

Hydrogeological Assessment and Terrain Analysis

Proposed Residential Development Braeburn Estates Phase 3

Shady Maple Road
Burnstown, Ontario

Prepared for KDSA Development Corp.

Report PH4748-REP.01 dated November 27, 2023

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1.0 Introduction

1.1 Terms of Reference

Paterson Group (Paterson) was retained by Braeburn Estates to conduct a hydrogeological assessment and terrain analysis for the third phase of a rural residential subdivision situated on Part of Lot 16, Concession 2 in the geographic Township of McNab, County of Renfrew, Ontario. The proposed residential subdivision will be known as Braeburn Estates Phase 3.

The purpose of this study is to confirm that the underlying hydrogeological and terrain conditions are capable of supporting the proposed Phase 3 expansion. Specifically, this analysis assesses the suitability of the water supply aquifer underlying the site to adequately supply the proposed development for potable water supply usage in addition to the site's suitability for onsite wastewater systems. As such, the hydrogeological assessment and terrain analysis reports from the previous phases were incorporated into this report. Phase 1 and Phase 2 of Braeburn Estates Subdivision have already been registered as a subdivision.

The following reports were previously completed for the subject site and should be read in conjunction with this report:

- ❑ Paterson Group Report PH2610-01 dated July 17, 2015 titled Hydrogeological Study and Terrain Evaluation – Proposed Residential Subdivision-Part of Lot 17, Concession 2 of Geographic Township of McNab.
- ❑ Paterson Group Report PH2610-LET.01 dated March 2, 2016 titled Development and Sampling of TW4 and Surface Water Impact Assessment -Braeburn Estates, Burnstown, Ontario
- ❑ Paterson Group Report PH4098-REP.01.REV.01 dated October 27, 2020 titled Supplemental Hydrogeological Study: Braeburn Estates Subdivision
- ❑ Paterson Group Report PG3155-LET.06.REV.01 dated June 20, 2023 titled Geotechnical Investigation – Future Rural Subdivision – Braeburn Estates – Phase 3

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and recommendations pertaining to the private services for the proposed development as understood at the time of writing this report.

1.2 Background

The proposed residential development is anticipated to consist of 41 lots with an average lot size of 0.60 ha, and a 0.42 ha park. The proposed lots are anticipated to be serviced by onsite sewage systems and private drilled wells. Five (5) water supply test wells were

installed on site to provide general coverage for the purpose of previous hydrogeological studies. It is anticipated that existing local roadways, vehicle parking areas, and landscaped areas will surround the proposed residential dwellings.

The proposed lot layout for Phase 3 is shown on Paterson Drawing PH4748-5 Lot Development Plan in Appendix 5.

Currently only three dwellings have been constructed and occupied in the previous phases. The three dwellings consist of Lot 6, Lot 13 and Lot 21. All three dwellings were approached for geochemical testing as part of this Hydrogeological Assessment.

2.0 Site Description

The subject site encompasses a total area of approximately 24.82 hectares and is located on the south shore of the Madawaska River, in the Village of Burnstown, Ontario.

2.1 Surface Conditions

The subject site is located along the south shore of the Madawaska River, south of the Village of Burnstown, Ontario. The site slopes downwards steeply to the Madawaska River and is heavily treed.

2.2 Surrounding Land Uses within 500 m

The Madawaska River is located directly north of the subject site. The lands east of the property are wooded as far east as McVicar Lane (approximately 350 m east from the property boundary), with residential properties located along McVicar Lane. The lands south of the property are wooded as far south as McLeod Road (approximately 550 m south from the property boundary), with residential properties located along McLeod Road. A residential dwelling and a Building Supply Retail store are located southwest of the site on Bldg Supply Road. All of the development in the surrounding area is on private well and sewage services.

Based on the available information, there are no obvious indicators of potential groundwater impacts present on the surrounding lands within 500 m of the subject property, which may negatively impact the proposed development.

3.0 Geology

3.1 Surficial Geology

According to published mapping (OGS MRD218), the surficial soils onsite consist of Precambrian bedrock on the southern and eastern portion of the site and a till material consisting of a silty sand to sand-textured till on Precambrian terrain over the remainder of the site. Refer to Paterson Drawing PH4748-3 Surficial Geology Plan located in Appendix 5 for additional details.

A total of 40 test pits, 2 boreholes and 5 drilled potable supply test wells have been put down across the subject site as part of the Hydrogeological Assessments, Geotechnical Assessments and Slope Stability Assessments. The Test Hole logs can be found in Appendix 1 and the Test Hole Location Plans (THLP) can be found in Appendix 5.

In general, the surficial soils consist of a topsoil overlying a glacial till consisting of a compact to dense brown silty sand with some gravel and cobbles trace boulders. Localized deposits of a silty sand to sandy silt were observed underlying the topsoil in the western portion of the site. Fill was observed in TP1 on the western side of the site, and in a number of test pits on the northeastern portion of the site. Based on the test pit and borehole programs, overburden thickness across the site is variable, ranging from non-existent in areas of localized bedrock outcropping, to in excess of 12 meters as evidenced at BH 1. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile at each test hole location. Textural soil classifications have been correlated against laboratory grain size distribution tests, which are also provided in Appendix 1. Test pit locations are summarized on Paterson Drawings PG3155-2 Test Hole Location Plan and PG3155-4 Test Hole Location Plan in Appendix 5.

3.2 Bedrock Geology

Published geological mapping (OGS MRD126), reveals that the site and immediate surroundings are underlain by carbonate metasedimentary rocks of Precambrian age. This formation can comprise of marble, calc-silicate rocks, skarn and tectonic breccias. The presence of marble and calc-silicate rocks is evidenced on the road cut along Burnstown Road, west of the site. Refer to Paterson Drawing PH4748-3 Bedrock Geology Plan located in Appendix 5 for additional details.

A cursory review of the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records also confirms that the wells in the surrounding area have been constructed into the Precambrian Formation. Some of the well records identify limestone based on well driller descriptions, which is not consistent with regional mapping. It is suspected that in those cases, the drilling actually encountered marble, which is a source of groundwater in wells throughout the area.

4.0 Method of Study

4.1 Hydrogeological Pre-consultation

A hydrogeological pre-consultation was completed with the Township and their Hydrogeological Reviewers (Cambium Inc.) on June 8, 2023. Paterson had submitted a proposed workplan via email to the Township and to Cambium to discuss during the hydrogeological pre-consultation. Cambium hydrogeologists agreed with the proposed workplan and that completing geochemical testing on the available wells currently in use

and updating the current Phase 1 and 2 reports with the data for Phase 3, is an appropriate manner to complete the study.

4.2 Test Well Installation

In order to evaluate the water supply aquifer(s) underlying the site, a total of five (5) test wells, hereafter denoted as TW1 to TW5, inclusive, were constructed at locations that were accessible to the well drilling equipment across the site. Reference should be made to Paterson Drawing PH4748-1 – Site Plan, located in Appendix 5, for the Test Well Locations.

A review of available Water Well Records (WWR's) for the immediate area, published by the MECP was undertaken as part this study. Overburden thickness, depth of casing, aquifer interception points and reported well yields were reviewed in detail in order to assist in establishing a conceptual hydrogeological model for the site.

TW1 was drilled by Stanton Drilling Inc. on September 19, 2014, and TW2, TW3 and TW4 were drilled by Air Rock Drilling Co. Ltd., in the interim of February 27 to March 31, 2015. TW5 was drilled by Air Rock Drilling Co. Ltd. on August 31, 2020. A technical representative from Paterson was present during the creation of the casing hole, installation of the casing and grouting of the annular space for each test well. The MECP Water Well Records for each test well appear in Appendix 2.

TW 1

A 241 mm diameter casing hole was advanced using a rotary tri-cone bit through the shallow overburden, to the underlying marble bedrock. The casing hole was advanced into the bedrock an additional 0.30 m to ensure that the casing was seated into competent (i.e., unfractured) bedrock.

A new, 152 mm diameter steel casing, having an approximate length of 9.75 m, was installed in the casing hole, thereby providing for a casing stickup of approximately 0.60 m. The annular space was grouted utilizing a bentonite grout slurry introduced into the bottom of the annular space and pumped, using pressure grouting equipment, to the surface of the ground. The return of the grout to the surface of the ground, was visually observed by Paterson staff. As such, the casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation 903, the current regulation governing water well construction in the Province of Ontario.

After the completion of the casing installation and seating into the bedrock, the open borehole was advanced using a 152 mm diameter air percussion button bit. The well contractor reported, as shown on the WWR for TW1, that a suitable water supply aquifer was located within the marble at a depth of 42.70 m.

TW 2

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the shallow overburden, to the underlying granite bedrock. The casing hole was advanced into the granitic bedrock an additional 3.00 m to ensure that the casing was seated into competent (i.e., unfractured bedrock).

A new, 152 mm diameter steel casing, having an approximate length of 7.62 m, was installed in the casing hole, thereby providing for a casing stickup of approximately 0.60 m. The annular space was grouted utilizing a neat cement and sodium bentonite slurry introduced into the bottom of the annular space and pumped, using pressure grouting equipment, to the surface of the ground. The return of the grout to the surface of the ground, was visually observed by Paterson staff. As such, the casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation 903, the current regulation governing water well construction in the Province of Ontario.

After the completion of the casing installation and seating into the bedrock, the open borehole was advanced using a 150 mm diameter air percussion button bit. The well contractor reported, as shown on the WWR for TW2, that a suitable water supply aquifer was located within the granite bedrock at a depth of 30.48 m.

Following completion of the drilling and purging process, the static water level was allowed to stabilize. Air Rock Drilling Company, in accordance with Ontario Regulation 903, proceeded to chlorinate the well and a one hour constant rate pumping test was carried out. The rate chosen (6 GPM) for the one hour pumping test was based on the preliminary findings of the well contractor at the time of installation and are those which are reflected on the published MECP Water Well Record.

TW 3

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the shallow overburden, to the underlying granite bedrock. The casing hole was advanced into the bedrock an additional 3.00 m to ensure that the casing was seated into competent (i.e., unfractured) bedrock.

A new, 152 mm diameter steel casing, having an approximate length of 6.70 m, was installed in the casing hole, thereby providing for a casing stickup of approximately 0.60 m. The annular space was grouted utilizing a neat cement and sodium bentonite slurry introduced into the bottom of the annular space and pumped, using pressure grouting equipment, to the surface of the ground. The return of the grout to the surface of the ground, was visually observed by Paterson staff. As such, the casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation 903, the current regulation governing water well construction in the Province of Ontario.

After the completion of the casing installation and seating into the bedrock, the open borehole was advanced using a 150 mm diameter air percussion button bit. The well

contractor reported, as shown on the WWR for TW3, that a suitable water supply aquifer was located within the Precambrian Formation at a depth of 46.6 m.

Following completion of the drilling and purging process, the static water level was allowed to stabilize. Air Rock Drilling Company, in accordance with Ontario Regulation 903, proceeded to chlorinate the well and a one hour constant rate pumping test was carried out. The rate chosen (6 GPM) for the one hour pumping test was based on the preliminary findings of the well contractor at the time of installation and are those which are reflected on the published MECP Water Well Record.

TW 4

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the shallow overburden, to the underlying limestone bedrock. The casing hole was advanced into the bedrock an additional 1.83 m to ensure that the casing was seated into competent (i.e. unfractured) bedrock.

A new, 152 mm diameter steel casing, having an approximate length of 6.7 m, was installed in the casing hole, thereby providing for a casing stickup of approximately 0.60m. The annular space was grouted utilizing a neat cement and sodium bentonite slurry introduced into the bottom of the annular space and pumped, using pressure grouting equipment, to the surface of the ground. The return of the grout to the surface of the ground, was visually observed by Paterson staff. As such, the casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation 903, the current regulation governing water well construction in the Province of Ontario.

After the completion of the casing installation and seating into the bedrock, the open borehole was advanced using a 150 mm diameter air percussion button bit. The well contractor reported, as shown on the WWR for TW4, that a water supply aquifer was located within the Precambrian Formation at a depth of 46.3 m. The well was subsequently pumped by the well driller at a rate of 5 GPM, and drained within a one hour period. A recommended pump rate of 2 GPM was set by the well driller.

Subsequent to the review of all data, the well was deepened an additional 30 metres to increase the well capacity by encountering an additional water bearing zone, and allowing for additional storage within the well itself. A second aquifer was encountered at a depth of 76.5 m. On completion of drilling, the formation was repeatedly surged with air and allowed to clear. Preliminary well yield was estimated and the well was purged until the water was observed to be in a sand free state. Following completion of the drilling and purging process, the static water level was allowed to stabilize. Air Rock Drilling, in accordance with Ontario Regulation 903, proceeded to chlorinate the well and a one hour constant rate pumping test was carried out. The rate chosen for the one hour pumping test was based on the preliminary findings of the well contractor at the time of installation and are those which are reflected on the published MECP Water Well Records. Accordingly, the revised Water Well Record recommends a pump rate of 3.4 GPM.

TW5

A 248 mm diameter casing hole was advanced using a rotary tri-cone bit through the overburden, to the underlying granite bedrock.

A new, 152 mm diameter steel casing, having an approximate length of 7.0 m, was installed in the casing hole, with a measured casing stickup of approximately 0.46 m. The annular space was grouted utilizing a neat cement and sodium bentonite slurry introduced into the bottom of the annular space and pumped, using pressure grouting equipment, to the surface of the ground. The return of the grout to the surface of the ground, was visually observed by Paterson staff. As such, the casing installation and grouting of the annular space is considered to be in compliance with Ontario Regulation 903, the current regulation governing water well construction in the Province of Ontario.

Following completion of the drilling and purging process, the static water level was allowed to stabilize. Air Rock Drilling Company, in accordance with Ontario Regulation 903, proceeded to chlorinate the well and a one hour constant rate pumping test was carried out. The rate chosen (7 GPM) for the one hour pumping test was based on the preliminary findings of the well contractor at the time of installation and are those which are reflected on the published MECP Water Well Record.

4.3 Aquifer Analysis

Each of the five (5) test wells were subjected to a constant rate pumping test for six (6) hours of continuous pumping. Each of the wells were pumped using a submersible pump. In all cases, the discharge point for each pumping test was downgradient of the subject well at a sufficient distance to utilize the natural surface drainage features (i.e., sloping terrain).

Each of the test wells were pumped at constant rates varying from 73.2 L/min at TW 1 to 15.0 L/min at TW 4, for a six hour period. These test rates were set with the expectation that the rate would stress the aquifer enough to result in a demonstrable reduction in potentiometric head (i.e., a lowering of the static water levels) within the water supply aquifer being tested. During the pumping test, the pumping rate was periodically monitored using the timed volume correlation method in order to ensure that the rate of discharge of the pumped water did not vary by more than 5%.

Drawdown observations during pumping and recovery were recorded using both manual methods and dataloggers installed in each of the test wells. In addition, turbidity and free chlorine residual measurements were taken at the well head at regular intervals during each pump test. No residual chlorine was detected at the time that the water samples were collected for analytical analyses.

Pumping test data for TW1 to TW5 was analyzed using Aquifer Test aquifer analysis software package, by Waterloo Hydrogeologic. The Theis model (drawdown and recovery) was selected as a means to calculate the aquifer parameters. For TW5, the

Theis (Theis, 1935) and Cooper & Jacob (Cooper & Jacob, 1946) methods were used as a means to calculate the aquifer parameters. During each pumping test, the nearby test wells served as observation wells. The observations wells did not experience any observable water level change during the pumping tests.

The results of the aquifer analyses are summarized in Table 1 in Section 6.1 and are provided in Appendix 4 of this report.

4.4 Topographic Survey

Existing ground site surveys were performed by others, providing geodetic elevations for the entire subdivision. The elevations are illustrated in Paterson Drawings PG3155-2 Test Hole Location Plan and PG3155-4 Test Hole Location Plan in Appendix 5.

4.5 Laboratory Testing

Gradation of Soils

The soil samples recovered from the test holes were returned to our laboratory and visually examined to review the results of the field logging. Ten (10) representative samples were selected for grain size analyses in our laboratory. The results of the soil testing are provided on the Grain Size Distribution curves in Appendix 1.

4.6 Groundwater Sampling

Test Wells

In addition to the groundwater sampling completed as part of the pumping tests, a supplementary groundwater sampling program was undertaken at the subject site. Select homeowners with established dwellings who were using the potable water supply wells installed onsite were contacted to participate in the groundwater sampling program. Any homeowner who contacted Paterson was scheduled for an appointment at the homeowner's convenience.

The following program was carried out at the participating properties on August 15, 2023:

- A survey was conducted with homeowners to determine the construction specifications of their well (well type and age, pump type, treatment system, water quality and quantity).
- Water samples were recovered from the homeowners well prior to filtration or water treatment.
- The samples were submitted for analytical testing (Subdivision Package, E.Coli/Total Coliforms and Trace Metals) at an accredited laboratory (Eurofins Environment Testing Canada Inc.)

Of the three (3) properties invited to participate in the sampling program, two (2) homeowners contacted Paterson to organize the sampling of their wells, and one declined

the invitation to participate (Lot 6). The following developed lots were successfully sampled:

- Lot 13
- Lot 21

The potable supply wells servicing Lot 13 and Lot 21 are TW4 and TW5, respectively. TW4 and TW5 are test wells which were constructed and tested as part of the Phase 1 and Phase 2 hydrogeological investigations on the subject site.

Test Holes

A water sample was collected from TP1-23 during the field investigation on May 18, 2023 and submitted for analytical testing consistent with the nitrogen family at an accredited laboratory, to assess the background nitrogen concentrations.

5.0 Regional Hydrogeology

5.1 Water Well Construction and Aquifer Interception

A search of the available MECP Water Well Records (WWRs) was undertaken as part of the background works in order to prepare a conceptual hydrogeological model for the subject property. The MECP WWR search was conducted for wells located in greater Burnstown, and in proximity to the site. The well locations, throughout the Burnstown area are identified on Paterson Drawing PH4748-2 – MECP Water Well Location Plan, located in Appendix 5.

In addition to the five (5) test wells, another 23 wells in proximity to the site were selected for more detailed review. Of the 23 MECP WWRs included in the analysis, 100% of the wells were noted to be drilled wells with the casings completed into bedrock. The choice of grouting compounds, where identified on the well records, was seen to be either a neat cement, or sodium bentonite slurry.

With respect to the depth of aquifer interception, the trend is variable as one would expect in Precambrian rock, with the aquifer depths ranging between 10 and 115 metres below the ground surface (bgs).

With respect to well yields, the recommended pump rates varied from 2 to 30 GPM, with the typical recommended rate set by the well drillers being approximately 5 GPM.

5.2 Neighbouring Water Quality

Due to the absence of available wells downgradient from the subject site, no off-site well testing was undertaken. The significant majority of wells are located north of the Madawaska River, some distance away, with a few others being along McLeod Road.

There are no identified wells within 250 m and a couple wells within 250 to 500 m of the site boundaries.

Given that most of the test holes were dry at the time of the fieldwork, the data would not support specific contouring of the overburden groundwater table. However, given the significant sloping of the land towards the Madawaska River, it is safe to conclude that the overburden aquifer slopes northerly towards the river, following the surficial terrain.

6.0 Aquifer Analyses

The results of the groundwater review, pumping tests performed and groundwater samples on the test wells are presented in the following sections.

6.1 Aquifer Characteristics

The aquifer characteristics determined from the compilations of the pumping tests for the five (5) test wells are summarized in Table 1 below:

Aquifer PARAMETER	TW1	TW2	TW3	TW4	TW5
Transmissivity ¹ (m ² /d)	144	542	0.73	0.14	1.36
Transmissivity ² (m ² /d)	30.3	4.64	0.99	0.26	1.86
Transmissivity ³ (m ² /d)	-	-	-	-	1.37
Average Pumping Rate (L/min)	73.2	30.6	18	15	19
Available Drawdown (m)	26.86	26.2	40.49	76.35	67.7
Maximum Drawdown (m)	4.68	6.54	18.31	47.78	10.2
% Drawdown	17.40%	24.90%	45.20%	62.60%	15.10%
Specific Capacity (L/min/m)	15.64	4.68	0.98	0.31	1.9
20 Year Safe Yield ⁴ (m ³ /day)	389	58	19	10	60

1. Transmissivity values calculated using the Theis Method and measured drawdown.
2. Transmissivity values calculated using the Theis Recovery Method.
3. Transmissivity values calculated using Cooper & Jacob (Cooper & Jacob, 1946).
4. 20 Year Safe Yield Calculated Using Transmissivities from Recovery Data.

Water Quantity Assessment

Using the procedure summarized in the MECP document entitled, “*Procedure D-5-5 Technical Guideline for Private Wells: Water Supply Assessment*”, prepared by the Ontario Ministry of the Environment, Conservation and Parks, an analysis of the suitability of the aquifer to supply the proposed development can be completed. Using the values contained within Procedure D-5-5, the per-person water requirement is set at 450 L/day. The peak demand, which occurs over a 120 minute period each day, equates to a peak demand rate of 3.75 L/min per person. Procedure D-5-5 suggests the utilization of the

number of bedrooms plus one, to determine the minimum number of people per house. As the proposed development will likely consist of three bedroom single family homes, using the Procedure D-5-5 methodology, the number of persons would be four (4) and the total peak demand rate is calculated to be 15 L/min.

Analysis of Table 1 reveals that the pumping rates chosen for each of the pumping wells are at or above this minimum pumping rate. Using the results of the pump tests, the 20 year long term safe yield values were calculated, suggesting that the actual well capacity is significantly better than what would be required based on representative water demands for residential subdivisions. The worst case exists at TW 4, which resulted in a 20 year safe yield of 10,000 litres/day, based on the well geometrics. This is more than four times the design consumption used for a typical residence.

6.2 Potential Well Interference

It is anticipated that a series of individual water supply wells, in addition to the existing test wells, will be constructed at the subject property in order to provide individual water supplies for each lot. The well alignments will be linear along the length of the site paralleling the Madawaska River, and as such, there will be minimal clustering of wells that could result in well interference. Also, these wells are anticipated to intercept aquifers located in the Precambrian Formation at varying depths, and considering the inherent intermittent nature of pumping, and the absence of wells on adjacent lands, potential well interference is anticipated to be negligible. This is further corroborated by the 20 year safe yield estimates established earlier in this report.

As the pumping is anticipated to be intermittent with several wells in operation at any given time, a potential well interference model was created to reflect a hypothetical worst case scenario for drawdown at the site. The model, assumes a series of 41 wells, located along concentric circular spacings extending outward from one central well, each pumping continuously at a rate of 2,400 L/day, over a period of 20 years. The analytical model worksheet is presented in Appendix 4.

To remain consistent with the previous Hydrogeological Assessments, and to provide a conservative analysis, the transmissivity value of 6 m²/day was used to support the analysis. The average transmissivity of all of the test wells is 7.6 m²/day. In the long term model, the maximum anticipated drawdown in the approximate center of the pumping wells, based on a total of 41 wells pumping continuously for 20 years at 2,400 L/day, is 10.7 metres. As the average well has a static head in the order of approximately 45 m, this drawdown represents a removal of approximately 24 % of the available drawdown. The conclusions reached using this model are consistent with the 20 year safe yield values in Table 1.

6.3 Groundwater Geochemistry Assessment

6.3.1 Pumping Test Results

During the pump tests, water samples were recovered for analytical testing purposes. For each well, analytical testing consistent with the parameters of a Subdivision Package was conducted on samples recovered at 3 hours and 6 hours. Given the absence of commercial or industrial activity, it is our opinion that no testing of other parameters would be required as part of this study.

The Subdivision Package suite of parameters laboratory water quality analytical results obtained from the pumping tests of TW1 through TW5 are provided in Table 2 below. The laboratory analyses reports can be found attached.

TABLE 2: SUMMARY OF SUBDIVISION SUPPLY PACKAGE WATER ANALYSES													
PARAMETER	UNITS	ODWS		TEST WELL									
		LIMIT	TYPE	TW1		TW2		TW3		TW4		TW5	
				2015		2015		2015		2015		2020	
				3hr	6hr	3hr	6hr	3hr	6hr	3hr	6hr	3hr	6hr
MICROBIOLOGICAL													
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	0	0	0	0	0	0	0	0
Total Coliforms	ct/100mL	0	MAC	0	0	0	0	0	0	0	0	0	0
GENERAL CHEMICAL - HEALTH RELATED													
Fluoride	mg/L	1.5(2.4)	MAC	0.44	0.42	0.31	0.31	0.99	1.08	<0.10	0.13	0.22	0.32
Nitrite	mg/L	1	MAC	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate	mg/L	10	MAC	0.3	0.26	0.14	0.14	<0.10	<0.10	<0.10	<0.10	0.21	0.20
Turbidity (Lab)	NTU	1.0(5.0)	MAC/AO	2.1	0.3	2.5	0.6	0.9	0.4	>100	11.7	1.8	0.3
Turbidity (Field)	NITU	1.0(5.0)	MAC/AO	2	0.4	2.5	0.7	0.6	0.6	102	10.4	2.82	0.68
Ammonia	mg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.09	0.08
Total Kjeldahl Nitrogen	mg/L			0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.1	<0.1
GENERAL CHEMICAL - AESTHETIC RELATED													
Hardness	mg/L	100	OG	291	294	269	274	263	265	179	198	221	223
Ion Balance	unitless			1.07	1.07	1.07	1.09	1.05	1.06	1.1	1.03	1.02	0.98
Total Dissolved Solids	mg/L	500	AO	341	348	312	317	296	302	207	228	240	240
Alkalinity	mg/L	500	OG	238	244	226	226	235	234	151	179	197	209
Chloride	mg/L	250	AO	13	14	8	8	2	2	5	4	3	3
Colour	TCU	5	AO	<2	<2	<2	<2	<2	<2	2	<2	<2	<2
Conductivity	uS/cm			525	535	480	487	455	465	319	350	416	417
pH	unitless	6.5-8.5	AO	8.14	8.16	8.09	8.1	8.14	8.15	8.13	8.2	8.17	8.20
Sulphide	mg/L	0.05	AO	<0.01	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<0.01	<0.01	<0.01
Sulphate	mg/L	500	AO	29	28	24	24	16	17	12	14	26	26
Calcium	mg/L			77	78	73	75	64	65	52	58	62	63
Iron	mg/L	0.3	AO	0.22	<0.03	0.14	<0.05	<0.03	<0.03	3.1	0.62	0.11	<0.03
Potassium	mg/L			2	3	2	2	2	2	1	1	3	3
Magnesium	mg/L			24	24	21	21	25	25	12	13	16	16
Manganese	mg/L	0.05	AO	<0.01	<0.01	<0.01	<0.01	0.04	0.05	0.12	0.02	<0.01	<0.01
Sodium	mg/L	200	AO	7	8	5	5	2	3	3	3	4	4
Phenols	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.003	<0.001	<0.001
Tannin & Lignin	mg/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	0.1	<0.1	<0.1
Dissolved Organic Carbon	mg/L	5	AO	1.4	1.5	1.7	1.5	1.8	1.4	1.4	1.3	1.000	1.0

- ODWS identifies the following types of parameters:
MAC=Maximum Allowable Concentration
AO = Aesthetic Objective
OG= Operational Guideline
- Shaded Concentration Indicates an Exceedance of the ODWS Objective

6.3.2 Supplementary Sampling Results

Additional water samples were recovered for analytical testing purposes from TW4 and TW5 on September 15, 2023. The purpose of the testing was to confirm that the underlying aquifer had not changed significantly with use, and to demonstrate that it was still capable of support the proposed Phase 3. For each well, an unfiltered water sample was collected and submitted for analytical testing consistent with a Subdivision package and trace metals.

The Subdivision Package and trace metals suite of parameters laboratory water quality analytical results obtained from TW4 and TW5 compared with previous sampling results from the same test wells are provided in Table 3 and Table 4 below. The laboratory analyses reports can be found attached.

TABLE 3: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY									
PARAMETER	UNITS	ODWS		TW4			TW5		
		LIMIT	TYPE	TW 4 WS 1 4/1/2015	TW 4 WS 2 4/1/2015	TW 4 WS 3 8/15/2023	TW5-GW1 8/31/2020	TW5-GW2 8/31/2020	TW5-GW3 8/15/2023
MICROBIOLOGICAL									
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	0	0	0	0
Total Coliforms	ct/100mL	0	MAC	0	0	0	0	0	0
GENERAL CHEMICAL - HEALTH RELATED									
Fluoride (F)	mg/L	1.5	MAC	<0.10	0.13	0.11	0.22	0.32	0.32
Ammonia (N-NH ₃)	mg/L	-	-	<0.02	<0.02	0.035	0.09	0.08	<0.020
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate (N-NO ₃)	mg/L	10	MAC	<0.10	<0.10	0.30	0.21	0.20	<0.10
Total Kjeldahl Nitrogen	mg/L	-	-	<0.10	<0.10	0.276	0.10	<0.10	0.133
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	-	-	-	-	-	-
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	>100	11.7	3.6	1.8	0.3	0.4
GENERAL CHEMICAL - AESTHETIC RELATED									
Alkalinity (as CaCO ₃)	mg/L	30-500	OG	151	179	237	197	209	222
Chloride (Cl)	mg/L	250	AO	5	4	23	3	3	4
Colour (Apparent)	TCU	5	AO	2	<2	12	<2	<2	<2
Colour (Field - True)	TCU	5	AO	-	-	-	-	-	-
Conductivity	uS/cm	-	-	319	350	559	416	417	441
Dissolved Organic Carbon	mg/L	5	AO	1.4	1.3	2.0	1.0	1.0	1.4
Hardness (as CaCO ₃)	mg/L	80-100	OG	179	198	279	221	223	237
Ion Balance	unitless	-	-	1.10	1.03	0.97	1.02	0.98	0.95
pH	unitless	6.5-8.5	AO	8.13	8.20	7.68	8.17	8.20	7.93
Phenols	mg/L	-	-	0.003	0.003	<0.001	<0.001	<0.001	<0.001
Sulphate (SO ₄)	mg/L	500	AO	12	14	45	26	26	29
Sulphide (S ₂ ⁻)	mg/L	0.05	AO	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01
Tannin & Lignin	mg/L	-	-	0.6	0.1	<0.5	<0.1	<0.1	<0.5
Total Dissolved Solids	mg/L	500	AO	207	228	363	240	240	287

- ODWS identifies the following types of parameters:
MAC = Maximum Allowable Concentration
AO = Aesthetic Objective
OG = Operational Guideline
- Shaded Concentration Indicates an Exceedance of the ODWS Objective

TABLE 4: GROUNDWATER GEOCHEMISTRY - METALS

PARAMETER	UNITS	ODWS		TW4			TW5		
		LIMIT	TYPE	TW 4 WS 1	TW 4 WS 2	TW 4 WS 3	TW5-GW1	TW5-GW2	TW5-GW3
				4/1/2015	4/1/2015	8/15/2023	8/31/2020	8/31/2020	8/15/2023
METALS									
Aluminum (Al)	mg/L	0.1	OG	-	-	0.02			<0.01
Antimony (Sb)	mg/L	0.006	IMAC	-	-	0.0006			0.0011
Arsenic (As)	mg/L	0.01	IMAC	-	-	<0.001			<0.001
Barium (Ba)	mg/L	1.0	MAC	-	-	0.04			0.09
Beryllium (Be)	mg/L	-	-	-	-	<0.0005			<0.0005
Boron (B)	mg/L	5.0	IMAC	-	-	0.04			0.01
Cadmium (Cd)	mg/L	0.005	MAC	-	-	<0.0001			<0.0001
Calcium (Ca)	mg/L	-	-	52	58	82	62	63	67
Chromium (Cr)	mg/L	0.05	MAC	-	-	<0.001			<0.001
Cobalt (Co)	mg/L	-	-	-	-	0.0005			<0.0002
Copper (Cu)	mg/L	1.0	AO	-	-	0.015			0.004
Iron (Fe)	mg/L	0.3	AO	3.1	0.62	1.37	0.11	<0.03	<0.03
Lead (Pb)	mg/L	0.01	MAC	-	-	<0.001			<0.001
Magnesium (Mg)	mg/L	-	-	12	13	18	16	16	17
Manganese (Mn)	mg/L	0.05	AO	0.12	0.02	0.05	<0.01	<0.01	<0.01
Molybdenum (Mo)	mg/L	-	-	-	-	<0.005			<0.005
Nickle (Ni)	mg/L	-	-	-	-	<0.005			<0.005
Potassium (K)	mg/L	-	-	1	1	<1	3	3	2
Selenium (Se)	mg/L	0.05	MAC	-	-	<0.001			<0.001
Silver (Ag)	mg/L	-	-	-	-	<0.0001			<0.0001
Sodium (Na)	mg/L	200	AO	3	3	13	4	4	3
Strontium (Sr)	mg/L	-	-	-	-	0.796			0.303
Thallium (Tl)	mg/L	-	-	-	-	<0.0001			<0.0001
Uranium (U)	mg/L	0.02	MAC	-	-	0.002			0.001
Vanadium (V)	mg/L	-	-	-	-	<0.001			<0.001
Zinc (Zn)	mg/L	5.0	AO	-	-	0.03			<0.01

- ODWS identifies the following types of parameters:
MAC = Maximum Acceptable Concentration
IMAC = Interim Maximum Acceptable Concentration
AO = Aesthetic Objective
OG = Operational Guideline
- Shaded Concentration Indicates an Exceedance of the ODWS Objective

In general, the water quality results from TW4 and TW5 are reasonably similar to results from the initial pumping tests of each well. Significant changes to treatment recommendations and other considerations are not required based on these new results.

6.3.3 Water Quality

A review of the water quality analysis data from the test wells, reveals that the raw water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC). The bacteriological test results indicate that the test samples at the 3 and 6 hour intervals for all test wells were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms. Furthermore, the water meets all of the aesthetic objectives (AO) and operational guidelines (OG) with the exception of the following:

- Hardness (ss CaCO₃)
- Iron
- Manganese
- Turbidity

Each of these groundwater parameters are discussed in detail below:

Hardness as CaCO₃

Hardness, expressed as calcium carbonate, is an operational guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. Hardness concentration at each testing well ranged from 179 to 294 mg/L, which is considered to be moderately hard, however, is below the reasonable treatable limit of 500 mg/L specified in Table 3 of the MECP guidance document for Procedure D-5-5 (1996). Hardness concentrations can be treated using conventional softening technologies.

Iron

Concentrations of iron above 0.3 mg/L can contribute to staining of fixtures and a metallic taste at higher concentrations. Precipitation of iron can promote the growth of iron bacteria in pipes. The precipitation of iron in analytical lab samples can also cause elevated apparent colour readings which are not typically indicative of normal operating conditions.

The concentration of iron in the groundwater in TW4 was measured to range between 0.62 and 3.1 mg/L whereas the concentration of iron in the remaining test wells ranged from non-detectable to 0.22 mg/L. The concentration of iron in the groundwater in the test wells is considered to be reasonably treatable in accordance with Procedure D-5-5. It is recommended that an iron filter be used to reduce the levels of iron and reduce the potential for excessive precipitate occurring in the water supply system, if desired.

Manganese

The manganese concentration results from the laboratory test samples yielded values ranging from 0.02 to 0.12 mg/L in the onsite wells, which is occasionally above the aesthetic objectives in the ODWSOG of 0.05 mg/L. Procedure D-5-5 gives a maximum concentration considered reasonably treatable for manganese as 1.0 mg/L. A conventional water softener or manganese greensand filter can be used to reduce the levels of manganese, if desired.

Turbidity

The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU.

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 3.6 NTU. It is our opinion that the turbidity levels measured in the laboratory tests can be attributed to the precipitation of iron and manganese out of the groundwater.

Colour

Colour may occur in drinking water for several reasons. It may be due to organic substances from the decay of vegetation, or the presence of metals such as iron, manganese, and copper, which are abundant in nature. The provincial aesthetic objective for colour in drinking water is 5 True Colour Units (TCU). The federal (Health Canada) guideline aesthetic objective limit for colour is 15 TCU (Guidelines for Canadian Drinking Water Quality, Health Canada June 2019). Procedure D-5-5 gives a maximum concentration considered reasonably treatable for colour as 7 TCU. As colour is a strictly aesthetic parameter, it can be reduced from the water supply, if desired, through the use of a carbon filter treatment system or manganese greensand treatment.

Apparent colour in the groundwater was measured to range between 0 and 12 TCU in the analytical results. All colour readings are below the aesthetic guidelines of 15 TCU. The elevated colour levels detected in the lab samples are attributed to the precipitation of iron and manganese out of the groundwater.

6.3.4 Background Nitrate Sampling Results

Water samples were collected from TP1-23 during the field investigations and submitted for analytical testing (nitrogen family) at an accredited laboratory, Eurofins Environment Testing Canada Inc., to determine the background nitrogen concentrations. The results are summarized in Table 5 below.

TABLE 5: SUMMARY OF NITROGEN FAMILY WATER ANALYSES				
PARAMETER	UNITS	ODWS		TP1-23 GW1
		LIMIT	TYPE	
5/18/2023				
GENERAL CHEMICAL - HEALTH RELATED				
Nitrite	mg/L	1	MAC	<0.10
Nitrate	mg/L	10	MAC	<0.10
Ammonia	mg/L			0.143
Organic Nitrogen	mg/L	0.15	OG	0.12
Total Kjeldahl Nitrogen	mg/L			0.264

- ODWS identifies the following types of parameters:
 - MAC=Maximum Allowable Concentration
 - AO = Aesthetic Objective
 - OG= Operational Guideline
2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

7.0 Terrain Analysis

The fieldwork completed as part of Paterson's previous field investigations for the site, Paterson Report PG3155-LET.06 dated June 15, 2022, and Paterson Report PH2610-01 dated July 17, 2015 are used in support of the Terrain Analysis. Additional information pertaining to this investigation was gathered from available geological mapping and surrounding WWR's.

7.1 Geological Conditions

The subsurface soils generally consisted of a topsoil overlying a glacial till consisting of a compact to dense brown silty sand with some gravel and cobbles trace boulders. Localized deposits of a silty sand to sandy silt were observed underlying the topsoil in the western portion of the site. Fill was observed in TP1 on the western side of the site, and in a number of test pits on the northeastern portion of the site.

Reference should be made to the Soil Profile and Test Data sheets appended to this report for the details of the soil profiles encountered at each test hole location. The client should be aware that any information pertaining to soils are furnished as a matter of general information only and test hole descriptions are not to be interpreted as descriptive of conditions at locations other than those described by the test holes themselves.

It should be noted that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. Therefore, groundwater levels could vary at the time of construction.

7.2 Hydrogeological Sensitivity of the Site

Presently, the subject site is located along the south shore of the Madawaska River, south of the Village of Burnstown, Ontario. The site slopes steeply to the Madawaska River and is heavily treed with a mature forest occupying the entire site. The lands south of the property are for the greater part wooded as far south as McLeod Road. A Building Supply Retail store exists southwest of the site close to Burnstown Road. The proposed lots on the subject site are to be serviced by private wells and septic systems.

The topography of the site slopes steeply to the Madawaska River to the north. The local flow direction of the surficial overburden aquifer is expected to be in a northerly direction towards the Madawaska River. The regional groundwater flow is considered to be in a north-easterly direction towards the Ottawa River.

Based on the test pit and borehole programs, overburden thickness across the site is variable, ranging from non-existent in areas of localized bedrock outcropping, and in excess of 12 meters as evidenced at BH 1. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile at each test hole location.

As the subject site has bedrock within 2 m of the ground surface, the site is considered to be hydrogeologically sensitive.

In order to minimize the risk of long-term contamination of services, a typical minimum separation distance of 15 m is required between any drilled potable supply well and the closest distribution pipe or septic tank of a sewage system. Due to the hydrogeological sensitivity of the site, it is recommended that the separation distance be increased to 30 m and the minimum well casing requirements be doubled to 12 m bgs.

A minimum of 100 mm of imported or in-situ soil seal would be required to provide system isolation due to the shallow overburden (<2 m), unless it can be demonstrated that there is over 2 m of overburden in the proposed sewage system location.

Additionally, a residential Ultra-Violet (UV) treatment system is recommended at the point of entry from all potable supply wells. The UV system should be maintained and operated as per the manufacturer's instructions.

7.3 Septic System Design

Conceptual Lot Development Plan

Building plan and design details were not available at the time of report preparation. As such, the theoretical dwelling design from the previous report (Paterson Report PH2610-01) was used in order to remain consistent. The theoretical dwelling design consists of an assumed two (2) storey residential dwelling with three (3) bedrooms and a finished floor area of approximately 280 m². The location of the proposed structures has not been assigned however it can be assumed to be central in most lots. The lot sizes vary from 0.40 to 1.19 ha, with an average lot size of 0.60 ha. Please note that any proposed design layouts are not meant to restrict the location of the proposed dwellings or private services and are designed to demonstrate that the minimum separation distances can be achieved.

