PATERSON GROUP

Consulting Engineers
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
Tel: (613) 226-7381

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

August 29, 2025

PH5103-LET.01

Nautical Lands Group
555 Legget Drive,
Tower A, Suite 920
Kanata, Ontario
K2K 3B8

Attention: Angela Mariani

Subject: **Hydrogeological Assessment and Terrain Analysis**
Re-zoning Application
2966-2978 Carp Road
Ottawa (Carp), Ontario

INTRODUCTION

Paterson Group Inc. (Paterson) was retained by Nautical Lands Group to conduct a Hydrogeological Assessment and Terrain Analysis in support of a Re-zoning Application for a proposed cheer academy located at 2960-2978 Carp Road in Ottawa (Carp), Ontario. It is our understanding that the current property, identified as the parcel with address 2966 Carp Road (GeoOttawa, 2025), consists of a 1.28 hectares (ha) parcel with an existing dwelling in the southern portion of the site. The proposed Re-zoning application aims to change the zoning of the 1.28 ha parcel that is designated as Rural Commercial (RC7) to include Instructional Facility. For specific planning details, please refer to the consultant report application package. Please refer to the Key Plan attached for the approximate site location.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site and to carry out a sewage 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 provide the maximum sewage flow volume which the subject site can support from a nitrate attenuation standpoint.

BACKGROUND

Subject Site

The subject property consists of a warehouse with associated landscaped areas and parking lots, and a residential dwelling with associated landscaped areas and driveways located at 2966 and 2978 Carp Road in the City of Ottawa (Carp), Ontario. The ground surface across the site is relatively flat, with a general downslope direction to the east. The general overburden groundwater flow direction is assumed to be north to northeast towards the Carp River.

The Carp Road corridor and buildings onsite are serviced by private services. The site is bordered to the northeast and northwest by undeveloped lands, to the southwest by Carp Road, followed by residential properties, and to the southeast by a commercial property.

The subject site is largely rectangular in shape with a total area of 1.28 ha. The site is currently zoned as RC7 (Rural Commercial). The land parcels to the north and east are zoned RC9 (Rural Commercial), and the residential properties to the west are zoned RR5 (Rural Residential Zone).

Regional Geology

Published surficial geology mapping (OGS MRD128) for the area in the vicinity of the subject site indicates that the subject site is underlain predominantly by stone-poor silty sand to sandy silt-textured till on Paleozoic Terrain.

Published bedrock geology mapping (OGS MRD219) indicates that the subject lands are underlain by limestone and shale of the Simcoe Group and Verulam Formation. The available bedrock mapping coincides with the well driller's description on the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) for the surrounding well supplies installed within the subject area, which generally indicate a grey limestone.

Karst Mapping

Published karst mapping (OGS GRS005) for the area indicated that the subject site is not within a potential or inferred karst area.

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 has been designated as a Highly Vulnerable Aquifer (HVA within the MRSPP) and a Significant Groundwater Recharge Area (SGRA) and is identified as two of the four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consists of HVA, SGRA, Intake Protection Zones (IPZ), and Wellhead Protection Areas (WHPA).

Based upon the designation, there are no restrictions of land uses on the subject site based upon its proposed usage. Therefore, there are no related requirements for an HVA or SGRA at this location.

Hydrogeological Pre-Consultation

A City of Ottawa pre-consultation was completed on August 27, 2025 to discuss the requirements for the hydrogeological assessment and terrain analysis of the subject site. Initial discussions were completed by email prior to the meeting.

FIELDWORK PROGRAM

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) servicing the existing warehouse was tested. TW1 has a Water Well Record (WWR) Well ID of A212621. TW1 has a 150 mm diameter steel casing that extends to 6.82 m bgs with a 0.45 m stick up. The well itself extends to a depth of 58.9 m bgs. According to the water well record, limestone bedrock was recorded at a depth of approximately 4.34 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 2 to 3 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to a 8-hour constant rate pumping test. The pumping test was conducted on March 22, 2022 under the full-time supervision of Paterson personnel. Prior to the pumping test a data-logger was installed to monitor the background groundwater levels.

The existing submersible pump was used for the 8-hour pumping test. A licensed water well technician (Air Rock) completed the necessary plumbing related activities. The discharge line was placed at a sufficient distance to ensure that the discharge water was being directed away from the well and the septic system onsite. Upon completion of the test, the system was returned to its normal configuration.

The pumping test was carried out at a pumping rate of 45 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

pumping 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 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 noted to have achieved 100% recovery approximately 1 minute after the completion of pumping.

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 along with Volatile Organic Compounds (VOCs).

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 directly 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. Calibration / confirmation of calibration of all field-testing equipment was performed in Paterson’s laboratory the day prior to the pumping test. Values are then confirmed again onsite prior to the start of the pumping test.

Total coliforms were detected in the analytical testing of TW1 during the pumping test at 19 ct/100 mL (TW1-GW1) in the sample taken 4 hours into the pumping test and at 23 ct/100 mL (Tw1-GW2) at 8 hours into the pumping test.

Paterson personnel went to site on April 1, 2022 to disinfect TW1 as per the Ministry of the Environment, Conservation and Parks (MECP) disinfection instruction sheet, attached. The existing submersible pump was used to circulate the water column ion order to ensure proper mixing of the disinfectant. Paterson personnel confirmed the presence and adequate mixing of the disinfectant.

On April 4, 2022, Paterson personnel confirmed the presence of free chlorine within the well water. The well was purged using the existing submersible pump to remove residual free chlorine prior to obtaining a bacteriological sample. The discharge locations were placed at a sufficient distance to ensure that the discharge water was being directed away from the wellhead.

TW1 was pumped for 8 hours at a rate of approximately 15 L/min. Paterson personnel confirmed that the free chlorine residual was 0 mg/L prior to the collection of the bacteriological sample (GW1) at the end of 8 hours of purging the well.

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

Total Coliforms were reported as 4 ct/100 mL in the analytical testing of TW1 after the disinfection process. E. Coli was found to be non-detect as per the original results.

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)	1,224
Pumping Rate (L/min)	45
Pre-test Static Water Level (m BTOC)	3.20
Post-test Static Water Level (m BTOC)	3.26
Maximum Drawdown (m BTOC)	3.34
Available Drawdown (m)	55.7
% Drawdown During Pumping Test (%)	0.3
Specific Capacity (L/min/m drawdown)	321

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 1,224 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 0.14 m (0.3% of the available drawdown), but only 0.06 m at the end of the test period. 95% recovery was achieved approximately one minute after the end of pumping. It should be noted that the water level was measured to be increasing throughout the 8-hour constant rate pumping test.

The total volume of water pumped during the 8-hour pumping event was approximately 21,600 L. This is approximately 3.2 times the maximum total daily design volume of effluent (6,811 L/d) using 57% nitrate reduction required to support the Re-zoning Application. Further discussion in the Terrain Analysis notes an additional technology that can support greater than 10,000 L/day, however the 6,811 L/day is above the required flows as calculated under Part 8 – OBC for a subsequent application.

The suitability of the aquifer to support the proposed Re-zoning application was assessed using the methodology provided in the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

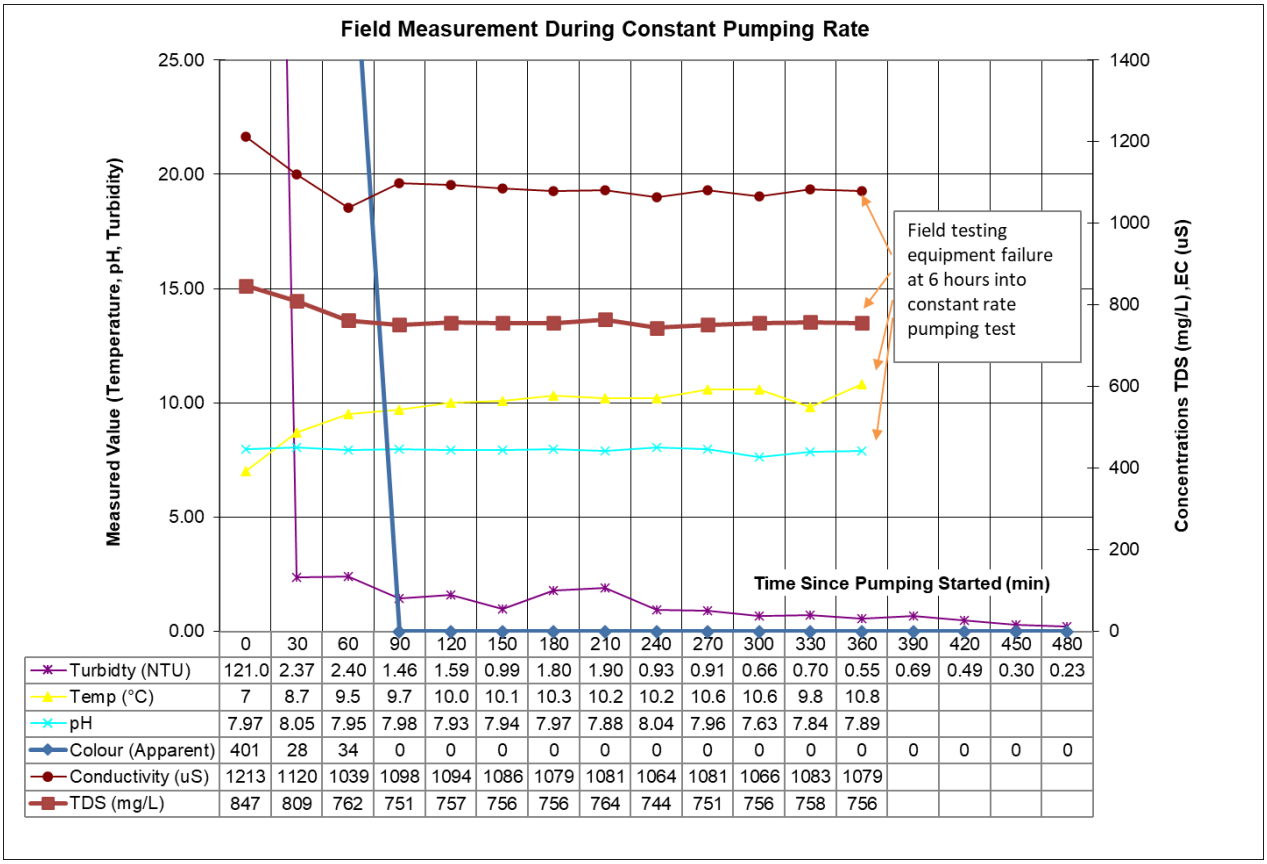
Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to service the proposed zoning usage.

Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Application.

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, true 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 discharged water prior to the collection of the water samples. During the constant rate pumping test, the field-testing equipment which tests for pH, TDS, EC, and temperature malfunctioned at the 6-hour point. These parameters were noted to have stabilized prior to the malfunction of the equipment.



	0	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480
Turbidty (NTU)	121.0	2.37	2.40	1.46	1.59	0.99	1.80	1.90	0.93	0.91	0.66	0.70	0.55	0.69	0.49	0.30	0.23
Temp (°C)	7	8.7	9.5	9.7	10.0	10.1	10.3	10.2	10.2	10.6	10.6	9.8	10.8				
pH	7.97	8.05	7.95	7.98	7.93	7.94	7.97	7.88	8.04	7.96	7.63	7.84	7.89				
Colour (Apparent)	401	28	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity (uS)	1213	1120	1039	1098	1094	1086	1079	1081	1064	1081	1066	1083	1079				
TDS (mg/L)	847	809	762	751	757	756	756	764	744	751	756	758	756				

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. 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) 2022-03-22	GW2 (8 hr) 2022-03-22	GW1 2022-04-04
MICROBIOLOGICAL						
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	0
Total Coliforms	ct/100mL	0	MAC	19	23	4
GENERAL CHEMICAL - HEALTH RELATED						
Fluoride (F)	mg/L	1.5	MAC	<0.10	<0.10	-
Ammonia (N-NH_3)	mg/L	-	-	<0.010	<0.010	-
Nitrite (N-NO_2)	mg/L	1	MAC	<0.10	<0.10	-
Nitrate (N-NO_3)	mg/L	10	MAC	3.15	3.02	-
Total Kjeldahl Nitrogen	mg/L	-	-	0.25	0.48	-
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	0.93	0.23	-
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	0.50	0.50	-
GENERAL CHEMICAL - AESTHETIC RELATED						
Alkalinity (as CaCO3)	mg/L	30-500	OG	251	243	-
Chloride (Cl)	mg/L	250	AO	135	142	-
Colour	TCU	5	AO	<2	<2	-
Colour (Field - Apparent)	TCU	5	AO	0	0	-
Conductivity	uS/cm	-	-	1,180	1,180	-
Dissolved Organic Carbon	mg/L	5	AO	2.40	2.40	-
Hardness (as CaCO3)	mg/L	100	OG	454	451	-
Ion Balance	unitless	-	-	0.97	0.97	-
pH	unitless	6.5-8.5	AO	7.95	7.93	-
Phenols	mg/L	-	-	<0.001	<0.001	-
Sulphate (SO_4)	mg/L	500	AO	182	175	-
Sulphide (S_2^-)	mg/L	0.05	AO	<0.01	<0.01	-
Tannin & Lignin	mg/L	-	-	1.00	1.00	-
Total Dissolved Solids	mg/L	500	AO	767	767	-

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) 2022-03-22	GW2 (8 hr) 2022-03-22
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	0.12	0.12
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.04	0.04
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001
Calcium (Ca)	mg/L	-	-	162	161
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	<0.001	<0.001
Iron (Fe)	mg/L	0.3	AO	<0.03	<0.03
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001
Magnesium (Mg)	mg/L	-	-	12	12
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	-	-	2	2
Selenium (Se)	mg/L	0.05	MAC	<0.001	<0.001
Silver (Ag)	mg/L	-	-	<0.0001	<0.0001
Sodium (Na)	mg/L	200	AO	77	75
Strontium (Sr)	mg/L	-	-	0.879	0.876
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) 2022-03-22	GW2 (8 hr) 2022-03-22
VOCs Surrogates					
1,2-dichloroethane-d4	%	-	-	100	119
4-bromofluorobenzene	%	-	-	71	76
Toluene-d8	%	-	-	91	98
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	-	-	<30	<30
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	-	-	<10	<10
Methyl Isobutyl Ketone (MIBK)	µg/L	-	-	<10	<10
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
2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

The bacteriological test results (Certificate of Analysis – Report No. 1973843) indicated that the test samples at the 4- and 8-hour interval were non-detect (0 ct/100 mL) for E.Coli, however, Total Coliforms were detected at concentrations of 19 ct/100 mL and 23 ct/100 mL, respectively.

Paterson personnel returned to site to disinfect the well. After the disinfection of the well and subsequent pumping, a bacteriological test was performed on the well water (Certificate of Analysis – Report No. 1974461) which indicated that E. Coli was not present (0 ct/100 mL) and that only 4 ct/100 mL Total Coliforms were present in the well water. Paterson personnel confirmed that the free chlorine residual was 0 mg/L prior to the collection of the bacteriological sample.

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 $CaCO_3$)
- ❑ Total Dissolved Solids (TDS)

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.

Should any water treatment be desired by the owner, it is recommended that a water treatment specialist be retained to ensure that water treatment occurs in a safe manner.

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 concentrations of 454 and 451 mg/L, the water is considered to be very 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), thus, hardness can be treated with readily available technologies.

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".

Total Dissolved Solids (TDS)

TDS refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium, and bicarbonates. The TDS concentration of 767 mg/L exceeds the Aesthetic Objective of 500 mg/L. At concentrations above 500 mg/L, some consumers may find the taste objectionable, however, as the objective is an aesthetic objective, no treatment is required. It is, however, recommended that a point-of-use reverse osmosis unit be installed or to provide bulk bottled water on an as-needed basis for drinking water purposes. As such, no taste problems will occur when the system is used, or bottled water is consumed.

The Langelier calculation provided an LSI of 0.7. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). Based on the range of stability in the positive direction, it is recommended that water softening be used to prevent scaling. See Langelier Saturation Index Calculation attached for calculation details.

Total Coliforms

Total Coliforms are a type of bacteria which naturally occur in soil and decaying vegetation. Total Coliforms may also be associated with animal and/or human waste.

The maximum acceptable concentration (MAC) for Total Coliforms for potable drinking water in support of a Re-zoning application, as established by the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG, 2021), is less than 6 ct/100 mL. According to the City of Ottawa HTAG, Total Coliforms counts of less than 6 per 100 mL sample shall be considered indicative of acceptable water quality.

Total Coliforms were detected at 19 and 23 count per 100 mL at the 4- and 8- hour mark of the pumping test, respectively. After disinfecting the well and purging the chlorinated water, Total Coliforms were detected at 4 ct/100 mL. 4 ct/100 mL Total Coliforms is below the City of Ottawa HTAG standard of less than 6 ct/100 mL.

As the site is not hydrogeologically sensitive (competent bedrock was encountered during the field investigations at depths of 2.4 to 5.9 m bgs), and is not located in an area which is mapped as potentially karstic, the Total Coliform level of 4 ct/100 mL is considered acceptable.

Consideration should be given to utilizing a Ultraviolet (UV) disinfection system on the water supply entering the existing warehouse and proposed development. Additionally, the turbidity was less than 1 NTU, indicating that there should be no turbidity based interference in disinfection.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at a concentration of 77 and 75 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no MAC 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.

TERRAIN ANALYSIS

The fieldwork which was completed as part of a Geotechnical Investigation for the site (PH3834-1R, dated January 5, 2017; and PG3834-2, dated March 1, 2022) is used in support of this assessment. Additional information pertaining to this investigation was gathered from available geological mapping and surrounding WWRs.

Surficial Geology

A series of test pits were excavated on the subject parcel to delineate the subsurface soil conditions as part of a Geotechnical Field Investigation. On February 8, 2022, seven (7) test pits were completed on the property. A previous investigation (PG3834-1R, dated January 5, 2017) was completed at the subject site in June and November 2016, during which fourteen (14) test pits were excavated and eleven (11) boreholes were completed onsite. The location of the test pits are delineated on the drawing PH5103-1-Test Hole Location Plan, attached. Note that the site plan on the drawing is not reflective of the proposed usage.

The test hole locations were recorded and the subsurface conditions, including the soil morphology and depth to the groundwater table (if encountered), were carefully observed and recorded. The soils encountered were classified texturally in the field and later reviewed in the laboratory.

The boreholes and test pits were advanced to a maximum depth of 5.9 and 3.4 m below ground surface (bgs), respectively. Bedrock was recorded in the WWR for TW1 at 4.34 m bgs. Refusal to excavation was recorded at depths ranging from 0.7 m to 5.9 m bgs on fractured bedrock. Competent bedrock was encountered at depths of 2.4 to 5.9 m bgs.

The subsurface profile generally consisted of topsoil extending to a maximum depth of 0.6 m bgs, underlain by silty sand to sandy silt with gravel, cobbles, boulders and trace clay which extend to a maximum depth of 1.9 m bgs. Frost heave/ frost shattered bedrock infilled with silty sand, gravel, cobbles, and boulders (unconsolidated soils) was observed under the silty sand to sandy silt with gravel, cobbles, boulders and trace clay. The testhole logs note split spoon sampling within this layer with significant sample recovery. TP1-22, TP2-22, TP6-22, and TP7-22 noted a fill of varying composition underlying the topsoil extending to depths of 1.75 m bgs. Groundwater was observed at depths between 3.6 to 4.3 m bgs in the boreholes and test pits.

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

Materials encountered during Paterson's Geotechnical Investigation were generally consistent with the available surficial and bedrock geology mapping.

Hydrogeological Sensitivity of the Site

The subject site currently consists of a warehouse and residential dwelling. The dwelling is currently unoccupied. The topography of the site is generally sloping downwards to the east. The local flow direction of the surficial aquifer is expected to be in the northeasterly direction towards the Carp River. The regional groundwater flow is considered to be in the northeast direction towards the Ottawa River.

The onsite overburden generally consists of topsoil overlying a brown silty sand with gravel, cobbles, boulders and trace clay which is underlain by a fractured bedrock (frost heave/frost shatter) infilled with unconsolidated soils. The unconsolidated soils are noted to have 50 to 80% recovery during split spoon sampling within this stratum. Competent bedrock was encountered during the field investigations at depths of 2.4 to 5.9 m bgs. The frost heave bedrock noted during the borehole field investigation contained high amounts of interspersed silty sand to sandy silt (unconsolidated soils), and some clay with fragmented bedrock. For the purposes of hydrogeological sensitivity, the "fractured bedrock" unit is considered an unconsolidated soil which would provide separation form the ground surface and the underlying competent bedrock. Furthermore, based on hydraulic conductivity testing, the fastest onsite T-time was 13.8 min/cm, which is an order of magnitude slower than the T-time of less than 1 min/ cm required for highly permeable soils. Based on this, the soils and underlying interbedded materials are not considered as highly permeable when reviewing against Ontario Building Code (OBC) Section 8.7.2.1 (1) (b)(i) and the MMAH Supplementary Standards SB-6.

