in the SGBLS SPP. However, moderate to low drinking water threats are identified within the area and apply to the Site. Best management practices must be established for the duration of the activities to reduce the potential for impacted groundwater from the proposed development:

- The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage.
- The establishment, operation, or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.
- The storage or application of agricultural source material to land.
- The handling, storage or application of commercial fertilizer to land.
- The handling, storage or application of non-agricultural source material to land.
- The handling, storage or application of pesticide to land.
- The handling, storage or application of road salt.
- The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.
- The handling and storage of an organic solvent.
- The handling and storage of fuel.
- The management of runoff that contains chemicals used in the de-icing of aircraft.
- The storage of snow.
- The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard (O. Reg. 385/08, s. 3.).
- The establishment and operation of a liquid hydrocarbon pipeline.

No additional threats to local drinking water are identified in the South Georgian Bay Lake Simcoe Source Protection Plan in reference to the subject property.

7.0 Onsite Sewage Impact Assessment

Municipal wastewater servicing is not available in the vicinity of the Site; therefore, it is proposed that the development will be serviced with individual onsite sewage systems. The following section provides a sewage impact assessment for the proposed development. As the proposed concept plan is to develop 22 employment lots on the Site, the assessment has been completed following the MECP's D-5-4 Procedure to assess potential groundwater impacts.

Individual onsite sewage systems typically serve one (1) employment building and are typically owned and operated by the landlord of the lot. Onsite sewage systems generally consist of a below grade septic tank, followed by a leaching bed. The leaching bed may be below or above grade, depending on the nature of the receiving soils. In some instances, advanced treatment units may be considered.

Onsite sewage systems with a total daily design sanitary sewage flow of less than 10,000 L/day are regulated by Part 8 of the Ontario Building Code. A building permit must be obtained prior to the construction of the system. Systems with sewage flows exceeding 10,000 L/day are regulated by the MECP. It is important to note that the 10,000 L/day threshold is a cumulative value that includes all the sewage systems on a property.

7.1 Onsite Sewage System Design Flows

According to the concept plan prepared by MHBC (March 2022) and correspondence with MHBC, 22 lots are proposed for the Site. The total daily design sewage flow was calculated in accordance with Table 8.2.1.3.B of the Ontario Building Code, Part 8, as shown in Table 7. Sewage flows are considered maximum day flows, and are based on the proposed facility, building area, as well as number of units and unit flow for the occupancy. For sanitary design purposes, we have assumed that the units will consist of a proposed building with a maximum area of 2,000 m^2 and a 40 m x 50 m footprint.

Table 7: Total Maximum Daily Sanitary Design Flows for Onsite System Servicing

Proposed Facility Description	Area (m^2)	Unit	Unit Flow	Number of Units	Total Flow Per Unit (L/day)
Stores	n/a	per employee	75	50	**3,750**
Total Daily Design Sanitary Sewage Flow:					**3,750**

In accordance with the OBC, it was determined that the total maximum day sanitary sewage flow for the proposed individual lots is 3,750 L/day.

7.2 Onsite Sewage System Footprint

Onsite sewage systems consist of two main components, a below grade septic tank, and a leaching bed. Depending on the nature of the receiving soils, the leaching bed may be constructed in the native soils, or, if soils are poor, constructed with imported sand raised above grade. The footprint of the leaching bed increases as the percolation rate of the receiving soils increases. If the percolation rate exceeds 50 min/cm, conventional leaching beds must be constructed in imported sand and are typically raised above grade. The leaching bed is typically sized according to the maximum total daily design sanitary sewage flow, and the T-time of the underlying soils.

As indicated above, the T-time for the soils on the Site are considered to range from 20 min/cm to 50 min/cm, therefore fill-based raised leaching beds will be required.

The design T-time will be verified by each lot owner upon the time of installing their private onsite sewage system. In very poor soils, or on Sites where space for the leaching bed is constrained, advanced treatment systems may be considered. Advanced treatment systems generally consist of a type of aeration unit that precedes the leaching bed and improves the treatment of the effluent prior to discharge to the bed.

Due to the enhanced treatment prior to discharge, alternative leaching beds, such as Type A dispersal beds and shallow buried trenches may be considered. These types of systems have considerably smaller footprints than more conventional systems.

Advanced treatment technologies must demonstrate that they can consistently meet "Level IV" effluent objectives as defined by the OBC to be used with smaller types of leaching beds. The testing standard for Ontario is the CAN/BNQ 3680 standard for residential onsite wastewater treatment technologies. A number of technologies are certified to this standard, including the Waterloo Biofilter, the Norweo Hydrokinetic, and the EcoBiofilter, among others.

7.3 Minimum Lot Sizing

The construction of an onsite sewage system must conform with the requirements of the OBC, which includes minimum mandatory setback distances from components of the sewage system to critical environmental and Site features. Table 8 shows the minimum mandatory OBC setback distances.

Table 8: Minimum Setback Distances for Onsite Sewage System Components

Site Feature	Horizontal Setback Distance (m)
Water Well[1]	15
Any other well[2]	30
Structure	1.5
Property Line	3
Surface Water Source	15

1. Must be equipped with a watertight casing to a depth of 6 m.
2. Only applies to "distribution pipe", not septic tanks or treatment units.

In addition to OBC setback distances the lot must also respect local zoning bylaws (Township Zoning By-Law 13-14), which include minimum front and side yard setbacks. For the purposes of this report, yard standard setback distances have been provided below based on the employment (E) zone provisions for Zone E1 and have been accounted for in the design. Table 9 outlines the minimum setback distances for buildings according to the local zoning.

Table 9: Minimum Setback Distances for Buildings

Yard Standard	Minimum Setback Distance (m)
Front	15.0
Internal Side	5.0
External Side	15.0
Rear	7.5

In addition to the setback distances, the zoning bylaw permits a maximum lot coverage of 25%, which would allow for a building footprint of 2,000 m^2 on a 0.8 ha lot, which is the minimum allowable lot size. Therefore, the proposed maximum development area of 29.54 ha could accommodate approximately 22 lots (assuming 15 - 20% of the area is required for roads, etc.). Detailed design of the employment lands layout would be required to further refine this number.

7.4 D-5-4 Assessment

The proposed development consists of 22 lots and will be a mix of industrial and commercial units. For the purposes of this report, we have assumed that the sewage systems will be individually owned. Note if the sewage systems are not individually owned, the Site would be subject to a Reasonable Use assessment in accordance with Chapter 22 of the MECP Design Guideline for Sewage Works.

Developments that consist of more than five (5) lots that will be serviced with individual onsite sewage systems are subject to the MECP Procedure D-5-4 Technical Guidelines for Individual Onsite Sewage Systems: Water Quality Impact Risk Assessment (Procedure D-5-4). This analysis evaluates the cumulative impact of the proposed sewage systems on the local groundwater regime. The potential for impacts to occur depends on the local hydrogeological setting, the volume of effluent discharged as well as the concentration of nutrients discharged in the effluent. The nutrient of concern is typically nitrate nitrogen.

Procedure D-5-4 outlines a three-step assessment process as follows.

- Step 1 – Assessment considers the minimum lot size for each private lot.
  - For developments where the lot size is one hectare or larger, it is assumed that the attenuative processes will be sufficient to reduce nitrate nitrogen to an acceptable concentration below the adjacent property. If smaller lots are proposed, the assessment proceeds to Step 2.
- Step 2 – System Isolation.
  - This considers the relationship between the individual onsite sewage systems and the groundwater. Developments are considered to be a low risk where it can be demonstrated that the effluent is hydrogeologically isolated from existing or potential supply aquifers. Where it cannot be demonstrated that the systems are isolated from existing or potential groundwater supplies, it is necessary to progress to the third step of the assessment.
- Step 3 – If lots smaller than 1.0 ha are proposed, and system isolation cannot be demonstrated a detailed examination of contaminant loading to the groundwater must be completed.
  - A predictive contaminant attenuation calculation must be completed that demonstrates that the proposed development will not cause concentrations of nitrate nitrogen in the groundwater to exceed the Ontario Drinking Water Quality Standards (ODWQS) value of 10 mg/L at the downgradient development boundary.

As noted in Section 7.4 the minimum lot size proposed is 0.80 ha. Therefore Step 1 cannot be satisfied and we must proceed to Step 2. As discussed in Sections 4 and 6 above, hydrogeological information for the area indicates that there are both shallow and deep-water supply wells near the subject property. Therefore, the assessment must progress to Step 3, the predictive contaminant attenuation assessment.

Crozier has completed a mass balance calculation to predict the concentration of nitrate nitrogen at the development boundary, using the following general assumptions, per D-5-4 guidelines:

- The concentration of nitrate in the effluent is 40 mg/L.
- The average volume of effluent generated by each building is approximately 1,500 L/day. A peaking factor of 2.5 was applied to the maximum total daily sewage flow.
- The only dilution mechanism is by infiltration of surface precipitation. An infiltration value of 200 mm/year has been assigned, based on the soils encountered on the Site (silty loam).
- Based on the assumption that the entire property area is available for dilution purposes, a background concentration of nitrate (as N) in the groundwater was calculated using the average nitrate groundwater sample concentrations from the monitoring program for the wells on the Site of 3.24 mg/L.

Using this approach, the resulting concentration of theoretical total nitrogen at the Site boundary is predicted to be 9.67 mg/L, which is below the maximum allowable concentration of 10 mg/L. Refer to Appendix I for detailed D-5-4 Impact Assessment calculations. It must be noted that this calculation is based on the development of only 22 lots, which is what can be supported on the Site with a minimum lot size of 0.8 ha, as described in the preceding section. Therefore, the proposed development of 22 lots can be serviced by individual onsite sewage systems.

There is an opportunity to decrease the effluent nitrate nitrogen loading from the Site through the implementation of nitrate treatment systems on the proposed lots, in addition to the conventional onsite sewage design recommendation. This consideration would be viable if there is limited space on a particular lot, due to the smaller sub-surface disposal footprint. Advanced Treatment Technologies of Level N-I have been certified to remove 50% total nitrogen, and Level N-II are certified for 75% nitrogen. It is proposed to use Waterloo Biofilter treatment systems or an approved equivalent advanced treatment system, as part of the development.

8.0 Conclusions & Recommendations

Based on the field work and analysis completed, we can make the following conclusions.

- The general surficial geology of the Site and surrounding area is characterized by silty clay to clay silt till with stones and sand to gravel layers. The water bearing units are characterized as semi-confined in nature and are comprised of sand and gravel layers within the clayey silt to silty clay till.
- Seasonally high-water levels are expected to range from 1.0 mbgs to 1.45 mbgs from northwest to southeast across the Site. Groundwater level monitoring will continue until at least the end of Spring 2022 to confirm seasonal groundwater elevations.
- Groundwater flows generally in a northwest to southeast direction towards the tributaries of the Boyne River and the Nottawasaga River.
- Five (5) test wells were constructed and tested in accordance with MECP Procedure D.5.5 for water quantity and water quality. Based on the results of short-term pumping tests, long-term pumping test forecasting and water quality sampling, Crozier is of the opinion that all five (5) test wells are suitable for water supply at above the minimum pumping rate of 13.7 L/min on a long-term sustainable basis.

- Water quality sampling was conducted at all monitoring well and all test wells on the Site on three (3) occasions. The final round of water sampling revealed elevated total coliforms in the test wells and below the ODWQS for all other parameters listed in MECP procedure D-5-5. Crozier is of the opinion that total coliforms present in the water following sampling suggest stagnant casing storage water in the wells was not all removed and is not suggestive of fecal or alternative contamination.

- It is recommended that groundwater sampling be conducted on an annual basis by the well owners for microbiological, inorganic and organic indicators and results be compared to the ODWQS. Sampling bottles can be obtained for free through the local health unit in most municipalities.

- Source Protection Information mapping notes that the subject property is not located within a Wellhead Protection Area (WHPA), Intake Protection Zone (IPZ), Significant Groundwater Recharge Area (SGRA) or Highly Vulnerable Aquifer (HVA). Therefore, no legally binding policies are identified in the SGBLS SPP. The Owner should follow best management practices in the application, handling and storage of pesticides, fertilizers, chemicals, snow and road salt on the property.

- The estimated maximum daily sewage flows for the proposed development are determined to be 3,750 L/day per lot. Note this value was determined using a proposed land use of industrial/commercial. Individual flows will be further defined in the detailed design of individual sewage systems to be completed by others.

- Based on the soil type across the Site, a percolation time of approximately 20 min/cm to 50 min/cm was assumed and a raised fill leaching bed design for onsite sewage is required.

- The minimum lot size required for the Site is assumed to be 0.80 ha.

- Based on the groundwater sampling results to date, the average nitrate nitrogen groundwater sample concentration is approximately 3.24 mg/L across the Site.

- The impact assessment calculations show that the combined effluent discharged from all of the individual onsite sewage systems in this development will have a minimal effect on the groundwater. With a total nitrate-nitrogen concentration of 9.67 mg/L at the Site boundary. The proposal to develop 22 lots is feasible based on the impact assessment.

- Additional nitrate treatment via treatment units capable of meeting Level N-II standards is optional.

9.0 References

Chapman, L.J. and D.F. Putnam. 1984. The Physiography of Southern Ontario, 3rd Edition. Ontario Geological Survey, Special Volume 2.

Ontario Ministry of Environment, Conservation and Parks. May 2019. B-1-5 Deriving Receiving Water Based Point Source and Effluent Requirements for Ontario Waters. Retrieved from: https://www.ontario.ca/page/b-1-5-deriving-receiving-water-based-point-source-effluent-requirements-ontario-waters

Ontario Ministry of Environment, Conservation and Parks. May 2019. F-5-1 Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works. Retrieved from: https://www.ontario.ca/page/f-5-1-determination-treatment-requirements-municipal-and-private-sewage-treatment-works

Ontario Ministry of Environment, Conservation and Parks. December 1996. Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario.

Ontario Ministry of Environment, Conservation and Parks. 2008. MECP Design Guidelines for Sewage Works, Chapter 22: Large Subsurface Disposal Systems.

Ontario Ministry of Environment, Conservation and Parks. September 2021. Map: Well Records. Retrieved from: https://www.ontario.ca/environment-and-energy/map-well-records

Ontario Ministry of Environment, Conservation and Parks. September 2021. Source Protection Information Atlas, Retrieved from: https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US,

Ontario Ministry of Natural Resources and Forestry. October 2020. Surface Topography. Retrieved from: https://www.gisapplication.lrc.gov.on.ca/matm/Index.html?Site=Make_A_Topographic_Map&viewer=MATM&locale=en-US

Ontario Ministry of Environment, Conservation and Parks. March 2019. Water Management: Policies, Guidelines, Provincial Water Quality Objectives. Retrieved from: https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives#section-15

South Georgian Bay-Lake Simcoe Source Protection Committee., 2015. Approved Assessment Report: Nottawasaga Valley Source Protection Area. Retrieved from: https://ourwatershed.ca/resources/reports-and-plans/assessment-reports/

Should you have any questions or require further information, please do not hesitate to contact the undersigned.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Chris Gerrits, M.Sc., P.Eng.
Senior Project Manager

C.F. CROZIER & ASSOCIATES INC.

Katherine Rentsch, P.Eng.
Senior Project Manager

CM/cj

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Reports\Hydrogeology Report\2022.10.18_D.5.5. D.5.4. Hydrogeology Report.docx

APPENDIX A

Wells Records Summary Table

MECP WATER WELL RECORDS

Project Number:	1101-4125	Address:	7723 Hwy 89, Alliston
Prepared by:	CM	Date completed:	2021-10-13

Key Number	Well ID	Diameter (mm)	Depth (m)	Static Level (mbgs)	Pumping Level (mbgs)	Pumping Rate (LPM)	Material	Aquifer[1]	Use	Notes
1	5706153	762	3.7	1.8	-	3.8	clay/sand/clay	OB	domestic	
2	5711567	762	9.4	3.0	9.1	3.8	sand/clay	OB	domestic	
3	5728862	762	9.1	3.0	6.1	18.9	sand/gravel	OB	domestic	
4	7316155	32	4.0	-	-	-	sand/clay	OB	monitoring	
5	5731607	914	10.1	1.8	-	11.4	sand/clay	OB	domestic	
6	5738137	152	73.2	24.4	53.4	18.9	clay/sand/clay	OB	domestic	
7	5727646	762	11.9	3.0	9.1	11.4	clay/sand/clay	OB	domestic	
8	7308342	152	34.1	1.2	-4.1	22.7	sand/clay/gravel/silt	OB	domestic	
9	5707123	762	5.5	1.8	2.4	3.8	clay/sand/clay	OB	domestic	
10	7286387	51	7.6	-	-	-	sand/silt	OB	monitoring	
11	7273608	152	44.2	10.1	16.8	75.7	clay/gravel	OB	domestic	
12	7273619	152	64.0	24.4	45.7	37.9	clay/sand	OB	domestic	
13	5713324	152	58.5	16.5	30.5	26.5	clay/sand/gravel	OB	domestic	
14	5710955	-	45.7	-	-	-	clay/sand	OB	testhole	
15	5706290	762	15.2	10.7	-	3.8	sand/clay	OB	domestic	
16	5706459	762	21.3	14.6	18.3	11.4	clay/sand	OB	domestic	
17	5711820	152	23.2	3.0	21.3	7.6	clay	OB	domestic	
18	7311300	51	4.0	-	-	-	silt/clay	OB	monitoring	
19	7296621	51	-	-	-	-	-	-	testhole	
20	5718303	762	7.0	2.4	6.1	7.6	clay/sand	OB	domestic	
21	5737530	51	-	-	-	-	-	-	abandoned	
22	5704559	102	93.3	36.6	54.9	15.2	clay/silt/sand	OB	domestic	
23	5728622	152	53.3	0.9	22.3	15.2	clay/silt/sand	OB	domestic	
24	5709038	762	8.5	5.5	9.1	3.8	clay/sand	OB	domestic	
25	5737581	152	45.7	4.6	41.1	37.9	clay/sand	OB	domestic	
26	5700160	914	9.8	6.7	-	11.4	clay/sand	OB	livestock	
27	7302045	152	31.1	1.2	-	56.8	silt/clay/sand	OB	domestic	
28	5715616	762	13.7	4.6	9.1	15.2	sand/clay/sand	OB	domestic	
29	7107242	222	9.1	3.0	4.6	36.4	clay/sand	OB	domestic	
30	5737993	152	40.2	10.7	12.5	378.5	sand/clay/silt	OB	domestic	
31	7293607	152	33.5	7.9	22.8	37.8	clay/gravel	OB	domestic	
32	5700184	102	28.4	-	-	-	silt/clay/sand	OB	domestic	artesian
33	5738136	762	-	-	-	-	-	-	abandoned	
34	5700190	762	4.3	1.8	-	7.6	clay/sand	OB	domestic	
35	5700186	762	9.1	6.1		7.6	clay/sand	OB	domestic	
36	7136141	152	25.9	-0.6	4.0	75.7	silt/clay/gravel	OB	domestic	
37	5700189	762	5.2	1.8	-	7.6	clay/sand	OB	domestic	
38	7148503	-	-	-	-	-	-	-	abandoned	
39	5730333	-	32.3	-	-	-	clay/sand	OB	abandoned	
40	5730336	-	32.9	-	-	-	clay/sand	OB	abandoned	
41	5724683	152	36.0	9.4	-	56.8	clay/gravel	OB	testhole	
42	7145204	-	-	-	-	-	-	-	abandoned	
43	5704557	127	85.3	-	-	-	clay/silt/sand/shale	BR	domestic	
44	5711127	762	22.9	21.3	21.3	11.4	clay/sand	OB	domestic	
45	5738501	152	35.0	8.2	18.3	60.6	clay/gravel	OB	domestic	
46	7316154	51	4.0	-	-	-	sand/clay	OB	testhole	
47	7286386	51	7.6	-	-	-	sand/silt	OB	monitoring	
48	5741375	159	32.0	4.6	25.9	45.5	clay/sand	OB	commercial	
49	7311301	152	4.0	-	-	-	silt/clay	OB	monitoring	
50	7220335	152	8.2	-	-	-	silt/clay	OB	monitoring	
51	5738256	914	13.7	3.0	13.7	7.6	clay/sand	OB	domestic	
52	7296618	51	-	-	-	-	-	OB	monitoring	
53	5730337	178	54.0	-	-	-	-	-	abandoned	
54	5741017	159	33.5	0.0	3.0	378.5	sand/clay/gravel	OB	domestic	
55	5712214	762	8.5	1.5	7.6	7.6	clay/sand/gravel	OB	domestic	
56	5707022	127	104.5	12.8	19.5	37.8	clay/silt/sand	OB	domestic	
57	5711514	762	13.1	9.8		11.4	clay/sand	OB	domestic	
58	7286388	51	7.6	-	-	-	sand/silt	OB	monitoring	
59	5722582	152	41.1	9.8	15.2	56.8	clay/sand	OB	domestic	
60	5730335	-	36.0	-	-	-	-	-	abandoned	
61	7288689	152	48.8	30.3	35.0	75.7	clay/gravel	OB	domestic	
62	5713494	762	20.7	18.3	20.1	7.6	clay/sand	OB	domestic	
63	5704558	152	40.2	16.5	18.6	102.2	clay/gravel	OB	testhole	
64	5704574	762	7.9	3.7	-	7.6	clay/gravel	OB	domestic	
65	5740428	-	-	-	-	-	-	-	-	clean out
66	5707124	762	24.4	12.2	13.2	7.6	clay/sand	OB	livestock	
67	5708978	762	4.6	2.1	2.4	3.8	sand/gravel	OB	domestic	
68	7324770	152	30.5	0.0	10.7	56.8	sand/clay/gravel	OB	domestic	
69	5715126	152	88.7	20.7	28.0	15.1	clay/gravel/shale	BR	domestic	
70	5737127	152	14.6	4.3	10.7	30.3	clay/sand	OB	domestic	
71	5710177	762	6.1	2.4	9.1	3.8	clay	OB	livestock	
72	5740645	159	38.1	0.0	15.8	37.8	sand/clay/gravel	OB	domestic	
73	5731519	152	37.2	7.0	11.6	56.8	sand/clay/gravel/sand	OB	commercial	
74	5707848	177	131.1	28.0	129.5	3.8	clay/sand/shale/limestone	OB	abandoned	
75	5700187	762	6.1	1.8		7.6	clay/sand	OB	domestic	
76	5737531	102	-	-	-	-	-	-	abandoned	
77	5712429	762	5.8	2.7	4.6	7.6	sand/clay/gravel	OB	domestic	
78	5711661	152	29	0.3	7.6	38	silt/clay/sand	OB	domestic	
79	5715617	762	13.4	4.6	6.1	15.1	sand/clay/sand	OB	domestic	
80	5700185	762	8.5	2.1		7.6	clay/gravel	OB	domestic	
81	5704575	762	6.4	3.0	5.8	3.8	sand	OB	domestic	
82	5721236	127	89.3	22.6	33.5	227.1	clay/sand	OB	domestic	
83	5711128	762	23.8	22.3		11.4	clay/sand	OB	commercial	