Sewage System Design

It is assumed that a single detached dwelling will be constructed on the proposed lots in the future.

The theoretical dwelling design for this review consists of an assumed two storey dwelling with three (3) bedrooms and a finished floor area of approximately 280 m². The sewage flow, calculated in accordance with Article 8.2.1.3 of the OBC, is 2,400 L/d, with a total peak demand rate of 15 L/min.

Given the sloping nature of the terrain on this site, it would be prudent to use tertiary systems to minimize the bed areas, which would serve to preserve, as much as possible, the tree cover on the site. These tertiary technologies are accepted in the Ontario Building Code. If larger homes are to be built, it is our opinion that the proposed lot sizes will readily accommodate a larger leaching bed.

In all instances, site specific analysis of the soil morphology in the area of each proposed leaching bed is required during the design stages of the leaching bed in order to determine if sufficient soil exists to facilitate the use of native soil for subgrade preparation. Detailed soil morphology should only be determined by a qualified geotechnical specialist.

It is not the intent of the Lot Development Plan (Drawing No. PH4748-5) to restrict placement of a dwelling on each lot. While the actual configuration and position of the home may change, the relative position of the home, sewage system and well should be maintained. In all cases, the separation criteria for the immediate and neighbouring lots should be followed.

Sewage systems must be designed according to Part 8 of the Ontario Building Code (OBC). The OBC sets out minimum design and construction standards for all approved classes of sewage systems.

OBC requirements state that there must be a minimum of 900 mm of suitable soil or leaching bed fill present between the base of the absorption trenches and the high groundwater table, bedrock or soil with a percolation rate greater than 50 min/cm. Although it is not expected that groundwater conditions will affect the design of the systems, there is a potential for shallow bedrock conditions to govern the siting of leaching beds on individual lots.

7.4 Lot Development Plan

Paterson prepared a drawing titled PH4748-5 - Lot Development Plan to show that the minimum separation distances can be achieved at the proposed residential subdivision. Please note that any proposed design layouts are not meant to restrict the location of the proposed dwellings or private services and are designed to demonstrate that the minimum separation distances can be achieved.

A conventional sewage system, as discussed above, has a footprint of 452 m². The conventional sewage system, a potable supply well and a 280 m² residential dwelling are depicted on each lot. A separation distance of 30 m between any drilled potable supply well and the closest distribution pipe or septic tank of a sewage system is also shown.

As demonstrated by the drawing, there is sufficient room on each lot to accommodate a conventional sewage system, a residential dwelling, and a private drilled well using a minimum separation distance of 30 m.

7.5 Nitrate Impact Assessment

Nitrate is considered to be a critical parameter of concern when assessing impacts to groundwater quality downgradient of an onsite sewage system. MECP Procedure D-5-4 applies for the proposed development. For the purpose of this guideline, the Ontario

Drinking Water Objective of 10 mg/L of nitrate is the maximum allowable concentration detectable in the groundwater prior to the property line.

Guideline D-5-4 indicates that where the lot size is 1.0 ha or larger, a detailed assessment is typically not required since it is considered be a low-risk development and that adequate surplus water is available in the soils to appropriately dilute the nitrate output on the property. The proposed severed lots are an average of 0.60 ha in size and, as such, a detailed impact assessment has been completed.

In order to demonstrate that private services would adequately support the proposed residential subdivision, a predictive nitrate impact assessment for the subject site is shown below. The values shown in the Predictive Nitrate Impact Assessment attached to this report are summarized below:

<input type="checkbox"/>	Site area	24.8 ha
<input type="checkbox"/>	Impervious area %	7 %
<input type="checkbox"/>	Daily sewage flow <i>(Based on Ontario Guideline D-5-4)</i>	41,000 L/day (41 Lots)
<input type="checkbox"/>	Concentration of nitrate in effluent <i>(Value based on typical effluent concentration for a conventional sewage system)</i>	40 mg/L
<input type="checkbox"/>	Surplus Water <i>(The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of fine sandy loam (Urban Lawn/Shallow Rooted Crops) and anthropogenic sources, which can be found attached)</i>	357 mm/year
<input type="checkbox"/>	Combined infiltration factor based on:	0.64
	● Topography infiltration factor	0.10
	● Soil texture infiltration factor	0.40
	● Cover infiltration factor	0.14

The topography infiltration factor of 0.1 is based upon hilly land with an average slope of 28 m to 47 m/km for the proposed development.

The soil texture infiltration factor was based on an open sandy loam which is a reasonable generalization based upon the geotechnical field investigation, available geological mapping and surrounding WWR's.

The vegetative cover infiltration factor was calculated as 0.14 based upon it being partway between the value for cultivated land (0.1) and woodland (0.2), which is the anticipated usage of the residential properties.

Based on Ontario Guideline D-5-4 Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment, the predictive nitrate impact assessment reviewed the potential impacts using a value of 1,000 L/day per lot. The calculation for a standard septic system results in a predicted nitrate concentration of 8.85 mg/L nitrate concentration for the subject sites, using a value of 40 mg/L nitrate concentration within the effluent.

Background nitrogen family nitrate concentrations were measured to range from 0.14 to 0.30 mg/L in the groundwater sample from TP1-23 and test well groundwater sampling, incorporating the highest measured nitrate concentration of 0.30 mg/L into the predicted nitrate concentration yields a value of 9.15 mg/L, which is still below the provincially mandated value of 10 mg/L by the property boundary.

Based on the results of the predicted nitrate impact assessment, it is our opinion that the proposed residential subdivision can adequately support the proposed single detached dwellings without having an adverse impact on the underlying bedrock aquifer.

7.6 Phosphorus Impact Assessment

Phosphorus is an essential nutrient found in all living tissue, but elevated phosphorus concentrations in surface water often cause eutrophication which adversely affects aquatic ecosystems.

The only surface water source near or onsite is the Madawaska River. The Madawaska River is 230 km long and drains an area of 8,470 km². Ontario Power Generation (OPG) operates a series of electrical power generation plants along the course of the Madawaska River and routinely collects information about water depths and flows in the River.

Ontario Ministry of the Environment, Conservation and Parks (MECP) Procedure D-5-4 indicates that the concentration of phosphate used in assessing the potential impact of sewage effluent should be 15 mg/L, at an effluent flow rate of 1000 L/day per lot.

The MECP Ontario Provincial Water Quality Objectives (PWQO) indicate that phosphorus in lakes should not exceed 20 ug/L, and that “excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L”.

Although the soils at the site are relatively coarse grained and calcareous (due to the underlying calcium carbonate rich bedrock), there will still be a lot of precipitation and adsorption of phosphorus immediately below each wastewater treatment system bed. Depending on the soil thickness and the relative elevation of the overburden water table, each location will have a variable amount of soil material available for binding of phosphorus beneath the wastewater treatment system, and between the wastewater treatment system and the Madawaska River. Breakout to the river will not occur for many

years but can be expected to occur eventually as all of the available soil becomes saturated with phosphorus. Preferential pathways for groundwater flow (gravel lenses, soil fractures) could also result in the transportation of some phosphorus impacted shallow groundwater to the river.

The following calculation assumes a worst case scenario where ALL of the phosphorus from 41 lots reaches the river on any given day:

- ❑ 41 lots x 1000 litres effluent /day x 15 mg/L phosphorus = 615 g phosphorus/day
- ❑ Flow rate in the Madawaska River = 11.8 billion litres/day
- ❑ 615 grams phosphorus dissolved into 11.8 billion litres water = 0.000000052 g/litre

The resultant phosphorus concentration is equal to 0.052 micrograms/litre (ug/L). This value is three (3) orders of magnitude less than the interim PWQO limit of 30 ug/L. If all of the phosphorus from the proposed subdivision flowed straight into the Madawaska River, there would be no significant impact.

7.7 Secondary Dwellings

An assessment of the feasibility of secondary dwellings was completed as part of the Terrain Analysis. Based on the results of the Nitrate Impact Assessment, the site does not have enough capacity to allow for secondary dwellings as part of the proposed development. As such, secondary dwellings are not considered feasible for this development.

8.0 Conclusions

Based on the information contained within the body of this report, the following conclusions can be drawn:

1. The water supply aquifer intercepted by the onsite test wells is considered to be adequate to support the water quantity demands for the proposed subdivision.
2. The preferred water supply intercepted by the onsite test wells contains a water supply that is potable and contains only elevated concentrations of hardness, iron, and manganese. The noted parameters can be treated with current readily available water conditioning equipment.
3. The results of the water supply assessment have provided satisfactory evidence that the water supply aquifer underlying the subject site can support the proposed subdivision development from both a quality and quantity perspective.
4. There are minimal potential impacts from surrounding land uses within 500 m of the site, based on available information. Moreover, offsite impacts from the proposed density of residential development are considered to be negligible.
5. The probable well yields determined on the basis of this investigation are representative of the yields which residents of the proposed subdivision are likely to obtain from their wells in the long term.
6. The subject property is located on a significantly sloping setting on the south shore of the Madawaska River, with all areas exhibiting good characteristics in pre-development condition.
7. Sampling of dwellings currently in use shows that the water supply aquifer is capable of supporting the proposed development from a water quality perspective.
8. As a precautionary measure, a residential Ultra-Violet (UV) treatment system is recommended at the point of entry from all potable supply wells due to the hydrogeological sensitivity.
9. The construction of an on-site sewage system should not affect the performance or water quality associated with a drilled well, contingent upon the on-site sewage system being designed in accordance with the Ontario Building Code (i.e., properly sized sewage system and conforming to all separation distances)

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10. A tertiary treatment system could be used to provide higher quality effluent and a reduced site footprint. A tertiary treatment system would require an annual maintenance contract to be reported to the local regulator.
 11. Secondary dwellings are not considered feasible for this development.
 12. The results of the Hydrogeological Report and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed residential subdivision with respect to water quality, quantity and sewage system placement.

9.0 Recommendations

Based on the information presented in the body of this report, the following recommendations can be made:

1. Future wells should be constructed in accordance with O.Reg. 903 and be installed similarly to the well construction of the onsite test wells. Due to the hydrogeological sensitivity of the region, future wells should be installed with a minimum casing length of 12 m bgs (double the standard length) and have a minimum of 30 m separation distance between any drilled potable supply well and the closest distribution pipe or septic tank of a sewage system.
2. The drilling of the casing hole, the installation of casing, and the grouting of the annular space should be inspected by a qualified individual, as per O.Reg. 903. All well construction must be carried out by a licensed well technician.
3. Future wells must be completed such that the top of the well casing is a minimum of 400 mm above the finished grade and the area surrounding the well is graded to shed water.
4. Well owners should ensure that the wellhead and surrounding area are maintained in accordance with the requirements of O.Reg. 903. Future well owners should refer to the MECP Water Supply Wells Requirements and Best Management Practices, for additional details.
5. Additional treatment to address hardness, iron, and manganese may be used as desired. Water treatment methods may include a water softener, reverse osmosis, coagulation/flocculation processes, biological filtration, and/or granulated activated charcoal filtration.
6. Existing wells which are not to be utilized for water supply wells, or retained for sentinel well purposes, should be decommissioned in accordance with O.Reg. 903.
7. Wells should be developed to a sand free state in order to ensure that the residual turbidity created by the well drilling activities is completely purged from the well. Additional well development, prior to placing the well into use, is strongly recommended in order to provide adequate development of the formation and remove extraneous rock debris from the aquifer pathways. It is likely that future wells at this site will require additional well development. The additional well development should take place during well construction, or alternatively, take place during the mandatory pumping test required by O.Reg. 903.
8. Individual future well owners should carry out semi annual verification of potability of the raw water supply, specifically bacteriological analyses (E.coli, and total coliforms). Moreover, the well owner should ensure that they maintain the wellhead

and immediate area in accordance with the requirements of Ontario Regulation 903.

9. The on-site sewage disposal needs can be accommodated with standard Class 4 sewage systems consisting of a septic tank and in-ground, partially or fully raised leaching beds, as per Part 8 of the Ontario Building Code.

10.0 Limitations

This Hydrogeological Assessment and Terrain Analysis report has been prepared in general accordance with the agreed scope-of-work and the requirements of MECP Procedure D-5-4 and Procedure D-5-5.

The conclusions presented herein are based on information taken from a limited historical review along with a field investigation and testing program. The findings of this investigation are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by provincial agencies and was limited within the scope-of-work, time, and budget of the project herein.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than **Braeburn Estates** or their agents, is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

We trust that the current submission satisfies your immediate requirements.

Paterson Group Inc.



Zavian Buchanan, E.I.T.



Erik Ardley, P.Geo.



Michael S. Killam, P.Eng.



APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS GRAIN SIZE DISTRIBUTION CURVES

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.




FILE NO.
PG3155

REMARKS

HOLE NO.
TP 1-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	191.19						
FILL: Loose, brown silty sand, some cobbles and boulders		G	1										
TOPSOIL		G	2			1	190.19						
GLACIAL TILL: Compact to dense, brown silty sand, some gravel and cobbles		G	3			2	189.19						
End of Test Pit TP terminated in glacial till at 4.20m depth (TP dry upon completion)						4	187.19						

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.



REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 2-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	188.90						
Compact, brown SILTY SAND , some gravel and cobbles		G	1										
	0.90					1	187.90						
GLACIAL TILL: Dense to very dense, brown silty sand, some gravel and cobbles, trace boulders													
		G	2										
	4.00					4	184.90						
End of Test Pit TP terminated in glacial till at 4.00m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 3-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.10	G	1			0	181.23						
Loose to compact, brown SILTY SAND , trace to some gravel, some boulders						1	180.23						
		G	2			2	179.23						
End of Test Pit	2.00												
TP terminated on bedrock surface at 2.00m depth (GWL @ 2.0m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 4-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	179.62						
TOPSOIL	0.40	G	1										
		G	2			1	178.62						∇
Loose to compact, brown SILTY SAND , trace some gravel and cobbles, trace boulders		G	3			2	177.62						
End of Test Pit	3.00					3	176.62						
TP terminated in silty sand at 3.00m depth (GWL @ 1.2m depth)													

○ Water Content %

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP 5-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	175.96						
TOPSOIL		G	1										
0.40													
Loose, dark brown SILTY SAND , some cobbles and boulders		G	2										
0.90													
GLACIAL TILL: Dense, brown silty sand, some gravel and cobbles		G	3			1	174.96						
						2	173.96						
						3	172.96						
3.20													
End of Test Pit													
TP terminated in glacial till at 3.20m depth (GWL @ 2.5m depth)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 6-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
PEAT		G	1			0	173.66						
	0.30												
Compact, brown SILT , some sand		G	2			1	172.66						
Compact, brown SILTY SAND , some gravel, cobbles and boulders		G	3			2	171.66						
	2.40												
	2.80												
End of Test Pit													
TP terminated in silty sand at 2.80m depth (GWL @ 0.3m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP 7-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	173.51						
TOPSOIL	0.20	G	1										
Loose to compact, brown SILTY SAND , trace gravel and cobbles		G	2			1	172.51						∇
						2	171.51						
GLACIAL TILL: Dense, brown silty sand, some gravel, cobbles and boulders	2.50	G	3										
						3	170.51						
End of Test Pit	3.20												
TP terminated in glacial till at 3.20m depth (GWL @ 1.5m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 8-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	172.80						
Loose to compact, brown SILTY SAND , some gravel and cobbles		G	1										
	0.70					1	171.80						
GLACIAL TILL: Compact to very dense, brown silty sand, some gravel, cobbles and boulders		G	2										∇
	3.90					2	170.80						
						3	169.80						
End of Test Pit TP terminated in glacial till at 3.90m depth (GWL @ 2.0m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP 9-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	165.93						
Compact, dark brown SILTY SAND , some gravel and cobbles		G	1										
	0.70					1	164.93						Piezometer Construction
GLACIAL TILL: Dense to very dense, brown silty sand with gravel, trace cobbles and boulders						2	163.93						
- grey by 3.0m depth	3.30	G	2			3	162.93						
End of Test Pit													
TP terminated in glacial till at 3.30m depth (GWL @ 0.9m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP10-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL		G	1			0	165.69						
Loose to compact, dark brown SILTY SAND , trace gravel	0.40	G	2										▽
	0.90					1	164.69						
Very dense, brown SILTY SAND with gravel, some cobbles and boulders		G	3										
	2.40					2	163.69						
End of Test Pit													
TP terminated on possible bedrock surface at 2.40m depth													
(Groundwater infiltration at 0.5m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP11-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	169.77						
TOPSOIL	0.30	G	1										
Loose, dark brown SILTY SAND , some gravel and cobbles	1.00	G	2			1	168.77						
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders						2	167.77						
	3.10	G	3			3	166.77						
End of Test Pit													
TP terminated in glacial till at 3.10m depth (GWL @ 2.4m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP12-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	184.96						
TOPSOIL	0.20	G	1										
		G	2			1	183.96						
						2	182.96						
						3	181.96						
		G	3			4	180.96						
End of Test Pit	4.10												
TP terminated in silty sand at 4.10m depth (TP dry upon completion)													

Loose to compact, brown **SILTY SAND**, some gravel, cobbles and boulders

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP13-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE													
TOPSOIL						0	182.17						
0.30 Loose to compact, dark brown SILTY SAND , some cobbles and boulders		G	1										
0.80 GLACIAL TILL : Compact to very dense, brown silty sand, some gravel, cobbles and boulders		G	2										
						1	181.17						
						2	180.17						∇
						3	179.17						
3.60 End of Test Pit TP terminated on possible bedrock surface at 3.60m depth (GWL @ 2.0m depth)		G	3										

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation - Proposed Roadway
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP14-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL					0	178.77							
Loose to dense, dark brown SILTY SAND , some boulders	0.25	G	1										
	0.70												
Dense to very dense, brown SILTY SAND with gravel, cobbles and boulders		G	2		1	177.77							
	1.70												
End of Test Pit													
TP terminated on bedrock surface at 1.70m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP15-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	167.10						
TOPSOIL	0.30												
Very dense, brown SILTY SAND with cobbles and boulders	G	1				1	166.10						
						2	165.10						
End of Test Pit	2.80												
TP terminated on bedrock surface at 2.80m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario


DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
REMARKS Surveying Limited.

FILE NO. **PG3155**

HOLE NO. **TP16-16**

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	168.98						
Very dense, dark brown SILTY SAND with cobbles and boulders		G	1										
End of Test Pit TP terminated on bedrock surface at 0.90m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

FILE NO.
PG3155

HOLE NO.
TP17-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	172.58						
Very dense, dark brown SILTY SAND with boulders		G	1										
End of Test Pit TP terminated on bedrock surface at 0.80m depth (TP dry upon completion)	0.80												

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP18-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	173.19						
Very dense, dark brown SILTY SAND with cobbles and boulders	G	1				1	172.19						
End of Test Pit TP terminated on bedrock surface at 1.10m depth (TP dry upon completion)	1.10												

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

FILE NO.
PG3155

HOLE NO.
TP19-16

BORINGS BY Excavator

DATE May 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
Very dense, dark brown SILTY SAND with cobbles and boulders		G	1			0	170.37					
						1	169.37					
End of Test Pit												
TP terminated on bedrock surface at 1.90m depth (TP dry upon completion)												

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 19, 2016

FILE NO.
PG3155

HOLE NO.
TP20-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	165.59						
TOPSOIL	0.15												
Dense to very dense, brown SILTY SAND with gravel, cobbles and boulders		G	1			1	164.59						
		G	2			2	163.59						
End of Test Pit	2.30												
TP terminated on bedrock surface at 2.30m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 20, 2016

FILE NO.
PG3155

HOLE NO.
TP21-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE													
TOPSOI	0.20	G	1			0	156.02						
Loose, dark brown SILTY SAND , some cobbles and boulders	0.60	G	2										
GLACIAL TILL: Compact to dense, brown silty sand, some cobbles and boulders						1	155.02						
						2	154.02						
						3	153.02						
						4	152.02						
						5	151.02						
End of Test Pit	5.50	G	3										
TP terminated in glacial till at 5.50m depth (Groundwater infiltration at 3.5m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP22-16

BORINGS BY Excavator

DATE May 20, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	160.58						
TOPSOIL	0.10												
Loose, dark brown SILTY SAND , some cobbles	0.70												
GLACIAL TILL : Compact, brown silty sand, some cobbles and boulders						1	159.58						
						2	158.58						
						3	157.58						
End of Test Pit	3.10												
TP terminated on bedrock surface at 3.10m depth (Groundwater infiltration at bottom of test pit)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

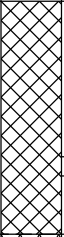

FILE NO.
PG3155

REMARKS

HOLE NO.
TP23-16

BORINGS BY Excavator

DATE May 20, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	148.46						
FILL: Boulders and cobbles with sand and topsoil		G	1			1	147.46						
GLACIAL TILL: Compact, brown silty sand with gravel and cobbles		G	2			2	146.46						
End of Test Pit TP terminated on bedrock at 2.60m depth (Groundwater infiltration at bottom of test pit)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.



REMARKS

BORINGS BY Excavator

DATE May 20, 2016

FILE NO.
PG3155

HOLE NO.
TP24-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	147.10						
FILL: Boulders with topsoil and sand		G	1			1	146.10						
						2	145.10						
GLACIAL TILL: Compact to very dense, brown silty sand with gravel, cobbles and boulders		G	2			3	144.10						
						4	143.10						
End of Test Pit TP terminated on inferred bedrock surface at 4.90m depth (Groundwater infiltration at 3.0m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

REMARKS

BORINGS BY Excavator

DATE May 20, 2016

FILE NO.
PG3155

HOLE NO.
TP25-16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	158.13						
TOPSOIL	0.15												
Loose to dense, dark brown SILTY SAND with cobbles and boulders		G	1			1	157.13						
	1.50												
GLACIAL TILL: Compact to very dense, brown silty sand with gravel, cobbles and boulders						2	156.13						
						3	155.13						▽
						4	154.13						
		G	2										
	5.10					5	153.13						
End of Test Pit TP terminated in glacial till at 5.10m depth (Groundwater infiltration at 3.0m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Slope Stability Investigation
Residential Development - Building Supply Road
Burnstown, Ontario

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak
Surveying Limited.

FILE NO.
PG3155

REMARKS

HOLE NO.
TP26-16

BORINGS BY Excavator

DATE May 20, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						0	160.94						
Loose, dark brown SILTY SAND , some boulders						1	159.94						
End of Test Pit	1.20	G	1										
TP terminated on bedrock surface at 1.20m depth (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevations at borehole locations provided by Adam Kasprzak Surveying Limited.

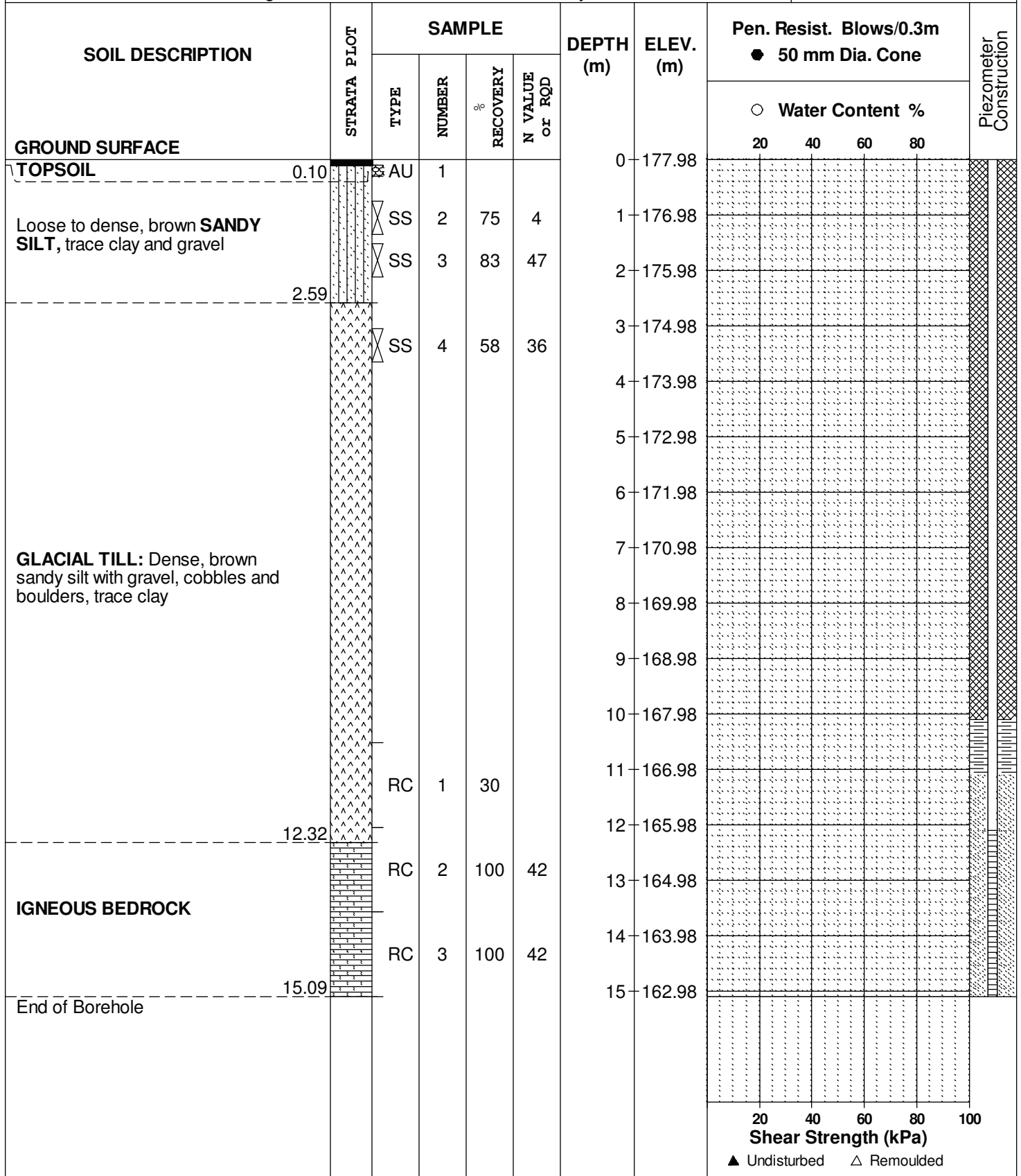
FILE NO.
PG3155

REMARKS

HOLE NO.
BH 1

BORINGS BY CME 45 Power Auger

DATE May 14, 2014



SOIL PROFILE AND TEST DATA

Braeburn Estates - Building Supply Road
Burnstown, Ontario
Burnstown, Ontario

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

REMARKS

FILE NO.
PH2610

HOLE NO.
TP 2

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	181.50	20	40	60	80	
TOPSOIL	0.15											
Dense, light brown SILTY SAND , some gravel and cobbles	G	3				1	180.50					
Dense, grey-brown SILTY SAND , some fine sand seams	G	4										
End of Test Pit (TP dry upon completion)	1.70											

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Braeburn Estates - Building Supply Road
Burnstown, Ontario
Burnstown, Ontario

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

FILE NO.
PH2610

REMARKS

HOLE NO.
TP 3

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	[REDACTED]					0	179.00						
----- 0.15													
Loose, reddish brown SAND, trace silt	[DOTTED]	G	5										
----- 0.80													
Light brown FINE SAND	[DOTTED]	G	6			1	178.00						
----- 1.70													
End of Test Pit (TP dry upon completion)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Braeburn Estates - Building Supply Road
Burnstown, Ontario
Burnstown, Ontario

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

REMARKS

FILE NO.
PH2610

HOLE NO.
TP 4

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	179.00	20	40	60	80	
TOPSOIL	0.20											
Reddish brown SILTY FINE SAND , some cobbles and boulders												
						1	178.00					
Grey-brown SANDY SILT												
End of Test Pit (TP dry upon completion)												

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

REMARKS

FILE NO.
PH2610

HOLE NO.
TP 5

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	174.00	20	40	60	80	
TOPSOIL	0.20											
Compact, reddish brown SILTY SAND , some gravel, cobbles and boulders		G	7			1	173.00					
Compact, grey-brown SILTY SAND , some gravel		G	8									
End of Test Pit (TP dry upon completion)	1.80											

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

FILE NO.
PH2610

REMARKS

HOLE NO.
TP 6

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	0.15					0	166.50						
Compact to dense, light brown SANDY SILT, some clay	0.70	G	9										∇
Loose, grey-brown coarse SAND	1.00	G	10										
Grey-brown CLAYEY SILT, some sand and gravel	1.70	G	11			1	165.50						
End of Test Pit (Groundwater infiltration at 0.7m depth)													

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Braeburn Estates - Building Supply Road
Burnstown, Ontario
Burnstown, Ontario

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

FILE NO.
PH2610

REMARKS

HOLE NO.
TP 7

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
TOPSOIL	0.20					0	165.00						
Compact, reddish brown SILTY SAND with cobbles and boulders													
	1.00					1	164.00						
Compact, grey-brown SANDY SILT , some gravel													
	1.30												
Loose, grey-brown coarse SAND with gravel		G	12										▽
End of Test Pit (Groundwater infiltration at 1.3m depth)	1.50												
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Braeburn Estates - Building Supply Road
Burnstown, Ontario
Burnstown, Ontario

DATUM Ground surface elevation interpolated from topographic plan prepared by Adam Kasprzak Surveying Ltd.

REMARKS

FILE NO.
PH2610

HOLE NO.
TP 8

BORINGS BY Backhoe

DATE March 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	149.00	20	40	60	80	
TOPSOIL	0.10											
Compact, red-brown SILTY SAND with cobbles and boulders		G	13			1	148.00					
End of Test Pit	1.30											
Refusal on inferred boulders at 1.30m depth (TP dry upon completion)												

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM Elevations are referenced to a geodetic datum

REMARKS

BORINGS BY Excavator

DATE May 17, 2023

FILE NO.
PG3155

HOLE NO.
TP 1-23

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
Ground Surface						0	181.63						
TOPSOIL with organics	0.25												
GLACIAL TILL: Compact, brown silty sand to sandy silt, some gravel and cobbles, trace clay	▲	G	1			1	180.63						
	▲	G	2			2	179.63						
	▲	G	3			3	178.63						
	▲					4	177.63						
End of Test Pit	4.50												
(Groundwater infiltration at 1.4m depth)													

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
 Future Rural Subdivision - Braeburn Estates - Phase 3
 Burnstown, Ontario

DATUM Elevations are referenced to a geodetic datum

REMARKS

BORINGS BY Excavator

DATE May 17, 2023

FILE NO.
PG3155

HOLE NO.
TP 2-23

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
Ground Surface						0	169.55	20	40	60	80	
TOPSOIL with organics	0.31											
GLACIAL TILL: Compact, brown silty sand to sandy silt, some cobbles and boulders, trace clay	G	1				1	168.55					
	G	2				2	167.55					
						3	166.55					
End of Test Pit	3.95											
TP terminated on boulders at 3.46m depth (Groundwater infiltration at 1.1m depth)												

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
 Future Rural Subdivision - Braeburn Estates - Phase 3
 Burnstown, Ontario

DATUM Elevations are referenced to a geodetic datum

FILE NO.
PG3155

REMARKS

HOLE NO.
TP 3-23

BORINGS BY Excavator

DATE May 17, 2023

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			20	40	60	80		
Ground Surface						0	170.65						
TOPSOIL with organics	0.35												
	▲					1	169.65						
	▲					2	168.65						
GLACIAL TILL: Brown silty sand to sandy silt, some gravel, cobbles, occasional boulders - increasing cobbles and boulders content with depth	▲					3	167.65						
	▲					4	166.65						
End of Test Pit TP terminated on boulder at 4.10m depth (Groundwater infiltration at 0.7m depth)	▲												

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
 Future Rural Subdivision - Braeburn Estates - Phase 3
 Burnstown, Ontario

DATUM Elevations are referenced to a geodetic datum

REMARKS

BORINGS BY Excavator

DATE May 17, 2023

FILE NO.
PG3155

HOLE NO.
TP 4-23

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
Ground Surface						0	176.45	20	40	60	80	
TOPSOIL with organics	0.26											
GLACIAL TILL: Compact, brown silty sand to sandy silt with gravel, cobble, some to trace boulders - grey by 1.7m depth	G	1				1	175.45					
	G	2				2	174.45					
						3	173.45					
End of Test Pit	3.90											
TP terminated on bedrock surface at 3.46m depth (TP dry upon completion)												

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
 Future Rural Subdivision - Braeburn Estates - Phase 3
 Burnstown, Ontario

DATUM Elevations are referenced to a geodetic datum

REMARKS

BORINGS BY Excavator

DATE May 17, 2023

FILE NO.
PG3155

HOLE NO.
TP 5-23

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
Ground Surface						0	177.22	20	40	60	80	
TOPSOIL with organics	0.31											
GLACIAL TILL: Compact, brown silty sand to sandy silt with gravel cobbles, some to trace boulders - grey by 1.6m depth	▲	G	1			1	176.22					
	▲	G	2			2	175.22					
End of Test Pit	3.10					3	174.22					
TP terminated on bedrock surface at 3.10m depth (Groundwater infiltration at 3.0m depth)												

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
 Future Rural Subdivision - Braeburn Estates - Phase 3
 Burnstown, Ontario

DATUM Elevations are referenced to a geodetic datum

REMARKS

BORINGS BY Excavator

DATE May 17, 2023

FILE NO.
PG3155

HOLE NO.
TP 6-23

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
Ground Surface						0	169.15	20	40	60	80	
TOPSOIL with organics	0.31											
GLACIAL TILL: Compact to dense, grey silty sand to sandy silt with gravel, cobbles, some to trace boulders - grey by 1.2m depth	G	1				1	168.15					
	G	2				2	167.15					
						3	166.15					
End of Test Pit	3.46											
TP terminated on bedrock surface at 3.46m depth (Groundwater infiltration at 2.6m depth)												

20 40 60 80 100
Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity, S_t , is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic Limit, % (water content above which soil behaves plastically)
PI	-	Plasticity Index, % (difference between LL and PL)
D _{xx}	-	Grain size at which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D ₁₀	-	Grain size at which 10% of the soil is finer (effective grain size)
D ₆₀	-	Grain size at which 60% of the soil is finer
C _c	-	Concavity coefficient = $(D_{30})^2 / (D_{10} \times D_{60})$
C _u	-	Uniformity coefficient = D_{60} / D_{10}

C_c and C_u are used to assess the grading of sands and gravels:

Well-graded gravels have: $1 < C_c < 3$ and $C_u > 4$

Well-graded sands have: $1 < C_c < 3$ and $C_u > 6$

Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.

