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PH4720-LET.02

Brunstad Christian Church Ottawa
1981 Century Road
North Gower (Ottawa), Ontario
K1G 6C9

Attention: **Peter Twilley**

Subject: **Hydrogeological Assessment and Terrain Analysis**
Proposed Church Building Addition
1981 Century Road, North Gower (Ottawa), Ontario

Introduction

Further to your request, Paterson Group (Paterson) has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Site Plan Control Application for the proposed building addition to the existing church located at 1981 Century Road in Ottawa (North Gower), Ontario. Please refer to the Key Plan (attached) for the approximate site location. The subject site refers to the parcel at 1981 Century Road in Ottawa.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site and to carry out a septic system impact assessment (Terrain Analysis) to determine the site's suitability for private on-site sewage systems. Specifically, the intent of the report is to determine the quality and quantity of water underlying the subject site, as well as to assess the subject sites ability to support the proposed sewage volumes from a nitrate attenuation standpoint.

The proposed Site Plan application is for a building addition. Details of the proposed building addition can be found in the attached drawing S.J Lawrence Architect Incorporated Drawing A1.0 "Proposed Site Plan" last revised on December 5, 2024.

The Subject Site consists of a 3.64 hectares (ha) lot and is currently occupied by the existing church with associated private infrastructure. The ground surface is generally flat. The general groundwater flow is anticipated to be in a northwestern direction towards a mapped watercourse which runs parallel with the northern and eastern property boundaries.

The Subject Site is bordered to the north, east and west by either agricultural or undeveloped land. Century road is located along the southern property boundary followed by agricultural lands.

HYDROGEGOLOICAL ASSESSMENT

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site to support the Site Plan Application for a proposed building addition. The purpose of this study has been to determine the suitability of the water supply aquifer system underlying the site to adequately supply the proposed development for potable supply usage. Specifically, the intent of this report is to review the availability of a safe and reliable water supply having sufficient quantity and quality to provide potable water for the proposed development.

Hydrogeological Pre-consultation

A Hydrogeological Pre-consultation was completed with a City of Ottawa Hydrogeologist on June 14, 2023. The City Hydrogeologist noted that the use of a NSF or BNQ verified sewage system with nitrate reduction for septic treatment was acceptable to support the Site Plan application.

DESCRIPTION OF SUBJECT SITE

The subject site is an approximately 3.64 ha lot and is currently occupied by a one-storey commercial building; Brunstad Christian Church Ottawa. The Site Plan application is for a proposed building addition. Please refer to Figure-1 Key Plan and the attached drawing S.J Lawrence Architect Incorporated Drawing A1.0 “Proposed Site Plan” last revised on December 5, 2024, for the proposed site location and site layout.

The subject site is currently serviced by an onsite sewage system and a private drilled well. A new sewage system is proposed to be located in the same location as the old sewage system. A new sewage system has been proposed due to the increase in sewage system flows associated with the proposed building addition. An approved Ottawa Septic System Office (OSSO) Sewage System Installation Permit was obtained for a total daily design sanitary sewage flow (TDDSSF) of 6,040 L/day. The approved OSSO Sewage System Installation Permit will be submitted along with the Site Plan application package.

The existing well, hereafter referred to as Test Well 1 (TW1) is the well which is currently servicing the existing building and will continue to service the building following the completion of the proposed addition.

The suitability of the aquifer to supply the subject site was assessed using the methodology provided in City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site is not mapped to be within any of the four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consist of Significant Groundwater Recharge Area (SGRA), Highly Vulnerable Aquifer (HVA), Intake Protection Zone (IPZ) and Wellhead Protection Area (WHPA). Therefore, there are no related requirements for an HVA, IPZ, SGRA or WPA at this location.

FIELDWORK PROGRAM

Well Inspection

A visual inspection of TW1 was performed by Paterson personnel. The well casing and cap were observed to be in good condition. The grading around the well was noted to be sufficiently graded to direct surface water away from the wellhead, as required by O.Reg 903. The stickup was measured to be 0.67 m above ground surface. Based on a visual inspection by Paterson personnel, the well was deemed to be in good condition.

Well Testing

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the existing drilled well (TW1) on the subject site was tested. TW1 has a Water Well Record (WWR) Well ID of A207617. TW1 has a 152.4 mm diameter steel casing that extends to 24.4 m below ground surface (bgs) with a 0.67 m stick up. The well itself extends to a depth of 57 m bgs. According to available geological mapping, the drift thickness at TW1 varies from 5 to 10 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on June 20, 2023 under the full-time supervision of Paterson personnel. Prior to the pumping test the well was disinfected as per the MECP Disinfection Instruction Sheet (attached), and a data-logger was installed to monitor the background groundwater levels.

A submersible pump was provided by Air Rock Drilling for the 8-hour pumping test. A licensed water well technician was retained to complete the necessary plumbing related activities. A discharge hose assembly with a gate valve was connected to the rented pump. The discharge line was placed at a sufficient distance to ensure that the discharge water was directed away from the well. Upon completion of the test, the pump was removed and the well was disinfected by Air Rock Drilling.

The pumping test was carried out at a pumping rate of 80 L/min for a duration of 8 hours. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pumping rate was maintained within 5% of the selected

pump rate. The static water level was recorded manually and an electric datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test. The selected rate of 80 L/min provides approximately 6.3 times the maximum total daily design volume for the septic system during the 8-hour pumping test. The rate was determined to be representative of a flow rate which would be in excess of what the proposed development would require.

The data logger recorded water levels at 30 second intervals. In addition, manual water level readings were taken at periodic intervals during the test.

Recovery data was collected from the well following the completion of the pumping. The well was measured to have achieved 71% recovery within 60 minutes after the end of pumping. After 60 minutes of recovery had passed, the pump was reconfigured back to its original condition by Air Rock personnel. The water level was measured to have achieved 95% recovery approximately 1 hour and 50 min after the end of the pumping test.

Groundwater samples were collected at 4 hours and 8 hours after the start of pumping. Prior to collection of the groundwater samples, the free chlorine residual was verified as non-detectable. The water samples were submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard “Subdivision Supply” suite of parameters plus trace metals, and Volatile Organic Compounds (VOC’s).

All samples were collected unfiltered and unchlorinated and were placed directly into clean bottles supplied by the analytical laboratory. Samples were placed immediately into a cooler with ice and were transported to Environmental Testing Canada Inc. (Eurofins) laboratory in Ottawa. All samples were received by the laboratory within 24 hours of collection.

A series of field tests of the pumped water were carried out at the well head during the 8-hour pumping test. The parameters tested at the well head included: pH, total dissolved solids, conductivity, turbidity, apparent colour, and temperature.

Aquifer Analysis

Water Quantity

Pumping test data was analyzed using AQTESOLV Pro Version 4 aquifer analysis software package by HydroSOLVE Inc. Drawdown data was measured using an electronic water level tape and an electronic datalogger unit.

Table 1: SUMMARY OF WATER SUPPLY AQUIFER CHARACTERISTICS OF TW1	
AQUIFER PARAMETER	**RESULT OF ANALYSIS**
Transmissivity (m^2/day)	367.1
Pumping Rate (L/min)	80
Pre-test Static Water Level (m)	2.5
Post-test Static Water Level (m)	2.8
Available Drawdown (m)	54.5
% Drawdown During Pump Test (%)	0.55
Specific Capacity (L/min/m drawdown)	145

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 367.1 m^2/day. Refer to the Theis and Cooper Jacob methods of analysis data sheets attached to this report.

The pumping test results show that TW1 has a high yield to support the water demands that may be required. Overall maximum drawdown at a constant pumping rate for a period of 8 hours was approximately 0.3 m (0.55% of the available drawdown). It should be noted that 95% recovery was measured at approximately 1 hour and 50 min after the end of the pumping test.

The total volume of water pumped during the 8-hour pumping event was approximately 38,400 L. This is approximately 6.3 times the maximum total daily design volume of water required (6,040 L/day) to support the Site Plan Control Application.

The suitability of the aquifer to supply the proposed Site Plan Application for the proposed building addition was assessed using the methodology provided in the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

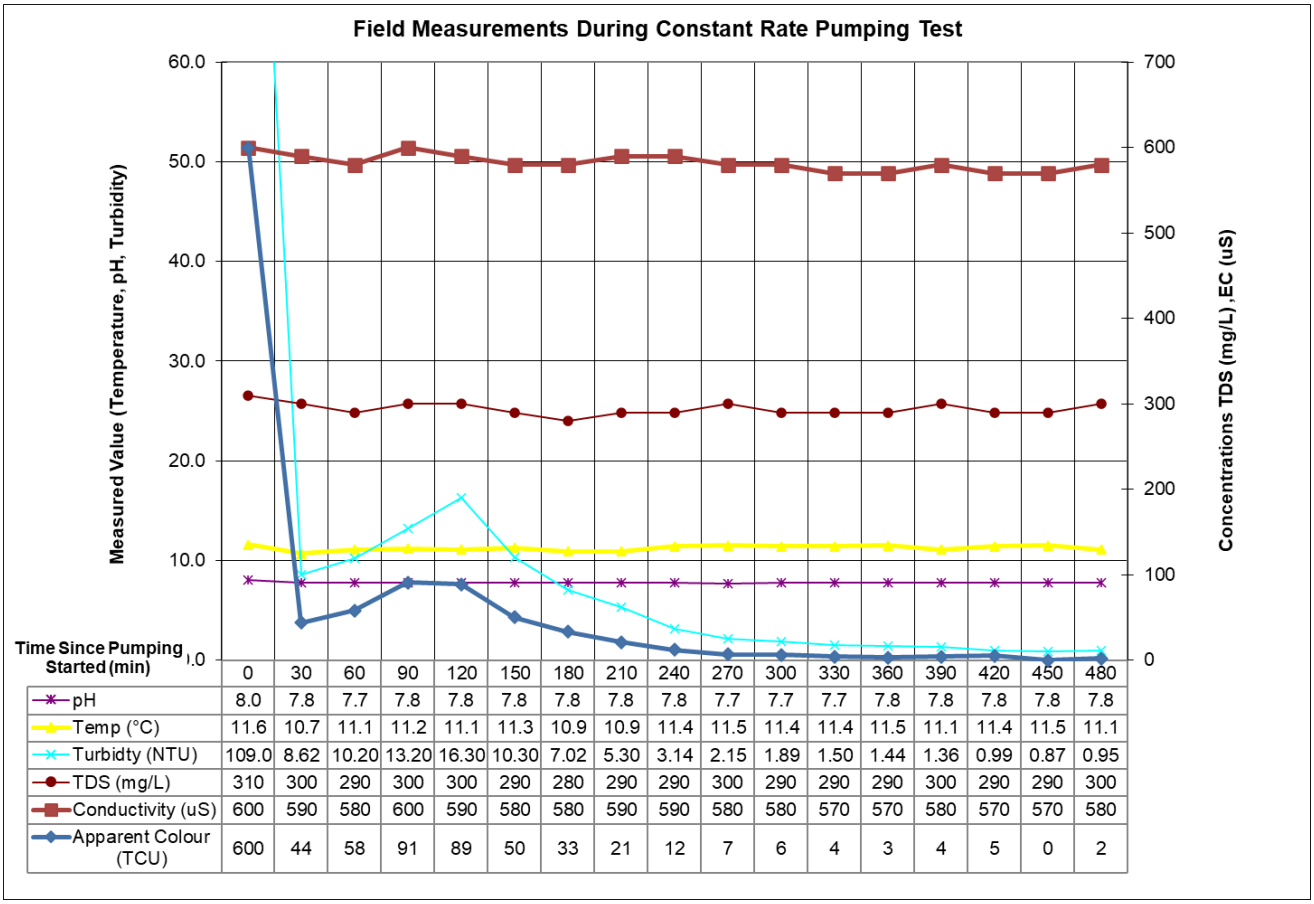
Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the proposed Site Plan Control application.

Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Site Plan Control application. Available water well records (WWR) of the neighboring properties on the MECP Well Record mapping website indicated that the wells were screened in limestone and sandstone. Surrounding WWR’s are attached to this report.

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, apparent color and temperature were measured at the wellhead during the pumping test. The measurements and time intervals for each of these parameters are summarized on the graphical representation below. In addition, a HACH Pocket Colorimeter II chlorine reader was used to measure the free chlorine residual level. No chlorine residual was detected in the discharge water prior to the collection of the water samples.



Time Since Pumping Started (min)	0	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480
pH	8.0	7.8	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8
Temp (°C)	11.6	10.7	11.1	11.2	11.1	11.3	10.9	10.9	11.4	11.5	11.4	11.4	11.5	11.1	11.4	11.5	11.1
Turbidty (NTU)	109.0	8.62	10.20	13.20	16.30	10.30	7.02	5.30	3.14	2.15	1.89	1.50	1.44	1.36	0.99	0.87	0.95
TDS (mg/L)	310	300	290	300	300	290	280	290	290	300	290	290	290	300	290	290	300
Conductivity (uS)	600	590	580	600	590	580	580	590	590	580	580	570	570	580	570	570	580
Apparent Colour (TCU)	600	44	58	91	89	50	33	21	12	7	6	4	3	4	5	0	2

Laboratory Data

The Subdivision Package suite of parameters and trace metals laboratory water quality obtained from the pumping test of TW1 is provided in Table 2a, 2b, and 2c below and the laboratory analyses reports can be found attached to this report. VOC laboratory analytical testing were completed and measured to be non-detect in the sample results. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 6/20/2023	GW2 (8 hr) 6/20/2023
MICROBIOLOGICAL					
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0
Total Coliforms	ct/100mL	0	MAC	0	0
GENERAL CHEMICAL - HEALTH RELATED					
Fluoride (F)	mg/L	1.5	MAC	0.36	0.35
Ammonia (N-NH_3)	mg/L	-	-	0.06	0.06
Nitrite (N-NO_2)	mg/L	1	MAC	<0.10	<0.10
Nitrate (N-NO_3)	mg/L	10	MAC	<0.10	<0.10
Total Kjeldahl Nitrogen	mg/L	-	-	0.15	0.12
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	3.14	0.95
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	2.1	1.3
GENERAL CHEMICAL - AESTHETIC RELATED					
Alkalinity (as CaCO3)	mg/L	30-500	OG	179	179
Chloride (Cl)	mg/L	250	AO	65	65
Colour (Apparent)	TCU	5	AO	17	15
Colour (Field - Apparent)	TCU	5	AO	12	2
Conductivity	uS/cm	-	-	563	558
Dissolved Organic Carbon	mg/L	5	AO	2.30	2.10
Hardness (as CaCO3)	mg/L	100	OG	243	243
Ion Balance	unitless	-	-	0.96	0.96
pH	unitless	6.5-8.5	AO	7.82	7.85
Phenols	mg/L	-	-	<0.001	<0.001
Sulphate (SO_4)	mg/L	500	AO	34	33
Sulphide (S_2^-)	mg/L	0.05	AO	<0.02	<0.02
Tannin & Lignin	mg/L	-	-	<0.5	<0.5
Total Dissolved Solids	mg/L	500	AO	366	363

1. 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

TABLE 2b: GROUNDWATER GEOCHEMISTRY - METALS					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 6/20/2023	GW2 (8 hr) 6/20/2023
Volatiles					
Aluminum (Al)	mg/L	0.1	OG	<0.01	<0.01
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005	<0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.18	0.18
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.05	0.05
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	61	61
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001
Cobalt (Co)	mg/L	-	-	<0.0002	<0.0002
Copper (Cu)	mg/L	1.0	AO	0.004	0.003
Iron (Fe)	mg/L	0.3	AO	0.38	0.29
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	22	22
Manganese (Mn)	mg/L	0.05	AO	<0.01	<0.01
Mercury (Hg)	mg/L	0.001	MAC	<0.0001	<0.0001
Molybdenum (Mo)	mg/L	-	-	<0.005	<0.005
Nickle (Ni)	mg/L	-	-	<0.005	<0.005
Potassium (K)	mg/L	-	-	3	3
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	22	21
Strontium (Sr)	mg/L	-	-	0.695	0.695
Thallium (Tl)	mg/L	-	-	<0.0001	<0.0001
Uranium (U)	mg/L	0.02	MAC	<0.001	<0.001
Vanadium (V)	mg/L	-	-	<0.001	<0.001
Zinc (Zn)	mg/L	5.0	AO	<0.01	<0.01