Key Number	Well ID	Diameter (mm)	Depth (m)	Static Level (mbgs)	Pumping Level (mbgs)	Pumping Rate (LPM)	Material	Aquifer[1]	Use	Notes
84	5740908	152	35.0	0.9	12.0	56.8	gravel/clay/sand	OB	industrial, domestic	
85	7284222	-	-	-	-	-	-	-	abandoned	
86	7296620	51	-	-	-	-	-	OB	monitoring	
87	7313430	152	15.2	1.2	8.2	37.8	clay/sand	OB	domestic	
88	5724682	152	39.0	7.0		75.7	clay/gravel/sand	OB	domestic	
89	7293715	152	39.3	13.4	27.4	37.8	clay/gravel/shale	OB	domestic	
90	5737574	152	76.2	22.3	44.1	18.9	clay/gravel/sand	OB	domestic	
91	7315179	60	38.4	0.0	-	-	clay/silt/sand	OB	testhole	
92	5725792	762	26.5	9.1	15.2	7.6	clay/sand	OB	domestic	
93	5720207	762	8.8	1.8	9.1	11.4	clay	OB	domestic	
94	5710179	762	12.2	2.1	2.7	3.8	clay/sand	OB	domestic	
95	5704555	457	19.8	-	-	-	clay	OB	livestock	
96	5714465	152	85.0	20.4	21.3	22.7	clay/silt/gravel	OB	domestic	
97	7321112	152	62.5	9.8	19.8	75.7	clay/silt/gravel	OB	domestic	
98	5713493	762	27.4	12.2	27.4	3.8	clay/gravel	OB	domestic	
99	5707427	762	24.4	10.4		3.8	clay	OB	domestic	
100	5720903	762	8.5	0.9	7.9	22.7	clay/sand	OB	domestic	
101	5739706	159	30.8	0.0	12.2	37.9	clay/gravel	OB	domestic	
102	5740295	159	38.1	3.7		94.6	clay/gravel	OB	commercial	
103	5705651	152	28.0	6.1	7.6	56.8	clay/gravel	OB	domestic	
104	5737385	-	-	-	-	-	-	-	-	replacement
105	5704561	762	23.8	15.8		11.4	gravel/clay/sand	OB	commercial	
106	5731574	152	50.3	2.1	47.2	75.7	clay/gravel/silt	OB	irrigation	
107	5736275	152	64.0	24.4	57.9	22.7	clay/sand	OB	domestic	
108	5737532	-	-	-	-	-	-	-	abandoned	
109	5731575	152	30.5	0.3	18.2	37.8	sand/clay/silt	OB	domestic	
110	5720984	762	18.3	4.0	16.7	22.7	clay/sand	OB		
111	7311302	51	4.0	-	-	-	silt/clay	OB	monitoring	
112	5712225	762	17.7	13.7	16.0	7.6	clay/sand	OB	domestic	
113	7220826	51	7.6	-	-	-	sand/silt/gravel	OB	monitoring	
114	5700164	51	30.8	4.0	-	-	clay/silt/sand	OB	testhole	
115	7286385	51	7.6	-	-	-	sand/silt/clay	OB	monitoring	
116	5700161	51	33.8	4.0	6.7	113.6	clay/sand/gravel	OB	testhole	
117	5737576	152	26.5	0.3	6.1	151.0	sand/silt/gravel	OB	domestic	
118	5719005	762	14.0	1.5	12.8	22.7	clay/sand	OB	domestic	
119	5704556	152	37.8	14.6	14.9	37.8	clay/sand/gravel	OB	domestic	
120	5732118	152	29.6	4.3	340.7	56.8	clay/silt/sand	OB	domestic	
121	7136135	152	73.2	25.0	49.4	11.4	clay/silt/gravel	OB	domestic	
122	7270103	-	-	-	-	-	-	-	abandoned	
123	7311299	51	3.0	-	-	-	silt/clay	OB	monitoring	
124	5730332	-	29.0	-	-	-	-	-	abandoned	
125	5734028	254	31.4	13.1	23.8	22.7	clay/gravel/sand	OB	domestic	
126	5712689	762	9.8	3.7	9.1	7.6	clay/sand	OB	domestic	
127	7296619	-	-	-	-	-	-	-	abandoned	
128	5714460	762	11.3	4.9	10.4	22.7	sand/clay	OB	domestic	
129	5740429	-	-	-	-	-	-	-	abandoned	
130	5713659	762	21.6	7.6	21.6	3.8	clay/sand	OB	domestic	
131	5722026	762	17.1	3.0	15.2	11.4	clay/sand	OB	domestic	
132	5720208	762	14.3	2.7	13.7	3.8	clay/gravel	OB	domestic	
133	7284221	-	-	-	-	-	-	-	abandoned	
134	7286389	51	7.6	-	-	-	sand/silt	OB	monitoring	
135	5700188	762	10.7	7.6		7.6	gravel/clay	OB	domestic	
136	5712683	762	15.2	9.1	14.6	7.6	clay/sand	OB	domestic	
137	7286739	-	-	-	-	-	-	-	abandoned	
138	5705977	762	11.6	4.0	7.6	5.7	sand/clay	OB	commercial	
139	7185449	152	24.4	0.0	15.5	15.1	clay/sand	OB	domestic	
140	5713180	762	22.9	2.1	18.3	26.5	clay	OB	domestic	
141	5736799	152	73.5	20.1	48.8	113.5	sand/clay/gravel	OB	domestic	
142	7165494	152	25.9	0.0	4.6	56.8	clay/gravel	OB	domestic	
143	7311374	152	51.5	1.5	9.3	11.4	sand/clay/gravel/silt	OB	domestic	
144	5737654	152	25.9	3.4	15.1	37.8	clay/sand	OB	domestic	
145	5723297	127	26.2	1.8	21.6	22.7	clay/sand/gravel	OB	domestic	
146	5709250	127	96.0	2.1	5.2	56.8	clay/sand/gravel	OB	domestic	
147	7279993	152	38.1	-1.5	9.1	75.7	sand/clay	OB	domestic	
148	5713657	762	12.5	2.4	12.2	7.6	sand/clay	OB	domestic	
149	7296622	-	-	-	-	-	-	-	monitoring	
150	5730339	-	54.9	-	-	-	clay/sand	OB	abandoned	
151	5733374	152	36.6	4.3	33.5	37.8	clay/gravel	OB	commercial	
152	5706313	762	13.7	9.1	12.2	7.6	sand	OB	domestic	
153	5731976	152	15.8	1.8	13.7	56.8	clay/sand/silt	OB	domestic	
154	5700163	102	30.8	4.0	9.1	10.2	clay/silt/sand	OB	testhole	
155	5700162	51	30.8	3.7	-	-	clay/silt/sand	OB	testhole	
156	5707428	762	29.0	-	-	-	clay	OB	abandoned	

1. OB - Overburden BR - Bedrock

APPENDIX B

Monitoring Well Logs

WELL CONSTRUCTION REPORT (WELL #21-1)

REPORT NO.: 1 of 5

PROJECT #: 1101-4125	PROJECT NAME: 7723 HWY 89	WEATHER: 25°C, Sunny	
DATE: June 7, 2021	CONTRACTOR: Walker Drilling Ltd.	PHOTOS: Yes	
LOCATION: Alliston, Ontario		ON SITE: 8:00 AM	OFF SITE: 4:30 PM
CFCA REPRESENTATIVE: Evan Finbow		WELL SPECIFIC	
SITE VISITORS: Caitlyn MacPhee, Chris Gerrits, Alex Laleva		START: 8:45 AM	END: 10:00 AM

EQUIPMENT & LABOUR ON SITE:	HOURS	EQUIPMENT & LABOUR ON SITE:	HOURS
Service Truck	7.5	Operator (1)	7.5
Drill Rig	7.5	Assistant (1)	7.5

WORK COMPLETED:

ITEM :	DESCRIPTION:	LOCATION:
Well #21-1	Most easterly location. Adjacent Concession 7.	~20m W of Concession 7 C/L, ~295m S of HWY 89 C/L

MATERIAL USED:

ITEM:	QUANTITY:	ITEM:	QUANTITY:
Cone	1	J Plug	1
10 Foot Screen	1	Cement (Bag)	1
Riser (10ft)	1.2	Well Sand (50lbs Bag)	4
Well Cover	1	Bentonite (50lbs Bag)	2

GEOLOGY:

DEPTH:	SOIL CLASIFICATION:
0-2 ft.	SANDY-SILT: Brown, dry, loose W/ trace clay, and organics.
2-4 ft.	SILTY-CLAY: Brownish grey, low moisture, dense, plastic W/ trace sand.
5-7 ft.	SILTY-CLAY TILL: Light brown, low moisture, very stiff W/ rounded gravel and trace sand.
7-9 ft.	CLAY TILL: Brown, moist, dense, plastic W/ some silt, trace rounded gravel and trace sand.
10-12 ft.	CLAY TILL: Brown, moist, dense, plastic W/ some silt, trace rounded gravel and trace sand.
14-16 ft.	SAND: Brown, medium, wet.
18-20 ft.	SAND: Brown, medium, moist, very dense, W/ trace gravel.

REMARKS:

- Sand pack at 8 ft.
- Water noted in bottom of borehole upon completion at 20 ft.
- Screen (10 ft.) installed at 20 ft.

WELL CONSTRUCTION REPORT (WELL #21-2)

REPORT NO.: 2 of 5

PROJECT #: 1101-4125

PROJECT NAME: 7723 HWY 89

WEATHER: 25°C, Sunny

DATE: June 7, 2021

CONTRACTOR: Walker Drilling Ltd.

PHOTOS: Yes

LOCATION: Alliston, Ontario

ON SITE: 8:00 AM

OFF SITE: 4:30 PM

CFCA REPRESENTATIVE: Evan Finbow

WELL SPECIFIC START: 10:15 AM

END: 12:00 PM

SITE VISITORS: Caitlyn MacPhee, Chris Gerrits, Alex Laleva

EQUIPMENT & LABOUR ON SITE:	HOURS	EQUIPMENT & LABOUR ON SITE:	HOURS
Service Truck	7.5	Operator (1)	7.5
Drill Rig	7.5	Assistant (1)	7.5

WORK COMPLETED:

ITEM :	DESCRIPTION:	LOCATION:
Well #21-2	Central location of site.	~345m W of Concession 7 C/L, ~285m S of HWY 89 C/L

MATERIAL USED:

ITEM:	QUANTITY:	ITEM:	QUANTITY:
Cone	1	J Plug	1
10 Foot Screen	1	Cement (Bag)	1
Riser (10ft)	1.2	Well Sand (50lbs Bag)	4
Well Cover	1	Bentonite (50lbs Bag)	2

CROZIER
CONSULTING ENGINEERS

GEOLOGY:

DEPTH:	SOIL CLASIFICATION:
0-2 ft.	4" SEAM > SILTY ORGANICS: Dark brown, low moisture, loose. CLAYEY-SILT: Greyish brown, low moisture, loose W/ trace sand, and organics.
2-4 ft.	CLAY TILL: Brownish grey, low moisture, dense, plastic W/ some rounded gravel.
5-7 ft.	CLAY TILL: Brownish grey, low moisture, dense, plastic W/ some rounded gravel. 4" SEAM > SAND: Grey, low moisture, dense.
7-9 ft.	CLAY TILL: Brownish grey, low moisture, dense, plastic W/ some rounded gravel.
10-12 ft.	CLAY TILL: Dark grey, dry, dense, stiff W/ some rounded gravel and trace sand.
14-16 ft.	CLAY TILL: Dark grey, dry, dense, stiff W/ some rounded gravel and trace sand.
18-20 ft.	CLAY TILL: Dark grey, dry, dense, stiff W/ some rounded gravel and trace sand.

REMARKS:

- Sand pack at 8 ft.
- Water noted in bottom of borehole upon completion at 20 ft.
- Screen (10 ft.) installed at 20 ft.

WELL CONSTRUCTION REPORT (WELL #21-3)

REPORT NO.: 3 of 5

PROJECT #: 1101-4125

PROJECT NAME: 7723 HWY 89

WEATHER: 25°C, Sunny

DATE: June 7, 2021

CONTRACTOR: Walker Drilling Ltd.

PHOTOS: Yes

LOCATION: Alliston, Ontario

ON SITE: 8:00 AM

OFF SITE: 4:30 PM

CFCA REPRESENTATIVE: Evan Finbow

WELL SPECIFIC START: 12:30 PM

END: 1:30 PM

SITE VISITORS: Caitlyn MacPhee, Chris Gerrits, Alex Laleva

EQUIPMENT & LABOUR ON SITE:	HOURS	EQUIPMENT & LABOUR ON SITE:	HOURS
Service Truck	7.5	Operator (1)	7.5
Drill Rig	7.5	Assistant (1)	7.5

WORK COMPLETED:

ITEM :	DESCRIPTION:	LOCATION:
Well #21-3	Near old farmhouse and barn, central portion of site.	~375m W of Concession 7 C/L, ~95m S of HWY 89 C/L

MATERIAL USED:

ITEM:	QUANTITY:	ITEM:	QUANTITY:
Cone	1	J Plug	1
10 Foot Screen	1	Cement (Bag)	1
Riser (10ft)	1.2	Well Sand (50lbs Bag)	4
Well Cover	1	Bentonite (50lbs Bag)	2

GEOLOGY:

DEPTH:	SOIL CLASIFICATION:
0-2 ft.	SANDY-SILT: Brown, dry, loose W/ trace clay, and organics.
2-4 ft.	SILTY-CLAY: Brownish grey, low moisture, dense, plastic W/ trace sand. POCKETS > SAND: Loose W/ oraganics.
5-7 ft.	CLAY TILL: Grey, low moisture, dense, plastic W/ rounded gravel, trace silt, and trace sand.
7-9 ft.	CLAY TILL: Grey, low moisture, dense, plastic W/ rounded gravel, trace silt, and trace sand.
10-12 ft.	CLAY TILL: Grey, low moisture, dense, plastic W/ rounded gravel, trace silt, and trace sand.
14-16 ft.	SILTY-CLAY TILL: Brownish grey, low moisture, dense, plastic W/ rounded gravel, and trace sand.
18-20 ft.	SILTY-CLAY TILL: Brownish grey, low moisture, dense, plastic W/ rounded gravel, and trace sand.

REMARKS:

- Sand pack at 8 ft.
- No water noted in bottom of borehole upon completion at 20 ft.
- Screen (10 ft.) installed at 20 ft.

WELL CONSTRUCTION REPORT (WELL #21-4)

REPORT NO.: 4 of 5

PROJECT #: 1101-4125 PROJECT NAME: 7723 HWY 89 WEATHER: 25°C, Sunny

DATE: June 7, 2021 CONTRACTOR: Walker Drilling Ltd. PHOTOS: Yes

LOCATION: Alliston, Ontario

ON SITE: 8:00 AM OFF SITE: 4:30 PM

CFCA REPRESENTATIVE: Evan Finbow

WELL SPECIFIC START: 2:00 PM END: 4:00 PM

SITE VISITORS: Caitlyn MacPhee, Chris Gerrits, Alex Laleva

EQUIPMENT & LABOUR ON SITE:	HOURS	EQUIPMENT & LABOUR ON SITE:	HOURS
Service Truck	7.5	Operator (1)	7.5
Drill Rig	7.5	Assistant (1)	7.5

WORK COMPLETED:

ITEM :	DESCRIPTION:	LOCATION:
Well #21-4	Northwest corner of subject property.	NW Corner, ~45m S of HWY 89 C/L

MATERIAL USED:

ITEM:	QUANTITY:	ITEM:	QUANTITY:
Cone	1	J Plug	1
10 Foot Screen	1	Cement (Bag)	1
Riser (10ft)	1.2	Well Sand (50lbs Bag)	4
Well Cover	1	Bentonite (50lbs Bag)	2

CROZIER
CONSULTING ENGINEERS

GEOLOGY:

DEPTH:	SOIL CLASIFICATION:
0-2 ft.	SANDY-SILT: Brown, dry, loose W/ trace clay, and organics.
2-4 ft.	SILTY-CLAY: Brown, low moisture, dense, plastic W/ trace sand.
5-7 ft.	CLAY TILL: Brown, low moisture, dense, plastic W/ rounded gravel, trace silt, and trace sand.
7-9 ft.	SILT TILL: Greyish brown, low moisture, dense, stiff W/ rounded gravel, trace cobbles, trace clay, and trace sand.
10-12 ft.	SILT TILL: Grey, wet, compact, dilatant W/ rounded gravel, trace clay, and trace sand.
14-16 ft.	SILT TILL: Grey, wet, compact, dilatant W/ rounded gravel, trace clay, and trace sand.
18-20 ft.	CLAYEY-SILT TILL: Dark grey, low moisture, very dense, stiff W/ rounded gravel, trace cobbles, and trace sand.

REMARKS:

- Sand pack at 8 ft.
- No water noted in bottom of borehole upon completion at 20 ft.
- Screen (10 ft.) installed at 20 ft.

WELL CONSTRUCTION REPORT (WELL #21-5)

REPORT NO.: 45 of 5

PROJECT #: 1101-4125 | PROJECT NAME: 7723 HWY 89 | WEATHER: 28°C, Sunny

DATE: June 8, 2021 | CONTRACTOR: Walker Drilling Ltd. | PHOTOS: Yes

LOCATION: Alliston, Ontario

ON SITE: 8:30 AM | OFF SITE: 12:00 PM

CFCA REPRESENTATIVE: Evan Finbow

WELL SPECIFIC START: 9:00 AM | END: 11:30 AM

SITE VISITORS: Caitlyn MacPhee, Chris Gerrits, Alex Laleva

EQUIPMENT & LABOUR ON SITE:	HOURS	EQUIPMENT & LABOUR ON SITE:	HOURS
Service Truck	3.5	Operator (1)	3.5
Drill Rig	3.5	Assistant (1)	3.5

WORK COMPLETED:

ITEM :	DESCRIPTION:	LOCATION:
Well #21-5	Southwest corner of subject property.	SW Corner, ~475m S of HWY 89 C/L

MATERIAL USED:

ITEM:	QUANTITY:	ITEM:	QUANTITY:
Cone	1	J Plug	1
10 Foot Screen	1	Cement (Bag)	1
Riser (10ft)	1.2	Well Sand (50lbs Bag)	4
Well Cover	1	Bentonite (50lbs Bag)	2

CROZIER
CONSULTING ENGINEERS

GEOLOGY:

DEPTH:	SOIL CLASIFICATION:
0-2 ft.	SILTY-SAND: Brown, medium, moist, compact W/ some clay, and organics.
2-4 ft.	SILTY-CLAY: Brown, low moisture, dense, plastic W/ trace sand.
5-7 ft.	SILTY-CLAY: Brown and grey, low moisture, dense, stiff W/ trace sand.
7-9 ft.	SILTY-CLAY TILL: Grey, dry, dense, stiff W/ rounded gravel, and trace sand.
10-12 ft.	SILTY-CLAY TILL: Grey, dry, dense, stiff W/ rounded gravel, and trace sand.
14-16 ft.	SILTY-CLAY TILL: Grey, dry, dense, stiff W/ rounded gravel, and trace sand.
18-20 ft.	SILTY-CLAY TILL: Grey, dry, dense, stiff W/ rounded gravel, and trace sand.

REMARKS:

- Sand pack at 8 ft.
- No water noted in bottom of borehole upon completion at 20 ft.
- Screen (10 ft.) installed at 20 ft.