C_c and C_u are not applicable for the description of soils with more than 10% silt and clay (more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

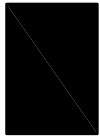
p' _o	-	Present effective overburden pressure at sample depth
p' _c	-	Preconsolidation pressure of (maximum past pressure on) sample
C _{cr}	-	Recompression index (in effect at pressures below p' _c)
C _c	-	Compression index (in effect at pressures above p' _c)
OC Ratio		Overconsolidation ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
W _o	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

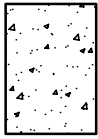
k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.
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SYMBOLS AND TERMS (continued)

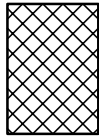
STRATA PLOT



Topsoil



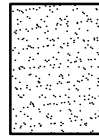
Asphalt



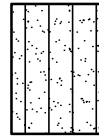
Fill



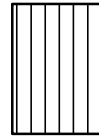
Peat



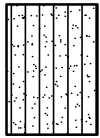
Sand



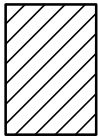
Silty Sand



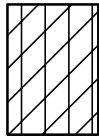
Silt



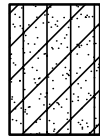
Sandy Silt



Clay



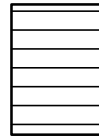
Silty Clay



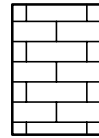
Clayey Silty Sand



Glacial Till



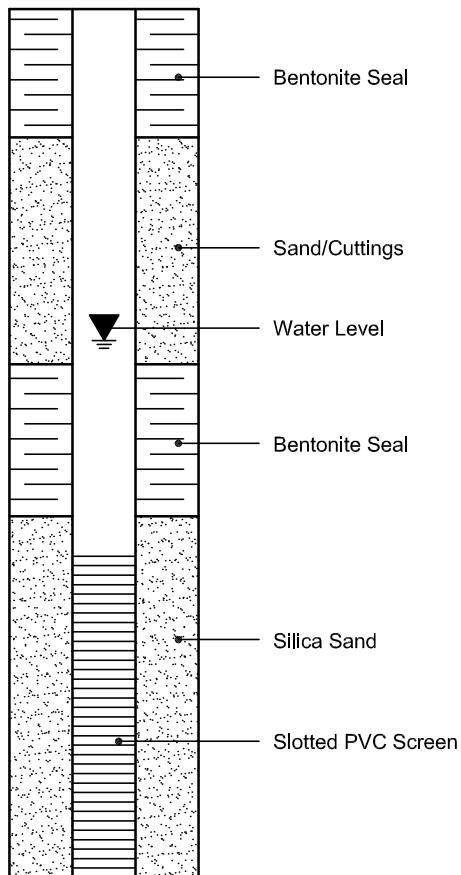
Shale



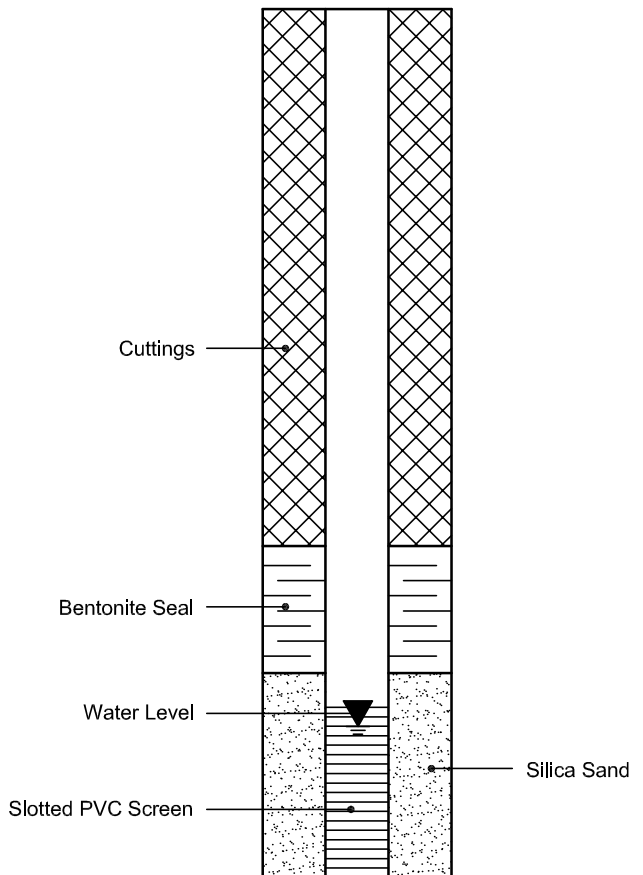
Bedrock

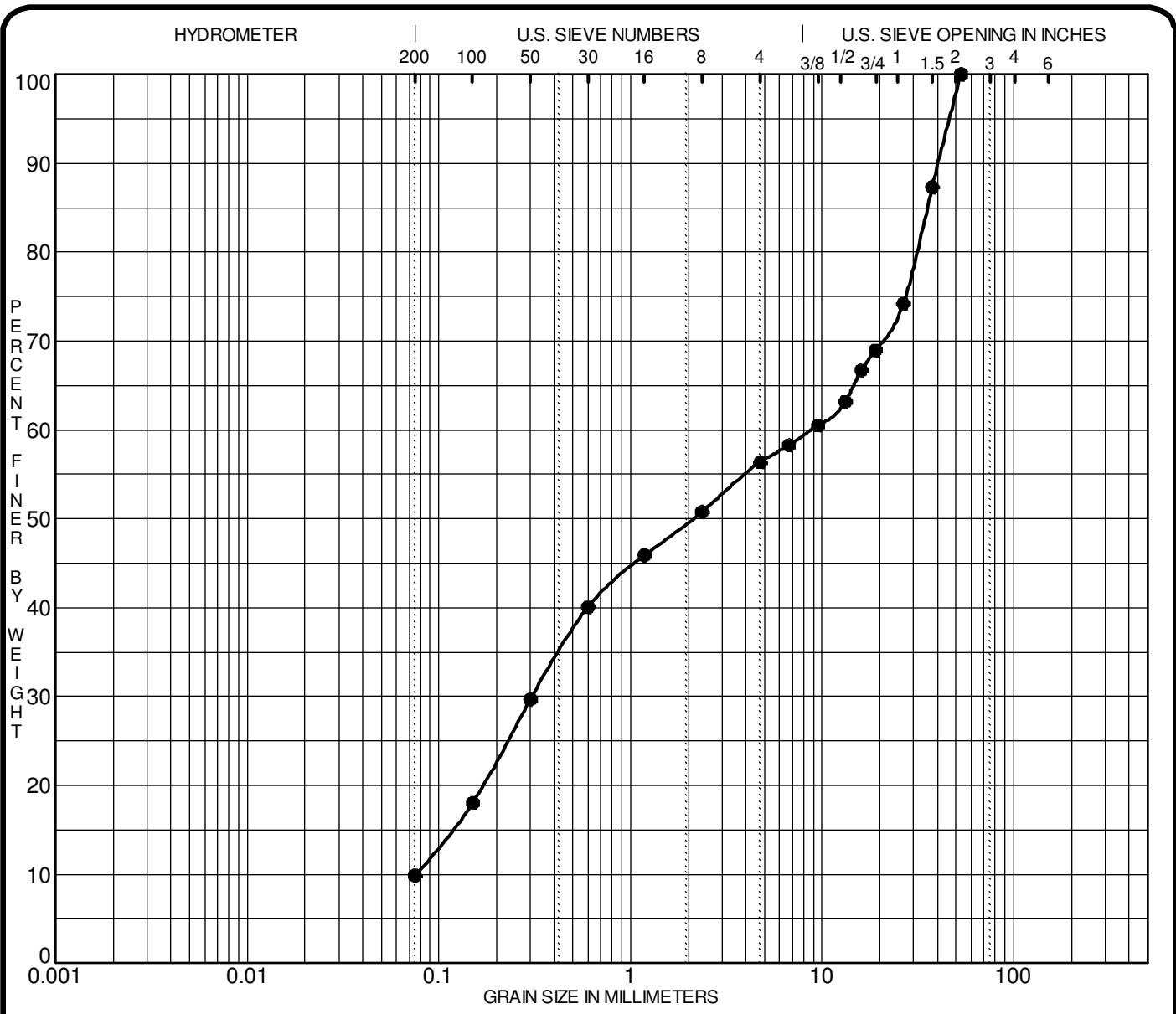
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 1 G 1	SAND-GRAVEL, some silt and clay					0.14	115.6

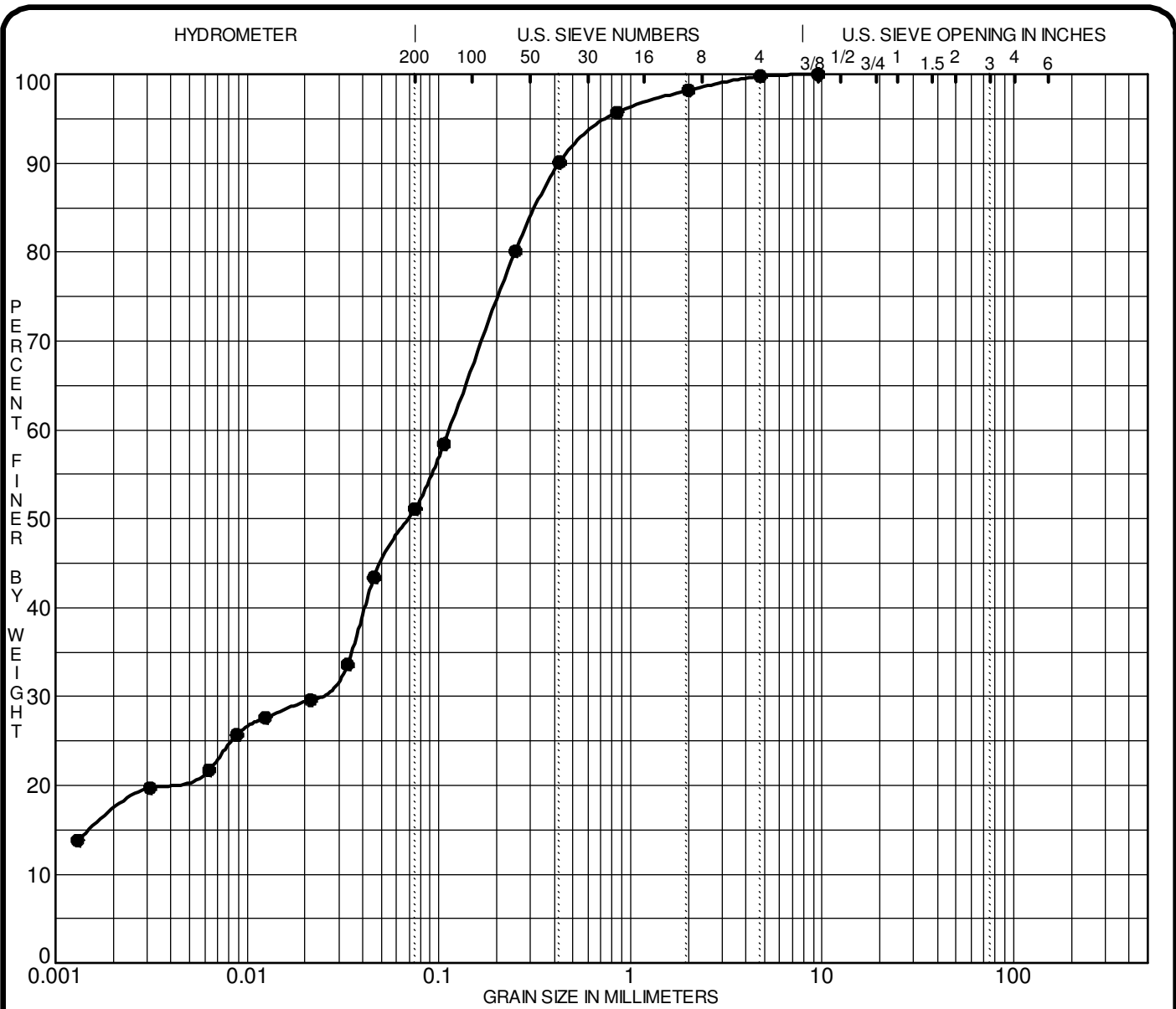
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 1 G 1	53.00	8.79	0.307	0.0761	43.6	46.5	9.8	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 1 G 2	SANDY SILT						

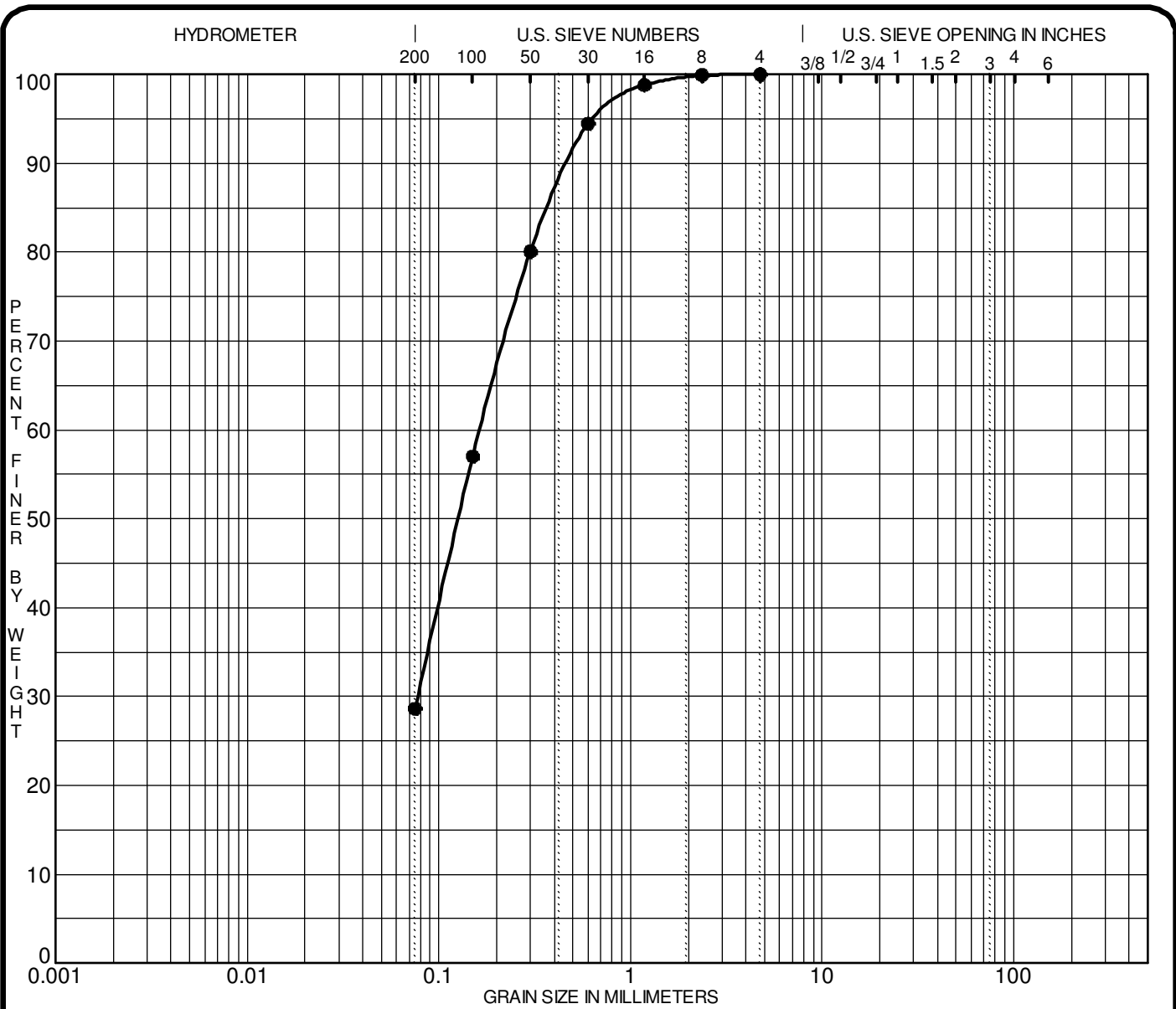
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 1 G 2	9.50	0.11	0.022		0.2	48.7	51.1	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 2 G 3	SILTY SAND						

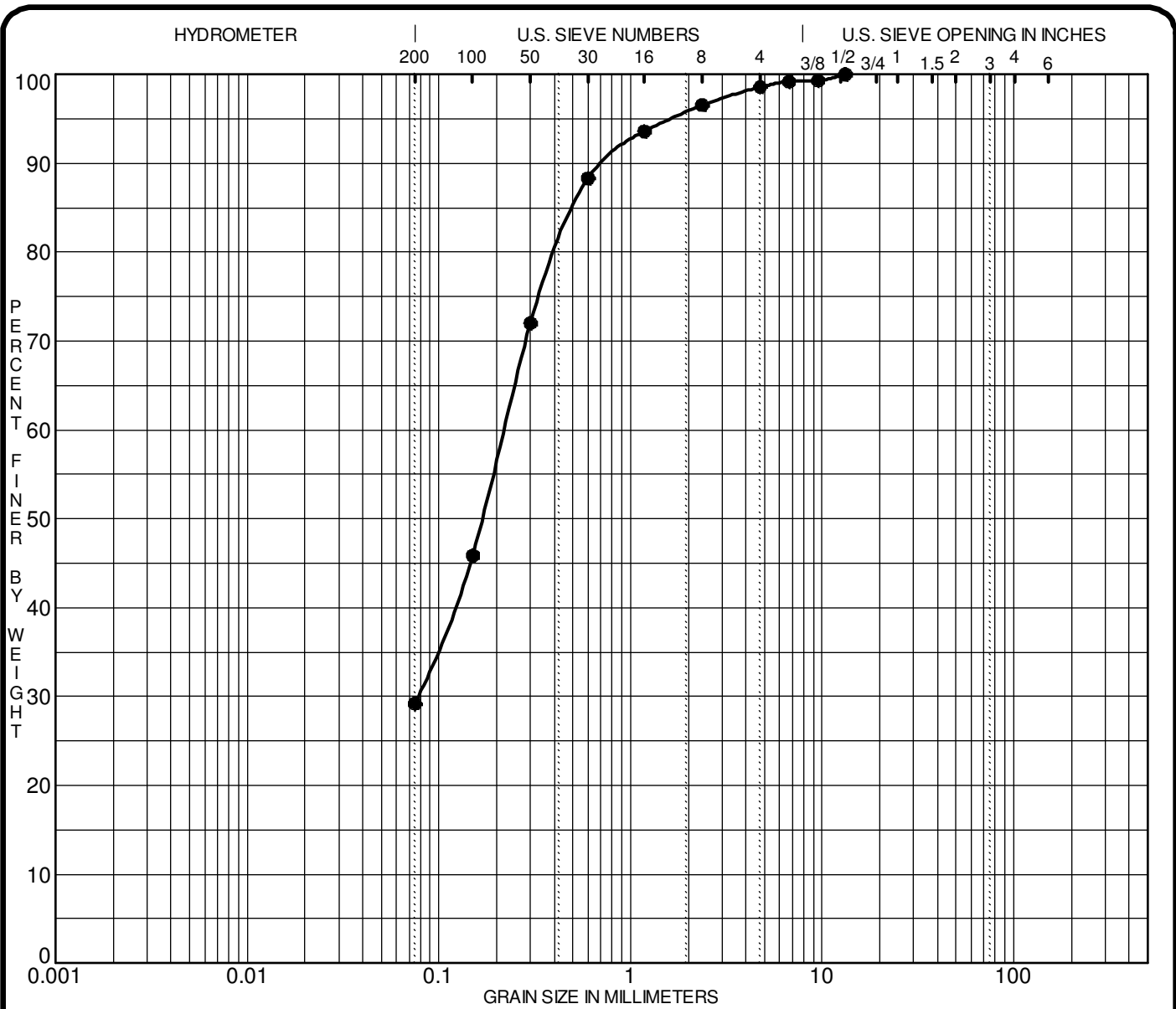
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 2 G 3	4.75	0.16	0.078		0.0	71.4	28.6	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● TP 2 G 4	SILTY SAND									

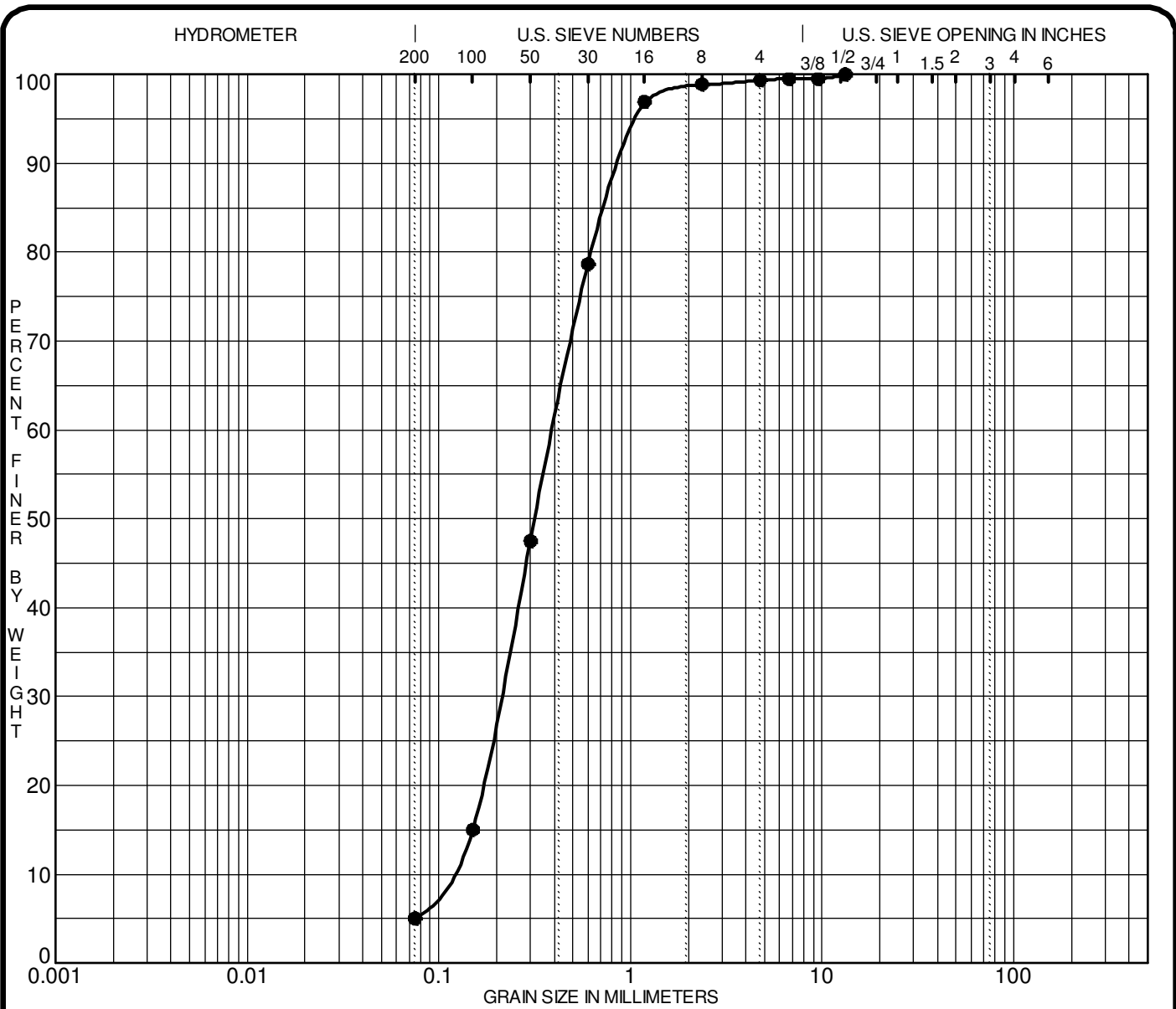
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 2 G 4	13.20	0.22	0.078		1.4	69.4	29.2	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 3 G 5	SAND, trace silt					1.02	3.7

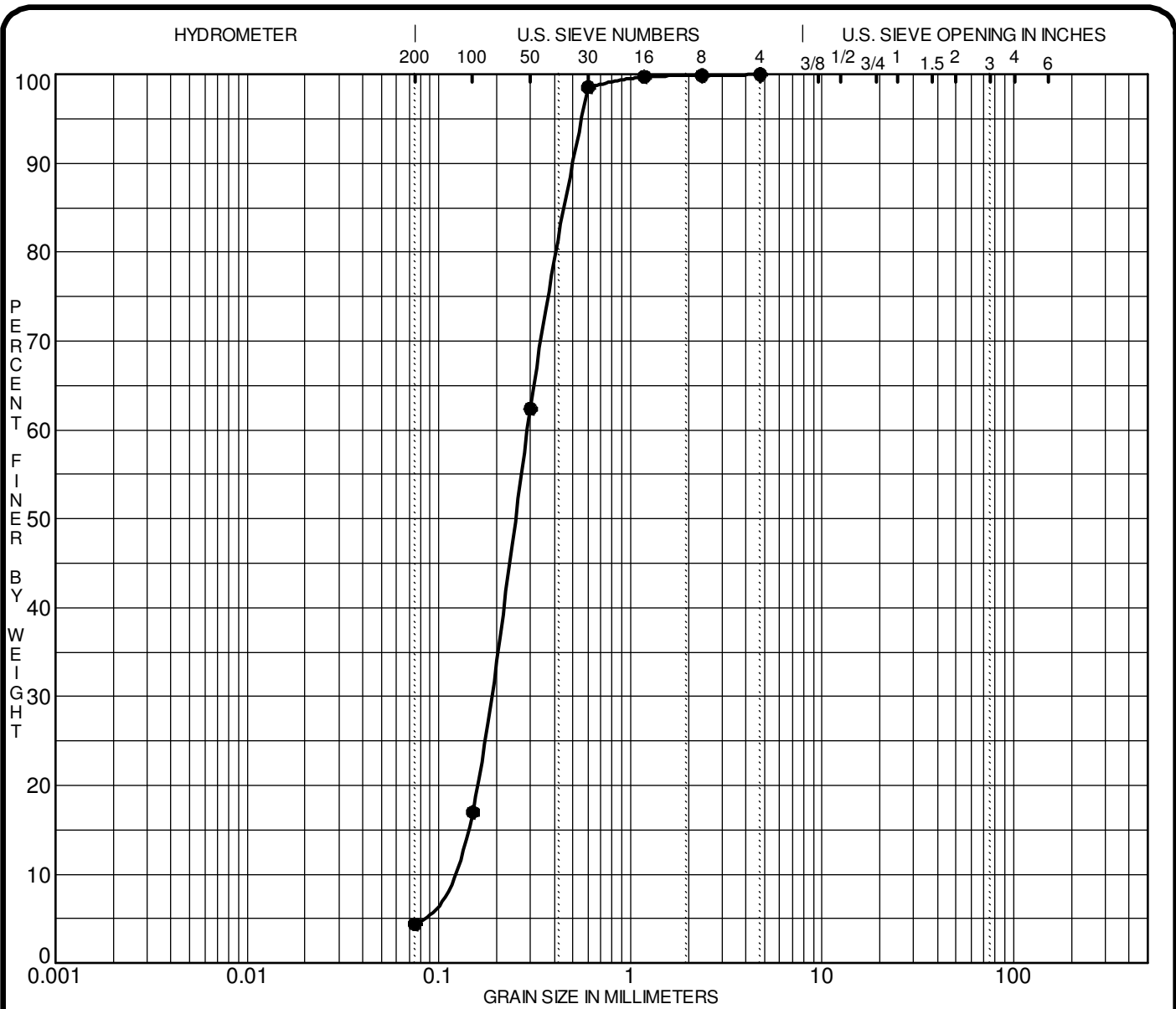
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 3 G 5	13.20	0.40	0.207	0.1060	0.7	94.3	5.0	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 3 G 6	FINE SAND					1.13	2.8

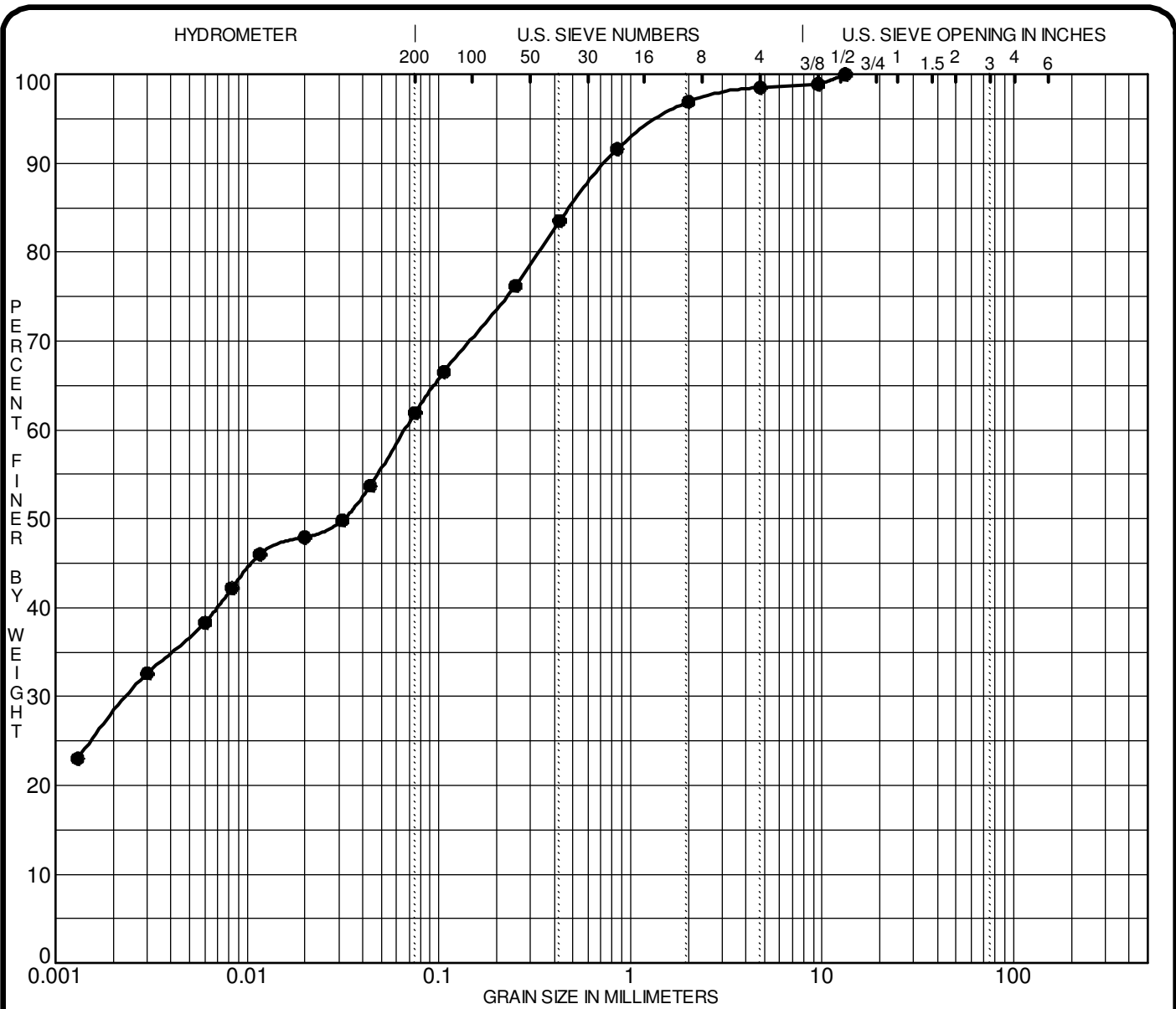
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 3 G 6	4.75	0.29	0.183	0.1022	0.0	95.6	4.4	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

pater songroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● TP 6 G 9	SANDY SILT, some clay						

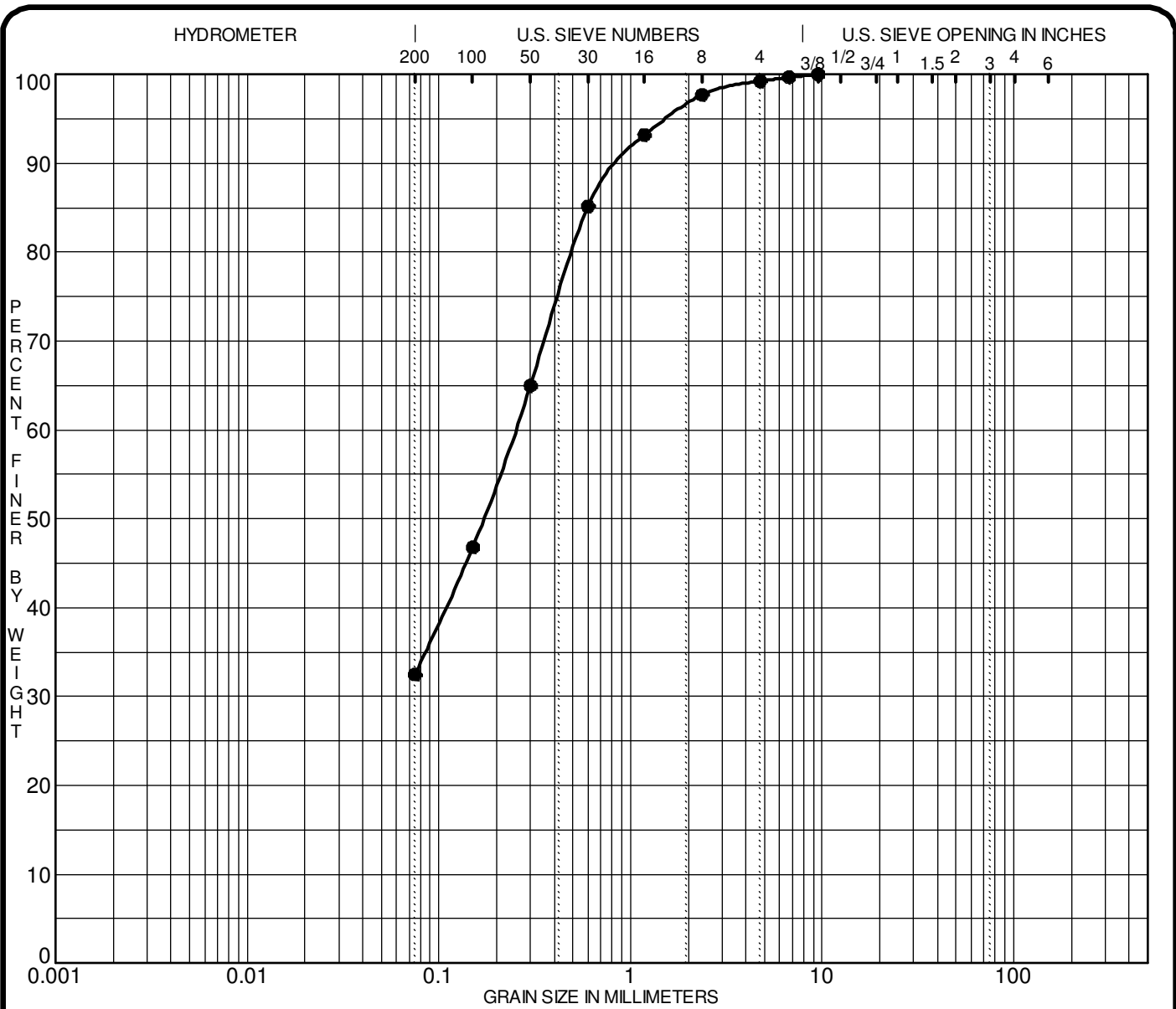
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 6 G 9	13.20	0.07	0.002		1.5	36.6	61.9	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● TP 8 G 13	SILTY SAND									

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP 8 G 13	9.50	0.25			0.8	66.7	32.5	

CLIENT KDSA Development
 PROJECT Braeburn Estates - Building Supply Road -
Burnstown, Ontario

FILE NO. PH2610
 DATE 10 Mar 15

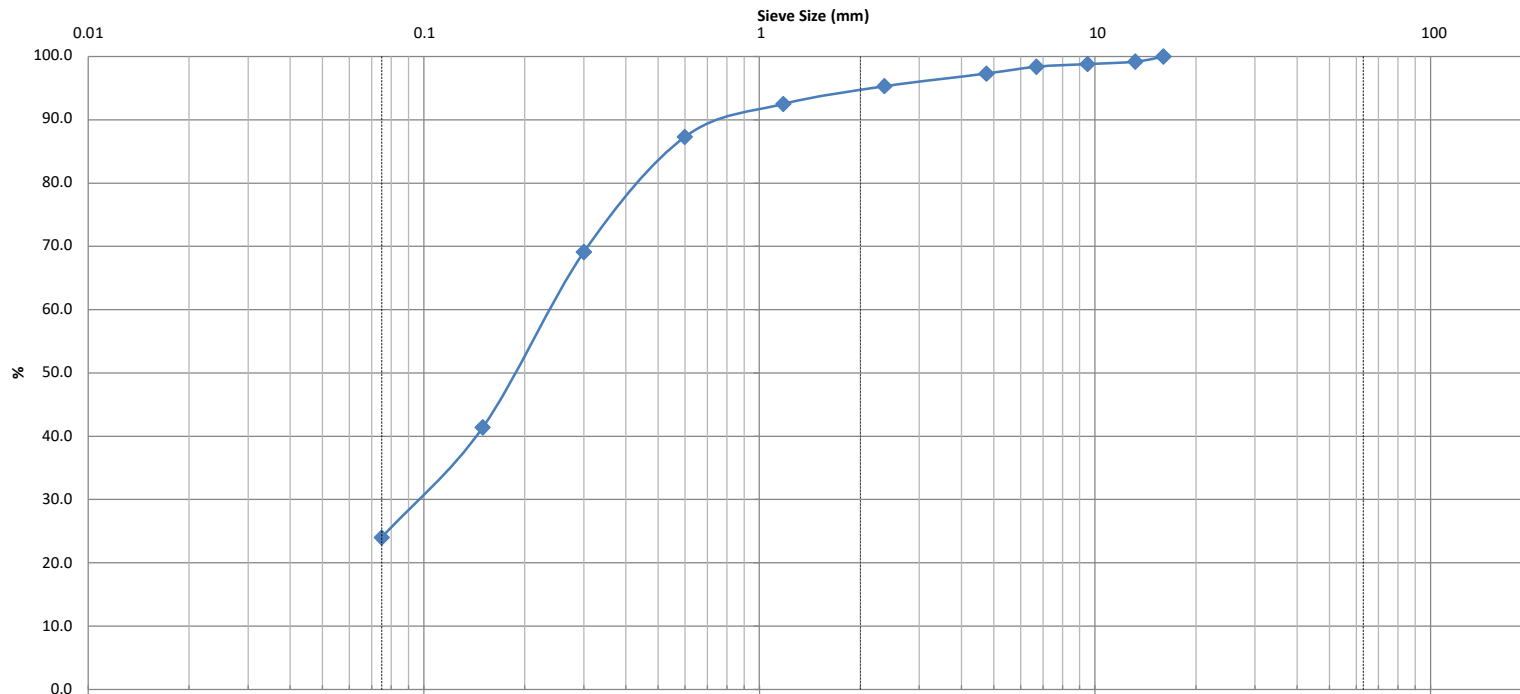
patersongroup Consulting Engineers
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



**SIEVE ANALYSIS
ASTM C136**

CLIENT:	Braeburn Estates	DESCRIPTION:	Fine Aggregate	FILE NO:	PH4748
CONTRACT NO.:	-	SPECIFICATION:	Sand	LAB NO:	46732
PROJECT:	Braeburn Estates - Ph. 3	INTENDED USE:	-	DATE RECEIVED:	22-Aug-23
		PIT OR QUARRY:	-	DATE TESTED:	23-Aug-23
DATE SAMPLED:	17-May-23	SOURCE LOCATION:	TP1-23 - G1	DATE REPORTED:	29-Aug-23
SAMPLED BY:	Z.B.	SAMPLE LOCATION:	0.6-0.7'	TESTED BY:	C.P/R.R



Silt and Clay	Sand			Gravel		Cobble
	Fine	Medium	Coarse	Fine	Coarse	

Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
	16	0.245	0.098	0.032	2.7	73.3		24.0		1.23	7.7

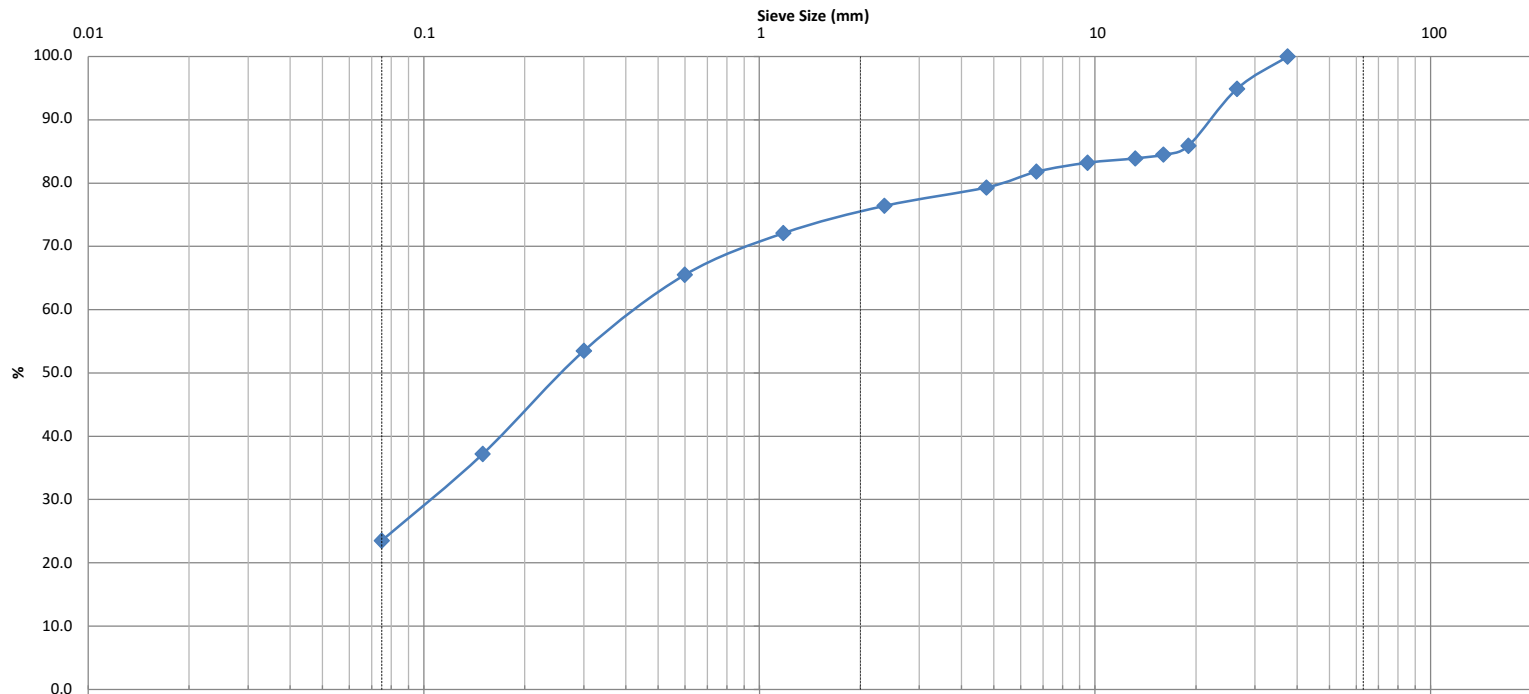
Comments:

REVIEWED BY:	Curtis Beadow					Joe Fosyth, P. Eng.					



**SIEVE ANALYSIS
ASTM C136**

CLIENT:	Braeburn Estates	DESCRIPTION:	Fine Aggregate	FILE NO:	PH4748
CONTRACT NO.:	-	SPECIFICATION:	Sand	LAB NO:	46731
PROJECT:	Braeburn Estates - Ph. 3	INTENDED USE:	-	DATE RECEIVED:	22-Aug-23
		PIT OR QUARRY:	-	DATE TESTED:	23-Aug-23
DATE SAMPLED:	17-May-23	SOURCE LOCATION:	TP3-23 - G1	DATE REPORTED:	29-Aug-23
SAMPLED BY:	Z.B.	SAMPLE LOCATION:	0.8-0.9'	TESTED BY:	C.P/R.R



Silt and Clay	Sand			Gravel		Cobble
	Fine	Medium	Coarse	Fine	Coarse	

Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
	37.5	0.425	0.15	0.032	20.7	55.8		23.5		1.65	13.3

Comments:

REVIEWED BY:	Curtis Beadow	Joe Fosyth, P. Eng.
	<i>[Signature]</i>	<i>[Signature]</i>

APPENDIX 2

TW1 TO TW5 WATER WELL RECORDS

MECP WATER WELL RECORDS



Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Here) Tag #: A166301

Well Record Regulation 903 Ontario Water Resources Act

Page 1 of 1

Measurements recorded in: Metric Imperial

COPY

TW1

Well Owner's Information

First Name: SUSAN Last Name / Organization: ANGLIN (KASA Development Corp) E-mail Address: [blank] Well Constructed by Well Owner:

Mailing Address (Street Number/Name): 205 BRADFORD ST Municipality: EPPINGA Province: ON Postal Code: R4B 2K6 Telephone No. (inc. area code): 416-223-4474

Well Location: Address of Well location (Street Number/Name): BUILDING SUPPLIES Township: MENNIS Lot: 16 Concession: 1

County/District/Municipality: RENFREW City/Town/Village: BURSTOWN Province: Ontario Postal Code: [blank]

UTM Coordinates: Zone: 18 Easting: 183765 Northing: 501066 Municipal Plan and Sublot Number: [blank] Other: [blank]

Overburden and Bedrock Materials: Abandonment/Sealing Record: [blank]

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m) From, To. Handwritten entries include: REDDISH BROWN CLAY, WHITE MORTAR (MASONRY), BLUE TILE, 0-22, 0-20, 20-25, 25-30, 30-35, 35-40, 40-45, 45-50, 50-55, 55-60, 60-65, 65-70, 70-75, 75-80, 80-85, 85-90, 90-95, 95-100.

Table with columns: Depth Set at (m) From, To; Type of Sealant Used (Material and Type); Volume Placed (m³); Results of Well Yield Testing (After test of well yield, water was...); Draw Down (Time (min), Water Level (m)); Recovery (Time (min), Water Level (m)).

Table with columns: Method of Construction; Well Use; Status of Well. Includes checkboxes for Cable Tool, Rotary, Boring, etc., and Public, Commercial, Industrial, etc.

Table with columns: Inside Diameter (cm), Open Hole OR Material, Wall Thickness (mm), Depth (m) From, To; 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.