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

TABLE 2c: GROUNDWATER GEOCHEMISTRY - VOLATILES					
PARAMETER	UNITS	ODWS		TW1	
		LIMIT	TYPE	GW1 (4 hr) 6/20/2023	GW2 (8 hr) 6/20/2023
VOCs Surrogates					
1,2-dichloroethane-d4	%	-	-	119	121
4-bromofluorobenzene	%	-	-	94	93
Toluene-d8	%	-	-	99	99
Volatiles					
1,1,1,2-tetrachloroethane	µg/L	-	-	<0.5	<0.5
1,1,1-trichloroethane	µg/L	-	-	<0.4	<0.4
1,1,2,2-tetrachloroethane	µg/L	-	-	<0.5	<0.5
1,1,2-trichloroethane	µg/L	-	-	<0.4	<0.4
1,1-dichloroethane	µg/L	-	-	<0.4	<0.4
1,1-dichloroethylene	µg/L	14.0	MAC	<0.5	<0.5
1,2-dichlorobenzene	µg/L	200.0	MAC	<0.4	<0.4
1,2-dichloroethane	µg/L	5.0	IMAC	<0.2	<0.2
1,2-dichloropropane	µg/L	-	-	<0.5	<0.5
1,3,5-trimethylbenzene	µg/L	-	-	<0.3	<0.3
1,3-dichlorobenzene	µg/L	-	-	<0.4	<0.4
1,3-Dichloropropylene (cis+trans)	µg/L	-	-	<0.3	<0.3
1,4-dichlorobenzene	µg/L	5.0	MAC	<0.4	<0.4
Acetone	µg/L	-	-	<5	<5
Benzene	µg/L	1.0	MAC	<0.5	<0.5
Bromodichloromethane	µg/L	-	-	<0.3	<0.3
Bromoform	µg/L	-	-	<0.4	<0.4
Bromomethane	µg/L	-	-	<0.5	<0.5
c-1,2-Dichloroethylene	µg/L	-	-	<0.4	<0.4
c-1,3-Dichloropropylene	µg/L	-	-	<0.2	<0.2
Carbon Tetrachloride	µg/L	2.0	MAC	<0.2	<0.2
Chloroethane	µg/L	-	-	<0.2	<0.2
Chloroform	µg/L	-	-	<0.5	<0.5
Dibromochloromethane	µg/L	-	-	<0.3	<0.3
Dichlorodifluoromethane	µg/L	-	-	<0.5	<0.5
Dichloromethane	µg/L	50	MAC	<4.0	<4.0
Ethylbenzene	µg/L	140	MAC	<0.5	<0.5
Ethylene Dibromide	µg/L	-	-	<0.2	<0.2
Hexane	µg/L	-	-	<5	<5
m/p-xylene	µg/L	-	-	<0.4	<0.4
Methyl Ethyl Ketone (MEK)	µg/L	-	-	<2	<2
Methyl Isobutyl Ketone (MIBK)	µg/L	-	-	<5	<5
Methyl Tert Butyl Ether (MTBE)	µg/L	15	AO	<2	<2
Monochlorobenzene	µg/L	80	MAC	<0.5	<0.5
o-xylene	µg/L	-	-	<0.4	<0.4
Styrene	µg/L	-	-	<0.5	<0.5
t-1,2-Dichloroethylene	µg/L	-	-	<0.4	<0.4
t-1,3-Dichloropropylene	µg/L	-	-	<0.2	<0.2
Tetrachloroethylene	µg/L	10	MAC	<0.3	<0.3
Toluene	µg/L	60	MAC	<0.4	<0.4
Trichloroethylene	µg/L	5	MAC	<0.3	<0.3
Trichlorofluoromethane	µg/L	-	-	<0.5	<0.5
Vinyl Chloride	µg/L	1	MAC	<0.2	<0.2
Xylene; total	µg/L	90	MAC	<0.5	<0.5

1. ODWS identifies the following types of parameters:
   MAC = Maximum Acceptable Concentration
   IMAC = Interim Maximum Acceptable Concentration
   AO = Aesthetic Objective
   OG = Operational Guideline

The bacteriological test results (Certificate of Analysis – Report No. 1998379) indicated that the test samples at the 4 and 8 hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.

The water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC). Furthermore, the water meets all of the Aesthetic Objectives (AO) and Operational Guidelines (OG) with the exception of the following.

- ❑ Hardness (as $CaCO_3$)

Exceedances of the above parameters are not uncommon of the water supply in the subject aquifer. Each of these groundwater parameters are discussed in detail below.

Hardness as $CaCO_3$

Hardness, expressed as calcium carbonate, is an operation 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. At the measured concentration of 243 mg/L, the water is considered to be hard, however, it is below the reasonable treatable limit of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996).

The Langelier calculation provided an LSI of 0.3. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

It is recommended that water hardness be treated using conventional technologies such as water softening or reverse osmosis, if desired by the owner. Without treating hardness, scaling can occur which can result in discolouration and residue buildup on water fixtures, or reduction in boiler efficiency due to scale build-up. According to Health Canada's *Guidelines for Canadian Drinking Water Quality - Summary Tables* "Although hardness may have significant aesthetic effects, a guideline has not been established because public acceptance of hardness may vary considerably according to the local conditions; major contributors to hardness (calcium and magnesium) are not of direct public health concern".

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 concentration of iron in the groundwater in TW1 was measured to be 0.38 and 0.29 mg/L. The concentration of iron in the groundwater in the test well 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 by the owner, however, continued pumping demonstrated a decrease in the iron concentration to below the aesthetic objective during the pumping test.

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, a manganese greensand filter or a carbon filter can be used to reduced manganese from the water supply, if desired by the owner.

During the field pumping test, a DR900 colorimeter was used to measure apparent colour in the groundwater at regular intervals. Apparent colour in the groundwater was measured as 2 TCU at the end of the pumping test, which is below the aesthetic guidelines of 15 TCU. The elevated apparent colour levels detected in the lab samples is attributed to the precipitation of iron out of the groundwater.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 2.1 and 1.3 NTU in the 4 and 8 hours tests, respectively. Field testing detected the samples at values of 3.14 and 0.95 NTU in the 4 and 8 hour field tests, respectively. Continued pumping showed a decrease towards the end of the test. It is expected that continued use of the well would further reduce turbidity values. The elevated turbidity in the laboratory analyzed samples is attributed to the precipitation of iron.

During the pumping test, a Hanna Instruments HI98703 Fast Tracker Turbidity Meter was used to measure the turbidity in the groundwater at regular intervals. 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. The field test parameters are below the 1 NTU objective.

As turbidity was detected above 1 NTU, particular care must be taken during testing to ensure that the bacteria requirements of Table 1 are met. The bacteriological test results indicated that the test samples at the 4 and 8 hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at concentrations of 22 and 21 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified of the water quality results, so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet. It should be noted that some water treatment technologies, such as water softeners, can increase the sodium concentration so care should be given if such treatment technologies are used.

TERRAIN ANALYSIS

The purpose of this study has been to carry out a Septic System Impact Analysis (Terrain Analysis) to determine the site's suitability for private on-site wastewater systems. Specifically, the intent of this report is to provide design details for private septic servicing and lot development potential.

Surficial Geology

Paterson carried out a Geotechnical Investigation on July 17, 2023 as part the Geotechnical Assessment with report number PG6727-1 dated September 5, 2023. Four (4) boreholes were installed in a manner to provide general coverage of the subject site, with specific consideration to the redevelopment. The general overburden was observed to be a thin layer of topsoil followed by fill and/or clayey silt or silty clay. Fill, consisting of brown silty sand, was encountered in BH1-23, to a maximum depth of 0.69 m bgs. Clayey Silt and silty clay with trace to some sand were both encountered underlying the fill layer. Various combinations of silt, clay and sand were encountered in all boreholes overlying a glacial till layer of a silty sand to sandy silt with gravel, cobbles and boulders which extended to the maximum depth of the boreholes. Practical refusal to augering was not encountered in any boreholes and DCPT refusal was observed in BH4-23 at a depth of 10.7 m bgs. The results of the geotechnical program are generally consistent with available geological mapping provided by the Ontario Geological Survey (OGS MRD128) and with the available historical surrounding Water Well Records (WWR). Further details can be found in Geotechnical Investigation report PG6727-1 dated September 5, 2023.

Available surficial geological mapping provided by the Ontario Geological Survey (OGS MRD128) is generally consistent with the available historical surrounding Water Well Records (WWR). The mapping indicates that a fine-textured glaciomarine deposit consisting of a silt and clay deposit with minor sand and gravel exists over the majority of the subject site. The eastern portion of the site is mapped to consist of a till with stone-poor, sandy-silt to silty sand with sand textured till. The surrounding WWR's indicate clay, sand and gravel with some boulders in the overburden layer.

Available bedrock geological mapping provided by the Ontario Geological Survey (MRD 219) indicates that the bedrock underlying the subject site consists of dolostone,

minor shale and sandstone of the Oxford Formation in the Beekmantown Group. Available overburden thickness mapping shows a drift thickness of 5 to 10 m across the subject site.

Karst Mapping

Available Karst mapping (OGS GRS005) was reviewed as part of this assessment. The available mapping does not indicate the presence of any inferred or potential karstic features. Furthermore, no indication of karstic features was observed during the site visits completed by Paterson personnel.

Hydrogeological Sensitivity of the Site

The subject site currently consists of an existing church building with associated infrastructure and private servicing (potable well and septic system). The subject site is currently occupied by a one-story commercial building, specifically the Brunstad Christian Church. The subject site is bordered to the north, east and west by either agricultural or undeveloped land and to the south by Century Road followed by agricultural land and a residential dwelling. All surrounding properties are on private services.

According to the geotechnical field investigation, the overburden thickness was observed to be greater than 2 m. As the proposed site does not have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive. Separation distances are not required to be increased between the septic components and the onsite well.

To corroborate our position in this matter, the water quality of the bedrock aquifer targeted by the onsite drilled potable supply well shows no indication of surface water or surface impacts from sewage system effluent.

Total Daily Design Sanitary Sewage Flow (TDDSSF)

An approved Ottawa Septic System Office (OSSO) Sewage System Installation Permit (SSIP) will be submitted as part of the Site Plan control application submission. The approved OSSO SSIP is for a Total Daily Design Sanitary Sewage Flow (TDDSSF) of 6,040 L/day. Please refer to the approved OSSO SSIP for additional details.

Predictive Nitrate Impact Assessment

In order to demonstrate that private services would adequately support the proposed Site Plan application, a Predictive Nitrate Impact Assessment (NIA) for the subject site was completed. The values shown in the Predictive NIA attached to this report are summarized below.

- Site area 3.64 ha
- Impervious area (%) 30 %

- ❑ Daily sewage flow — 6.04 m^3/d
- ❑ Concentration of nitrate in effluent — 40 mg/L
  (Value based on typical effluent concentration)
- ❑ Concentration of nitrate in effluent with treatment — 20 mg/L
  (Value based on NSF245/BNQ certified nitrate reduction system with 50% nitrate reduction)
- ❑ Surplus Water — 341 mm/yr
  (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of a silt loam (Urban lawns / Shallow Rooted Crops) and anthropogenic sources.)
- ❑ Combined infiltration factor based on: — 0.50
  - Topography infiltration factor — 0.20
  - Soil texture infiltration factor — 0.20
  - Cover infiltration factor — 0.10

The topography infiltration factor of 0.20 is based upon a rolling land with an average slope of 2.8 to 3.8 m/km. The soil texture infiltration factor was based upon an “medium combinations of loam and clay” with a value of 0.2 which is a reasonable generalization based upon the site investigations and available geological mapping. The “cover infiltration factor” was calculated at 0.10 based upon a cultivated land type cover.

The calculation for a conventional septic system results in a predicted nitrate concentration of 13.48 mg/L nitrate for the subject site, using a value of 40 mg/L nitrate concentration within the effluent. This value was based upon a daily sewage flow of 6,040 L/day. It is expected that the actual usage should be lower. The inclusion of nitrate reduction technology (50 % nitrogen reduction in the of the effluent nitrate, BNQ or NSF 245 certified technology) would result in a nitrate concentration of **6.74 mg/L** at the property boundary using a value of 20 mg/L nitrate within the effluent, which is below the maximum property value of 10 mg/L nitrate.

Based on the results of the predictive NIA, it is our opinion that the property can adequately support the proposed Site Plan application without having an adverse impact on the underlying bedrock aquifer, provided that a BNQ/NSF 245 certified nitrate reduction system or similar technology is used in the sewage system.

Ottawa Septic System Office Sewage System Installation Permit

An approved Ottawa Septic System Office (OSSO) Sewage System Installation Permit (SSIP) will be submitted as part of the Site Plan control application submission. The approved OSSO permit needs to include a BNQ 3680-600 or NSF 245 certified technology. Any system that has a BNQ 3680-600 or NSF/ANSI 245 standard certification is capable of a minimum of 50 % nitrogen reduction in the effluent.

The approved OSSO SSIP that has been submitted with the Site Plan control application submission package contains a sewage system which is designed for a TDDSSF of 6,040 L/day. It includes an Eljen GSF denitrification system which is NSF 245 approved.

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 existing well is considered to be adequate to support the water quantity demands for the proposed building addition.

2. Based on a visual inspection performed by Paterson personnel, the well casing, stickup, well cap, and surrounding grading are of sufficient standard to meet O.Reg 903.

3. As TW1 currently provides potable water to the existing building, the client is familiar with the quality of the groundwater.

4. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness.

5. A residential grade water softener is recommended to facilitate the reduction of the hardness concentration, if desired by the owner. If a water softener is used for the proposed development, the owner should be made aware that additional sodium will be added to the water to reduce hardness. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source.

6. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets.

7. The site is not considered hydrogeologically sensitive.

8. The predicted nitrate concentrations at the property boundary is calculated to be below the required 10 mg/L threshold when a BNQ/NSF 245 certified technology with 50% nitrate reduction is used.

9. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction on the proposed warehouse addition or the proposed septic system.

10. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed building addition with respect to water quality, quantity and sewage system placement.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT

Erik Ardley, P.Geo

Attachments:

- ❑ Key Plan
- ❑ MECP Water Well Records
- ❑ Eurofins Certificate of Analysis
- ❑ Langelier Calculation
- ❑ AQTESOLV - Pumping Test Analysis Reports
- ❑ Nitrate Impact Assessment Calculations
- ❑ MECP Disinfection Instruction Sheet
- ❑ S.J. Lawrence Architect Incorporated - Proposed Site Plan, dated December 5, 2024

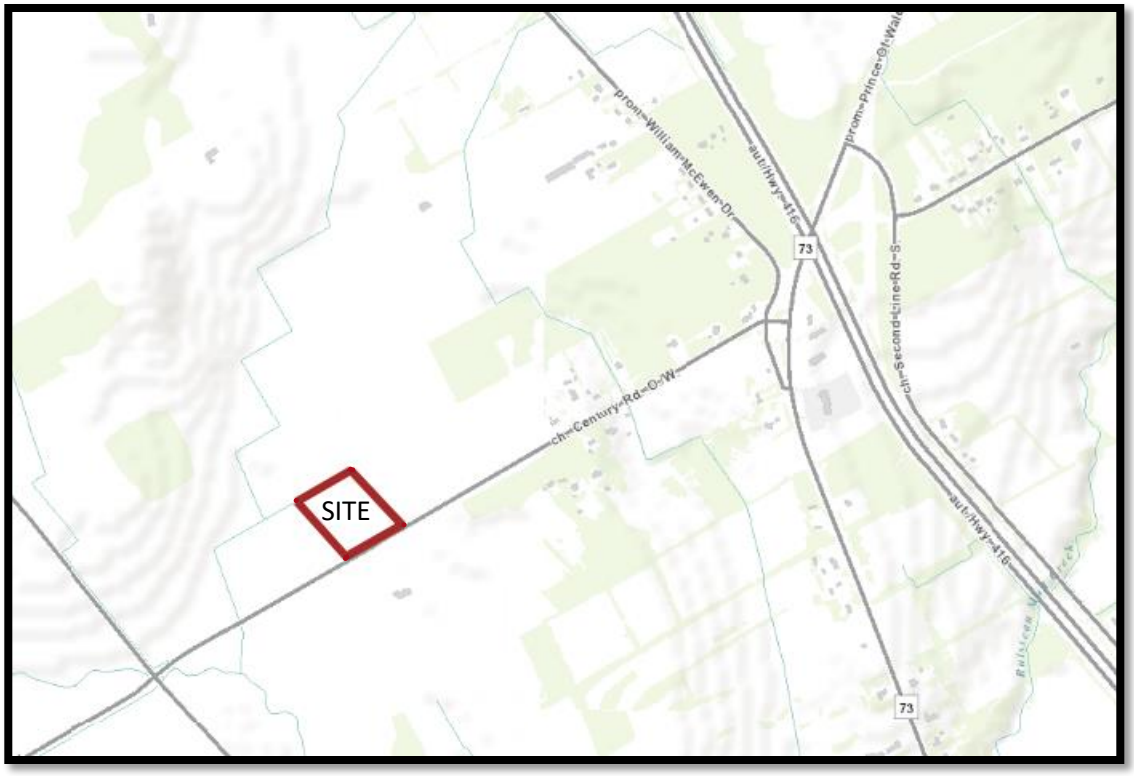


FIGURE 1

KEY PLAN

PATERSON GROUP

TW1

Ontario — Ministry of the Environment and Climate Change

Tag#: A 207617 (t Below)

A207617

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Measurements recorded in: ☐ Metric ☒ Imperial

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Rideau Christian Fellowship Centre		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1981 Century Road West	North Gower	ON	K0A 2T0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1981 Century Road West	Rideau	P/L 5	2

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa-Carleton	North Gower	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	441817	5003968	5R-13075	Part 2

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
	Sand & Gravel	+ Boulders		0'	38'
Grey	Limestone			38'	97'
White	Sandstone			97'	179'
White	Sandstone			179'	181'
White	Sandstone			181'	187'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/cu ft)
80'	70'	Neat cement	10.9
70'	0'	Bentonite slurry	50.4

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6¼"	Steel	.188"	+2'	80'
6⅛"	Open Hole		80'	187'

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0'	80'	9¾"
80'	187'	6⅛"

Results of Well Yield Testing

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

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 160

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 6.4"

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

Recommended pump depth (m/ft): 100'

Recommended pump rate (l/min / GPM): 20

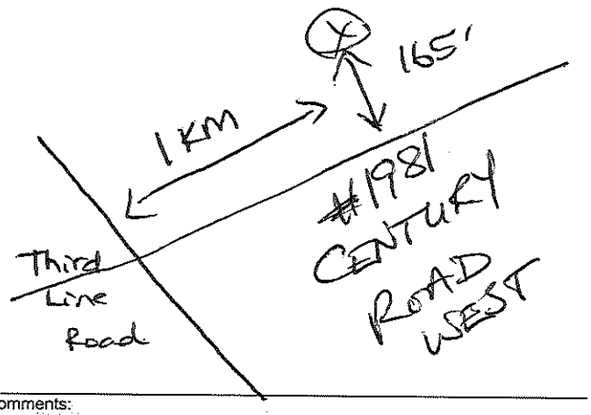
Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	5'7"			6.4'
1	6.2	1	5.7	
2	6.2	2	5.7	
3	6.2	3	5.7	
4	6.2	4	5.7	
5	6.3	5	5.7	
10	6.3	10	5.7	
15	6.3	15	5.7	
20	6.4	20	5.7	
25	6.4	25	5.7	
30	6.4	30	5.7	
40	6.4	40	5.7	
50	6.4	50	5.7	
60	6.4'	60	5.7'	

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 3/4 HP - 15 GPM SET @ 100 FT

Well Contractor and Well Technician Information

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

Business Address (Street Number/Name)	Municipality
6859 Franktown Road, RR#1	Richmond

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

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (Y Y Y Y M M D D)
13632		2017 04 28

Well owner's information package delivered	Date Package Delivered (Y Y Y Y M M D D)	Date Work Completed (Y Y Y Y M M D D)
☒ Yes ☐ No	2017 04 24	2017 04 19

Ministry Use Only

Audit No. Z237336

Received JUN 07 2017

0506E (2014/11)

Ministry's Copy

31 C/14g

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 1510643 | MUNICIP. 15004 | CON. GN 02

COUNTY OR DISTRICT: [redacted]

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: North Gower

CON., BLOCK, TRACT, SURVEY, ETC.: 2

LOT: ~~5~~ 005

[redacted] 6 Dover Cr Ottawa

DATE COMPLETED: DAY 04 MO. 06 YR 70

RC | ELEVATION | RC | BASIN CODE

0 3 9 5 0 | 4 | 0 3 1 0 | 4 | 2 5

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
brown	hardpan	boulders	hard	0	14
black	limestone		hard	14	66

31 | 0 0 1 4 6 1 4 1 3 | 0 0 6 6 8 1 5

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0064	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
05	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE	188	0	~~21~~ 0021
~~8~~			21	~~66~~
05	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			0066
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(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 FROM	DEPTH SET AT – FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 0010 GPM. | DURATION OF PUMPING: 01 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
010 FEET	013 FEET		013 FEET	013 FEET	013 FEET	013 FEET

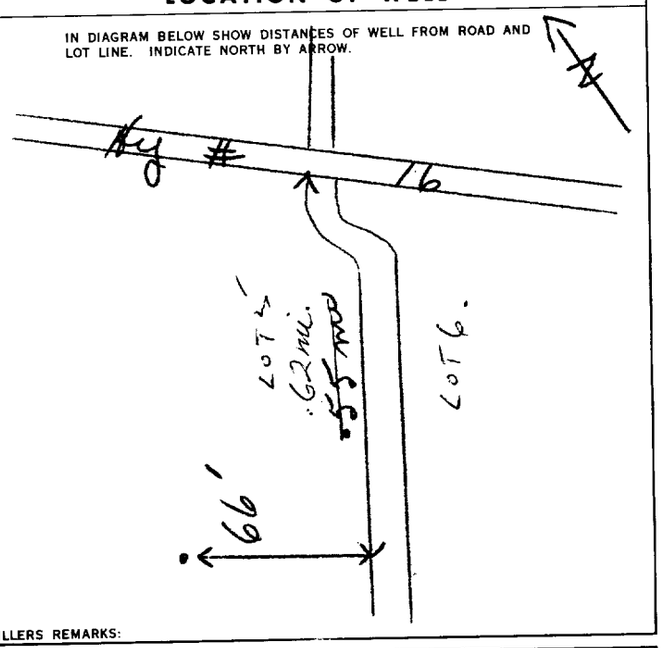
IF FLOWING, GIVE RATE: GPM. | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 050 FEET | RECOMMENDED PUMPING RATE: 0005 GPM.

GPM./FT. SPECIFIC CAPACITY: 003.3

LOCATION OF WELL

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



DRILLERS REMARKS:

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 ☐ UNFINISHED

WATER USE 01: 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply | LICENCE NUMBER: 1552

ADDRESS: 14 Ashford Dr Ottawa

NAME OF DRILLER OR BORER: B Acres | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Walter Kavanagh | SUBMISSION DATE: DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1558 | DATE RECEIVED: 210770

DATE OF INSPECTION | INSPECTOR

REMARKS:

OWRC COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

31G4g

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

11 1517431 MUNICIP 15004 CON. C9N 02

COUNTY OR DISTRICT: Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Richmond (North Gower)
CON., BLOCK, TRACT, SURVEY, ETC.: Con 2
LOT: 006
ADDRESS OF WELL LOCATION: RR#3, North Gower K0A 2T0
DATE COMPLETED: DAY 29 MO 05 YR 80
NORTHING: 03799 RC: 4 EASTING: 0310 RC: 4 BASIN CODE: 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	clay	stony		0	12
grey	gravel			12	16
grey	limestone			16	40

31 00122051 2 00162111 00402115

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
035	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	009
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

71 PUMPING TEST

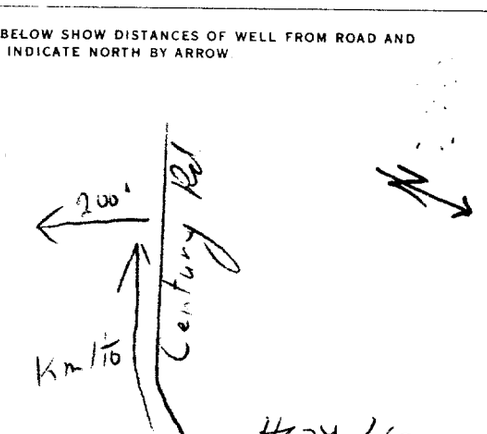
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0020 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
004 FEET	025 FEET		025 FEET	025 FEET	025 FEET	025 FEET

IF FLOWING GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 025 FEET
RECOMMENDED PUMPING RATE: 0010 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL: 1

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

WATER USE: 03

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

METHOD OF DRILLING: 5

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling — LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont
NAME OF DRILLER OR BORER: Henry Mains — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR:
SUBMISSION DATE: DAY 29 MO 5 YR 80

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 3644 DATE RECEIVED: 80 1280
DATE OF INSPECTION: INSPECTOR: K
REMARKS: CSS, ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1519576 15004 CoN 02

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

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Rideau	Conc. 2	6

DATE COMPLETED: DAY 09 MO 04 YR 85

[redacted] orthview Apt. # 8; Nepean, Ont. K2E 7E4

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Hardpan	Boulders & Gravel		0	19
Gray	Limestone		Hard	19	60

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
50	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	22
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		22	60
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	50 GPM	1 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
6 FEET	20 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	20 FEET	20 FEET	20 FEET	20 FEET

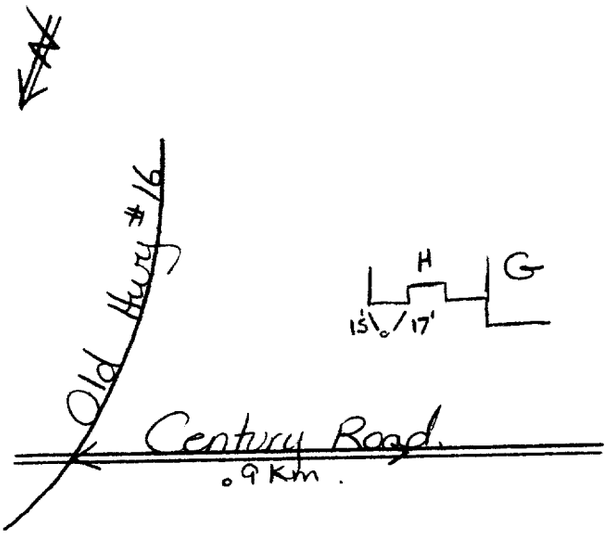
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	20 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	30 FEET	5 GPM

LOCATION OF WELL

6561

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



DRILLERS REMARKS

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 ☐ UNFINISHED
WATER USE	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER 9 ☐ NOT USED
METHOD OF DRILLING	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd. | LICENCE NUMBER: 1558

ADDRESS: Box 490; Stittsville, Ontario. K0A 3G0

NAME OF DRILLER OR BORER: S. Miller | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: W. Kawasaki | SUBMISSION DATE: DAY 09 MO 04 YR 85

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED: 16 04 85

DATE OF INSPECTION | INSPECTOR

REMARKS: WDE CSS S8

FORM NO. 0506—4—77 FORM 7

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 1520433

MUNICIP (10–14) CON. (15–22 23 24)

COUNTY OR DISTRICT: [redacted]

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Gowers / Manotick Ont

CON., BLOCK, TRACT, SURVEY, ETC.: 2

LOT (25-27): 5

DATE COMPLETED (44-53): DAY 28 MO 8 YR 85

LAT (10–17) LONG (18–24) RC (25) ELEVATION (26) RC (30) BASIN CODE (31): II III IV (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	clay			0	15
	gravel			15	24
grey	Limestone			24	97
	Sandstone			97	140

31

32 (1 2 10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
133	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 1 ☐ CONCRETE 4 ☐ OPEN HOLE	18	0	28
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	20 GPM	HOURS MINS 30

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
12 FEET	50 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	50 FEET	50 FEET	FEET	FEET

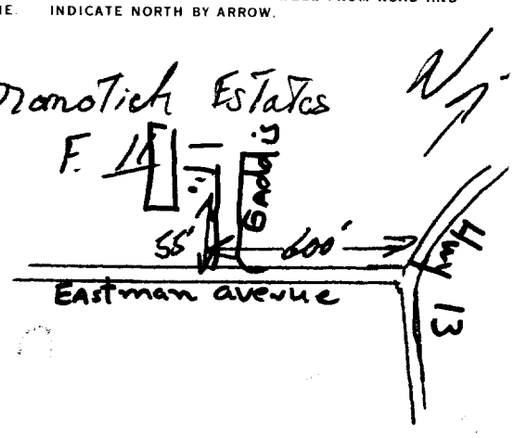
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	60 FEET	20 GPM

8668

LOCATION OF WELL

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



cap 10 cm from ground level.

DRILLERS REMARKS:

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 ☐ UNFINISHED

WATER USE

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

METHOD OF DRILLING

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Pit Rock Drilling Ltd — LICENCE NUMBER: 1119

ADDRESS: RR# 2 Jasper, Ont

NAME OF DRILLER OR BORER: Wallace Desaulniers — LICENCE NUMBER: 1119

SIGNATURE OF CONTRACTOR: [signature] — SUBMISSION DATE: DAY 10 MO. 2 YR. 86

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED 200286

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS. ES

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 1523375 | MUNICIP 15004 | CON. CON | 02

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON BLOCK, TRACT, SURVEY ETC	LOT
	Rideau	2	6

[redacted] R. #3 North Gower, Ontario K0A 2T0

DATE COMPLETED: DAY 16 MO 02 YR 89

RC | ELEVATION | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Hardpan	Boulders	Packed	0	13
Gray	Hardpan	Boulders	Packed	13	17
Gray	Limestone		Medium Hard	17	50

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
46	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	21
6	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☒ PLASTIC		21	50
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
Grouted	Cement	

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 25 GPM

DURATION OF PUMPING: 1 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☒ PUMPING 2 ☐ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
10 FEET	20 FEET		20 FEET	20 FEET	20 FEET	20 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: 20 FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

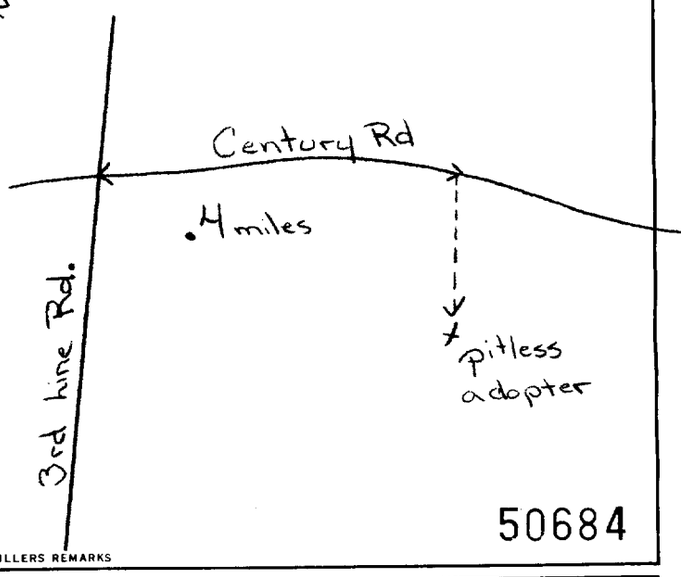
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 30 FEET

RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

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



50684

DRILLERS REMARKS

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 ☐ UNFINISHED ☐ DEWATERING

WATER USE

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

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 ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd.

