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July 30, 2025
File: 1645.00-102

Brittany Mulhern, MCIP RPP
Associate
FOTENN Planning + Design
The Woolen Mill
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Subject: Hydrogeological Evaluation Update for Part of Lots 19 & 20 Concession 1, Leeds and the Thousand Islands, Ontario

Dear Mr. Hamilton:

Malroz Engineering Inc. (Malroz) was retained FOTENN Planning + Design (the Client), to conduct an update to a hydrogeological evaluation that was previously completed by Oliver, Mangione, McCalla and Associates Limited[1]. The evaluation was completed to address The United Counties of Leeds and Grenville's conditions and amendments to final plan approval for registration of subdivision, file no. 08-T-92002, specifically comments 23 and 24:

23. Prior to final approval, the report prepared by Oliver, Mangione, McCalla and Associates Limited entitled "Regina Residential Subdivision Hydrogeological and Terrain Analysis Report" Part of Lots 19 and 20, Concession 1 in the Township of Front of Leeds and Lansdowne, dated February 1991 and all addendums will be updated by a qualified professional to conform with current requirements. The study will also be peer reviewed by the Township's/Counties peer reviewer at the applicant's expense and any recommendations implemented through the Township's subdivision agreement with provisions to be included by the owner in all Offers of Purchase and Sale. The updated study, peer review and implementation of recommendations through the subdivision agreement must be complete prior the release of Condition 23 by the Counties and the Township.

The updated report must address the following provincial guidelines and requirements:

a) *Guideline D-5. Planning for Sewage and Water Services. Ontario Ministry of the Environment, August 1996;*

[1] Oliver Mangione McCalla & Associates Limited, Consulting Engineers. (1991). Regina Residential Subdivision Hydrogeology & Terrain Analysis Report, Part Lots 19 & 20, Concession 1, Front of Leeds & Lansdowne Township. Kingston, Ontario.

b) *Procedure D-5-4. Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment. Ontario Ministry of the Environment, August 1996;*
c) *Procedure D-5-5. Private Wells: Water Supply Assessment. Ontario Ministry of the Environment, August 1996.*
d) *Retesting of any of the wells used for the original study to ensure that the water quantity and quality are adequate for the proposed development. Additional wells may be required.*
e) *Review local land uses (including the adjacent retirement community) and include a survey of neighbouring groundwater users to determine if any potential issues with groundwater quality or quantity exist.*

24. That the existing recommendations from the report prepared by Oliver, Mangione, McCalla and Associates Limited entitled "Regina Residential Subdivision Hydrogeological and Terrain Analysis Report", dated February 1991 are to be updated through Condition 23. At a minimum, the subdivision agreement and all Offers of Purchase and Sale will contain this letter report has been prepared to address the above noted comments.

We understand that an updated terrain analysis will be required to support final approval, which is to be completed once lot fabric and development layout details are finalized,.

1.0 Introduction

The subject site is located on Parts of Lots 19 and 20, Concession 1 in the township of Leeds and the Thousand Islands. The subject site is bounded by Highway 401 to the north and the Thousand Islands Parkway to the south. The proposed plan includes the subdivision of the subject site into 25 single family lots as shown on the attached Draft Plan of Subdivision and Figure 1.

1.1 Review of Prior OMM&A Report

A report completed for the subject site by Oliver, Mangione, McCalla & Associates Limited (OMM&A) dated February 1991[2] was provided. The report contemplated 26 lots at the site and recommended approval.

The investigation included gathering geological and hydrogeological background information on the subject site from publicly available information.

[2] Oliver Mangione McCalla & Associates Limited, Consulting Engineers. (1991). Regina Residential Subdivision Hydrogeology & Terrain Analysis Report, Part Lots 19 & 20, Concession 1, Front of Leeds & Lansdowne Township. Kingston, Ontario.

Five water wells, (referred to herein as the test wells TWI through TWV) were installed on the site. The water wells were installed by Jack Knox Well Drilling a licensed water well contractor. A copy of the water well records (WWRs) is attached.

On-site conditions were assessed through the construction and testing of three test wells installed into bedrock at depths ranging from 35 to 38 mbg. Three six-hour pumping tests were performed on the on-site wells and two water quality samples were collected from each well, one from the beginning and one from the end of each pumping test.

The overburden conditions were investigated by advancing 21 test pits to a maximum depth of 3.3 mbg (or refusal on bedrock) across the subject site and during the drilling of the test wells.

Interviews were conducted with two neighbouring homeowners regarding their groundwater supplies, groundwater quality samples were also collected from these locations.

The conclusions enumerated in the report are summarized below:

1. The water wells records within a 5 km radius were reviewed and indicated all but three out of the 60 well records obtained exceeded the pumping rate of 13.6 L/min which was considered the minimum to supply a single-family residence.

2. Results of the on-site pumping tests indicate sufficient groundwater to supply single family residences.

3. Hydraulic interconnection was not observed between the on-site test wells and as a result unacceptable mutual well interference is not anticipated.

4. Recommendations for installation of wells on-site to prevent contamination from local infiltration of surface water.

5. For the parameters analyzed, the five wells that were tested, (three on-site an two off-site) met the criteria for chemical and bacteriological parameters related to health. The following elevated concentrations were noted:

    a. Sodium concentrations exceeded the 20mg/L warning level, but not the 200mg/L aesthetic objective on each of the 3 wells that were tested;
    b. Total organic nitrogen (TON) exceeded the aesthetic objective of 0.15 mg/L at TWI;
    c. Manganese exceeded the aesthetic objective of 0.05 mg/L in TWII;
    d. Total dissolved solids (TDS) was assumed to have exceeded the aesthetic objective of 500 mg/L based on conductivity levels above 800 µmhos in TWI and TWII.

6. Due to the type of overburden encountered on-site (mainly clay) fully raised Class IV absorption trench sewage disposal systems were recommended to meet the conditions of Ontario Regulation 374/81.

2.0 Methodology

The scope of the hydrogeological assessment included the following:

1. Inspection of each previously installed well by a licensed water well contractor.
2. Manually monitor water levels in the test wells prior to and during each pumping test.
3. Instrument the test wells, and the drinking water well located at Fox Run By The River Retirement Residence (well tag #A100275), the neighboring property to the east, with a groundwater data logger (levelogger) to automatically record water levels during the pumping tests and up to 24 hours after the tests for the duration of groundwater recovery.
4. Conduct an approximate 6-hour pumping test at four of the test wells (one more pumping test than conducted in the 1991 OMM&A Report) on test wells TWI, TWIII, TWIV, and TWV, to evaluate the yield of the wells and assess for well interference. A pumping test was not performed on TWII as it had previously been damaged.
5. Collect two water samples from the test wells (TWI, TWIII, TWIV, and TWV): one during the first hour of pumping (or when free of residual chlorine), and one during the last hour of the pumping test. Submit to an independent accredited analytical laboratory for typical subdivision suite of analyses.
6. Evaluate the water quality, quantity, and potential for well interference based on collected and available data.

The pumping tests were conducted on July 11, July 12, July 21 and July 26, 2022, by MacLellan Water Technologies (MacLellan), a licensed well contractor. The pumping tests were conducted for a total pumping time of 6 hours each. The results of the pumping tests are presented in Table 1.

To monitor for well interference, a well access request letter was sent to the property owners of the Fox Run by The River Retirement Residence. This was identified as a nearby property with likely high groundwater usage compared to a single family home. Permission to access the well (#A100275), was obtained and the well was instrumented with a levelogger.

The test well and observation well locations were surveyed using a Trimble R10 Global Navigation Satellite System device (Trimble GNSS). The locations of the test wells and observation well are indicated on Figure 1.

2.1 Water Quantity

Pumping tests were conducted in TWI, TWIII, TWIV, and TWV. On the day of the pumping tests, a submersible pump was installed approximately 1 metre above the bottom of the wells. Water levels were measured using a Solinst levelogger installed in the test wells, measuring water levels at 5 minute intervals for the duration of the pumping tests and for approximately 24 hours after completion of the tests. The drawdown in the test wells was also manually monitored during the tests to confirm water levels.

Water was pumped from the test wells at a rate of approximately 18.9 litres per minute for the duration of the pumping tests.

2.2 Groundwater Quality

The test wells were shock chlorinated prior to each of the pumping tests. Upon initiation of the pumping test, free chlorine was monitored in the water. A water sample was collected from the test wells approximately one hour after the start of pumping test, once monitoring indicated that the discharge water was free of chlorine. A subsequent sample was collected during the final hour of the pumping tests in accordance with the D-5-5 guideline.

A second pumping and sampling event was conducted on February 22, 2023 to resample wells for bacteria. The test wells were shocked and upon initiation of the pumping free chlorine was monitored in the water. A sample was collected after monitoring indicated that the discharge water was free of chlorine.

The samples were collected into laboratory-prepared bottles and submitted to Caduceon Environmental Laboratories (Caduceon). The pumping test samples were analyzed for a typical subdivision suite of analyses. During the subsequent pumping and sampling event the samples were analyzed for Escherichia Coli (E. Coli) and Total Coliforms.

2.3 Well Interference

The potential for well interference was assessed during the pumping tests by monitoring the drawdown at the other test wells and at the observation well (#A100275). Leveloggers were installed in these wells and configured to record water levels at 5 minute intervals prior to the pumping tests and until approximately 24 hours after the pumping tests.

3.0 Results and Discussion

3.1 Water Quantity

A summary of the well information and results of the pumping test are included in Table 1 (enclosed). Results from the manual measurements and levelogger data recording the drawdown of the wells during the pumping tests are enclosed as Figure 2a to 2d. Based on the proposed development of a single residential dwelling per proposed lot, comprising 4 bedrooms for a total of 5 people, and assuming per-person water demand of 450 litres per day, we calculated an anticipated daily water demand of 2,250 litres. Approximately 6,800 litres of water was pumped from the test wells over a period of 6 hours each. This is approximately 3 times the peak daily water demand calculated for the proposed lots should the lots be fully occupied. Environment Canada[3] reports that average daily demand per person is approximately 274 litres per day. The volume pumped during each test was approximately 5 times the average daily demand for a house occupied by 5 people.

The static water levels and maximum observed drawdown in the test wells are provided in Table 1 (attached). A summary of observations is provided below:

- The first pumping test was conducted on TWI on July 11, 2022. A maximum drawdown of approximately 6.1 m (to a depth of approximately 14.6 metres below the top of the well casing (mbTOC) was observed and approximately 24.4 meters of water remained in the well at the completion of the pumping test. TWI returned to 95% of the initial water level, within approximately 4 hours and 55 minutes after the completion of the pumping test.

- The second pumping test was conducted on TWIV on July 12, 2022. A maximum drawdown of approximately 0.5 m (to a depth of approximately 7.4 mbTOC) was observed and approximately 23.9 meters of water remained in the well at the completion of the pumping test. TWIV returned to 95% of the initial water level, within approximately 2 hours after the completion of the pumping test.

- The third pumping test was conducted on TWV on July 21, 2022. A maximum drawdown of approximately 3.2 m (to a depth of approximately 8.6 mbTOC) was observed and approximately 41.1 meters of water remained in the well at the completion of the pumping test. TWV returned to 95% of the initial water level, within approximately 9 hours and 53 minutes after the completion of the pumping test.