Table with columns: Outside Diameter (cm), Material (Plastic, Galvanized, Steel), Slot No., Depth (m) From, To; Construction Record - Screen; Map of Well Location (Please provide a map below following instructions on the back).

Table with columns: Water Details (Water found at Depth, Kind of Water: Fresh, Untested, Gas, Other); Hole Diameter (Depth (m) From, To, Diameter (cm)).

Table with columns: Well Contractor and Well Technician Information (Business Name of Well Contractor: STANLEY DRINKING INC; Well Contractor's Licence No.: 4875; Business Address: 602 ST. PIERRE AVENUE W. WILHELMIAH; Province: ON; Postal Code: R4B 2K6; Business E-mail Address: stanley.drinking@bell.net).

Table with columns: Well Technician's Information (Business Name of Well Technician: STANLEY DRINKING INC; Well Technician's Licence No.: 00006; Signature: [blank]; Date of Issue: 2010/09/26; Name of Well Technician (Last Name, First Name): STANLEY, TEBIL; Date of Completion: 2010/09/26).



Ministry of the Environment

Tag#: A177746 (Below) A177746

Well Record Regulation 903 Ontario Water Resources Act Page of

Measurements recorded in: Metric Imperial

Well Owner's Information

Well Owner's Information form including fields for First Name, Last Name / Organization (KDSA Development Corp), Mailing Address (228 Bradford Street, Ottawa, ON), and Well Location (1 No Civic Building Supply Road, Renfrew, Ontario).

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m) From, To. Contains data for sand, boulders, clay, quartzite, and granite.

TEST WELL # 2 OF 4

Table with columns: Depth Set (m) From, To; Type of Sealer Used; Volume Placed (m³). Details sealant used at 13m depth.

Methods of Construction and Well Use form. Includes checkboxes for Cable Tool, Rotary, Boring, etc., and Well Use for Domestic, Commercial, etc.

Construction Record - Casing table with columns: Inside Diameter (cm), Material, Wall Thickness (mm), Depth (m) From, To. Lists casing materials like steel and CPVC.

Construction Record - Screen table with columns: Outside Diameter (mm), Material, Slot No., Depth (m) From, To.

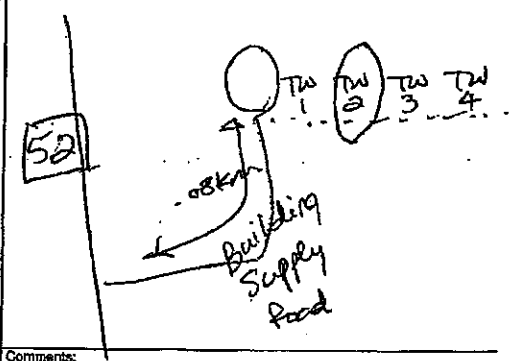
Water Details and Hole Diameter table. Includes water found at depth (60m, 94m, 23m) and hole diameter (9 3/4", 5 7/8").

Well Contractor and Well Technician Information form. Includes Business Name (Air Rock Drilling Co Ltd) and Well Contractor's Licence No.

Well Technician's Licence No. and Signature/Date Submitted form. Includes signature of Hogan Dan and date 2015-02-27.

Results of Well Yield Testing table. Columns: Time (min), Water Level (m), Recovery (min). Shows draw-down and recovery data for various pumping rates.

Map of Well Location. Please provide a map below following instructions on the back.



Comments and Date Work Completed form. Includes comment '12 HP - 5 GPM SET @ 30 FT' and date '2015-02-28'.



Ministry of the Environment

Tag #: A177747 (Below)
A177747

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: Metric Imperial

Page ___ of ___

Well Owner's Information

First Name: _____ Last Name / Organization: **KDSA Development Corp** E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): **228 Bradford Street** Municipality: **Ottawa** Province: **ON** Postal Code: **K2B 5Z6** Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): **(No Civic) Building Supply Road** Township: **McNab** Lot: **17** Concession: **2**

County/District/Municipality: **Renfrew** City/Town/Village: **Burnstown** Province: **Ontario** Postal Code: _____

UTM Coordinates: Zone: **18** Easting: **37705B** Northing: **5027134** Municipal Plan and Sublot Number: _____ Other: _____

NAD: **83** **18** **37705B** **5027134** **TEST WELL # 3 OF 4**

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

General Colour	Most Common Material	Other Materials	General Description	Depth (mft)
				From To
	Sand	Boulders		0' 10'
White	Quartzite	Grey Granite		10' 148'
White	Quartzite	Grey Granite		148' 153'
White	Quartzite	Grey Granite		153' 180'

TEST WELL # 3 OF 4

Annular Space

Depth Set at (mft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³)
20' to 10'	Neoseal cement	7.8
10' to 0'	Benctonite slurry	8.4

Method of Construction: Cable Tool Rotary (Conventional) Rotary (Reverse) Boring Air percussion Other, specify _____

Type of Sealant Used: Diamond Jetting Driving Digging

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)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (mft)	Status of Well
			From To	
64	Steel	188	20	<input checked="" type="checkbox"/> Water Supply
515/16	Open Hole		20	<input type="checkbox"/> Replacement Well
			180	<input type="checkbox"/> Test Hole
				<input type="checkbox"/> Recharge Well
				<input type="checkbox"/> Dewatering Well
				<input type="checkbox"/> Observation and/or Monitoring Hole
				<input type="checkbox"/> Alteration (Construction)
				<input type="checkbox"/> Abandoned, Insufficient Supply
				<input type="checkbox"/> Abandoned, Poor Water Quality
				<input type="checkbox"/> Abandoned, other, specify _____
				<input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (mm)	Material (Plastic, Galvanized, Steel)	Slot Size	Depth (mft)
			From To

Water Details

Water found at Depth (mft)	Kind of Water	Kind of Water	Hole Diameter
	Fresh <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Untested <input checked="" type="checkbox"/>	Depth (mft) Diameter (cm)
148			20' 93/4"
153			20' 515/16"

Well Contractor and Well Technician Information

Business Name of Well Contractor: **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No.: **1119**

Business Address (Street Number/Name): **6659 Franktown Road, St. Catharines** Municipality: **Richmond Hill**

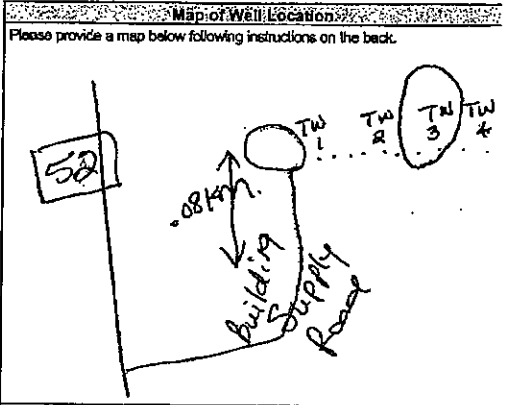
Province: **ON** Postal Code: **K0A 2Z0** Business E-mail Address: **airrock@sympatico.ca**

Bus Telephone No. (inc. area code): **905-382-1700** Name of Well Technician (Last Name, First Name): **Hogan, Dan**

Well Technician's Licence No.: **13058** Signature of Technician and/or Contractor: _____ Date: **2015 02 27**

Results of Well Yield Testing

After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify: Not tested	Draw Down		Recovery	
	Time (min)	Water Level (mft)	Time (min)	Water Level (mft)
Pumping discontinued, give reason: _____	1	27.4	1	94.7
	2	33	2	70.4
	3	36.8	3	68.2
	4	30.7	4	68.4
	5	42.1	5	63.9
	6	44.5	6	63.3
Pump intake set at (mft): 150				
Pumping rate (l/min): 6				
Duration of pumping: _____				
Final water level end of pumping (mft): 94.7	10	54.4	10	57.8
If flowing give rate (l/min): 6	15	61.9	15	54
Recommended pump depth (mft): 150	20	68	20	50.2
Recommended pump rate (l/min): 6	25	75.2	25	46.4
Well production (l/min): 6	30	78.7	30	42.8
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	40	83	40	38.4
	50	89.3	50	38.8
	60	94.7	60	27.4



Comments: **1/2 HP - 5 GPM SET @ 150 FT**

Well owner's information package delivered: Yes No

Date Package Delivered: **2015 02 27**

Date Work Completed: **2015 01 26**

Ministry Use Only: Audit No: **191366**

Received: _____



Ministry of the Environment

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

A177748

Well Record Regulation 903 Ontario Water Resources Act

Measurements recorded in: Metric Imperial

Page of

Well Owner's Information

First Name: KDSA, Last Name/Organization: Development Corp, Mailing Address: 228 Bradford Street, Ottawa, Ont, Postal Code: K5B5Z6

Well Location

Address of Well Location: (No civic) building supply road, Township: McNabb, Lot: 17, Concession: 2, County/District/Municipality: Renfrew, City/Town/Village: Burnstown, Province: Ontario

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

Table with columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m/D) From, To. Rows include: Deeper Existing, Grey Limestone w/ Quartz, Black Granite, Green-black Granite w/ Quartz, White Quartz.

Test well #4 - Drilled Jan 27/15 Aug 21/15 219/371

Annular Space table with columns: Depth Set at (m/D) From, To, Type of Sealant Used (Material and Type), Volume Placed (m³/lbs)

Method of Construction: Air percussion, Well Use: Domestic, Livestock, Irrigation, Industrial

Construction Record - Casing table with columns: Inside Diameter (cm/in), Open Hole OR Material, Wall Thickness (cm/in), Depth (m/D) From, To, Status of Well

Construction Record - Screen table with columns: Outside Diameter (cm/in), Material, Slot No., Depth (m/D) From, To, Status of Well

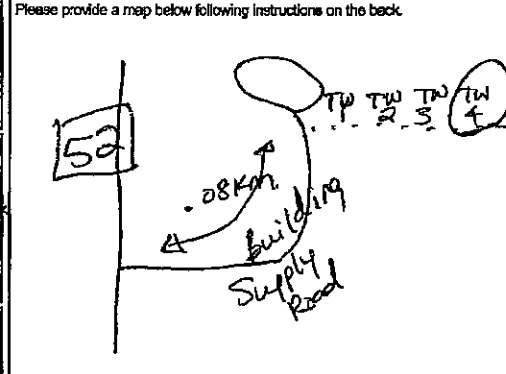
Water Details table with columns: Water found at Depth (m/D), Kind of Water, Hole Diameter Depth (m/D) Front, To, Diameter (cm/in)

Well Contractor and Well Technician Information: Business Name: Air Rock Drilling Co Ltd, Well Contractor's Licence No.: 111191, Business Address: RR#1 Richmond

Well Technician Information: Bus. Telephone No.: 613-888-2170, Name of Well Technician: HOGAN DAN, Well Technician's Licence No.: TB058

Results of Well Yield Testing table with columns: After test of well yield, water was, Draw Down, Recovery, Pumping rate, Duration of pumping, Final water level end of pumping, If flowing give rate, Recommended pump depth, Recommended pump rate, Well production, Disinfected?

Map of Well Location



Comments: (3) 1/4" 5/8" @ 250', Well owner's information package delivered: Yes, Date Package Delivered: 20150303, Date Work Completed: 20150319, Ministry Use Only: Audit No. Z166944

* well was deepened due to lack of water



Ministry of the Environment

Tag #: A 177748 (Print Below)
A177748

Well Record
Regulation 903 Ontario Water Resources Act
Page ___ of ___

Measurements recorded in: Metric Imperial

Well Owner's Information

First Name: _____ Last Name / Organization: **KDSA Development Corp** E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): **228 Bradford Street** Municipality: **Ottawa** Province: **ON** Postal Code: **K2B 5Z6** Telephone No. (inc. area code): _____

Well Location

Address of Well Location (Street Number/Name): **(No Civic) Building Supply Road** Township: **McNab** Lot: **17** Concession: **2**

County/District/Municipality: **Renfrew** City/Town/Village: **Burnstown** Province: **Ontario** Postal Code: _____

UTM Coordinates: Zone: **18** Easting: **370197** Northing: **5027224** Municipal Plan and Sublot Number: _____ Other: **TW # 4 OF 4**

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

General Colour	Most Common Material	Other Materials		General Description	Depth (m/d)	
					From	To
	Sand	q	Boulders		0'	14'
White	Quartzite	W/Grey	Granite		14'	152'
White	Quartzite	W/Grey	Granite		152'	160'

TEST WELL # 4 OF 4

Annular Space

Depth Set at (m/d) From To	Type of Sealant Used (Material and Type)	Volume Placed (m ³)
20' to 10'	Neat cement	7.5
10' to 0'	Benotite slurry	3.4

Method of Construction: Cable Tool Rotary (Conventional) Rotary (Reverse) Boring Air percussion Other, specify _____

Well Use: Domestic Livestock Irrigation Industrial Public Commercial Municipal Test Hole Cooling & Air Conditioning Not used Dewatering Monitoring

Construction Record - Casing

Inside Diameter (cm/d)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/d)	Depth (m/d)		Status of Well
			From	To	
614	Steel	18.8	0	20	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
551/2	Open Hole	20	20	160	

Construction Record - Screen

Outside Diameter (cm/d)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/d)	
			From	To

Water Details

Water found at Depth (m/d)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Hole Diameter	
		Depth (m/d) From To	Diameter (cm/d)
		162	0' to 20'
	20' to 160'	5 1/2"	

Well Contractor and Well Technician Information

Business Name of Well Contractor: **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No.: **1419**

Business Address: **6069 Franklin Road, Renfrew** Municipality: **McNab**

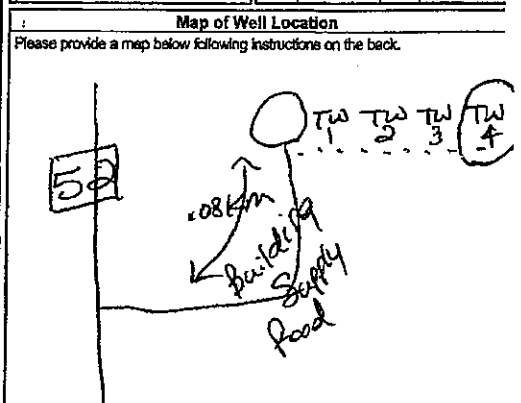
Province: **ON** Postal Code: **K2A 2Z0** Business E-mail Address: **air-rock@sympatico.ca**

Business Telephone No. (inc. area code): **613-322-1700** Name of Well Technician (Last Name, First Name): **Kerny, Dan**

Well Contractor's Licence No.: **1338** Signature of Technician and/or Contractor: *[Signature]* Date Submitted: **2015 02 27**

Results of Well Yield Testing

After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input checked="" type="checkbox"/> Other, specify: Not tested	Draw Down		Recovery	
	Time (min)	Water Level (m/d)	Time (min)	Water Level (m/d)
If pumping discontinued, give reason: <input checked="" type="checkbox"/> Pumping discontinued	1	14.7	1	16.7
	2	16.2	2	16.7
Pump intake set at (m/d) 150	3	18.4	3	16.7
	4	19.4	4	16.7
Pumping rate (l/min / GPM) 5.5	5	20.8	5	16.7
	6	25.3	6	16.7
Final water level end of pumping (m/d) 152	7	25.3	7	16.7
	8	25.3	8	16.7
If flowing give rate (l/min / GPM) 0	9	25.3	9	16.7
	10	25.3	10	16.7
Recommended pump depth (m/d) 150	11	25.3	11	16.7
	12	25.3	12	16.7
Recommended pump rate (l/min / GPM) 2.3	13	25.3	13	16.7
	14	25.3	14	16.7
Well production (l/min / GPM) 2.3	15	25.3	15	16.7
	16	25.3	16	16.7
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	17	25.3	17	16.7
	18	25.3	18	16.7
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	19	25.3	19	16.7
	20	25.3	20	16.7



Comments: **1/2 HP - 5 GPM. SEC @ 150 FT**

Well owner's information package delivered: Yes No

Date Package Delivered: **2015 02 27**

Ministry Use Only

Audit No.: **Z191371**

Date Work Completed: **2015 01 27**

Received: _____

Measurements recorded in: Metric Imperial

A295274

Regulation 903 Ontario Water Resources Act

Page ___ of ___

Well Owner's Information

First Name _____ Last Name/Organization **Braeburn Estates** E-mail Address _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name) **228 Bradford Street** Municipality **Ottawa** Province **ON** Postal Code **K2B 5Z6** Telephone No. (Inc. area code) _____

Well Location

Address of Well Location (Street Number/Name) **Building Supply Road (NO CIVIC)** Township **McNab** Lot **17** Concession **2**

County/District/Municipality **Renfrew** City/Town/Village **Burnstown** Province **Ontario** Postal Code _____

UTM Coordinates: Zone **18** Easting **377521** Northing **5027481** Municipal Plan and Sublot Number _____ Other **S/L 21 TW#5**

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
	Hard Pan			0' 15'
Grey	Granite			15' 130'
White	Quartzite			130' 165'
Grey	Granite			165' 188'
Grey	Granite			188' 233'
Grey	Granite			233' 240'

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
21' 0'	Neat cement	7.8

Results of Well Yield Testing

Time (min)	Water Level (m/ft)	Recovery	
		Time (min)	Water Level (m/ft)
Static Level	18.0'		130.5'
1	23.7	1	110.5
2	27	2	107
3	29.1	3	99.4
4	32	4	94.2
5	36.3	5	90.2
10	55	10	69.6
15	69	15	55
20	79.8	20	43.2
25	88.7	25	32.1
30	96	30	23.3
40	107	40	19.8
50	119	50	18.2
60	130.5	60	18.2

After test of well yield, water was:
 Clear and sand free
 Other, specify **Not tested**

If pumping discontinued, give reason: _____

Pump intake set at (m/ft) **220 FT**

Pumping rate (l/min/GPM) **7**

Duration of pumping _____ hrs + _____ min

Final water level end of pumping (m/ft) **130.5'**

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

Disinfected? Yes No

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock Test Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion Other, specify _____

Well Use

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	Status of Well
6 1/4"	Steel	.188	+2' 21'	<input checked="" type="checkbox"/> Water Supply
5 7/8"	Open Hole		21' 240'	<input type="checkbox"/> Replacement Well

Construction Record - Screen

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

Water Details

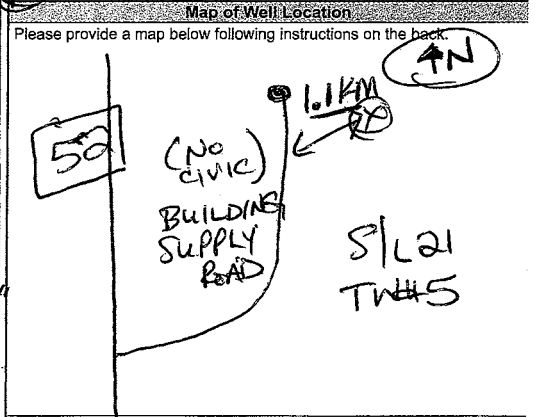
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Hole Diameter
188 (m/ft)		Depth (m/ft) From To Diameter (cm/in)
233 (m/ft)		0' 21' 1 3/4"
		21' 240' 5 7/8"

Well Contractor and Well Technician Information

Business Name of Well Contractor **Air Rock Drilling Co. Ltd.** Well Contractor's Licence No. **7881**

Business Address (Street Number/Name) **8658 Franktown Road** Municipality **Richmond**

Province **ON** Postal Code **K0A 2Z0** Business E-mail Address **air-rock@sympatico.ca**



Comments: **3/4HP-76GPM S&E @ 220 FT**

Bus. Telephone No. (inc. area code) **8138382170** Name of Well Technician (Last Name, First Name) **Purcell, Shannon**

Well Technician's Licence No. **T40331** Signature of Technician and/or Contractor _____ Date Submitted **2020 08 31**

Date Package Delivered **2020 08 23** Ministry/Use Only Audit No. **2344015**

Date Work Completed **2020 08 20**

Well owner's information package completed? Yes No

NTL 7 8 2 3 7 6 4 6 5 E
 9 R 5 0 2 6 9 4 0 N
 Elev 9 R 0 5 0 0
 Basin 2 5



ONTARIO

The Well Drillers Act
 Department of Mines, Province of Ontario

55 No 1186
RECEIVED
 MAY 28 1950
 GEOLOGICAL BRANCH
 DEPARTMENT OF MINES

Water Well Record

Ken Frew ~~Ken Frew~~ ~~McNab~~ McNab
 County or Territorial District ~~McNab~~ Township, Village, Town or City (Burnstown)
 Town or City... ~~County Road~~
 s... ~~Burnstown~~
 Date Completed... / / Cost of well (excluding pump)...

Pipe and Casing Record

Pumping Test

Casing diameter (s) 3" Date.....
 Length (s) of casing (s) 69 FT Static level 20'
 Type of screen..... Pumping level.....
 Length of screen..... Pumping rate.....
 Distance from top of screen to ground level..... Duration of test.....
 Is well a gravel-wall type? rock Distance from cylinder or bowls to ground level.....

Water Record

Kind (fresh or mineral).....	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<u>fresh</u>	<u>20'</u>	<u>fresh</u>	<u>15'</u>
Quality (hard, soft, contains iron, sulphur, etc.) <u>soft</u>	<u>145'</u>		
Appearance (clear, cloudy, coloured) <u>clear</u>			
For what purpose(s) is the water to be used? <u>general</u>			
How far is well from possible source of contamination? <u>none</u>			
What is the source of contamination? <u>none</u>			
Enclose a copy of any mineral analysis that has been made of water.....			

Well Log

Overburden and Bedrock Record

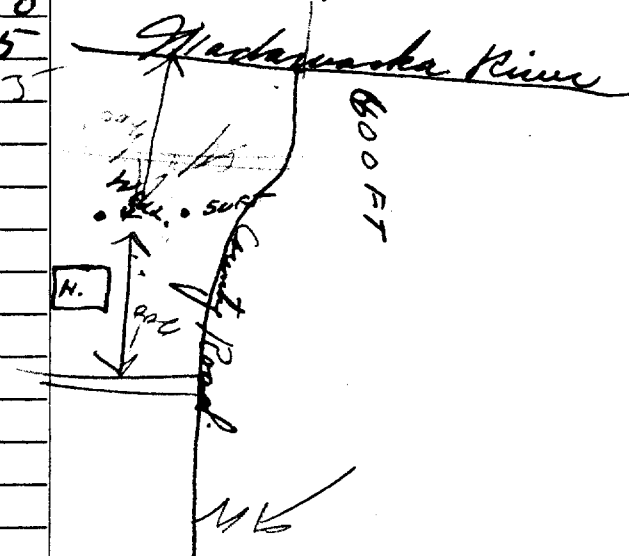
From To

0 ft.ft.

<u>clay</u>	<u>0</u>	<u>10</u>
<u>gravel</u>	<u>10</u>	<u>60</u>
<u>beddy gravel</u>	<u>60</u>	<u>75</u>
<u>Red granite</u>	<u>75</u>	<u>155</u>

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Situation: Is well on upland, in valley, or on hillside?.....
 Drilling Firm... J.B. Sufus
 Address.....
 Name of Driller Francis Coosette Address same
 Date..... Licence Number 89
 Signature of Licensee J.B. Sufus

UT. 11812 3770150E



55 No 1137

5R 5027500N

Elev CON 515

Basin 257 17

The Ontario Water Resources Commission Act, 1957

GROUND WATER BRANCH
JUL 27 1959
ONTARIO WATER RESOURCES COMMISSION

WATER WELL RECORD

County or District RENEWAL Township, Village, Town or City 1707113
Date completed 13 JULY 59
(day month year)
Address RENEWAL

Casing and Screen Record

Inside diameter of casing 4"
Total length of casing 24'
Type of screen -
Length of screen -
Depth to top of screen -
Diameter of finished hole 4"

Pumping Test

Static level TOP
Test-pumping rate 8 G.P.M.
Pumping level DRY
Duration of test pumping 4 HRS
Water clear or cloudy at end of test CLEAR
Recommended pumping rate 4 G.P.M.
with pumping level of 80

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
<u>GRAVEL</u>	<u>0</u>	<u>11</u>			
<u>RED GRANITE</u>	<u>11</u>	<u>13</u>			
<u>GRAVEL + STONES</u>	<u>13</u>	<u>14</u>			
<u>RED GRANITE</u>	<u>14</u>	<u>18</u>			
<u>GRAVEL</u>	<u>18</u>	<u>19</u>			
<u>GREY GRANITE</u>	<u>19</u>	<u>78</u>			
<u>ROTTEN RANDOM GRANITE</u>	<u>78</u>	<u>90</u>			
<u>GREY GRANITE</u>	<u>90</u>	<u>106</u>	<u>106</u>	<u>106</u>	<u>FRESH</u>

For what purpose(s) is the water to be used?
RIVERSIDE LODGE

Is well on upland, in valley, or on hillside?

Drilling Firm GHLAW

Address CALABOGIE

Licence Number 333

Name of Driller SAINE

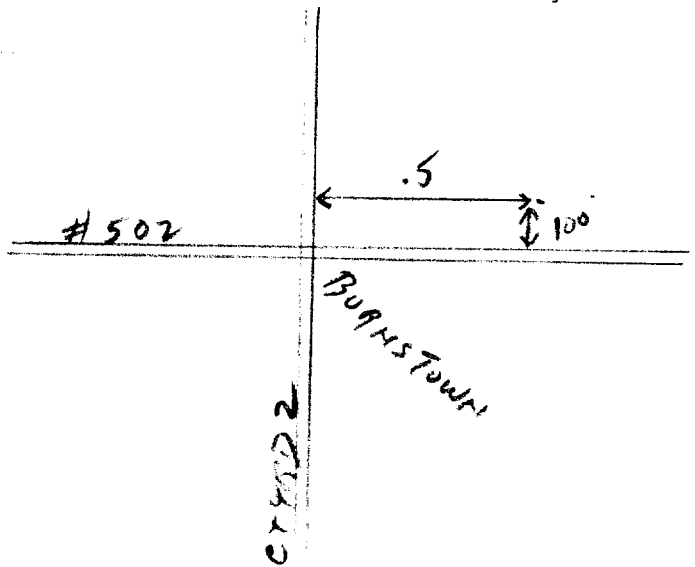
Address

Date JULY 21/59

GHLAW
(Signature of Licensed Drilling Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.





The Ontario Water Resources Commission Act

WATER WELL RECORD

31F/7E

Water management in Ontario

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

11 5502899

MUNICIP. 55022 CON. CQN

COUNTY OR DISTRICT: RENEWAL BOARD OF EDWARDS TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: 3 CON. BLOCK, TRACT, SURVEY, ETC.: IL LOT: 017

OWNER (SURNAME FIRST): RENEWAL BOARD OF EDWARDS ADDRESS: Burnstown ONTARIO DATE COMPLETED: 48-53

DAY: 27 MO: 06 YR: 72

UTM: 21 EASTING: 1395420 NORTHING: 5021030 ELEVATION: 0530 BASIN CODE: 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	SOIL	Boulders	Sand & Boulders	0	14
Black	ROCK		Black Granite	14	46
Grey	ROCK		Grey Granite	46	79
Red	ROCK		Red Granite	79	91
White	ROCK		White Limestone	91	101

31 001462813 0046821 0079221 0091721 0101115

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
15-18	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		

51 CASING & OPEN HOLE RECORD

INSIDE DIA. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11	1 <input checked="" type="checkbox"/> STEEL		0	26
	2 <input type="checkbox"/> GALVANIZED	155		
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
17-18	1 <input type="checkbox"/> STEEL		26	0101
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL			
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH

MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: _____ FEET

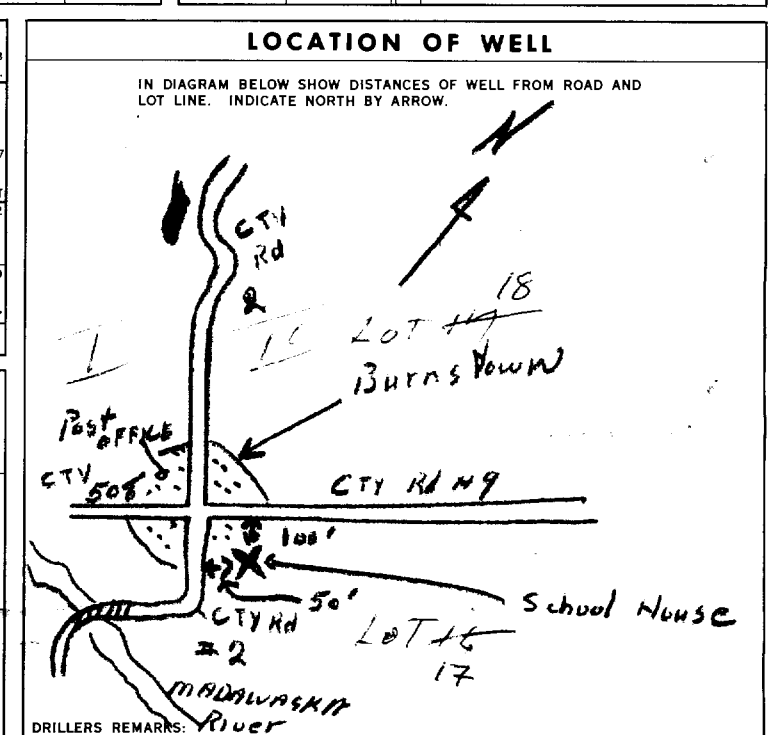
61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	<u>0045</u> GPM	<u>05</u> HOURS <u>00</u> MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
<u>012</u> FEET	<u>021</u> FEET	15 MINUTES: <u>021</u> 30 MINUTES: <u>021</u> 45 MINUTES: <u>021</u> 60 MINUTES: <u>021</u>
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	<u>29</u> GPM	<u>1</u> CLEARLY CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input checked="" type="checkbox"/> SHALLOW <input type="checkbox"/> DEEP	<u>029</u> FEET	<u>0015</u> GPM

50-53 005.0 GPM./FT. SPECIFIC CAPACITY



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 OTHER 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: Hill Giffin & Son LICENCE NUMBER: 2307

ADDRESS: BR#2 Renfrew

NAME OF DRILLER OR BORER: Tim Giffin LICENCE NUMBER: 2339

SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: DAY 20 MO. 09 YR. 72

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 2307 DATE RECEIVED: 200972

DATE OF INSPECTION: Aug. 29/73 INSPECTOR: JCB

REMARKS: P/JB

WI



WATER WELL RECORD

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

11

5504947

MUNICIPALITY 55022

CON. Cdn

02

COUNTY OR DISTRICT <i>Hamilton</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>McCabe</i>	CON., BLOCK, TRACT, SURVEY, ETC. <i>Con 2</i>	LOT <i>016</i>
DATE COMPLETED DAY <i>15</i> MO <i>12</i> YR <i>77</i>			
ELEVATION <i>26600</i>		BASIN CODE <i>5</i>	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>sand</i>			<i>0</i>	<i>5</i>
<i>Grey</i>	<i>limestone</i>			<i>5</i>	<i>155</i>

31	<i>0005028</i>	<i>0155215</i>
32		

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<i>0150</i>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
<i>06</i>	<input checked="" type="checkbox"/> STEEL	<i>158</i>	<i>0</i>
	<input type="checkbox"/> GALVANIZED		<i>0022</i>
	<input type="checkbox"/> CONCRETE		
	<input type="checkbox"/> OPEN HOLE		

SCREEN

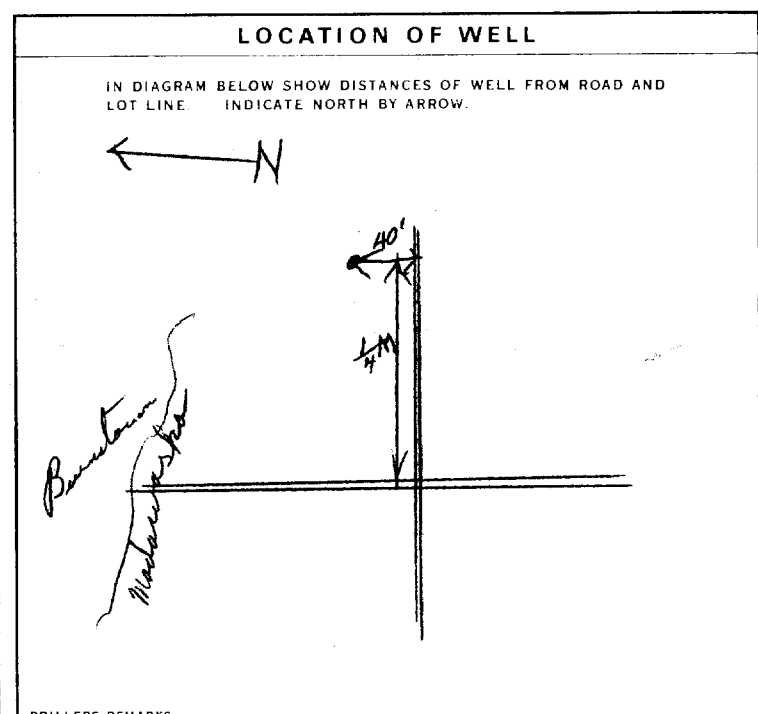
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE
<i>10-13</i>	<i>14-17</i>
<i>18-21</i>	<i>22-25</i>
<i>26-29</i>	<i>30-33</i>

71 PUMPING TEST

PUMPING TEST METHOD <input checked="" type="checkbox"/> PUMP <input type="checkbox"/> BAILER	PUMPING RATE <i>0015</i> GPM	DURATION OF PUMPING <i>01</i> HOURS <i>00</i> MINS
STATIC LEVEL <i>015</i> FEET	WATER LEVEL END OF PUMPING <i>120</i> FEET	WATER LEVELS DURING
		15 MINUTES <i>020</i> FEET 30 MINUTES <i>020</i> FEET 45 MINUTES <i>020</i> FEET 60 MINUTES <i>015</i> FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT <i>130</i> FEET	WATER AT END OF TEST <input checked="" type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING <i>130</i> FEET	RECOMMENDED PUMPING RATE <i>0006</i> GPM



FINAL STATUS OF WELL

1

<input checked="" type="checkbox"/> WATER SUPPLY	<input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
<input type="checkbox"/> OBSERVATION WELL	<input type="checkbox"/> ABANDONED, POOR QUALITY
<input type="checkbox"/> TEST HOLE	<input type="checkbox"/> UNFINISHED
<input type="checkbox"/> RECHARGE WELL	

WATER USE

01

<input checked="" type="checkbox"/> DOMESTIC	<input type="checkbox"/> COMMERCIAL
<input type="checkbox"/> STOCK	<input type="checkbox"/> MUNICIPAL
<input type="checkbox"/> IRRIGATION	<input type="checkbox"/> PUBLIC SUPPLY
<input type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	<input type="checkbox"/> NOT USED

METHOD OF DRILLING

5

<input checked="" type="checkbox"/> CABLE TOOL	<input type="checkbox"/> BORING
<input type="checkbox"/> ROTARY (CONVENTIONAL)	<input type="checkbox"/> DIAMOND
<input type="checkbox"/> ROTARY (REVERSE)	<input type="checkbox"/> JETTING
<input type="checkbox"/> ROTARY (AIR)	<input type="checkbox"/> DRIVING
<input checked="" type="checkbox"/> AIR PERCUSSION	

CONTRACTOR

NAME OF WELL CONTRACTOR: *George H Law Son*
 LICENCE NUMBER: *3323*
 ADDRESS: *Calabogie Ont*
 NAME OF DRILLER OR BORER: *Alf Law*
 LICENCE NUMBER: *3352*
 SIGNATURE OF CONTRACTOR: *George H Law*
 SUBMISSION DATE: DAY *20* MO *1* YR *78*

OFFICE USE ONLY

DATA SOURCE: *1*
 CONTRACTOR: *3323*
 DATE RECEIVED: *060278*
 DATE OF INSPECTION: *12/06/79*
 INSPECTOR: *[Signature]*

WATER WELL RECORD

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

11

5506642

MUNICIPALITY 55022

CON. CDN

02

COUNTY OR DISTRICT: **PERKINS** TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: **W. V. S.** CON. BLOCK, TRACT, SUB-LOT, ETC.: **2** LOT: **015**
DATE COMPLETED: **04** MO **09** YR **81**
ELEVATION: **266.199** RC: **5** ELEVATION: **0550** RC: **5** BASIN CODE: **26**

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Grey Grey & Blk.	Clay GRANITE	Boulders	Packed Hard	0	14 89

31 00142051379 008922173

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input checked="" type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input checked="" type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	1/4	0 (0021)
17-18	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		21 (0089)
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE		27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
	34-38	39-40

MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: _____ FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER ETC.
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST METHOD

1 PUMP 2 BAILEY

PUMPING RATE: **0030** GPM

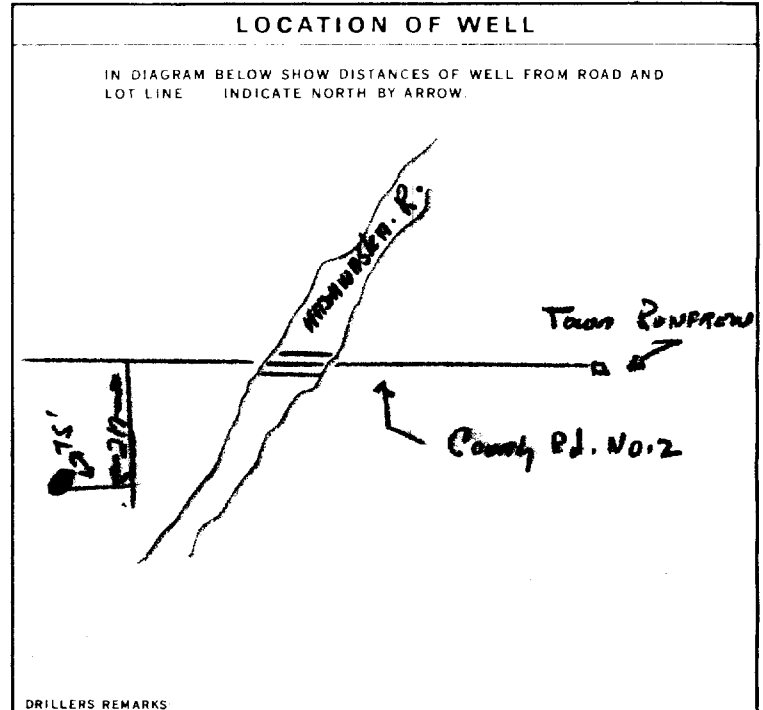
DURATION OF PUMPING: **02** HOURS **00** MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21	22-24	15 MINUTES 26-28
014 FEET	060 FEET	014 FEET

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: **060** FEET

RECOMMENDED PUMPING RATE: **0030** GPM



FINAL STATUS OF WELL: **1**

WATER USE: **01**

METHOD OF DRILLING: **1**

CONTRACTOR: **Lindsay Drilling Reqd** LICENCE NUMBER: **3363**

ADDRESS: **R.R.#1 PERKINS ONT K7U 3Z4**

NAME OF DRILLER OR BORER: **Leslie Lindsay** LICENCE NUMBER: **3353**

SIGNATURE OF CONTRACTOR: _____ SUBMISSION DATE: **16** DAY **11** MO **81** YR

OFFICE USE ONLY

DATA SOURCE: **1** CONTRACTOR: **3363** DATE RECEIVED: **011281**

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____



Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

5507120

MUNICIPALITY 55022

CON. 2

LOT 16

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

11

COUNTY OR DISTRICT _____ TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE **Burnstown, Ontario**

CON. BLOCK, TRACT, SURVEY, ETC. **Con. 2** LOT **16**

DATE COMPLETED **9** MO **3** YR **83**

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Grey	Clay		Packed	0	13
Grey	Sandstone		Hard	13	25
White	Limestone		Hard	25	65
Brown	Limestone		Hard	65	82

31 _____

32 _____

WATER FOUND AT - FEET	KIND OF WATER
65	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
80	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
6	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	1/4	0 - 21
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		21 - 82