Refusal to excavation was recorded on competent bedrock ranging from 2.4 to 5.9 m bgs. According to the geotechnical investigation, the overburden thickness (which includes the fractured bedrock unit with interspersed unconsolidated soils) was observed to be greater than 2 m at all borehole locations. The subject site does not have any mapped karst topography on site. Furthermore, from the TW1 WWR, bedrock was observed at a depth of 4.34 m bgs. As the proposed site does not have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive. Although mitigative measures, such as increased separation distances, are not required, there is sufficient space onsite to keep the onsite well greater than 30 m away from any onsite septic components.

Conceptual Lot Development

As this Terrain Analysis is completed to support a Re-zoning Application, a Site Plan is not available.

Sewage System Design and Total Daily Design Sewage Flow

As this Terrain Analysis is completed to support a Re-zoning Application, a Site Plan is not available at this time. As such a sewage system design and flows have not yet been completed. A maximum predicted nitrate concentration will be determined for the site as a whole, and the current assessment will be completed based on existing conditions.

The proposed property will be analyzed as part of the Re-zoning Application to ensure the theoretical impacts are below the Ontario Drinking Water Objective maximum allowable concentration of 10 mg/L of nitrate in the groundwater prior to the property line.

PREDICTIVE NITRATE IMPACT ASSESSMENT

Nitrate is considered to be a critical parameter of concern when assessing impacts to groundwater quality downgradient of an onsite sewage system. The City of Ottawa annotated MECP Procedure D-5-4 in the Hydrogeological and Terrain Analysis Guidelines (HTAG) applies for the proposed development. For the purpose of this guideline, the Ontario Drinking Water Objective of 10 mg/L of nitrate is the maximum allowable concentration detectable in the groundwater prior to the property line.

A detailed impact assessment is required due to the proposed zoning of the site. In order to demonstrate that private services would adequately support the proposed Re-zoning Application, a predictive nitrate impact assessment for the subject site was completed. This calculation was completed to determine the maximum sewage flow volume which could be applied to the subject site with the current site conditions. As the site is within the Carp Road Corridor, the use of tertiary treatment systems (nitrate reducing systems) are allowed to be considered in support of re-zoning. The values shown in the Predictive Nitrate Impact Assessment calculation attached to this report are summarized below:

- ❑ Site area — 1.28 ha
- ❑ Impervious area % — 45 %
- ❑ Concentration of nitrate in effluent — 40 mg/L
  (Value based on conventional effluent concentration)
- ❑ Concentration of nitrate in effluent — 17.2 mg/L
  (Value based on using NSF 245/BNQ certified 57% nitrate reduction technology)
- ❑ Surplus Water — 378 mm/year

(The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of clay loam (urban lawn) and anthropogenic sources, which can be found attached.)

❑	Combined infiltration factor based on:	0.67
	● Topography infiltration factor	0.25
	● Soil texture infiltration factor	0.30
	● Cover infiltration factor	0.12

The topography infiltration factor of 0.25 is based upon a slope between “flat land” (<0.6 m/km) and “rolling land” (average slope of 2.8 to 3.8 m/km) based on available mapping.

The soil texture infiltration factor was based upon a soil that is between “open sandy loam” with a value of 0.4 and “medium combinations of clay and loam” with a value of 0.2 which is a reasonable generalization based upon the field investigation by Paterson, available geological mapping and surrounding WWRs.

The “vegetative cover infiltration factor” was calculated as 0.12 based upon the site being used as cultivated land with some trees throughout the site.

As part of the rezoning process, the City of Ottawa does not typically allow the use of tertiary treatment systems to support the re-zoning application, however, as the site is within the Carp Road Corridor, tertiary treatment systems can be used to support the re-zoning application. As a tertiary treatment system requires annual monitoring by the Ottawa Septic System Office (OSSO), and allows for advanced treatment of sewage effluent, a tertiary treatment system is being reviewed for the Subject Site. The mandatory monitoring required on tertiary treatment systems by the OSSO ensures that the system is properly maintained and replaced when required, whereas there is no mandatory monitoring on a conventional sewage system. In order to demonstrate the viability and sustainability aspects of private servicing on the subject site, a Nitrate Impact Assessment was completed using the above noted parameters.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction) results in a maximum of **1.6 m^3/day** of effluent using a nitrate concentration of 40 mg/L. The inclusion of nitrate reduction technology (57 % nitrogen reduction in the of the effluent nitrate) would result in a maximum of **6.81 m^3/day** of effluent using a nitrate concentration of 17.2 mg/L. The Waterloo-Biofilter technology (WaterNOx) is capable of up to 90% nitrate reduction, which would allow greater than **10 m^3/day**. Both maximum sewage flow volumes with their respective reduced nitrate concentrations meet the nitrate concentration threshold of below 10 mg/L at the property boundary. Additional re-infiltration from stormwater (up to 10%) could be used to increase the dilution of septic effluent, if needed.

A sewage system installation application for a new sewage system on any site in the City of Ottawa with a sewage flow volume of less than 10 m^3/day will require an OSSO application.

CONCLUSIONS

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

1. The water supply aquifer underlying the subject site is considered to be adequate to support the water quantity demands for the proposed zoning.

2. The preferred water supply intercepted by TW1 contains a water supply that is potable and contains only elevated concentrations of hardness and TDS. The noted parameters can be treated with current readily available water conditioning equipment.

3. Total Coliforms were detected at 4 ct/100 mL, as such, it is recommended that a UV system is installed to assist in the removal of any remnant Total Coliforms found in the groundwater, as a precautionary measure.

4. If desired by the property owner, a residential grade water softener can be used to facilitate the reduction of the hardness concentration and reduce scaling. 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 without increasing sodium levels.

5. It is recommended that either a point-of-use reverse osmosis system be used to reduce the TDS concentration, or bulk bottled water is provided as a drinking water source.

6. The subject site is sufficient in size to accommodate two new sewage systems and meet all of the regulatory separation criteria. As a precautionary measure, a 30 m setback should be maintained between the drinking water well and any septic system components.

7. A maximum sewage flow volume of **1.6 m^3/day** at a nitrate concentration of 40 mg/L or **6.8 m^3/day** at a nitrate concentration of 17.2 mg/L can be accommodated on the subject site based on the current layout and still be below the predictive nitrate concentration threshold of 10 mg/L at the property boundary.

8. Onsite sewage disposal needs can be accommodated with a Class 4 Sewage System utilizing tertiary treatment technologies.

9. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction on the proposed structures or amenities/services.

10. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed zoning usage 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

Michael Killam, P.Eng

Attachments:

- ❑ Key Plan
- ❑ MECP Water Well Records – 1973843 & 1974461
- ❑ Eurofins Certificate of Analysis
- ❑ Paterson PG3834 - Test Pit and Borehole Logs
- ❑ AQTESOLV - Pumping Test Analysis Reports
- ❑ Langelier Calculation
- ❑ Nitrate Impact Assessment Calculations
- ❑ Paterson Drawing PH5103-1 - Test Hole Location Plan
- ❑ Well Disinfection Instruction Sheet

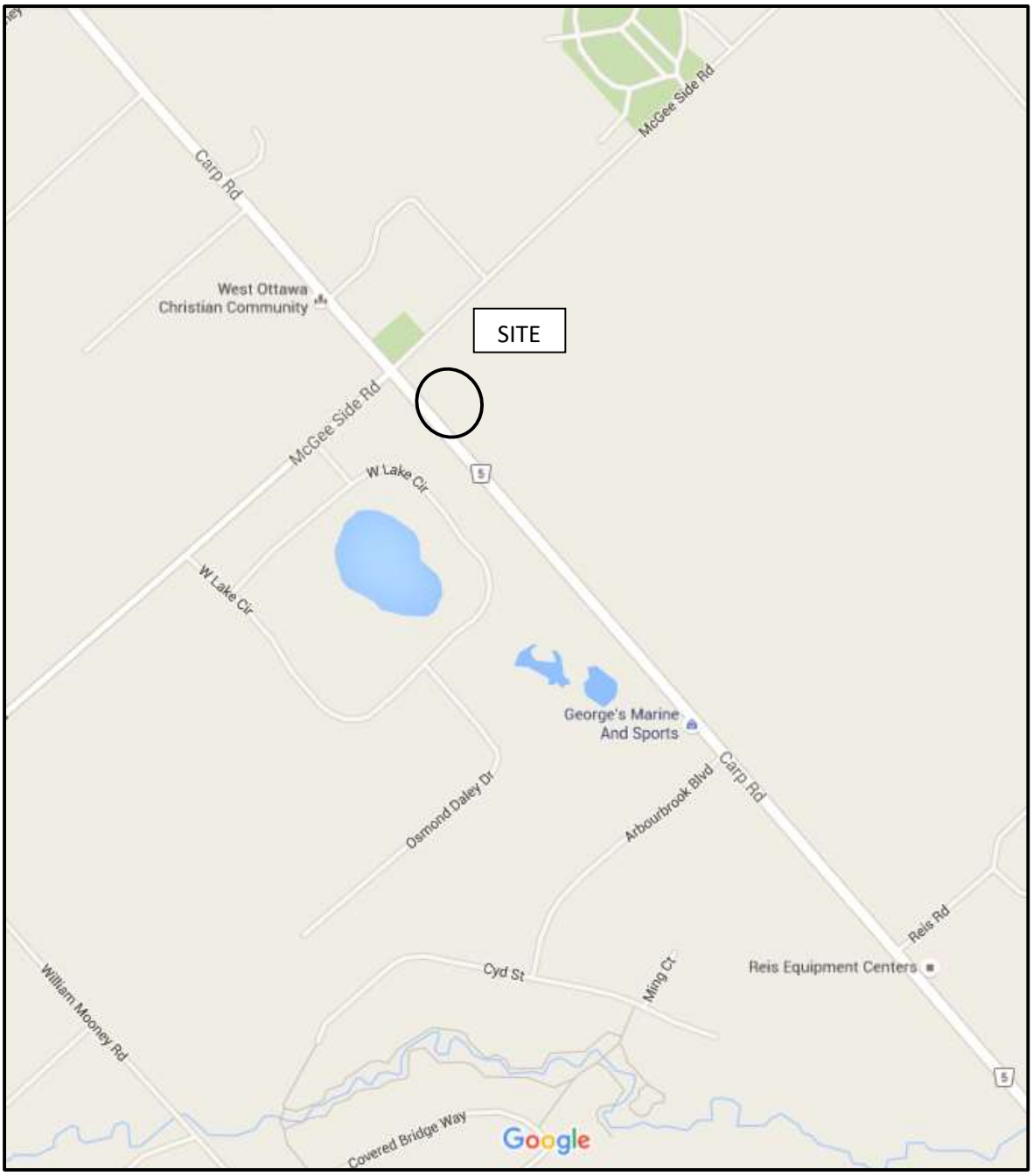


Figure 1 – Key Plan

Municipality	Province	Postal Code	Telephone No
2962 Carp Rd — Carp	ON	K0A 1L0	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2978 Carp Rd.	West Carleton	10	2