[3] Environment Canada. 2011. Municipal Water Use, 2009 Statistics. Ottawa https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/residential-water-use.html

- The fourth pumping test was conducted on TWIII on July 26, 2022. A maximum drawdown of approximately 5.6 m (to a depth of approximately 10.1 mbTOC) was observed and approximately 26.8 meters of water remained in the well at the completion of the pumping test. TWV returned to 95% of the initial water level, within approximately 10 minutes after the completion of the pumping test.

During the 6-hour pumping tests conducted at TWI, TWIII, TWIV, and TWV, level loggers were utilized to monitor the water levels in the test wells and the observation well (#A100275) located at Fox Run by the River Retirement Residence. Water level data collected from the observation well (#A100275) between July 8 and 28, 2022 indicates a trend of approximately 2 meters of drawdown per day followed by recovery over approximately 8 hours. The observed drawdown in this well seems to be associated with the water usage by the occupants of Fox Run by the River Retirement Residence (refer to Figure 3 attached).

3.2 Water Quality Assessment

Results of the water quality analyses are summarized in Table 2 (enclosed) and are discussed briefly below. Laboratory certificates of analyses are enclosed.

Results from the sampling events generally met the ODWQS, objectives and guidelines, with the following exceptions:

- Turbidity was reported above the ODWS aesthetic objective in the samples collected from TWV during the first and last hour of pumping and from TWIII during the first hour of pumping.

- Hardness was reported above the ODWS operational guideline in the samples collected from TWI, TWIV, TWV, and TWIII during the first and last hour of pumping.

- Iron and manganese were reported above the ODWS aesthetic objectives in the samples collected from TWV during the first and last hour of pumping and from TWIII during the first hour of pumping.

- Sodium was reported above the ODWS aesthetic objectives in the samples collected from TWIV, TWV, TIII during the first and last hour of pumping and from TWI during the last hour of pumping.

- The presence of Total Coliform was reported in the samples collected during the first and last hour from TWIII and TWIV on July 26, 2022 and July 21, 2022 respectively. Test wells TWIII and TWIV were resampled On February 22, 2023 to further evaluate the Total Coliforms detections. The resampling results showed that E. Coli and Total Coliforms were not detected.

3.3 Well Interference

During the 6-hour pumping tests performed at TWI, TWIII, TWIV, and TWV, the water levels in the test wells and the observation well (#A100275) located at Fox Run by the River Retirement Residence were monitored through the use of level loggers. A Review of the data indicates that during the pumping tests only the pumping well exhibited drawdown related to pumping (see Figures 2a to 2d, attached).

Water level data collected from the observation well (#A100275) for the period of July 8 to 28, 2022 indicates a trend showing drawdown and recovery over an approximate 24-hour cycle. Observed drawdown in this well appears to be associated with water usage by the occupants of the Fox Run by the River Retirement Residence (see Figure 3, attached). Pumping tests conducted at the four test wells does not appear to contribute to the drawdown observed at the off-site observation well.

In our opinion, the recorded water level data indicates that the proposed water takings evaluated would not significantly interfere with the nearby monitored water wells considering the following:

- During the pumping tests the water levels in TWI, TWIII TWIV and TWV had a maximum drawdown of 0.5 to 6.1 m (to a depth of approximately 7.4 to 14.6 mBTOC) with approximately 80.0 to 97.9 % water column remaining at the end of the pumping tests. During these pumping tests approximately 3 times the peak daily water demand calculated for each proposed lot was pumped from the test wells.

- The test wells returned to 95% their initial water levels, within a period ranging from approximately 10 minutes to 9 hours and 53 minutes after the completion of the pumping tests.

4.0 Conclusions and Recommendations

Based on the findings of this study, these wells appear to have an adequate yield and water quality to support the proposed subdivision development, including 4 bedroom with 5 occupant residential dwellings, with an anticipated total peak daily water demand of 2,250 litres per day per lot. In our opinion the data further indicates that the water takings evaluated would not have an adverse impact on the nearby monitored water well located at the Fox Run by the River Retirement Residence. Due to the distance between the test wells, the effects of the radius of influence are unclear however significant impacts are not anticipated based on this study.

The findings of this Hydrogeological Evaluation Update are in general agreement with the conclusions presented in the Oliver, Mangione, McCalla and Associates Limited report entitled “Regina Residential Subdivision Hydrogeological and Terrain Analysis Report” Part of Lots 19 and 20, Concession 1 in the Township of Front of Leeds and

Lansdowne, dated February 1991. The current plan is a reduction from the previously proposed 26 lots down to the current proposed 25 lots. Additional recommendations for consideration are provided below:

- Concentrations of hardness exceeded the recommended ODWQS operational levels. Turbidity, and concentrations of iron and manganese, exceeded the aesthetic objectives. It is recommended that a water treatment specialist be consulted regarding the water quality and as a general best practice in maintaining a safe drinking water supply at the subject site.

- The presence of Total Coliform was reported in the samples collected during the first and last hour from TWIII and TWIV on July 26, 2022 and July 21, 2022 respectively. Test wells TWIII and TWIV were resampled On February 22, 2023 to further evaluate the Total Coliforms detections. The resampling results showed that E. Coli and Total Coliforms were not detected. Malroz recommends that drinking wells be equipped with an appropriate pre-filter and ultraviolet (UV) unit (or similar equipment) as a precautionary measure.

- Concentrations of nitrate should be considered as a part of the terrain and D-5-4 analyses.

- Concentrations of sodium exceeded the ODWS warning level but not the aesthetic objective. The ODQWS recommends that elevated sodium concentrations (above 20 mg/L) be reported to the local Medical Officer of Health (MOH). As a result, Malroz provided the attached letter to the Leeds and Grenville MOH on February 28, 2023. In addition, we recommend that a warning indicating elevated levels of sodium be included in future agreements of purchase and sale for the property.

In our opinion this investigation provides a reasonable characterization of the lands considered as part of the proposed development. It is also our opinion that this report satisfies conditions 23 and 24 as noted above, except the portions relating to the terrain and D-5-4 analyses which we understand is being conducted by others.

5.0 Closure

The findings reported in this document are based on the tasks completed by Malroz under the mutually agreed scope of work. Professional judgement, experience with similar investigations, and available data collected within the scope of work, form the basis for this letter. Malroz has prepared this letter using information understood to be factual and correct, and shall not be responsible for conditions arising from information or facts that were inaccurate, concealed, or not fully disclosed at the time of investigation.

This document has been prepared by Malroz for the sole use of FOTENN Planning + Design, in assessing the hydrogeological conditions at the proposed residential development in Leeds and the Thousand Islands, Ontario. Unauthorized reuse of this document for any other purpose, or by third parties, without the express written consent of Malroz, shall be at such party's sole risk without liability to Malroz. Malroz accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions taken based on this report.

Please contact us if you have any questions, comments, or concerns with respect to this document or the appended data.

Yours truly,

Malroz Engineering Inc. (Malroz)

PROFESSIONAL GEOSCIENTIST
JOHN ROBERT PYKE
PRACTISING MEMBER
1855
ONTARIO

per: John Pyke, P.Geo.
Environmental Geoscientist/Project Manager

encl.:
Thousand Island Parkway Subdivision – Draft Plan of Proposed Subdivision
Figure 1: Site Plan
Figure 2a to 2d: Pumping Test Water Levels
Figure 3: Observation Well Water Levels
Table 1: Pumping Test Summary
Table 2: Groundwater Analytical Results
Laboratory Certificates of Analyses
Test Well WWRs
Letter to Medical Officer of Health

DRAFT PLAN of PROPOSED SUBDIVISION

PART OF LOTS 19 & 20, CONCESSION 1

Geographic Township of Leeds

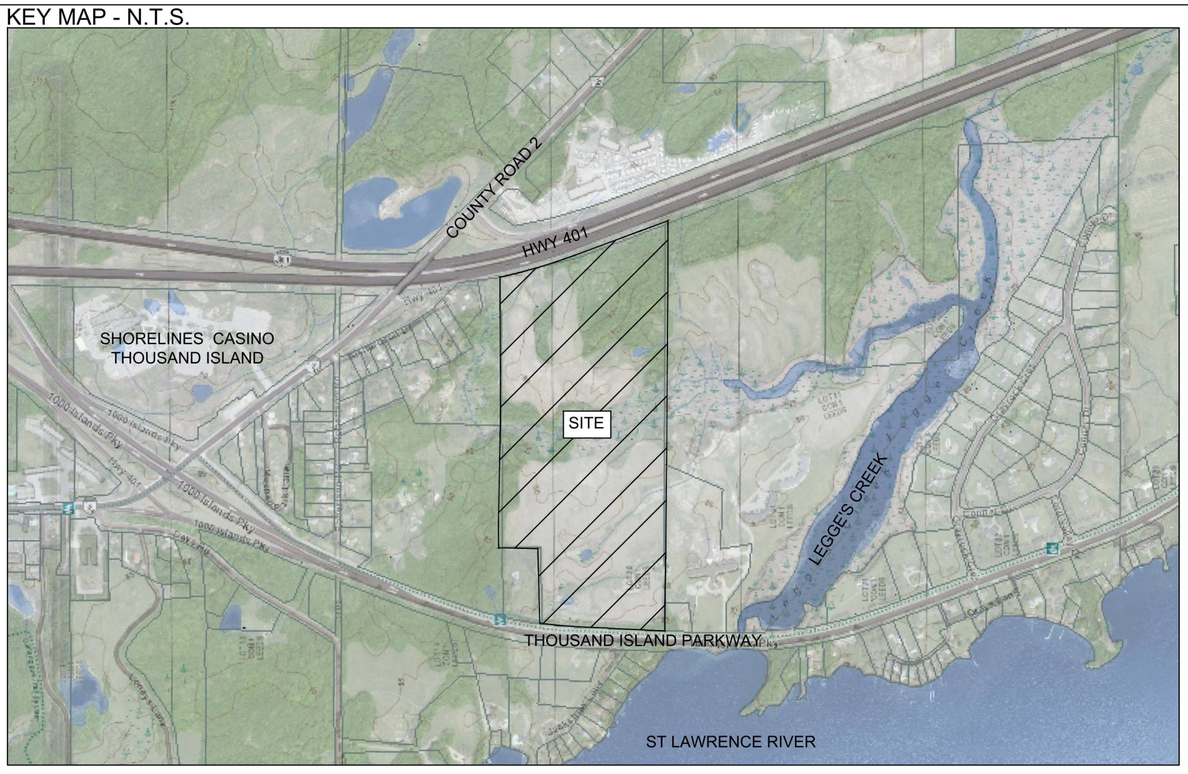
TOWNSHIP OF LEEDS AND THE THOUSAND ISLANDS

COUNTY of LEEDS

SCALE = 1:1500

0 40 80 m H=1:1500

KEY MAP - N.T.S.



Forefront Engineering Inc

FOREFRONT Engineering Inc.
1329 Gardiners Road, Suite 210, Kingston, Ontario, Canada, K7P 0L8
T613.634.9009 F888.884.9392

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51.17(A–L) OF THE PLANNING ACT

a: Shown on Draft Plan
b: Shown on Draft Plan
c: All Lands Owned, or In Which the Applicant Have An Interest Are Shown On the Key Plan.
d: Residential
e: Shown On Draft Plan
f: Shown On Draft Plan
g: Shown On Draft Plan
h: Well Supplied
i: Napanee Clay, and Rockland
j: Shown On Draft Plan
k: Road Maintenance, Garbage Collection, Phone, Cable, and Hydro
l: Shown on Draft Plan

OWNER'S CERTIFICATE

I, DAN GREENE, HEREBY AUTHORIZE FOREFRONT TO PREPARE AND SUBMIT THIS PLAN FOR REVIEW AND APPROVAL.