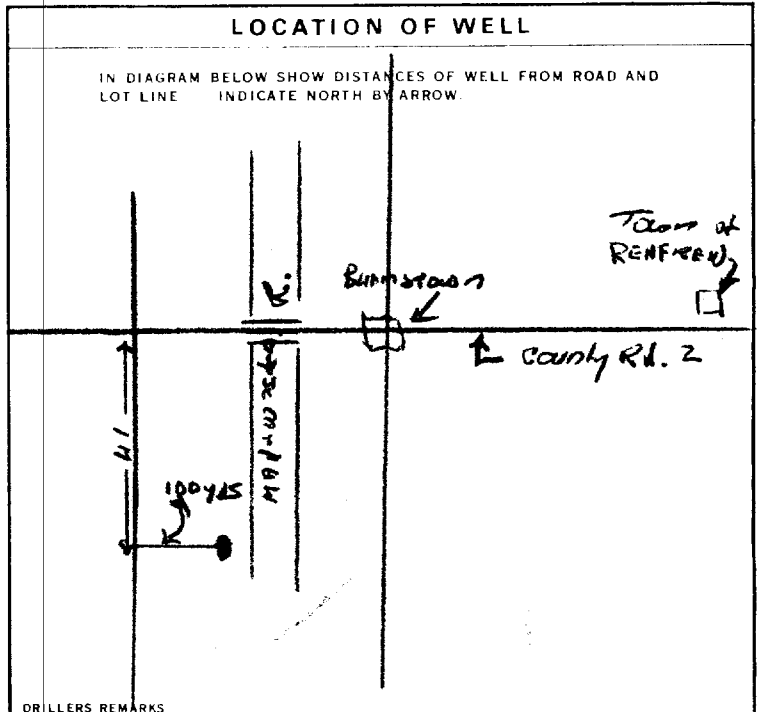
SIZE OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
10-13		
18-21		
26-29		

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	10 GPM	2 HOURS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
38 FEET	60 FEET	15 MINUTES: 38 FEET 30 MINUTES: _____ FEET 45 MINUTES: _____ FEET 60 MINUTES: _____ FEET

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	70 FEET	1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY



FINAL STATUS OF WELL	WATER USE	METHOD OF DRILLING
1 <input type="checkbox"/> WATER SUPPLY 2 <input type="checkbox"/> OBSERVATION WELL 3 <input type="checkbox"/> TEST HOLE 4 <input type="checkbox"/> RECHARGE WELL	1 <input checked="" type="checkbox"/> DOMESTIC 2 <input type="checkbox"/> STOCK 3 <input type="checkbox"/> IRRIGATION 4 <input type="checkbox"/> INDUSTRIAL 5 <input type="checkbox"/> OTHER	1 <input checked="" type="checkbox"/> CABLE TOOL 2 <input type="checkbox"/> ROTARY (CONVENTIONAL) 3 <input type="checkbox"/> ROTARY (REVERSE) 4 <input type="checkbox"/> ROTARY (AIR) 5 <input type="checkbox"/> AIR PERCUSSION

CONTRACTOR	CONTRACTOR	DATE RECEIVED
Linlaw Drilling Reg'd 3363	3363	17 05 83
Leslie Linlaw 3353	3353	

REMARKS: **WDE**

DRILLERS REMARKS



WATER WELL RECORD

5510923

MUNICIPALITY 55022

CON. NO. CON 02

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

11

COUNTY OR DISTRICT RENFREW	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE RENFREW	CON. BLOCK, TRACT, SURVEY, ETC. 2	LOT 17
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DEL., RENFREW, ONTARIO

DATE COMPLETED
DAY **20** MO **04** YR **92**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	Sand	Stones & Boulders	Compacted Overburden	0	15
Black	Diorite		Hard	15	47
Grey	Granite		Hard	47	80
Red	Granite		Medium Hard	80	92
White	Limestone		Medium Hard	92	105

31	32
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41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER	
10-13	1 <input checked="" type="checkbox"/> FRESH 2 <input checked="" type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 2 <input type="checkbox"/> SALTY	3 <input type="checkbox"/> SULPHUR 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6.25	1 <input checked="" type="checkbox"/> STEEL 2 <input checked="" type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	.188	0	66
6.13	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		66	105
	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			27-30

SCREEN

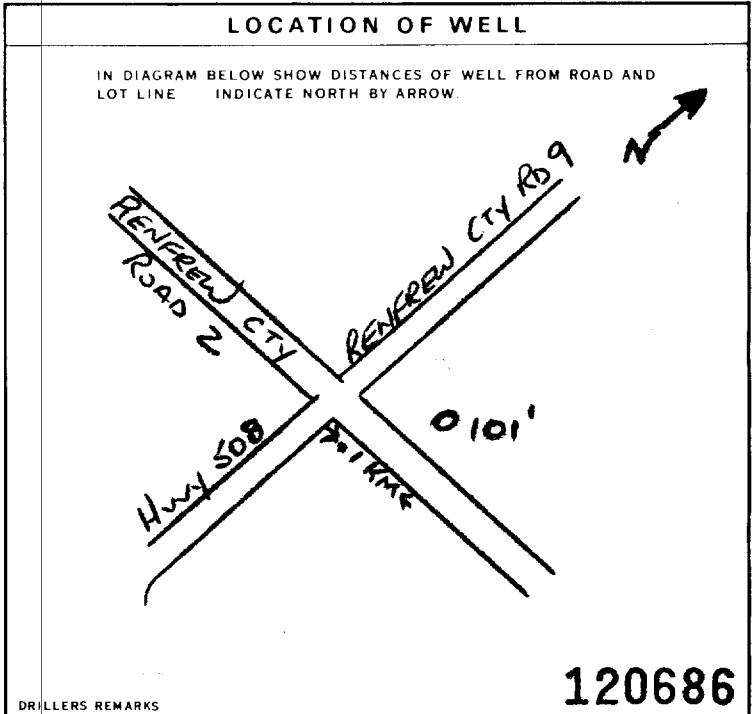
SIZE(S) OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
		INCHES		FEET	
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN		41-44	10	
			FEET		

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
66	0	Benseal Pressure Grout

71 PUMPING TEST

PUMPING TEST METHOD 1 <input checked="" type="checkbox"/> PUMP 2 <input type="checkbox"/> BAILER	PUMPING RATE 12 GPM	DURATION OF PUMPING 15-16 HOURS 17-18 MINS 2
STATIC LEVEL 0 FEET	WATER LEVEL END OF PUMPING 74 FEET	WATER LEVELS DURING 1 <input type="checkbox"/> PUMPING 2 <input checked="" type="checkbox"/> RECOVERY
IF FLOWING, GIVE RATE .25 GPM	PUMP INTAKE SET AT 95 FEET	WATER AT END OF TEST 1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 95 FEET	RECOMMENDED PUMPING RATE 10 GPM



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> DEWATERING

WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF CONSTRUCTION

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR GIFFIN WELL DRILLING LTD.	WELL CONTRACTOR'S LICENCE NUMBER 2307
ADDRESS R.R. # 2, RENFREW, ONTARIO	K7V 3Z5
NAME OF WELL TECHNICIAN Paul Giffin/Tim Giffin	WELL TECHNICIAN'S LICENCE NUMBER T0261
SIGNATURE OF TECHNICIAN/CONTRACTOR <i>Paul Giffin</i>	SUBMISSION DATE DAY 18 NO. 07 YR 92

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR 2307	DATE RECEIVED JUL 23 1992
DATE OF INSPECTION	INSPECTOR	
REMARKS		



Ministry
of the
Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
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11

5511247

551023 CON

02

COUNTY OR DISTRICT: *Burnhamthorpe* TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: *McCowan Twp* CON. BLOCK, TRACT, SURVEY ETC: *Con* LOT 25-27: *17*

DATE COMPLETED 48-53: DAY *23* MO *6* YR *88*

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>Sand Balders</i>			<i>0</i>	<i>15'</i>
<i>Grey</i>	<i>Hardpan Balders</i>			<i>15</i>	<i>36'</i>
<i>White Brown</i>	<i>Limestone</i>			<i>36</i>	<i>80'</i>

31

32

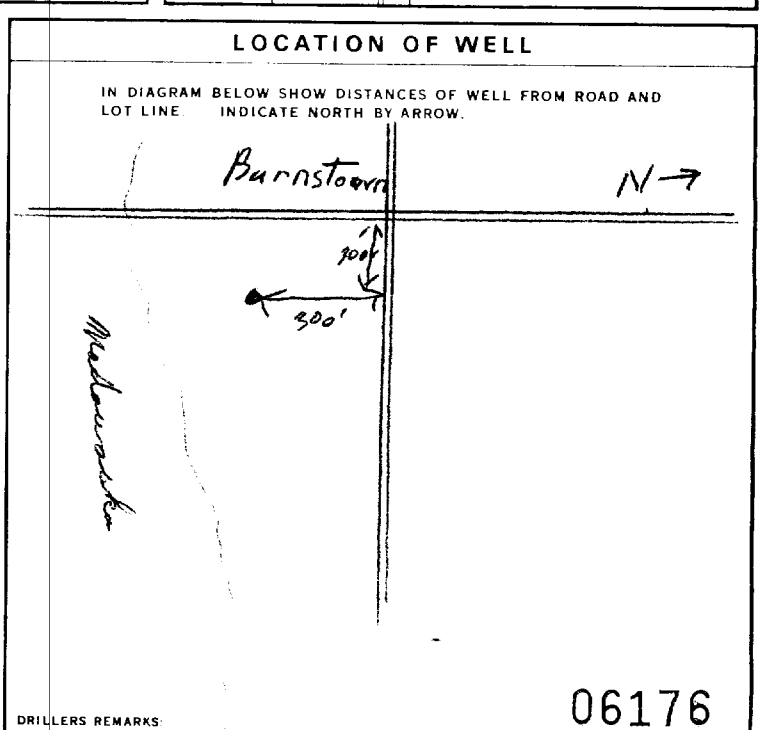
41 WATER RECORD	
WATER FOUND AT - FEET	KIND OF WATER
10-13	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 14 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 19 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 24 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 29 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 34 30 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD				
INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>10 7/8</i>	1 <input checked="" type="checkbox"/> STEEL 12 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	<i>189</i>	<i>0</i>	<i>13-16</i>
<i>17-18</i>	1 <input type="checkbox"/> STEEL 19 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			<i>20-23</i>
<i>24-25</i>	1 <input type="checkbox"/> STEEL 26 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE			<i>27-30</i>

SCREEN	SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
		INCHES	FEET

61 PLUGGING & SEALING RECORD		
DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO	
<i>10-13</i>	<i>14-17</i>	
<i>18-21</i>	<i>22-25</i>	
<i>26-29</i>	<i>30-33</i> 80	

71 PUMPING TEST	PUMPING TEST METHOD 10		PUMPING RATE 11-14	DURATION OF PUMPING	
	1 <input type="checkbox"/> PUMP	2 <input checked="" type="checkbox"/> BAILER	<i>5</i> GPM	<i>1</i> 15-16 HOURS	17-18 MINS
	STATIC LEVEL	WATER LEVEL END OF PUMPING	25 WATER LEVELS DURING		
	<i>0</i> FEET	<i>80</i> FEET	15 MINUTES	30 MINUTES	45 MINUTES
		<i>0</i> FEET	<i>0</i> FEET	<i>0</i> FEET	<i>0</i> FEET
IF FLOWING, GIVE RATE <i>100</i> GPM		38-41 PUMP INTAKE SET AT <i>75</i> FEET		42 WATER AT END OF TEST	
RECOMMENDED PUMP TYPE <input checked="" type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP		43-45 RECOMMENDED PUMP SETTING <i>75</i> FEET		46-49 RECOMMENDED PUMPING RATE <i>5</i> GPM	



FINAL STATUS OF WELL 54	1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
	2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
	3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL		
WATER USE 55-56	1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
	2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
	3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
	4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
	<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED
METHOD OF DRILLING	1 <input type="checkbox"/> CABLE TOOL	5 <input type="checkbox"/> BORING
	2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	6 <input type="checkbox"/> DIAMOND
	3 <input type="checkbox"/> ROTARY (REVERSE)	7 <input type="checkbox"/> JETTING
	4 <input type="checkbox"/> ROTARY (AIR)	8 <input type="checkbox"/> DRIVING
	5 <input checked="" type="checkbox"/> AIR PERCUSSION	

CONTRACTOR	NAME OF WELL CONTRACTOR		LICENCE NUMBER
	<i>George H. Law Son Ltd</i>		<i>3323</i>
	ADDRESS <i>Calalogic Ont</i>		
	NAME OF DRILLER OR BORER <i>Allen Fingers</i>		LICENCE NUMBER
SIGNATURE OF CONTRACTOR <i>George H. Law</i>		SUBMISSION DATE DAY <i>23</i> MO <i>6</i> YR <i>88</i>	

OFFICE USE ONLY	DATE RECEIVED	DATE OF INSPECTION	INSPECTOR
	<i>3323</i>	<i>OCT 20 1992</i>	
	REMARKS		

WATER WELL RECORD

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

5511248

55022 CON
MUNICIPAL No. 1 Well Cataraugus 02

COUNTY OR DISTRICT <i>Brant</i>	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE <i>McNab Twp</i>	CON., BLOCK, TRACT, SURVEY, ETC. <i>Con 2</i>	LOT <i>17</i>
DATE COMPLETED DAY <i>24</i> MO <i>6</i> YR <i>88</i>			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
<i>Brown</i>	<i>Sand</i>			<i>0</i>	<i>7'</i>
<i>Brown</i>	<i>Gravel</i>			<i>7'</i>	<i>43</i>
<i>Grey</i>	<i>Granite</i>			<i>43'</i>	<i>105'</i>

31

32

4 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
<i>100</i>	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>15-18</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>20-23</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>25-28</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
<i>30-33</i>	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
<i>6 1/4</i>	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE	<i>1 1/8</i>	<i>0</i>	<i>43'</i>
<i>17-18</i>	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE			<i>20-23</i>
<i>24-25</i>	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE			<i>27-30</i>

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
<i>43</i>	<i>Cement Grout</i>
<i>18-21</i>	
<i>26-29</i>	

71 PUMPING TEST

PUMPING TEST METHOD <input checked="" type="checkbox"/> PUMP <input type="checkbox"/> BAILER	PUMPING RATE <i>20</i> GPM	DURATION OF PUMPING <i>1</i> HOURS								
STATIC LEVEL <i>10</i> FEET	WATER LEVEL END OF PUMPING <i>90</i> FEET	WATER LEVELS DURING								
<table border="1"> <tr> <th>15 MINUTES</th> <th>30 MINUTES</th> <th>45 MINUTES</th> <th>60 MINUTES</th> </tr> <tr> <td><i>10</i></td> <td><i>10</i></td> <td><i>16</i></td> <td><i>10</i></td> </tr> </table>			15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	<i>10</i>	<i>10</i>	<i>16</i>	<i>10</i>
15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES							
<i>10</i>	<i>10</i>	<i>16</i>	<i>10</i>							
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT <i>90</i> FEET	WATER AT END OF TEST <input checked="" type="checkbox"/> CLEAR <input type="checkbox"/> CLOUDY								
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING <i>90</i> FEET	RECOMMENDED PUMPING RATE <i>10</i> GPM								

LOCATION OF WELL

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

Barnstoun Road

150'

N →

FINAL STATUS OF WELL

<input checked="" type="checkbox"/> WATER SUPPLY	<input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
<input type="checkbox"/> OBSERVATION WELL	<input type="checkbox"/> ABANDONED, POOR QUALITY
<input type="checkbox"/> TEST HOLE	<input type="checkbox"/> UNFINISHED
<input type="checkbox"/> RECHARGE WELL	

WATER USE

<input checked="" type="checkbox"/> DOMESTIC	<input type="checkbox"/> COMMERCIAL
<input type="checkbox"/> STOCK	<input type="checkbox"/> MUNICIPAL
<input type="checkbox"/> IRRIGATION	<input type="checkbox"/> PUBLIC SUPPLY
<input type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	<input type="checkbox"/> NOT USED

METHOD OF DRILLING

<input type="checkbox"/> CABLE TOOL	<input type="checkbox"/> BORING
<input type="checkbox"/> ROTARY (CONVENTIONAL)	<input type="checkbox"/> DIAMOND
<input type="checkbox"/> ROTARY (REVERSE)	<input type="checkbox"/> JETTING
<input type="checkbox"/> ROTARY (AIR)	<input type="checkbox"/> DRIVING
<input checked="" type="checkbox"/> AIR PERCUSSION	

CONTRACTOR

NAME OF WELL CONTRACTOR <i>George H. New Son Ltd</i>	LICENCE NUMBER <i>3323</i>
ADDRESS <i>Cataraugus Ont</i>	
NAME OF DRILLER OR BORER <i>Allan Fougere</i>	LICENCE NUMBER
SIGNATURE OF CONTRACTOR <i>G. H. New</i>	SUBMISSION DATE DAY <i>24</i> MO <i>6</i> YR <i>88</i>

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR 3323	DATE RECEIVED OCT 20 1992
DATE OF INSPECTION	INSPECTOR	
REMARKS		

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

5513156

Municipality 55022 Con. CON 02

County or District [redacted] Township/Borough/City/Town/Village **McNab** Con block tract survey, etc. **Con 2** Lot **17**
Address **Burnstown, Ont** Date completed **18 11 97**
Northing RC Elevation RC Basin Code ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
brown	Sand			0	4'
black/gray	gault			4'	345'

31
32

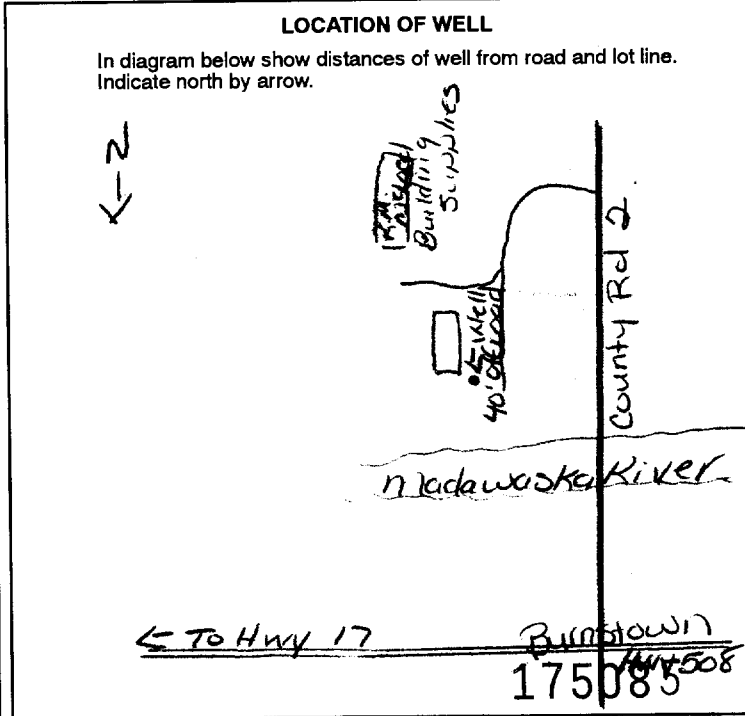
41 WATER RECORD			
Water found at - feet	Kind of water		
10-13 240	1 <input checked="" type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas	14
15-18	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas	19
20-23	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas	24
25-28	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas	29
30-33	1 <input type="checkbox"/> Fresh 2 <input type="checkbox"/> Salty	3 <input type="checkbox"/> Sulphur 4 <input type="checkbox"/> Minerals 6 <input type="checkbox"/> Gas	34

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
19-11 6 1/4	1 <input checked="" type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic	.188	0	20
17-18	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic			20-23
24-25	1 <input type="checkbox"/> Steel 2 <input type="checkbox"/> Galvanized 3 <input type="checkbox"/> Concrete 4 <input type="checkbox"/> Open hole 5 <input type="checkbox"/> Plastic			27-30

SCREEN	Sizes of opening (Slot No.)	Diameter	Length
		inches	feet
	Material and type	Depth at top of screen	
		feet	

61 PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
20	14	Cement Grout	
18-21	22-25		
26-29	30-33		

71 PUMPING TEST		Pumping rate		Duration of pumping	
Static level	Water level end of pumping	GPM	Hours	Mins	
46 feet	190 feet	3	1	18	
Water levels during		<input checked="" type="checkbox"/> Pumping <input type="checkbox"/> Recovery			
15 minutes	30 minutes	45 minutes	60 minutes		
105 feet	140 feet	190 feet	190 feet		
If flowing give rate		Pump intake set at		Water at end of test	
GPM		feet		<input checked="" type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
Recommended pump type		Recommended pump setting		Recommended pump rate	
<input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep		320 feet		4 GPM	



FINAL STATUS OF WELL

1 Water supply
2 Observation well
3 Test hole
4 Recharge well

5 Abandoned, insufficient supply
6 Abandoned, poor quality
7 Abandoned (Other)
8 Dewatering

9 Unfinished
10 Replacement well

WATER USE

1 Domestic
2 Stock
3 Irrigation
4 Industrial

5 Commercial
6 Municipal
7 Public supply
8 Cooling & air conditioning

9 Not used
10 Other

METHOD OF CONSTRUCTION

1 Cable tool
2 Rotary (conventional)
3 Rotary (reverse)
4 Rotary (air)

5 Air percussion
6 Boring
7 Diamond
8 Jetting

9 Driving
10 Digging
11 Other

Name of Well Contractor **George H. Law & Son Ltd** Well Contractor's Licence No. **3323**
Address **Box 155, Culabogie, Ont K0J-1H0**
Name of Well Technician **Alf Law** Well Technician's Licence No. **T-0433**
Signature of Technician/Contractor **George H. Law** Submission date **day 18 mo 11 yr 97**

MINISTRY USE ONLY

Data source **3323** Contractor **3323** Date received **DEC 19 1997**
Date of inspection Inspector
Remarks **ess. 52**

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

5513158

Municipality 55022 Con. CON 02

County or District [redacted] Township/Borough/City/Town/Village McNab
 Address RR# Burnstown, Ont
 Con block tract survey, etc. Con 2 Lot 17
 Date completed 17 11 97

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
black/gray	granite	Re: Deepened well			205'445'

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

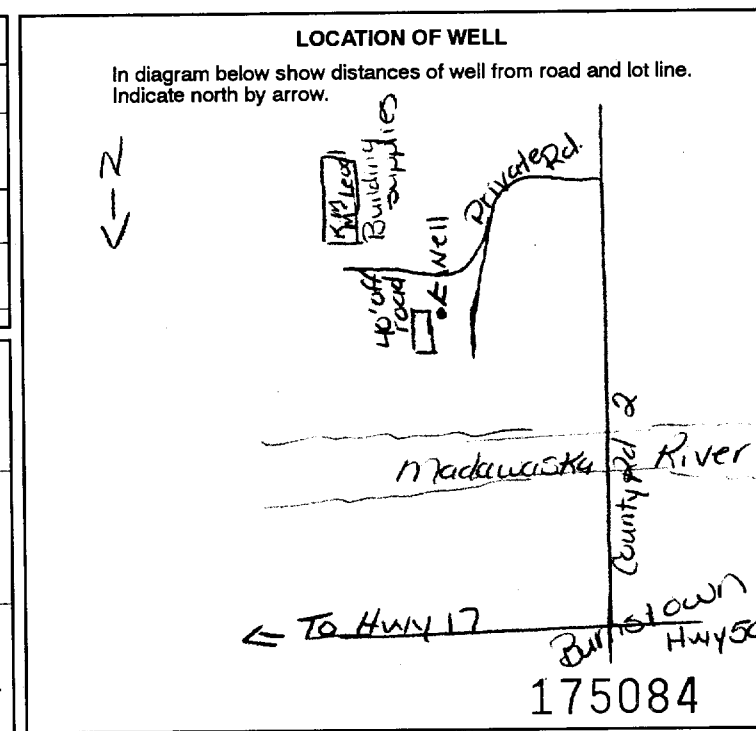
41 WATER RECORD			
Water found at - feet	Kind of water		
260	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas	

51 CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic			13-16
17-18	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic			20-23
24-25	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic			27-30

SCREEN	Sizes of opening (Slot No.)	Diameter inches	Length feet

61 PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-13	14-17		
18-21	22-25		
26-29	30-33		

71	Pumping test method <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Bailer	Pumping rate 5 GPM	Duration of pumping 17 Hours 18 Mins
PUMPING TEST	Static level 46 feet	Water level end of pumping 22-24 feet	Water levels during 15 minutes 400 feet 30 minutes 352 feet 45 minutes 315 feet 60 minutes 275 feet
	If flowing give rate GPM	Pump intake set at feet	Water at end of test <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Cloudy
	Recommended pump type <input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	Recommended pump setting 300 feet	Recommended pump rate 5 GPM



FINAL STATUS OF WELL			
<input checked="" type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished	
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well	
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)		
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Dewatering		
WATER USE			
<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used	
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other	
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply		
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning		
METHOD OF CONSTRUCTION			
<input type="checkbox"/> Cable tool	<input checked="" type="checkbox"/> Air percussion	<input type="checkbox"/> Driving	
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other	
<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jetting		

Name of Well Contractor George H. Law & Son Ltd.	Well Contractor's Licence No. 3323
Address Box 155 Culabogre, Ont K0J 1H0	Well Technician's Licence No. T-0433
Name of Well Technician A.H. Law	Submission date 17 mo 11 yr 97
Signature of Technician/Contractor George H. Law	

MINISTRY USE ONLY	Data source 3323	Date received DEC 19 1997
	Date of inspection	Inspector
	Remarks ces. sb	

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Help Desk (Toll Free) at 1-888-396-9355.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

Address of Well Location (County/District/Municipality) **Renfrew** Township **McNab** Lot **W/2L17** Concession **2**
 RR#/Street Number/Name **56 Stacey Lane** City/Town/Village **Burnstown** Site/Compartment/Block/Tract etc.
 GPS Reading NAD **83** Zone **18** Easting **376749** Northing **5027353** Unit Make/Model **Muridan** Mode of Operation: Undifferentiated Averaged Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth	
				From	Metres To
brown	sand			0	2.17
gray	limestone			2.17	12.40
black	granite			12.40	55.80

Hole Diameter			Construction Record				Test of Well Yield					
Depth From	Metres To	Diameter Centimetres	Inside diam centimetres	Material	Wall thickness centimetres	Depth		Pumping test method	Draw Down		Recovery	
						From	To		Time min	Water Level Metres	Time min	Water Level Metres
0	55.80	27.28										
			Casing									
			15.55	<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Fibreglass	.48	0	6.82	Pump intake set at - (metres) 54.25	Static Level 8.28			
							Pumping rate - (litres/min) 45					
							Duration of pumping 1 hrs + ___ min					
							Final water level end of pumping 47.10 metres					
							Recommended pump type <input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep					
							Recommended pump depth 52.0 metres					
							Recommended pump rate 46.50 (litres/min)					
							If flowing give rate - (litres/min)					
							If pumping discontinued, give reason.					
							10 23.06 10 47.05					
							15 29.27 15 46.72					
							20 34.92 20 46.36					
							25 37.95 25 46.12					
							30 40.97 30 45.91					
							40 46.28 40 45.61					
							50 47.58 50 45.30					
							60 49.10 60 45.16					

Plugging and Sealing Record Annular space Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6.20	Cement Grout	.14

Method of Construction

Cable Tool Rotary (air) Diamond Digging
 Rotary (conventional) Air percussion Jetting Other
 Rotary (reverse) Boring Driving

Water Use

Domestic Industrial Public Supply Other
 Stock Commercial Not used
 Irrigation Municipal Cooling & air conditioning

Final Status of Well

Water Supply Recharge well Unfinished Abandoned, (Other)
 Observation well Abandoned, insufficient supply Dewatering
 Test Hole Abandoned, poor quality Replacement well

Well Contractor/Technician Information

Name of Well Contractor **George H. Law + Son Ltd** Well Contractor's Licence No. **3323**
 Business Address (street name, number, city etc.) **Box 155 Calabogre, ON K0J-1H0**
 Name of Well Technician (last name, first name) **Fougere Allan** Well Technician's Licence No. **T-0432**
 Signature of Technician/Contractor **[Signature]** Date Submitted **2007 08 15**

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.

Audit No. **Z 71348** Date Well Completed **2007 08 15**
 Was the well owner's information package delivered? Yes No Date Delivered **2007 10 28**

Ministry Use Only

Data Source **3323** Contractor **3323**
 Date Received **SEP 17 2007** DD Date of Inspection **2007 08 15** MM DD
 Remarks _____ Well Record Number _____

Measurements recorded in: Metric Imperial

Address of well location (Street Number/Name) 18 STACEY DR. Township MUNAB/BRAESIDE Lot 5 Concession _____
 County/District/Municipality RENFREW City/Town/Village BURNSTOWN Province Ontario Postal Code K0J1G0
 UTM Coordinates Zone 18 Easting 376523 Northing 5027206 Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	Depth (m/ft)	
			From	To
BROWN	SAND	GRAVEL, STONES + BOULDERS	0	20
GREY	SAND	CLAY, GRAVEL, STONES + BOULDERS	20	44½
GREY	DOLOMITE	WHITE DOLOMITE	44½	106
GREY	GRANITE	BLACK + PINK GRANITE	106	195

Annular Space			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	
From	To		
0	52½	BENTONITE SLURRY	0.768

Results of Well Yield Testing				
After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify <u>CLEARING</u>	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level	27.8		
	1	31.0	1	77.6
Pump intake set at (m/ft) <u>185'</u>	2	33.6	2	74.5
	3	36.2	3	71.8
Pumping rate (l/min / GPM) <u>5</u>	4	38.4	4	70.4
	5	40.4	5	68.8
Duration of pumping <u>1 hrs + 0 min</u>	10	48.9	10	60.9
	15	55.2	15	55.0
Final water level end of pumping (m/ft) <u>83.1</u>	20	61.0	20	50.4
	25	65.3	25	47.5
If flowing give rate (l/min / GPM)	30	68.4	30	44.6
	40	74.6	40	41.9
Recommended pump depth (m/ft) <u>185</u>	50	79.2	50	39.85
	60	83.1	60	38.5
Recommended pump rate (l/min / GPM) <u>5</u>				
	Well production (l/min / GPM) <u>6</u>			
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

Method of Construction		Well Use		
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> Other, specify _____		

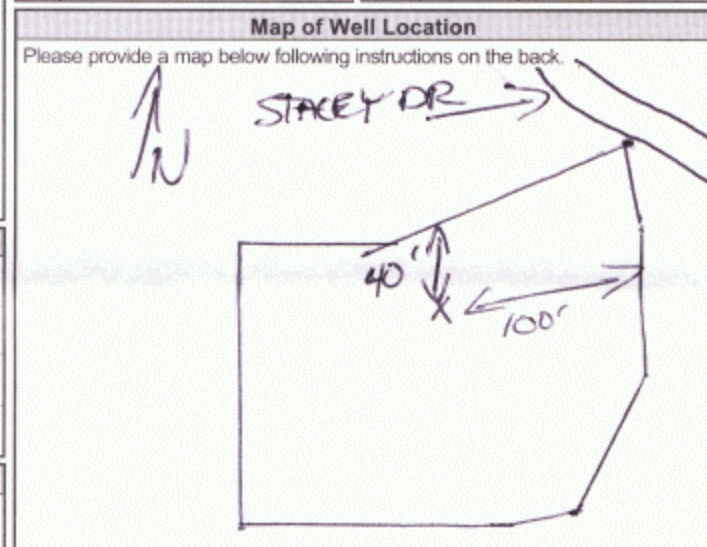
Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input checked="" type="checkbox"/> Water Supply
			From	To	
6½	STEEL	0.188	0+2	52½	<input type="checkbox"/> Replacement Well
					<input type="checkbox"/> Test Hole
					<input type="checkbox"/> Recharge Well
					<input type="checkbox"/> Dewatering Well
					<input type="checkbox"/> Observation and/or Monitoring Hole
					<input type="checkbox"/> Alteration (Construction)
					<input type="checkbox"/> Abandoned, Insufficient Supply
					<input type="checkbox"/> Abandoned, Poor Water Quality
					<input type="checkbox"/> Abandoned, other, specify _____
					<input type="checkbox"/> Other, specify _____

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
		From	To
185	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	52½	195
			6"

Well Contractor and Well Technician Information			
Business Name of Well Contractor <u>T. SAUNDERS DRILLING LTD</u>	Well Contractor's Licence No. <u>4879</u>		
Business Address (Street Number/Name) <u>RR#1</u>	Municipality <u>BRAESIDE</u>		
Province <u>ONT.</u>	Postal Code <u>K0A1G0</u>	Business E-mail Address	

Bus. Telephone No. (inc. area code) <u>6136235648</u>	Name of Well Technician (Last Name, First Name) <u>SAUNDERS TROY</u>
Well Technician's Licence No. <u>T517</u>	Signature of Technician and/or Contractor <u>Jay Saunders</u>
	Date Submitted <u>20080928</u>



Well owner's information package delivered <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered <u>20080828</u>	Ministry Use Only Audit No. Z 87301 OCT 24 2008 Received
	Date Work Completed <u>20080828</u>	

Measurements recorded in: Metric Imperial

Page _____ of _____

Well Owner's Information

First Name: _____ Last Name / Organization: **Township of McNab / Braeside** E-mail Address: _____ Well Constructed by Well Owner

Mailing Address (Street Number/Name): **2508 Russet Dr. RR#2** Municipality: **Arnprior** Province: **ON** Postal Code: **K7S 3G8** Telephone No. (inc. area code): **613 623-XXXX**

Well Location

Address of Well Location (Street Number/Name): **1537 Calabogie Rd** Township: **McNab** Lot: **EPT 417** Concession: **2**

County/District/Municipality: **Renfrew** City/Town/Village: **Burnstown** Province: **Ontario** Postal Code: **K0J 1G0**

UTM Coordinates Zone: **18** Easting: **376854** Northing: **5027065** Municipal Plan and Sublot Number: _____ Other: _____ Project #: **1400 09072**

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	gravel			0	12.40
brown	hardpan			12.40	16.74
gray/black	granite			16.74	58.90

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0 to 9.30	Quick Grout	1.21

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free				
<input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	3.71		
Pump intake set at (m/ft): 46.50	1	4.60	1	6.56
Pumping rate (l/min / GPM): 45	2	4.82	2	5.35
Duration of pumping: 1 hrs + 0 min	3	5.09	3	4.47
Final water level end of pumping (m/ft): 8.43	4	5.34	4	4.09
If flowing give rate (l/min / GPM): _____	5	5.55	5	3.81
Recommended pump depth (m/ft): 46.50	10	6.40	10	3.71
Recommended pump rate (l/min / GPM): 45	15	6.82	15	3.71
Well production (l/min / GPM): _____	20	7.18	20	
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	25	7.55	25	
	30	7.76	30	
	40	8.09	40	
	50	8.40	50	
	60	8.43	60	3.71

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock Test Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion Industrial Other, specify _____

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)		Status of Well
			From	To	
15.55	Steel	.48	0	16.82	<input checked="" type="checkbox"/> Water Supply
					<input type="checkbox"/> Replacement Well
					<input type="checkbox"/> Test Hole
					<input type="checkbox"/> Recharge Well
					<input type="checkbox"/> Dewatering Well
					<input type="checkbox"/> Observation and/or Monitoring Hole
					<input type="checkbox"/> Alteration (Construction)
					<input type="checkbox"/> Abandoned, Insufficient Supply
					<input type="checkbox"/> Abandoned, Poor Water Quality
					<input type="checkbox"/> Abandoned, other, specify _____
					<input type="checkbox"/> Other, specify _____

Construction Record - Screen

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

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Hole Diameter	
		Depth (m/ft)	Diameter (cm/in)
55.80	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0 to 16.74	27.28
		16.74 to 58.90	15.55

Well Contractor and Well Technician Information

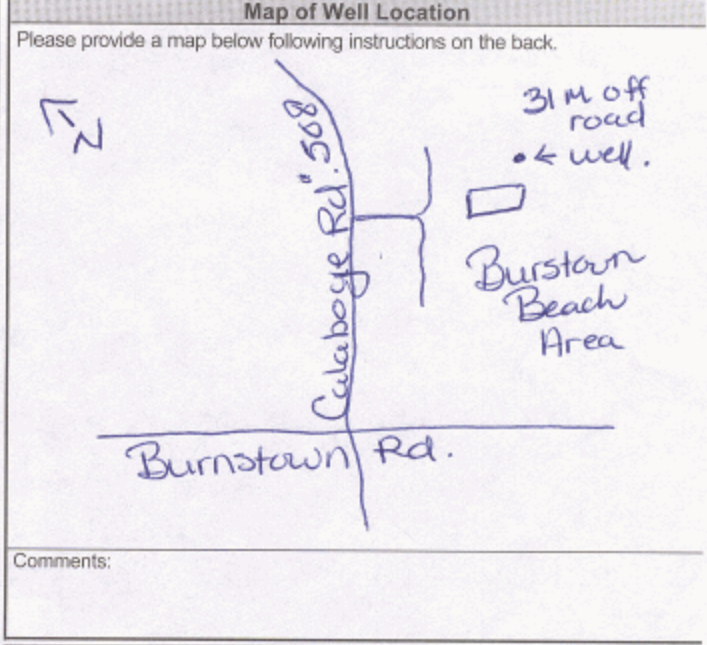
Business Name of Well Contractor: **George H. Law & Son Ltd** Well Contractor's Licence No.: **3323**

Business Address (Street Number/Name): **4848A Calabogie Rd, Box 155** Municipality: **Calabogie**

Province: **ON** Postal Code: **K0J 1H0** Business E-mail Address: _____

Bus. Telephone No. (inc. area code): **613 752 2080** Name of Well Technician (Last Name, First Name): **Fougere Allan**

Well Technician's Licence No.: **0432** Signature of Technician and/or Contractor: **Allan Fougere** Date Submitted: **2010 08 31**



Well owner's information package delivered: Yes No

Date Package Delivered: **2010 08 31** Date Work Completed: **2010 08 23**

Ministry Use Only

Audit No.: **Z 106016**

Received: **SEP 09 2010**

Measurements recorded in: Metric Imperial

Address of Well Location (Street Number/Name) 1668 BURNSTOWN RD.		Township MCNAB/BRAESIDE		Lot		Concession	
County/District/Municipality RENFREW		City/Town/Village BURNSTOWN		Province Ontario		Postal Code K0A1G0	
UTM Coordinates Zone Easting Northing NAD 83 18 376467 5027174		Municipal Plan and Sublot Number		Other			

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
PINK, WHITE & BLACK	GRAVEL	SAND & STONES		0	28
GREY	SAND	GRAVEL, CLAY & STONES		28	57
BLACK	GRANITE			57	151
BLACK	GRANITE	PINK GRANITE		151	198

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0 60	BENTONITE SLURRY	0.768

Method of Construction		Well Use		
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input checked="" type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify		

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify <input type="checkbox"/> Other, specify
			From	To	
6 7/8	STEEL	0.188	0+2	60	
6	OPEN HOLE		60	198	

Construction Record - Screen		Water Details		Hole Diameter		
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	
					From	To
					0	60
					60	198

Well Contractor and Well Technician Information	
Business Name of Well Contractor T. SAUNDERS DRILLING LTD	Well Contractor's Licence No. 4 8 7 9
Business Address (Street Number/Name) BR#1	Municipality BRAESIDE
Province ONT.	Postal Code K0A1G0
Business E-mail Address	

Water Details		Hole Diameter	
Water found at Depth 86 (m/ft)	Kind of Water: <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft) From 0 To 60	Diameter (cm/in) 9 3/4
Water found at Depth 151 (m/ft)	Kind of Water: <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft) From 60 To 198	Diameter (cm/in) 6
Water found at Depth 186 (m/ft)	Kind of Water: <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify		

Results of Well Yield Testing					
After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify CLEARING	Draw Down		Recovery		
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)	
If pumping discontinued, give reason: _____	Static Level	14.1			
	1	19.3	1	89.2	
	Pump intake set at (m/ft) 180	2	23.8	2	87.3
	Pumping rate (l/min / GPM) 5	3	26.4	3	85.45
	Duration of pumping 1 hrs + 0 min	4	29.2	4	83.6
	Final water level end of pumping (m/ft) 91.1	5	31.65	5	81.9
If flowing give rate (l/min / GPM) _____	10	43.1	10	73.5	
	15	52.3	15	66.9	
	20	58.6	20	60.95	
	Recommended pump depth (m/ft) 180	25	66.5	25	55.75
	Recommended pump rate (l/min / GPM) 5	30	72.1	30	51.1
	Well production (l/min / GPM) 5+	40	81.5	40	43.65
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	50	87.4	50	38.1	
	60	91.1	60	33.75	

Map of Well Location	
Please provide a map below following instructions on the back.	
Comments:	

Well owner's information		Date Package Delivered		Ministry Use Only	
Well owner's information package delivered	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered 2010/10/25	Date Work Completed 2010/10/25	Audit No. z120563	Received NOV 08 2010



Measurements recorded in: Metric Imperial

Page of

Address of Well Location (Street Number/Name) 21 STACEY DR Township MENAB/BRAESIDE Lot _____ Concession _____

County/District/Municipality BENFREW City/Town/Village BURNSTOWN Province Ontario Postal Code K0J1G0

UTM Coordinates Zone Easting Northing NAD 83 18 376556 5027287 Municipal Plan and Sublot Number _____ Other _____

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	SAND	STONES		0	8
GREY	SAND	CLAY & STONES	TILL	8	22 1/2
BLACK	GRANITE			22 1/2	160