County/District/Municipality	City/Town/Village	Province	
Ottawa		Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421689	5017621		

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

General Colour	Most Common Material	Other Materials	General Description	Fr
brown	Sand + gravel			0
gray	limestone			4

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6.20	Cement Grout	.14

Method of Construction

- [ ] Cable Tool
- [ ] 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	To
15.55	Steel	.48	0	6.82

Construction Record - Screen

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

Status of Well

- [x] Water Supply
- [ ] Replacement Well
- [ ] Test Hole
- [ ] Recharge Well
- [x] 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)	Gas	Kind of Water	Other, specify
23.25	☐	☐ Fresh ☑ Untested	
58.90	☐	☐ Fresh ☑ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	6.20	27.28
6.20	58.90	15.55

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
George H. Law + Son Ltd	3123

Business Address (Street Number/Name)	Municipality

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): 18.60.

Pumping rate (l/min / GPM): 45

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 2.28

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

Recommended pump depth (m/ft): ~~67.50~~ 9.30

Recommended pump rate (l/min / GPM): 67.50+

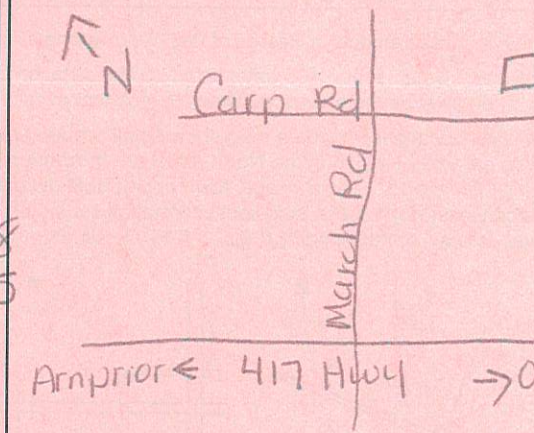
Well production (l/min / GPM):

Disinfected?
- [x] Yes
- [ ] No

Draw Down Time (min)	Water Level (m/ft)	T (m)
Static Level	2.16	
1	2.23	
2	2.24	
3	2.25	
4	2.26	
5	2.27	
10	2.28	
15	2.28	
20	↓	2
25		2
30		3
40		4
50	2.28	5
60	2.28	6

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Basin 2 5

RESOURCES COMMISSION

WATER WELL RECORD

County or District Carleton Township, ~~Village, Town or City~~ Huntley

Con. 2 [redacted] Lot 10 Date completed 18 (day) mar (month) 1960 (year)

[redacted] Address Carp Ont

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 24'

Type of screen none

Length of screen —

Depth to top of screen —

Diameter of finished hole 4"

Pumping Test

Static level 20'

Test-pumping rate 5 G.P.M.

Pumping level 21'

Duration of test pumping ½ hr

Water clear or cloudy at end of test clear

Recommended pumping rate 5 G.P.M.

with pumping level of 21'

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
Clayloam	0'	4'	178-180'	160'	fresh
greystonestone	4'	180'			

Water Record

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

House

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

upland

Drilling Firm K L Sparks

Address South March Ont

Licence Number 484

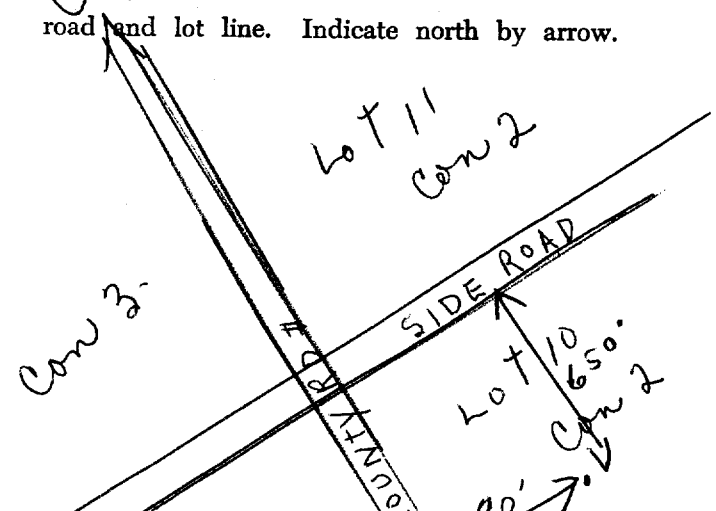
Name of Driller K L Sparks

Address South March Ont

Date Mar 18/60

Location of Well

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



CD

UTM 18 Z 4 2 2 2 5 0 E

5 R 5 0 1 7 9 1 0 N

Elev. 4 R 0 3 8 5

Basin 2 5

C

15 No 3066

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Carl

Township, Village, Town or City Huntley

Con. II Lot 10

Date completed 4 (day) Nov (month) 1985 (year)

[redacted] Address 3159 Carling Ave

Casing and Screen Record

Inside diameter of casing 5"

Total length of casing 30'

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 5"

Pumping Test

Static level 25'

Test-pumping rate 3 G.P.M.

Pumping level 75'

Duration of test pumping 1 hr

Water clear or cloudy at end of test cloudy

Recommended pumping rate 3 G.P.M.

with pump setting of 60 + 35' tailpipe feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
gravel & boulders	0'	5'	70	sulphur
limestone	5	100	95	"

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

new house

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

Drilling or Boring Firm Capital Water Supply

Address 1243 Heron Rd. Ottawa 733-0600

Licence Number 1687

Name of Driller or Borer D Colburne

Address

Date 15 Nov 1965

Walter Kavanagh

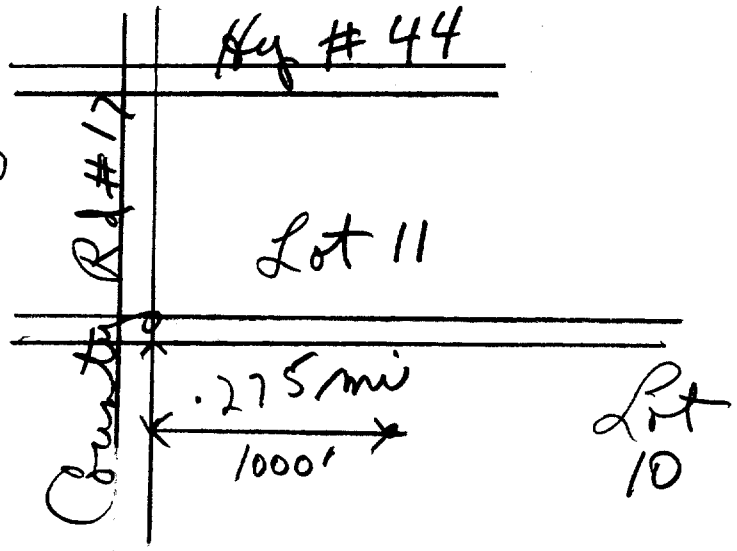
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

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



CSS.S3

GROUND WATER BRANCH
JUN 15 1962
ONTARIO WATER RESOURCES COMMISSION

No. 3069

UTM 18 Z 421735 E
5 R 5018140 N
Elev. 4 R 03810
Basin 25

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Carleton Township, ~~Village, Town or City~~ Huntley
Con. 2 Lot 11 Date completed 23 (day) May (month) 62 (year)
[redacted] Address RR 3 Carp

Casing and Screen Record

Inside diameter of casing 4½"
Total length of casing 12
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 4"

Pumping Test

Static level 20'
Test-pumping rate 6 G.P.M.
Pumping level 55'
Duration of test pumping 1½
Water clear or cloudy at end of test clear
Recommended pumping rate 5 G.P.M.
with pump setting of 100 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
previously drilled		70		
limestone	70	130	125'	fresh

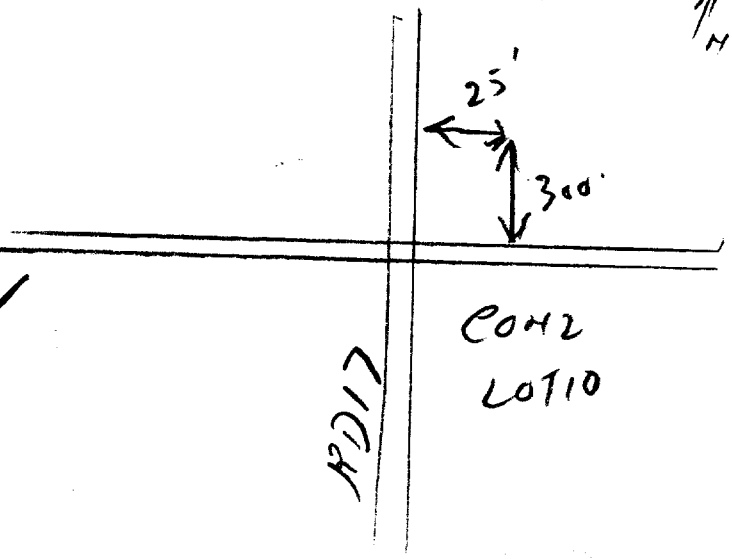
For what purpose(s) is the water to be used? Home
Is well on upland, in valley, or on hillside? upland
Drilling or Boring Firm B. E. Sparks
Address
Licence Number 700
Name of Driller or Borer B. E. Sparks
Address 413 Edgeworth
Date May 28/62
(Signature of Licensed Drilling or Boring Contractor) B. E. Sparks

Form 7 15M Sets 60-3930

OWRC COPY

Location of Well

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



5 13

UTM 18 | 421710 E
Con 11 5 R 5018050 N
Lot 11
Elev. 4 R 0375

Basin 25

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Carleton Township, ~~Village, Town or City~~ Huntley

Con. 3 Lot 11 Date completed 28 (day) Sept (month) 61 (year)

[redacted]ddress Carp Ont

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 7'

Type of screen none

Length of screen —

Depth to top of screen

Diameter of finished hole 4"

Pumping Test

Static level 20'

Test-pumping rate 5 G.P.M.