GREENE'S ELECTRIC, PLUMBING & HEATING LTD.

DAN GREENE.

DATE: _____

SURVEYOR'S CERTIFICATE

1. THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THE RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

HOPKINS CHITTY LAND SURVEYORS INC.

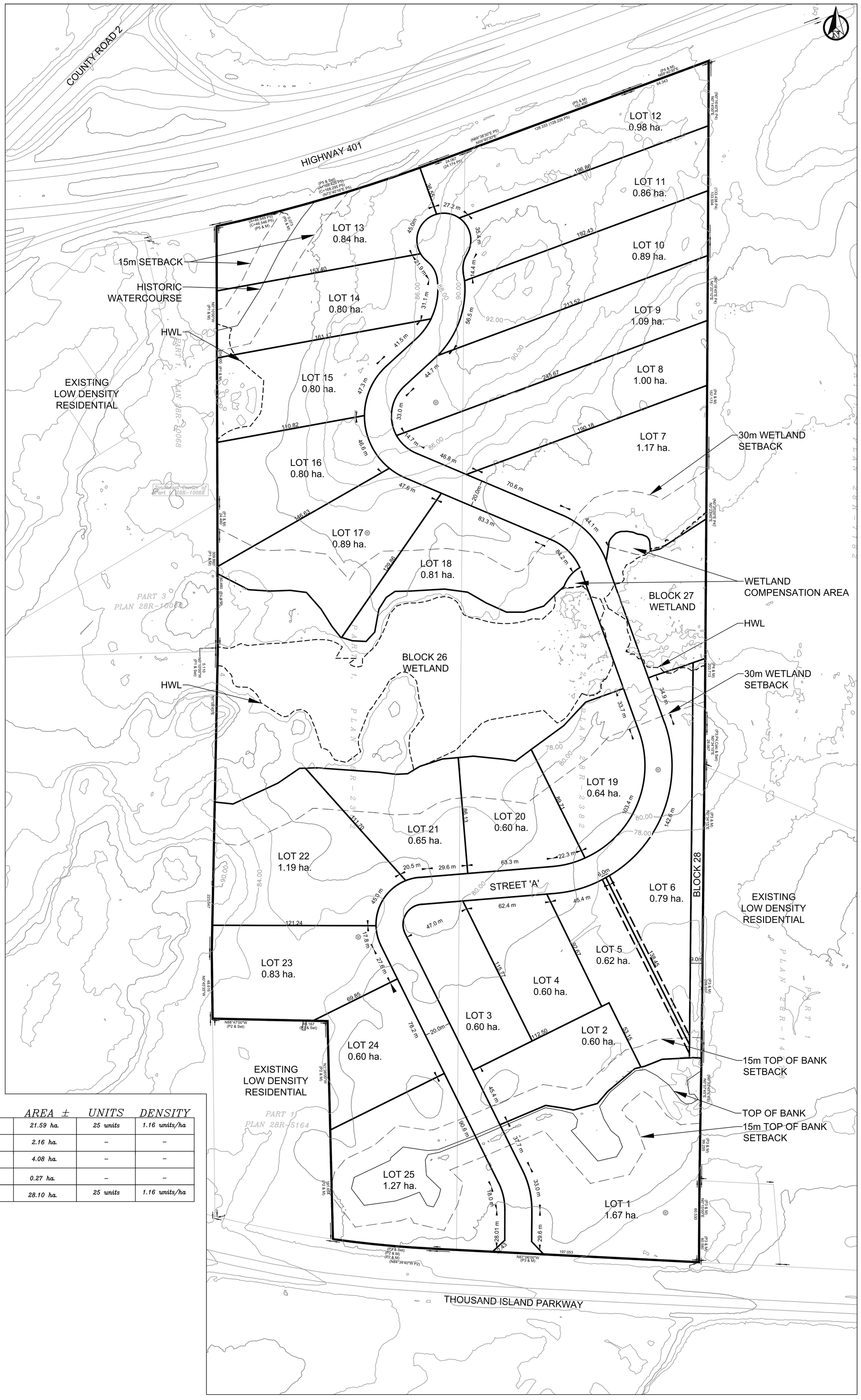
PHIL CHITTY – O.L.S.

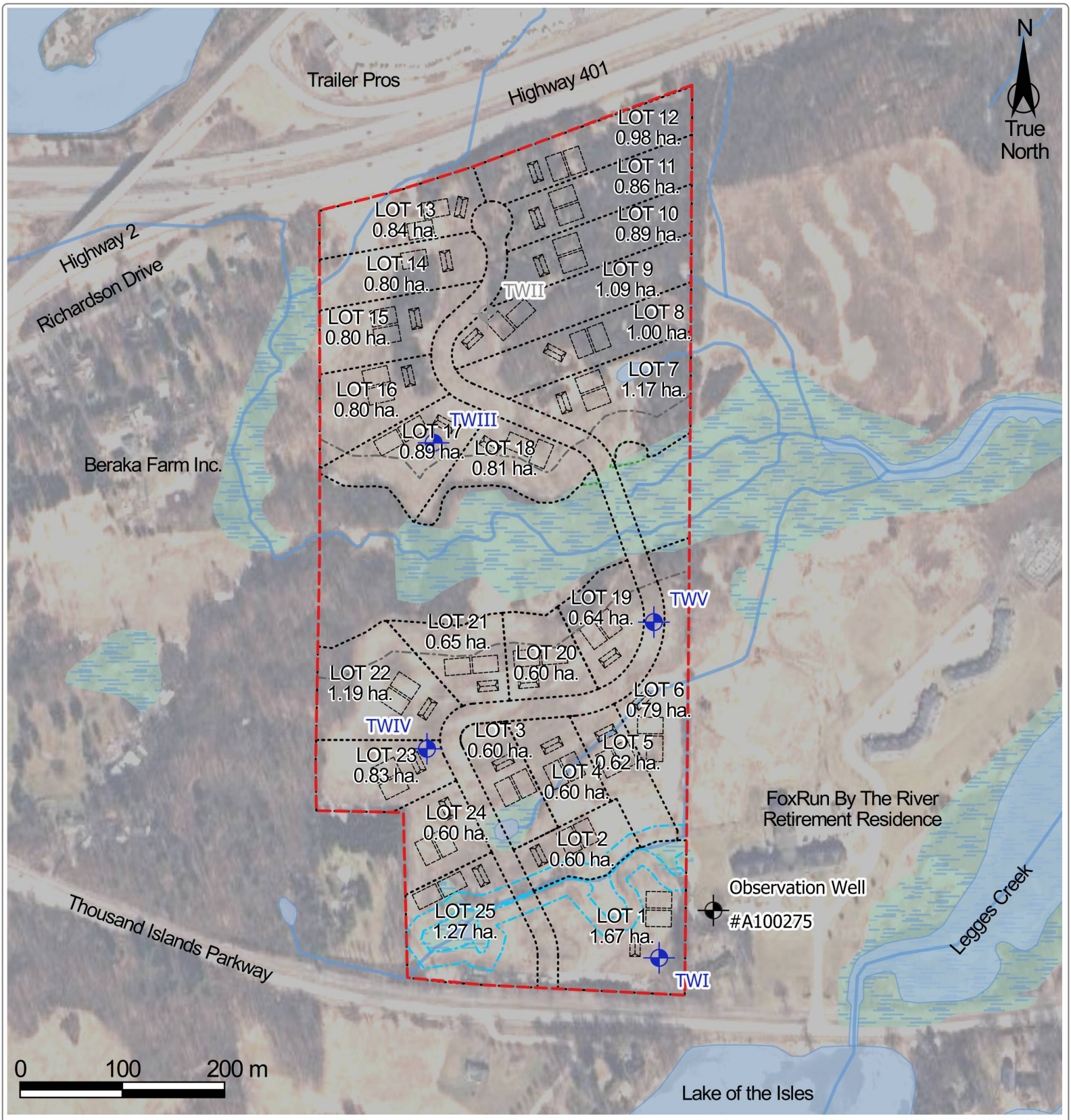
DATE: _____

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

SITE DATA

LAND USE	LOTS & BLOCKS	AREA ±	UNITS	DENSITY
SINGLE DETACHED	LOTS 1–25	21.59 ha.	25 units	1.16 units/ha
STREETS/RESERVES	STREET 'A'	2.16 ha.	–	–
WETLAND	BLOCK 26, BLOCK 27	4.08 ha.	–	–
AREA COMPENSATION	BLOCK 28	0.27 ha.	–	–
TOTAL		28.10 ha.	25 units	1.16 units/ha





Legend

- approximate subject site boundary
- wetlands
- surface water body
- surface water course
- proposed lots with houses
- proposed drainage features
- proposed creek offsets
- proposed wetlands
- approximate location of test wells
- approximate location of observation well
- approximate location of damaged test well not included in testing program

Data Sources:Figure based on Google Earth imagery, Ontario Geohub Open Data and Regina Residential Subdivision Hydrogeology & Terrain Analysis Report Part Lots 19 & 20, Concession 1 Front of Leeds & Lansdowne Township by Oliver, Magione, McCalla & Associates Dated February 1991.