APPENDIX C

Water Well Records for Test Wells TW1 – TW5

Ontario | Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below)
Tag#:A309223 A309223

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: [X] Metric [ ] Imperial

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	[ ] Well Constructed by Well Owner
Joe	Pilla (Pilla Investments Inc)		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
633224 Hwy 10	Mono	ON	L9W5P7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
7723 Highway 89	Adjala	31	6

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Alliston	Ontario	L9R1V1

UTM Coordinates Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83 17	588084	4888178		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Topsoil			0	.3
Brown	clay			.3	3.35
Brown	clay	stones		3.35	7.62
Brown	sand	silt		7.62	9.14
Brown	sand			9.14	13.10
Grey	clay	stones		13.10	26.51
Brown	sand	gravel		26.51	31.39
Brown	gravel	sand		31.39	32.30

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.4	Bentonite	.21

Results of Well Yield Testing

After test of well yield, water was: [X] Clear and sand free [ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 28.34

Pumping rate (l/min / GPM): 22.73

Duration of pumping: 6 hrs + 0 min

Final water level end of pumping (m/ft): 6.85

If flowing give rate (l/min/GPM):

Recommended pump depth (m/ft): 28.34

Recommended pump rate (l/min/GPM): 45.46

Well production (l/min/GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	6.30		
1	6.58	1	6.63
2	6.56	2	6.62
3	6.57	3	6.61
4	6.58	4	6.61
5	6.58	5	6.61
10	6.58	10	6.61
15	6.59	15	6.60
20	6.59	20	6.60
25	6.60	25	6.60
30	6.61	30	6.60
40	6.62	40	6.59
50	6.63	50	6.58
60	6.63	60	6.58

Method of Construction

[ ] Cable Tool [ ] Diamond [X] Rotary (Conventional) [ ] Jetting [ ] Rotary (Reverse) [ ] Driving [ ] Boring [ ] Digging [ ] Air percussion [ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used [ ] Domestic [ ] Municipal [ ] Dewatering [ ] Livestock [X] Test Hole [ ] Monitoring [ ] Irrigation [ ] Cooling & Air Conditioning [ ] Industrial [ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.24	Steel	.477	+.45	31.69
10.16	Steel + K Packer	.477	29.87	30.78

Status of Well

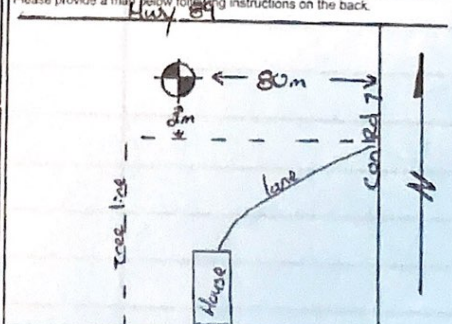
[ ] Water Supply [ ] Replacement Well [X] Test Hole [ ] Recharge Well [ ] Dewatering Well [ ] Observation and/or Monitoring Hole [ ] Alteration (Construction) [ ] Abandoned, Insufficient Supply [ ] Abandoned, Poor Water Quality [ ] Abandoned, other, specify [ ] Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
10.16	Stainless	12	30.78	32.30

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth 32.00 (m/ft) Kind of Water: [ ] Fresh [X] Untested [ ] Gas [ ] Other, specify

Water found at Depth (m/ft) Kind of Water: [ ] Fresh [ ] Untested [ ] Gas [ ] Other, specify

Water found at Depth (m/ft) Kind of Water: [ ] Fresh [ ] Untested [ ] Gas [ ] Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.4	25.4
6.4	32.30	19.68

Well Contractor and Well Technician Information

Business Name of Well Contractor: Franklin Drilling Services Inc — Well Contractor's Licence No.: 7719

Business Address (Street Number/Name): 6891 Sdrd 7 West — Municipality: Mount Forest

Province: ON — Postal Code: N0G2L0 — Business E-mail Address:

Bus. Telephone No. (inc. area code): 5195014750 — Name of Well Technician (Last Name, First Name): Franklin Liam

Well Technician's Licence No.: 3594 — Signature of Technician and/or Contractor: [signature] — Date Submitted: 20210705

Comments:

Well owner's information package delivered: [X] Yes [ ] No

Date Package Delivered: 20210630

Date Work Completed: 20210611

Ministry Use Only

Audit No. Z365979

Received

Ontario Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below) **Tag#:A335252** A335252

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
Joe	Pilla (Pilla Investments Inc)		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
633224 Hwy 10	Mono	ON	L9W5P7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
7723 Hwy 89	Adjala	31	6

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Alliston	Ontario	L9R1V1

UTM Coordinates Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83 17	587860	4881176		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Topsoil			0	.6
Brown	clay	stones		.6	28.65
Grey	clay	stones		28.65	39.92
Brown	silt	sand		39.92	45.72
Brown	sand	gravel		45.72	47.85

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.09	Bentonite	.19

Method of Construction

☐ Cable Tool ☐ Diamond ☒ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☒ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.24	Steel	.477	+.50	46.63
10.16	steel + kpacker	.477	45.72	46.63

Status of Well

☐ Water Supply ☐ Replacement Well ☒ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
10.16	Stainless	12	46.63	47.85

Water Details

Water found at Depth	Kind of Water
47.24 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.04	25.4
6.09	47.85	19.68

Results of Well Yield Testing

After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 45.11

Pumping rate (l/min / GPM): 22.73

Duration of pumping: 6 hrs + 0 min

Final water level end of pumping (m/ft): 38.95

If flowing give rate (l/min/GPM):

Recommended pump depth (m/ft): 45.11

Recommended pump rate (l/min/GPM): 22.73

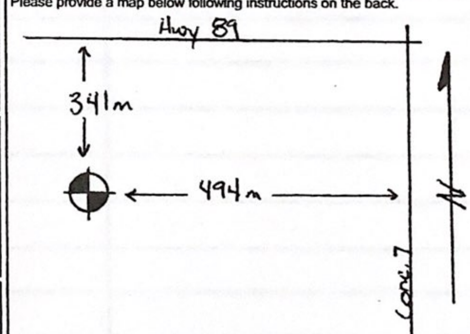
Well production (l/min/GPM):

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	10.97		
1	12.64	1	38.00
2	13.50	2	37.12
3	14.20	3	36.24
4	14.63	4	35.38
5	15.63	5	34.59
10	18.40	10	30.99
15	21.06	15	27.85
20	23.10	20	25.23
25	24.07	25	23.43
30	25.38	30	21.73
40	27.58	40	19.01
50	29.26	50	17.28
60	30.48	60	15.81

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Franklin Drilling Services Inc.	7719

Business Address (Street Number/Name)	Municipality
6891 Sdrd 7 West	Mount Forest

Province	Postal Code	Business E-mail Address
ON	N0G2L0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5195014750	Franklin Liam

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3594	[signature]	20210730

Well owner's information package delivered: ☒ Yes ☐ No

Date Package Delivered: 20210716

Date Work Completed: 20210705

Ministry Use Only — Audit No. Z365971 — Received

Ministry's Copy

Ontario Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below) Tag#:A299793 A299793

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: [X] Metric [ ] Imperial

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	[ ] Well Constructed by Well Owner
Joe	Pilla (Pilla Investments Inc)		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
633224 Hwy 10	Mono	ON	L9W5P7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
7723 Hwy 89	Adjala	31	6

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Alliston	Ontario	L9R1V1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	587746	4886285		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	clay	gravel		0	2.74
Grey	clay	silt		2.74	32.00
Grey	sand	gravel		32.00	34.44

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.4	Bentonite	.21

Results of Well Yield Testing

After test of well yield, water was: [X] Clear and sand free [ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30.48

Pumping rate (l/min / GPM): 13.63

Duration of pumping: 6 hrs + 0 min

Final water level end of pumping (m/ft): 19.07

If flowing give rate (l/min/GPM):

Recommended pump depth (m/ft): 30.48

Recommended pump rate (l/min/GPM): 13.63

Well production (l/min/GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	15.54		
1	16.41	1	18.56
2	16.71	2	18.12
3	16.96	3	17.76
4	17.15	4	17.42
5	17.33	5	17.16
10	17.92	10	16.27
15	18.08	15	15.79
20	18.25	20	15.55
25	18.40	25	15.54
30	18.49	30	
40	18.56	40	
50	18.58	50	
60	18.59	60	

Method of Construction

[ ] Cable Tool [ ] Diamond [X] Rotary (Conventional) [ ] Jetting [ ] Rotary (Reverse) [ ] Driving [ ] Boring [ ] Digging [ ] Air percussion [ ] Other, specify

Well Use

[ ] Public [ ] Commercial [ ] Not used [ ] Domestic [ ] Municipal [ ] Dewatering [ ] Livestock [X] Test Hole [ ] Monitoring [ ] Irrigation [ ] Cooling & Air Conditioning [ ] Industrial [ ] Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.24	steel	.477	+.45	32.91
10.16	steel + K packer	.477	32.00	32.91

Status of Well

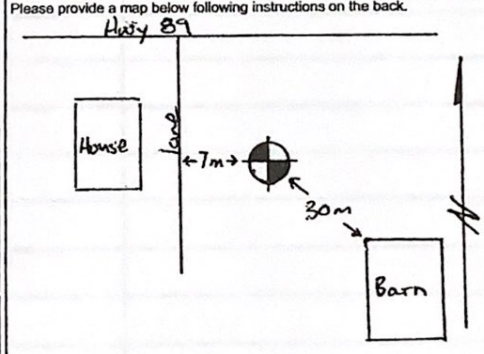
[X] Water Supply [ ] Replacement Well [X] Test Hole [ ] Recharge Well [ ] Dewatering Well [ ] Observation and/or Monitoring Hole [ ] Alteration (Construction) [ ] Abandoned, Insufficient Supply [ ] Abandoned, Poor Water Quality [ ] Abandoned, other, specify [ ] Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
10.16	Stainless	10	32.91	34.44

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth 34.13 (m/ft) [ ] Gas Kind of Water: [ ] Fresh [X] Untested [ ] Other, specify

Water found at Depth (m/ft) [ ] Gas Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify

Water found at Depth (m/ft) [ ] Gas Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.4	25.4
6.4	34.44	19.68

Well Contractor and Well Technician Information

Business Name of Well Contractor: Franklin Drilling Services Inc.

Well Contractor's Licence No.: 7119

Business Address (Street Number/Name): 6891 Sdrd 7 West

Municipality: Mount Forest

Province: ON Postal Code: N0G2L0 Business E-mail Address:

Bus. Telephone No. (inc. area code): 5195014750

Name of Well Technician (Last Name, First Name): Franklin Liam

Well Technician's Licence No.: 3594

Signature of Technician and/or Contractor: [signature] Date Submitted: 20210930

Comments:

Well owner's information package delivered: [X] Yes [ ] No

Date Package Delivered: 20210916

Date Work Completed: 20210816

Ministry Use Only

Audit No. Z365965

Received

Ontario Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☒ Metric ☐ Imperial

Well Tag No. (Place Sticker and/or Print Below)
Tag#:A299789
A299789

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
Joe	Pilla (Pilla Investments Inc)		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
633224 Hwy 10	Mono	ON	L9W5P7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
7723 Hwy 89	Adjala	31	6

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Alliston	Ontario	L9R1V1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	587382	4887776		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	clay	sand, stones		0	8.22
Grey	clay			8.22	42.67
Grey	silt			42.67	50.29
Grey	clay			50.29	65.22
Brown	sand	gravel		65.22	66.44
Grey	clay			66.44	67.66
Grey	silt			67.66	69.79
Brown	sand			69.79	72.84

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.09	Bentonite	.19

Results of Well Yield Testing

After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 42.67

Pumping rate (l/min/GPM): 22.73

Duration of pumping: 6 hrs + 0 min

Final water level end of pumping (m/ft): 16.18

If flowing give rate (l/min/GPM):

Recommended pump depth (m/ft): 20

Recommended pump rate (l/min/GPM): ~~16.0~~ 22.73

Well production (l/min/GPM):

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	12.61		
1	13.47	1	15.36
2	14.02	2	14.69
3	14.44	3	14.17
4	14.78	4	13.80
5	15.05	5	13.53
10	15.69	10	12.92
15	15.83	15	12.77
20	16.18	20	12.61
25	16.18	25	↓
30	16.18	30	
40	16.18	40	
50	16.18	50	
60	16.18	60	

Method of Construction

☐ Cable Tool ☐ Diamond ☒ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☒ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.24	steel	.477	+.50	71.62
10.16	steel + packer	.477	70.71	71.62

Status of Well

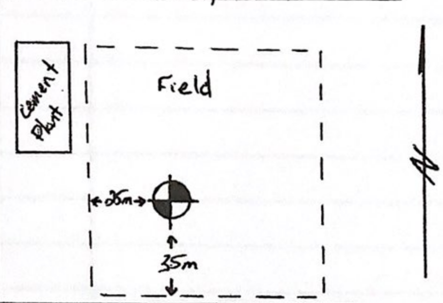
☐ Water Supply ☐ Replacement Well ☒ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
10.16	Stainless	8	71.62	72.84

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth 72.23 (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☒ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.09	25.4
6.09	72.84	19.68

Well Contractor and Well Technician Information

Business Name of Well Contractor: Franklin Drilling Services Inc. — Well Contractor's Licence No.: 7119

Business Address (Street Number/Name): 6891 Sideroad 7 West — Municipality: Mount Forest

Province: ON — Postal Code: N0G2L0 — Business E-mail Address:

Bus. Telephone No. (inc. area code): 5195014750 — Name of Well Technician (Last Name, First Name): Franklin Liam

Well Technician's Licence No.: 3 5 9 4 — Signature of Technician and/or Contractor: [signature] — Date Submitted: 20210930

Comments:

Well owner's information package delivered: ☒ Yes ☐ No

Date Package Delivered: 20210916

Date Work Completed: 20210823

Ministry Use Only — Audit No. Z365964 — Received

0506E (2020/06) © Queen's Printer for Ontario, 2020

Ministry's Copy

Ontario Ministry of the Environment, Conservation and Parks

Well Tag No. (Place Sticker and/or Print Below) Tag#:A299790 A299790

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☒ Metric ☐ Imperial

Page 1 of 1

Well Owner's Information

First Name	Last Name/Organization	E-mail Address	☐ Well Constructed by Well Owner
Joe	Pilla (Pilla Investments Inc)		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
633224 Hwy 10	Mono	ON	L9W5P7	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
7723 Hwy 89	Adjala	31	6

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Alliston	Ontario	L9R1V1

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	587435	4882249		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Brown	Topsoil			0	.3
Brown	clay			.3	2.43
Grey	clay	silt, gravel		2.43	49.98
Grey	silt			49.98	56.38
Brown	clay			56.38	57.60
Grey	clay	silt, gravel		57.60	79.55
Brown	sand			79.55	90.22

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.4	Bentonite	.22

Results of Well Yield Testing

After test of well yield, water was: ☒ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30.48

Pumping rate (l/min / GPM): 22.73

Duration of pumping: 6 hrs + 0 min

Final water level end of pumping (m/ft): 21.54

If flowing give rate (l/min/GPM):

Recommended pump depth (m/ft): 30.48

Recommended pump rate (l/min/GPM): 22.73

Well production (l/min/GPM):

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	21.24		
1	21.54	1	21.24
2	↓	2	↓
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50	↓	50	↓
60	21.54	60	21.24

Method of Construction

☐ Cable Tool ☒ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging

Well Use

☐ Public ☐ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☒ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
15.24	Steel	.477	+.50	89.00
10.16	steel + KPacker	.477	88.08	89.00

Status of Well

☐ Water Supply ☐ Replacement Well ☒ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
10.16	Stainless	6	89.00	90.22

Water Details

Water found at Depth 89.6 (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☒ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

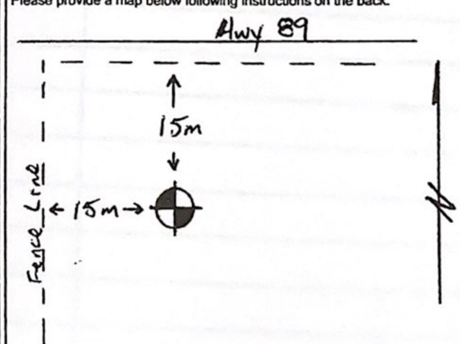
Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.4	25.4
6.4	90.22	19.68

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Franklin Drilling Services Inc.	7119

Business Address (Street Number/Name)	Municipality
6891 Sideroad 7 West	Mount Forest

Province	Postal Code	Business E-mail Address
ON	N0G2L0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5195014750	Franklin Liam

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3594	[signature]	20210930

Well owner's information package delivered ☒ Yes ☐ No

Date Package Delivered 20210916

Date Work Completed 20210825

Ministry Use Only — Audit No. Z365936 — Received

0506E (2020/06)

Ministry's Copy

APPENDIX D

Groundwater Sampling Results

Groundwater Quality Sampling Results

CROZIER CONSULTING ENGINEERS

Project Number: 1101-4125 | Project Location: 7723 Highway 89, Alliston

Sampled by: CM | Sample Date: July 30th, 2021

Prepared by: CM | Checked by: CG/KR

MONITORING WELL WATER QUALITY RESULTS JULY 2021

Parameter	Unit	G/S	RDL	Well					Notes
				MW1	MW2	MW3	MW4	MW5	
E.Coli	CFU/100 mL	0	2	ND	ND	ND	ND	ND	MAC
Total Coliforms	CFU/100 mL	0	100	3100	700	800	1500	2800	MAC
Flouride	mg/L	1.5	0.05	<0.05	0.2	<0.05	<0.05	<0.05	MAC
Chloride	mg/L	250	0.10	20	23.9	236	1100	48.7	AO
Nitrate	mg/L	10	0.05	5.93	8.57	<0.05	0.9	0.74	MAC
Nitrite	mg/L	1	0.05	0.25	0.33	<0.05	<0.11	0.38	MAC
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	<0.11	<0.05	
Sulphate	mg/L	500	0.10	14	53.2	30.5	42.6	56.3	AO
Phosphate	mg/L		0.10	<0.10	<0.10	<0.10	<0.26	<0.10	
Total Aluminum	mg/L	0.1	0.010	1.410	0.022	0.045	0.027	0.01	OG
Total Antimony	mg/L	0.006	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	MAC
Total Arsenic	mg/L	0.025	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	MAC
Total Barium	mg/L	1	0.002	0.060	0.136	0.226	0.407	0.140	MAC
Total Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Total Bismuth	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Boron	mg/L	5	0.010	0.012	0.087	0.084	0.100	0.063	MAC
Total Cadmium	mg/L	0.005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC
Total Chromium	mg/L	0.05	0.003	0.003	<0.003	<0.003	<0.003	<0.003	MAC
Total Cobalt	mg/L		0.0005	0.0007	<0.0005	<0.0005	0.0008	<0.0005	
Total Copper	mg/L	1	0.001	0.005	0.004	0.003	0.004	0.004	AO
Total Iron	mg/L	0.3	0.010	1.54	0.013	0.053	0.030	0.01	AO
Total Lead	mg/L	0.01	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	MAC
Total Manganese	mg/L	0.05	0.002	0.063	0.059	0.043	0.082	0.054	AO
Total Mercury	mg/L	0.001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC
Total Molybdenum	mg/L		0.002	<0.002	0.006	0.002	0.004	0.002	
Total Nickel	mg/L		0.003	0.004	<0.003	<0.003	<0.003	<0.003	
Total Phosphorus	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Total Selenium	mg/L	0.05	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	MAC
Total Silicon	mg/L		0.08	12.10	7.89	6.11	8.40	8.27	
Total Silver	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Strontium	mg/L		0.005	0.246	0.520	0.869	1.520	0.58	
Total Thallium	mg/L		0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
Total Tin	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Titanium	mg/L		0.002	0.085	<0.002	0.003	0.004	0.003	
Total Uranium	mg/L	0.02	0.0005	0.001	0.0035	0.0026	0.0016	0.0033	MAC
Total Vanadium	mg/L		0.002	0.003	<0.002	<0.002	<0.002	<0.002	
Total Zinc	mg/L	5.0	0.005	0.012	<0.005	<0.005	<0.005	0.005	AO
Total Zirconium	mg/L		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	

* - detection limit of 100 CFU/100 mL

** Aesthetic objective for drinking water is 200 mg/L. Where concentrations are found to exceed 20 mg/L, the local medical health officer must be notified.

AO - Aesthetic Objective

MAC - Maximum Allowable Concentration

OG - Operational Guideline

(pink) exceeds standard

(yellow) at standard

Groundwater Quality Sampling Results

Project Number: 1101-4125 | Project Location: 7723 Highway 89, Alliston

Sampled by: CM | Sample Date: September 7th, 2021

Prepared by: CM | Checked by: CG/KR

TEST WELL WATER QUALITY RESULTS SEPTEMBER 2021

Parameter	Unit	G/S	RDL	Well					Notes
				TW1	TW2	TW3	TW4	TW5	
E.Coli	CFU/100 mL	0	1	ND	13	ND	ND	ND	MAC
Total Coliforms	CFU/100 mL	0	1	2	41	1500*	2	22	MAC
Flouride	mg/L	1.5	0.05	0.38	<0.05	0.27	<0.05	0.17	MAC
Chloride	mg/L	250	0.10	15.9	19.2	42.2	19.1	14.2	AO
Nitrate	mg/L	10	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	MAC
Nitrite	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	MAC
Bromide	mg/L		0.05	<0.05	0.22	0.48	<0.05	<0.05	
Sulphate	mg/L	500	0.10	1.72	0.31	3.39	0.32	3.74	AO
Phosphate	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Total Calcium	mg/L	500	0.16	33.00	12.80	9.09	39.40	176.00	AO
Total Magnesium	mg/L	500	0.17	19.30	16.70	5.95	19.90	25.00	AO
Total Potassium	mg/L		0.58	1.88	1.67	1.59	1.66	2.72	
Total Sodium	mg/L	20**	0.22	62.30	31.50	92.70	19.70	24.50	MAC
Total Aluminum	mg/L	0.1	0.010	0.013	0.014	0.017	0.059	2.46	OG
Total Antimony	mg/L	0.006	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	MAC
Total Arsenic	mg/L	0.025	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	MAC
Total Barium	mg/L	1	0.002	0.064	0.059	0.059	0.051	0.103	MAC
Total Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Total Bismuth	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Boron	mg/L	5	0.010	0.169	0.114	0.172	0.098	0.111	MAC
Total Cadmium	mg/L	0.005	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC
Total Chromium	mg/L	0.05	0.003	<0.003	<0.003	<0.003	<0.003	0.004	MAC
Total Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	
Total Copper	mg/L	1	0.001	0.003	0.003	0.001	0.003	0.010	AO
Total Iron	mg/L	0.3	0.010	2.36	0.121	0.112	0.452	3.76	AO
Total Lead	mg/L	0.01	0.001	<0.001	<0.001	<0.001	<0.001	0.002	MAC
Total Manganese	mg/L	0.05	0.002	0.223	0.065	0.020	0.205	0.374	AO
Total Mercury	mg/L	0.001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	MAC
Total Molybdenum	mg/L		0.002	0.020	0.002	0.031	0.004	0.005	
Total Nickel	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Total Phosphorus	mg/L		0.10	<0.10	<0.10	<0.10	0.22	0.92	
Total Selenium	mg/L	0.05	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	MAC
Total Silicon	mg/L		0.08	0.98	0.20	0.44	2.63	7.57	
Total Silver	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Strontium	mg/L		0.005	0.507	0.583	0.184	0.759	1.10	
Total Thallium	mg/L		0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
Total Tin	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Total Titanium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	0.087	
Total Uranium	mg/L	0.02	0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	MAC
Total Vanadium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	0.004	
Total Zinc	mg/L	5.0	0.005	<0.005	<0.005	<0.005	<0.005	0.010	AO
Total Zirconium	mg/L		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	

* - detection limit of 100 CFU/100 mL

** Aesthetic objective for drinking water is 200 mg/L. Where concentrations are found to exceed 20 mg/L, the local medical health officer must be notified.