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³)
From	To	
0	26 BENTONITE SLURRY	260

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock Test Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion Industrial Other, specify _____

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)		Status of Well
			From	To	
6 1/4	STEEL	0.188	0	26	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6	OPEN HOLE		26	160	

Construction Record - Screen

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

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	From	To
7.2		0	9 3/4
		26	6

Well Contractor and Well Technician Information

Business Name of Well Contractor SAUNDERS WELL DRILLING Well Contractor's Licence No. 418719

Business Address (Street Number/Name) RR #1 Municipality BRAESIDE

Province ONT. Postal Code K0A1G0 Business E-mail Address _____

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
1	3.88	1	107.0	
2	6.45	2	104.99	
3	9.16	3	103.28	
4	11.78	4	101.47	
5	14.11	5	99.96	
10	25.85	10	91.91	
15	36.87	15	87.68	
20	47.10	20	83.78	
25	56.47	25	79.94	
30	65.42	30	76.38	
40	81.48	40	70.18	
50	96.91	50	64.19	
60	110.02	60	58.64	

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

If pumping discontinued, give reason: _____

Pump intake set at (m/ft) 155

Pumping rate (l/min / GPM) 4

Duration of pumping 1 hrs + 0 min

Final water level end of pumping (m/ft) 110.02

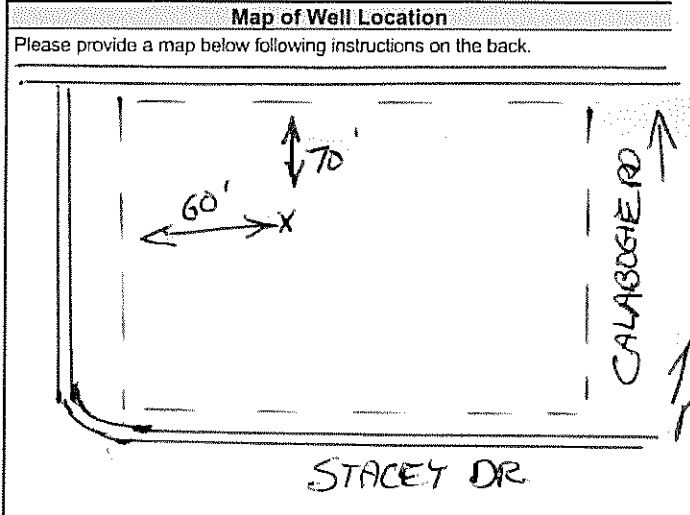
If flowing give rate (l/min / GPM) _____

Recommended pump depth (m/ft) 150

Recommended pump rate (l/min / GPM) 3

Well production (l/min / GPM) 3

Disinfected? Yes No



Comments:

Well owner's information

Well owner's information package delivered Yes No

Date Package Delivered 20130110

Date Work Completed 20130218

Ministry Use Only

Audit No. 2158231

Received FEB 22 2013

Address of Well Location (Street Number/Name) **1645 CALABOGUE RD** Township **MUNAB/BRAESIDE** Lot Concession

County/District/Municipality **RENEW** City/Town/Village **BURNSTOWN** Province **Ontario** Postal Code **K0J1G0**

UTM Coordinates Zone Easting Northing **18L3768575027411** Municipal Plan and Sublot Number Other

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	SAND	GRAVEL	FILL	0	3
BROWN	SAND	STONES & BOULDERS		3	9 1/2
GREY & WHITE	GRANITE			9 1/2	43
PINK	GRANITE	QUARTZITE		43	63
BLACK	GRANITE			63	171
WHITE	GRANITE	GREY GRANITE		171	180

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³)
0 to 10	BENTONITE SLURRY	0.128
10 to 20	CEMENT GROUT	0.150

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	24.47			
1	26.55	1	110.85	
2	28.16	2	109.29	
3	31.13	3	107.54	
4	31.88	4	106.03	
5	31.98	5	104.33	
10	37.96	10	98.86	
15	47.94	15	95.19	
20	57.46	20	91.56	
25	65.82	25	87.90	
30	73.84	30	85.78	
40	88.75	40	78.49	
50	102.42	50	72.69	
60	115.59	60	67.38	

After test of well yield, water was:
 Clear and sand free
 Other, specify **CLEARING**

If pumping discontinued, give reason:

Pump intake set at (m/ft): **170**

Pumping rate (l/min / GPM): **4**

Duration of pumping: **1** hrs + **0** min

Final water level end of pumping (m/ft): **115.59**

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

Recommended pump depth (m/ft): **170**

Recommended pump rate (l/min / GPM): **4**

Well production (l/min / GPM): **3**

Disinfected? Yes No

Method of Construction

<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input checked="" type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> 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)		Status of Well
			From	To	
6 1/4	STEEL	0.188	0	20	<input checked="" type="checkbox"/> Water Supply
6	OPEN HOLE		20	180	<input type="checkbox"/> Replacement Well

Status of 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

Water Details

Water found at Depth (m/ft)	Kind of Water:	Hole Diameter
32	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft): 20 to 180, Diameter (cm/in): 6
171	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	

Well Contractor and Well Technician Information

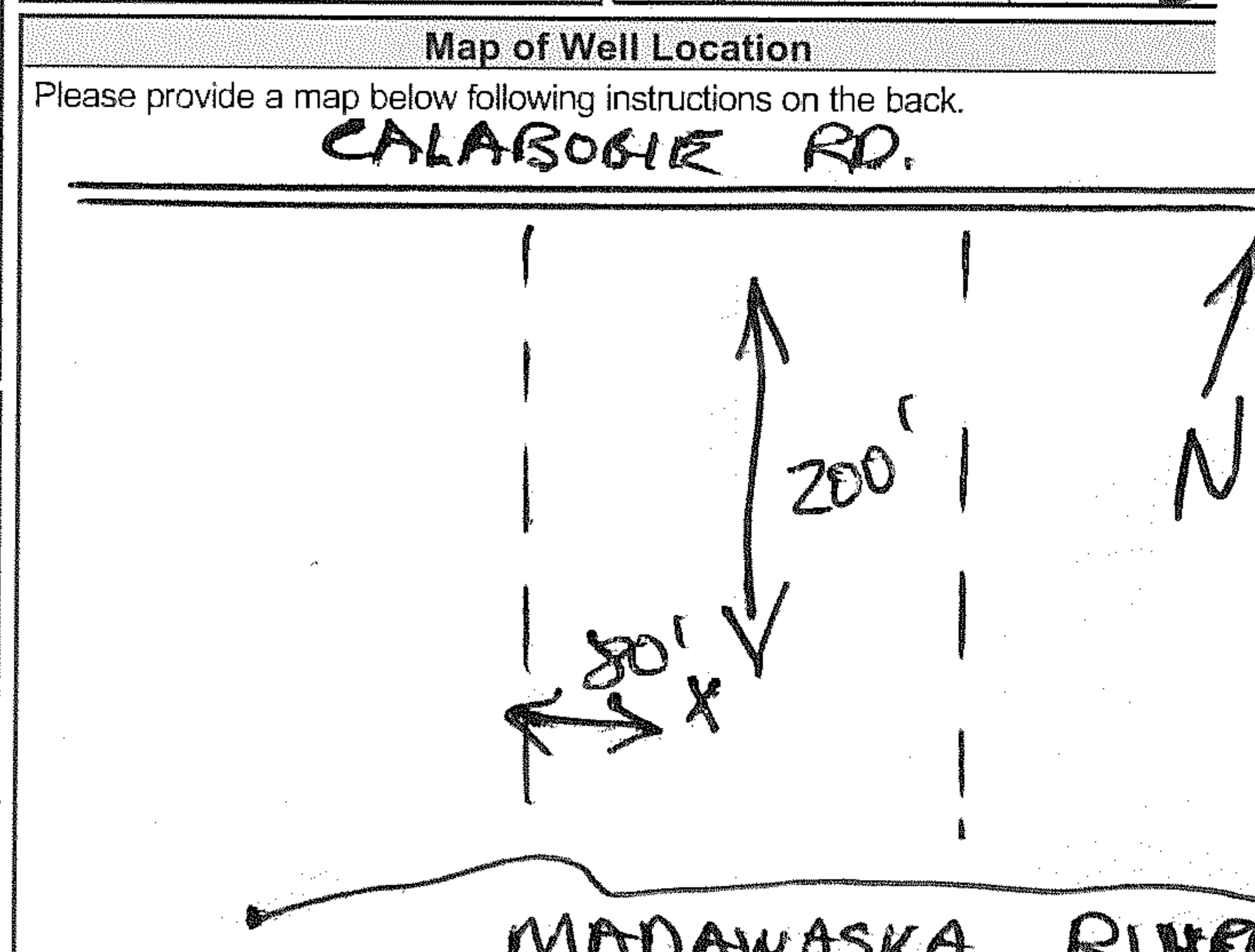
Business Name of Well Contractor: **SAUNDERS WELL DRILLING** Well Contractor's Licence No.: **4879**

Business Address (Street Number/Name): **RR#1** Municipality: **BRAESIDE**

Province: **ONT.** Postal Code: **K0A1G0** Business E-mail Address: _____

Bus. Telephone No. (inc. area code): **6136235648** Name of Well Technician (Last Name, First Name): **SAUNDERS TROY**

Well Technician's Licence No.: **T517** Signature of Technician and/or Contractor: **Troy Saunders** Date Submitted: **20130919**



Comments:

Well owner's information package delivered: Yes No

Date Package Delivered: **20130808**

Date Work Completed: **20130819**

Ministry Use Only

Audit No.: **Z1752A7**

Received: **AUG 29 2013**



W Tag#: A248924 Below
A248924

Measurements recorded in: Metric Imperial

Well Owner's Information

First Name: Last Name / Organization: KANSC Consulting Ltd. E-mail Address: Well Constructed by Well Owner

Mailing Address (Street Number/Name): 1716 Calabogie Rd. Municipality: Burnstown Province: Ont Postal Code: K0J1G0 Telephone No. (inc. area code): 613-761-9810

Well Location

Address of Well Location (Street Number/Name): 1716 Calabogie Rd. Township: McNab Lot: PTL717 4/8 Concession: 2

County/District/Municipality: Renfrew City/Town/Village: Burnstown Province: Ontario Postal Code: K0J1G0

UTM Coordinates: Zone: 18 Easting: 488500 Northing: 57327 Municipal Plan and Sublot Number: Other:

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

Table with 5 columns: General Colour, Most Common Material, Other Materials, General Description, Depth (m/ft) From To. Includes handwritten entries for brown hardpan and black/grey granite mix.

Annular Space table with columns: Depth Set at (m/ft) From To, Type of Sealant Used (Material and Type), Volume Placed (m³/ft³). Includes handwritten entry for Cement Grout.

Results of Well Yield Testing table with columns: Draw Down (Time, Water Level), Recovery (Time, Water Level). Includes handwritten data for pumping rate and draw down.

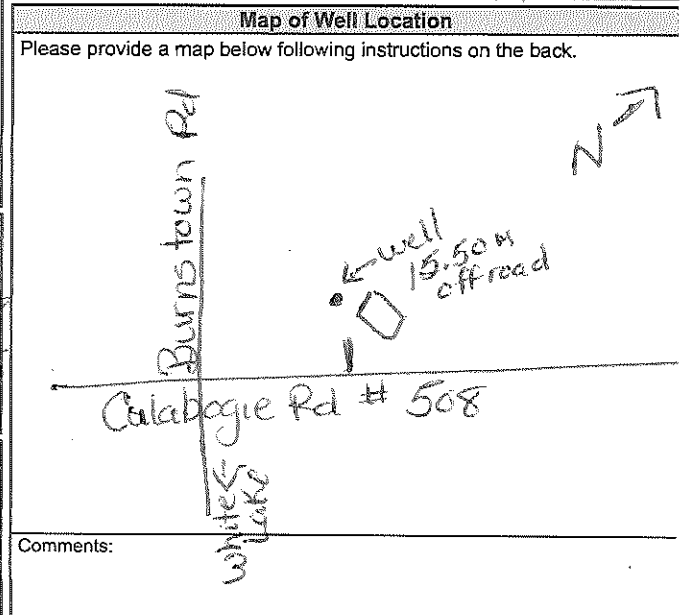
Method of Construction and Well Use table with checkboxes for Cable Tool, Rotary, Boring, etc., and Public, Commercial, Domestic, etc.

Construction Record - Casing table with columns: Inside Diameter (cm/in), Open Hole OR Material, Wall Thickness (cm/in), Depth (m/ft) From To, Status of Well.

Construction Record - Screen table with columns: Outside Diameter (cm/in), Material, Slot No., Depth (m/ft) From To.

Water Details and Hole Diameter table with columns: Water found at Depth, Kind of Water, Hole Diameter (Depth, Diameter).

Well Contractor and Well Technician Information table with fields for Business Name, Address, Licence No., Name of Well Technician, etc.



Well owner's information package delivered table with fields for Date Package Delivered, Date Work Completed, and Yes/No checkboxes.

Ministry Use Only table with fields for Audit No. (2288323), Date (SEP 14 2018), and Received.

Measurements recorded in: Metric Imperial

Tag #: A166329

Page 1 of 1

Address of Well Location (Street Number/Name): 1600 BURKSTOWN ROAD
 Township: McNAB/BRAESIDE Lot: 17 Concession: 2
 County/District/Municipality: RENFREW City/Town/Village: BURKSTOWN Province: Ontario Postal Code: _____
 UTM Coordinates Zone: Easting: 18 Northing: 376458027195 Municipal Plan and Sublot Number: _____ Other: _____

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	Depth (m/ft) To
GRAY/BROWN	SAND/GRAVEL	SPONS/ROCKERS		0.00	7.32
GRAY	TILL			7.32	14.19
BLACK	GRAVEL			14.19	31.16 (112')

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0.00	6.00	BENTONITE MUDPLUG CROUT.	

Results of Well Yield Testing

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	9.78			
1	9.80	1	17.52	
2	10.22	2	16.94	
3	10.58	3	16.98	
4	10.93	4	15.92	
5	11.22	5	15.48	
10	12.56	10	13.93	
15	13.57	15	13.10	
20	14.47	20	12.40	
25	15.28	25	11.86	
30	15.90	30	11.42	
40	16.96	40	10.57	
50	17.71	50	10.25	
60	18.13	60	10.02	

After test of well yield, water was:
 Clear and sand free
 Other, specify Clearing
 If pumping discontinued, give reason: N/A
 Pump intake set at (m/ft): 30.5m (100')
 Pumping rate (l/min / GPM): 11 lpm
 Duration of pumping: 1 hrs + 0 min
 Final water level end of pumping (m/ft): Bel 3m (59')
 If flowing give rate (l/min / GPM): N/A
 Recommended pump depth (m/ft): 29m (95')
 Recommended pump rate (l/min / GPM): 13 l (30 gpm)
 Well production (l/min / GPM): 13.7 lpm (30 gpm)
 Disinfected? Yes No

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial Other, specify _____
 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)		Status of Well
			From	To	
15.88	SPCL ASB	0.47	10.60	14.34	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
13.18	" "	0.47	14.03	20.74	

Construction Record - Screen N/A

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

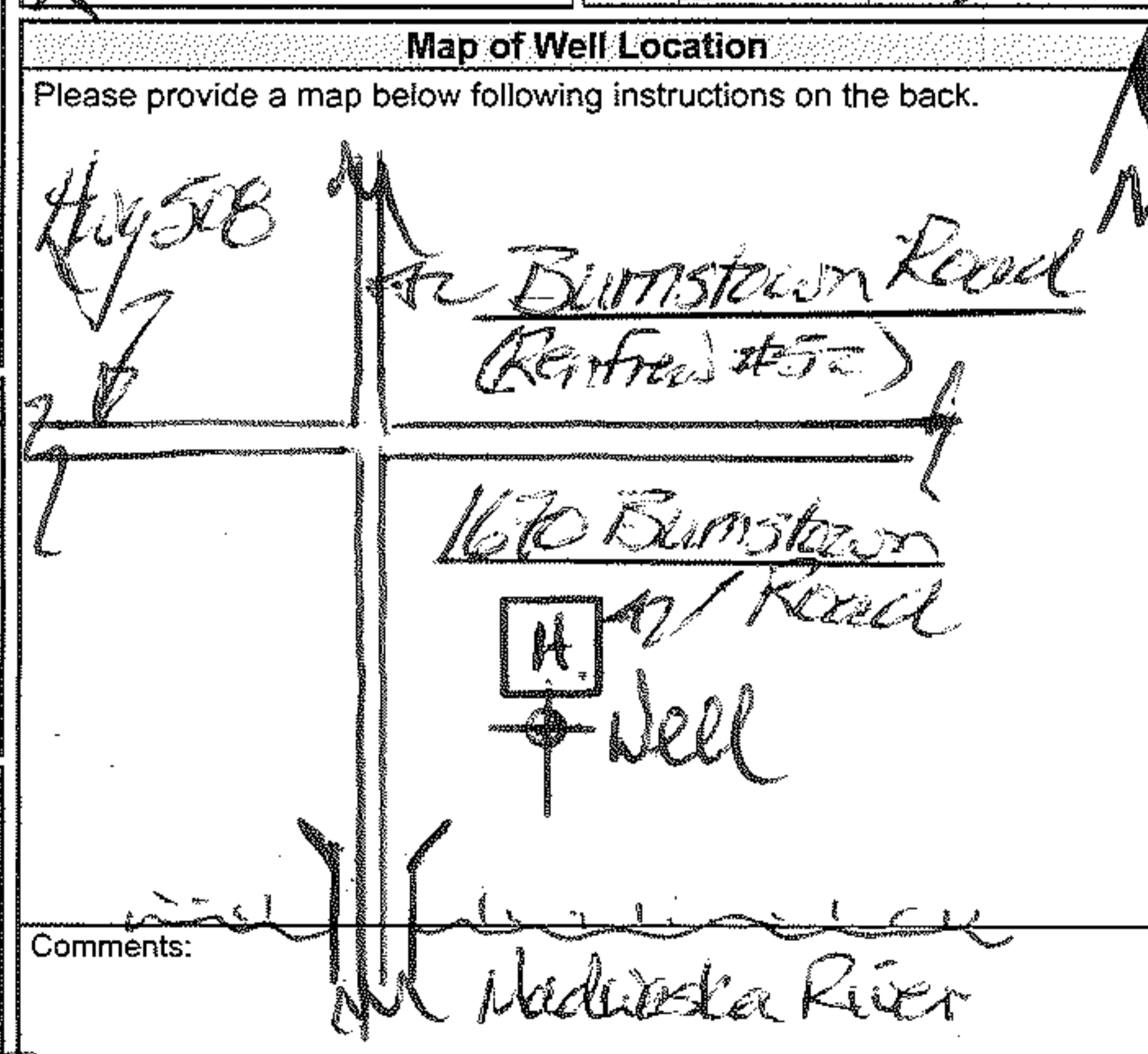
Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
26.9	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0.00	14.34	15.88
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	14.03	20.74	13.18
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	20.74	31.16	12.34

Well Contractor and Well Technician Information

Business Name of Well Contractor: STANTON DRILLING INC Well Contractor's Licence No.: 4875
 Business Address (Street Number/Name): 157 FIVE ARCHES DR. Municipality: PAKENHAM
 Province: ON Postal Code: K0A 2X0 Business E-mail Address: stanton.drilling@bell.net

Bus. Telephone No. (inc. area code): (416) 64-5622 Name of Well Technician (Last Name, First Name): STANTON, PETER
 Well Technician's Licence No.: 0086 Signature of Technician and/or Contractor: [Signature] Date Submitted: 20190307



Well owner's information package delivered: Yes No
 Date Package Delivered: 20190307
 Date Work Completed: 20190307
Ministry Use Only
 Audit No.: 2252127
MAR 08 2019
 Received: _____



Measurements recorded in: Metric Imperial

Tag#: A258174

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Well Location

Address of Well Location (Street Number/Name) 1645A Calabogie Rd Township McNab Lot Pt of 17 Concession 2

County/District/Municipality Renfrew City/Town/Village _____ Province Ontario Postal Code _____

UTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number Other

NAD | 8 | 3 | 18 | 376789 | 5027413

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
<u>brown</u>	<u>Sand + boulders</u>			<u>0</u>	<u>7'</u>
<u>black/gray</u>	<u>granite</u>			<u>7'</u>	<u>390'</u>

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
<u>0</u>	<u>20</u>	<u>Cement Grout</u>	<u>6.40</u>

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) 280

Pumping rate (l/min / GPM) 3

Duration of pumping 1 hrs + _____ min

Final water level end of pumping (m/ft) 97.6'

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

Recommended pump depth (m/ft) 375'

Recommended pump rate (l/min / GPM) 3

Well production (l/min / GPM) 3

Disinfected? Yes No

Time (min)	Draw Down		Recovery	
	Water Level (m/ft)	Time (min)	Water Level (m/ft)	Time (min)
Static Level	<u>33.6'</u>			
1	<u>35.6'</u>	1	<u>95.3'</u>	
2	<u>36.6'</u>	2	<u>93.3'</u>	
3	<u>37.3'</u>	3	<u>91.9'</u>	
4	<u>38.0'</u>	4	<u>91.1'</u>	
5	<u>38.7'</u>	5	<u>90.3'</u>	
10	<u>40.0'</u>	10	<u>86.5'</u>	
15	<u>40.8'</u>	15	<u>83.0'</u>	
20	<u>42.0'</u>	20	<u>80.1'</u>	
25	<u>49.6'</u>	25	<u>76.9'</u>	
30	<u>57.1'</u>	30	<u>74.0'</u>	
40	<u>71.6'</u>	40	<u>68.2'</u>	
50	<u>84.6'</u>	50	<u>62.4'</u>	
60	<u>97.6'</u>	60	<u>56.8'</u>	

Method of Construction

Cable Tool Diamond Public Commercial Not used

Rotary (Conventional) Jetting Domestic Municipal Dewatering

Rotary (Reverse) Driving Livestock Test Hole Monitoring

Boring Digging Irrigation Cooling & Air Conditioning

Air percussion 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)		Status of Well
			From	To	
<u>6.25</u>	<u>Steel</u>	<u>0.188" ± 2</u>		<u>20</u>	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		Status of Well
			From	To	
					<input type="checkbox"/> Other, specify _____

Water Details

Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft) From	To	Diameter (cm/in)
<u>380</u>	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	<u>0</u>	<u>20'</u>	<u>10"</u>
		<u>20'</u>	<u>390'</u>	<u>6"</u>

Well Contractor and Well Technician Information

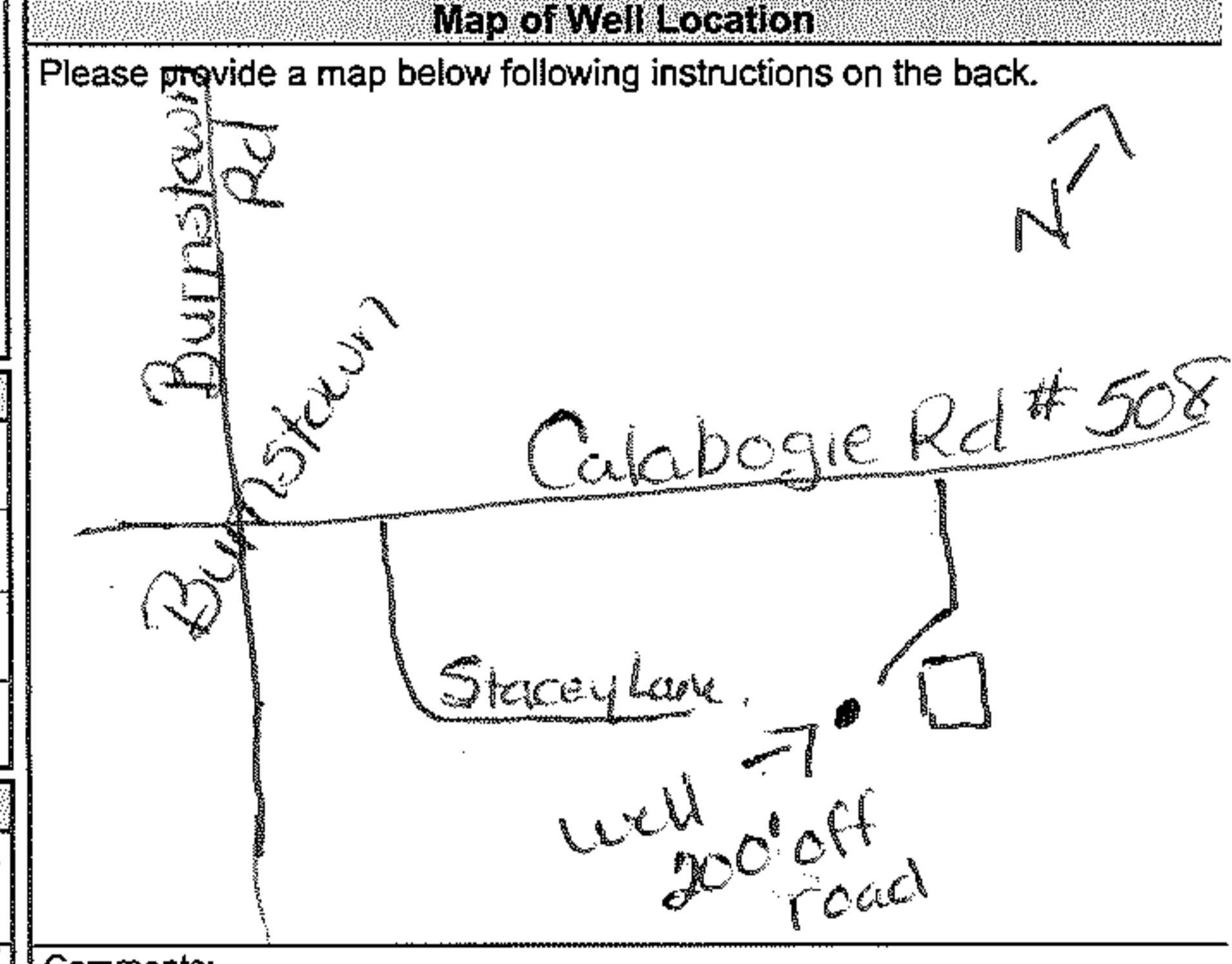
Business Name of Well Contractor George H. Law & Son Ltd Well Contractor's Licence No. 313 12 13

Business Address (Street Number/Name) 4848A Calabogie Rd, P.O. Box 155 Municipality Calabogie

Province ON Postal Code K0J1H0 Business E-mail Address _____

Bus. Telephone No. (inc. area code) 1413752000 Name of Well Technician (Last Name, First Name) Fougere Allan

Well Technician's Licence No. 014312 Signature of Technician and/or Contractor Allan Fougere Date Submitted 2019/07/26



Comments:

Well owner's information package delivered Yes No

Date Package Delivered 2019/07/19

Date Work Completed 2019/07/07

Ministry Use Only

Audit No. Z299166

JUL 26 2019

Received _____

APPENDIX 3

LABORATORY CERTIFICATE OF ANALYSIS

Client: Paterson Group
 154 Colonnade Rd South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15935
 Invoice to: Paterson Group

Report Number: 1502616
 Date Submitted: 2015-02-19
 Date Reported: 2015-02-22
 Project: PH2610
 COC #: 51110

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1160981 Water - 2015-02-19 TW1 WS1	1160982 Water - 2015-02-19 TW1 WS2
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0		0	0
	Total Coliforms	0	ct/100mL	MAC-0		0	0

Guideline = ODWSOG

*** = Guideline Exceedence**

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15935
 Invoice to: Paterson Group

Report Number: 1502618
 Date Submitted: 2015-02-20
 Date Reported: 2015-02-26
 Project: PH2610
 COC #: 51110

Group	Analyte	MRL	Units	Guideline	Lab I.D.	
					Sample Matrix	Sample Type
					1160986	1160987
					Water	Water
					2015-02-19	2015-02-19
					TW1 WS1	TW1 WS2
Calculations	Hardness as CaCO3	1	mg/L	OG-100	291*	294*
	Ion Balance	0.01			1.07	1.07
	TDS (COND - CALC)	1	mg/L	AO-500	341	348
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	238	244
	Cl	1	mg/L	AO-250	13	14
	Colour	2	TCU	AO-5	<2	<2
	Conductivity	5	uS/cm		525	535
	DOC	0.5	mg/L	AO-5	1.4	1.5
	F	0.10	mg/L	MAC-1.5	0.44	0.42
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	0.30	0.26
	pH	1.00		6.5-8.5	8.14	8.16
	S2-	0.01	mg/L	AO-0.05	<0.01	<0.01
	SO4	1	mg/L	AO-500	29	28
	Turbidity	0.1	NTU	AO-5.0	2.1	0.3
	Metals	Ca	1	mg/L		77
Fe		0.03	mg/L	AO-0.3	0.22	<0.03
K		1	mg/L		2	3
Mg		1	mg/L		24	24
Mn		0.01	mg/L	AO-0.05	<0.01	<0.01
Na		2	mg/L	AO-200	7	8
Nutrients	N-NH3	0.02	mg/L		<0.02	<0.02
	Phenols	0.001	mg/L		<0.001	<0.001
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1
	Total Kjeldahl Nitrogen	0.10	mg/L		0.11	<0.10

Guideline = ODWSOG * = **Guideline Exceedence**
 All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
 Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15936
 Invoice to: Paterson Group

Report Number: 1502949
 Date Submitted: 2015-02-25
 Date Reported: 2015-02-26
 Project: PH 2610
 COC #: 45783

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1161731	Water		2015-02-25	TW 2 SW 3
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	1161732	Water		2015-02-25	TW 2 SW 4
	Total Coliforms	0	ct/100mL	MAC-0					

Guideline = ODWSOG

*** = Guideline Exceedence**

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Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15940
 Invoice to: Paterson Group

Report Number: 1503737
 Date Submitted: 2015-03-11
 Date Reported: 2015-03-12
 Project: PH 2610
 COC #: 51116

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1163709	Water		2015-03-10	TW3 WS5
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	1163710	Water		2015-03-10	TW3 WS6
	Total Coliforms	0	ct/100mL	MAC-0					

Guideline = ODWSOG

*** = Guideline Exceedence**

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Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

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Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15940
 Invoice to: Paterson Group

Report Number: 1503739
 Date Submitted: 2015-03-10
 Date Reported: 2015-03-16
 Project: PH2610
 COC #: 51116

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.		
					1163714	Water		2015-03-10	TW3 WS5	1163715	Water
Calculations	Hardness as CaCO3	1	mg/L	OG-100						263*	265*
	Ion Balance	0.01								1.05	1.06
	TDS (COND - CALC)	1	mg/L	AO-500						296	302
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500						235	234
	Cl	1	mg/L	AO-250						2	2
	Colour	2	TCU	AO-5						<2	<2
	Conductivity	5	uS/cm							455	465
	DOC	0.5	mg/L	AO-5						1.8	1.4
	F	0.10	mg/L	MAC-1.5						0.99	1.08
	N-NO2	0.10	mg/L	MAC-1.0						<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0						<0.10	<0.10
	pH	1.00		6.5-8.5						8.14	8.15
	S2-	0.01	mg/L	AO-0.05						<0.01	<0.01
	SO4	1	mg/L	AO-500						16	17
	Turbidity	0.1	NTU	AO-5.0						0.9	0.4
Metals	Ca	1	mg/L							64	65
	Fe	0.03	mg/L	AO-0.3						<0.03	<0.03
	K	1	mg/L							2	2
	Mg	1	mg/L							25	25
	Mn	0.01	mg/L	AO-0.05						0.04	0.05
	Na	2	mg/L	AO-200						2	3
Nutrients	N-NH3	0.02	mg/L							<0.02	<0.02
	Phenols	0.001	mg/L							<0.001	<0.001
	Tannin & Lignin	0.1	mg/L							<0.1	<0.1
	Total Kjeldahl Nitrogen	0.10	mg/L							<0.10	<0.10

Guideline = ODWSOG * = **Guideline Exceedence**
 All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
 Results relate only to the parameters tested on the samples submitted.
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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15945
 Invoice to: Paterson Group

Report Number: 1504877
 Date Submitted: 2015-04-01
 Date Reported: 2015-04-02
 Project: PH2610
 COC #: 45785

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1166754	Water		2015-04-01	TW 4 WS 1
Microbiology	Escherichia Coli	0	ct/100mL	MAC-0	0				
	Total Coliforms	0	ct/100mL	MAC-0	0				

Guideline = ODWSOG

*** = Guideline Exceedence**

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Jamie Blakely
 PO#: 15945
 Invoice to: Paterson Group

Report Number: 1504878
 Date Submitted: 2015-04-01
 Date Reported: 2015-04-07
 Project: PH2610
 COC #: 45785

Group	Analyte	MRL	Units	Guideline	Lab I.D.	
					Sample Matrix	Sample Type
				1166756	1166757	
				Water	Water	
				2015-04-01	2015-04-01	
				TW 4 WS 1	TW 4 WS 2	
Calculations	Hardness as CaCO3	1	mg/L	OG-100	179*	198*
	Ion Balance	0.01			1.10	1.03
	TDS (COND - CALC)	1	mg/L	AO-500	207	228
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG-500	151	179
	Cl	1	mg/L	AO-250	5	4
	Colour	2	TCU	AO-5	2	<2
	Conductivity	5	uS/cm		319	350
	DOC	0.5	mg/L	AO-5	1.4	1.3
	F	0.10	mg/L	MAC-1.5	<0.10	0.13
	N-NO2	0.10	mg/L	MAC-1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC-10.0	<0.10	<0.10
	pH	1.00		6.5-8.5	8.13	8.20
	S2-	0.01	mg/L	AO-0.05		<0.01
		0.10	mg/L	AO-0.05	<0.10	
	SO4	1	mg/L	AO-500	12	14
	Turbidity	0.1	NTU	AO-5.0	>100	11.7*
Metals	Ca	1	mg/L		52	58
	Fe	0.03	mg/L	AO-0.3	3.10*	0.62*
	K	1	mg/L		1	1
	Mg	1	mg/L		12	13
	Mn	0.01	mg/L	AO-0.05	0.12*	0.02
	Na	2	mg/L	AO-200	3	3
Nutrients	N-NH3	0.02	mg/L		<0.02	<0.02
	Phenols	0.001	mg/L		0.003	0.003
	Tannin & Lignin	0.1	mg/L		0.6	0.1
	Total Kjeldahl Nitrogen	0.10	mg/L		<0.10	<0.10

Guideline = ODWSOG * = **Guideline Exceedence**
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Client: Paterson Group
 9 AURIGA DRIVE
 Ottawa, ON
 K2E 7T9
 Attention: Mr. Jeremy Milsom
 PO#: 58133
 Invoice to: Paterson Group

Report Number: 3000399
 Date Submitted: 2023-08-15
 Date Reported: 2023-08-21
 Project: PH4748
 COC #: 909903

Lab I.D.
 Sample Matrix
 Sample Type
 Sampling Date
 Sample I.D.

1699522
 GW
 2023-08-15
 TW 4 WS 3

Group	Analyte	MRL	Units	Guideline	
Anions	Cl	1	mg/L	AO 250	23
	F	0.10	mg/L	MAC 1.5	0.11
	N-NO2	0.10	mg/L	MAC 1.0	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	0.30
	SO4	1	mg/L	AO 500	45
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	237
	Colour (Apparent)	2	TCU	AO 5	12*
	Conductivity	5	uS/cm		559
	DOC	0.5	mg/L	AO 5	2.0
	pH	1.00		6.5-8.5	7.68
	Phenols	0.001	mg/L		<0.001
	S2-	0.01	mg/L	AO 0.05	<0.01
	TDS (COND - CALC)	1	mg/L	AO 500	363
Turbidity	0.1	NTU	AO 5	3.6	
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100	279*
Indices/Calc	Ion Balance	0.01			0.97
Metals	Ag	0.0001	mg/L		<0.0001
	Al	0.01	mg/L	OG 0.1	0.02
	As	0.001	mg/L	IMAC 0.01	<0.001
	B	0.01	mg/L	IMAC 5.0	0.04
	Ba	0.01	mg/L	MAC 1.0	0.04
	Be	0.0005	mg/L		<0.0005
	Ca	1	mg/L		82
	Cd	0.0001	mg/L	MAC 0.005	<0.0001
	Co	0.0002	mg/L		0.0005

Guideline = ODWSOG

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 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Paterson Group
 9 AURIGA DRIVE
 Ottawa, ON
 K2E 7T9
 Attention: Mr. Jeremy Milsom
 PO#: 58133
 Invoice to: Paterson Group

Report Number: 3000399
 Date Submitted: 2023-08-15
 Date Reported: 2023-08-21
 Project: PH4748
 COC #: 909903

Lab I.D. 1699522
 Sample Matrix GW
 Sample Type
 Sampling Date 2023-08-15
 Sample I.D. TW 4 WS 3

Group	Analyte	MRL	Units	Guideline	
Metals	Cr	0.001	mg/L	MAC 0.05	<0.001
	Cu	0.001	mg/L	AO 1	0.015
	Fe	0.03	mg/L	AO 0.3	1.37*
	Hg	0.0001	mg/L	MAC 0.001	<0.0001
	K	1	mg/L		<1
	Mg	1	mg/L		18
	Mn	0.01	mg/L	AO 0.05	0.05
	Mo	0.005	mg/L		<0.005
	Na	1	mg/L	AO 200	13
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	0.0006
	Se	0.001	mg/L	MAC 0.05	<0.001
	Sr	0.001	mg/L		0.796
	Tl	0.0001	mg/L		<0.0001
	U	0.001	mg/L	MAC 0.02	0.002
	V	0.001	mg/L		<0.001
Zn	0.01	mg/L	AO 5	0.03	
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0
	Total Coliforms	0	ct/100mL	MAC 0	0
Nutrients	N-NH3	0.020	mg/L		0.035
	Total Kjeldahl Nitrogen	0.100	mg/L		0.276
Subcontract-Inorg	Tannin & Lignin	0.5	mg/L		<0.5

Guideline = ODWSOG

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 Methods references and/or additional QA/QC information available on request.