Rev	Date	Description	By	Chkd
R0	2024-06-07	issued in final	ZL	JMP

Site Plan

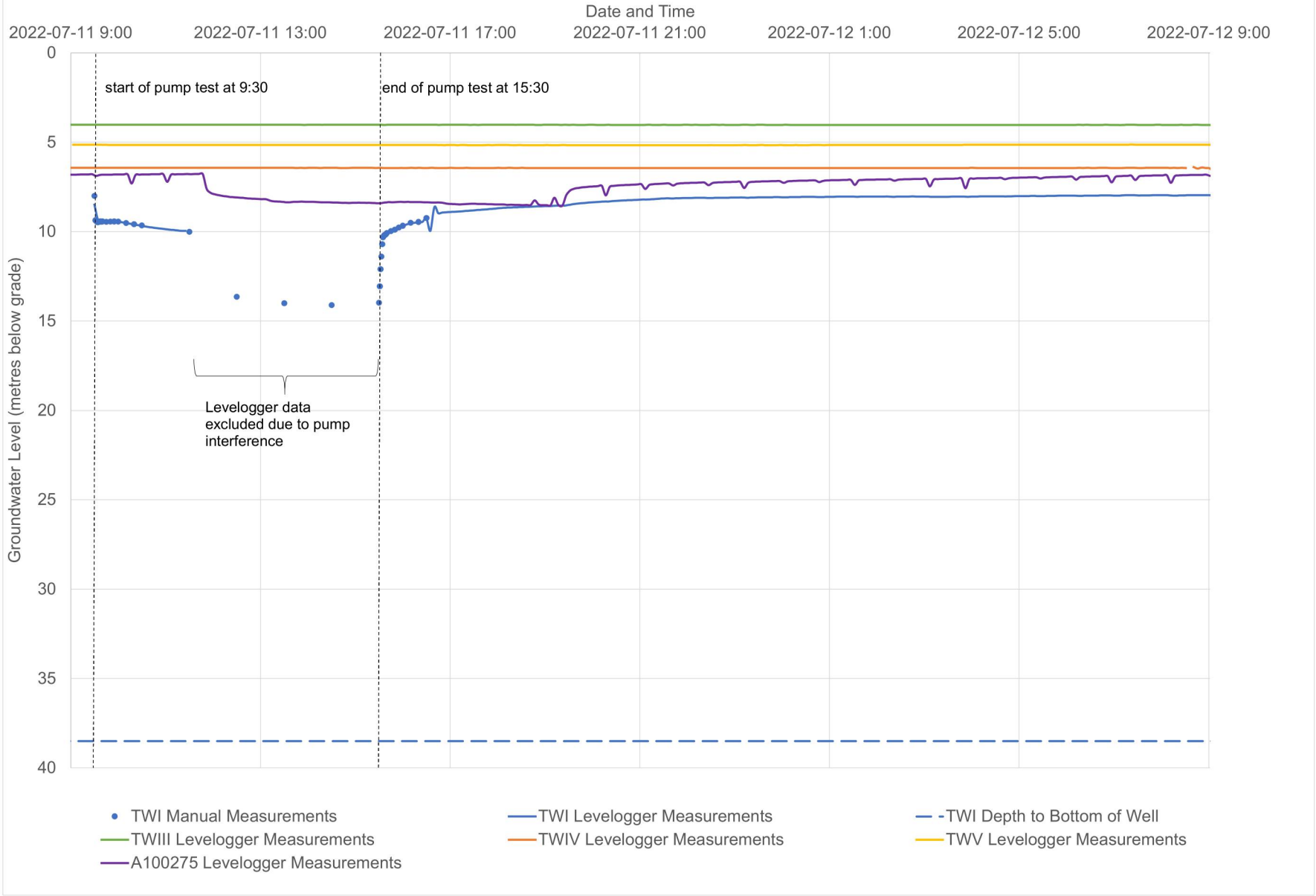
Hydrogeological Evaluation
Part of Lots 19 & 20 Concession 1,
Leeds and the Thousand Islands, ON

File: 1645.00-102

Figure 1

MALROZ

Figure 2a
Pump Test TWI - Water Level vs Time



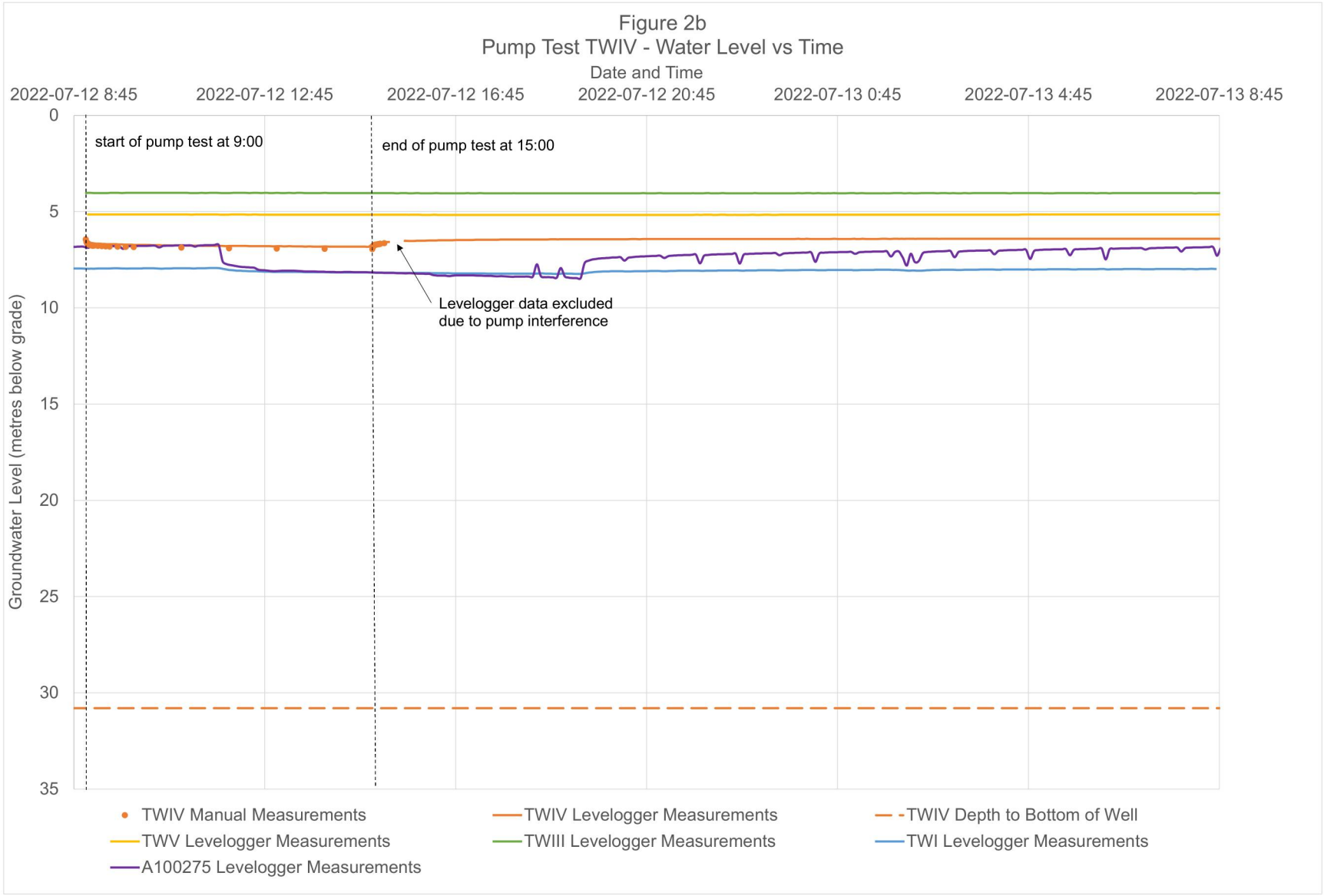

Figure 2b
Pump Test TWIV - Water Level vs Time
Date and Time
2022-07-12 8:45
2022-07-12 12:45
2022-07-12 16:45
2022-07-12 20:45
2022-07-13 0:45
2022-07-13 4:45
2022-07-13 8:45
Groundwater Level (metres below grade)
0
5
10
15
20
25
30
35
start of pump test at 9:00
end of pump test at 15:00
Levelogger data excluded due to pump interference
TWIV Manual Measurements
TWIV Levelogger Measurements
TWIV Depth to Bottom of Well
TWV Levelogger Measurements
TWIII Levelogger Measurements
TWI Levelogger Measurements
A100275 Levelogger Measurements