AO - Aesthetic Objective

MAC - Maximum Allowable Concentration

OG - Operational Guideline

exceeds standard (pink shading)

at standard (yellow shading)

Groundwater Quality Sampling Results

CROZIER CONSULTING ENGINEERS

Project Number: 1101-4125 | Project Location: 7723 Highway 89, Alliston

Sampled by: CM | Sample Date: October 8th, 2021

Prepared by: CM | Checked by: CG/KR

TEST WELL WATER QUALITY RESULTS OCTOBER 2021

Parameter	Unit	G/S	RDL	Well					Notes
				TW1	TW2	TW3	TW4	TW5	
E.Coli	CFU/100 mL	0	1	ND	ND	ND	ND	ND	MAC
Total Coliforms	CFU/100 mL	0	1	21	1	5700*	ND	ND	MAC
Nitrate	mg/L	10	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	MAC
Nitrite	mg/L	1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	MAC

* - detection limit of 100 CFU/100 mL

AO - Aesthetic Objective

MAC - Maximum Allowable Concentration

OG - Operational Guideline

exceeds standard

at standard

CROZIER
CONSULTING ENGINEERS

Groundwater Quality Sampling Results

Project Number: 1101-4125 | Project Location: 7723 Highway 89, Alliston

Sampled by: CM | Sample Date: October 8th, 2021

Prepared by: CM | Checked by: CG/KR

MONITORING WELL WATER QUALITY RESULTS OCTOBER 2021

Parameter	Unit	G/S	RDL	Well					Notes
				MW1	MW2				
E.Coli	CFU/100 mL	0	1	ND	ND				MAC
Total Coliforms	CFU/100 mL	0	1	55	18				MAC
Nitrate	mg/L	10	0.05	8.57	9.26				MAC
Nitrite	mg/L	1	0.05	<0.05	0.26				MAC

AO - Aesthetic Objective
MAC - Maximum Allowable Concentration
OG - Operational Guideline

exceeds standard
at standard

APPENDIX E

Pumping Test Results

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365979 **Well Tag No.** A309223

Date 06/11/2021 **Client** Crozier + Associates - Joe Pilla - Pilla Investments

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
TEST WELL #1	6.30	5 IGPM	22.86m		Open Hole		

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @ '
0							
1			6.50		6.64		
2			6.56		6.62		
3			6.57		6.61		
4			6.58		6.61		
5			6.58		6.61		
6			6.58		6.61		
7			6.58		6.61		
8			6.58		6.61		
9			6.58		6.61		
10			6.58		6.61		
12			6.59		6.61		
14			6.59		6.60		
15			6.59		6.60		
16			6.59		6.60		
18			6.59		6.60		
20			6.59		6.60		
25			6.60		6.60		
30			6.61		6.60		
35			6.62		6.59		
40			6.62		6.59		
45			6.62		6.59		
50			6.63		6.58		
55			6.63		6.58		
60			6.63		6.58		
90			6.68				
2/120			6.70				
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 1/2

UTM Coordinates| Zone Easting Northing

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No.		Well Tag No. A309223					
Date 06/11/2021			Client				
Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth	Datum
TEST WELL #1	6.30	5 IGPM			Open Hole	To Grade	Top of Casing

	Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @ '
2.5	150	~~6.71~~		6.71				
3	180	~~6.72~~		6.72				
3.5	210	~~6.73~~		6.73				
4	240	~~6.75~~		6.75				
4.5	270			6.78				
5	300			6.81				
5.5	330			6.82				
6	* 360			6.85				
	390							
	420							
	450							
	480							
	510							
	540							
	16							
	18							
	20							
	25							
	30							
	35							
	40							
	45							
	50							
	55							
	60							
	Drawdown @ 60 Minutes							
	Recovery @ 60 Minutes							

Comments

Page 2/2

FRANKLIN DRILLING SERVICES
6891 SR7W, Mt Forest, Ont. N0G 2L0
519-501-4750 MOE Lic. 7719
Well Test Data

MOE Audit No. Z365971 Well Tag No. A335252

Date July 12, 2021 Client Crozier + Associates - Joe Pilla - Pilla Investments

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
2	10.97m	5 IGPM	45.11m		Open Hole		

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0							
1	12.64				38.00		
2	13.50				37.12		
3	14.20				36.24		
4	14.63				35.38		
5	15.63				34.59		
6	16.21				33.77		
7	16.82				33.10		
8	17.37				32.40		
9	17.89				31.69		
10	18.40				30.99		
12	19.35				29.74		
14	19.93				28.59		
15	21.06				27.85		
16	21.82				27.43		
18	22.52				26.45		
20	23.01				25.23		
25	24.07				23.43		
30	25.38				21.73		
35	26.57						
40	27.49				19.01		
45	28.46						
50	29.26				17.28		
55							
60	30.48				15.81		
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 1/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365971 Well Tag No. A335252

Date July 12, 2021 Client Crozier + Associates - Joe Pilla - Pilla Investments

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
2		IGPM			Open Hole		

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0	90 min	33.04m					
1	120	34.47					
2	150	35.41					
3	180	36.08					
4	210	36.57					
5	240	36.94					
6	270	37.52					
7	300	38.95					
8	330	38.95					
9	360	38.95					
10							
12							
14							
15							
16							
18							
20							
25							
30							
35							
40							
45							
50							
55							
60							
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 2/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0
519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365965 **Well Tag No.** A299793

Date Aug 17, 2021 **Client** Crozier + Associates - Joe Pilla - Pilla Investments

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
3	15.54m	3 IGPM	30.48m		Open Hole		

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0							
1	16.41				18.56		
2	16.71				18.12		
3	16.96				17.76		
4	17.15				17.42		
5	17.33				17.16		
6	17.48				16.94		
7	17.61				16.74		
8	17.72				16.58		
9	17.83				16.40		
10	17.92				16.27		
12	18.07				16.03		
14	18.08				15.87		
15	18.08				15.79		
16	18.09				15.73		
18	18.18				15.64		
20	18.25				15.55		
25	18.40				15.54		
30	18.49						
35							
40	18.56						
45							
50	18.58						
55							
60	18.64						
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 1/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750   MOE Lic. 7719

Well Test Data

MOE Audit No.			Well Tag No. A299793				
Date		Client					
Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth	Datum
		IGPM			Open Hole	To Grade	Top of Casing

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @ '
0	90 min	18.64m					
1	120	18.67					
2	150	18.74					
3	180	18.79					
4	210	18.86					
5	240	18.91					
6	270	18.97					
7	300	19.00					
8	330	19.04					
9	360	19.07					
10							
12							
14							
15							
16							
18							
20							
25							
30							
35							
40							
45							
50							
55							
60							
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 2/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750   MOE Lic. 7719

Well Test Data

MOE Audit No. Z365964			Well Tag No. A299789					
Date Sept 6/21		Client Crozier + Associates - Joe Pilla - Pilla Investments Inc						
Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen		Ttl Dpth	Datum
4	12.6m	5 IGPM	42.67m		Open	Hole	To Grade	Top of Casing

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0					16.18m		
1	13.47m				15.36		
2	14.02				14.69		
3	14.44				14.17		
4	14.78				13.80		
5	15.05				13.53		
6	15.24				13.31		
7	15.45				13.16		
8	15.54				13.04		
9	15.60				12.98		
10	15.69				12.92		
12	15.70				12.86		
14	15.77				12.80		
15	15.83				12.77		
16	15.92				12.74		
18	16.04				12.67		
20	16.18				12.61		
25	16.18						
30	16.18						
35							
40	16.18						
45							
50	16.18						
55							
60	16.18						
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 1/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0
519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365964		Well Tag No. A299789					
Date Sept. 6/21		Client Crozier & Associates - Joe Pilla - Pilla Investments Inc.					
Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth	Datum
4	1261m	5 IGPM	42.67m		Open Hole	To Grade	Top of Casing

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0	90 min	16.18m					
1	120	16.18					
2	150	16.18					
3	180	16.18					
4	210	16.18					
5	240	16.18					
6	270	16.18					
7	300	16.18					
8	330	16.18					
9	360	16.18					
10							
12							
14							
15							
16							
18							
20							
25							
30							
35							
40							
45							
50							
55							
60							
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 2/2

FRANKLIN DRILLING SERVICES
6891 SR7W, Mt Forest, Ont. N0G 2L0
519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365936 Well Tag No. A299790

Date Sept. 6/21 Client Crozier + Associates – Joe Pilla – Pilla Investments

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
5	21.24	5 IGPM			Open Hole		

Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0							
1	21.54				21.24		
2	21.54				↓		
3	21.54						
4	21.54						
5	21.54						
6	↓						
7							
8							
9							
10							
12							
14							
15							
16							
18							
20							
25							
30							
35							
40							
45							
50							
55							
60	21.54				21.24		
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

Page 1/2

FRANKLIN DRILLING SERVICES

6891 SR7W, Mt Forest, Ont. N0G 2L0

519-501-4750 MOE Lic. 7719

Well Test Data

MOE Audit No. Z365936 **Well Tag No.** A279790

Date Sept 6/21 **Client** Crozier + Associates - Joe Pilla - Pilla Investments Inc

Well #	Static	Pumping Rate	Intke At	Amnt/Casing	Amnt/Screen	Ttl Dpth To Grade	Datum Top of Casing
5		5 IGPM			Open Hole		

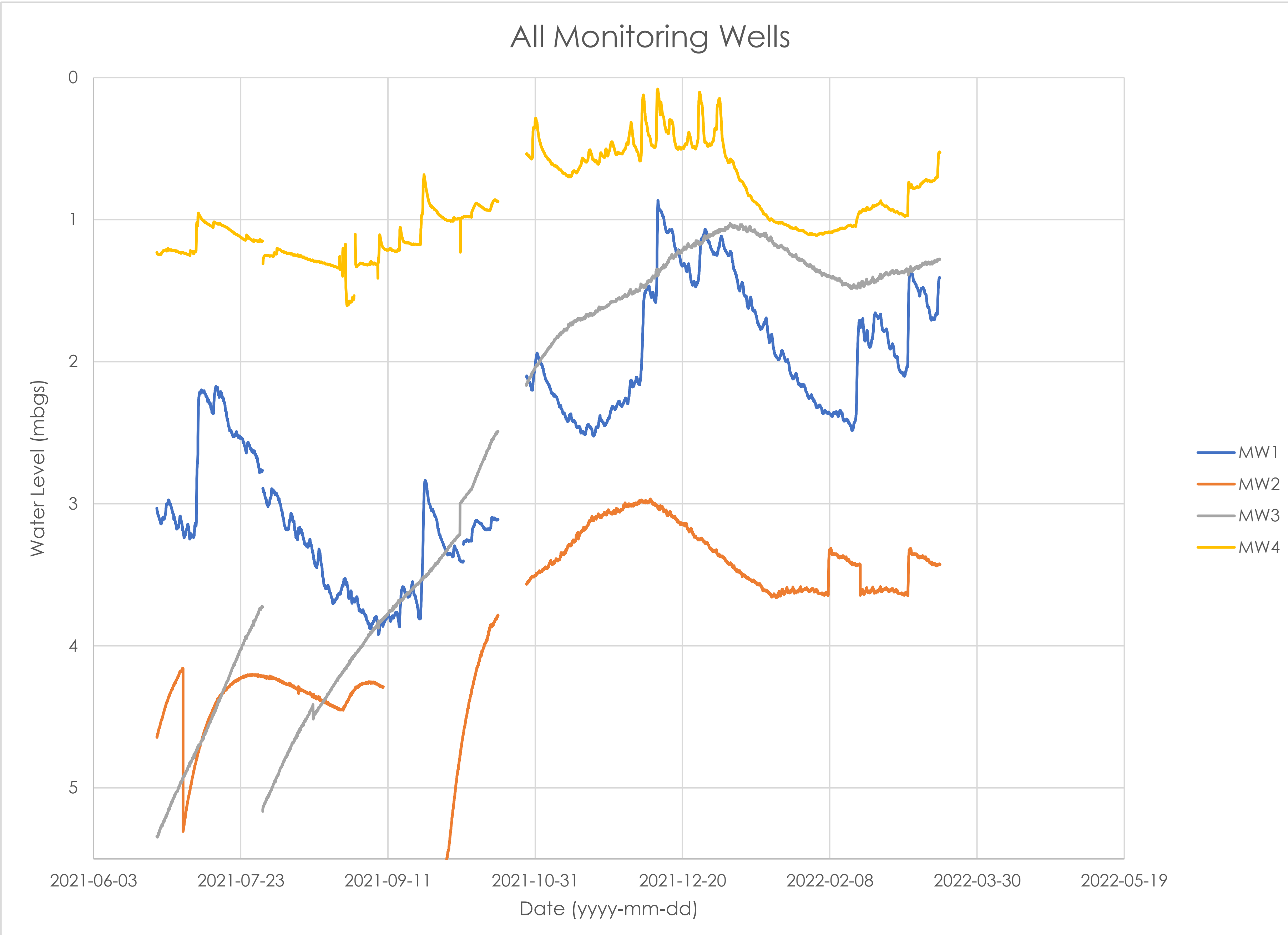
Elapsd Time	Water Level Meters	Water Level Feet	Draw Down Meters	Draw Down Feet	Recovery Meters	Recovery Feet	Remarks Rock starts @
0	90min	21.54m					
1	120	↓					
2	150						
3	180						
4	210						
5	240						
6	270						
7	300						
8	330						
9	360	21.54m					
10							
12							
14							
15							
16							
18							
20							
25							
30							
35							
40							
45							
50							
55							
60							
Drawdown @ 60 Minutes							
Recovery @ 60 Minutes							

Comments

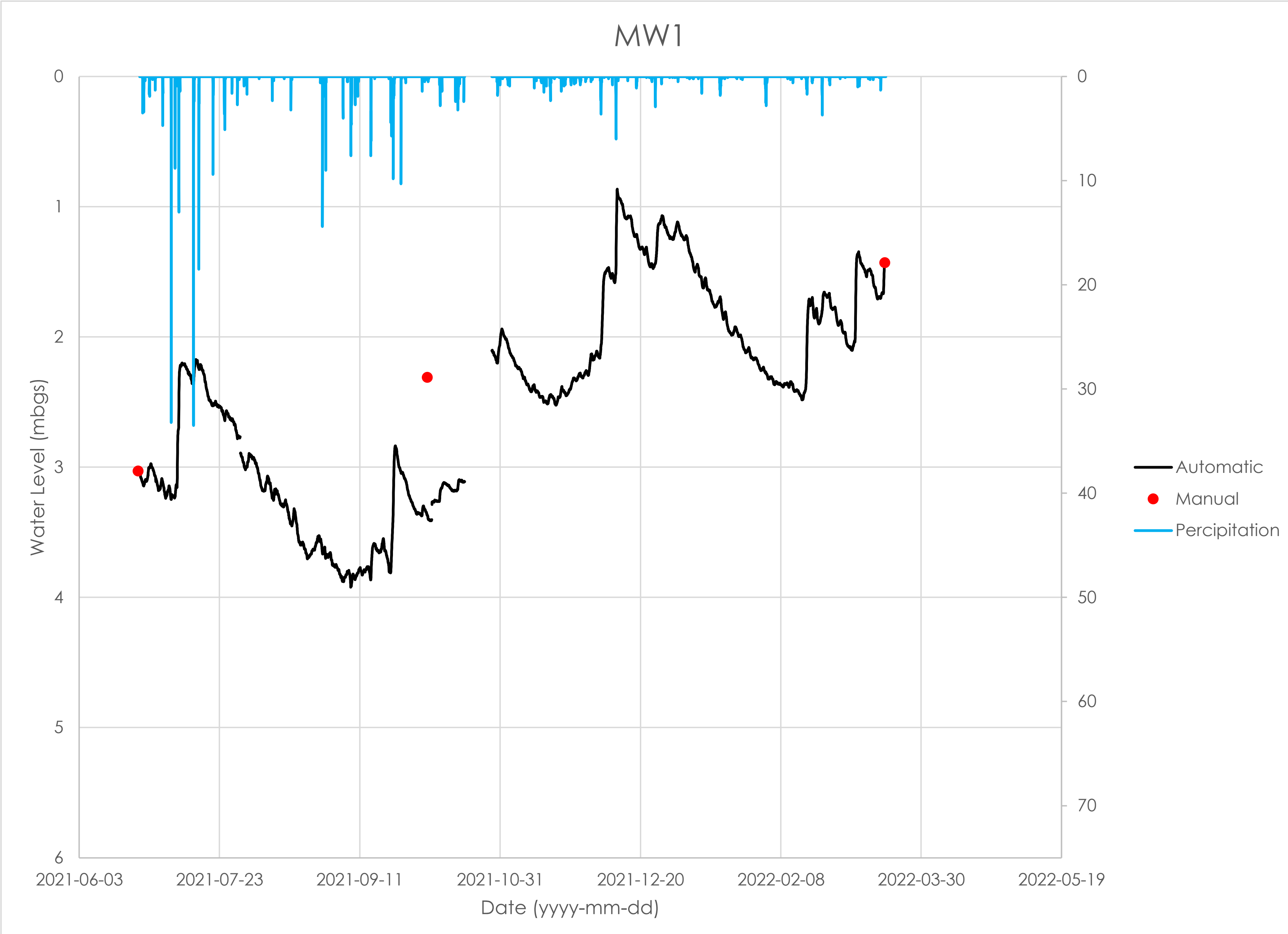
Page 2/2

APPENDIX F

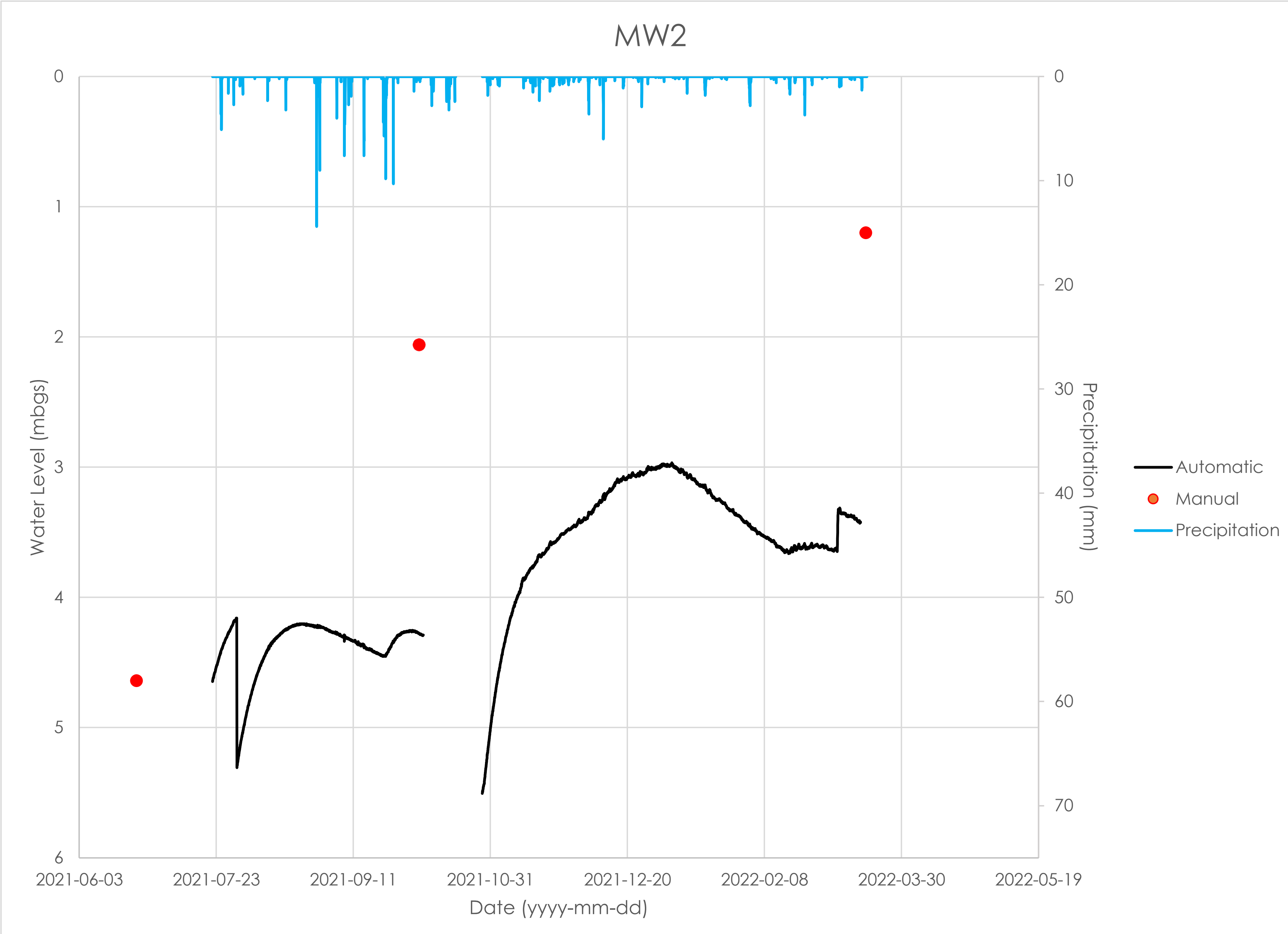
Hydrographs



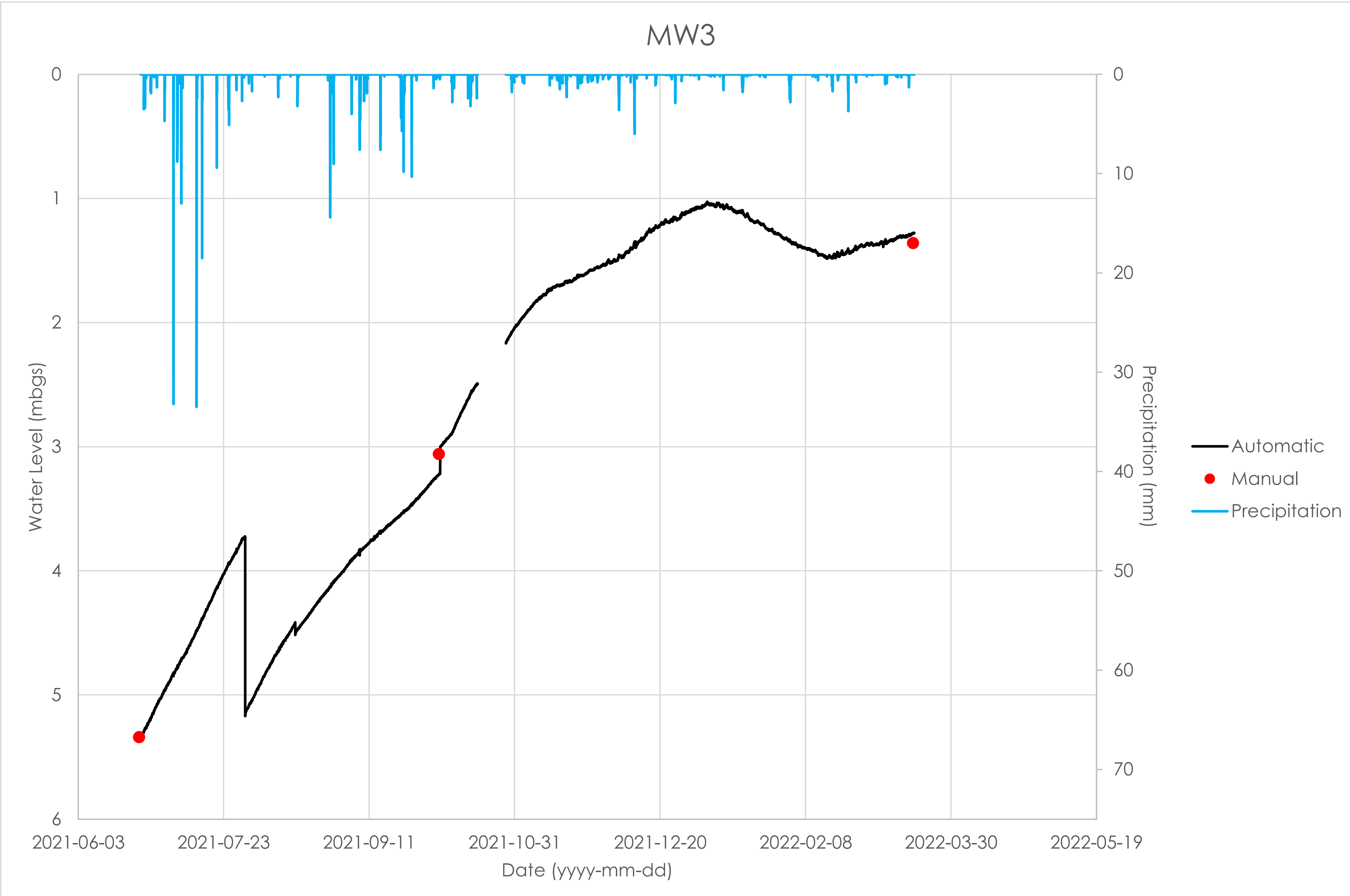
All Monitoring Wells
Water Level (mbgs)
0
1
2
3
4
5
2021-06-03
2021-07-23
2021-09-11
2021-10-31
2021-12-20
2022-02-08
2022-03-30
2022-05-19
Date (yyyy-mm-dd)
MW1
MW2
MW3
MW4