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Certificate of Analysis

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Erik Ardley
 PO#: 30102
 Invoice to: Paterson Group

Report Number: 1937749
 Date Submitted: 2020-09-01
 Date Reported: 2020-09-02
 Project: PH4098
 COC #: 862183

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1513903	GW		2020-08-31	TW5-GW1
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0				0
	Total Coliforms	0	ct/100mL	MAC 0	0				0

Guideline = ODWSOG

*** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.

Analytical Method: AMBCOLM1

additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Paterson Group
 154 Colonnade Rd. South
 Nepean, ON
 K2E 7T7
 Attention: Mr. Erik Ardley
 PO#: 30102
 Invoice to: Paterson Group

Report Number: 1937774
 Date Submitted: 2020-09-01
 Date Reported: 2020-09-11
 Project: PH4098
 COC #: 862183

Group	Analyte	MRL	Units	Guideline	1513973 GW 2020-08-31 TW5-GW1	1513974 GW 2020-08-31 TW5-GW2
Anions	Cl	1	mg/L	AO 250	3	3
	F	0.10	mg/L	MAC 1.5	0.22	0.32
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	0.21	0.20
	SO4	1	mg/L	AO 500	26	26
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 500	197	209
	Colour	2	TCU		<2	<2
	Conductivity	5	uS/cm		416	417
	DOC	0.5	mg/L	AO 5	1.0	1.0
	pH	1.00		6.5-8.5	8.17	8.20
	S2-	0.01	mg/L	AO 0.05	<0.01	<0.01
	TDS	10	mg/L	AO 500	240	240
	Turbidity	0.1	NTU	AO 5.0	1.8	0.3
Hardness	Hardness as CaCO3	1	mg/L	OG 100	221*	223*
Indices/Calc	Ion Balance	0.01			1.02	0.98
Metals	Ca	1	mg/L		62	63
	Fe	0.03	mg/L	AO 0.3	0.11	<0.03
	K	1	mg/L		3	3
	Mg	1	mg/L		16	16
	Mn	0.01	mg/L	AO 0.05	<0.01	<0.01
	Na	2	mg/L	AO 200	4	4
Subcontract-Inorg	N-NH3	0.01	mg/L		0.09	0.08
	Phenols	0.001	mg/L		<0.001	<0.001
	Tannin & Lignin	0.1	mg/L		<0.1	<0.1
	Total Kjeldahl Nitrogen	0.1	mg/L		0.1	<0.1

Guideline = ODWSOG

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Paterson Group
 9 AURIGA DRIVE
 Ottawa, ON
 K2E 7T9
 Attention: Mr. Jeremy Milsom
 PO#: 58128
 Invoice to: Paterson Group

Report Number: 3000398
 Date Submitted: 2023-08-15
 Date Reported: 2023-08-21
 Project: PH4748
 COC #: 909902

Lab I.D. 1699521
 Sample Matrix GW
 Sample Type
 Sampling Date 2023-08-15
 Sample I.D. TW5-GW3

Group	Analyte	MRL	Units	Guideline	
Anions	Cl	1	mg/L	AO 250	4
	F	0.10	mg/L	MAC 1.5	0.32
	N-NO2	0.10	mg/L	MAC 1.0	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10
	SO4	1	mg/L	AO 500	29
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	222
	Colour (Apparent)	2	TCU	AO 5	<2
	Conductivity	5	uS/cm		441
	DOC	0.5	mg/L	AO 5	1.4
	pH	1.00		6.5-8.5	7.93
	Phenols	0.001	mg/L		<0.001
	S2-	0.01	mg/L	AO 0.05	<0.01
	TDS (COND - CALC)	1	mg/L	AO 500	287
Turbidity	0.1	NTU	AO 5	0.4	
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100	237*
Indices/Calc	Ion Balance	0.01			0.95
Metals	Ag	0.0001	mg/L		<0.0001
	Al	0.01	mg/L	OG 0.1	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001
	B	0.01	mg/L	IMAC 5.0	0.01
	Ba	0.01	mg/L	MAC 1.0	0.09
	Be	0.0005	mg/L		<0.0005
	Ca	1	mg/L		67
	Cd	0.0001	mg/L	MAC 0.005	<0.0001
	Co	0.0002	mg/L		<0.0002

Guideline = ODWSOG

* = Guideline Exceedence

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

Client: Paterson Group
 9 AURIGA DRIVE
 Ottawa, ON
 K2E 7T9
 Attention: Mr. Jeremy Milsom
 PO#: 58128
 Invoice to: Paterson Group

Report Number: 3000398
 Date Submitted: 2023-08-15
 Date Reported: 2023-08-21
 Project: PH4748
 COC #: 909902

Lab I.D. 1699521
 Sample Matrix GW
 Sample Type
 Sampling Date 2023-08-15
 Sample I.D. TW5-GW3

Group	Analyte	MRL	Units	Guideline	
Metals	Cr	0.001	mg/L	MAC 0.05	<0.001
	Cu	0.001	mg/L	AO 1	0.004
	Fe	0.03	mg/L	AO 0.3	<0.03
	Hg	0.0001	mg/L	MAC 0.001	<0.0001
	K	1	mg/L		2
	Mg	1	mg/L		17
	Mn	0.01	mg/L	AO 0.05	<0.01
	Mo	0.005	mg/L		<0.005
	Na	1	mg/L	AO 200	3
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	0.0011
	Se	0.001	mg/L	MAC 0.05	<0.001
	Sr	0.001	mg/L		0.303
	Tl	0.0001	mg/L		<0.0001
	U	0.001	mg/L	MAC 0.02	0.001
	V	0.001	mg/L		<0.001
Zn	0.01	mg/L	AO 5	<0.01	
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0
	Total Coliforms	0	ct/100mL	MAC 0	0
Nutrients	N-NH3	0.020	mg/L		<0.020
	Total Kjeldahl Nitrogen	0.100	mg/L		0.133
Subcontract-Inorg	Tannin & Lignin	0.5	mg/L		<0.5

Guideline = ODWSOG

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Paterson Group
 9 Auriga Dr
 Nepean, ON
 K2E 7T9
 Attention: Mr. Alex Schopf
 PO#: 57543
 Invoice to: Paterson Group

Report Number: 1997248
 Date Submitted: 2023-05-19
 Date Reported: 2023-05-25
 Project: PH4748
 COC #: 907994

Lab I.D. 1687807
 Sample Matrix GW
 Sample Type
 Sampling Date 2023-05-18
 Sample I.D. TP1-23 GW1

Group	Analyte	MRL	Units	Guideline	
Nutrients	N-NH3	0.020	mg/L		0.143
	Organic Nitrogen	0.08	mg/L	OG 0.15	0.12
	Total Kjeldahl Nitrogen	0.100	mg/L		0.264
Others	N-NO2	0.10	mg/L	MAC 1.0	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10

Guideline = ODWSOG

*** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

APPENDIX 4

**AQUIFER ANALYSIS DATA FOR TEST WELLS
DETERMINATION OF POTENTIAL WELL INTERFERENCE WORKSHEET
PREDICTIVE IMPACT ASSESSMENT FOR NITRATES
WATER BUDGET MEAN – 75 MM**

Paterson Group Inc. 154 Colonnade Road South Ottawa, Ontario K2E 7J5	Pumping Test - Water Level Data		Page 1 of 1
	Project: Braeburn Estates		
	Number: PH2610		
	Client: KDSA Developments		

Location: Burnstown, ON	Pumping Test: TW 1	Pumping Well: TW 1
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Test Conducted by:	Test Date: 2/19/2015	Discharge: variable, average rate 1.2207 [l/s]
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Observation Well: TW 1	Static Water Level [m]: 15.84	Radial Distance to PW [m]: -
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	Time [min]	Water Level [m]	Drawdown [m]
1	0	15.84	0.00
2	1	17.60	1.76
3	2	17.79	1.95
4	3	17.84	2.00
5	4	17.87	2.03
6	5	17.90	2.06
7	6	17.92	2.08
8	7	17.92	2.08
9	8	17.93	2.09
10	9	17.94	2.10
11	30	18.06	2.22
12	34	18.50	2.66
13	35	18.67	2.83
14	38	18.83	2.99
15	40	18.87	3.03
16	45	18.93	3.09
17	50	18.97	3.13
18	60	19.03	3.19
19	70	19.09	3.25
20	80	19.16	3.32
21	90	19.47	3.63
22	120	19.73	3.89
23	180	19.84	4.00
24	210	19.98	4.14
25	240	20.08	4.24
26	270	20.16	4.32
27	300	20.26	4.42
28	330	20.35	4.51
29	360	20.46	4.62
30	382	20.52	4.68
31	383	18.00	2.16
32	385	17.77	1.93
33	387	17.71	1.87
34	388	17.68	1.84
35	389	17.65	1.81
36	390	17.63	1.79
37	391	17.62	1.78
38	392	17.60	1.76
39	402	17.48	1.64
40	412	17.38	1.54
41	422	17.30	1.46
42	452	17.05	1.21
43	482	16.90	1.06
44	502	16.79	0.95
45	532	16.65	0.81

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Discharge Data

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 1

Pumping Well: TW 1

Test Conducted by:

Test Date: 2/19/2015

Discharge: variable, average rate 1.2207 [l/s]

Observation Well: TW 1

Radial Distance to PW [m]: -

	Time [min]	Discharge [l/s]
1	0	0.76
2	30	0.76
3	30.1	1.26
4	382	1.26
5	382.1	0.00
6	422	0.00

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 1

Pumping Well: TW 1

Test Conducted by:

Test Date: 2/19/2015

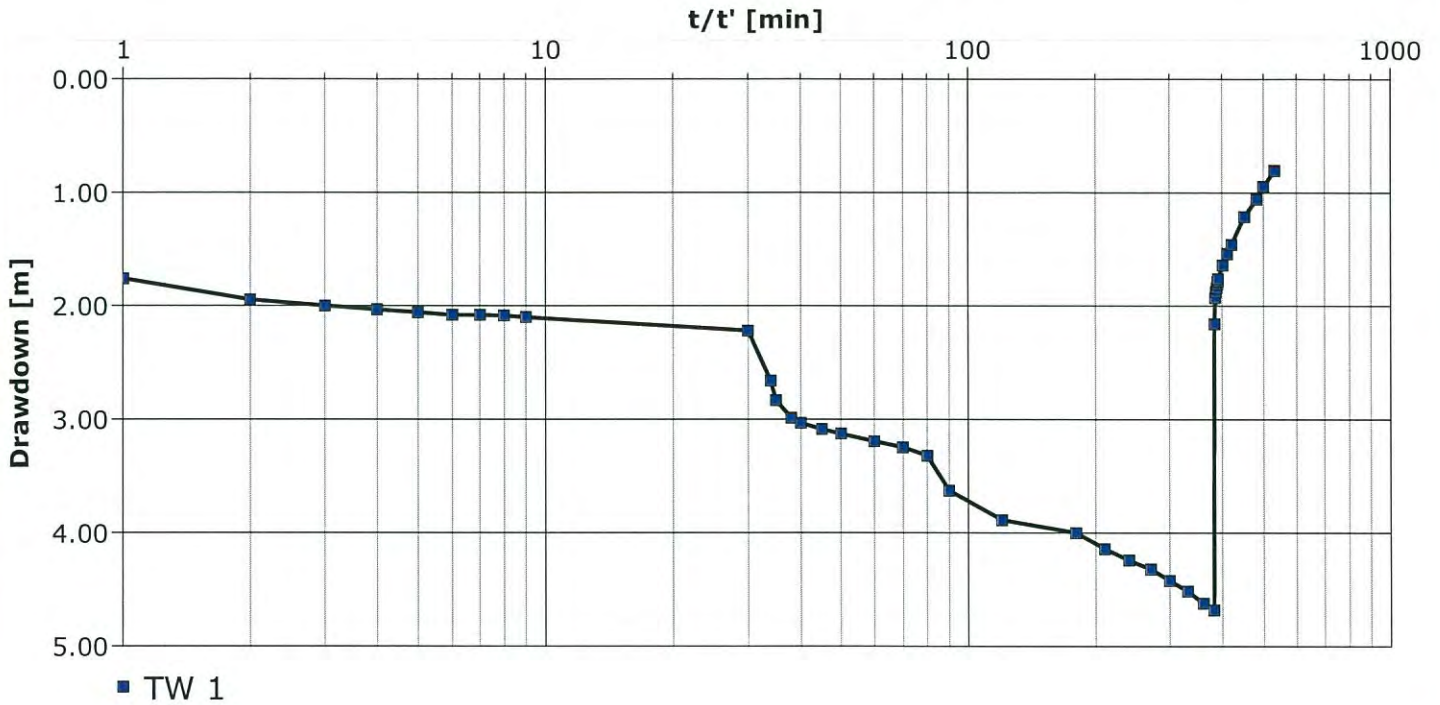
Analysis Performed by: SW

TW 1

Analysis Date: 6/10/2015

Aquifer Thickness:

Discharge: variable, average rate 1.2207 [l/s]



Paterson Group Inc.
 154 Colonnade Road South
 Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 1

Pumping Well: TW 1

Test Conducted by:

Test Date: 2/19/2015

Aquifer Thickness: 33.55 m

Discharge: variable, average rate 1.2207 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	TW 1	SW	6/10/2015	Theis	TW 1	1.44 × 10 ²	4.29 × 10 ⁰	1.58 × 10 ⁻¹⁸

Paterson Group Inc. 154 Colonnade Road South Ottawa, Ontario K2E 7J5	Pumping Test Analysis Report		
	Project: Braeburn Estates		
	Number: PH2610		
	Client: KDSA Developments		

Location: Burnstown, ON	Pumping Test: TW 1	Pumping Well: TW 1
-------------------------	--------------------	--------------------

Test Conducted by:	Test Date: 2/19/2015
--------------------	----------------------

Aquifer Thickness: 33.55 m	Discharge: variable, average rate 1.2207 [l/s]
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	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	TW 1	SW	6/10/2015	Theis Recovery	TW 1	3.03 × 10 ¹	9.04 × 10 ⁻¹	

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Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Water Level Data

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 2

Pumping Well: TW 2

Test Conducted by: AO

Test Date: 2/25/2015

Discharge: variable, average rate 0.61 [l/s]

Observation Well: TW 2

Static Water Level [m]: 4.25

Radial Distance to PW [m]: -

	Time [min]	Water Level [m]	Drawdown [m]
1	0	4.25	0.00
2	1	5.52	1.27
3	2	6.65	2.40
4	3	7.31	3.06
5	4	7.81	3.56
6	5	8.36	4.11
7	6	8.71	4.46
8	7	8.91	4.66
9	8	9.07	4.82
10	9	9.22	4.97
11	10	9.31	5.06
12	15	9.44	5.19
13	20	9.62	5.37
14	25	9.67	5.42
15	30	9.72	5.47
16	40	9.78	5.53
17	50	9.86	5.61
18	60	9.91	5.66
19	75	9.95	5.70
20	90	9.99	5.74
21	120	10.10	5.85
22	150	10.21	5.96
23	180	10.31	6.06
24	210	10.40	6.15
25	240	10.46	6.21
26	270	10.55	6.30
27	300	10.63	6.38
28	330	10.69	6.44
29	360	10.79	6.54
30	360.1	10.79	6.54
31	363	8.09	3.84
32	368	6.86	2.61
33	370	6.34	2.09
34	375	6.13	1.88
35	380	5.81	1.56
36	400	5.42	1.17
37	420	5.24	0.99
38	450	4.99	0.74
39	480	4.77	0.52
40	510	4.52	0.27

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Discharge Data

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 2

Pumping Well: TW 2

Test Conducted by: AO

Test Date: 2/25/2015

Discharge: variable, average rate 0.61 [l/s]

Observation Well: TW 2

Radial Distance to PW [m]: -

	Time [min]	Discharge [l/s]
1	0	0.61
2	360	0.61
3	360.1	0.00
4	480	0.00

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 2

Pumping Well: TW 2

Test Conducted by: AO

Test Date: 2/25/2015

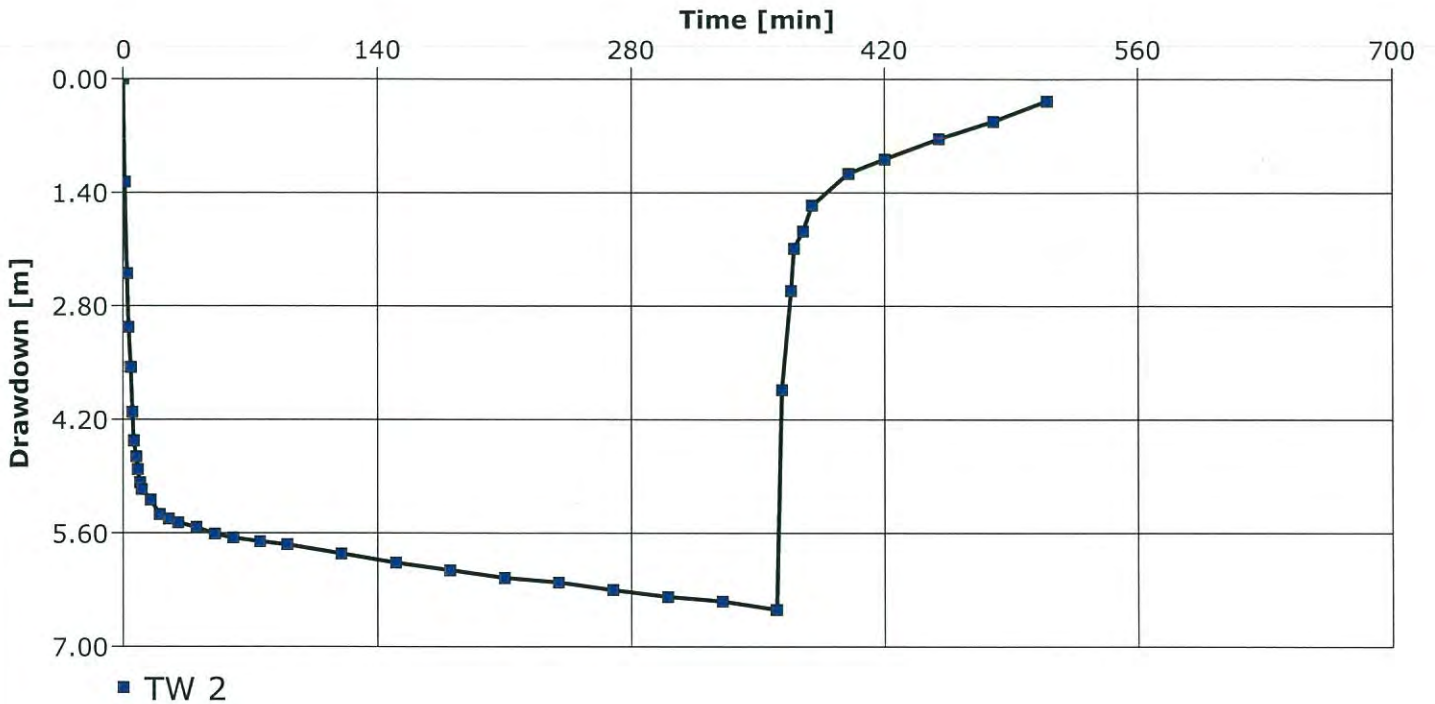
Analysis Performed by: SW

TW 2

Analysis Date: 6/10/2015

Aquifer Thickness: 2.00 m

Discharge: variable, average rate 0.61 [l/s]



Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 2

Pumping Well: TW 2

Test Conducted by: AO

Test Date: 2/25/2015

Aquifer Thickness: 2.00 m

Discharge: variable, average rate 0.61 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	TW 2	SW	6/10/2015	Theis Recovery	TW 2	4.64×10^0	2.32×10^0	

Paterson Group Inc. 154 Colonnade Road South Ottawa, Ontario K2E 7J5	Pumping Test Analysis Report		
	Project: Braeburn Estates		
	Number: PH2610		
	Client: KDSA Developments		

Location: Burnstown, ON	Pumping Test: TW 2	Pumping Well: TW 2
-------------------------	--------------------	--------------------

Test Conducted by: AO	Test Date: 2/25/2015
-----------------------	----------------------

Aquifer Thickness: 2.00 m	Discharge: variable, average rate 0.61 [l/s]
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	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	TW 2	SW	6/10/2015	Theis	TW 2	5.42 × 10 ²	2.71 × 10 ²	1.59 × 10 ⁻³¹⁵

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Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Water Level Data

Project: Braeburn Estates

Number: PH8610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 3

Pumping Well: TW 3

Test Conducted by: AO

Test Date: 3/10/2015

Discharge: variable, average rate 0.3 [l/s]

Observation Well: TW 3

Static Water Level [m]: 8.28

Radial Distance to PW [m]: -

	Time [min]	Water Level [m]	Drawdown [m]
1	0	8.28	0.00
2	1	9.90	1.62
3	2	10.60	2.32
4	3	11.17	2.89
5	4	11.54	3.26
6	5	12.06	3.78
7	6	12.37	4.09
8	7	12.69	4.41
9	8	13.03	4.75
10	9	13.38	5.10
11	10	13.74	5.46
12	15	14.17	5.89
13	20	14.71	6.43
14	30	16.08	7.80
15	40	16.36	8.08
16	50	17.70	9.42
17	60	19.30	11.02
18	75	19.65	11.37
19	90	20.90	12.62
20	120	22.00	13.72
21	150	23.22	14.94
22	180	24.18	15.90
23	210	24.89	16.61
24	240	25.49	17.21
25	270	25.89	17.61
26	300	26.23	17.95
27	330	26.41	18.13
28	360	26.59	18.31
29	360.1	26.59	18.31
30	363	24.13	15.85
31	364	24.00	15.72
32	367	23.50	15.22
33	369	22.96	14.68
34	370	22.50	14.22
35	375	21.68	13.40
36	380	20.75	12.47
37	385	20.17	11.89
38	390	19.10	10.82
39	420	17.93	9.65
40	450	16.70	8.42
41	480	15.90	7.62
42	540	13.50	5.22
43	600	11.20	2.92

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Discharge Data

Project: Braeburn Estates

Number: PH8610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 3

Pumping Well: TW 3

Test Conducted by: AO

Test Date: 3/10/2015

Discharge: variable, average rate 0.3 [l/s]

Observation Well: TW 3

Radial Distance to PW [m]: -

	Time [min]	Discharge [l/s]
1	0	0.30
2	360	0.30
3	360.1	0.00
4	480	0.00

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH8610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 3

Pumping Well: TW 3

Test Conducted by: AO

Test Date: 3/10/2015

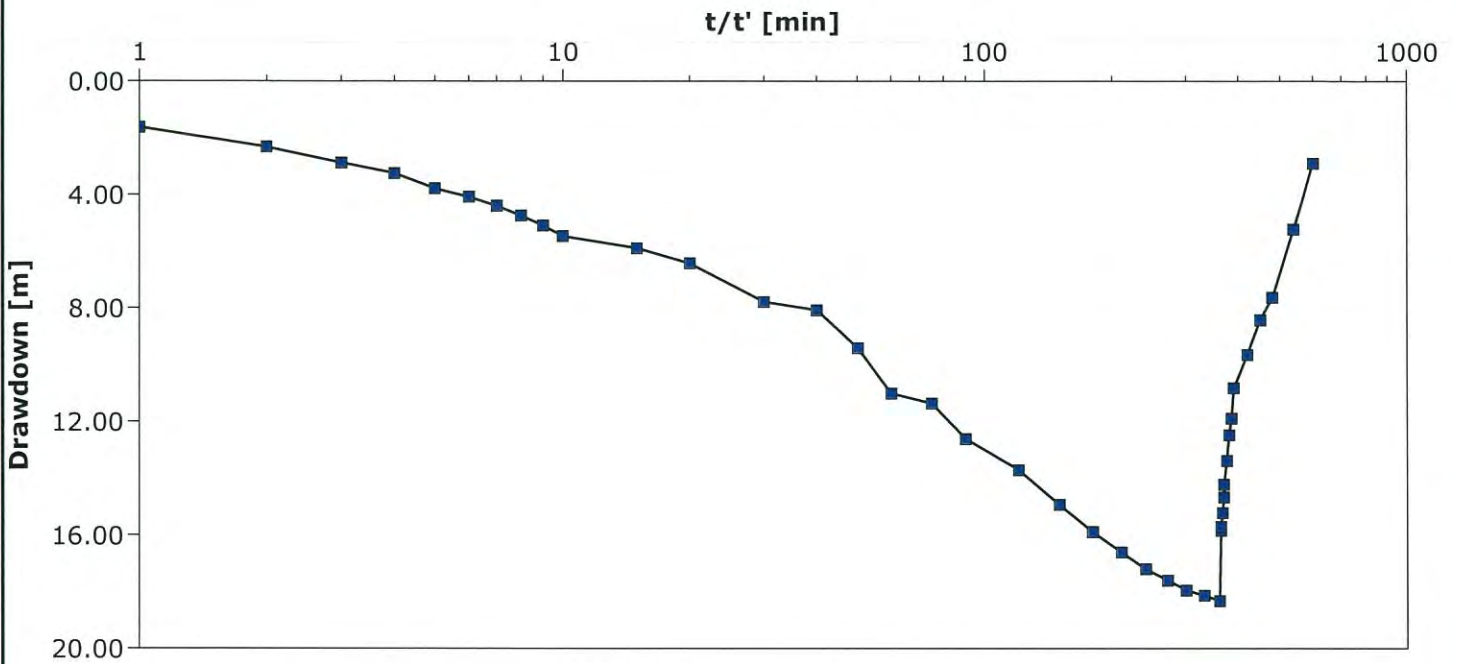
Analysis Performed by: SW

New analysis 1

Analysis Date: 5/12/2015

Aquifer Thickness: 39.39 m

Discharge: variable, average rate 0.3 [l/s]



Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH8610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 3

Pumping Well: TW 3

Test Conducted by: AO

Test Date: 3/10/2015

Aquifer Thickness: 39.39 m

Discharge: variable, average rate 0.3 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	New analysis 1		7/14/2015	Theis	TW 3	7.27×10^{-1}	1.85×10^{-2}	1.22×10^{-1}

Paterson Group Inc.
 154 Colonnade Road South
 Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH8610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 3

Pumping Well: TW 3

Test Conducted by: AO

Test Date: 3/10/2015

Aquifer Thickness: 39.39 m

Discharge: variable, average rate 0.3 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	New analysis 1	SW	5/12/2015	Theis Recovery	TW 3	9.92×10^{-1}	2.52×10^{-2}	

Paterson Group Inc.
 154 Colonnade Road South
 Ottawa, Ontario K2E 7J5

Pumping Test - Water Level Data

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 4

Pumping Well: TW 4

Test Conducted by: AO

Test Date: 4/1/2015

Discharge: variable, average rate 0.25 [l/s]

Observation Well: TW 4

Static Water Level [m]: 2.90

Radial Distance to PW [m]: -

	Time [min]	Water Level [m]	Drawdown [m]
1	0	2.90	0.00
2	1	3.90	1.00
3	2	4.23	1.33
4	3	4.54	1.64
5	4	4.97	2.07
6	5	5.26	2.36
7	7	5.59	2.69
8	8	5.84	2.94
9	9	5.97	3.07
10	10	6.07	3.17
11	15	6.46	3.56
12	20	7.68	4.78
13	25	8.45	5.55
14	30	9.59	6.69
15	40	11.68	8.78
16	50	13.75	10.85
17	60	15.90	13.00
18	75	19.29	16.39
19	90	22.07	19.17
20	120	27.45	24.55
21	150	32.55	29.65
22	180	36.79	33.89
23	210	40.40	37.50
24	240	44.09	41.19
25	270	46.85	43.95
26	300	48.52	45.62
27	330	49.57	46.67
28	360	50.68	47.78
29	360.1	50.68	47.78
30	361	31.80	28.90
31	365	27.82	24.92
32	369	26.36	23.46
33	375	24.38	21.48
34	380	21.12	18.22
35	410	7.89	4.99
36	420	4.49	1.59

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test - Discharge Data

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 4

Pumping Well: TW 4

Test Conducted by: AO

Test Date: 4/1/2015

Discharge: variable, average rate 0.25 [l/s]

Observation Well: TW 4

Radial Distance to PW [m]: -

	Time [min]	Discharge [l/s]
1	0	0.25
2	360	0.25
3	360.1	0.00
4	480	0.00

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 4

Pumping Well: TW 4

Test Conducted by: AO

Test Date: 4/1/2015

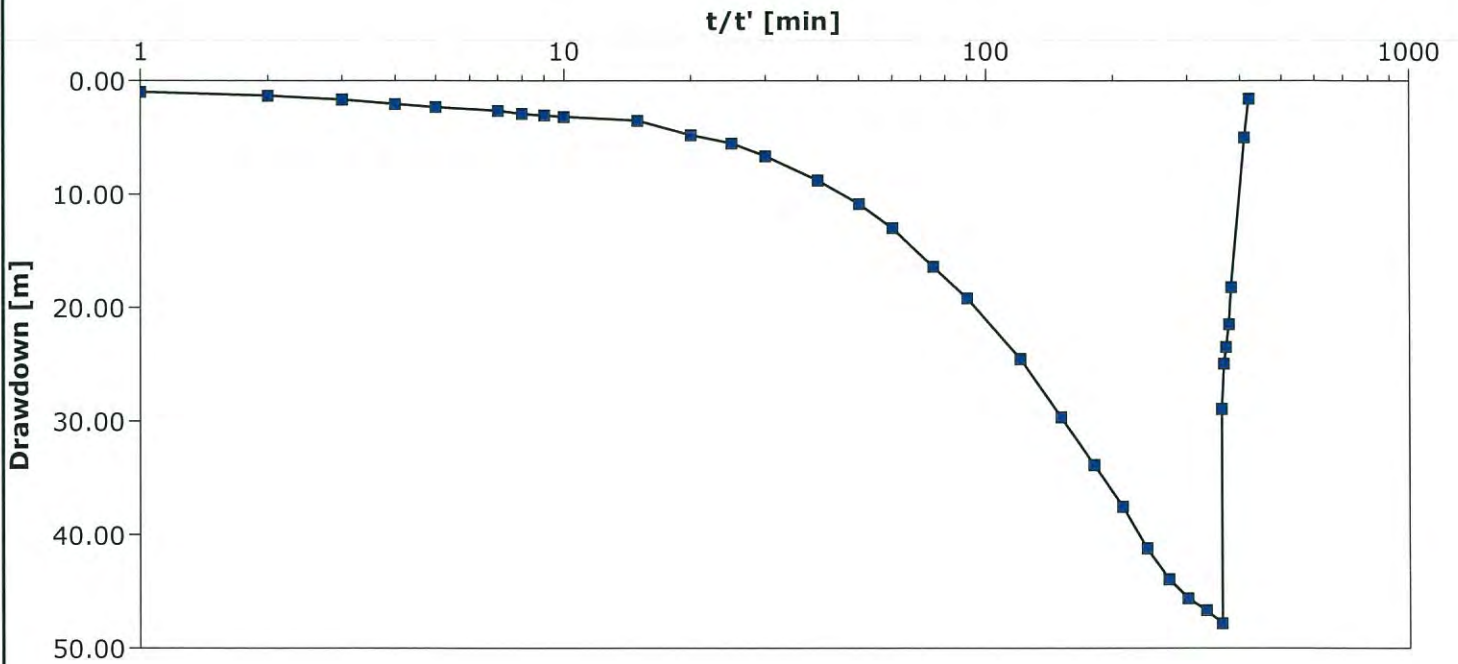
Analysis Performed by:

New analysis 1

Analysis Date: 7/10/2015

Aquifer Thickness: 73.15 m

Discharge: variable, average rate 0.25 [l/s]



Paterson Group Inc.
 154 Colonnade Road South
 Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 4

Pumping Well: TW 4

Test Conducted by: AO

Test Date: 4/1/2015

Aquifer Thickness: 73.15 m

Discharge: variable, average rate 0.25 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	New analysis 1		7/10/2015	Theis	TW 4	1.43×10^{-1}	1.96×10^{-3}	4.49×10^{-1}

Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario K2E 7J5

Pumping Test Analysis Report

Project: Braeburn Estates

Number: PH2610

Client: KDSA Developments

Location: Burnstown, ON

Pumping Test: TW 4

Pumping Well: TW 4

Test Conducted by: AO

Test Date: 4/1/2015

Aquifer Thickness: 73.15 m

Discharge: variable, average rate 0.25 [l/s]

	Analysis Name	Analysis Performed by	Analysis Date	Method name	Well	T [m ² /d]	K [m/d]	S
1	New analysis 1		7/10/2015	Theis Recovery	TW 4	2.64×10^{-1}	3.61×10^{-3}	

Pumping Test Analysis Report

Project: TW5 - Pumping Test

Number: PH4098

Client: Braeburn Estates

Location: Burnstown, Ontario

Pumping Test: Pumping Test -TW5

Pumping Well: Well 1

Test Conducted by: EA

Test Date: 29/09/2020

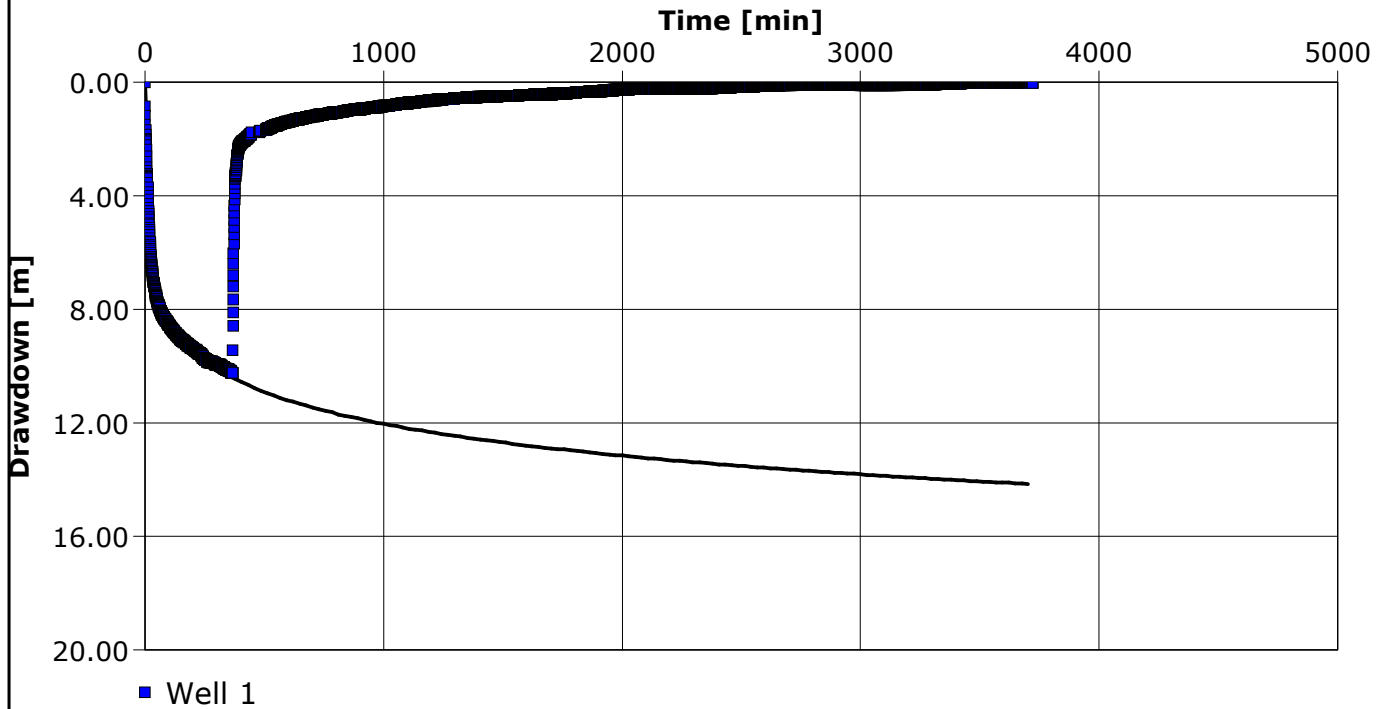
Analysis Performed by: EA

Theis

Analysis Date: 29/09/2020

Aquifer Thickness:

Discharge: variable, average rate 0.32 [l/s]



Calculation using Theis

Observation Well	Transmissivity [m ² /d]	Storage coefficient	Radial Distance to PW [m]
Well 1	1.36 × 10 ⁰		0.08

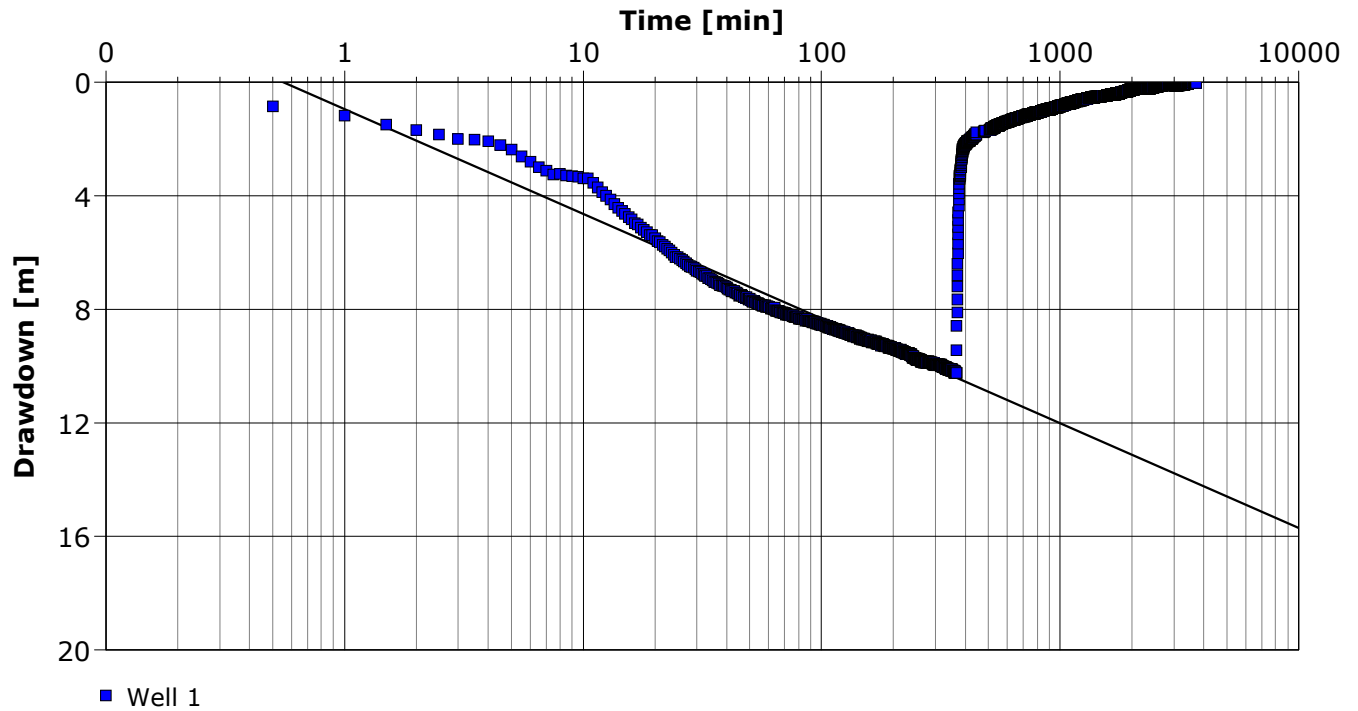
Pumping Test Analysis Report

Project: TW5 - Pumping Test

Number: PH4098

Client: Braeburn Estates

Location: Burnstown, Ontario	Pumping Test: Pumping Test -TW5	Pumping Well: Well 1
Test Conducted by: EA		Test Date: 29/09/2020
Analysis Performed by: EA	Cooper Jacob 1	Analysis Date: 29/09/2020
Aquifer Thickness:	Discharge: variable, average rate 0.32 [l/s]	



Calculation using COOPER & JACOB

Observation Well	Transmissivity [m ² /d]	Storage coefficient	Radial Distance to PW [m]
Well 1	1.37 × 10 ⁰		0.08

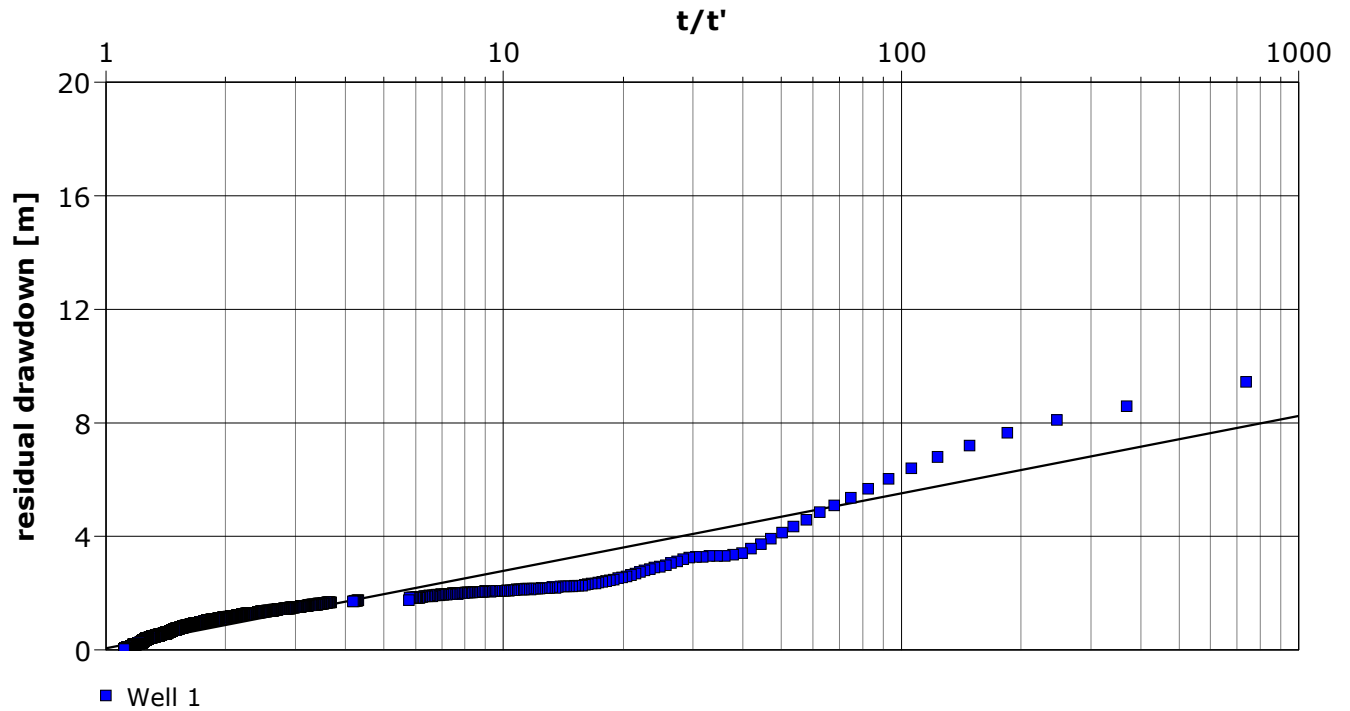
Pumping Test Analysis Report

Project: TW5 - Pumping Test

Number: PH4098

Client: Braeburn Estates

Location: Burnstown, Ontario	Pumping Test: Pumping Test -TW5	Pumping Well: Well 1
Test Conducted by: EA		Test Date: 29/09/2020
Analysis Performed by: EA	Theis Recovery	Analysis Date: 29/09/2020
Aquifer Thickness:	Discharge: variable, average rate 0.32 [l/s]	



Calculation using THEIS & JACOB

Observation Well	Transmissivity [m ² /d]	Radial Distance to PW [m]	
Well 1	1.86 × 10 ⁰	0.08	

	Pumping Test Analysis Report
	Project: TW5 - Pumping Test
	Number: PH4098
	Client: Braeburn Estates

Location: Burnstown, Ontario	Pumping Test: Pumping Test -TW5	Pumping Well: Well 1
Test Conducted by: EA		Test Date: 29/09/2020
Aquifer Thickness: NAN m	Discharge: variable, average rate 0.32 [l/s]	

	Analysis Name	Analysis Performed by	Method name	Well	T [m ² /d]	S
1	Theis	EA	Theis	Well 1	1.36 × 10 ⁰	
2	Cooper Jacob 1	EA	Cooper & Jacob I	Well 1	1.37 × 10 ⁰	
3	Theis Recovery	EA	Theis Recovery	Well 1	1.86 × 10 ⁰	

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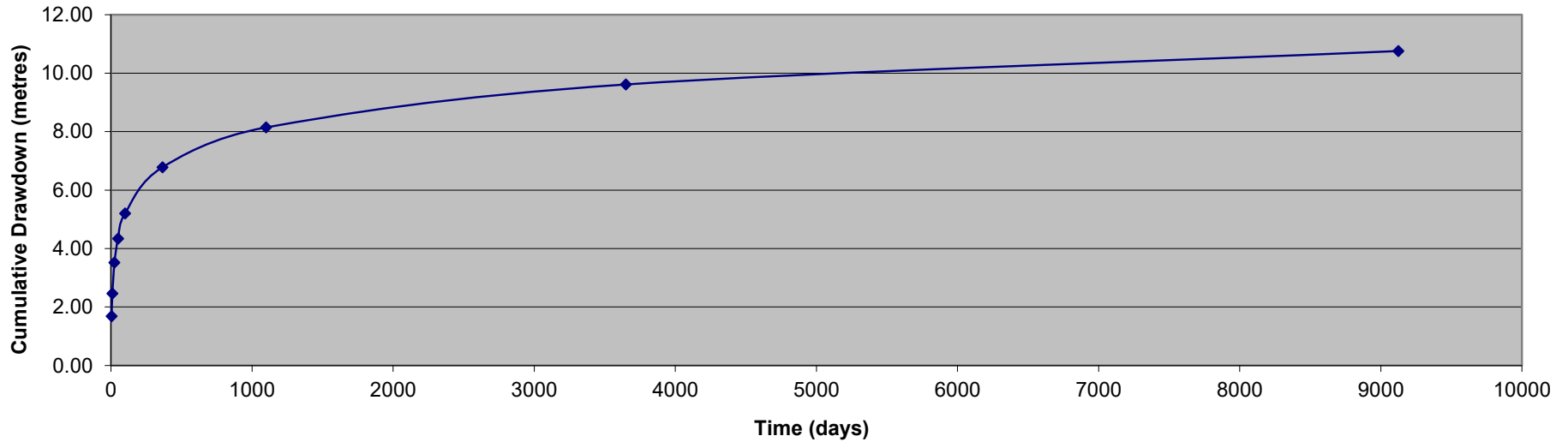
Model No. 1: Determination of Potential Well Interference- 20 Year Cumulative Impact

Pumping Rate (Q) m³/day 2.4
 Transmissivity (T) m²/day 6.0
 Average Well Spacing (m) r 50
 Coefficient of Storage S 0.001

Notes: Analysis Assumes Continuous Pumping of 38 to 63 Wells

Time (days)	1st Well Grouping		2nd Well Grouping		3rd Well Grouping		4th Well Grouping		Drawdown
	u	W(u)	u	W(u)	u	W(u)	u	W(u)	
5	1.0E-02	2.8965	3.1E-02	1.8505	5.2E-02	1.4092	7.3E-02	1.1099	1.69
10	5.2E-03	3.5739	1.6E-02	2.5068	2.6E-02	2.0155	3.6E-02	1.7371	2.46
25	2.1E-03	4.4652	6.3E-03	3.4050	1.0E-02	2.8965	1.5E-02	2.5684	3.52
50	1.0E-03	5.1706	3.1E-03	4.0681	5.2E-03	3.5739	7.3E-03	3.2179	4.34
100	5.2E-04	5.8621	1.6E-03	4.7667	2.6E-03	4.2468	3.6E-03	3.9436	5.20
365	1.4E-04	7.1520	4.3E-04	6.0695	7.1E-04	5.5443	1.0E-03	5.2022	6.78
1100	4.7E-05	8.2278	1.4E-04	7.1520	2.4E-04	6.6324	3.3E-04	6.3315	8.14
3650	1.4E-05	9.4541	4.3E-05	8.3709	7.1E-05	7.8449	1.0E-04	7.5020	9.61
9125	5.7E-06	10.3479	1.7E-05	9.2681	2.9E-05	8.7610	4.0E-05	8.4509	10.76

Graph of Drawdown vs. Time





BRAEBURN ESTATES

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors

Topography	0.10
Soil	0.40
Cover	0.14
Total	0.64

Site Characteristics

Area of Site :	248246	m ²
Total of roof areas:	11480	m ²
Total area of paved driveway areas:	6150	m ²
Roof + paved driveway areas	17630	m ²
Impervious Area	17630	m ²
Percent Impervious Area =	7	%
Infiltration Area =	230616	m ²

Septic Effluent

Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	41	m ³
See Notes below.		