WELL CONTRACTOR'S LICENCE NUMBER: 1558

ADDRESS: Box 490 Stittsville, Ontario K0A 3G0

NAME OF WELL TECHNICIAN: S. Miller

WELL TECHNICIAN'S LICENCE NUMBER: T0097

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]

SUBMISSION DATE: DAY 16 MO 02 YR 89

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 1558 | DATE RECEIVED: APR 06 1989

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS. FS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 1526027 — MUNICIP 15004 — CON. CON — 02

COUNTY OR DISTRICT: [redacted] — TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rideau North Gower Ont — CON, BLOCK, TRACT, SURVEY, ETC: 2 — LOT: 6

DATE COMPLETED: DAY 25 MO 10 YR 91

RC — ELEVATION — RC — BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	sand, gravel & boulders			0	27
	limestone			27	100

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
33	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
94	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	32
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
5	32	Cement grout

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 40 GPM — DURATION OF PUMPING: 1 HOURS ___ MINS

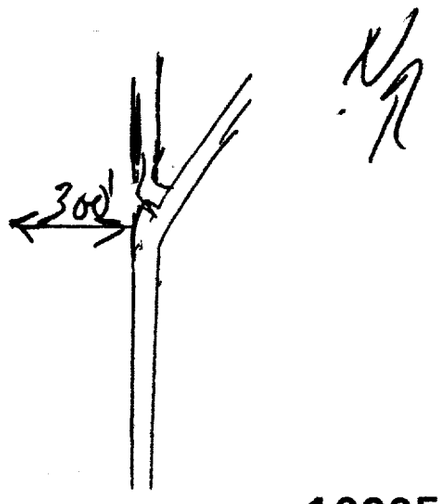
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
10 FEET	50 FEET	50 FEET	50 FEET	50 FEET	50 FEET

IF FLOWING GIVE RATE: ___ GPM — PUMP INTAKE SET AT: ___ FEET — WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP — RECOMMENDED PUMP SETTING: 60 FEET — RECOMMENDED PUMPING RATE: 40 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 102059

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 ☐ UNFINISHED; ☐ DEWATERING

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

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; ☐ DIGGING; ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Air-Rock Drilling Co Ltd — WELL CONTRACTOR'S LICENCE NUMBER: 1119

ADDRESS: RR#2 Jasper Ont

NAME OF WELL TECHNICIAN: Kenny Desaulniers — WELL TECHNICIAN'S LICENCE NUMBER: T0004

SIGNATURE OF TECHNICIAN/CONTRACTOR: Kenny Desaulniers — SUBMISSION DATE: DAY ___ MO ___ YR ___

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR: 1119 — DATE RECEIVED: JAN 30 1992

DATE OF INSPECTION — INSPECTOR

REMARKS: CSS, ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/88) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 1527457 MUNICIP. 15004 CON. CON 02

COUNTY OR DISTRICT: [redacted]
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: [redacted]eau
CON: 2
LOT: 5
ADDRESS OF WELL LOCATION: [redacted]anotick, Ontario K0A 2N0
DATE COMPLETED: DAY 22 MO 9 YR 93
OVERBURDEN: RC: ELEVATION: RC: BASIN CODE: I II III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
			Note; Water level was 18 feet when well was plugged		

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
15-18	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
20-23	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
25-28	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
30-33	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
10-11	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			13-16
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			20-23
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER INCHES 34-38	LENGTH FEET 39-40
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET 41-44	80

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
10-13 185	14-17 80	1/4" clear chrushed rock
18-21 80	22-25 6	3/4" Hole plug
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD 10: 1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE 11-14 GPM
DURATION OF PUMPING 15-16 HOURS 17-18 MINS

STATIC LEVEL FEET	WATER LEVEL END OF PUMPING FEET	WATER LEVELS DURING 25: 1 ☐ PUMPING 2 ☐ RECOVERY 15 MINUTES FEET	30 MINUTES FEET	45 MINUTES FEET	60 MINUTES FEET
19-21	22-24	26-28	29-31	32-34	35-37

IF FLOWING GIVE RATE 38-41 GPM
PUMP INTAKE SET AT FEET
WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING 43-45 FEET
RECOMMENDED PUMPING RATE 46-49 GPM
50-53

FINAL STATUS OF WELL 54

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

WATER USE 55-56

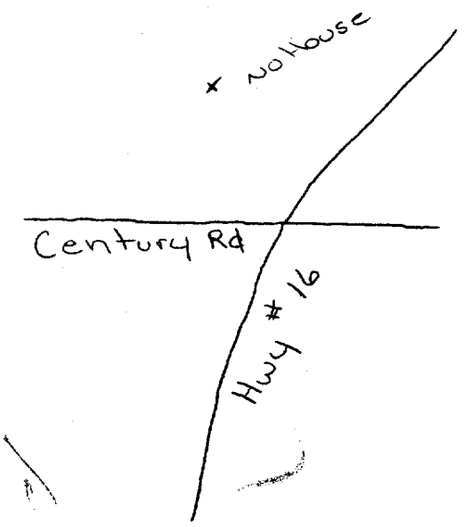
1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION 57

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

LOCATION OF WELL

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



DRILLERS REMARKS 138001

CONTRACTOR

NAME OF WELL CONTRACTOR: Capital Water Supply Ltd.
WELL CONTRACTOR'S LICENCE NUMBER: 1558
ADDRESS: Box 490 Stittsville, Ontario K2S 1A6
NAME OF WELL TECHNICIAN: S. Miller/ W. Kavanagh
WELL TECHNICIAN'S LICENCE NUMBER: T0097/T0095
SIGNATURE OF TECHNICIAN/CONTRACTOR: Walter Kavanagh
SUBMISSION DATE: DAY 24 MO 9 YR 93

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE 58
CONTRACTOR 59-62: 1558
DATE RECEIVED 63-68: OCT 14 1993
DATE OF INSPECTION
INSPECTOR
REMARKS: COULD NOT LOCATE ORIGINAL WATER WELL RECORD. OCT. 14/93. AS.
CSS. RS

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 (1 2) — 1528268 — MUNICIP. (10-14) 1500A — CON. (15-22) CON 102

COUNTY OR DISTRICT: [redacted] Carleton
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rideau North Gower
CON, BLOCK, TRACT, SURVEY, ETC: Con 2
LOT (23-25): 5
DATE COMPLETED (48-53): DAY 13 MO 10 YR 94
[redacted] North Gower
(10 12 17 18 24 RC 25 ELEVATION 26 RC 30 BASIN CODE 31 II III IV 47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
grey	clay			0	9
grey	hardpan	stones		9	36
grey	~~boulders~~ gravel			36	38

31 (1 2 10 14 15 21 32 43 54 65 75 80)
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER						
38	1 ☐ FRESH	2 ☐ SALTY	3 ☐ SULPHUR	4 ☐ MINERALS	6 ☐ GAS	Not Tested	
	1 ☐ FRESH	2 ☐ SALTY	3 ☐ SULPHUR	4 ☐ MINERALS	6 ☐ GAS		
	1 ☐ FRESH	2 ☐ SALTY	3 ☐ SULPHUR	4 ☐ MINERALS	6 ☐ GAS		
	1 ☐ FRESH	2 ☐ SALTY	3 ☐ SULPHUR	4 ☐ MINERALS	6 ☐ GAS		
	1 ☐ FRESH	2 ☐ SALTY	3 ☐ SULPHUR	4 ☐ MINERALS	6 ☐ GAS		

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☒ STEEL, 2 ☐ GALVANIZED, 3 ☐ CONCRETE, 4 ☐ OPEN HOLE, 5 ☐ PLASTIC	.188	0	38
	1 ☐ STEEL, 2 ☐ GALVANIZED, 3 ☐ CONCRETE, 4 ☐ OPEN HOLE, 5 ☐ PLASTIC			
	1 ☐ STEEL, 2 ☐ GALVANIZED, 3 ☐ CONCRETE, 4 ☐ OPEN HOLE, 5 ☐ PLASTIC			

SCREEN

SIZE(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 FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
		cement grouted

71 PUMPING TEST

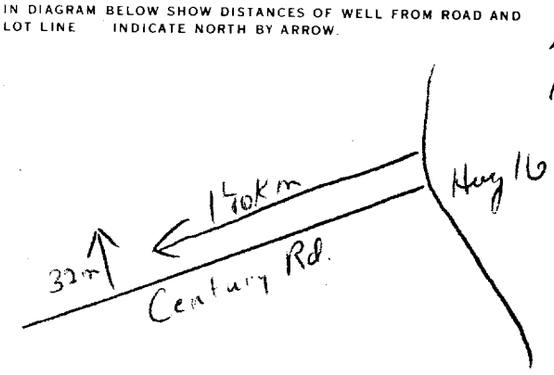
PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 20 GPM
DURATION OF PUMPING: 1 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
8 FEET	25 FEET		8 FEET	8 FEET	8 FEET	8 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY
RECOMMENDED PUMP TYPE: ~~SHALLOW~~ ☐ DEEP
RECOMMENDED PUMP SETTING: 25 FEET
RECOMMENDED PUMPING RATE: 10 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 137510

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 ☐ UNFINISHED; ☐ DEWATERING

WATER USE

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

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; ☐ DIGGING; ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: H. Mains Well Drilling — WELL CONTRACTOR'S LICENCE NUMBER: 3644
ADDRESS: Box 326 Richmond Ont.
NAME OF WELL TECHNICIAN: Henry Mains — WELL TECHNICIAN'S LICENCE NUMBER: T-5564
SIGNATURE OF TECHNICIAN/CONTRACTOR
SUBMISSION DATE: DAY 13 MO 10 YR 94

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 3644 | DATE RECEIVED NOV 03 1994
DATE OF INSPECTION | INSPECTOR
REMARKS
CSS, GS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 (1 2) **1530048**

Municipality (10–14): 15004 Con. (15–22): CON 02

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
[redacted]	Rideau	2	6

Address: 1890 Century Road North Gower Ontario K0A 2T0

Date completed (48-53): 2 day 7 month 98 year

21 (1 2) Northing (10–17) Easting (18–24) RC (25 26) Basin Code (30 31): i ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	Clay		Packed	0	9
Brown	Hardpan	Boulders		9	14
Gray	Limestone		Layered &	14	20
Gray	Limestone		Medium Hard	20	148
Gray & White	Sandstone		Hard	148	190

31 (10 14 15 21 32 43 54 65 75 80)

32 (10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water
183	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
NOT TESTED	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4	1 ☐ Steel 2 ☒ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	44.5
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		44.5	190
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

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

Material and type | Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
43'6"	0	Grouted Cement (16)

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer

Pumping rate: 15 GPM

Duration of pumping: 1 Hours ..... Mins

Static level: 11'1" feet

Water level end of pumping: 30 feet

Water levels during: 1 ☐ Pumping 2 ☐ Recovery

15 minutes	30 minutes	45 minutes	60 minutes
12'11" feet	12'3" feet	12'2" feet	11'11" feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☒ Cloudy

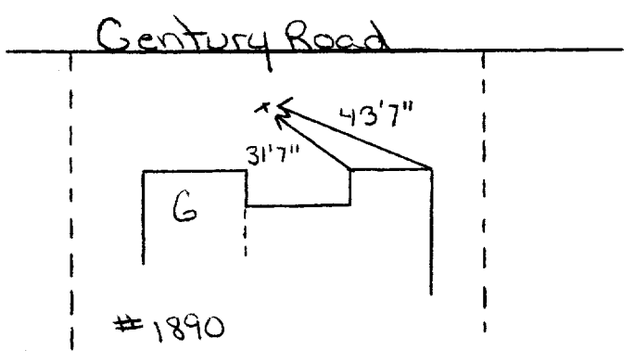
Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump setting: 60 feet

Recommended pump rate: 5 GPM

LOCATION OF WELL

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



183899

FINAL STATUS OF WELL (54)

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 (55-56)

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 (57)

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: Capital Water Supply Ltd.
Well Contractor's Licence No.: 1558

Address: P.O. Box 490 Stittsville, Ontario K2S 1A6

Name of Well Technician: S. Miller
Well Technician's Licence No.: T0097

Signature of Technician/Contractor

Submission date: day 3 mo 7 yr 98

MINISTRY USE ONLY

Data source (58) | Contractor (59-62): 1558 | Date received (63-68): JUL 22 1998 (80)

Date of inspection | Inspector

Remarks: CSS. S9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

Ontario

Ministry of the Environment and Climate Change

Measurements recorded in: [X] Metric [ ] Imperial

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

A165087

Tag #: A165087

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1934 Century Road, West	Rideau		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	North Gower	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	442228	5004016		

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
Brown	Sandy Soil	Stones	Loose	0	2.74
Grey	Sandy Soil		Packed	2.74	5.48
Grey	Gravel	Broken Rock	Very Wet	5.48	6.40
Grey	Limestone		Hard	6.40	36.57
Grey & White	Sandstone		Hard	36.57	45.10

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
7.31	0	Grouted Cement & Bentonite	.884m^3

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
27.13			0	7.31
15.86	Steel	.48	+2.43	7.31

Construction Record - Screen

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

Status of Well

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

Results of Well Yield Testing

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

If pumping discontinued, give reason:

Pump intake set at (m/ft): 30.47

Pumping rate (l/min / GPM): 45.5

Duration of pumping: 1 hrs + _____ min

Final water level end of pumping (m/ft): 9.16

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

Recommended pump depth (m/ft): 30.47

Recommended pump rate (l/min / GPM): 45.5

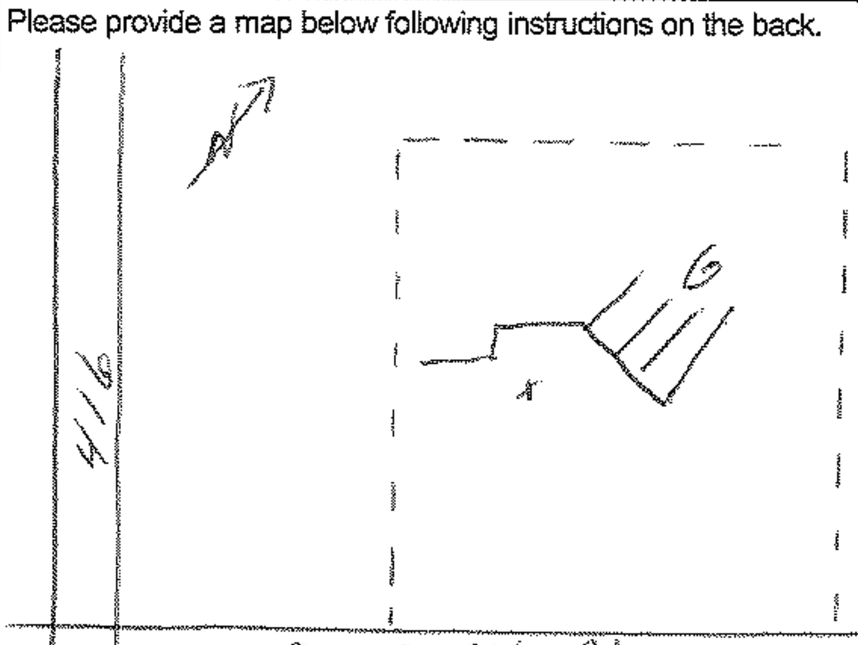
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	6.00		
1	7.45	1	7.10
2	7.97	2	6.58
3	8.27	3	6.29
4	8.45	4	6.21
5	8.63	5	6.17
10	8.91	10	6.10
15	9.02	15	6.08
20	9.10	20	6.04
25	9.12	25	6.03
30	9.14	30	6.02
40	9.15	40	6.00
50	9.16	50	6.00
60	9.16	60	6.00