Figure 2c
Pump Test TWV - Water Level vs Time

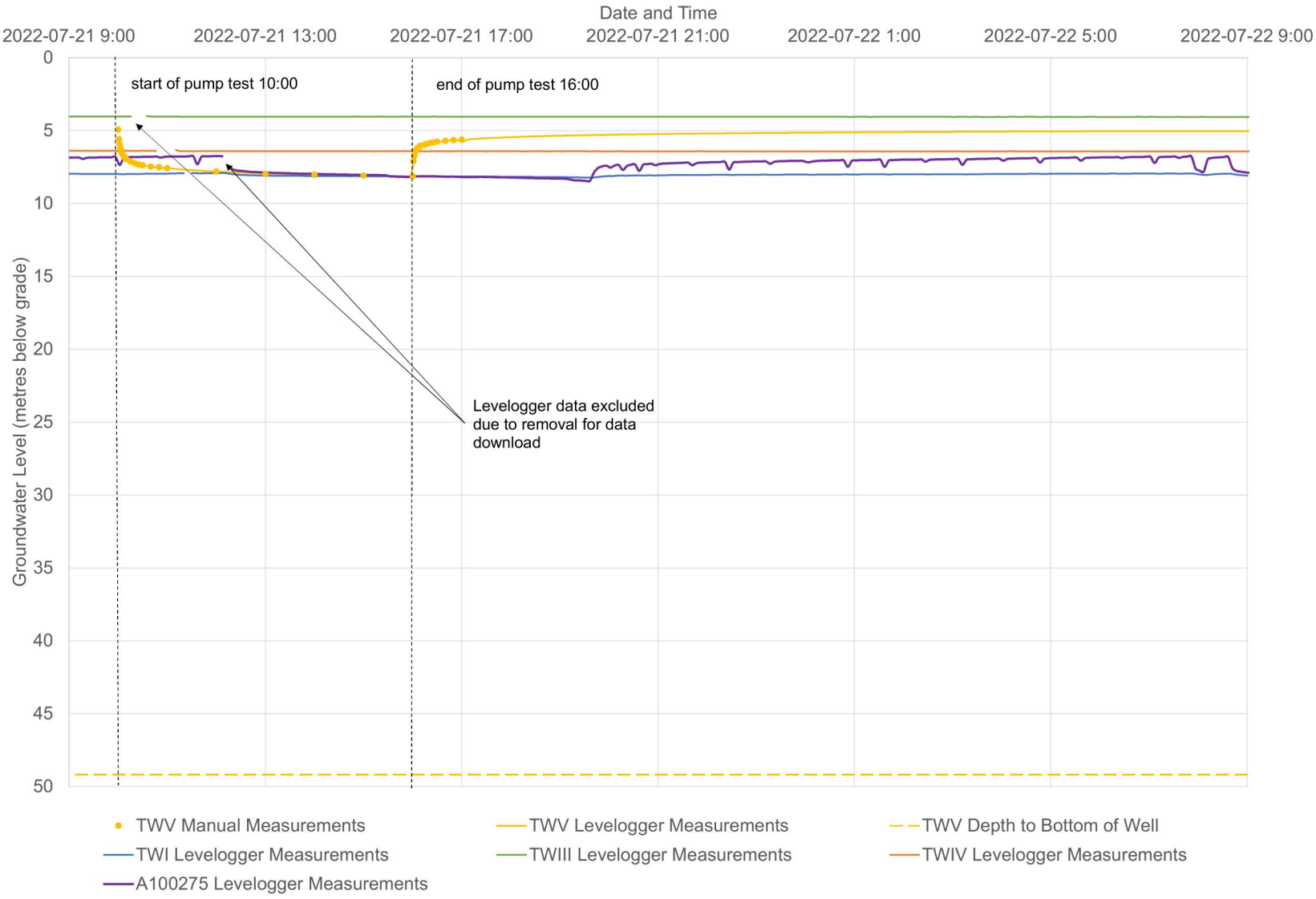


Figure 2d
Pump Test TWIII - Water Level vs Time

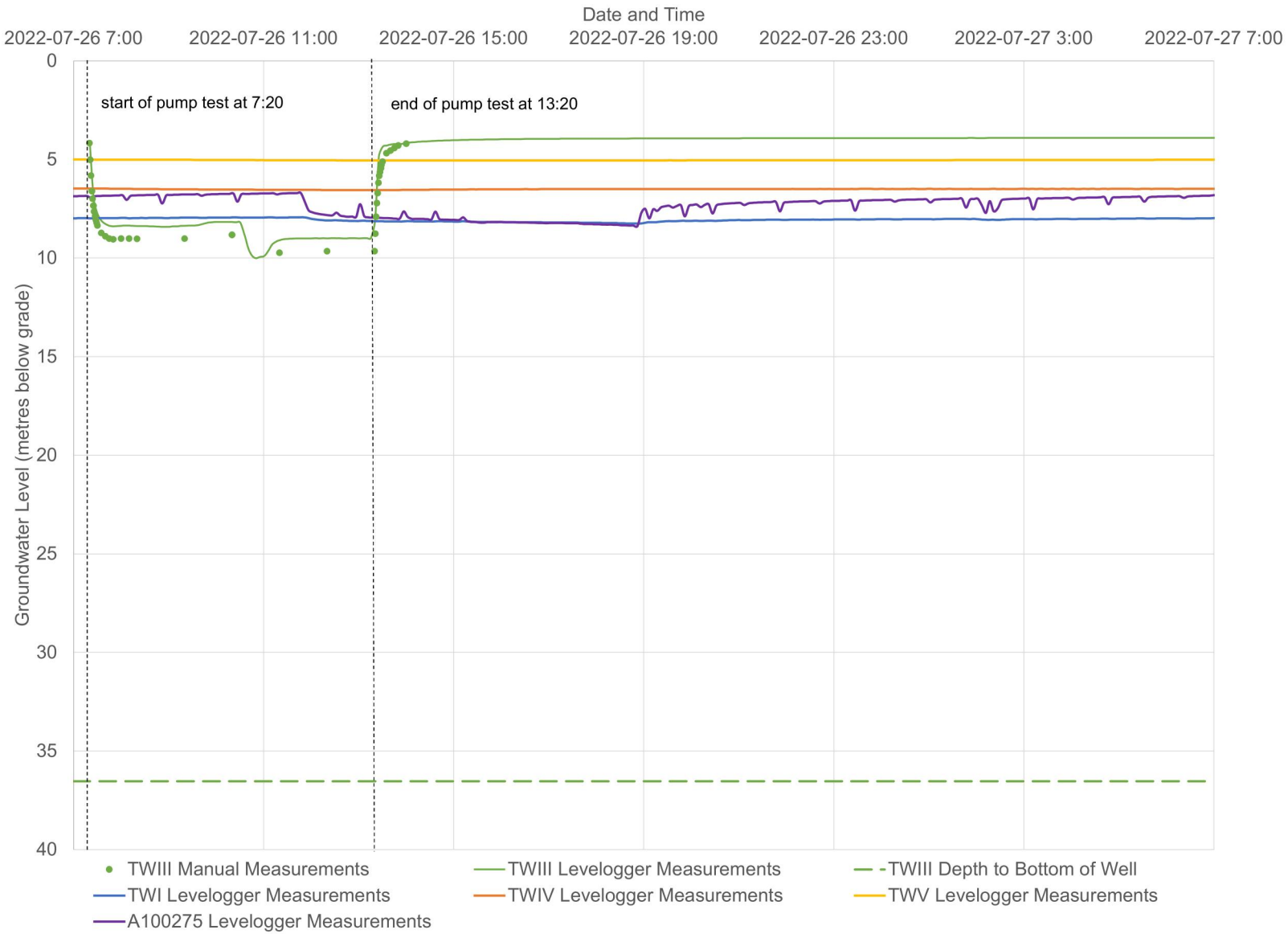


Figure 3
Observation Well (#A100275) - Water Level vs Time

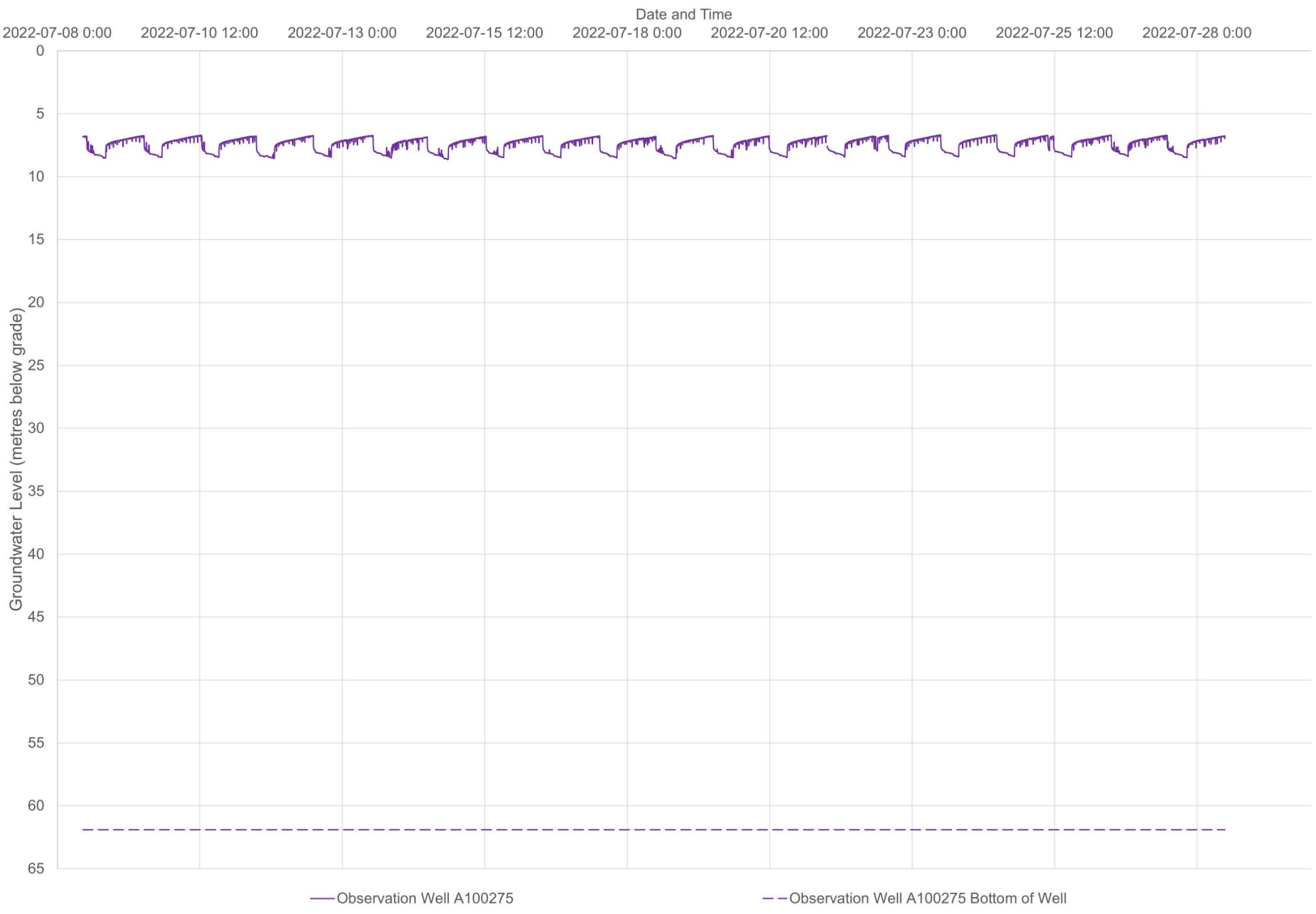


Table 1
Pumping Test Summary - Test Wells TWI, TWIII, TWIV, TWV

Location	Subject Site - Part of Lots 19 & 20 Concession 1, Leeds and the Thousand Islands			
	TWI	TWIV	TWV	TWIII
Date of Pump Test	July 11, 2022	July 12, 2022	July 21, 2022	July 26, 2022
Pumping Rate (litres/minute)	18.9	18.9	18.9	18.9
Depth of Well (mbTOC)	39.00	31.20	49.70	36.91
Static Water Level (mbTOC)	8.50	6.85	5.46	4.55
Available Drawdown (m)	30.50	24.35	44.24	32.36
Duration of Pumping (hours)	6	6	6	6
Calculated Volume Pumped From Well (litres)	6,800	6,800	6,800	6,800
Maximum Drawdown Observed (m)	6.11	0.50	3.18	5.57
Depth to Water during Maximum Drawdown (mbTOC)	14.61	7.35	8.64	10.12
Time to 95 % Recovery of Initial Pumping Water Level (mins)	295	120	593	10
Percentage of Water Column Drawdown During Pumping	20.0%	2.1%	7.2%	17.2%
Percentage of Static Water Column Remaining at the End of Pumping Test	80.0%	97.9%	92.8%	82.8%

Notes: mbTOC metres below top of well casing

Data Input: JMP
Data Check: RV

Table 2
Groundwater Analytical Results

Parameter	Units	M.D.L.	Location:	TWI		TWIV			TWV		TWIII			ODWS	
			Date Collected:	2022-07-11		2022-07-12		2023-02-22	2022-07-21		2022-07-26		2023-02-22		
			Time Collected:	10:20	14:40	9:40	14:30	-	11:20	15:45	8:12	13:15	-		
			Client ID:	22-W001	22-W002	22-W003	22-W004	TWIV	22-W005	22-W006	22-W007	22-W008	TWIII		
			Sample ID:	B22-21653-1	B22-21653-2	B22-21987-1	B22-21987-2	23-003060-1	B22-23223-1	B22-23223-1	B22-23655-1	B22-23655-1	23-003059-1	Objective	Type of Objective
Total Coliform	cfu/100mL	1		0	0	NDOGT	22	0	0	0	NDOGT	NDOGT	0	0	MAC
E coli	cfu/100mL	1		0	0	NDOGT	3	0	0	0	NDOGT	NDOGT	0	0	MAC
Background	cfu/100mL	1		0	63	NDOGT	> 200	-	141	44	NDOGT	NDOGT	-		
Alkalinity(CaCO3) to pH4.5	mg/L	5		324	352	419	407	-	463	450	184	243	-	30-500	OG
pH @25°C	pH Units	N/A		7.88	7.89	8.19	8.1	-	8.16	8.15	8.1	8	-	6.5-8.5	OG
Conductivity @25°C	µmho/cm	1		676	1130	916	851	-	838	832	977	576	-		
Colour	TCU	2		<	<	<	<	-	<	<	<	<	-	5	AO
Turbidity	NTU	0.1		2.6	0.3	0.5	0.2	-	6.4	5.6	36.1	1.4	-	5	AO
Fluoride	mg/L	0.1		0.3	0.2	0.4	0.3	-	0.3	0.3	0.5	0.3	-	1.5	MAC
Chloride	mg/L	0.5		11.3	150	46.6	34.6	-	4.5	5.7	155	13.7	-	250	AO
Nitrate (N)	mg/L	0.1		6.9	3.7	3.5	2.6	-	<	<	<	2.2	-	10.0	MAC
Nitrite (N)	mg/L	0.1		<	<	<	<	-	<	<	<	<	-	1.0	MAC
Sulphate	mg/L	1		7	17	19	19	-	22	24	69	37	-	500	AO
Total Kjeldahl Nitrogen	mg/L	0.1		<	0.1	0.8	<	-	0.3	0.3	2.8	0.2	-		
Ammonia + Ammonium (N)	mg/L	0.01		<	<	0.83	0.02	-	0.16	0.15	2.24	0.05	-		
Organic Nitrogen (Calculation)	mg/L	0.1		<	0.1	<	<	-	0.1	0.1	0.5	0.1	-	0.15	OG
Tannins and Lignins	mg/L	0.5		<	<	<	<	-	<	<	<	1	-	5	AO
Dissolved Organic Carbon	mg/L	0.2		1.7	1.1	1.5	1.4	-	2.1	2	<	<	-		
Phenolics	mg/L	0.001		<	<	<	<	-	<	<	0.006	<	-		
Sulphide	mg/L	0.01		<	<	0.01	<	-	0.01	<	0.59	<	-	0.05	AO
Hardness (as CaCO3)	mg/L	1		364	453	466	448	-	440	426	181	269	-	500,80-100	ODWO,OG
Calcium	mg/L	0.02		76.2	98.5	72.4	74.5	-	72.1	70.9	55	78.5	-		
Copper	mg/L	0.002		0.004	<	<	<	-	<	<	<	<	-	1	AO
Iron	mg/L	0.005		0.083	0.005	0.099	0.027	-	0.674	0.691	1.54	0.152	-	0.3	AO
Magnesium	mg/L	0.02		42.2	50.3	69.3	63.8	-	63.1	60.6	10.6	17.6	-		
Manganese	mg/L	0.001		0.006	<	0.024	0.001	-	0.054	0.053	0.091	0.03	-	0.05	AO
Potassium	mg/L	0.1		1.2	1.6	2.1	1.8	-	2.4	2.4	1.8	1.6	-		
Sodium	mg/L	0.2		14.9	80	37.3	28.9	-	37.3	38.1	127	21.6	-	200,20	AO,WL
Zinc	mg/L	0.005		0.005	<	0.017	0.019	-	<	<	<	<	-	5	AO
Silicon	mg/L	0.01		9.53	9.15	10	9.33	-	16	16.1	13.6	9.33	-		
Silica	mg/L	0.02		20.4	19.6	21.4	20	-	34.2	34.4	29.2	20	-		