Pumping level 25'

Duration of test pumping ½ hr

Water clear or cloudy at end of test clear

Recommended pumping rate 5 G.P.M.

with pump setting of 90' feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Clay loam	0'	7'		
grey limestone	7'	101'	100-101	fresh

For what purpose(s) is the water to be used? house & farm

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

Drilling or Boring Firm W M E Sparks

Address 413 Edgeworth Ave Ottawa 3

Licence Number 485

Name of Driller or Borer W M E Sparks

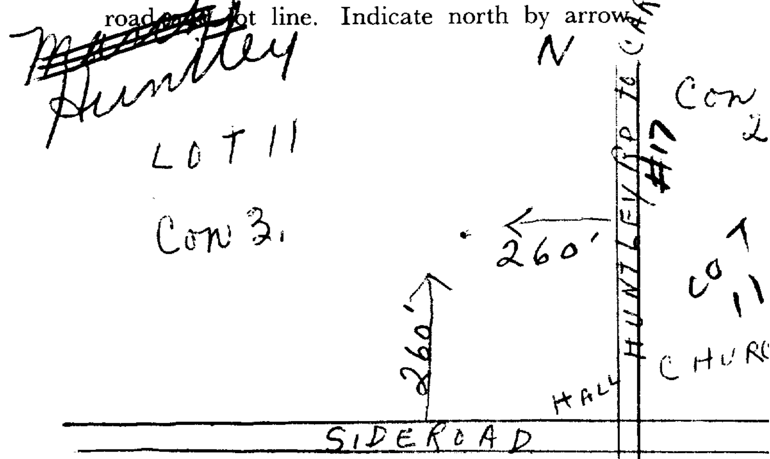
Address

Date Sept 28 /61

W M E Sparks
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



Form 7 15M Sets 60-5930

OWRC COPY

CSS.58

UTM 18 Z 421660 E

5 R 5018050 N

The Ontario Water Resources Commission Act

Elev. 4 R 0375

WATER WELL RECORD

15 No 3127

Basin 25 County or District CARLETON Township, Village, Town or City HUNTLEY

Con. 3 Lot 11 Date completed 15 (day) MAR (month) 66 (year)

[redacted] dress CARP RR

Casing and Screen Record	
Inside diameter of casing	4
Total length of casing	10
Type of screen	
Length of screen	
Depth to top of screen	
Diameter of finished hole	4

Pumping Test	
Static level	15
Test-pumping rate	3 G.P.M.
Pumping level	50
Duration of test pumping	1 HR
Water clear or cloudy at end of test	Clear
Recommended pumping rate	3 G.P.M.
with pump setting of	70 feet below ground surface

Well Log: Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
GRAVEL	0	10		
Limestone	10	81	80	FRESH

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

Is well on upland, in valley, or on hillside? (upland circled)

Drilling or Boring Firm F P SPARKS

Address STITTSVILLE

Licence Number

Name of Driller or Borer C H SPARKS

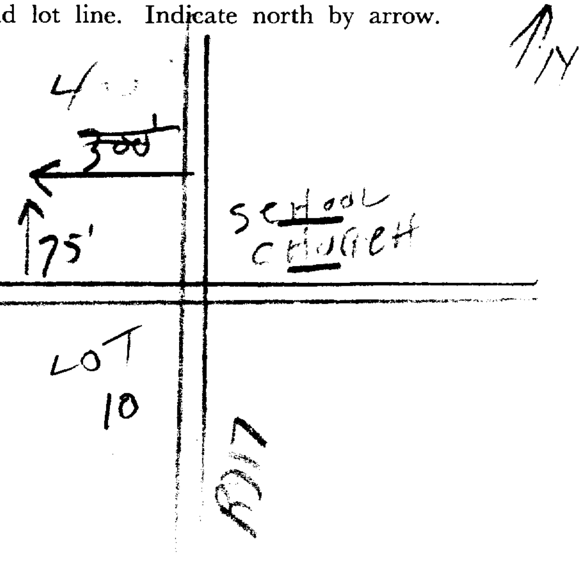
Address

Date MAY 10

F. P. Sparks
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

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



Form 7 15M-60-4138

OWRC COPY

WHITE Lime

[redacted]

DATE COMPLETED 48-53 DAY 24 MO 07 YR 68

HING 0 1 8 1 7 0 (24) RC. 4 (25) ELEVATION 0 3 8 0 (26) RC. 5 (30) BASIN CODE 2 5 (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	shale			0	9
"	limestone			9	121

31 00092117 01212115

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0073	1 X FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
0121	1 X 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
06 1/4	1 X STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE	.188	0	0027 27
	1 ☐ STEEL; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 X OPEN HOLE			0121
	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 X BAILER

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

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 X PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
021 FEET	080 FEET	038 FEET	050 FEET	068 FEET	080 FEET

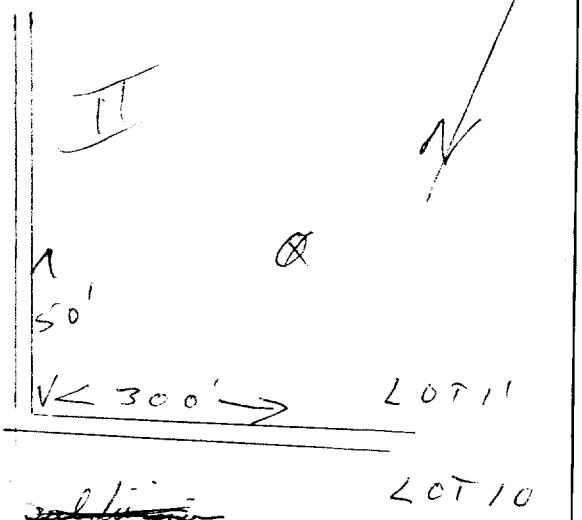
IF FLOWING, GIVE RATE: GPM. PUMP INTAKE SET AT: FEET. WATER AT END OF TEST: 1 X CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW X DEEP. RECOMMENDED PUMP SETTING: 100 FEET. RECOMMENDED PUMPING RATE: 0010 GPM.

50-53 000.2 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS: [redacted]

FINAL STATUS OF WELL (54)
1 X WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 01 (55-56)
1 X 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 (57)
1 X 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: AUSTIN STANTON — LICENCE NUMBER: 3389

ADDRESS: [redacted]

FOR MOE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 4806 — DATE RECEIVED 63-68: 170270

DATE OF INSPECTION — INSPECTOR

Huntley | 2 | 010

[redacted] ADDRESS 306 Wellington St, Ottawa

DATE COMPLETED 48-53 DAY 20 MO. 06 YR. 78

NORTHING 017700 | RC. 4 | ELEVATION 0385 | RC. 4 | BASIN CODE 26 | 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
Brown	sand	gravel & boulders		0	14
grey	limestone		soft	14	179
black	limestone			179	237

31 | 0014628 11 3 | 0179 21 5 S5T | 0237 8 15T

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13: 0235	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL (14)
15-18	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL (19)
20-23	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL (24)
25-28	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL (29)
30-33	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL (34, 80)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
10-11: 06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE (12)	188	0	0022 (13-16)
17-18: 06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☑ OPEN HOLE (19)		22	0237 (20-23)
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE (26)			(27-30)

SCREEN

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

61 PLUGGING & SEALING RECORD

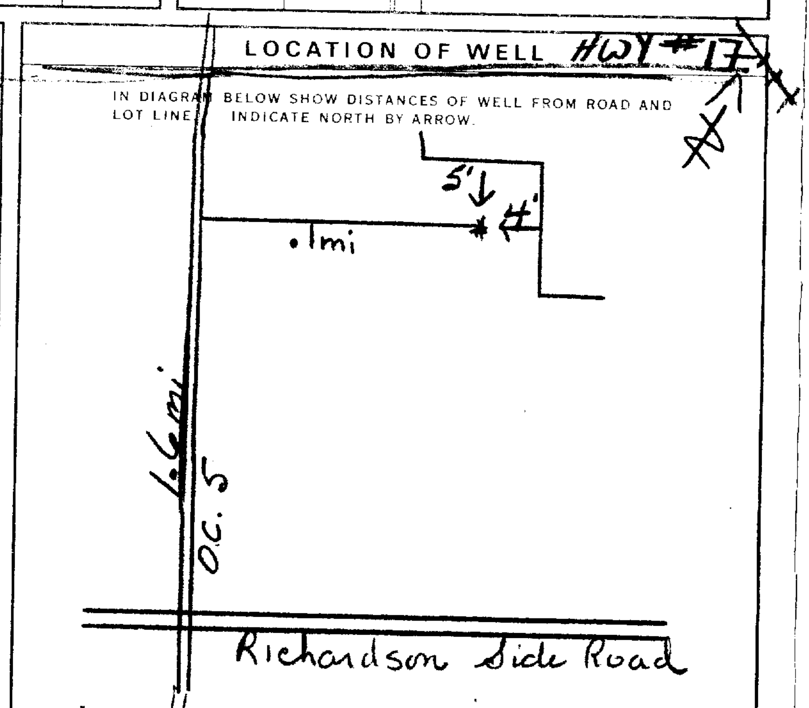
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD (10): 1 ☑ PUMP 2 ☐ BAILER	PUMPING RATE (11-14): 0010 GPM	DURATION OF PUMPING: 01 HOURS (15-16) 00 MINS (17-18)			
STATIC LEVEL (19-21)	WATER LEVEL END OF PUMPING (22-24)	WATER LEVELS DURING (25): 1 ☑ PUMPING 2 ☐ RECOVERY			
		15 MINUTES (26-28)	30 MINUTES (29-31)	45 MINUTES (32-34)	60 MINUTES (35-37)
025 FEET	085 FEET	085 FEET	085 FEET	085 FEET	085 FEET
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): 085 FEET	RECOMMENDED PUMPING RATE (46-49): 0005 GPM			
50-53 ——— GPM./FT. SPECIFIC CAPACITY					