Infiltration Calculation

Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	357	mm/yr
Factored Water Surplus =	228	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q _i) =	144	m ³ /day

Mass Balance Model (MOEE, 1995)

$$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i) = \text{Cumulative Nitrate Concentration}$$

Q _b = flow entering the system across the upgradient area	0	m ³ /day
C _b = background nitrate concentration	0	mg/L
Q _e = flow entering the system from the septic drainfield	41	m ³ /day
C _e = concentration of nitrates in the septic effluent	40	mg/L
Q _i = flow entering the system from infiltration	144	m ³ /day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	8.85	mg/L
Estimate Number of Lots	41	lots

Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume was calculated by Paterson Group as a preliminary design flow.

Appleton WATER BUDGET MEANS FOR THE PERIOD 1992-2021 DC20492

LAT.... 45.18 WATER HOLDING CAPACITY... 75 MM HEAT INDEX... 37.24
 LONG... 76.12 LOWER ZONE..... 45 MM A..... 1.088

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-9.5	62	16	22	1	1	0	36	55	74	285
28- 2	-8.1	50	14	23	1	1	0	35	68	75	334
31- 3	-2.3	58	27	72	7	7	0	92	26	75	391
30- 4	5.8	75	69	32	31	31	0	70	0	75	467
31- 5	13.2	71	71	0	81	81	0	12	0	53	537
30- 6	18.3	98	98	0	116	106	-10	8	0	36	636
31- 7	20.7	95	95	0	134	108	-26	4	0	19	730
31- 8	19.7	89	89	0	117	88	-29	1	0	18	816
30- 9	15.4	86	86	0	78	72	-7	3	0	29	903
31-10	8.6	84	82	1	38	38	0	17	0	58	85
30-11	1.7	72	57	11	11	11	0	42	5	72	157
31-12	-5.2	67	27	14	2	2	0	37	31	74	224
AVE	6.6 TTL	905	731	175	617	546	-72	357			

Appleton STANDARD DEVIATIONS FOR THE PERIOD 1992-2021 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.1	27	19	22	1	1	0	37	35	4	51
28- 2	2.8	21	15	20	1	1	0	29	40	2	55
31- 3	2.6	25	19	33	6	6	0	36	48	0	62
30- 4	1.5	39	38	47	7	7	0	59	0	1	79
31- 5	1.6	36	36	0	11	11	0	22	0	25	95
30- 6	1.2	38	38	0	8	18	19	13	0	32	109
31- 7	1.4	53	53	0	10	33	37	24	0	25	135
31- 8	1.2	45	45	0	8	31	35	7	0	26	140
30- 9	1.5	36	36	0	8	14	15	10	0	29	131
31-10	1.6	34	35	4	7	8	1	25	2	22	34
30-11	2.0	24	24	9	5	5	0	31	12	8	46
31-12	2.7	25	19	15	2	2	0	27	30	4	51

APPENDIX 5

PH4748-1 – SITE PLAN

PH4748-2 – MECP WATER WELL RECORDS

PH4748-3 – SURFICIAL GEOLOGY

PH4748-4 – BEDROCK GEOLOGY

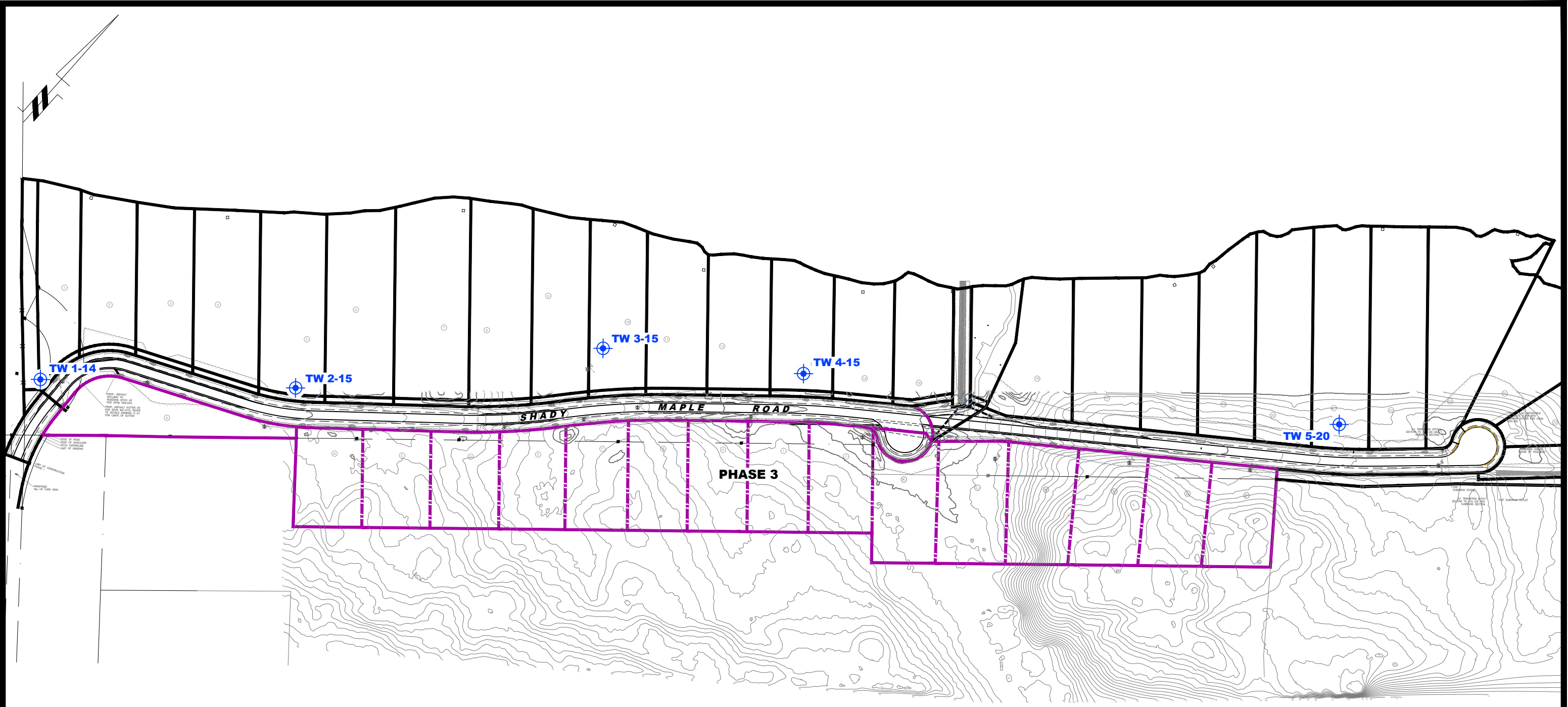
PG3155-2 – TEST HOLE LOCATION PLAN

PG3155-4 – TEST HOLE LOCATION PLAN

PH2610-1 – TEST HOLE LOCATION & LOT DEVELOPMENT PLAN

PH4098-1 – TEST HOLE LOCATION & LOT DEVELOPMENT PLAN

PH4748-5 – LOT DEVELOPMENT PLAN



LEGEND:

 TEST WELL LOCATION

SCALE: 1:3000




PATERSON GROUP
 9 AURIGA DRIVE
 OTTAWA, ON
 K2E 7T9
 TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

OTTAWA, ONTARIO

BRAEBURN ESTATES - PHASE 3

Title: **SITE PLAN**

Scale:	1:2000	Date:	06/2023
Drawn by:	YA	Report No.:	PH4748-1
Checked by:	EA	Dwg. No.:	PH4748-1
Approved by:	EA	Revision No.:	



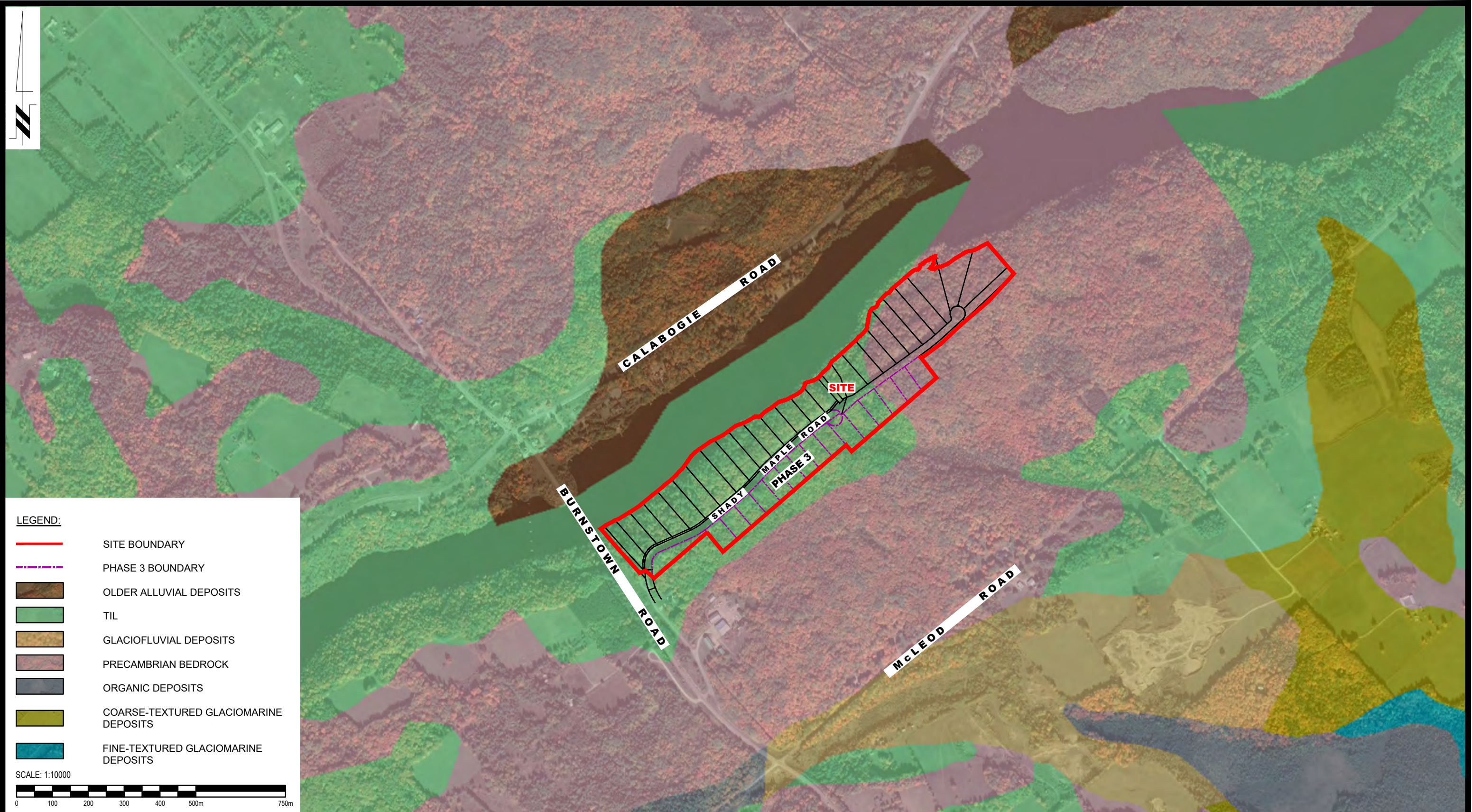
NO.	REVISIONS	DATE	INITIAL

BRAEBURN ESTATES
HYDROGEOLOGICAL ASSESSMENT AND TERRAIN ANALYSIS
PROPOSED RESIDENTIAL DEVELOPMENT

BURNSTOWN, ONTARIO

Title:
MECP WATER WELL LOCATION PLAN

Scale:	1:10000	Date:	08/2023
Drawn by:	GK	Report No.:	PH4748-REP.01
Checked by:	ZB	Dwg. No.:	PH4748-2
Approved by:	EA	Revision No.:	



LEGEND:

- SITE BOUNDARY
- PHASE 3 BOUNDARY
- OLDER ALLUVIAL DEPOSITS
- TIL
- GLACIOFLUVIAL DEPOSITS
- PRECAMBRIAN BEDROCK
- ORGANIC DEPOSITS
- COARSE-TEXTURED GLACIOMARINE DEPOSITS
- FINE-TEXTURED GLACIOMARINE DEPOSITS



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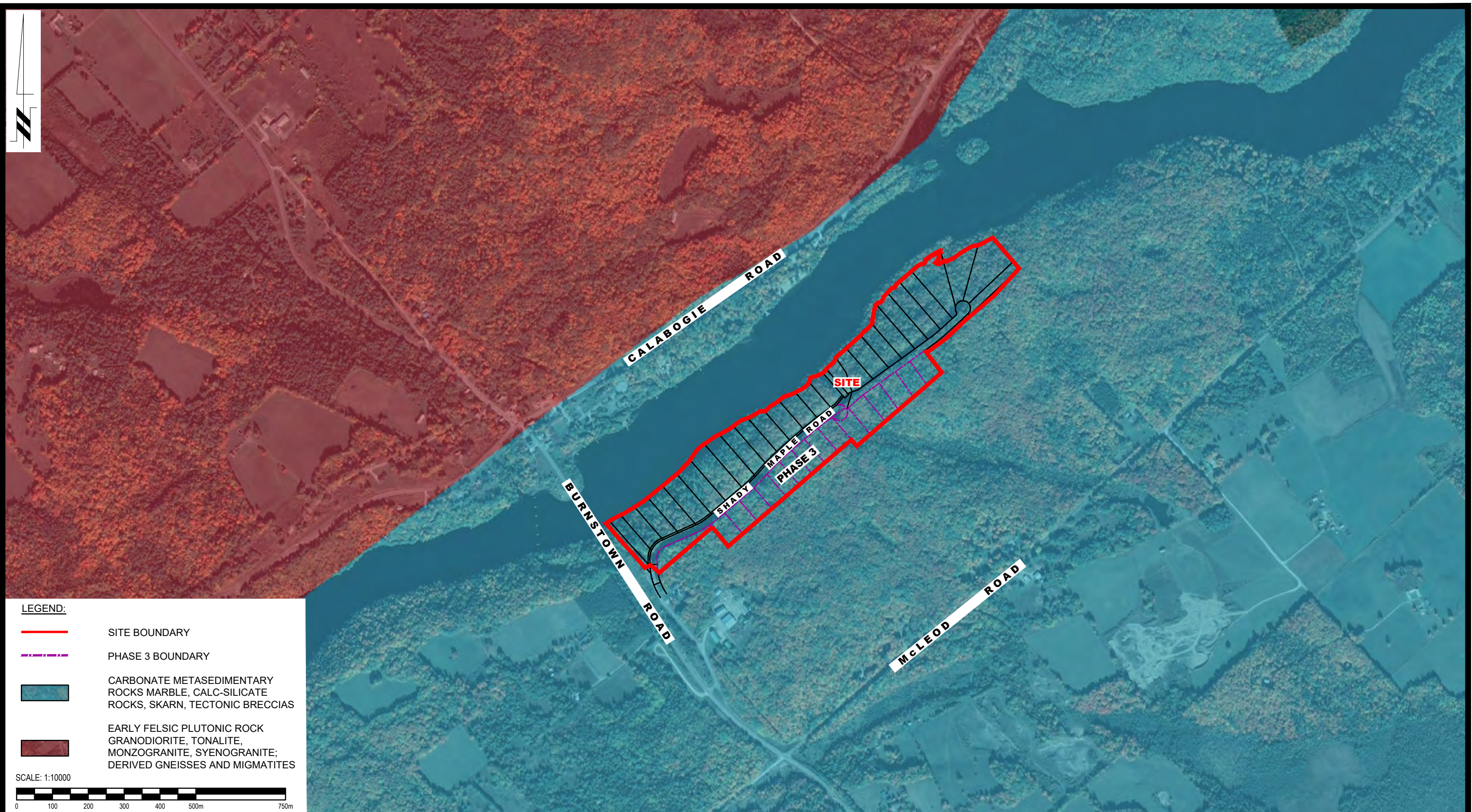
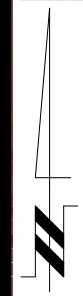
NO.	REVISIONS	DATE	INITIAL

BRAEBURN ESTATES
HYDROGEOLOGICAL ASSESSMENT AND TERRAIN ANALYSIS
PROPOSED RESIDENTIAL DEVELOPMENT

BURNSTOWN, ONTARIO

Title: **SURFICIAL GEOLOGY PLAN**

Scale:	1:10000	Date:	08/2023
Drawn by:	GK	Report No.:	PH4748-REP.01
Checked by:	ZB	Dwg. No.:	PH4748-3
Approved by:	EA	Revision No.:	



LEGEND:

- SITE BOUNDARY
- PHASE 3 BOUNDARY
- █ CARBONATE METASEDIMENTARY ROCKS MARBLE, CALC-SILICATE ROCKS, SKARN, TECTONIC BRECCIAS
- █ EARLY FELSIC PLUTONIC ROCK GRANODIORITE, TONALITE, MONZOGRANITE, SYENOGANITE; DERIVED GNEISSES AND MIGMATITES

SCALE: 1:10000

9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

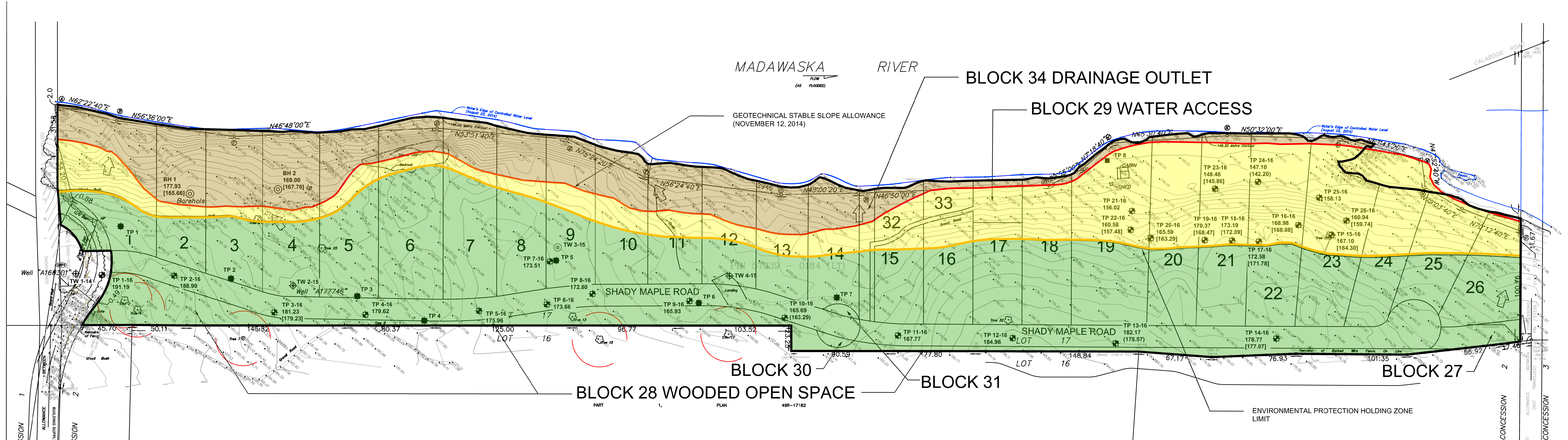
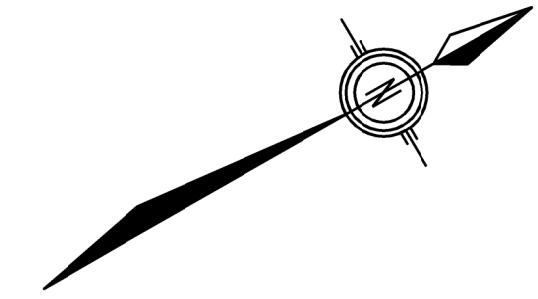
NO.	REVISIONS	DATE	INITIAL

**BRAEBURN ESTATES
HYDROGEOLOGICAL ASSESSMENT AND TERRAIN ANALYSIS
PROPOSED RESIDENTIAL DEVELOPMENT**

BURNSTOWN, ONTARIO

BEDROCK GEOLOGY PLAN

Scale:	1:10000	Date:	08/2023
Drawn by:	GK	Report No.:	PH4748-REP.01
Checked by:	ZB	Dwg. No.:	PH4748-4
Approved by:	EA	Revision No.:	



- LEGEND:**
- ⊕ TEST PIT LOCATION, CURRENT INVESTIGATION
 - ⊕ BOREHOLE LOCATION, PREVIOUS INVESTIGATION - PG3155, 2014
 - ⊕ TEST PIT LOCATION, PATERSON GROUP REPORT - PH2610, 2015
 - ⊕ TEST WELL LOCATION, PATERSON GROUP REPORT - PH2610, 2015
 - 177.98 GROUND SURFACE ELEVATION (m)
 - [165.66] BEDROCK SURFACE ELEVATION (m)
 - [163.29] PRACTICAL REFUSAL TO EXCAVATION ON INFERRED BEDROCK SURFACE (m)
 - ⊕-⊕ CROSS-SECTION LOCATION
- TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS AT TEST HOLE LOCATIONS PROVIDED BY ADAM KASPRZAK SURVEYING LIMITED.
- BASE PLAN PROVIDED BY JP2G CONSULTANTS INC.
- SCALE: 1:1500
-

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consulting engineers

154 Colonnade Road South
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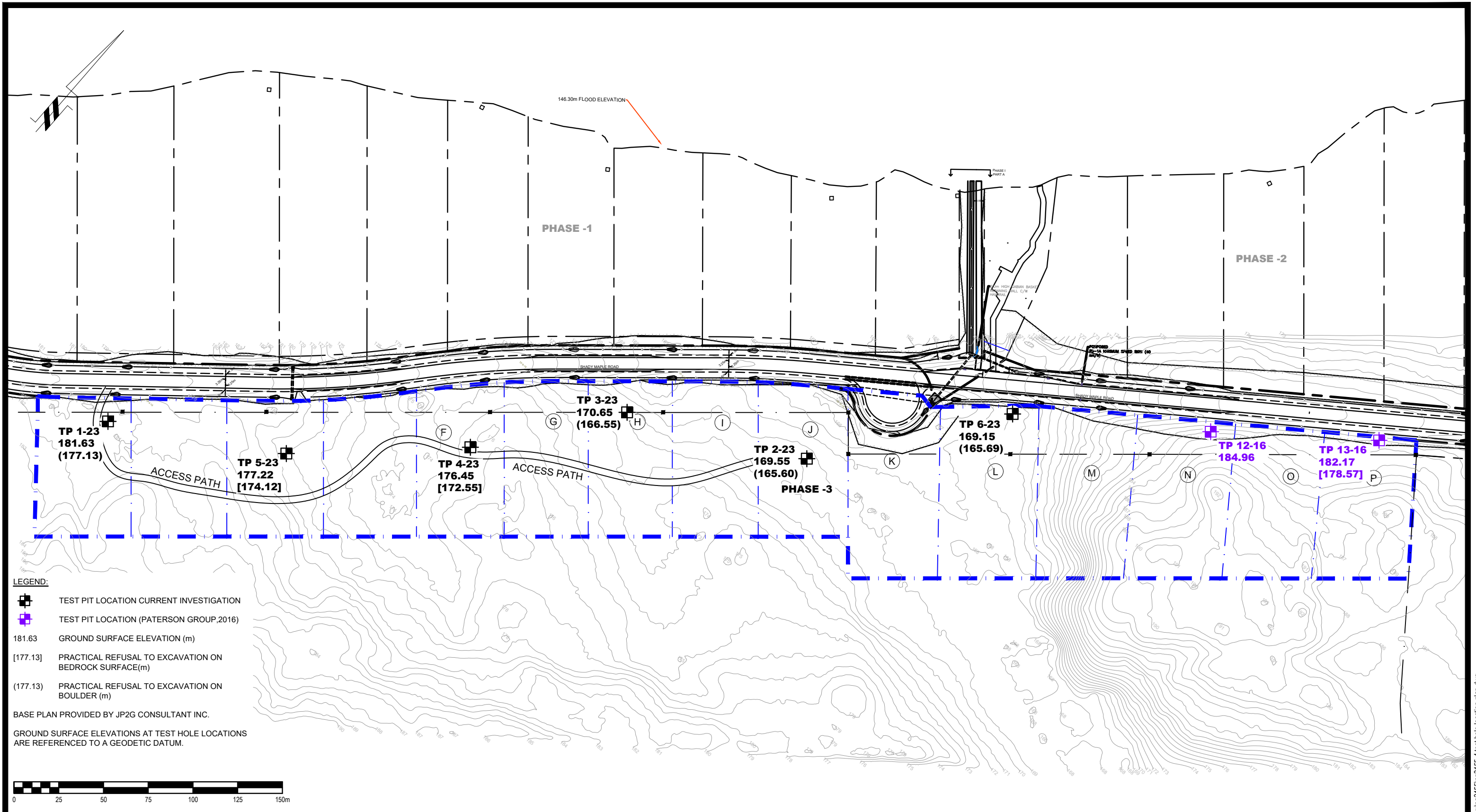
NO.	REVISIONS	DATE	INITIAL
3	BASED PLAN UPDATED	MARCH 1, 2017	RG
2	PLACEMENT OF SLOPE STABILITY ZONES	FEB 19, 2017	RG
1	CONCEPTUAL SITE PLAN UPDATED	JULY 18, 2016	RG

KDSA DEVELOPMENT CORP.

**PAVEMENT STRUCTURE RECOMMENDATIONS - SHADY MAPLE ROAD
PROPOSED RESIDENTIAL DEVELOPMENT - BUILDING SUPPLY ROAD
BURNSTOWN, ONTARIO**

TEST HOLE LOCATION PLAN

Scale:	1:1500	Report No.:	PG3155-LET.05
Drawn by:	RCG	Drawing No.:	
Checked by:	RG		
Approved by:	DJG		PG3155-2
Date:	06/2016	Revision No.:	3



NO.	REVISIONS	DATE	INITIAL

KDSA DEVELOPMENT CORP.

GEOTECHNICAL INVESTIGATION

FUTURE RURAL SUBDIVISION - PHASE 3

BUILDING SUPPLY ROAD STREET

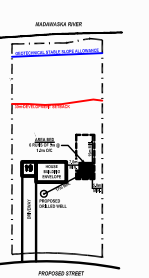
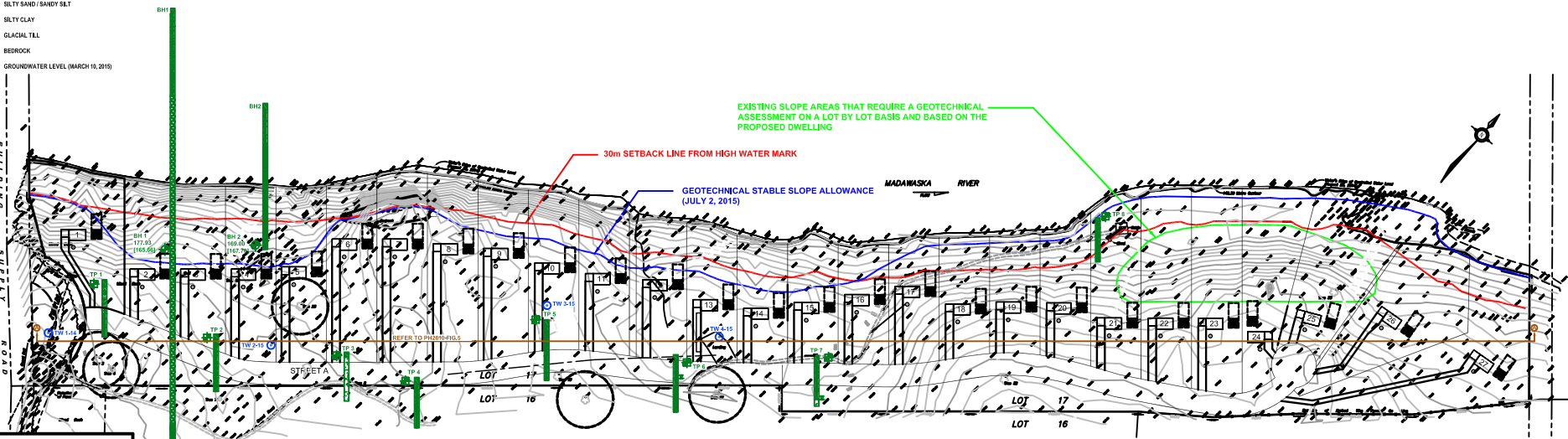
ONTARIO

BURNSTOWN,
Title:

TEST HOLE LOCATION PLAN

Scale:	1:2000	Date:	05/2023
Drawn by:	GK	Report No.:	PG3155-LET.06
Checked by:	PB	Dwg. No.:	PG3155-4
Approved by:	MS	Revision No.:	

- SOIL STRATIGRAPHY**
- TOPSOIL
 - SAND-GRAVEL
 - SAND / FINE SAND
 - SILTY SAND / SANDY SILT
 - SILTY CLAY
 - GLACIAL TILL
 - BEDROCK
 - GROUNDWATER LEVEL (MARCH 10, 2015)



PROPOSED STREET

SEWER
WATER

PROPOSED WELL

BOREHOLE LOCATIONS AND GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS PROVIDED BY ADAM HASKOPK SURVEYING LIMITED.

SCALE: 1:500

- LEGEND**
- TW 24-15 2015 TEST WELL LOCATION
 - TW 24-14 2014 TEST WELL LOCATION
 - BH BOREHOLE LOCATION (PUT DOWN MAY 14, 2014)
 - TP-1 TEST HOLE LOCATION (PUT DOWN MARCH 10, 2015)
 - GROUND SURFACE CONTOUR
 - EXISTING GROUND SURFACE ELEVATION (m)
 - INFERRED BEDROCK ELEVATION (m)
 - PROPOSED DWELLING AND LOT NO.
 - PROPOSED LEACHING BED AREA
 - PROPOSED WELL LOCATION

patersongroup
consulting engineers

154 Colonnade Road South
Oshawa, Ontario R2E 7Z8
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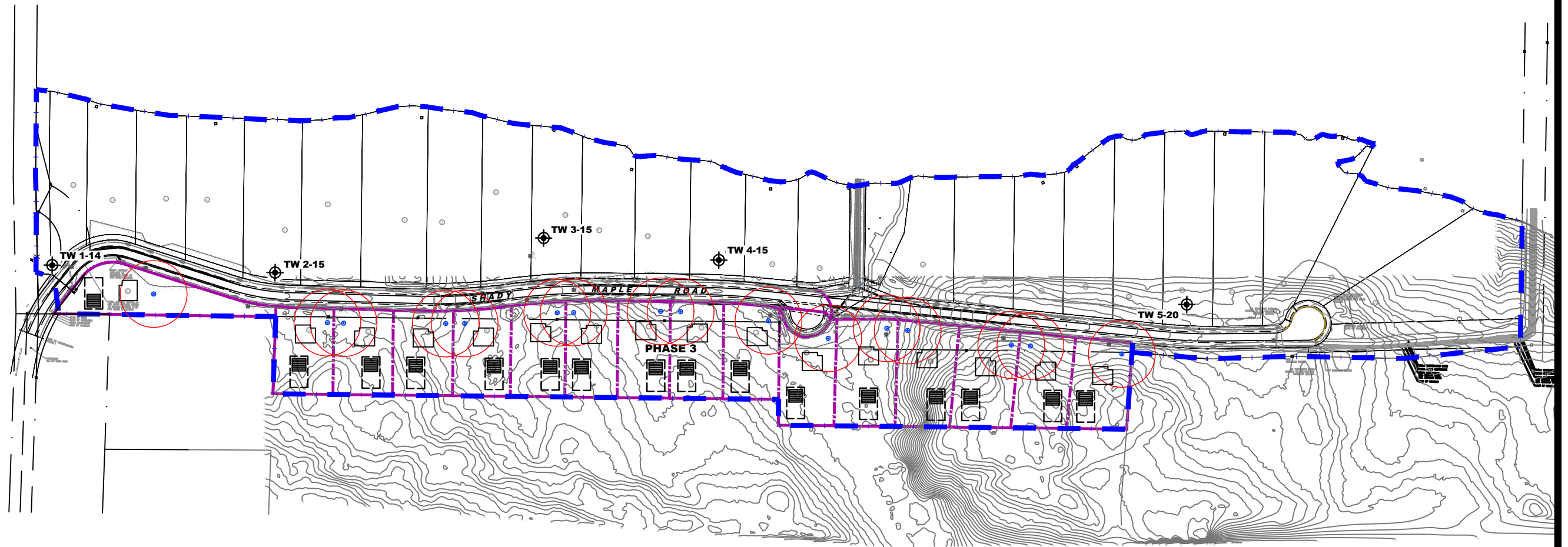
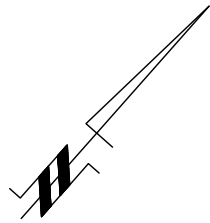
NO.	REVISIONS	DATE	INITIAL
1	ISSUED WITH REPORT NO. PH2610-REP-01	1/27/2015	AW

KOSA DEVELOPMENT CORPORATION
PROPOSED RESIDENTIAL SUBDIVISION
BRAEBURN ESTATES
BUILDING SUPPLY ROAD
BURNSTOWN, ONTARIO








TEST HOLE LOCATION & LOT DEVELOPMENT PLAN

Scale:	1:1500	Report No.:	PH2610-REP.01
Checked by:	AW	Drawing No.:	PH2610-1
Approved by:	SJW	Revision No.:	0
Drawn by:	JB		
Date:	07/2015		

PH2610-1.dwg 2015/07/20 10:00:00 AM



LEGEND:

-  TEST WELL LOCATION
-  PROPOSED WATER SUPPLY WELL
-  PROPOSED SAND MANTLE
-  PROPOSED CONVENTIONAL SEPTIC BED
-  30m RADIUS
-  PROPERTY BOUNDARY
-  PHASE 3 BOUNDARY

CONCEPTUAL CONVENTIONAL BED SEWAGE SYSTEM SIZING CRITERIA:

HOUSE: 3 BEDROOMS, 280m² FINISHED FLOOR AREA,
 SINGLE FAMILY DWELLING
 DESIGN DAILY SEWAGE FLOW = 2400L / DAY
 LENGTH OF DISTRIBUTION PIPE REQUIRED =
 $QT/200 = 2400(8)/200 = 96 \text{ m}^2$
 SAND AREA REQUIRED = $Q/8 = 2,400/8 = 300\text{m}^2$
 USE 8 RUNS OF 12 m EACH
 LENGTH OF DISTRIBUTION PIPE PROVIDED = 96 m
 SAND AREA PROVIDED = 452 m²

SCALE: 1:4000




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NO.	REVISIONS	DATE	INIT
NO.1	Issued For Review	30/10/23	EA

**BRAEBURN ESTATES - PHASE 3
 HYDROGEOLOGICAL ASSESSMENT AND TERRAIN ANALYSIS
 PROPOSED RESIDENTIAL DEVELOPMENT**

BURNSTOWN, ONTARIO

LOT DEVELOPMENT PLAN

Scale:	1:4000	Date:	10/2023
Drawn by:	GK	Report No.:	PH4748-REP.01
Checked by:	ZB	Dwg. No.:	PH4748-5
Approved by:	EA	Revision No.:	1