Data Input: CM
Data Check: AS

Notes:

M.D.L.	method detection limit
<	result below M.D.L.
N/A	not applicable
-	not analyzed
	indicates value exceeds Ontario Drinking Water Quality Standards

OG - Operational Guideline AO - Aesthetic Objective CS- Chemical Standard

NDOGT no data, sample overgrown with target bacteria

* The aesthetic objective for sodium is 200 mg/L, however, the local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diet

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120182 **REPORT No. B22-21653**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Mallory Wright

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Jul-22
DATE REPORTED: 20-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1424
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W001	22-W002	ODWS	
			Sample I.D.:		B22-21653-1	B22-21653-2	Objective	Type of Objective
			Date Collected:		11-Jul-22	11-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Total Coliform	cfu/100mL	1	MOE E3407	12-Jul-22/K	0	0	0	MAC
E coli	cfu/100mL	1	MOE E3407	12-Jul-22/K	0	0	0	MAC
Background	cfu/100mL	1	SM9222B	12-Jul-22/K	0	63		
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	12-Jul-22/O	324	352	30-500	OG
pH @25°C	pH Units		SM 4500H	12-Jul-22/O	7.88	7.89	6.5-8.5	OG
Conductivity @25°C	µmho/cm	1	SM 2510B	12-Jul-22/O	676	1130		
Colour	TCU	2	SM 2120C	14-Jul-22/O	< 2	< 2	5	AO
Turbidity	NTU	0.1	SM 2130	14-Jul-22/O	2.6	0.3	5	AO
Fluoride	mg/L	0.1	SM4110C	12-Jul-22/O	0.3	0.2	1.5	MAC
Chloride	mg/L	0.5	SM4110C	12-Jul-22/O	11.3	150	250	AO
Nitrate (N)	mg/L	0.1	SM4110C	12-Jul-22/O	6.9	3.7	10	MAC
Nitrite (N)	mg/L	0.1	SM4110C	12-Jul-22/O	< 0.1	< 0.1	1	MAC
Sulphate	mg/L	1	SM4110C	12-Jul-22/O	7	17	500	AO
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	15-Jul-22/K	< 0.1	0.1		
Ammonia + Ammonium (N)	mg/L	0.01	SM4500-NH3-H	13-Jul-22/K	< 0.01	< 0.01		
Organic Nitrogen (Calculation)	mg/L	0.1	E3516.2	19-Jul-22/K	< 0.1	0.1	0.15	OG
Tannins and Lignins	mg/L	0.5	SM5500B	12-Jul-22/K	< 0.5	< 0.5		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	12-Jul-22/O	1.7	1.1	5	AO
Phenolics	mg/L	0.001	MOEE 3179	18-Jul-22/K	< 0.001	< 0.001		
Sulphide	mg/L	0.01	SM4500-S2	14-Jul-22/K	< 0.01	< 0.01	0.05	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Jul-22/O	**364**	**453**	500,80-100	ODWO,OG
Calcium	mg/L	0.02	SM 3120	13-Jul-22/O	76.2	98.5		
Copper	mg/L	0.002	SM 3120	13-Jul-22/O	0.004	< 0.002	1	AO
Iron	mg/L	0.005	SM 3120	13-Jul-22/O	0.083	0.005	0.3	AO
Magnesium	mg/L	0.02	SM 3120	13-Jul-22/O	42.2	50.3		

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120182 **REPORT No. B22-21653**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Mallory Wright

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Jul-22
DATE REPORTED: 20-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1424
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W001	22-W002	ODWS	
			Sample I.D.:		B22-21653-1	B22-21653-2	Objective	Type of Objective
			Date Collected:		11-Jul-22	11-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Manganese	mg/L	0.001	SM 3120	13-Jul-22/O	0.006	< 0.001	0.05	AO
Potassium	mg/L	0.1	SM 3120	13-Jul-22/O	1.2	1.6		
Sodium	mg/L	0.2	SM 3120	13-Jul-22/O	14.9	**80.0**	200,20	AO,WL
Zinc	mg/L	0.005	SM 3120	13-Jul-22/O	0.005	< 0.005	5	AO
Silicon	mg/L	0.01	SM 3120	13-Jul-22/O	9.53	9.15		
Silica	mg/L	0.02	SM 3120	13-Jul-22/O	20.4	19.6		

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120181 **REPORT No. B22-21987**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 12-Jul-22
DATE REPORTED: 20-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

					Client I.D.:	22-W003	22-W004	ODWS	
					Sample I.D.:	B22-21987-1	B22-21987-2	Objective	Type of Objective
					Date Collected:	12-Jul-22	12-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**					
Total Coliform	cfu/100mL	1	MOE E3407	13-Jul-22/K		NDOGT	22	0	MAC
E coli	cfu/100mL	1	MOE E3407	13-Jul-22/K		NDOGT	3	0	MAC
Background	cfu/100mL	1	SM9222B	13-Jul-22/K		NDOGT	> 200		
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	13-Jul-22/O		419	407	30-500	OG
pH @25°C	pH Units		SM 4500H	13-Jul-22/O		8.19	8.10	6.5-8.5	OG
Conductivity @25°C	µmho/cm	1	SM 2510B	13-Jul-22/O		916	851		
Colour	TCU	2	SM 2120C	14-Jul-22/O		< 2	< 2	5	AO
Turbidity	NTU	0.1	SM 2130	14-Jul-22/O		0.5	0.2	5	AO
Fluoride	mg/L	0.1	SM4110C	13-Jul-22/O		0.4	0.3	1.5	MAC
Chloride	mg/L	0.5	SM4110C	13-Jul-22/O		46.6	34.6	250	AO
Nitrate (N)	mg/L	0.1	SM4110C	13-Jul-22/O		3.5	2.6	10	MAC
Nitrite (N)	mg/L	0.1	SM4110C	13-Jul-22/O		< 0.1	< 0.1	1	MAC
Sulphate	mg/L	1	SM4110C	13-Jul-22/O		19	19	500	AO
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	15-Jul-22/K		0.8	< 0.1		
Ammonia + Ammonium (N)	mg/L	0.01	SM4500-NH3-H	15-Jul-22/K		0.83	0.02		
Organic Nitrogen (Calculation)	mg/L	0.1	E3516.2	19-Jul-22/K		< 0.1	< 0.1	0.15	OG
Tannins and Lignins	mg/L	0.5	SM5500B	19-Jul-22/K		< 0.5	< 0.5		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	14-Jul-22/O		1.5	1.4	5	AO
Phenolics	mg/L	0.001	MOEE 3179	18-Jul-22/K		< 0.001	< 0.001		
Sulphide	mg/L	0.01	SM4500-S2	14-Jul-22/K		0.01	< 0.01	0.05	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Jul-22/O		466	448	500,80-100	ODWO,OG
Calcium	mg/L	0.02	SM 3120	13-Jul-22/O		72.4	74.5		
Copper	mg/L	0.002	SM 3120	13-Jul-22/O		< 0.002	< 0.002	1	AO
Iron	mg/L	0.005	SM 3120	13-Jul-22/O		0.099	0.027	0.3	AO
Magnesium	mg/L	0.02	SM 3120	13-Jul-22/O		69.3	63.8		

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120181 **REPORT No. B22-21987**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 12-Jul-22
DATE REPORTED: 20-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W003	22-W004	ODWS	
			Sample I.D.:		B22-21987-1	B22-21987-2	Objective	Type of Objective
			Date Collected:		12-Jul-22	12-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Manganese	mg/L	0.001	SM 3120	13-Jul-22/O	0.024	0.001	0.05	AO
Potassium	mg/L	0.1	SM 3120	13-Jul-22/O	2.1	1.8		
Sodium	mg/L	0.2	SM 3120	13-Jul-22/O	37.3	28.9	200,20	AO,WL
Zinc	mg/L	0.005	SM 3120	13-Jul-22/O	0.017	0.019	5	AO
Silicon	mg/L	0.01	SM 3120	13-Jul-22/O	10.0	9.33		
Silica	mg/L	0.02	SM 3120	13-Jul-22/O	21.4	20.0		

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett
Director of Laboratory Services

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120183 **REPORT No. B22-23223**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 22-Jul-22
DATE REPORTED: 28-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

	Client I.D.:	22-W005	22-W006	ODWS	
	Sample I.D.:	B22-23223-1	B22-23223-2	Objective	Type of Objective
	Date Collected:	21-Jul-22	21-Jul-22		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Total Coliform	cfu/100mL	1	MOE E3407	22-Jul-22/K	0	0	0	MAC
E coli	cfu/100mL	1	MOE E3407	22-Jul-22/K	0	0	0	MAC
Background	cfu/100mL	1	SM9222B	22-Jul-22/K	141	44		
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Jul-22/O	463	450	30-500	OG
pH @25°C	pH Units		SM 4500H	22-Jul-22/O	8.16	8.15	6.5-8.5	OG
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Jul-22/O	838	832		
Colour	TCU	2	SM 2120C	25-Jul-22/O	< 2	< 2	5	AO
Turbidity	NTU	0.1	SM 2130	18-Jul-22/O	**6.4**	**5.6**	5	AO
Fluoride	mg/L	0.1	SM4110C	22-Jul-22/O	0.3	0.3	1.5	MAC
Chloride	mg/L	0.5	SM4110C	22-Jul-22/O	4.5	5.7	250	AO
Nitrite (N)	mg/L	0.1	SM4110C	22-Jul-22/O	< 0.1	< 0.1	1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	22-Jul-22/O	< 0.1	< 0.1	10	MAC
Sulphate	mg/L	1	SM4110C	22-Jul-22/O	22	24	500	AO
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	26-Jul-22/K	0.3	0.3		
Ammonia + Ammonium (N)	mg/L	0.01	SM4500-NH3-H	25-Jul-22/K	0.16	0.15		
Organic Nitrogen (Calculation)	mg/L	0.1	E3516.2	28-Jul-22/K	0.1	0.1	0.15	OG
Tannins and Lignins	mg/L	0.5	SM5500B	26-Jul-22/K	< 0.5	< 0.5		
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	25-Jul-22/O	2.1	2.0	5	AO
Sulphide	mg/L	0.01	SM4500-S2	25-Jul-22/K	0.01	< 0.01	0.05	AO
Phenolics	mg/L	0.001	MOEE 3179	22-Jul-22/K	< 0.001	< 0.001		
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Jul-22/O	**440**	**426**	500,80-100	ODWO,OG
Calcium	mg/L	0.02	SM 3120	22-Jul-22/O	72.1	70.9		
Copper	mg/L	0.002	SM 3120	22-Jul-22/O	< 0.002	< 0.002	1	AO
Iron	mg/L	0.005	SM 3120	22-Jul-22/O	**0.674**	**0.691**	0.3	AO
Magnesium	mg/L	0.02	SM 3120	22-Jul-22/O	63.1	60.6		