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Water Details

Water found at Depth	Kind of Water	
11.58 (m/ft) [ ] Gas	[ ] Fresh [X] Untested	[ ] Other, *specify* _____
Water found at Depth 43.27 (m/ft) [ ] Gas	[ ] Fresh [X] Untested	[ ] Other, *specify* _____
Water found at Depth (m/ft) [ ] Gas	[ ] Fresh [ ] Untested	[ ] Other, *specify* _____

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	7.31	15.86
7.31	45.10	15.23

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Capital Water Supply Ltd.	1558

Business Address (Street Number/Name)	Municipality
Box 490	Stittsville

Province	Postal Code	Business E-mail Address
Ontario	K2S1A6	office capitalwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138361766	Miller, Stephen

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
0097		2016092 0

Well owner's information package delivered	Date Package Delivered	Date Work Completed
[X] Yes [ ] No	20160919	20160808

Ministry Use Only

Audit No. Z226817

Received MAY 25 2017

0506E (2014/11)

Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☑ Metric ☐ Imperial

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

Tag#: A250952

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1978 Century rd West	Rideau		

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa-carleton	North Gower	Ontario	K0A2T0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	441940	5003841		

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

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
.1m	1.75m	bentonite	.35m^3

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.86	steel	.48	+.45m	1.75m
10	steel	.48	1.75m	unknown

Construction Record - Screen

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

Status of Well

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

Water Details

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

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)

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)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

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

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

Recommended pump depth *(m/ft)*

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

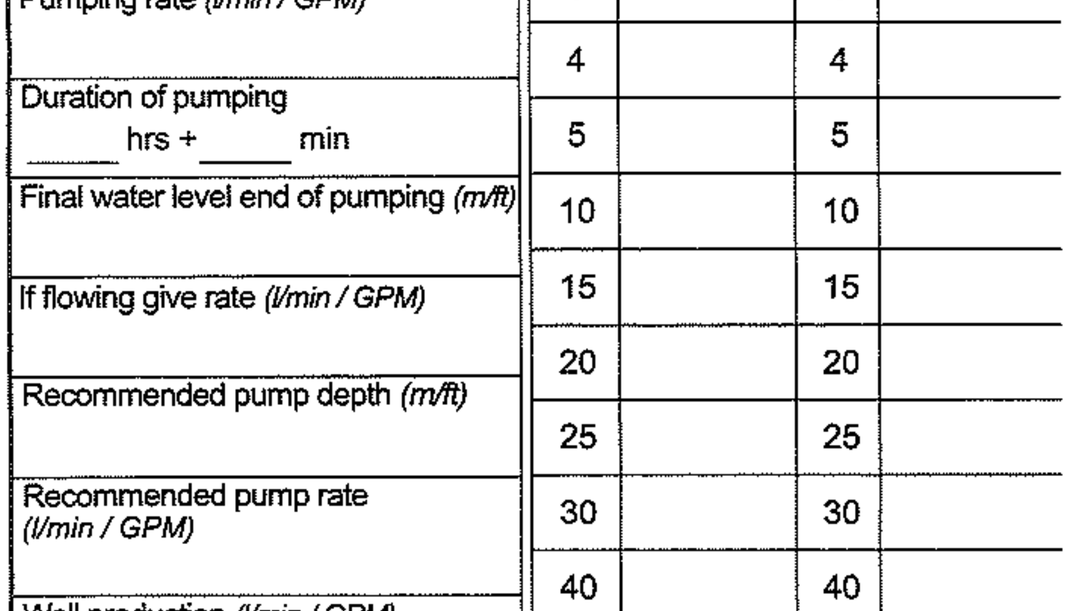
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

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

Map of Well Location

Please provide a map below following instructions on the back.



Comments: extend well casing above grade

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
H.O. Wright + Sons Limited	6357

Business Address (Street Number/Name)	Municipality
2383 Church st. North Gower	

Province	Postal Code	Business E-mail Address
ON	K0A2T0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6134893372	Wilson, Wendel

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
4084	Wendel Wil	2019/06/12

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2019/06/12

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Audit No. Z291350

AUG 15 2019 Received

0506E (2014/11) Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

W Tag#:A260841 (Print Below)

A260841

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1942 Century Road West	Rideau	P/L 6	2

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Noth Gower	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	442123	5004062		

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
	Sand	& Gravel & Boulders		0'	41'
Grey	Limestone			41'	105'
Grey	Limestone			105'	155'
Grey	Limestone			155'	163'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/imp gal)
80'	70'	Neat cement	9.36
70'	0'	Bentonite slurry	16.8

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 1/4"	Steel	.188"	+2'	80'
6"	Open Hole		80'	163'

Construction Record - Screen

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

Status of Well

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

Results of Well Yield Testing

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

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 140

Pumping rate (l/min / GPM): 10

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 57.2'

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

Recommended pump depth (m/ft): 140'

Recommended pump rate (l/min / GPM): 10 10GPM

Well production (l/min / GPM): 10

Disinfected? ☒ Yes ☐ No

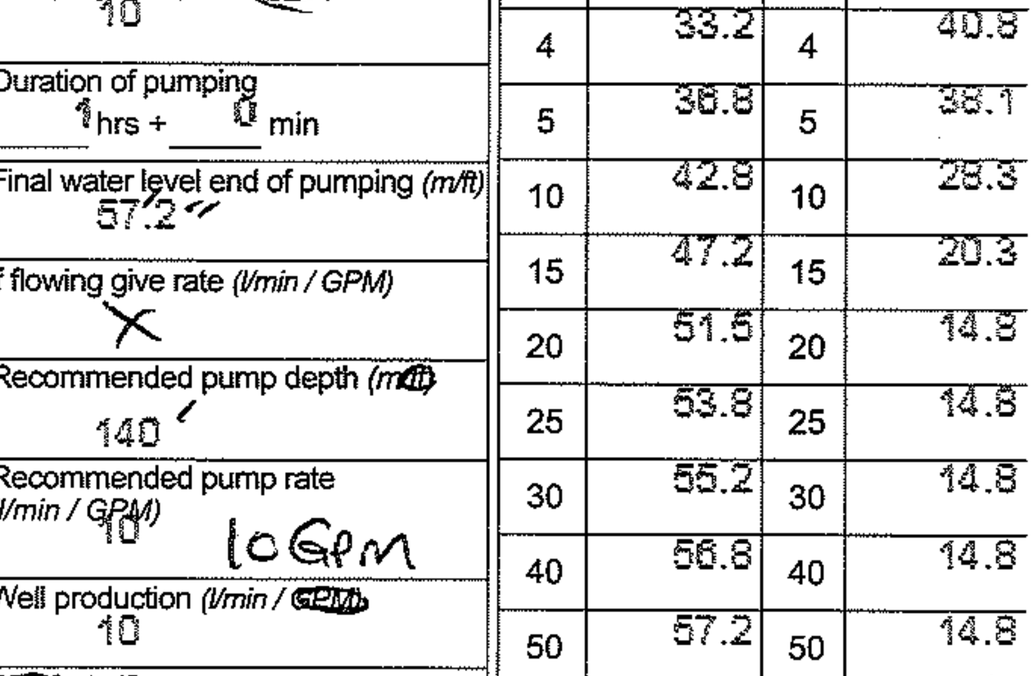
Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	14'8"		57.2'
1	20.3	1	48.6
2	25.5	2	45.5
3	29.3	3	42.9
4	33.2	4	40.8
5	36.8	5	38.1
10	42.8	10	28.3
15	47.2	15	20.3
20	51.5	20	14.8
25	53.8	25	14.8
30	55.2	30	14.8
40	56.8	40	14.8
50	57.2	50	14.8
60	57.2"	60	14'8"

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	To	Diameter (cm/in)
105 ☐ Gas	☐ Fresh ☒ Untested ☐ Other, *specify*		0' 80'	9 3/4"
155 ☐ Gas	☐ Fresh ☒ Untested ☐ Other, *specify*		80' 163'	6"
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1/2HP - 10 GPM Set @ 140 FT

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Air Rock Drilling Co. Ltd.	7681

Business Address (Street Number/Name)	Municipality
6538 Fankitown Road	Richmond

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

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6138382170	Hogan, Dan

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (Y Y Y Y M M D D)
13058		2019 08 30

Well owner's information package delivered	Date Package Delivered (Y Y Y Y M M D D)	Date Work Completed (Y Y Y Y M M D D)
☒ Yes ☐ No	2019 08 01	2019 07 24

Ministry Use Only

Audit No. Z302357

Received OCT 11 2019

0506E (2014/11) Ministry's Copy

Certificate of Analysis

Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 57758
Invoice to: Paterson Group

Report Number: 1998379
Date Submitted: 2023-06-21
Date Reported: 2023-07-05
Project: PH4720
COC #: 908628

Dear Alex Schopf:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Rebecca Koshy
2023.07.05
18:39:22 -04'00'

APPROVAL: _____
Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

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Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Client: Paterson Group
9 Auriga Dr
Nepean, ON
K2E 7T9
Attention: Mr. Alex Schopf
PO#: 57758
Invoice to: Paterson Group

Report Number: 1998379
Date Submitted: 2023-06-21
Date Reported: 2023-07-05
Project: PH4720
COC #: 908628

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	
					1692147 GW 2023-06-20 GW1	1692148 GW 2023-06-20 GW2
Anions	Cl	1	mg/L	AO 250	65	65
	F	0.10	mg/L	MAC 1.5	0.36	0.35
	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
	SO4	1	mg/L	AO 500	34	33
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	179	179
	Colour (Apparent)	2	TCU	AO 5	17*	15*
	Conductivity	5	uS/cm		563	558
	DOC	0.5	mg/L	AO 5	2.3	2.1
	pH	1.00		6.5-8.5	7.82	7.85
	Phenols	0.001	mg/L		<0.001	<0.001
	S2-	0.02	mg/L	AO 0.05	<0.02	<0.02
	TDS (COND - CALC)	1	mg/L	AO 500	366	363
	Turbidity	0.1	NTU	AO 5	2.1	1.3
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100	243*	243*
Indices/Calc	Ion Balance	0.01			0.96	0.96
Metals	Ag	0.0001	mg/L		<0.0001	<0.0001
	Al	0.01	mg/L	OG 0.1	<0.01	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0	0.05	0.05
	Ba	0.01	mg/L	MAC 1.0	0.18	0.18
	Be	0.0005	mg/L		<0.0005	<0.0005
	Ca	1	mg/L		61	61
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001
	Co	0.0002	mg/L		<0.0002	<0.0002

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Group	Analyte	MRL	Units	Guideline	1692147 GW 2023-06-20 GW1	1692148 GW 2023-06-20 GW2
	Lab I.D.				1692147	1692148
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2023-06-20	2023-06-20
	Sample I.D.				GW1	GW2
Metals	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1	0.004	0.003
	Fe	0.03	mg/L	AO 0.3	0.38*	0.29
	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001
	K	1	mg/L		3	3
	Mg	1	mg/L		22	22
	Mn	0.01	mg/L	AO 0.05	<0.01	<0.01
	Mo	0.005	mg/L		<0.005	<0.005
	Na	1	mg/L	AO 200	22	21
	Ni	0.005	mg/L		<0.005	<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	<0.0005	<0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Sr	0.001	mg/L		0.695	0.685
	Tl	0.0001	mg/L		<0.0001	<0.0001
	U	0.001	mg/L	MAC 0.02	<0.001	<0.001
	V	0.001	mg/L		<0.001	<0.001
	Zn	0.01	mg/L	AO 5	<0.01	<0.01
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0	0
	Total Coliforms	0	ct/100mL	MAC 0	0	0
Nutrients	N-NH3	0.020	mg/L		0.058	0.057
	Total Kjeldahl Nitrogen	0.100	mg/L		0.146	0.117
Subcontract-Inorg	Tannin & Lignin	0.5	mg/L		<0.5	<0.5
VOCs Surrogates	1,2-dichloroethane-d4	0	%		119	121
	4-bromofluorobenzene	0	%		94	93

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Group	Analyte	MRL	Units	Guideline	1692147 GW 2023-06-20 GW1	1692148 GW 2023-06-20 GW2
	Lab I.D.				1692147	1692148
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2023-06-20	2023-06-20
	Sample I.D.				GW1	GW2
VOCs Surrogates	Toluene-d8	0	%		99	99
Volatiles	1,1,1,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,1-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L		<0.5	<0.5
	1,1,2-trichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethane	0.4	ug/L		<0.4	<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC 14	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 200	<0.4	<0.4
	1,2-dichloroethane	0.5	ug/L	IMAC 5	<0.5	<0.5
	1,2-dichloropropane	0.5	ug/L		<0.5	<0.5
	1,3,5-trimethylbenzene	0.3	ug/L		<0.3	<0.3
	1,3-dichlorobenzene	0.4	ug/L		<0.4	<0.4
	1,3-Dichloropropylene (cis+trans)	0.5	ug/L		<0.5	<0.5
	1,4-dichlorobenzene	0.4	ug/L	MAC 5	<0.4	<0.4
	Acetone	5	ug/L		<5	<5
	Benzene	0.5	ug/L	MAC 1	<0.5	<0.5
	Bromodichloromethane	0.3	ug/L		<0.3	<0.3
	Bromoform	0.4	ug/L		<0.4	<0.4
	Bromomethane	0.5	ug/L		<0.5	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L		<0.4	<0.4
	c-1,3-Dichloropropylene	0.5	ug/L		<0.5	<0.5
	Carbon Tetrachloride	0.2	ug/L	MAC 2	<0.2	<0.2
	Chloroethane	0.5	ug/L		<0.5	<0.5
	Chloroform	0.5	ug/L		<0.5	<0.5
	Dibromochloromethane	0.3	ug/L		<0.3	<0.3

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Project: PH4720
COC #: 908628

Group	Analyte	MRL	Units	Guideline	1692147 GW 2023-06-20 GW1	1692148 GW 2023-06-20 GW2
	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.					
Volatiles	Dichlorodifluoromethane	0.5	ug/L		<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50	<4.0	<4.0
	Ethylbenzene	0.5	ug/L	MAC 140	<0.5	<0.5
	Ethylene Dibromide	0.2	ug/L		<0.2	<0.2
	Hexane	5	ug/L		<5	<5
	m/p-xylene	0.4	ug/L		<0.4	<0.4
	Methyl Ethyl Ketone (MEK)	2	ug/L		<2	<2
	Methyl Isobutyl Ketone (MIBK)	5	ug/L		<5	<5
	Methyl Tert Butyl Ether (MTBE)	2	ug/L	AO 15	<2	<2
	Monochlorobenzene	0.5	ug/L	MAC 80	<0.5	<0.5
	o-xylene	0.4	ug/L		<0.4	<0.4
	Styrene	0.5	ug/L		<0.5	<0.5
	t-1,2-Dichloroethylene	0.4	ug/L		<0.4	<0.4
	t-1,3-Dichloropropylene	0.5	ug/L		<0.5	<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 10	<0.3	<0.3
	Toluene	0.4	ug/L	MAC 60	<0.4	<0.4
	Trichloroethylene	0.3	ug/L	MAC 5	<0.3	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5	<0.5
	Vinyl Chloride	0.2	ug/L	MAC 1	<0.2	<0.2
	Xylene; total	0.5	ug/L	MAC 90	<0.5	<0.5