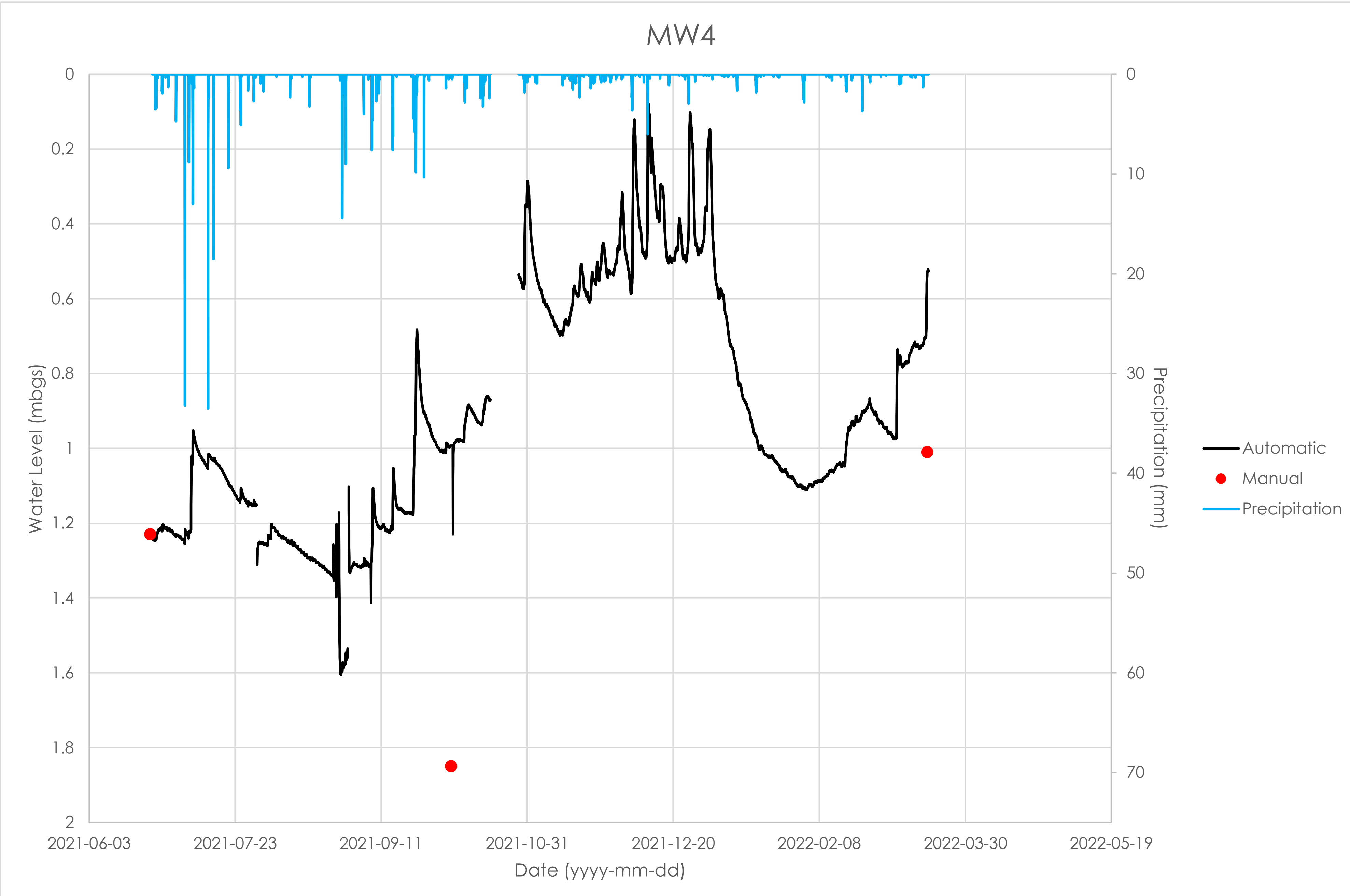
MW1
Water Level (mbgs)
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
2021-06-03
2021-07-23
2021-09-11
2021-10-31
2021-12-20
2022-02-08
2022-03-30
2022-05-19
Date (yyyy-mm-dd)
Automatic
Manual
Percipitation



MW2
Water Level (mbgs)
0
1
2
3
4
5
6
Precipitation (mm)
0
10
20
30
40
50
60
70
2021-06-03
2021-07-23
2021-09-11
2021-10-31
2021-12-20
2022-02-08
2022-03-30
2022-05-19
Date (yyyy-mm-dd)
Automatic
Manual
Precipitation

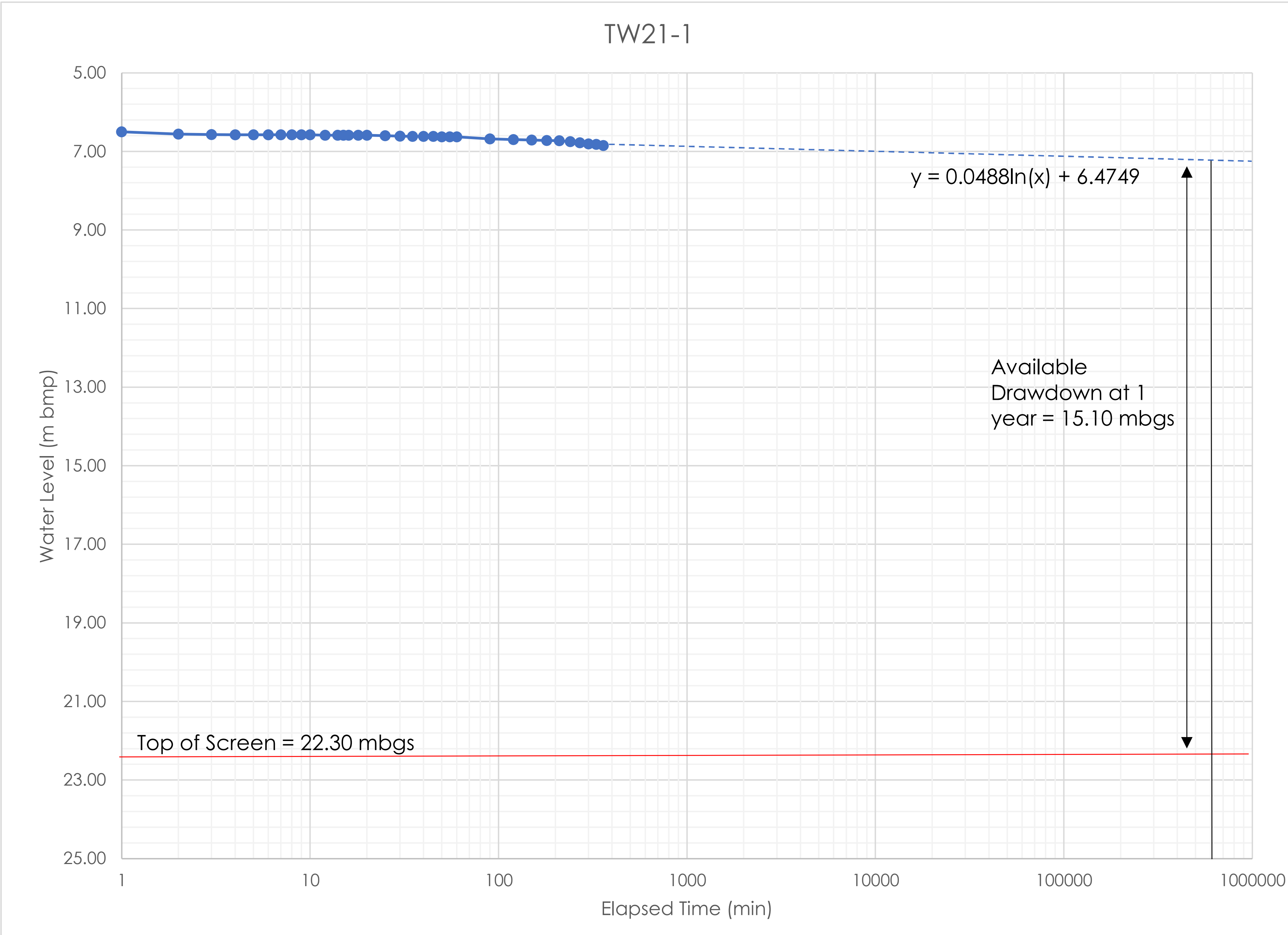


MW3
Water Level (mbgs)
0
1
2
3
4
5
6
Precipitation (mm)
0
10
20
30
40
50
60
70
2021-06-03
2021-07-23
2021-09-11
2021-10-31
2021-12-20
2022-02-08
2022-03-30
2022-05-19
Date (yyyy-mm-dd)
Automatic
Manual
Precipitation

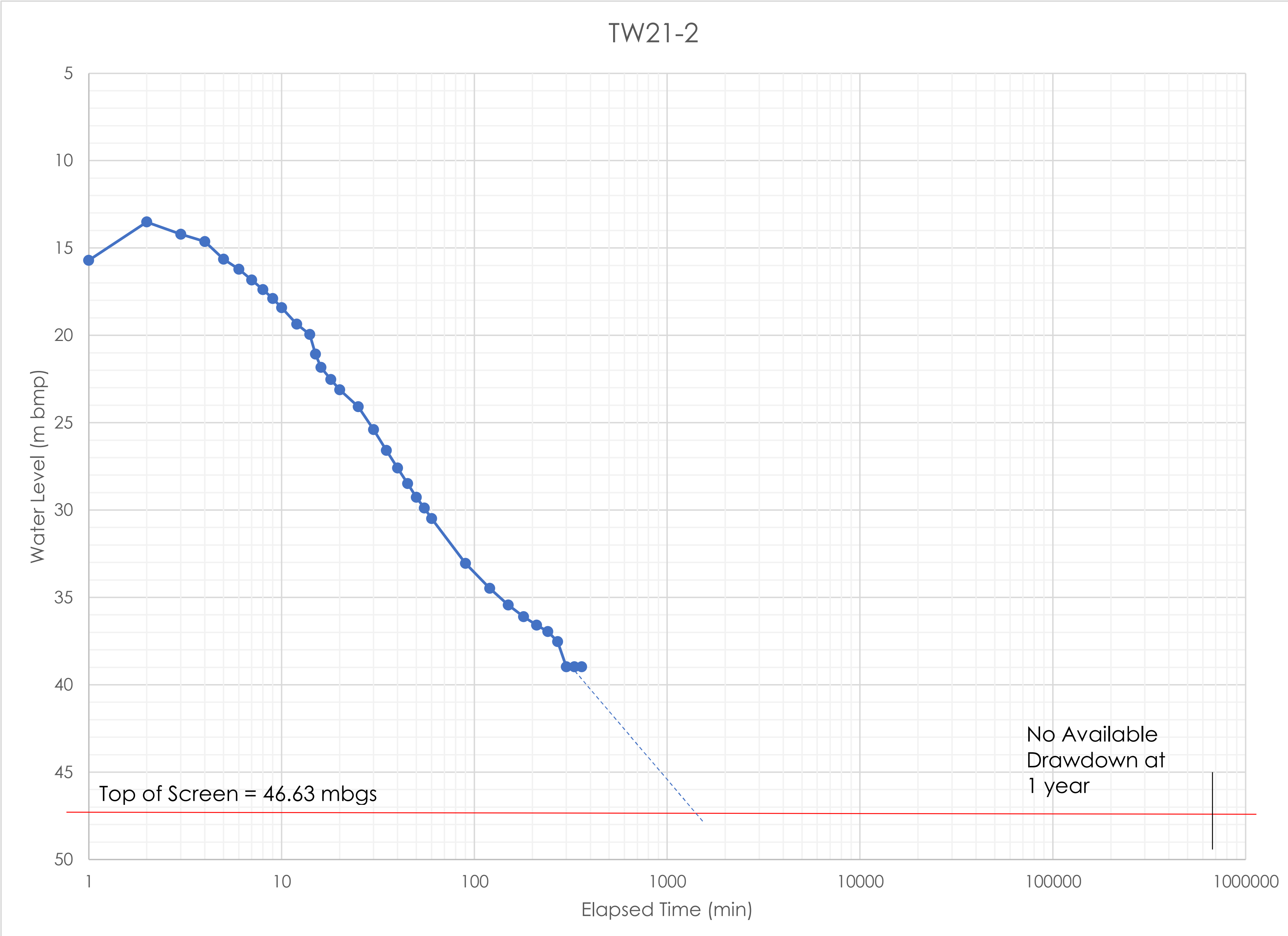

MW4
Water Level (mbgs)
Precipitation (mm)
Date (yyyy-mm-dd)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
10
20
30
40
50
60
70
2021-06-03
2021-07-23
2021-09-11
2021-10-31
2021-12-20
2022-02-08
2022-03-30
2022-05-19
Automatic
Manual
Precipitation

APPENDIX G

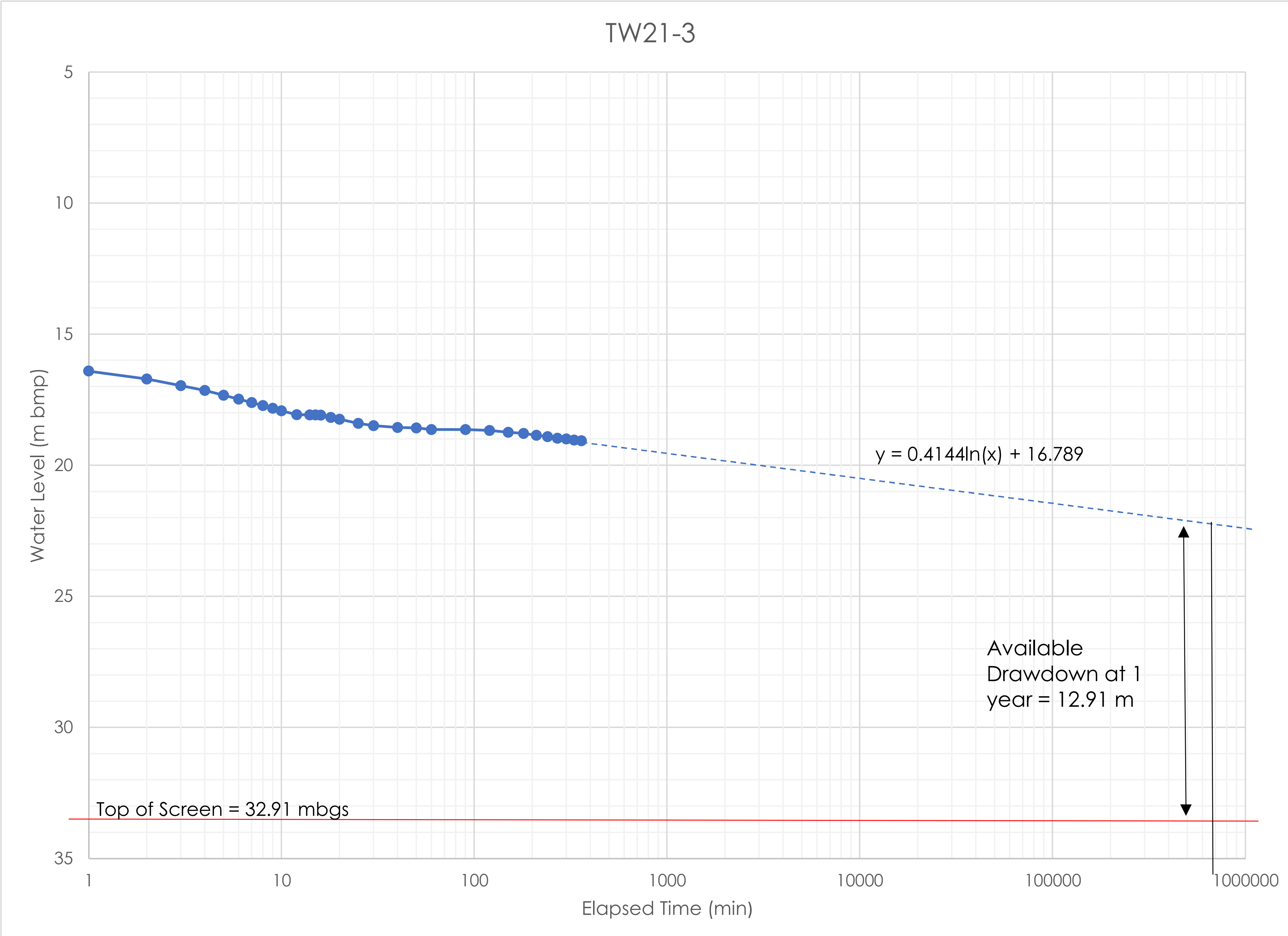
Pumping Test Results



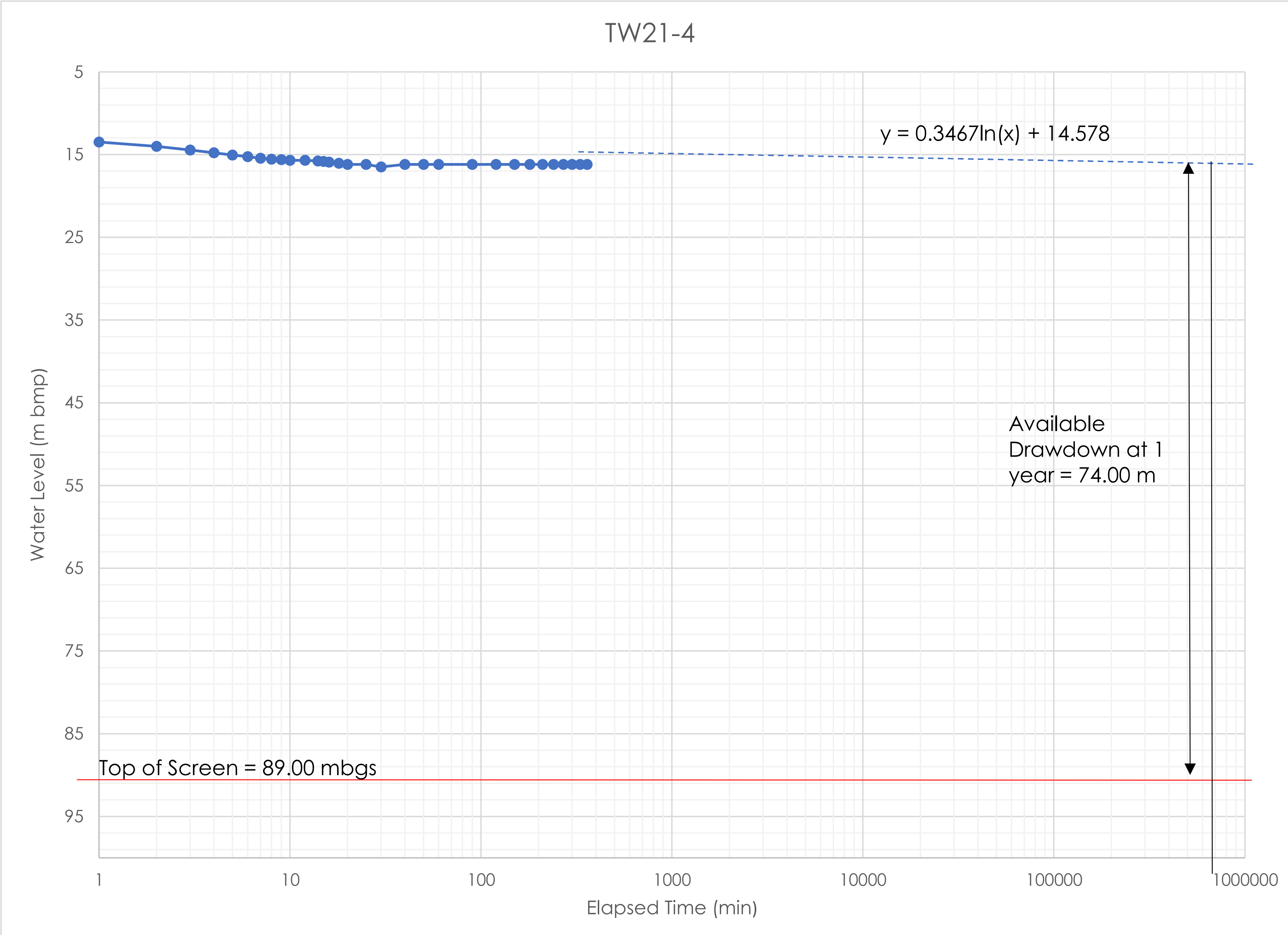
TW21-1
5.00
7.00
9.00
11.00
13.00
15.00
17.00
19.00
21.00
23.00
25.00
Water Level (m bmp)
1
10
100
1000
10000
100000
1000000
Elapsed Time (min)
y = 0.0488ln(x) + 6.4749
Available Drawdown at 1 year = 15.10 mbgs
Top of Screen = 22.30 mbgs