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120183 **REPORT No. B22-23223**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 22-Jul-22
DATE REPORTED: 28-Jul-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W005	22-W006	ODWS	
			Sample I.D.:		B22-23223-1	B22-23223-2	Objective	Type of Objective
			Date Collected:		21-Jul-22	21-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Manganese	mg/L	0.001	SM 3120	22-Jul-22/O	**0.054**	**0.053**	0.05	AO
Potassium	mg/L	0.1	SM 3120	22-Jul-22/O	2.4	2.4		
Sodium	mg/L	0.2	SM 3120	22-Jul-22/O	**37.3**	**38.1**	200,20	AO,WL
Silicon	mg/L	0.01	SM 3120	22-Jul-22/O	16.0	16.1		
Silica	mg/L	0.02	SM 3120	22-Jul-22/O	34.2	34.4		
Zinc	mg/L	0.005	SM 3120	22-Jul-22/O	< 0.005	< 0.005	5	AO

1 . Sodium results are above the ODWS of 20mg/L

ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets
R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120184 **REPORT No. B22-23655**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W007	22-W008	ODWS	
			Sample I.D.:		B22-23655-1	B22-23655-2	Objective	Type of Objective
			Date Collected:		26-Jul-22	26-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Total Coliform	cfu/100mL	1	MOE E3407	26-Jul-22/K	NDOGT [1]	NDOGT [1]	0	MAC
E coli	cfu/100mL	1	MOE E3407	26-Jul-22/K	NDOGT	NDOGT	0	MAC
Background	cfu/100mL	1	MOE E3407	26-Jul-22/K	NDOGT	NDOGT		
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	28-Jul-22/O	184	243	30-500	OG
pH @25°C	pH Units		SM 4500H	28-Jul-22/O	8.10	8.00	6.5-8.5	OG
Conductivity @25°C	µmho/cm	1	SM 2510B	28-Jul-22/O	977	576		
Colour	TCU	2	SM 2120C	28-Jul-22/O	< 2	< 2	5	AO
Turbidity	NTU	0.1	SM 2130	28-Jul-22/O	36.1	1.4	5	AO
Fluoride	mg/L	0.1	SM4110C	27-Jul-22/O	0.5	0.3	1.5	MAC
Chloride	mg/L	0.5	SM4110C	27-Jul-22/O	155	13.7	250	AO
Nitrite (N)	mg/L	0.1	SM4110C	27-Jul-22/O	< 0.1	< 0.1	1	MAC
Nitrate (N)	mg/L	0.1	SM4110C	27-Jul-22/O	< 0.1	2.2	10	MAC
Sulphate	mg/L	1	SM4110C	27-Jul-22/O	69	37	500	AO
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	29-Jul-22/K	2.8	0.2		
Ammonia + Ammonium (N)	mg/L	0.01	SM4500-NH3-H	28-Jul-22/K	2.24	0.05		
Organic Nitrogen (Calculation)	mg/L	0.1	E3516.2	02-Aug-22/K	0.5	0.1	0.15	OG
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	28-Jul-22/O	< 0.2	1.0	5	AO
Tannins and Lignins	mg/L	0.5	SM5500B	02-Aug-22/K	< 0.5	< 0.5		
Phenolics	mg/L	0.001	MOEE 3179	29-Jul-22/K	0.006	< 0.001		
Sulphide	mg/L	0.01	SM4500-S2	29-Jul-22/K	0.59	< 0.01	0.05	AO
Hardness (as CaCO3)	mg/L	1	SM 3120	27-Jul-22/O	181	269	500,80-100	ODWO,OG
Calcium	mg/L	0.02	SM 3120	27-Jul-22/O	55.0	78.5		
Copper	mg/L	0.002	SM 3120	27-Jul-22/O	< 0.002	< 0.002	1	AO
Iron	mg/L	0.005	SM 3120	27-Jul-22/O	1.54	0.152	0.3	AO
Magnesium	mg/L	0.02	SM 3120	27-Jul-22/O	10.6	17.6		

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW120184 **REPORT No. B22-23655**

Report To:

Malroz Engineering Inc.
308 Wellington Street, 2nd Floor
Kingston ON K7K 7A8 Canada
Attention: Jessie Payeur

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 26-Jul-22
DATE REPORTED: 03-Aug-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 1645
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.:		22-W007	22-W008	ODWS	
			Sample I.D.:		B22-23655-1	B22-23655-2	Objective	Type of Objective
			Date Collected:		26-Jul-22	26-Jul-22		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Manganese	mg/L	0.001	SM 3120	27-Jul-22/O	0.091	0.030	0.05	AO
Potassium	mg/L	0.1	SM 3120	27-Jul-22/O	1.8	1.6		
Silicon	mg/L	0.01	SM 3120	27-Jul-22/O	13.6	9.33		
Silica	mg/L	0.02	SM 3120	27-Jul-22/O	29.2	20.0		
Sodium	mg/L	0.2	SM 3120	27-Jul-22/O	127	21.6	200,20	AO,WL
Zinc	mg/L	0.005	SM 3120	27-Jul-22/O	< 0.005	< 0.005	5	AO

1. NDOGT = No Data; Overgrown with target bacteria.
2. Sodium result for sample #1 is above the ODWS of 20mg/L

Michelle Dubien
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: **Malroz Gan**

REPORT No: 23-003059 - Rev. 0

Report To:
MacLellan Water Technology
388 Millhaven Rd,
P.O. Box 392
Odessa, ON K0H 2H0

CADUCEON Environmental Laboratories
285 Dalton Ave
Kingston, ON K7K 6Z1

Attention: William Vanderwilp

DATE RECEIVED: 2023-Feb-23
DATE REPORTED: 2023-Feb-27
SAMPLE MATRIX: Drinking Water

CUSTOMER PROJECT:
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Ecoli m-TECH Media (Liquid)	1	KINGSTON	ELIVERMORE	2023-Feb-23	EC-001	MECP E3371
Total Coliforms (m-Endo Media)	1	KINGSTON	ELIVERMORE	2023-Feb-23	TC-001	SM 9222B

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

		Parameter	Total Coliform	E coli
		Units	CFU/100mL	CFU/100mL
		R.L.	1	1
Client I.D.	Sample I.D.	Date Collected	-	-
TWIII	23-003059-1	2023-Feb-22	0	0

E. Livermore

Evan Livermore
Microbiology Supervisor

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

CADUCEON ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: **Malroz Gan**

REPORT No: 23-003060 - Rev. 0

Report To:
MacLellan Water Technology
388 Millhaven Rd,
P.O. Box 392
Odessa, ON K0H 2H0

CADUCEON Environmental Laboratories
285 Dalton Ave
Kingston, ON K7K 6Z1

Attention: William Vanderwilp

DATE RECEIVED: 2023-Feb-23
DATE REPORTED: 2023-Feb-27
SAMPLE MATRIX: Drinking Water

CUSTOMER PROJECT:
P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Ecoli m-TECH Media (Liquid)	1	KINGSTON	ELIVERMORE	2023-Feb-23	EC-001	MECP E3371
Total Coliforms (m-Endo Media)	1	KINGSTON	ELIVERMORE	2023-Feb-23	TC-001	SM 9222B

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

		Parameter	Total Coliform	E coli
		Units	CFU/100mL	CFU/100mL
		R.L.	1	1
Client I.D.	Sample I.D.	Date Collected	-	-
TWIV	23-003060-1	2023-Feb-22	0	0

E. Livermore

Evan Livermore
Microbiology Supervisor

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1 PRINT ONLY IN SPACES PROVIDED
2 CHECK ☒ CORRECT BOX WHERE APPLICABLE Test well #1

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON	BLOCK, TRACT, SURVEY, ETC.	LOT
Leeds-Grenville	Leeds	1	#1 Building Lot 3	19-20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Regina, Peter	RR2, Gananoque, Ontario K7G2V4	DAY 12 MO 11 YR 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay			0	8
Brown	Sandstone			8	28
White	Quartz			28	35
White Brown	Quartz	some Sandstone		35	41
White	Quartz			41	126

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
118	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	3/16	0	22
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
22	2	Annular Cement Grout

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ PUMP ☑ BAILER	10 GPM	2 HOURS ____ MINS

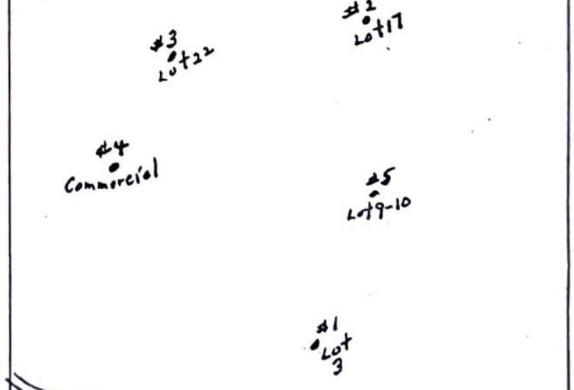
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☐ PUMPING ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
28 FEET	90 FEET		42 FEET	53 FEET	61 FEET	66 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☑ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	124 FEET	10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



90051

DRILLERS REMARKS

FINAL STATUS OF WELL		
	☑ WATER SUPPLY	☐ ABANDONED, INSUFFICIENT SUPPLY
	☐ OBSERVATION WELL	☐ ABANDONED, POOR QUALITY
	☑ TEST HOLE	☐ UNFINISHED
	☐ RECHARGE WELL	☐ DEWATERING

WATER USE		
	☑ DOMESTIC	☐ COMMERCIAL
	☐ STOCK	☐ MUNICIPAL
	☐ IRRIGATION	☐ PUBLIC SUPPLY
	☐ INDUSTRIAL	☐ COOLING OR AIR CONDITIONING
	☐ OTHER	☐ NOT USED

METHOD OF CONSTRUCTION		
	☑ CABLE TOOL	☐ BORING
	☐ ROTARY (CONVENTIONAL)	☐ DIAMOND
	☐ ROTARY (REVERSE)	☐ JETTING
	☐ ROTARY (AIR)	☐ DRIVING
	☑ AIR PERCUSSION	☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Jack Knox Well Drilling	3220
ADDRESS	
Glenburnie, Ontario	K0H 1S0
NAME OF WELL TECHNICIAN	TECHNICIAN'S LICENCE NUMBER
Ron Knox	3041
SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE
Jack Knox	DAY ____ YR ____

CONTRACTOR'S COPY

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Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