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 443724 **Analysis/Extraction Date** 2023-06-22 **Analyst** L V **Method** AMBCOLM1			
Escherichia Coli			
Total Coliforms			
Run No 443744 **Analysis/Extraction Date** 2023-06-21 **Analyst** M E **Method** C SM2130B			
Turbidity	<0.1 NTU	102	70-130
Run No 443771 **Analysis/Extraction Date** 2023-06-22 **Analyst** AaN **Method** C SM2120C			
Colour (Apparent)	<2 TCU	103	90-110
Run No 443789 **Analysis/Extraction Date** 2023-06-22 **Analyst** AaN **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	106	90-110
N-NO3	<0.10 mg/L	108	90-110
SO4	<1 mg/L	105	90-110
Run No 443800 **Analysis/Extraction Date** 2023-06-22 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	107	70-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 443810 **Analysis/Extraction Date** 2023-06-22 **Analyst** SD **Method** EPA 200.8			
Silver	<0.0001 mg/L	95	80-120
Aluminum	<0.01 mg/L	104	80-120
Arsenic	<0.001 mg/L	86	80-120
Boron (total)	<0.01 mg/L	94	80-120
Barium	<0.01 mg/L	86	80-120
Beryllium	<0.0005 mg/L	97	80-120
Cadmium	<0.0001 mg/L	94	80-120
Cobalt	<0.0002 mg/L	91	80-120
Chromium Total	<0.001 mg/L	98	80-120
Copper	<0.001 mg/L	93	80-120
Iron	<0.03 mg/L	88	80-120
Mercury	<0.0001 mg/L	110	80-120
Manganese	<0.01 mg/L	93	80-120
Molybdenum	<0.005 mg/L	83	80-120
Nickel	<0.005 mg/L	93	80-120
Lead	<0.001 mg/L	95	80-120

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Antimony	<0.0005 mg/L	113	80-120
Selenium	<0.001 mg/L	94	80-120
Strontium	<0.001 mg/L	93	80-120
Thallium	<0.0001 mg/L	96	80-120
Uranium	<0.001 mg/L	90	80-120
Vanadium	<0.001 mg/L	89	80-120
Zinc	<0.01 mg/L	94	80-120
Run No 443842 **Analysis/Extraction Date** 2023-06-22 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	104	80-120
Run No 443845 **Analysis/Extraction Date** 2023-06-22 **Analyst** AET **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	101	90-110
F	<0.10 mg/L	102	90-110
pH		100	90-110
Run No 443947 **Analysis/Extraction Date** 2023-06-23 **Analyst** PJ **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	88	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Trichloroethane, 1,1,1-	<0.4 ug/L	81	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	109	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	87	60-130
Dichloroethane, 1,1-	<0.4 ug/L	102	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	91	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	104	60-130
Dichloroethane, 1,2-	<0.5 ug/L	82	60-130
Dichloropropane, 1,2-	<0.5 ug/L	82	60-130
1,3,5-trimethylbenzene	<0.3 ug/L	109	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	100	60-130
Dichloropropene,1,3-			
Dichlorobenzene, 1,4-	<0.4 ug/L	100	60-130
Acetone	<5 ug/L	80	60-130
Benzene	<0.5 ug/L	84	60-130
Bromodichloromethane	<0.3 ug/L	102	60-130
Bromoform	<0.4 ug/L	84	60-130
Bromomethane	<0.5 ug/L	101	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	110	60-130

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Analyte	Blank	QC % Rec	QC Limits
Dichloropropene,1,3-cis-	<0.5 ug/L	102	60-130
Carbon Tetrachloride	<0.2 ug/L	83	60-130
Chloroethane	<0.5 ug/L	103	60-130
Chloroform	<0.5 ug/L	103	60-130
Dibromochloromethane	<0.3 ug/L	83	60-130
Dichlorodifluoromethane	<0.5 ug/L	92	60-130
Methylene Chloride	<4.0 ug/L	107	60-130
Ethylbenzene	<0.5 ug/L	80	60-130
Ethylene dibromide	<0.2 ug/L	89	60-130
Hexane (n)	<5 ug/L	100	60-130
m/p-xylene	<0.4 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	120	60-130
Methyl Isobutyl Ketone	<5 ug/L	110	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	100	60-130
Chlorobenzene	<0.5 ug/L	83	60-130
o-xylene	<0.4 ug/L	102	60-130
Styrene	<0.5 ug/L	99	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	103	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichloropropene,1,3-trans-	<0.5 ug/L	96	60-130
Tetrachloroethylene	<0.3 ug/L	110	60-130
Toluene	<0.4 ug/L	108	60-130
Trichloroethylene	<0.3 ug/L	99	60-130
Trichlorofluoromethane	<0.5 ug/L	110	60-130
Vinyl Chloride	<0.2 ug/L	99	60-130
Run No 443965 **Analysis/Extraction Date** 2023-06-26 **Analyst** PJ **Method** EPA 8260			
Xylene Mixture			
Run No 444352 **Analysis/Extraction Date** 2023-06-27 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	104	50-120
Run No 444385 **Analysis/Extraction Date** 2023-06-27 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	101	90-110
Potassium	<1 mg/L	110	87-113
Magnesium	<1 mg/L	100	76-124
Sodium	<1 mg/L	109	82-118

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 444466 **Analysis/Extraction Date** 2023-06-27 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 444495 **Analysis/Extraction Date** 2023-06-27 **Analyst** AsA **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	87	80-120
Run No 444500 **Analysis/Extraction Date** 2023-06-27 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	96	80-120
Run No 444943 **Analysis/Extraction Date** 2023-07-05 **Analyst** R K **Method** SUBCONTRACT-CA-INORG			
Tannin & Lignin	<0.5 mg/L		

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PO#: 57758
Invoice to: Paterson Group

Report Number: 1998379
Date Submitted: 2023-06-21
Date Reported: 2023-07-05
Project: PH4720
COC #: 908628

Sample Comment Summary

Sample ID: 1692147	GW1	S2-	MRL elevated due to matrix interference (dilution was done).
Sample ID: 1692148	GW2	S2-	MRL elevated due to matrix interference (dilution was done).

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

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1981 Centruy Road

PH4720

TW1 inputs

pH	7.85	A	0.16
TDS	363	B	2.36
Hardness	243	C	1.99
Alkalinity	179	D	2.25
Temp.	11.1		
		pHs =	7.577988771

Langelier Saturation Index (LSI) Calculation

(Langelier, 1936)

LSI = pH - pHs

pHs = (9.3 + A + B) - (C + D)

Where:

A = (Log10 [TDS] - 1) / 10

B = -13.12 x Log10 (oC + 273) + 34.55

C = Log10 [Ca2+ as CaCO3] - 0.4

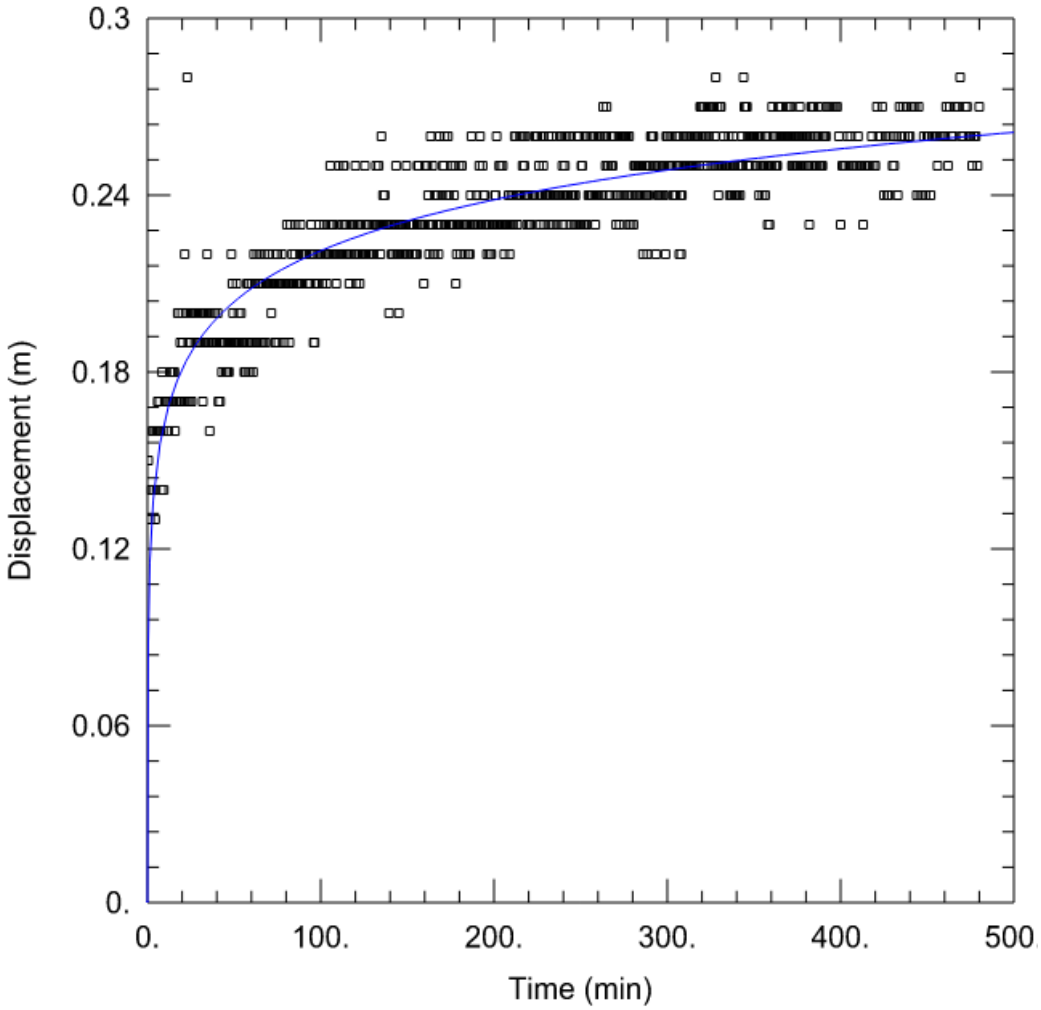
D = Log10 [alkalinity as CaCO3]

LSI = 0.3

LSI	Effect
0.5 to 2	**Water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive)**
0 to 0.5	**Water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and corrosive).**
0	Water is saturated (in equilibrium) with calcium carbonate. A scale layer of calcium carbonate is neither precipitated nor dissolved.
0 to -0.5	Water is under saturated and tends to dissolve solid calcium carbonate (slightly corrosivebut non-scale forming).
-0.5 to -2	Water is under saturated and tends to dissolve solid calcium carbonate (seriously corrosive).

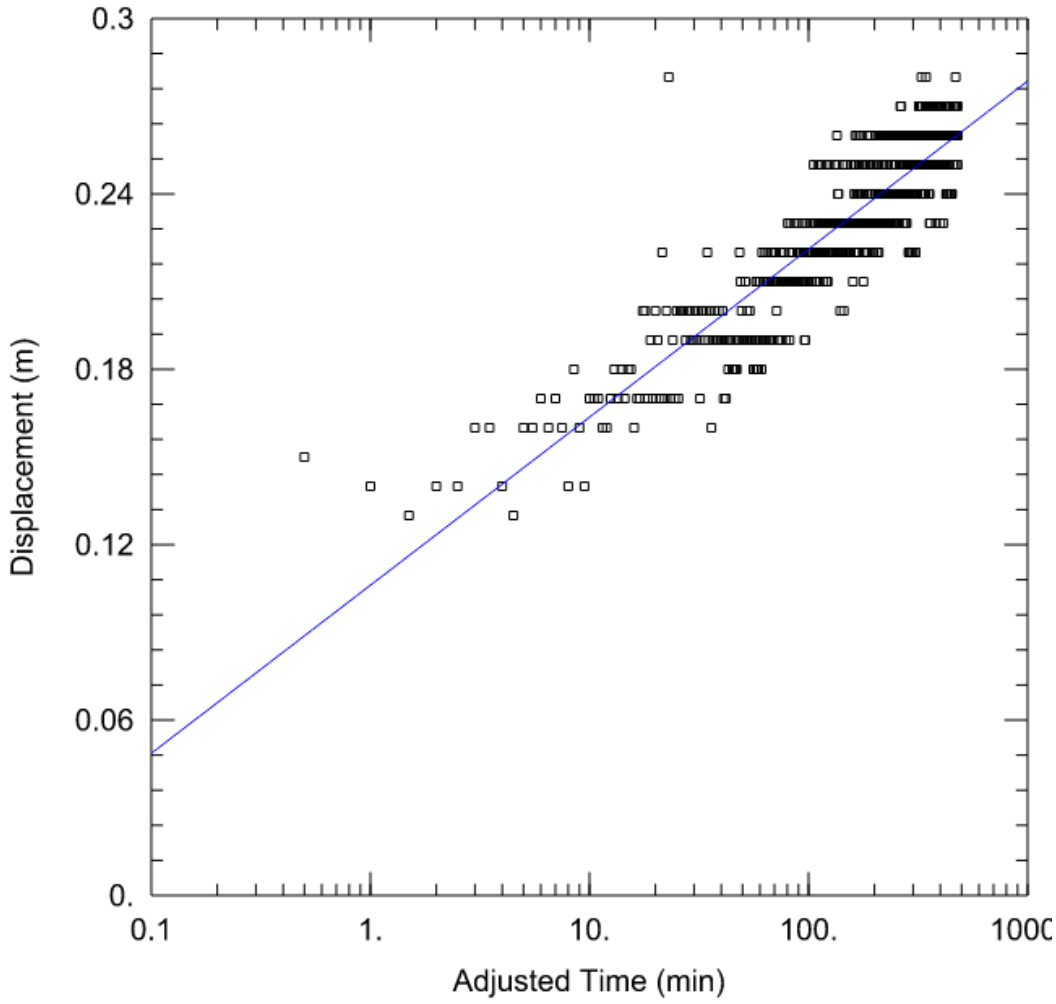
Pumping Test Analysis Report

File No.	PH4720	Well ID:	TW1
Date:	Thursday, June 1, 2023	Solution Method:	**Theis**
Client:	Brunstad Christian Church	Transmissitivity (m2/day):	367.1
Site Address:	1981 Century Road	Discharge Rate (L/min)	80
Project:	Proposed Commercial Development	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH4720	Well ID:	TW1
Date:	Thursday, June 1, 2023	Solution Method:	**Cooper-Jacob**
Client:	Brunstad Christian Church	Transmissitivity (m2/day):	367.1
Site Address:	1981 Century Road	Discharge Rate (L/min)	80
Project:	Proposed Commercial Development	Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH4720
Date:	Thursday, June 1, 2023
Client:	Brunstad Christian Church
Site Address:	1981 Century Road
Project:	Proposed Commercial Development

Summary Table:

Solution Method:	Well ID:	Transmissitivity (m2/day):
Theis	TW1	367.1
Cooper-Jacob	TW1	367.1
Average:		**367.10**

1981 Century Road

PH4720

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.20	
Soil	0.20	
Cover	0.10	
Total	**0.50**	
Site Characteristics		
Area of Site :	36420	m^2
Total of roof areas:	3586	m^2
Total area of paved driveway areas:	7384	m^2
Roof + paved driveway areas	10970	m^2
Impervious Area	10970	m^2
Percent Impervious Area =	30	%
Infiltration Area =	25450	m^2
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	6.04	m^3
See Notes below.		
Infiltration Calculation		
Nitrate concentration in precipitation (C_i) =	0	mg/L
Surplus Water (Environment Canada)	341	mm/yr
Factored Water Surplus =	171	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	12	m^3/day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$ = 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	6.04	m^3/day
C_e = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	12	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**13.48**	**mg/L**

Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume was calculted by Paterson Group as a preliminary design flow.