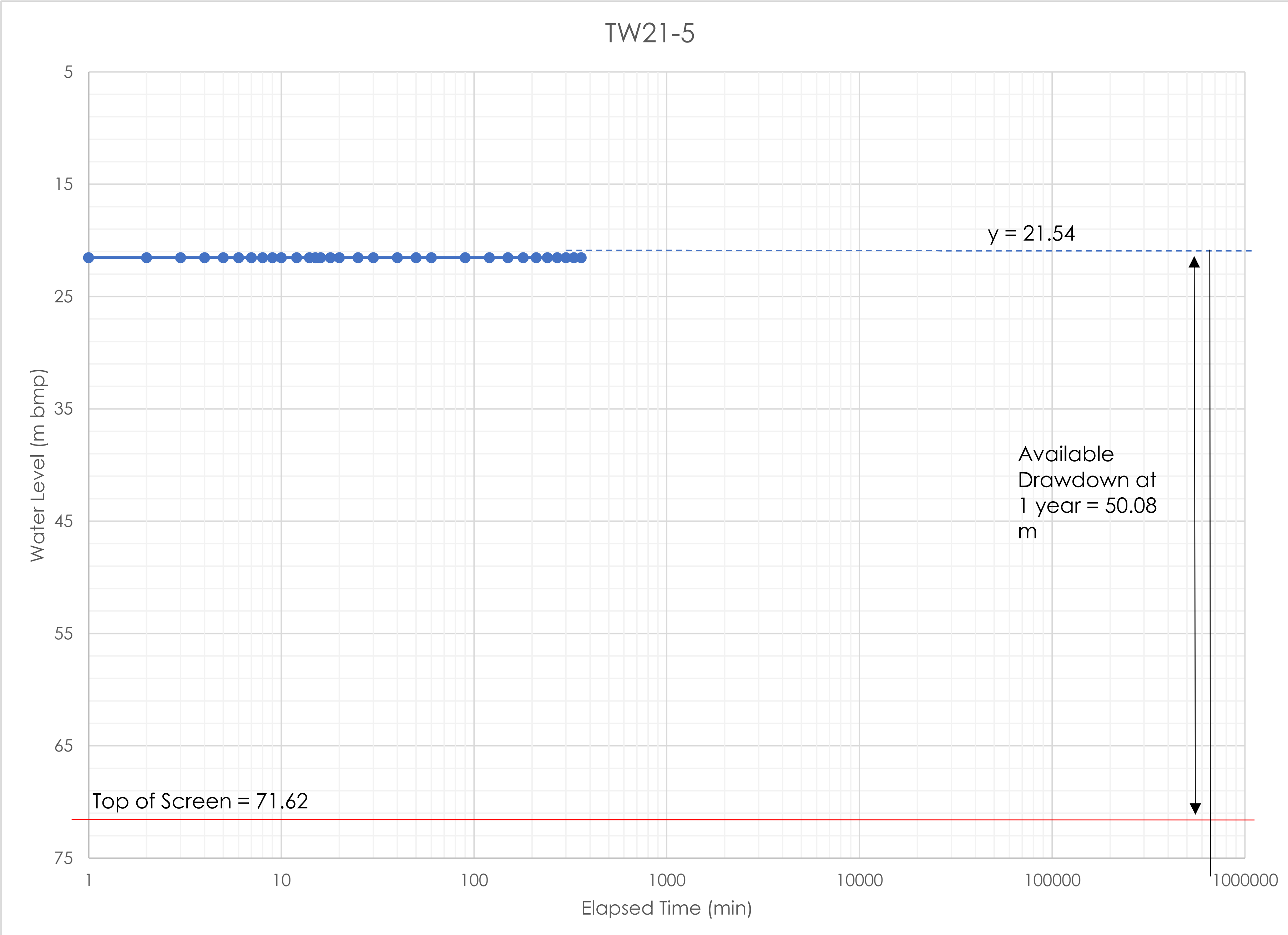
TW21-2
Water Level (m bmp)
5
10
15
20
25
30
35
40
45
50
1
10
100
1000
10000
100000
1000000
Elapsed Time (min)
Top of Screen = 46.63 mbgs
No Available
Drawdown at
1 year



TW21-3
Water Level (m bmp)
Elapsed Time (min)
y = 0.4144ln(x) + 16.789
Available Drawdown at 1 year = 12.91 m
Top of Screen = 32.91 mbgs
5
10
15
20
25
30
35
1
10
100
1000
10000
100000
1000000



TW21-4
y = 0.3467ln(x) + 14.578
Available Drawdown at 1 year = 74.00 m
Top of Screen = 89.00 mbgs
Water Level (m bmp)
5
15
25
35
45
55
65
75
85
95
1
10
100
1000
10000
100000
1000000
Elapsed Time (min)


TW21-5
y = 21.54
Available Drawdown at 1 year = 50.08 m
Top of Screen = 71.62
Water Level (m bmp)
Elapsed Time (min)
5
15
25
35
45
55
65
75
1
10
100
1000
10000
100000
1000000

APPENDIX H

Certificate of Analyses

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4
905-875-0026

ATTENTION TO: Caitlyn Macphee

PROJECT: Alliston Site (1101-4125)

AGAT WORK ORDER: 21T812364

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

WATER ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

DATE REPORTED: Oct 08, 2021

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

Certificate of Analysis

AGAT WORK ORDER: 21T812364
PROJECT: Alliston Site (1101-4125)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE:Alliston | **SAMPLED BY:C. MacPhee**

Total Coliforms & E. Coli (Using MI Agar)

DATE RECEIVED: 2021-10-06 | **DATE REPORTED: 2021-10-08**

			SAMPLE DESCRIPTION:	TW1	TW2		TW3		TW4	TW5	MW1
			SAMPLE TYPE:	Water	Water		Water		Water	Water	Water
			DATE SAMPLED:	2021-10-06 14:00	2021-10-06 14:00		2021-10-05 12:00		2021-10-05 09:00	2021-10-05 14:00	2021-10-06 14:00
Parameter	**Unit**	**G / S**	**RDL**	**3061969**	**3061978**	**RDL**	**3061979**	**RDL**	**3061980**	**3061981**	**3061982**
Escherichia coli	CFU/100mL		1	ND	ND	1	ND	1	ND	ND	ND
Total Coliforms	CFU/100mL		1	21	1	100	5700	1	1	ND	55

			SAMPLE DESCRIPTION:	MW2
			SAMPLE TYPE:	Water
			DATE SAMPLED:	2021-10-06 14:00
Parameter	**Unit**	**G / S**	**RDL**	**3061983**
Escherichia coli	CFU/100mL		1	ND
Total Coliforms	CFU/100mL		1	18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

3061969-3061983 If RDL >1 indicates dilutions of the sample.
ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 21T812364

PROJECT: Alliston Site (1101-4125)

CLIENT NAME: CROZIER & ASSOCIATES

ATTENTION TO: Caitlyn Macphee

SAMPLING SITE:Alliston

SAMPLED BY:C. MacPhee

(Water) Nitrate, Nitrite

DATE RECEIVED: 2021-10-06

DATE REPORTED: 2021-10-08

			SAMPLE DESCRIPTION:	TW1	TW2	TW3	TW4	TW5	MW1	MW2
			SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-10-06 14:00	2021-10-06 14:00	2021-10-05 12:00	2021-10-05 09:00	2021-10-05 14:00	2021-10-06 14:00	2021-10-06 14:00
Parameter	**Unit**	**G / S**	**RDL**	**3061969**	**3061978**	**3061979**	**3061980**	**3061981**	**3061982**	**3061983**
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	8.57	9.26
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.26

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES
PROJECT: Alliston Site (1101-4125)
SAMPLING SITE:Alliston

AGAT WORK ORDER: 21T812364
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:C. MacPhee

Microbiology Analysis

RPT Date: Oct 08, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Total Coliforms & E. Coli (Using MI Agar)															
Escherichia coli	3061969	3061969	ND	ND	NA	< 1									
Total Coliforms	3061969	3061969	21	20	4.9%	< 1									

Comments: ND - Not Detected, NA - % RPD Not Applicable.

Certified By:

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES
PROJECT: Alliston Site (1101-4125)
SAMPLING SITE:Alliston

AGAT WORK ORDER: 21T812364
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:C. MacPhee

Water Analysis

RPT Date: Oct 08, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
(Water) Nitrate, Nitrite															
Nitrate as N	3061743		1.47	1.52	3.3%	< 0.05	101%	70%	130%	108%	80%	120%	107%	70%	130%
Nitrite as N	3061743		<0.05	<0.05	NA	< 0.05	108%	70%	130%	108%	80%	120%	111%	70%	130%

Comments: NA Signifies Not Applicable.
Duplicate NA: results are less than 5X the RDL and RPD will not be calculated.

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T812364**

PROJECT: Alliston Site (1101-4125) | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE:Alliston | **SAMPLED BY:C. MacPhee**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration
Water Analysis			
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH

AGAT Laboratories mi-bi

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only
Work Order #: 21T812364
Cooler Quantity: 1 sm C
Arrival Temperatures: 5.8 | 5.2 | 5.6
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: Free Ice

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:
Company: C.F. Crozier & associates
Contact: Caitlyn MacPhee
Address: 2800 high point drive Milton, ON Suite 100
Phone: 905.8765067 Fax:
Reports to be sent to:
1. Email: cmacphee@cfcrozier.ca
2. Email: cgerrits@cfcrozier.ca

Regulatory Requirements:
(Please check all applicable boxes)

☐ Regulation 153/04 — Table ___ *Indicate One* ☐ Ind/Com ☐ Res/Park ☐ Agriculture; Soil Texture *(Check One)* ☐ Coarse ☐ Fine
☐ Excess Soils R406 — Table ___ *Indicate One*; ☐ Regulation 558; ☐ CCME
☐ Sewer Use ☐ Sanitary ☐ Storm; ___ *Region*; ☐ Prov. Water Quality Objectives (PWQO); ☐ Other ___ *Indicate One*

Is this submission for a Record of Site Condition? ☐ Yes ☒ No
Report Guideline on Certificate of Analysis ☐ Yes ☒ No

Turnaround Time (TAT) Required:
Regular TAT ☐ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply) ☒ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply): ___
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*
For 'Same Day' analysis, please contact your AGAT CPM

Project Information:
Project: Alliston Site (1101-4125)
Site Location: Alliston
Sampled By: C.macphee
AGAT Quote #: ___ PO: ___
Please note: If quotation number is not provided, client will be billed full price for analysis.

Sample Matrix Legend
B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Invoice Information:
Bill To Same: Yes ☐ No ☐
Company: C.F. Crozier & associates
Contact: Elaine Plewes
Address: e 1st st. Suite 200 collingwood
Email: eplewes@cfcrozier.ca

Analysis columns: Field Filtered - Metals, Hg, CrVI, DOC (Y/N); O. Reg 153: Metals & Inorganics; Metals - ☐ CrVI, ☐ Hg, ☐ HWSB; BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No; PAHs; PCBs; VOC; O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs; Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4; Salt - EC/SAR; E. Coli; Total Coliforms; Nitrate, Nitrite; Potentially Hazardous or High Concentration (Y/N)

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	E. Coli	Total Coliforms	Nitrate, Nitrite
TW1	10/06	200 PM	3	GW		N	✓	✓	✓
TW2	10/06	200 AM/PM	3	GW		N	✓	✓	✓
TW3	10/05	1200 AM/PM	3	GW		N	✓	✓	✓
TW4	10/05	900 AM/PM	3	GW		N	✓	✓	✓
TW5	10/05	200 AM/PM	3	GW		N	✓	✓	✓
MW1	10/06	200 AM/PM	3	GW		N	✓	✓	✓
MW2	10/06	200 AM/PM	3	GW		N	✓	✓	✓
		AM PM							
		AM PM							
		AM PM							
		AM PM							

21 OCT 6 5:41PM

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Caitlyn MacPhee [signature]	10/06	4:35	NEAL G [signature]		

Page 1 of 1
Nº: T 125150

Document ID: DIV-78-1511.021 Date Issued: March 9, 2021
Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4
905-875-0026

ATTENTION TO: Caitlyn Macphee

PROJECT: Alliston (1101-4125)

AGAT WORK ORDER: 21T798235

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Sep 14, 2021

PAGES (INCLUDING COVER): 13

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE:Alliston | **SAMPLED BY:C. MacPhee**

Total Coliforms & E. Coli (Using MI Agar)

DATE RECEIVED: 2021-09-07 | **DATE REPORTED: 2021-09-14**

			SAMPLE DESCRIPTION:	T1	T2		T3		T4	T5
			SAMPLE TYPE:	Water	Water		Water		Water	Water
			DATE SAMPLED:	2021-09-07 15:01	2021-09-07 15:30		2021-09-07 11:00		2021-09-07 12:00	2021-09-07 13:00
Parameter	**Unit**	**G / S**	**RDL**	**2940146**	**2940154**	**RDL**	**2940155**	**RDL**	**2940156**	**2940157**
Escherichia coli	CFU/100mL		1	ND	13	1	ND	1	ND	ND
Total Coliforms	CFU/100mL		1	2	41	100	1500	1	2	22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

2940146 ND - Not Detected.

2940155 ND - Not Detected.
RDL >1 indicates dilutions of the sample.

2940156-2940157 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 21T798235

PROJECT: Alliston (1101-4125)

CLIENT NAME: CROZIER & ASSOCIATES

SAMPLING SITE:Alliston

ATTENTION TO: Caitlyn Macphee

SAMPLED BY:C. MacPhee

Anion Scan

DATE RECEIVED: 2021-09-07 **DATE REPORTED: 2021-09-14**

			SAMPLE DESCRIPTION:	T1	T2	T3	T4	T5
			SAMPLE TYPE:	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-09-07 15:01	2021-09-07 15:30	2021-09-07 11:00	2021-09-07 12:00	2021-09-07 13:00
Parameter	**Unit**	**G / S**	**RDL**	**2940146**	**2940154**	**2940155**	**2940156**	**2940157**
Fluoride	mg/L		0.05	0.38	<0.05	0.27	<0.05	0.17
Chloride	mg/L		0.10	15.9	19.2	42.2	19.1	14.2
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromide	mg/L		0.05	<0.05	0.22	0.48	<0.05	<0.05
Sulphate	mg/L		0.10	1.72	0.31	3.39	0.32	3.74
Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
ATTENTION TO: Caitlyn Macphee
SAMPLING SITE:Alliston
SAMPLED BY:C. MacPhee

Cations in Water - Total (mg/L)

DATE RECEIVED: 2021-09-07
DATE REPORTED: 2021-09-14

			SAMPLE DESCRIPTION:	T1	T2	T3	T4	T5
			SAMPLE TYPE:	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-09-07 15:01	2021-09-07 15:30	2021-09-07 11:00	2021-09-07 12:00	2021-09-07 13:00
Parameter	**Unit**	**G / S**	**RDL**	**2940146**	**2940154**	**2940155**	**2940156**	**2940157**
Total Calcium	mg/L		0.16	33.0	12.8	9.09	39.4	176
Total Magnesium	mg/L		0.17	19.3	16.7	5.95	19.9	25.0
Total Potassium	mg/L		0.58	1.88	1.67	1.59	1.66	2.72
Total Sodium	mg/L		0.22	62.3	31.5	92.7	19.7	24.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
2940146-2940157 Dilution required, RDL has been increased accordingly.
Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 21T798235

PROJECT: Alliston (1101-4125)

CLIENT NAME: CROZIER & ASSOCIATES

ATTENTION TO: Caitlyn Macphee

SAMPLING SITE:Alliston

SAMPLED BY:C. MacPhee

Total Metals in water (mg/L)

DATE RECEIVED: 2021-09-07

DATE REPORTED: 2021-09-14

			SAMPLE DESCRIPTION:	T1	T2	T3	T4	T5
			SAMPLE TYPE:	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-09-07 15:01	2021-09-07 15:30	2021-09-07 11:00	2021-09-07 12:00	2021-09-07 13:00
Parameter	**Unit**	**G / S**	**RDL**	**2940146**	**2940154**	**2940155**	**2940156**	**2940157**
Total Aluminum	mg/L		0.010	0.013	0.014	0.017	0.059	2.46
Total Antimony	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Arsenic	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Barium	mg/L		0.002	0.064	0.059	0.059	0.051	0.103
Total Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Bismuth	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron	mg/L		0.010	0.169	0.114	0.172	0.098	0.111
Total Cadmium	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Chromium	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	0.004
Total Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0013
Total Copper	mg/L		0.001	0.003	0.003	0.001	0.003	0.010
Total Iron	mg/L		0.010	2.36	0.121	0.112	0.452	3.76
Total Lead	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	0.002
Total Manganese	mg/L		0.002	0.223	0.065	0.020	0.205	0.374
Total Mercury	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Molybdenum	mg/L		0.002	0.020	0.002	0.031	0.004	0.005
Total Nickel	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Phosphorus	mg/L		0.10	<0.10	<0.10	<0.10	0.22	0.92
Total Selenium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Silicon	mg/L		0.08	0.98	0.20	0.44	2.63	7.57
Total Silver	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Strontium	mg/L		0.005	0.507	0.583	0.184	0.759	1.10
Total Thallium	mg/L		0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Total Tin	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	0.087
Total Uranium	mg/L		0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005
Total Vanadium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	0.004
Total Zinc	mg/L		0.005	<0.005	<0.005	<0.005	<0.005	0.010
Total Zirconium	mg/L		0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Certified By:

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Laboratories

Certificate of Analysis

AGAT WORK ORDER: 21T798235
PROJECT: Alliston (1101-4125)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE:Alliston **SAMPLED BY:C. MacPhee**

Total Metals in water (mg/L)

DATE RECEIVED: 2021-09-07	**DATE REPORTED: 2021-09-14**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Toronto (unless marked by *)

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Certified By:

Results relate only to the items tested. Results apply to samples as received.

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES
PROJECT: Alliston (1101-4125)
SAMPLING SITE:Alliston

AGAT WORK ORDER: 21T798235
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:C. MacPhee

Microbiology Analysis

RPT Date: Sep 14, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Coliforms & E. Coli (Using MI Agar)															
Escherichia coli	2940146	2940146	ND	ND	NA	< 1									
Total Coliforms	2940146	2940146	2	1	NA	< 1									

Comments: ND - Not Detected, NA - % RPD Not Applicable.

NA - % RPD Not Reportable based on the number of colonies count acceptable for RPD calculation.