LOCATION OF WELL

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



DRILLERS REMARKS: QUEENSWAY

FINAL STATUS OF WELL (54): 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 (55-56): 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 (57): 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: CAPITAL WATER SUPPLY LTD | LICENCE NUMBER: 1558

ADDRESS: [illegible]

ONLY — DATA SOURCE (58): 1 | CONTRACTOR (59-62): 1558 | DATE RECEIVED (63-68): 00778 | 80

DATE OF INSPECTION | INSPECTOR

Carleton | West Carleton (Huntley) | Con 2. | 010

[redacted] 1 Majestic Dr. Apt 10, Nepean

DATE COMPLETED DAY 30 MO 10 YR 80 (48-53)

…018199 | RC 4 | ELEVATION 0280 | 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	stones		0	12
grey	shaly limestone			12	84

31 | 0012005112 | 0084121582

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0080	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
06	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0020
	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	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☑ PUMP 2 ☐ BAILER

PUMPING RATE: 0004 GPM

DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL: 025 FEET

WATER LEVEL END OF PUMPING: 080 FEET

WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
080 FEET	080 FEET	080 FEET	080 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: 080 FEET

RECOMMENDED PUMPING RATE: 0004 GPM

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: 01

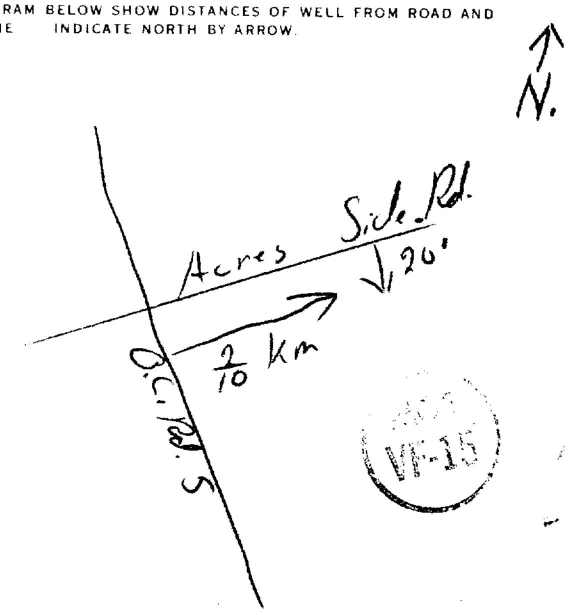
1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 5

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

LOCATION OF WELL

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



DRILLERS REMARKS

NAME OF WELL CONTRACTOR: Henry Mains Well Drilling | LICENCE NUMBER 3644

ADDRESS

DATA SOURCE 1 | CONTRACTOR 3644 | DATE RECEIVED 011280

DATE OF INSPECTION | INSPECTOR

OTTAWA-CARLETON WEST CARLETON | M-600 | W-5 | 10

[redacted] AVANAUGH DRIVE

DATE COMPLETED 48-53 DAY 10 MO 5 YR. 88

RC | ELEVATION | RC | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
GREY	CLAY		HARD	0	30
GREY	SILT		SOUPY	30	90
GREY	SAND	CLAY LAYERS	FINE	90	150
GREY	GRAVEL	STONES	PACKED	150	168

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
165	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	TO
6 1/2	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	165
	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	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
0	30	Cement Grout.

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER

PUMPING RATE: 25 GPM

DURATION OF PUMPING: 4 HOURS — MINS

STATIC LEVEL: 45 FEET

WATER LEVEL END OF PUMPING: 100 FEET

WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY

15 MINUTES: " FEET — 30 MINUTES: " FEET — 45 MINUTES: " FEET — 60 MINUTES: " FEET

IF FLOWING, GIVE RATE: — GPM

PUMP INTAKE SET AT: 100 FEET

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

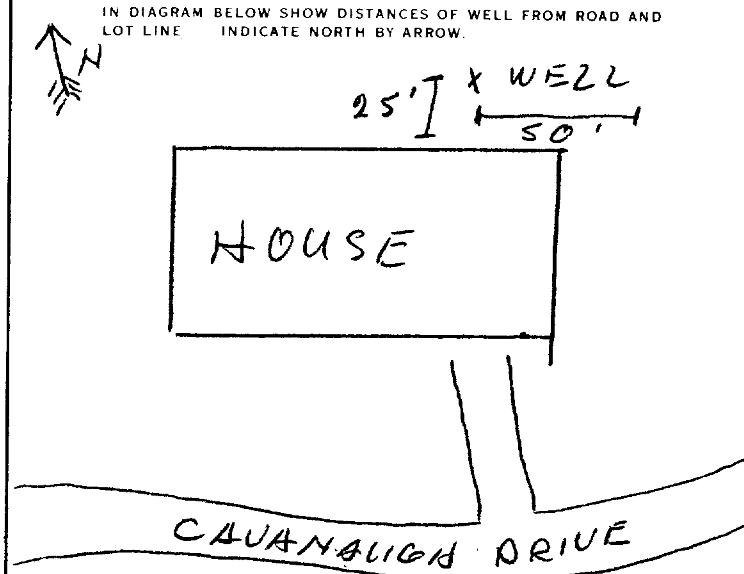
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING: 100 FEET

RECOMMENDED PUMPING RATE: 20 GPM

LOCATION OF WELL

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



32740

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 9 ☐ 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

NAME OF WELL CONTRACTOR: Valley Drilling Co. Ltd — WELL CONTRACTOR'S LICENCE NUMBER: 5222

ADDRESS

DATA SOURCE — CONTRACTOR 5222 — DATE RECEIVED JAN 09 1989

DATE OF INSPECTION — INSPECTOR

[redacted]

West Carleton - Huntley | 2 | 10

70 McGee Road Carp,Ontario K0A 1L0

DATE COMPLETED 48-53 DAY 20 MO 12 YR 93

1 2 | 10 12 | 17 18 | HING 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
Brown	Soil	Stones		0	4
Gray	Limestone	Soft Layers		4	155

31

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

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13: 74	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (14)
15-18: 132	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (19)
20-23: 147	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (24)
25-28: NOT TESTED	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (29)
30-33	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (34) (40)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4 (10-11)	1 ☒ STEEL (12) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	22 (16)
17-18: 6	1 ☐ STEEL (19) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		22	155 (20-23)
24-25	1 ☐ STEEL (26) 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			(27-30)

SCREEN

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

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
10-13: 21	14-17: 0	Grouted Cement (4)
18-21	22-25	
26-29	30-33 (80)	

71 PUMPING TEST

PUMPING TEST METHOD (10)	PUMPING RATE (11-14)	DURATION OF PUMPING (15-16 HOURS / 17-18 MINS)
1 ☐ PUMP 2 ☒ BAILER	8 GPM	1 HOURS

STATIC LEVEL (19-21)	WATER LEVEL END OF PUMPING (22-24)	WATER LEVELS DURING (25) 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES (26-28)	30 MINUTES (29-31)	45 MINUTES (32-34)	60 MINUTES (35-37)
14 FEET	85 FEET		76 FEET	85 FEET	85 FEET	85 FEET

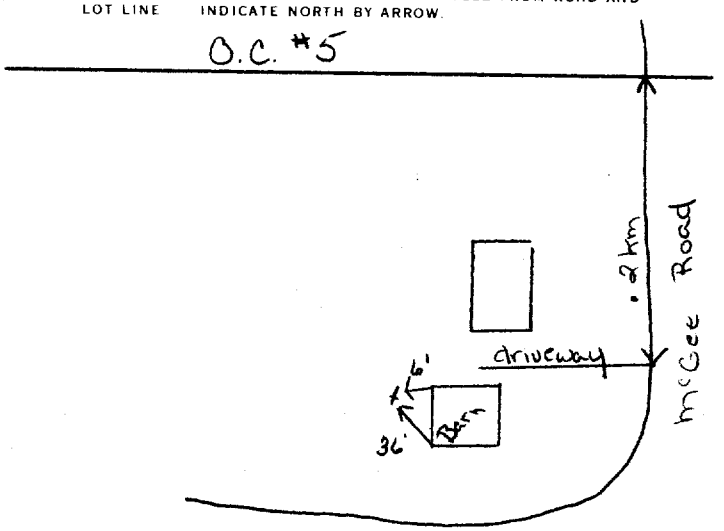
IF FLOWING, GIVE RATE (38-41)	PUMP INTAKE SET AT	WATER AT END OF TEST (42)
GPM	FEET	1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING (43-45)	RECOMMENDED PUMPING RATE (46-49)
☐ SHALLOW ☒ DEEP	100 FEET	5 GPM

(50-53)

LOCATION OF WELL

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



DRILLERS REMARKS

138065

54 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

55-56 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

57 METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL 75~~0~~155 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 0-75 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

ONLY

DATA SOURCE (58) | CONTRACTOR (59-62): 1558 | DATE RECEIVED (63-68): JAN 24 1994 (80)

DATE OF INSPECTION | INSPECTOR

[redacted] CARLETON HUNTLEY #2 | 10

[redacted] 2170 McGEE Sd. RD. | DATE COMPLETED DAY 10 MO 5 YR 94

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	SAND	STONES, CLAY		0	7'
GREY	LIMESTONE		MED, HARD	7'	110'
GREY	LIMESTONE	BLACK LIMESTONE	MED, HARD	110'	150'
GREY	LIMESTONE	BLACK LIMESTONE	HARD	150'	200'

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
140'	1 ☑ FRESH 2 ☐ SALTY
189'	1 ☑ FRESH 2 ☐ SALTY
	1 ☐ FRESH 2 ☐ SALTY
	1 ☐ FRESH 2 ☐ SALTY
	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	22'
6"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☑ OPEN HOLE 5 ☐ PLASTIC		22'	200'
	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.)
0	20'	CEMENT GROUT

71 PUMPING TEST

PUMPING TEST METHOD: ☑ 1 PUMP ☐ 2 BAILER — AIR

PUMPING RATE: 3 GPM

DURATION OF PUMPING: 2 HOURS ____ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
18 FEET	175 FEET	☑ 1 PUMPING ☐ 2 RECOVERY	FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: 175 FEET