1981 Century Road

PH4720

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.20	
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C_e = concentration of nitrates in the septic effluent	20	mg/L
Q_i = flow entering the system from infiltration	12	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**6.74**	**mg/L**

Notes: Site characteristic values were measured as approximate values from the available site plan. Daily Sewage Flow volume was calculted by Paterson Group as a preliminary design flow.

SOIL PROFILE AND TEST DATA

GEOTECHNICAL INVESTIGATION

1981 Century Road, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 364500.506 **NORTHING:** 5005505.065 **ELEVATION:** 92.70

PROJECT: Geotechnical Investigation - Proposed Church Addition

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: July 17, 2023

FILE NO. PG6727

HOLE NO. BH 1-23

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE No.	SAMPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	DCPT	DEPTH (m)	Remoulded Shear Strength (kPa)	Peak Shear Strength (kPa)	Water Content (%)	Piezometer Construction
								0 25 50 75 100	0 25 50 75 100	W_{PL} W W_{LL} 20 40 60 80	
Ground Surface EL 92.7 m							0				
TOPSOIL 0.3 m EL 92.4 m		AU1									
FILL: Brown silty sand 0.69 m EL 92.01 m		SS2		50	6		1				
Very stiff, brown CLAYEY SILT, trace sand		SS3		50	9		2				
2.97 m EL 89.73 m		SS4		100	P		3	40	(119)		
Very loose, grey SILTY SAND, trace to some gravel 3.73 m EL 88.97 m		SS5		25	2		4				
GLACIAL TILL: Loose to compact, grey silty sand to sandy silt with gravel, cobbles and boulders		SS6		67	8		5				
		SS7		83	8		6				
5.94 m EL 86.76 m		SS8		42	15		7				
End of Borehole							8				
(GWL @ 1.78m - July 24, 2023)							9				
							10				
							11				
							12				
							13				
							14				

SOIL PROFILE AND TEST DATA

GEOTECHNICAL INVESTIGATION

1981 Century Road, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 364543.428 **NORTHING:** 5005517.55 **ELEVATION:** 92.10

PROJECT: Geotechnical Investigation - Proposed Church Addition

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: July 17, 2023

FILE NO. PG6727

HOLE NO. BH 2-23

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE No.	SAMPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	DCPT	DEPTH (m)	Remoulded Shear Strength (kPa)	Peak Shear Strength (kPa)	Water Content (%)	Piezometer Construction
								0 25 50 75 100	0 25 50 75 100	W_{PL} W W_{LL} 20 40 60 80	
Ground Surface EL 92.1 m											
TOPSOIL 0.33 m EL 91.77 m		AU1 AU2					0				
Very stiff, brown CLAYEY SILT, trace sand		SS3		100	6		1				
1.83 m EL 90.27 m		SS4		100	P		2	60	(139)		
Loose, brown SANDY SILT, trace clay 2.44 m EL 89.66 m		SS5		100	1		3		29		
Firm, grey CLAYEY SILT, trace sand 3.45 m EL 88.65 m		SS6		83	P		4				
GLACIAL TILL: Loose to compact, brown silty sand with gravel, cobbles and boulders, some clay		SS7		50	9		5				
		SS8		42	17		6				
		SS9		50	21		7				
6.71 m EL 85.39 m		SS10		42	14		8				
End of Borehole							9				
(GWL @ 1.99m - July 24, 2023)							10				
							11				
							12				
							13				
							14				

SOIL PROFILE AND TEST DATA

GEOTECHNICAL INVESTIGATION

1981 Century Road, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 364517.298 **NORTHING:** 5005546.179 **ELEVATION:** 91.87

PROJECT: Geotechnical Investigation - Proposed Church Addition

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: July 17, 2023

FILE NO. PG6727

HOLE NO. BH 3-23

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE No.	SAMPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	DCPT	DEPTH (m)	Remoulded Shear Strength (kPa)	Peak Shear Strength (kPa)	Water Content (%)	Piezometer Construction
								0 25 50 75 100	0 25 50 75 100	W_{PL} W W_{LL} 20 40 60 80	
Ground Surface EL 91.87 m							0				
TOPSOIL 0.3 m EL 91.57 m		AU1									
		AU2									
Very stiff, brown CLAYEY SILT, trace sand		SS3		100	6		1				
- sand content increasing with depth		SS4		67	P		2	30	(104)		
2.29 m EL 89.58 m		SS5		58	P			20	60		
Stiff to firm, grey CLAYEY SILT, trace sand		SS6		8	P		3	19.3	34		
		SS7		75	P		4	19.3	29		
4.88 m EL 86.99 m		SS8		0	P				(121)		
GLACIAL TILL: Compact to dense, grey silty sand to sandy silt with gravel, cobbles and boulders		SS9		67	15		5				
6.71 m EL 85.16 m		SS10		50	40		6				
End of Borehole							7				
(GWL @ 1.10m - July 24, 2023)							8				
							9				
							10				
							11				
							12				
							13				
							14				

Monitoring Well

SOIL PROFILE AND TEST DATA

GEOTECHNICAL INVESTIGATION

1981 Century Road, Ottawa, Ontario

DATUM: Geodetic **EASTING:** 364447.399 **NORTHING:** 5005517.13 **ELEVATION:** 92.03

PROJECT: Geotechnical Investigation - Proposed Church Addition

BORINGS BY: CME Low Clearance Drill

REMARKS:

DATE: July 17, 2023

FILE NO. PG6727

HOLE NO. BH 4-23

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE No.	SAMPLE Type	SAMPLE % RECOVERY	N VALUE or RQD	DCPT	DEPTH (m)	Remoulded Shear Strength (kPa)	Peak Shear Strength (kPa)	Water Content (%)	Piezometer Construction
								0 25 50 75 100	0 25 50 75 100	W_{PL} W W_{LL} 20 40 60 80	
Ground Surface EL 92.03 m							0				
TOPSOIL 0.3 m EL 91.73 m		AU1									
		AU2									
Stiff to firm, brown SILTY CLAY, trace to some sand		SS3	▽	100	6	25	1				
		SS4	▽	100	P	34	2	20	89		
2.59 m EL 89.44 m		SS5	▽	67	P	54		10	30		
Firm, grey CLAYEY SILT, trace sand		SS6	▽	33	P	33	3	12.1	43		
3.96 m EL 88.07 m		SS7	▽	75	7	42	4				
Loose, grey SILTY SAND, trace clay and gravel 4.72 m EL 87.31 m		SS8	▽	100	6	46					
GLACIAL TILL: Loose to compact, grey silty sand to sandy silt with gravel, cobbles and boulders 6.1 m EL 85.93 m		SS9	▽	42	19	45	5				
Dynamic Cone Penetration Test commenced at 6.10m depth.						48					
						24	6				
						38					
						51	7				
						56					
						42	8				
						43					
						50	9				
10.74 m EL 81.29 m						80/100					
End of Borehole							10				
Practical DCPT refusal at 10.74m depth.											
(GWL @ 1.25m - July 24, 2023)							11				
							12				
							13				
							14				

Piezometer

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)
Dxx	-	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
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu 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

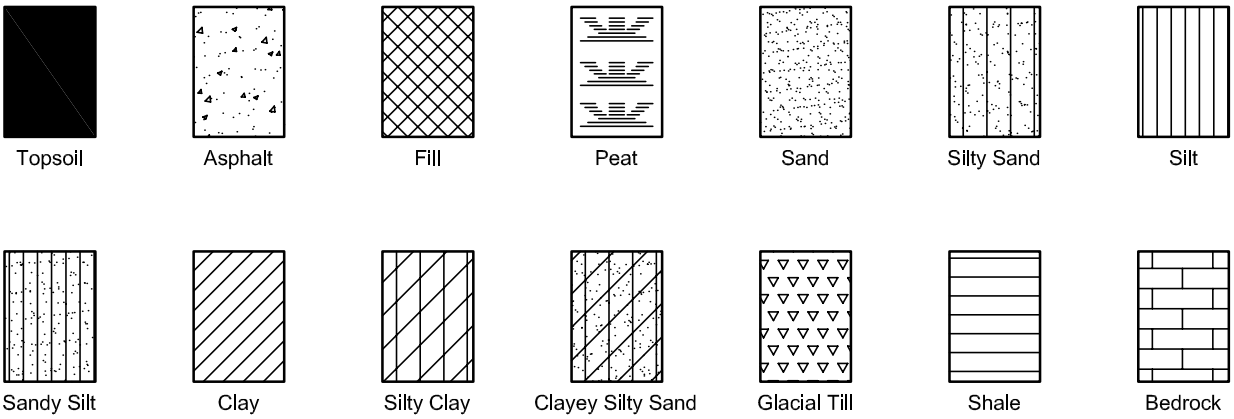
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	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.

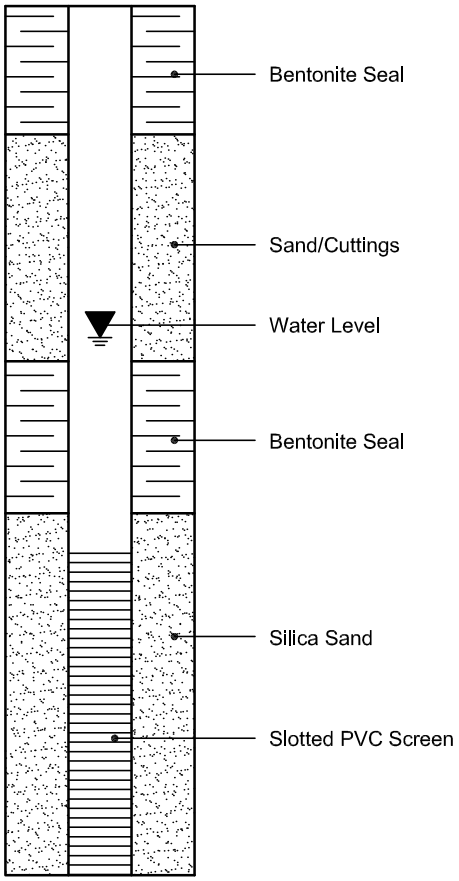
SYMBOLS AND TERMS (continued)

STRATA PLOT

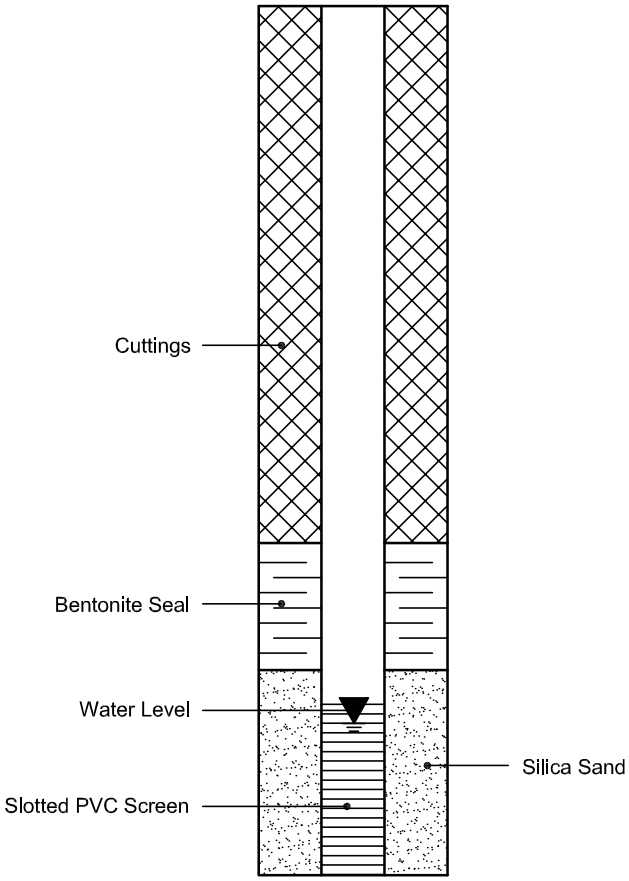


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 92.03 GROUND SURFACE ELEVATION (m)
- (81.29) GROUNDWATER SURFACE ELEVATION (m)

CONCEPTUAL PLAN PROVIDED BY S.J.LAWRENCE ARCHITECT INCORPORATED.

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:1000

0 10 20 30 40 50m 75m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

BRUNSTAD CHRISTIAN CHURCH OTTAWA

GEOTECHNICAL INVESTIGATION
PROPOSED BUILDING ADDITION
1981 CENTURY ROAD

OTTAWA, ONTARIO

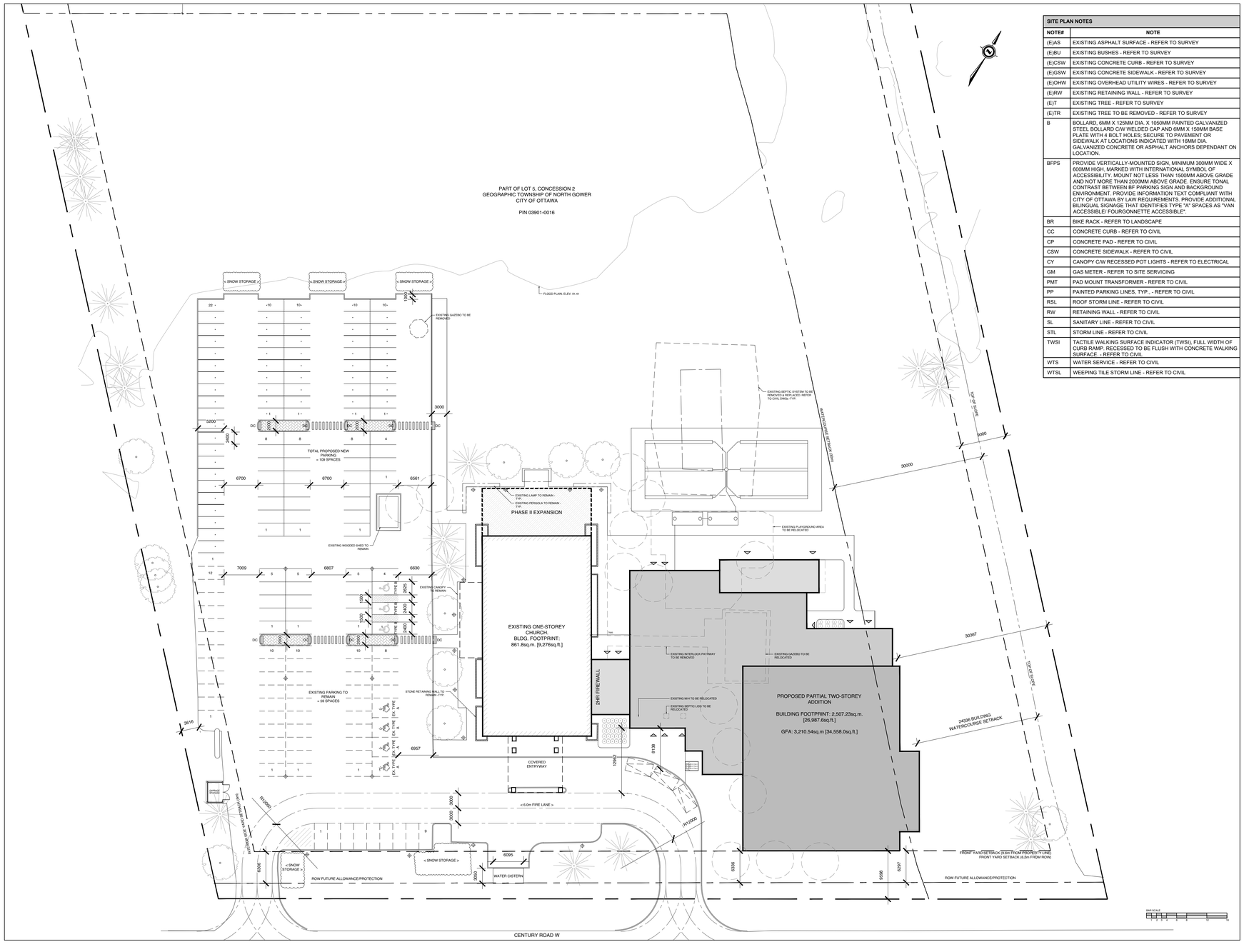
Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000	Date: 09/2023
Drawn by: GK	Report No.: PG6727-1
Checked by: KP	Dwg. No.: PG6727-1
Approved by: SD	Revision No.:

p:\autocad drawings\geotechnical\pg67xx\pg6727\pg6727-1 test hole location plan.dwg