Certified By:

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

AGAT Laboratories

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES
PROJECT: Alliston (1101-4125)
SAMPLING SITE:Alliston

AGAT WORK ORDER: 21T798235
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:C. MacPhee

Water Analysis

RPT Date: Sep 14, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Anion Scan															
Fluoride	2954187		<0.05	<0.05	NA	< 0.05	99%	70%	130%	101%	80%	120%	110%	70%	130%
Chloride	2954187		135	132	2.2%	< 0.10	94%	70%	130%	100%	80%	120%	107%	70%	130%
Nitrate as N	2954187		<0.07	<0.07	NA	< 0.05	98%	70%	130%	102%	80%	120%	111%	70%	130%
Nitrite as N	2954187		<0.05	<0.05	NA	< 0.05	96%	70%	130%	95%	80%	120%	108%	70%	130%
Bromide	2954187		0.89	0.77	14.5%	< 0.05	104%	70%	130%	105%	80%	120%	108%	70%	130%
Sulphate	2954187		322	323	0.3%	< 0.10	101%	70%	130%	101%	80%	120%	NA	70%	130%
Phosphate as P	2954187		<0.13	<0.13	NA	< 0.10	105%	70%	130%	103%	80%	120%	100%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Total Metals in water (mg/L)															
Total Aluminum	2936001		<0.010	<0.010	NA	< 0.010	98%	70%	130%	105%	80%	120%	108%	70%	130%
Total Antimony	2936001		<0.003	<0.003	NA	< 0.003	100%	70%	130%	98%	80%	120%	100%	70%	130%
Total Arsenic	2936001		<0.003	<0.003	NA	< 0.003	92%	70%	130%	105%	80%	120%	105%	70%	130%
Total Barium	2936001		<0.002	<0.002	NA	< 0.002	98%	70%	130%	99%	80%	120%	100%	70%	130%
Total Beryllium	2936001		<0.0005	<0.0005	NA	< 0.0005	94%	70%	130%	103%	80%	120%	105%	70%	130%
Total Bismuth	2936001		<0.002	<0.002	NA	< 0.002	93%	70%	130%	108%	80%	120%	110%	70%	130%
Total Boron	2936001		<0.010	<0.010	NA	< 0.010	96%	70%	130%	104%	80%	120%	105%	70%	130%
Total Cadmium	2936001		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	100%	80%	120%	98%	70%	130%
Total Chromium	2936001		<0.003	<0.003	NA	< 0.003	97%	70%	130%	99%	80%	120%	105%	70%	130%
Total Cobalt	2936001		<0.0005	<0.0005	NA	< 0.0005	99%	70%	130%	101%	80%	120%	107%	70%	130%
Total Copper	2936001		<0.001	<0.001	NA	< 0.001	97%	70%	130%	100%	80%	120%	106%	70%	130%
Total Iron	2936001		<0.010	<0.010	NA	< 0.010	103%	70%	130%	107%	80%	120%	108%	70%	130%
Total Lead	2936001		<0.001	<0.001	NA	< 0.001	101%	70%	130%	102%	80%	120%	105%	70%	130%
Total Manganese	2936001		<0.002	<0.002	NA	< 0.002	100%	70%	130%	102%	80%	120%	103%	70%	130%
Total Mercury	2936001		<0.0001	<0.0001	NA	< 0.0001	105%	70%	130%	98%	80%	120%	100%	70%	130%
Total Molybdenum	2936001		<0.002	<0.002	NA	< 0.002	101%	70%	130%	102%	80%	120%	110%	70%	130%
Total Nickel	2936001		<0.003	<0.003	NA	< 0.003	98%	70%	130%	103%	80%	120%	106%	70%	130%
Total Phosphorus	2936001		<0.10	<0.10	NA	< 0.10	103%	70%	130%	96%	80%	120%	115%	70%	130%
Total Selenium	2936001		<0.002	<0.002	NA	< 0.002	99%	70%	130%	112%	80%	120%	105%	70%	130%
Total Silicon	2936001		<0.08	<0.08	NA	< 0.08	91%	70%	130%	97%	80%	120%	107%	70%	130%
Total Silver	2936001		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	103%	80%	120%	109%	70%	130%
Total Strontium	2936001		<0.005	<0.005	NA	< 0.005	99%	70%	130%	103%	80%	120%	106%	70%	130%
Total Thallium	2936001		<0.0003	<0.0003	NA	< 0.0003	93%	70%	130%	107%	80%	120%	107%	70%	130%
Total Tin	2936001		<0.002	<0.002	NA	< 0.002	94%	70%	130%	100%	80%	120%	100%	70%	130%
Total Titanium	2936001		<0.002	<0.002	NA	< 0.002	105%	70%	130%	88%	80%	120%	97%	70%	130%
Total Uranium	2936001		<0.0005	<0.0005	NA	< 0.0005	103%	70%	130%	104%	80%	120%	106%	70%	130%

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T798235**
PROJECT: Alliston (1101-4125) | **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE:Alliston | **SAMPLED BY:C. MacPhee**

Water Analysis (Continued)

RPT Date: Sep 14, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Total Vanadium	2936001		<0.002	<0.002	NA	< 0.002	98%	70%	130%	99%	80%	120%	104%	70%	130%
Total Zinc	2936001		<0.005	<0.005	NA	< 0.005	97%	70%	130%	100%	80%	120%	109%	70%	130%
Total Zirconium	2936001		<0.004	<0.004	NA	< 0.004	95%	70%	130%	100%	80%	120%	106%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Cations in Water - Total (mg/L)

Total Calcium	2936001		<0.10	<0.10	NA	< 0.10	97%	70%	130%	96%	80%	120%	95%	70%	130%
Total Magnesium	2936001		<0.10	<0.10	NA	< 0.10	101%	70%	130%	100%	80%	120%	98%	70%	130%
Total Potassium	2936001		<0.50	<0.50	NA	< 0.50	100%	70%	130%	100%	80%	120%	100%	70%	130%
Total Sodium	2936001		<0.10	<0.10	NA	< 0.10	96%	70%	130%	95%	80%	120%	99%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES
PROJECT: Alliston (1101-4125)
SAMPLING SITE:Alliston

AGAT WORK ORDER: 21T798235
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:C. MacPhee

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T798235**
PROJECT: Alliston (1101-4125) | **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE:Alliston | **SAMPLED BY:C. MacPhee**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Total Calcium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Magnesium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Potassium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Sodium	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Aluminum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Bismuth	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Phosphorus	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silicon	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES **AGAT WORK ORDER: 21T798235**
PROJECT: Alliston (1101-4125) **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE:Alliston **SAMPLED BY:C. MacPhee**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

AGAT Laboratories

Mi-bi

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 21T798235

Cooler Quantity: 1 large

Arrival Temperatures: 9.7 | 9.6 | 8.9

Custody Seal Intact: ☐ Yes ☐ No ☒ N/A

Notes: free Ice

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: CF Crozier & associates
Contact: Caitlyn MacPhee
Address: Suite 100, 2800 highpoint dr, Milton, ON
Phone: Fax:
Reports to be sent to:
1. Email: cmacphee@cfcrozier.ca
2. Email: cgerrits@cfcrozier.ca

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 — Table (Indicate One): ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One): ☐ Coarse ☐ Fine
☐ Excess Soils R406 — Table (Indicate One)
☐ Regulation 558
☐ CCME
☐ Sewer Use — ☐ Sanitary ☐ Storm — Region
☐ Prov. Water Quality Objectives (PWQO)
☐ Other (Indicate One)

Is this submission for a Record of Site Condition? ☐ Yes ☐ No

Report Guideline on Certificate of Analysis: ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: Alliston (1101-4125)
Site Location: Alliston
Sampled By: C. MacPhee
AGAT ID #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company: C.F. Crozier & associates
Contact: Elaine Plewes
Address: 1 First St. Suite 200 Collingwood
Email: eplewes@cfcrozier.ca

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	Metals & Inorganics	Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No	PAHs	Total PCBs ☐ Aroclor	VOC	Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs	Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	E. Coli	total coliforms					Potentially Hazardous or High Concentration (Y/N)
T1	09/07	3 PM	5	GW	metals field filtered w/ 0.45 µm	✓	✓	✓									✓	✓					
T2	↓	330 PM	5	GW		✓	✓	✓									✓	✓					
T3	↓	11 AM	5	GW		✓	✓	✓									✓	✓					
T4	↓	12 PM	5	GW		✓	✓	✓									✓	✓					
T5	↓	1 PM	5	GW		✓	✓	✓									✓	✓					
		AM PM																					
		AM PM																					
		AM PM																					
		AM PM																					
		AM PM																					
		AM PM																					

Column groups: O. Reg 153 (Metals & Inorganics through VOC); O. Reg 558 (Landfill Disposal Characterization TCLP); O. Reg 406 (Excess Soils columns).

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Caitlyn MacPhee	09/07	6:00pm	NEAL		

'21 SEP 7 6:06PM

Page 1 of 1

Nº: T124170

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4
905-875-0026

ATTENTION TO: Caitlyn Macphee

PROJECT: Alliston(1101-4125)

AGAT WORK ORDER: 21T781957

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Aug 06, 2021

PAGES (INCLUDING COVER): 12

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

Notes

Certificate of Analysis

AGAT WORK ORDER: 21T781957
PROJECT: Alliston(1101-4125)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE: **SAMPLED BY:**

Total Coliforms & E. Coli (Using MI Agar)

DATE RECEIVED: 2021-07-30 **DATE REPORTED: 2021-08-06**

			SAMPLE DESCRIPTION:	MW1	MW2	MW3	MW4	MW5
			SAMPLE TYPE:	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-07-30 09:00	2021-07-30 09:30	2021-07-30 10:00	2021-07-30 11:30	2021-07-30 12:00
Parameter	**Unit**	**G / S**	**RDL**	**2801012**	**2801148**	**2801149**	**2801150**	**2801151**
Escherichia coli	CFU/100mL		2	ND	ND	ND	ND	ND
Total Coliforms	CFU/100mL		100	3100	700	800	1500	2800

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

2801012-2801151 ND - Not Detected.
If RDL >1 indicates dilutions of the sample.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

CHARTERED NIVINE BASILY CHEMIST — ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Results relate only to the items tested. Results apply to samples as received.

Certificate of Analysis

AGAT WORK ORDER: 21T781957
PROJECT: Alliston(1101-4125)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE: **SAMPLED BY:**

Anion Scan

DATE RECEIVED: 2021-07-30 **DATE REPORTED: 2021-08-06**

			SAMPLE DESCRIPTION:	MW1	MW2		MW3		MW4		MW5
			SAMPLE TYPE:	Water	Water		Water		Water		Water
			DATE SAMPLED:	2021-07-30 09:00	2021-07-30 09:30		2021-07-30 10:00		2021-07-30 11:30		2021-07-30 12:00
Parameter	**Unit**	**G / S**	**RDL**	**2801012**	**2801148**	**RDL**	**2801149**	**RDL**	**2801150**	**RDL**	**2801151**
Fluoride	mg/L		0.05	<0.05	0.20	0.05	<0.05	0.05	<0.05	0.05	<0.05
Chloride	mg/L		0.10	20.0	23.9	0.12	236	0.49	1100	0.10	48.7
Nitrate as N	mg/L		0.05	5.93	8.57	0.05	<0.05	0.14	0.90	0.05	0.74
Nitrite as N	mg/L		0.05	0.25	0.33	0.05	<0.05	0.11	<0.11	0.05	0.38
Bromide	mg/L		0.05	<0.05	<0.05	0.05	<0.05	0.11	<0.11	0.05	<0.05
Sulphate	mg/L		0.10	14.0	53.2	0.10	30.5	0.38	42.6	0.10	56.3
Phosphate as P	mg/L		0.10	<0.10	<0.10	0.10	<0.10	0.26	<0.26	0.10	<0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
2801149-2801150 Dilution required, RDL has been increased accordingly.
Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
SAMPLING SITE:
ATTENTION TO: Caitlyn Macphee
SAMPLED BY:

Total Metals in water (mg/L)

DATE RECEIVED: 2021-07-30 **DATE REPORTED: 2021-08-06**

			SAMPLE DESCRIPTION:	MW1	MW2	MW3	MW4	MW5
			SAMPLE TYPE:	Water	Water	Water	Water	Water
			DATE SAMPLED:	2021-07-30 09:00	2021-07-30 09:30	2021-07-30 10:00	2021-07-30 11:30	2021-07-30 12:00
Parameter	Unit	G / S	RDL	2801012	2801148	2801149	2801150	2801151
Total Aluminum	mg/L		0.010	1.41	0.022	0.045	0.027	0.014
Total Antimony	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Arsenic	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Barium	mg/L		0.002	0.060	0.136	0.226	0.407	0.140
Total Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Bismuth	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Boron	mg/L		0.010	0.012	0.087	0.084	0.100	0.063
Total Cadmium	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Chromium	mg/L		0.003	0.003	<0.003	<0.003	<0.003	<0.003
Total Cobalt	mg/L		0.0005	0.0007	<0.0005	<0.0005	0.0008	<0.0005
Total Copper	mg/L		0.001	0.005	0.004	0.003	0.004	0.004
Total Iron	mg/L		0.010	1.54	0.013	0.053	0.030	0.013
Total Lead	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Manganese	mg/L		0.002	0.063	0.059	0.043	0.082	0.054
Total Mercury	mg/L		0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Molybdenum	mg/L		0.002	<0.002	0.006	0.002	0.004	0.002
Total Nickel	mg/L		0.003	0.004	<0.003	<0.003	<0.003	<0.003
Total Phosphorus	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Selenium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Silicon	mg/L		0.08	12.1	7.89	6.11	8.40	8.27
Total Silver	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Strontium	mg/L		0.005	0.246	0.520	0.869	1.52	0.580
Total Thallium	mg/L		0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Total Tin	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Titanium	mg/L		0.002	0.085	<0.002	0.003	0.004	0.003
Total Uranium	mg/L		0.0005	0.0010	0.0035	0.0026	0.0016	0.0033
Total Vanadium	mg/L		0.002	0.003	<0.002	<0.002	<0.002	<0.002
Total Zinc	mg/L		0.005	0.012	<0.005	<0.005	<0.005	0.005
Total Zirconium	mg/L		0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Certified By: Iris Verástegui

Certificate of Analysis

AGAT WORK ORDER: 21T781957
PROJECT: Alliston(1101-4125)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CROZIER & ASSOCIATES
ATTENTION TO: Caitlyn Macphee
SAMPLING SITE:
SAMPLED BY:

Total Metals in water (mg/L)

DATE RECEIVED: 2021-07-30 **DATE REPORTED: 2021-08-06**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T781957**
PROJECT: Alliston(1101-4125) | **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE: | **SAMPLED BY:**

Microbiology Analysis

RPT Date: Aug 06, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Total Coliforms & E. Coli (Using MI Agar)															
Escherichia coli	2801012	2801012	ND	ND	NA	< 1									
Total Coliforms	2801012	2801012	3100	2900	6.7%	< 1									

Comments: ND - Not Detected, NA - % RPD Not Applicable.

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T781957**

PROJECT: Alliston(1101-4125) | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE: | **SAMPLED BY:**

Water Analysis

RPT Date: Aug 06, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Anion Scan															
Fluoride	2799410		<0.05	<0.05	NA	< 0.05	103%	70%	130%	105%	80%	120%	97%	70%	130%
Chloride	2799410		121	121	0.0%	< 0.10	96%	70%	130%	102%	80%	120%	101%	70%	130%
Nitrate as N	2799410		<0.05	<0.05	NA	< 0.05	96%	70%	130%	100%	80%	120%	97%	70%	130%
Nitrite as N	2799410		<0.05	<0.05	NA	< 0.05	97%	70%	130%	93%	80%	120%	108%	70%	130%
Bromide	2799410		<0.05	<0.05	NA	< 0.05	103%	70%	130%	101%	80%	120%	98%	70%	130%
Sulphate	2799410		57.0	57.3	0.5%	< 0.10	97%	70%	130%	99%	80%	120%	97%	70%	130%
Phosphate as P	2799410		<0.10	<0.10	NA	< 0.10	104%	70%	130%	97%	80%	120%	96%	70%	130%
Total Metals in water (mg/L)															
Total Aluminum	2796934		0.576	0.607	5.2%	< 0.010	103%	70%	130%	104%	80%	120%	98%	70%	130%
Total Antimony	2796934		<0.003	<0.003	NA	< 0.003	98%	70%	130%	101%	80%	120%	101%	70%	130%
Total Arsenic	2796934		0.007	0.008	NA	< 0.003	95%	70%	130%	103%	80%	120%	104%	70%	130%
Total Barium	2796934		0.020	0.021	4.9%	< 0.002	101%	70%	130%	100%	80%	120%	101%	70%	130%
Total Beryllium	2796934		<0.0005	<0.0005	NA	< 0.0005	109%	70%	130%	107%	80%	120%	110%	70%	130%
Total Bismuth	2796934		<0.002	<0.002	NA	< 0.002	105%	70%	130%	104%	80%	120%	96%	70%	130%
Total Boron	2796934		0.126	0.131	3.9%	< 0.010	101%	70%	130%	102%	80%	120%	106%	70%	130%
Total Cadmium	2796934		<0.0001	<0.0001	NA	< 0.0001	101%	70%	130%	103%	80%	120%	102%	70%	130%
Total Chromium	2796934		0.029	0.028	3.5%	< 0.003	103%	70%	130%	99%	80%	120%	103%	70%	130%
Total Cobalt	2796934		<0.0005	<0.0005	NA	< 0.0005	103%	70%	130%	103%	80%	120%	103%	70%	130%
Total Copper	2796934		0.010	0.010	0.0%	< 0.001	99%	70%	130%	100%	80%	120%	100%	70%	130%
Total Iron	2796934		0.082	0.096	15.7%	< 0.010	105%	70%	130%	103%	80%	120%	100%	70%	130%
Total Lead	2796934		<0.001	<0.001	NA	< 0.001	104%	70%	130%	103%	80%	120%	96%	70%	130%
Total Manganese	2796934		0.130	0.131	0.8%	< 0.002	103%	70%	130%	101%	80%	120%	100%	70%	130%
Total Mercury	2798708		<0.0001	<0.0001	NA	< 0.0001	102%	70%	130%	100%	80%	120%	96%	70%	130%
Total Molybdenum	2796934		0.005	0.004	NA	< 0.002	104%	70%	130%	102%	80%	120%	109%	70%	130%
Total Nickel	2796934		0.436	0.446	2.3%	< 0.003	108%	70%	130%	101%	80%	120%	103%	70%	130%
Total Phosphorus	2796934		2.45	2.46	0.4%	< 0.10	98%	70%	130%	97%	80%	120%	104%	70%	130%
Total Selenium	2796934		0.012	0.012	0.0%	< 0.002	101%	70%	130%	101%	80%	120%	103%	70%	130%
Total Silicon	2796934		3.05	2.86	6.4%	< 0.08	106%	70%	130%	105%	80%	120%	95%	70%	130%
Total Silver	2796934		<0.0001	<0.0001	NA	< 0.0001	102%	70%	130%	102%	80%	120%	88%	70%	130%
Total Strontium	2796934		3.23	3.20	0.9%	< 0.005	103%	70%	130%	101%	80%	120%	97%	70%	130%
Total Thallium	2796934		<0.0003	<0.0003	NA	< 0.0003	104%	70%	130%	102%	80%	120%	96%	70%	130%
Total Tin	2796934		0.014	0.013	7.4%	< 0.002	94%	70%	130%	94%	80%	120%	92%	70%	130%
Total Titanium	2796934		0.009	0.009	NA	< 0.002	104%	70%	130%	100%	80%	120%	104%	70%	130%
Total Uranium	2796934		<0.0005	<0.0005	NA	< 0.0005	105%	70%	130%	102%	80%	120%	102%	70%	130%
Total Vanadium	2796934		<0.002	<0.002	NA	< 0.002	106%	70%	130%	104%	80%	120%	108%	70%	130%
Total Zinc	2796934		0.292	0.263	10.5%	< 0.005	103%	70%	130%	104%	80%	120%	98%	70%	130%
Total Zirconium	2796934		<0.004	<0.004	NA	< 0.004	98%	70%	130%	102%	80%	120%	103%	70%	130%

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T781957**

PROJECT: Alliston(1101-4125) | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE: | **SAMPLED BY:**

Water Analysis (Continued)

RPT Date: Aug 06, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: NA signifies Not Applicable.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By: Iris Verástegui

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES | **AGAT WORK ORDER: 21T781957**

PROJECT: Alliston(1101-4125) | **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE: | **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

AGAT Laboratories

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES **AGAT WORK ORDER: 21T781957**
PROJECT: Alliston(1101-4125) **ATTENTION TO: Caitlyn Macphee**
SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Total Aluminum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Bismuth	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Phosphorus	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silicon	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CROZIER & ASSOCIATES **AGAT WORK ORDER: 21T781957**

PROJECT: Alliston(1101-4125) **ATTENTION TO: Caitlyn Macphee**

SAMPLING SITE: **SAMPLED BY:**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 21T781957

Cooler Quantity:

Arrival Temperatures: 13.6 | 14.1 | 14.2

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes: ice

Report Information:

Company: C.F. Crozier + Associates
Contact: Caitlyn MacPhee
Address: 2800 High Point dr suite 100, Milton ON L9T 6P4
Phone: Fax:
Reports to be sent to:
1. Email: cmacphee@cfcrozier.ca
2. Email: krentsch@cfcrozier.ca

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04
Table ___ *Indicate One*
☐Ind/Com
☐Res/Park
☐Agriculture
Soil Texture *(Check One)*
☐Coarse
☐Fine

☐ Excess Soils R406
Table ___ *Indicate One*
☐ Regulation 558
☐ CCME

☐ Sewer Use
☐Sanitary ☐Storm
___ *Region*
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
___ *Indicate One*

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☑ No

Project Information:

Project: Alliston (1101-4125)
Site Location: Alliston, ON
Sampled By: Caitlyn MacPhee
AGAT ID #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company: C.F. Crozier + Associates
Contact: Elaine Plewes
Address: 2800 high pt dr, Milton
Email: eplewes@cfcrozier.ca

Sample Matrix Legend

- **B** Biota
- **GW** Ground Water
- **O** Oil
- **P** Paint
- **S** Soil
- **SD** Sediment
- **SW** Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	Metals - ☐ CrVI, ☑ Hg, ☐ HWSB	BTEX, F1-F4 PHCs / Analyze F4G if required ☐ Yes ☐ No	PAHs	Total PCBs ☐ Aroclor	VOC	O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs	Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	E. Coli	Total Coliforms	HPC	Anions / Nitrate & Nitrite			Potentially Hazardous or High Concentration (Y/N)
MW1	07/30	9:00 AM	8	GW		Y	✓	✓									✓	✓	✓	✓			
MW2	07/30	9:30 AM	8	GW		Y	✓	✓									✓	✓	✓	✓			
MW3	07/30	10:00 AM	8	GW		Y	✓	✓									✓	✓	✓	✓			
MW4	07/30	11:50 AM	8	GW		Y	✓	✓									✓	✓	✓	✓			
MW5	07/30	12:00 PM	8	GW		N	✓	✓									✓	✓	✓	✓			

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Caitlyn MacPhee CM	07/30	2:15	Simran		2:18