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

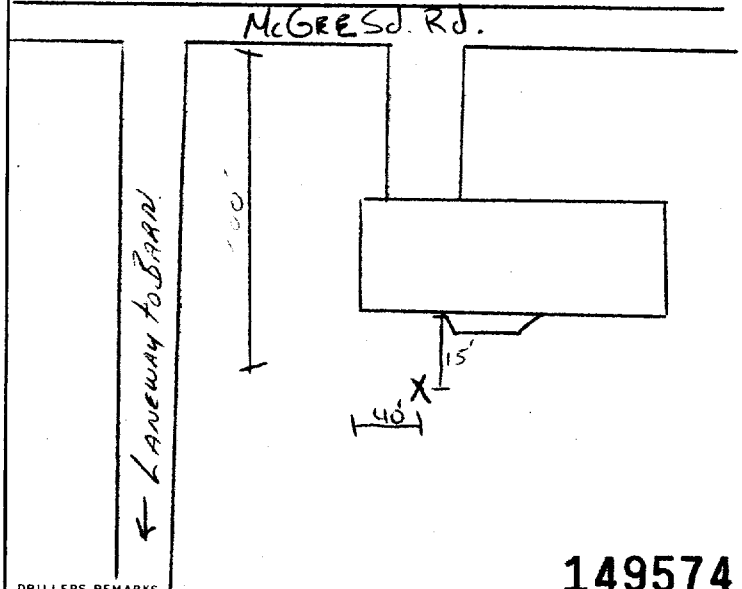
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP

RECOMMENDED PUMP SETTING: 175 FEET

RECOMMENDED PUMPING RATE: 3 GPM

LOCATION OF WELL

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



DRILLERS REMARKS

149574

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 ☐ 5 COMMERCIAL ☐ 6 MUNICIPAL ☐ 7 PUBLIC SUPPLY ☐ 8 COOLING OR AIR CONDITIONING ☐ OTHER ☐ 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: VALLEY DRILLING INC

WELL CONTRACTOR'S LICENCE NUMBER: 5222

ADDRESS

FOR MOE USE ONLY

DATA SOURCE

CONTRACTOR 5222

DATE RECEIVED AUG 28 1995

DATE OF INSPECTION

INSPECTOR

#2171 McGee Side Road Carp ON K0A 1L0

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
# 2171 McGee Side Road	Huntley	11	2

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa. Carleton	Carp	Ontario	

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation	
NAD 8 3	18	421921	5018437	Magellan	200	☐ Undifferentiated	☒ Averaged
						☐ Differentiated, specify	

Overburden and Bedrock Materials *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	Depth (Metres) To
	Sand	Gravel		0	4.27
	Grey	Limestone		4.27	152.39

* Plan RP5R12610 *

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
6.10	0	Neat Cement Slurry	.2724

Method of Construction

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

Water Use

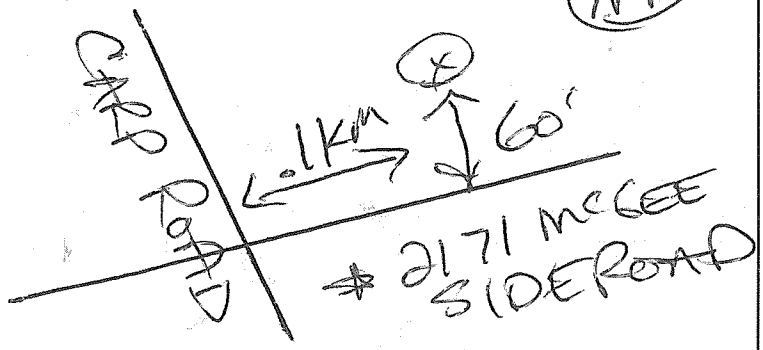
☐ Public ☒ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Status of Well

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

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- vidigital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2007-08-31	☒ Yes ☐ No	2007-08-31

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
AIR Rock DRILLING Co LTD	7119

Business Address (Street No./Name, number, RR)	Municipality
RR#1	Carp ON

Results of Well Yield Testing

Check box if after test of well yield, water was:
☐ Clear and sand free
☐ Cannot develop to sand-free state

If pumping discontinued, give reason: NOTED

Pumping test method: SubPump

Pump intake set at *(Metres)*: 91.44

Pumping rate *(Litres/min)*: 26.5

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping *(Metres)*: 34.90

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 91.44 Metres

Recommended pump rate *(Litres/min)*: 26.5

If flowing give rate *(Litres/min)*: X

	Draw Down Time (Min)	Draw Down Water Level (Metres)	Recovery Time (Min)	Recovery Water Level (Metres)
Static Level	5.75		Static Level	34.90
1	7.08		1	32.36
2	8.20		2	31.30
3	9.30		3	30.22
4	10.30		4	29.18
5	11.20		5	28.20
10	15.26		10	23.70
15	18.60		15	20.
20	21.40		20	16.60
25	23.87		25	13.90
30	26.		30	11.58
40	29.66		40	9.90
50	32.60		50	7.80
60	34.90		60	6.30

Water Details

Water found at Depth		Kind of Water	
105.8 Metres	☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur	☐ Minerals
Water found at Depth		Kind of Water	
147.82 Metres	☐ Gas	☐ Fresh ☐ Salty ☒ Sulphur (NOTED)	☐ Minerals
Water found at Depth		Kind of Water	
Metres	☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur	☐ Minerals

Casing Used

☐ Galvanized
☒ Steel
☐ Fibreglass
☐ Plastic
☐ Concrete

Screen Used

☐ Galvanized
☐ Steel
☐ Fibreglass
☐ Plastic
☐ Concrete

No Casing and Screen Used

☒ Open Hole 6.10 - 152.39

Disinfected? ☒ Yes ☐ No

Casing and Well Details

Diameter of the Hole *(Centimetres)*: 14.00

Depth of the Hole *(Metres)*: 152.39

Wall Thickness *(Metres)*: 1.48cm

Inside Diameter of the Casing *(Metres)*: 1588

Depth of the Casing *(Metres)*: 6.71

Shell Star Holdings

by Well Owner

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
P.O. Box 569	Stittsville	Ontario	K2S 1A6	613 831 9041

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
245 West Lake Circle	West Carleton	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421755	5018048		

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	Hardpan	Boulders		0	2.43
Gray	Limestone		Layered & Soft	2.43	6.09
Gray	Limestone		Medium	6.09	49.37

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
7.31	0	Grouted Cement & Bentonite	.31m^3

Method of Construction

- ☐ Cable Tool
- ☐ Diamond
- ☐ Rotary (Conventional)
- ☐ Jetting
- ☒ Rotary (Reverse) Air
- ☐ 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	+.45	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

- ☒ 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	Kind of Water	Gas	Other
33.52 m/ft	☐ Fresh ☒ Untested	☐	☐ Other, *specify*
49.07 m/ft	☐ Fresh ☒ Untested	☐	☐ Other, *specify*
m/ft	☐ Fresh ☐ Untested	☐	☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	7.31	15.86
7.31	49.37	15.23

Well Contractor and Well Technician Information

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

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): 22.85

Pumping rate (l/min / GPM): 54.6

Duration of pumping: 2 hrs + ____ min

Final water level end of pumping (m/ft): 6.23

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

Recommended pump depth (m/ft): 22.85

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

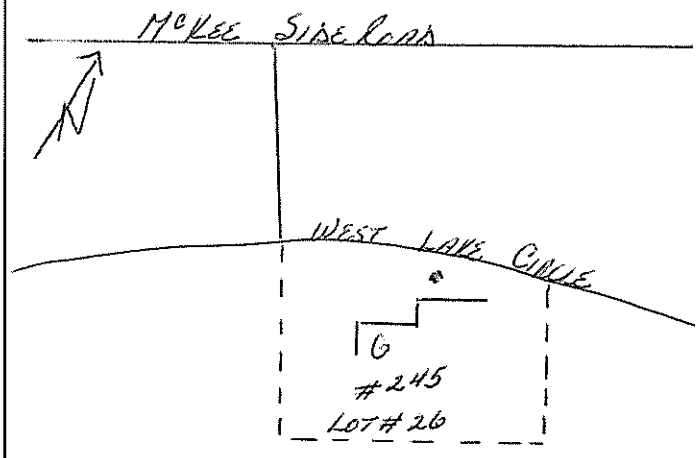
Well production (l/min / GPM):

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	4.89		
1	5.55	1	5.27
2	5.79	2	5.06
3	5.89	3	4.98
4	5.96	4	4.93
5	5.97	5	4.90
10	6.07	10	
15	6.10	15	
20	6.12	20	
25	6.13	25	
30	6.14	30	
40	6.17	40	
50	6.22	50	
60	6.23	60	

Map of Well Location

Please provide a map below following instructions on the back.



Address of Well Location (Street Number/Name)	Township	Lot	Concession
# 305 West Lake Circle	West Carleton	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421900	5017952	PLAN 4M-1316	S/L 28

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'	17'
	Grey limestone			17'	135'
	Grey limestone & Sandstone Mix			135'	160'
	Grey limestone			160'	200'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
28'	18'	Neat Cement Slurry	7.8
18'	0'	Neat Bentonite Slurry	16.8

Method of Construction

- ☐ Cable Tool
- ☐ Rotary (Conventional)
- ☐ Rotary (Reverse)
- ☐ Boring
- ☒ Air percussion
- ☐ Other, specify

- ☐ Diamond
- ☐ Jetting
- ☐ Driving
- ☐ Digging

Well Use

- ☐ Public
- ☒ Domestic
- ☐ Livestock
- ☐ Irrigation
- ☐ Industrial
- ☐ Other, specify

- ☐ Commercial
- ☐ Municipal
- ☐ Test Hole
- ☐ Cooling & Air Conditioning

- ☐ Not used
- ☐ Dewatering
- ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6"	Steel	.188"	+2'	28'
6"	Open Hole		28'	200'

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)	Gas	Kind of Water	Other, specify
152	☐	☐ Fresh ☒ Untested	
186	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0'	200'	6"

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
A & R Rock Drilling Ltd.	1119

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): 180'

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 56'

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

Recommended pump depth (m/ft): 100'

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

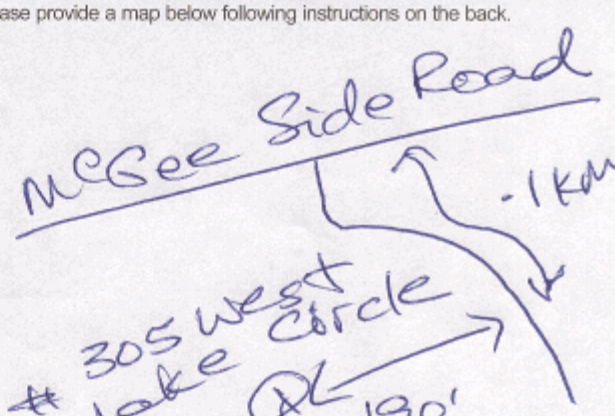
Well production (l/min / GPM): 20

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	11'7"		56'
1	25'9"	1	53'2"
2	31'2"	2	30'
3	33'9"	3	16'8"
4	37'7"	4	13'9"
5	40'7"	5	11'8"
10	49'2"	10	11'
15	52'1"	15	
20	53'4"	20	
25	54'6"	25	
30	55'	30	
40	55'6"	40	
50	55'8"	50	
60	56'	60	

Map of Well Location

Please provide a map below following instructions on the back.