11x17

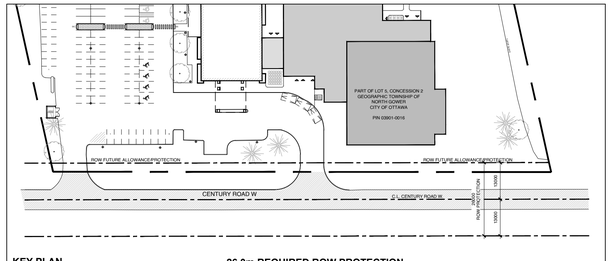


SITE PLAN NOTES	
NOTE#	NOTE
(E)AS	EXISTING ASPHALT SURFACE - REFER TO SURVEY
(E)BU	EXISTING BUSHES - REFER TO SURVEY
(E)CSW	EXISTING CONCRETE CURB - REFER TO SURVEY
(E)GSW	EXISTING CONCRETE SIDEWALK - REFER TO SURVEY
(E)OHW	EXISTING OVERHEAD UTILITY WIRES - REFER TO SURVEY
(E)RW	EXISTING RETAINING WALL - REFER TO SURVEY
(E)T	EXISTING TREE - REFER TO SURVEY
(E)TR	EXISTING TREE TO BE REMOVED - REFER TO SURVEY
B	BOLLARD, 6MM X 125MM DIA. X 1050MM PAINTED GALVANIZED STEEL BOLLARD C/W WELDED CAP AND 6MM X 150MM BASE PLATE WITH 4 BOLT HOLES; SECURE TO PAVEMENT OR SIDEWALK AT LOCATIONS INDICATED WITH 16MM DIA. GALVANIZED CONCRETE OR ASPHALT ANCHORS DEPENDANT ON LOCATION.
BFPS	PROVIDE VERTICALLY-MOUNTED SIGN, MINIMUM 300MM WIDE X 600MM HIGH, MARKED WITH INTERNATIONAL SYMBOL OF ACCESSIBILITY. MOUNT NOT LESS THAN 1500MM ABOVE GRADE AND NOT MORE THAN 2000MM ABOVE GRADE. ENSURE TONAL CONTRAST BETWEEN BF PARKING SIGN AND BACKGROUND ENVIRONMENT. PROVIDE INFORMATION TEXT COMPLIANT WITH CITY OF OTTAWA BY LAW REQUIREMENTS. PROVIDE ADDITIONAL BILINGUAL SIGNAGE THAT IDENTIFIES TYPE "A" SPACES AS "VAN ACCESSIBLE/ FOURGONNETTE ACCESSIBLE".
BR	BIKE RACK - REFER TO LANDSCAPE
CC	CONCRETE CURB - REFER TO CIVIL
CP	CONCRETE PAD - REFER TO CIVIL
CSW	CONCRETE SIDEWALK - REFER TO CIVIL
CY	CANOPY C/W RECESSED POT LIGHTS - REFER TO ELECTRICAL
GM	GAS METER - REFER TO SITE SERVICING
PMT	PAD MOUNT TRANSFORMER - REFER TO CIVIL
PP	PAINTED PARKING LINES, TYP., - REFER TO CIVIL
RSL	ROOF STORM LINE - REFER TO CIVIL
RW	RETAINING WALL - REFER TO CIVIL
SL	SANITARY LINE - REFER TO CIVIL
STL	STORM LINE - REFER TO CIVIL
TWSI	TACTILE WALKING SURFACE INDICATOR (TWSI), FULL WIDTH OF CURB RAMP. RECESSED TO BE FLUSH WITH CONCRETE WALKING SURFACE. - REFER TO CIVIL
WTS	WATER SERVICE - REFER TO CIVIL
WTSL	WEEPING TILE STORM LINE - REFER TO CIVIL

01 A1.0 CONCEPT SITE PLAN
SCALE: 1:400

LEGEND

- NEW OVERHEAD DOOR (O/H)
- NEW DOOR / ENTRANCE
- BICYCLE PARKING SPACE (1.8Mx0.6M)
- NO PARKING LINES
- (#) PARKING STALL COUNT PER ROW
- S# NEW SIGN, REFER TO SIGN LEGEND
- S1 FIRE ROUTE SIGN
- SL STREET LIGHT
- DESIGNATED ACCESSIBLE PARKING SPACE AS PER AODA STANDARDS
- V VISITOR PARKING
- TWO WAY TRAFFIC
- DEPRESSED CURB (DC)
- TACTILE WALKING SURFACE INDICATORS (TWSIs)
- PROPERTY LINE
- PROPOSED FENCE
- * COMPACT PARKING SPACES
- MINIMUM SETBACKS (ZONING)
- NEW CONSTRUCTION
- EXISTING BUILDINGS
- SOFT LANDSCAPING
- CONCRETE SIDEWALK
- BUILDING MOUNTED LIGHTS REFER TO ELECTRICAL DWGs



26.0m REQUIRED ROW PROTECTION

CITY OF OTTAWA ZONING BY-LAW

ZONING MECHANISM (RIS)	REQUIRED	PROVIDED
MINIMUM LOT WIDTH	75m	176.79m
MINIMUM LOT AREA	10,000m²	36,422.13m²
MAXIMUM BUILDING HEIGHT	12m	7.5m
MINIMUM FRONT YARD SETBACK	9.0m	9.6m FROM PROPERTY LINE 6.3m FROM ROW
MINIMUM REAR YARD SETBACK	10m	130m
MINIMUM INTERIOR YARD SETBACK	9.0m	30.4m/80m
MAXIMUM LOT COVERAGE	30%	6.9%
MINIMUM LANDSCAPED AREA	20%	70.5%
PROVIDED TOTAL LANDSCAPE AREA		25,670m²
WATERCOURSE SETBACK	30m	24.34m
PARKING PROVISIONS		
MINIMUM REQUIRED VEHICLE PARKING SPACES (AREA D ON SCHEDULE 1A) (COMMUNITY CENTRE / PLACE OF WORSHIP)	**EXISTING CHURCH** • PLACE OF WORSHIP: 861.8 m² • 10 SPACES PER 100m² GFA = 861.8/100 = 8.618 x 10 = 87 SPACES **PROPOSED ADDITION** • COMMUNITY CENTER (ANCILLARY AREA): 1387.5 m² • 4 SPACES PER 100m² GFA = 1387.5/100 = 13.875 x 4 = 56 SPACES • PLACE OF WORSHIP: 587.7 m² • 10 SPACES PER 100m² GFA = 587.7/100 = 5.877 x 10 = 59 SPACES • TOTAL: 115 SPACES NEW BUILD + EXISTING : 87 + 115 = 202 SPACES REQUIRED	168 SPACES PROVIDED
PROVIDED PARKING	REGULAR SPACES (EXISTING)	55
	REGULAR SPACES (NEW)	45
	ACCESSIBLE SPACE (TYPE A)	4 (EXISTING)
	ACCESSIBLE SPACE (TYPE B)	3
	COMPACT SPACES (50% OF PARKING SPACES: BY-LAW 2021-218, PART 4 - SECTION 106)	61
	TOTAL	168
BICYCLE PARKING REQUIRED	1 PER 1500 m² OF GFA = 3 SPACES	3
MINIMUM DRIVEWAY WIDTH	PARKING LOT: 6.0m	6.0m
MINIMUM AISLE WIDTH	PARKING LOT: 6.0m	6.0m
MINIMUM PARKING SPACE DIMENSIONS	LENGTH: 5.2m WIDTH: 2.6m	LENGTH: 5.2m WIDTH: 2.6m
	UP TO 50% OF REQUIRED PARKING SPACES MAY BE 4.6m x 2.4m	50% (81 SPACES PERMITTED) = 61 SPACES

AREA SCHEDULE

ROOM NAME	ROOM AREA	LOCATION
PRIMARY USE (WORSHIP)		
EXISTING ONE-STOREY CHURCH	861.8 SQ.M	GROUND FLOOR
NURSERY ROOM	134.7 SQ.M	GROUND FLOOR
NURSERY W/C	4.9 SQ.M	GROUND FLOOR
FEEDING ROOM	21.2 SQ.M	GROUND FLOOR
STROLLER STORAGE	5.9 SQ.M	GROUND FLOOR
SUNDAY SCHOOL ROOM 01	59.4 SQ.M	SECOND FLOOR
YOUTH LOUNGE	192.7 SQ.M	SECOND FLOOR
MEZZANINE	27.9 SQ.M	SECOND FLOOR
SENIORS LOUNGE	70.8 SQ.M	SECOND FLOOR
SUNDAY SCHOOL ROOM 02	47.8 SQ.M	SECOND FLOOR
OFFICE	11.2 SQ.M	SECOND FLOOR
OFFICE	11.2 SQ.M	SECOND FLOOR
SECONDARY USE (ANCILLARY)		
MULTI PURPOSE SPACE	1102.4 SQ.M	GROUND FLOOR
FEAST HALL/CAFE	245.6 SQ.M	GROUND FLOOR
COFFEE BAR	10.6 SQ.M	GROUND FLOOR
MEETING ROOM	28.9 SQ.M	SECOND FLOOR
SERVICE SPACE		
COAT CHECK	16.3 SQ.M	GROUND FLOOR
RECEPTION	7.7 SQ.M	GROUND FLOOR
MALE CHANGE ROOM	85.9 SQ.M	GROUND FLOOR
FEMALE CHANGE ROOM	86.8 SQ.M	GROUND FLOOR
UNIVERSAL W/C	9.3 SQ.M	GROUND FLOOR
STORAGE/JAN. CL.	15.0 SQ.M	GROUND FLOOR
COMMERCIAL KITCHEN	134.5 SQ.M	GROUND FLOOR
STAFF W/C	4.8 SQ.M	GROUND FLOOR
STAFF W/C	3.6 SQ.M	GROUND FLOOR
STORAGE/MECH	44.5 SQ.M	GROUND FLOOR
STORAGE	56.5 SQ.M	GROUND FLOOR
JAN. CL.	6.3 SQ.M	SECOND FLOOR
W/C	3.8 SQ.M	SECOND FLOOR
B.F W/C	6.5 SQ.M	SECOND FLOOR
CIRCULATION		
BUILDING LINK	55.5 SQ.M	GROUND FLOOR
LOBBY	117.6 SQ.M	GROUND FLOOR
VESTIBULE	15.4 SQ.M	GROUND FLOOR
EXIT CORRIDOR	3.8 SQ.M	GROUND FLOOR
STAIR A	22.7 SQ.M	GROUND FLOOR
CORRIDOR 01	48.3 SQ.M	GROUND FLOOR
STAIR B	24.2 SQ.M	GROUND FLOOR
CORRIDOR 02	62.4 SQ.M	GROUND FLOOR
CORRIDOR 03	120.2 SQ.M	SECOND FLOOR
STAIR A	22.7 SQ.M	SECOND FLOOR
STAIR B	20.5 SQ.M	SECOND FLOOR
AREA TOTALS		
PRIMARY USE (WORSHIP):	**1449.5 SQ.M**	[587.7 SQ.M NEW BUILD ONLY]
SECONDARY USE (ANCILLARY):	**1387.5 SQ.M**	
SERVICE SPACE:	**481.5 SQ.M**	
CIRCULATION:	**513.3 SQ.M**	

BUILDING AREAS	SQ.M.	SQ.FT.
BUILDING FOOTPRINT	2,507.23m²	26,987.6ft²
GROUND FLR. GROSS AREA	2,507.23m²	26,987.6ft²
SECOND FLR. GROSS AREA	703.31m²	7,570.4ft²
TOTAL GROSS FLR. AREA	3,210.54m²	34,558.0ft²

CLIENT NAME:

BCCO BRUNSTAD CHRISTIAN CHURCH

NOTES:

1) ALL WORK TO BE IN COMPLIANCE WITH LOCAL BUILDING CODES, REGULATIONS AND BY-LAWS.

2) ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH PLANS IN CONTRACT DOCUMENTS.

3) DO NOT SCALE DRAWINGS.

4) ALL SUB-CONTRACTORS TO TAKE THEIR OWN ON-SITE MEASUREMENTS AND BE RESPONSIBLE FOR THEIR ACCURACY

5) NOTIFY SHAWN J. LAWRENCE ARCHITECT FOR ANY ERRORS AND/OR OMISSIONS PRIOR TO START OF WORK.

CONSULTANTS:

ARCHITECTURAL DRAWINGS

S.J. LAWRENCE ARCHITECT INC.
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613.134.7710

STRUCTURAL DRAWINGS

CLELAND JARDINE (BPA)
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613.591.1533

MECHANICAL & ELECTRICAL DRAWINGS

GOODKEY, KEEDMARK & ASSOCIATES LTD. (GWAL)
1635 ADDIEWARD DR, OTTAWA, ON K2C 3R3
613.721.5111

CIVIL DRAWINGS

TATHAM ENGINEERING
100-5535 CANOTEK RD, GLOUCESTER, ON K1J 9L4
613.747.5636

SEPTIC DRAWINGS

PATERSON GROUP
9 AURIGA DRIVE, OTTAWA,ON K2E 7T9
613.226.7381

LANDSCAPE DRAWINGS

VS LANDSCAPE GROUP
4226 BANK ST, OTTAWA, ON K1X 1G7
613.714.5246

URBAN PLANNER

QR PLANNING + DESIGN
43 SCIGLEN ST UNIT C, OTTAWA, ON K1R 6S3
613.590.0345

SEAL:

NORTH ARROW:

NO.	DATE	REVISION
19	2024.12.05	ISSUED FOR COORDINATION
18	2024.08.29	ISSUED FOR COORDINATION
16	2024.06.10	ISSUED FOR REVIEW
15	2024.02.12	ISSUED FOR REVIEW
14	2024.02.05	ISSUED FOR COORDINATION
13	2024.01.23	ISSUED FOR REVIEW
12	2023.12.04	ISSUED FOR PRE-CONSULT
11	2023.11.30	ISSUED FOR REVIEW
10	2023.10.24	ISSUED FOR REVIEW
09	2023.10.20	ISSUED FOR REVIEW
08	2023.10.17	ISSUED FOR REVIEW
07	2023.10.02	ISSUED FOR REVIEW
06	2023.04.13	ISSUED FOR REVIEW
05	2023.03.22	ISSUED FOR REVIEW
04	2023.01.27	ISSUED FOR REVIEW
03	2023.01.12	ISSUED FOR REVIEW
02	2023.09.29	ISSUED FOR REVIEW
01	2023.04.28	ISSUED FOR REVIEW

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PROJECT:

BCCO CHURCH ADDITION

1451 CENTURY RD W, NORTH GOWER, ON

SHEET TITLE:

PROPOSED SITE PLAN

DRAWN BY:	CHECKED BY:
D.T. B.L.	S.J.L.
PLOT DATE: 2024.12.05	PROJECT DATE: 2023.03.15
JOB NUMBER: SL-1090-23	SCALE: 1:400

SHEET NUMBER:

A1.0

PLAN #

APPLICATION #