'21 JUL 30 2:18PM

Page ___ of ___

Nº: T 117274

APPENDIX I

D-5-4 Impact Assessment

Table 1: D-5-4 Impact Assessment

CROZIER CONSULTING ENGINEERS

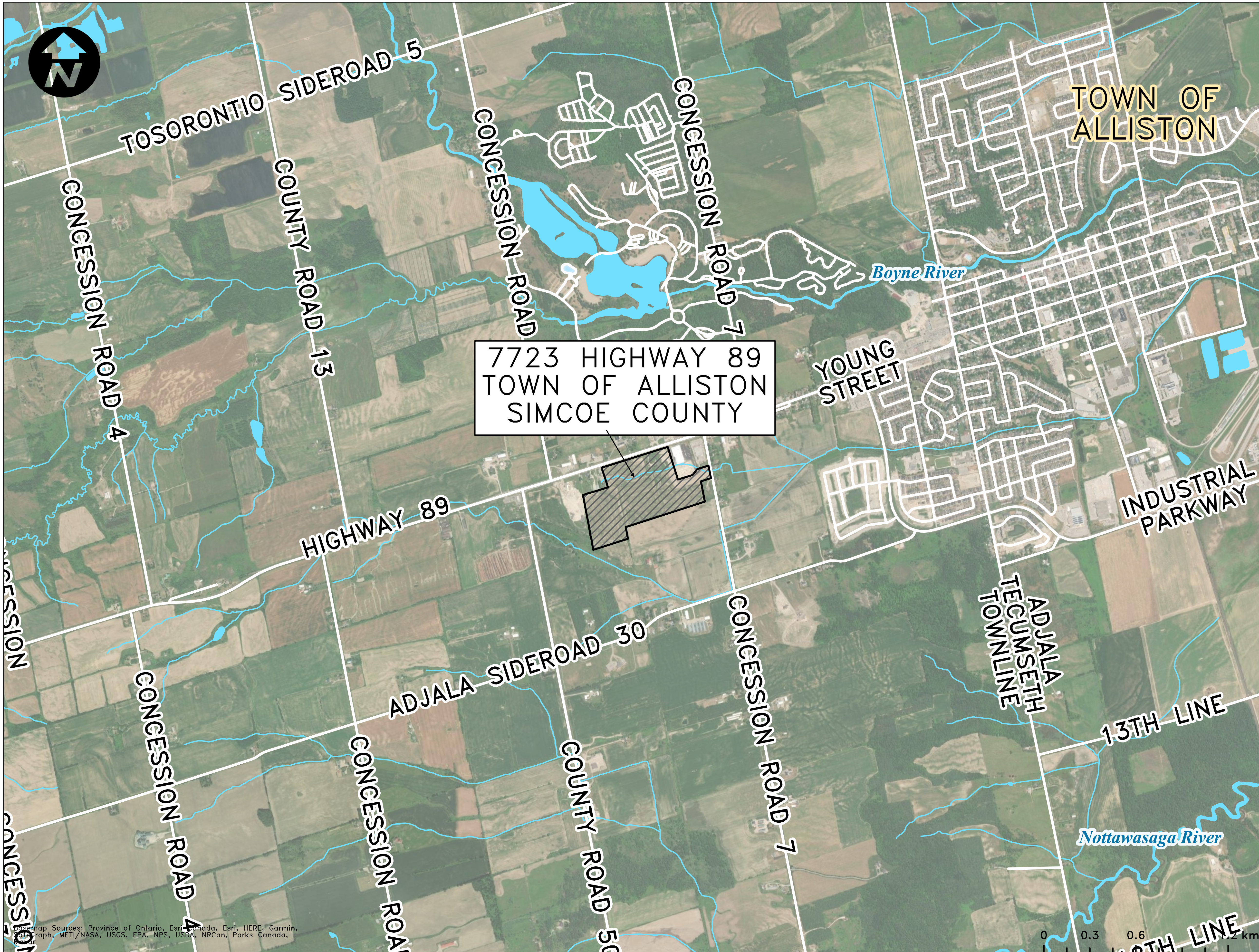
Project Name: Pilla Alliston 7723 HWY 89
Project Number: 1101-4125
Date: 7/6/2021
Designed By: AL
Checked By: KR

D-5-4 IMPACT ASSESSMENT

Calculate the Nitrate Concentration at a Boundary (Property *or* Surface Water)

Parameter	Value	Unit	Notes:
Infiltration Volume			
Area of Dilution =	28.4	ha	Total area of site
Background Nitrate Quality in Groundwater =	3.24	mg/L	Average of nitrate sample concentrations for all wells 8/6/2021
Annual Infiltration Rate =	200	mm/m2/yr	MECP infiltration rate for silt loam
	5,479.45	L/ha/day	
Annual Infiltration Volume =	56,800	m^3/year	
Total Average Background Nitrate =	503,886	mg/day	
Sewage Effluent Volume			
Proposed Number of Lots	22		
Average Daily Volume of Sewage Effluent =	1,500	L/day	Max total daily sewage flow (3,750L/d) with average day peaking factor (2.5)
Number of Days of Operation/Use =	365	days/year	
Annual Volume of Sewage Effluent =	12,045	m^3/year	
Nitrate Concentration in wastewater =	40.0	mg/L	MECP standard effluent for conventional systems = 40 mg/L
Total Average Nitrate Loading =	1,320,000	mg/day	
Totals			
Total Dilutant = wastewater V + infiltration V =	68,845	m^3/year	
Nitrate Concentration in Percolate =	**9.67**	**mg/L**	Less than 10 mg/L, sufficient for D-5-4 Impact Assessment

FIGURES



KEY PLAN
SCALE: 1:100,000

LEGEND

- Property Limits
- Streets
- Waterbody
- Watercourse
- Water Label
- Street Label

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

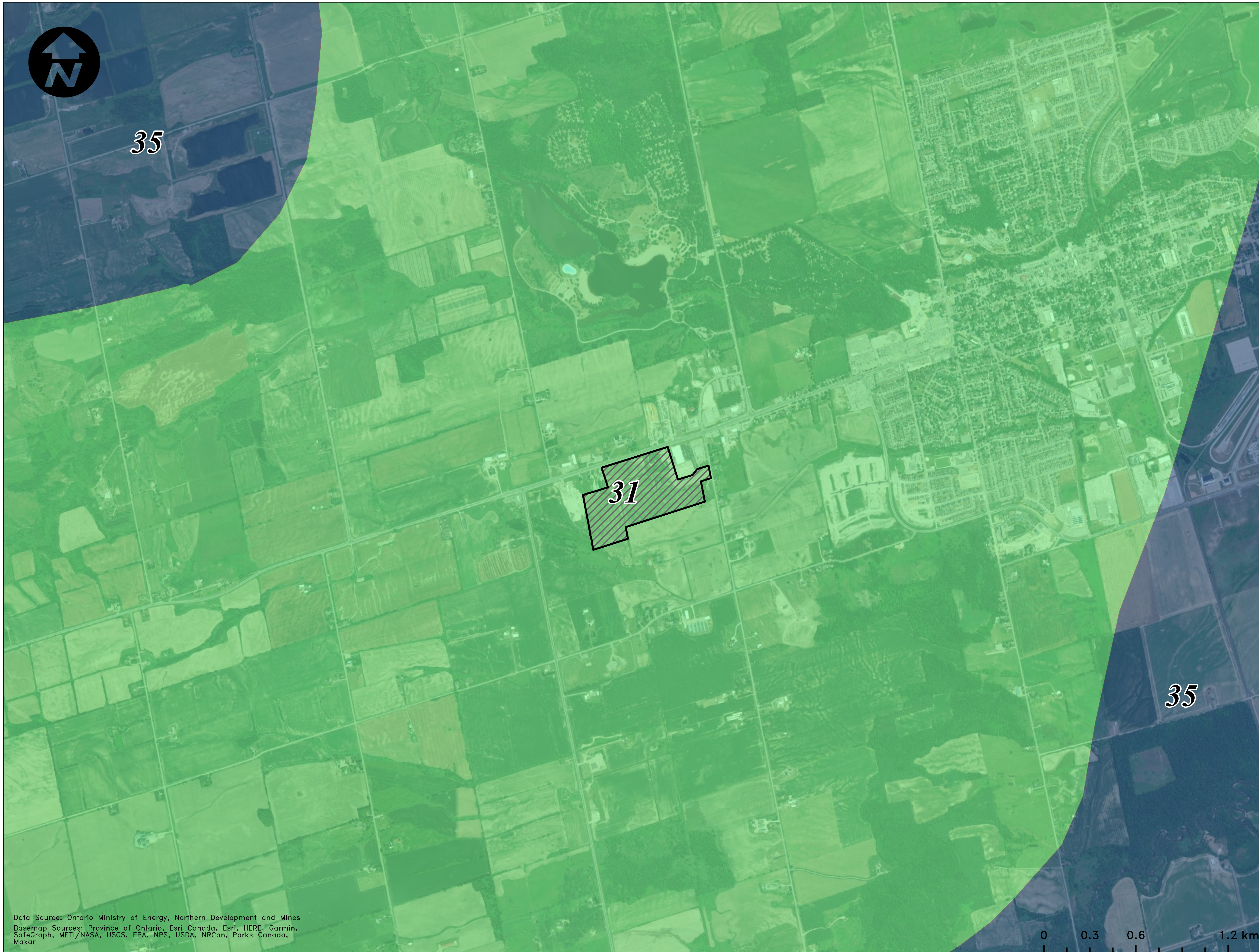
Project
7723 HIGHWAY 89
TOWN OF ALLISTON

Drawing
SITE LOCATION PLAN

CROZIER
CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No. 1101-4125	
Date 2021-11-24	Projection EPSG:26917	Scale 1:24,000	Dwg. FIG. 01

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx



KEY PLAN
SCALE: 1:100,000

LEGEND

Property Limits

Physiographic Region

31: Peterborough Drumlin Field

35: Simcoe Lowlands

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

7723 HIGHWAY 89
TOWN OF ALLISTON

Drawing

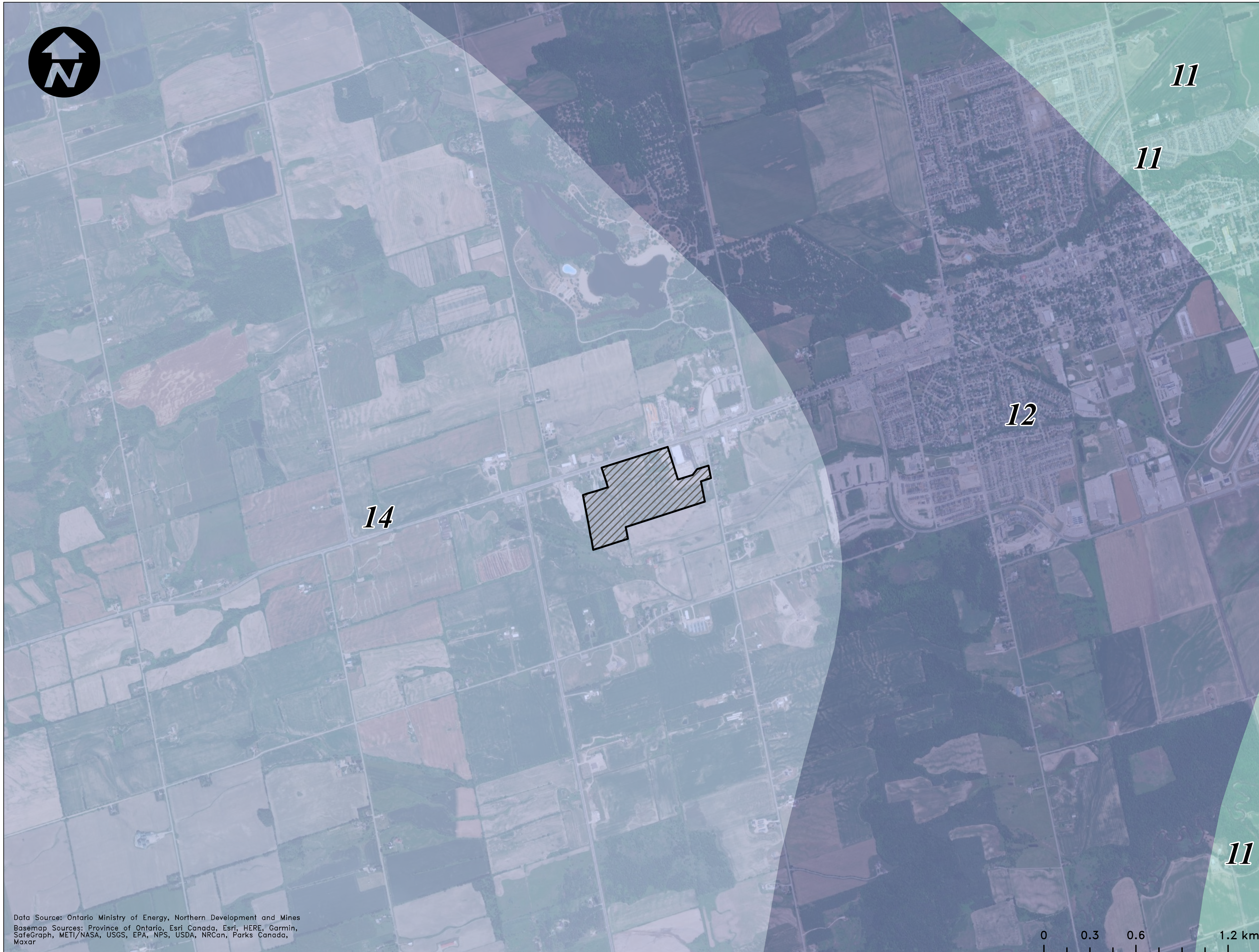
PHYSIOGRAPHY

CROZIER
CONSULTING ENGINEERS

2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No.	1101-4125
Date 2021-11-24	Projection EPSG:26917	Scale 1:24,000	Dwg. FIG. 02

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx



LEGEND

Property Limits

Bedrock Formation

11 Lindsay Formation: grey, fine to coarse limestone

12 Blue Formation: black shale, thin limestone interbeds

14 Georgian Bay: green-grey shale, limestone interbeds

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

7723 HIGHWAY 89
TOWN OF ALLISTON

Drawing

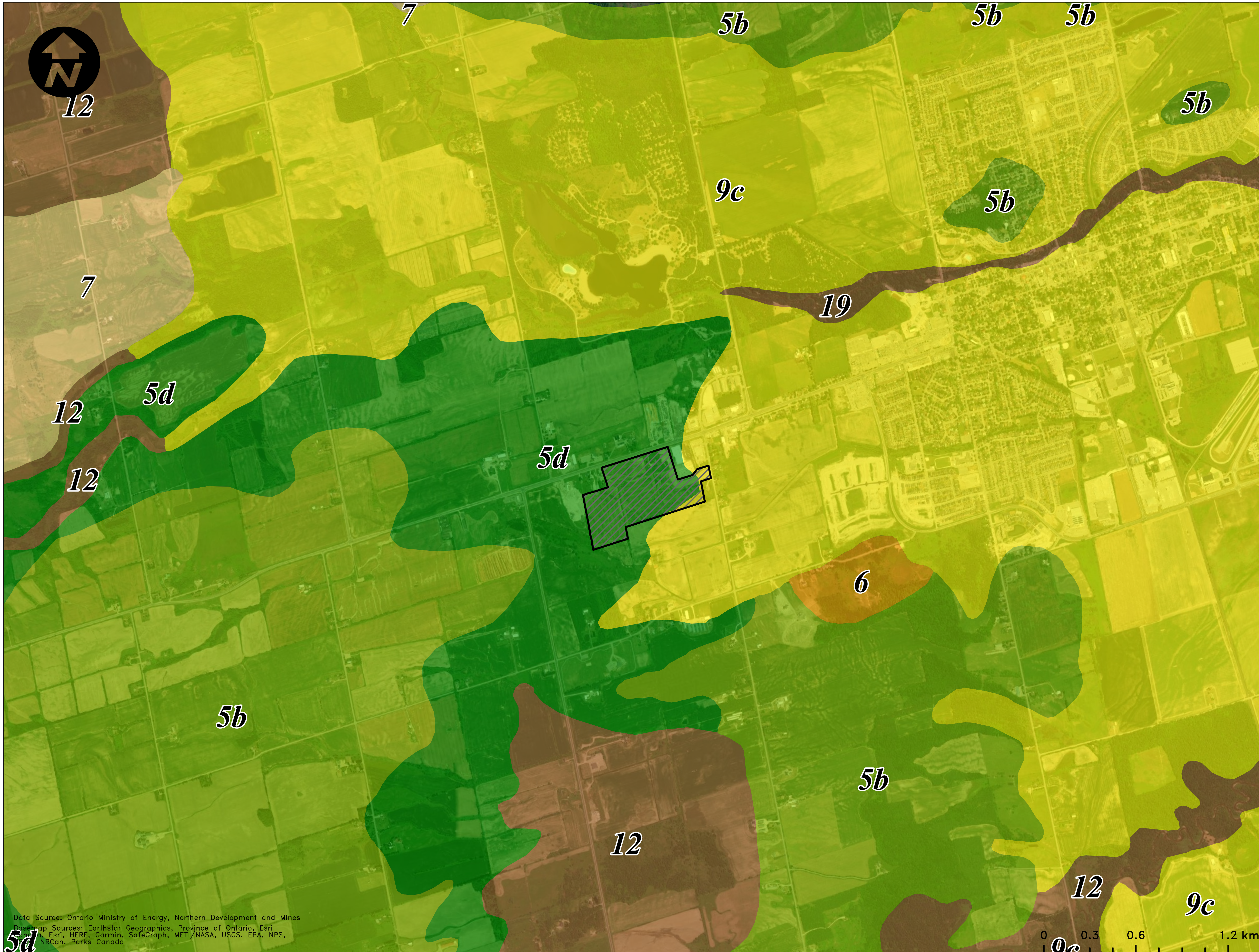
BEDROCK GEOLOGY

CROZIER CONSULTING ENGINEERS

2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No. 1101-4125	
Date 2021-11-24	Projection EPSG:26917	Scale 1:24,000	Dwg. FIG. 03

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx



KEY PLAN
SCALE: 1:100,000

LEGEND

Property Limits

Surficial Geology

- 19: clay, silt, sand, gravel
- 12: clay, silt, sand, gravel
- 9c: sand, silt
- 7: sand
- 6: sand, gravel
- 5b: silty to sandy till, stone-poor
- 5d: silty to clayey till

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

7723 HIGHWAY 89
TOWN OF ALLISTON

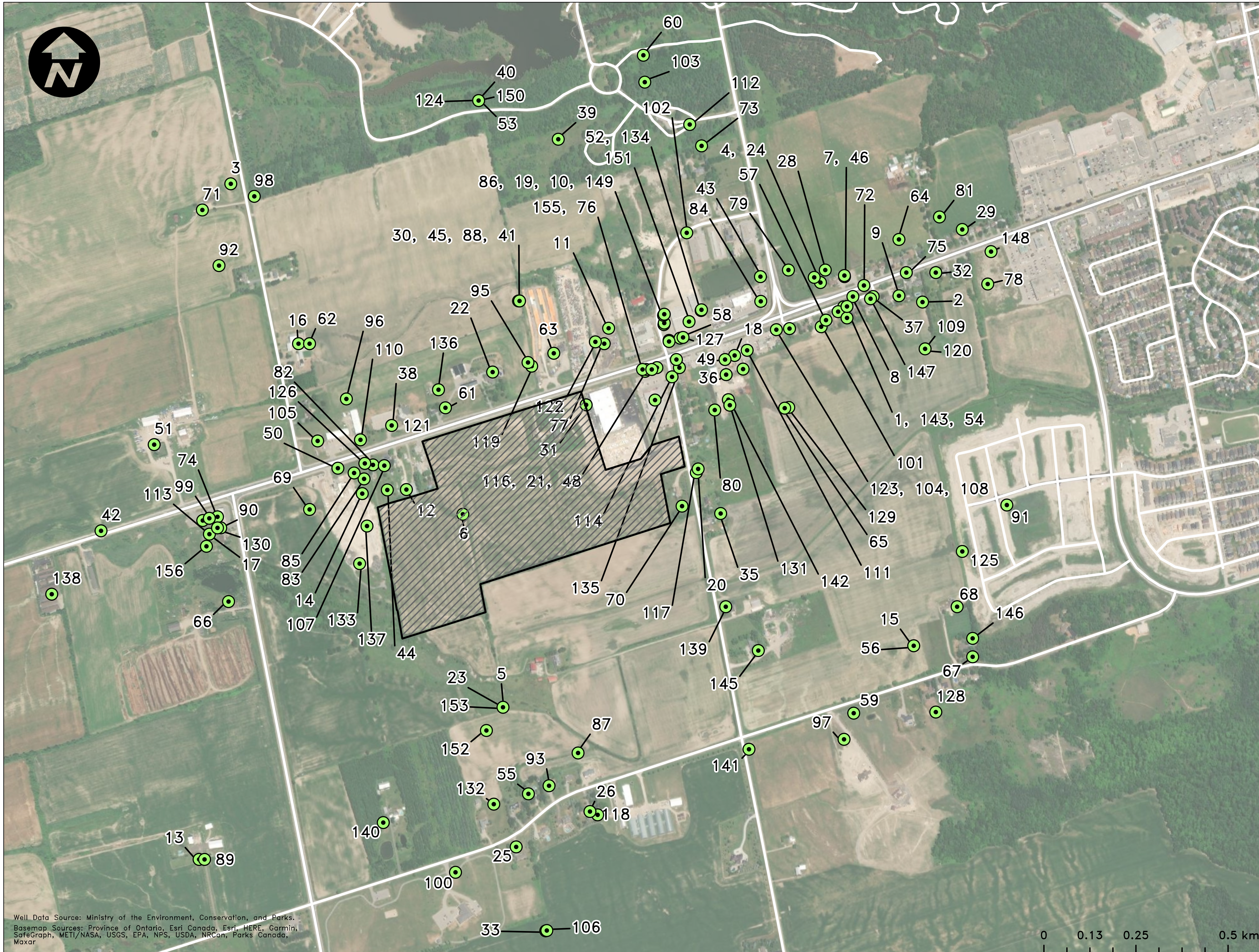
Drawing

SURFICIAL GEOLOGY

CROZIER
CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No. 1101-4125	
Date 2021-11-24	Projection EPSG:26917	Scale 1:24,000	Dwg. FIG. 04

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx



LEGEND

- Property Limits
- MECP Wells
- Streets
- 48 Key Number - Refer to Appendix A

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

7723 HIGHWAY 89
TOWN OF ALLISTON

Drawing

MECP WELL LOCATION PLAN

CROZIER CONSULTING ENGINEERS

2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No. 1101-4125	
Date 2021-11-24	Projection EPSG:26917	Scale 1:10,000	Dwg. FIG. 05

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx

KEY PLAN
SCALE: 1:100,000

LEGEND

- Property Limits
- Test Wells
- Monitoring Wells
- Streets
- MW1-21 Well Label

DRAWING NOTES:

THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART OF IT WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

7723 HIGHWAY 89
TOWN OF ALLISTON

Drawing

WELL LOCATION PLAN

CROZIER
CONSULTING ENGINEERS

2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn C.M.	Design C.G.	Project No. 1101-4125	
Date 2021-11-24	Projection EPSG:26917	Scale 1:4,000	Dwg. FIG. 06

J:\1100\1101-Joe Pilla\4125-7723 HWY 89\Design\GIS\APRXs\7723_HWY_89\7723_HWY_89.aprx