Test Well #2

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. / BLOCK, TRACT, SURVEY, ETC.	LOT
Leeds Grenville	Leeds	1 (#2 Building lot 17)	19-20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Regina, Peter	RR2, Gananoque, Ontario K7G2V4	DAY 14 MO 11 YR 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Blue	Clay			0	5
Brown	Sand			5	7
Black	Granite			7	51
Grey	Granite	some Quartz		51	63
Black	Granite			63	88
Grey-white	Quartz			88	114

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
57	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
104	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	3/16	0	22
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
22	2	Annular Cement Grout

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ PUMP ☑ BAILER	10 GPM	3 HOURS ___ MINS

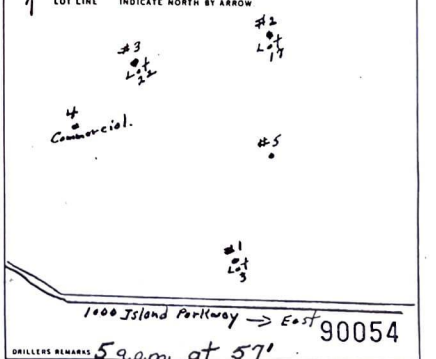
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☐ PUMPING ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
28 FEET	88 FEET	51 FEET	59 FEET	66 FEET	70 FEET

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☑ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	112 FEET	10 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW



DRILLERS REMARKS: 5 g.p.m. at 57'

FINAL STATUS OF WELL

☑ WATER SUPPLY ☐ OBSERVATION WELL ☑ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED ☐ DEWATERING

WATER USE

☑ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF CONSTRUCTION

☑ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☑ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Jack Knox Well Drilling	3200
ADDRESS: Glenburnie, Ontario	KOH1S0
NAME OF WELL TECHNICIAN: Arnold Munro	WELL TECHNICIAN'S LICENCE NUMBER: T-80042
SIGNATURE OF TECHNICIAN/CONTRACTOR: Jack Knox	SUBMISSION DATE: DAY ___ MO ___ YR ___

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CONTRACTOR'S COPY

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Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1 PRINT ONLY IN SPACES PROVIDED
2 CHECK ☒ CORRECT BOX WHERE APPLICABLE

Test Well # 3

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON	BLOCK, TRACT, SURVEY, ETC.	LOT
Leeds Grenville	Leeds	1	(# 3 Building lot 12)	19-20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Regina, Peter	RR2, Gananoque, Ontario K7G 2V4	DAY 13 MO 11 YR 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay			0	18½
Brown	Sand			18½	21
Grey-White	Quartz			21	34
White	Quartz			34	121

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
60	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
118	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	3/16	0	26
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE-SLOT OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
26	2	Annular Cement Grout

PUMPING TEST

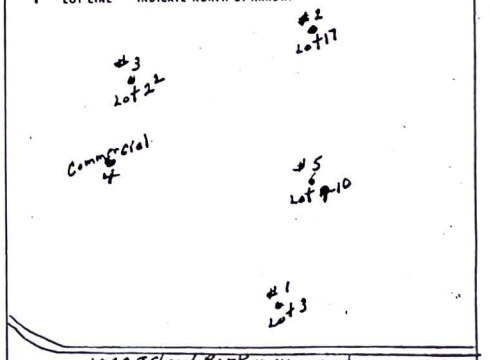
PUMPING TEST METHOD: ☐ PUMP ☑ BAILER
PUMPING RATE: 7 GPM
DURATION OF PUMPING: 2 HOURS ____ MINS
WATER LEVELS DURING: ☐ PUMPING ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
16 FEET	110 FEET	47 FEET	66 FEET	80 FEET	89 FEET

IF FLOWING, GIVE RATE: ____ GPM
PUMP INTAKE SET AT: ____ FEET
WATER AT END OF TEST: ☑ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 119 FEET
RECOMMENDED PUMPING RATE: 7 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



1000 Island Park Way → East

DRILLERS REMARKS: 2 Gal. Per. min. At 60. ft. 90052

FINAL STATUS OF WELL

☑ WATER SUPPLY ☐ ABANDONED, INSUFFICIENT SUPPLY
☐ OBSERVATION WELL ☐ ABANDONED, POOR QUALITY
☑ TEST HOLE ☐ UNFINISHED
☐ RECHARGE WELL ☐ DEWATERING

WATER USE

☑ DOMESTIC ☐ COMMERCIAL
☐ STOCK ☐ MUNICIPAL
☐ IRRIGATION ☐ PUBLIC SUPPLY
☐ INDUSTRIAL ☐ COOLING OR AIR CONDITIONING
☐ OTHER ☐ NOT USED

METHOD OF CONSTRUCTION

☐ CABLE TOOL ☐ BORING
☐ ROTARY (CONVENTIONAL) ☐ DIAMOND
☐ ROTARY (REVERSE) ☐ JETTING
☐ ROTARY (AIR) ☐ DRIVING
☑ AIR PERCUSSION ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Jack Knox Well Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 3202
ADDRESS: Glenburnie Ontario K0H 1S0
NAME OF WELL TECHNICIAN: Ron Knox
WELL TECHNICIAN'S LICENCE NUMBER: [illegible]
SIGNATURE OF TECHNICIAN/CONTRACTOR: Jack Knox
SUBMISSION DATE: DAY ____ MO ____ YR ____

CONTRACTOR'S COPY

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FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE Test well #4

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON	BLOCK, TRACT, SURVEY, ETC.	LOT
Leeds Grenville	Leeds	1	(#4 Commercial)	19-20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Regina, Peter	RR2 Gananoque, Ontario K7G2V4	DAY 14 MO 11 YR 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Blue	Cloy			0	8
white	Quartz			8	100

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
60	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
89	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	3/16	0	22
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
22	2'	Annular Cement Grout

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ PUMP ☑ BAILER	20 GPM	2 HOURS ____ MINS

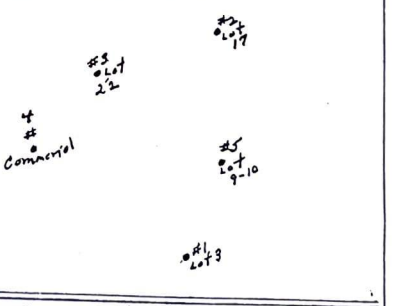
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☐ PUMPING ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
23 FEET	88 FEET		59 FEET	71 FEET	78 FEET	82 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☑ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	99 FEET	20 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS: 4 Gal. Per. min. At 60 ft.

90053

FINAL STATUS OF WELL

☑ WATER SUPPLY ☐ OBSERVATION WELL ☑ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED ☐ DEWATERING

WATER USE

☑ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF CONSTRUCTION

☐ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☑ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Jack Knox Well Drilling	3202
ADDRESS	
Glenburnie, Ontario	K0H1S0
NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER
Ron Knox	7-0889
SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE
Jack Knox	DAY ____ MO ____ YR ____

CONTRACTOR'S COPY

OFFICE USE ONLY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE Test well #5

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. / BLOCK / TRACT / SURVEY, ETC.	LOT
Leeds Grenville	Leeds	1 (#5 Building lot gor 10)	19-20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Regina, Peter	RR2 Gananoque, Ontario K7G2V4	DAY 15 MO 11 YR 90

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Blue	Clay			0	35
Grey-White	Quartz			35	49
Black	Granite			49	92
Grey-White	Quartz			92	120
Green	Granite			120	135
Black	Granite			135	157

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
63	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
147	☑ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	☑ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	3/16	0	41
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD, PACKER, ETC.)
41	2'	Annular Cement Grout

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ PUMP ☑ BAILER	12 GPM	2 HOURS ___ MINS

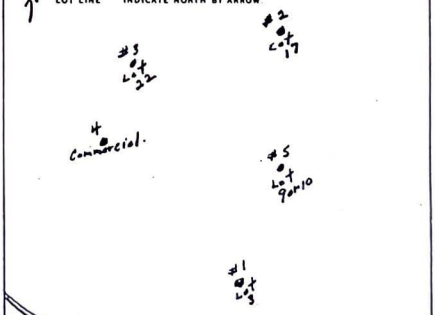
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☐ PUMPING ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
19 FEET	139 FEET		63 FEET	88 FEET	100 FEET	110 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☑ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	155 FEET	12 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS 48 l. Pen. min. At 63 ft. 90055

FINAL STATUS OF WELL		
	☑ WATER SUPPLY	☐ ABANDONED, INSUFFICIENT SUPPLY
	☐ OBSERVATION WELL	☐ ABANDONED, POOR QUALITY
	☑ TEST HOLE	☐ UNFINISHED
	☐ RECHARGE WELL	☐ DEWATERING

WATER USE		
	☑ DOMESTIC	☐ COMMERCIAL
	☐ STOCK	☐ MUNICIPAL
	☐ IRRIGATION	☐ PUBLIC SUPPLY
	☐ INDUSTRIAL	☐ COOLING OR AIR CONDITIONING
	☐ OTHER	☐ NOT USED

METHOD OF CONSTRUCTION		
	☑ CABLE TOOL	☐ BORING
	☐ ROTARY (CONVENTIONAL)	☐ DIAMOND
	☐ ROTARY (REVERSE)	☐ JETTING
	☐ ROTARY (AIR)	☐ DRIVING
	☑ AIR PERCUSSION	☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Jock Knox Well Drilling — WELL CONTRACTOR'S LICENCE NUMBER: 3202
ADDRESS: Glenburnie, Ontario — K0H1S0
NAME OF WELL TECHNICIAN: Arnold Munro — WELL TECHNICIAN'S LICENCE NUMBER: T-80492
SIGNATURE OF TECHNICIAN/CONTRACTOR: Jack Knox — SUBMISSION DATE: DAY ___ MO ___ YR ___

CONTRACTOR'S COPY

OFFICE USE ONLY

FORM NO. 0506 (11/86) FORM 9

MALROZ
ENGINEERING INCORPORATED

308 Wellington Street
2nd Floor
Kingston, ON K7K 7A8
Canada

613-548-3446
www.malroz.com

Via: email (contact@healthunit.org)

February 28, 2023
File: 1645.00-103

Dr. Linna Li
Medical Officer of Health
Leeds, Grenville and Lanark District Health Unit
458 Laurier Blvd
Brockville, ON K6V 7A3

Subject: Drinking Water Well Elevated Sodium Levels Part of Lots 19 & 20 Concession 1, Leeds and the Thousand Islands, Ontario

Dear Dr. Li,

We are sending this letter as notice that groundwater sampling and analysis from four potable residential drinking water wells located at Part of Lots 19 & 20 Concession 1, Leeds and the Thousand Islands, Ontario had reported sodium concentrations greater than 20 mg/L. In accordance with the Ontario Drinking Water Quality Standards, we are sending this letter so that this information can be provided to local physicians for their use with patients on sodium restricted diets that reside in this area and obtain drinking water from a water well.

Additional information is provided below:

- Groundwater sampling and analyses of the water wells was undertaken as part of a hydrogeological well assessment, which included a 6 hour pump test at each well to determine the water quantity and quality of the wells.
- Sampling was undertaken between July 11 and 26, 2022. A sample collected in the first hour of pumping and in the last hour of pumping had a reported concentration of 163 mg/L.
- Copies of the certificates of analysis, are attached.

Let us know if you have any questions or concerns with respect to this letter.

Yours truly,

Malroz Engineering Inc.

Per: John Pyke, P. Geo.
Geoscientist
encl.: Laboratory Certificates of Analysis and Water Well Records