Address of Well Location (Street Number/Name)	Township	Lot	Concession
# 350 WEST LAKE CIRCLE	West Carleton	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	465232	5029454	PLAN # 4M-13 16 S/L # 11	

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, Clay & Gravel			0'	15'
	Grey Limestone			15'	120

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
28'	18'	Neat Cement Slurry	7.8
18'	0'	Neat Bentonite Slurry	12.6

Method of Construction

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

Well Use

- [ ] Public
- [ ] Commercial
- [ ] Not used
- [x] 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
6"	Steel	.188"	+2'	28'
5 15/16"	Open hole		28'	120'

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*

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	Depth To	Diameter (cm/in)
112 (m/ft) ☐ Gas	☐ Fresh ☒ ~~Untested~~ ☐ Other, *specify*	0'	28'	6"
(m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*	28'	120'	5 15/16"
(m/ft) ☐ Gas	Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*			

Well Contractor and Well Technician Information

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

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) 125

Pumping rate (l/min / GPM) 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft) 111.8

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

Recommended pump depth (m/ft) (3/4HP-15gpm) 100'

Recommended pump rate (l/min / GPM) 20

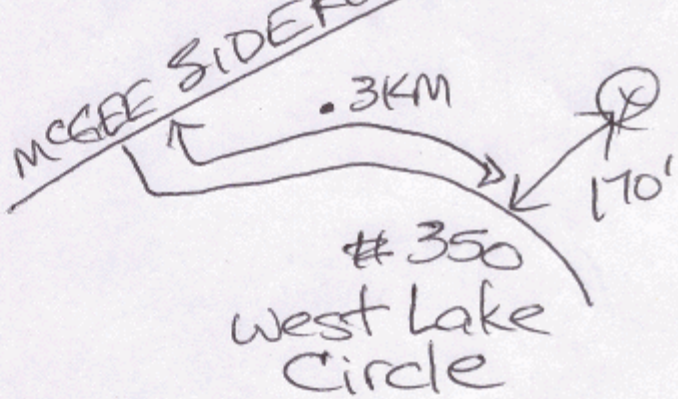
Well production (l/min / GPM) 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	16'2"		111'8"
1	26'5"	1	84'
2	33'4"	2	72'2"
3	39'3"	3	62'5"
4	44'	4	55'
5	48'	5	48'9"
10	61'5"	10	32'5"
15	69'4"	15	25'3"
20	78'	20	21'7"
25	86'2"	25	19'7"
30	91'5"	30	18'1"
40	101'3"	40	16'2"
50	107'3"	50	
60	111'8"	60	

Map of Well Location

Please provide a map below following instructions on the back.



Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 5 West Lake Estates	West Carleton-Huntley	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421718	5018158		

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	Soil			0	.60
Brown	Shale		Soft	.60	5.48
Grey	Limestone	Brown Layers	Medium Soft	5.48	70.40

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
8.83	0	Grouted Cement Slurry	.21m^3

Method of Construction

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

Well Use

- [ ] Public
- [ ] Commercial
- [ ] Not used
- [X] 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	+.45	8.83

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

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	
70.10-70.40	[ ]	[X] Untested	[ ] Fresh [ ] Other, specify
	[ ]	[ ] Untested	[ ] Fresh [ ] Other, specify
	[ ]	[ ] Untested	[ ] Fresh [ ] Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	8.83	15.86
8.83	70.40	15.55

Well Contractor and Well Technician Information

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

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): 18.28

Pumping rate (l/min / GPM): 45.5

Duration of pumping: 2 hrs + ____ min

Final water level end of pumping (m/ft): 7.46

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

Recommended pump depth (m/ft): 18.28

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

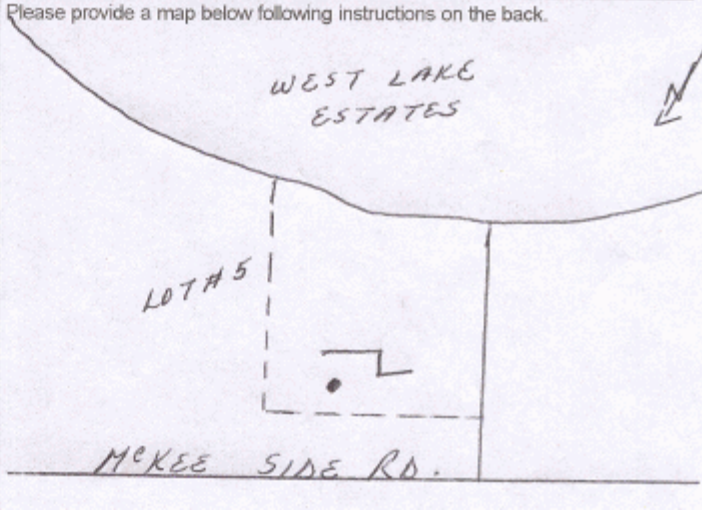
Well production (l/min / GPM):

Disinfected?
- [X] Yes
- [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	6.38		
1	7.03	1	6.65
2	7.14	2	6.41
3	7.18	3	6.38
4	7.19	4	
5	7.20	5	
10	7.22	10	
15	7.26	15	
20	7.32	20	
25	7.40	25	
30	7.45	30	
40		40	
50	7.48	50	
60	7.47	60	

Map of Well Location

Please provide a map below following instructions on the back.



Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 30 West Lake Estates	West Carleton - Huntley	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421995	5017833		

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	Soil	Large Boulders		0	7.31
Grey	Limestone	Dark Layers	Medium	7.31	83.20

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
10.36	0	Grouted Bentonite Slurry	.548m^3

Method of Construction

- [ ] Cable Tool
- [X] Rotary (Conventional) — Mud
- [ ] 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
15.86	Steel	.48	+.45	10.36

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

Water Details

Water found at Depth	Kind of Water	
33.52 (m/ft)	[X] Untested	[ ] Gas
79.24 (m/ft)	[X] Untested	[ ] Gas
(m/ft)	[ ] Untested	[ ] Gas

Kind of Water: [ ] Fresh [X] Untested [ ] Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	10.36	15.86
10.36	83.20	15.39

Well Contractor and Well Technician Information

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

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): 45.71

Pumping rate (l/min / GPM): 36.40

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 41.0

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

Recommended pump depth (m/ft): 45.71

Recommended pump rate (l/min / GPM): 36.40

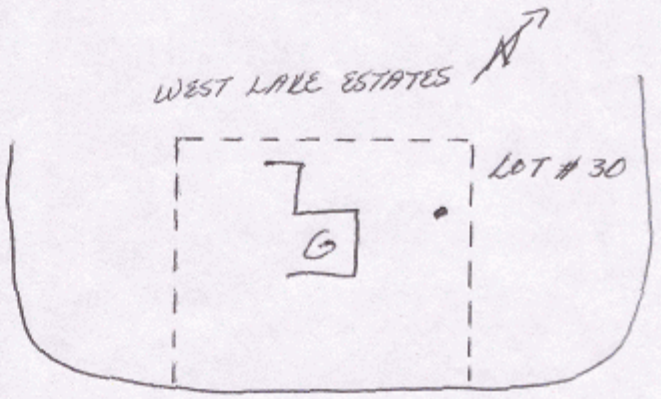
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	4.14		
1	6.40	1	38.65
2	8.53	2	37.60
3		3	36.17
4	10.42	4	34.60
5	12.40	5	33.15
10	16.50	10	26.60
15	20.08	15	20.49
20	22.20	20	17.30
25	25.13	25	16.26
30	28.85	30	12.46
40	32.95	40	9.91
50	36.77	50	6.43
60	41.	60	4.40

Map of Well Location

Please provide a map below following instructions on the back.



P.O. Box 309

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 12 West Lake Estates	West Carleton - Huntley	10	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	422071	5017793		

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	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
37.48	0	Grouted Bentonite Hole Plug (33 bags)	3/8 inch

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To

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	Hole Diameter Depth (m/ft) From	Hole Diameter Depth (m/ft) To	Hole Diameter (cm/in)
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			
☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*			

Well Contractor and Well Technician Information

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

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)*

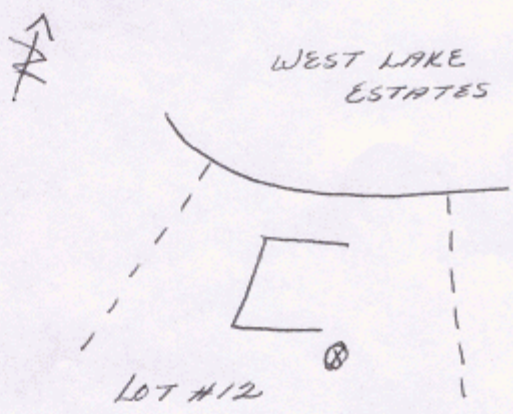
Well production *(l/min / GPM)*

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.



535 West Lake Circle | Carp | Ontario | K0A 1L0 | 613 227 4978

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 29 West Lake Estates	West Carleton - Huntley		

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421948	5017894		

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	Soil	Large Boulders		0	5.48
Grey	Limestone	Dark Layers		5.48	83.20

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
8.53	0	Grouted Bentonite Slurry	.46m^3

Method of Construction

- [ ] Cable Tool
- [X] Rotary (Conventional) — Mud
- [ ] Rotary (Reverse)
- [ ] Boring
- [ ] 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
15.86	Steel	.48	+.45	8.53

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	8.53	15.86
8.53	83.20	15.23

Well Contractor and Well Technician Information

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

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): 76.19

Pumping rate (l/min / GPM): 45.5

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 6.79

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

Recommended pump depth (m/ft): 22.85

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

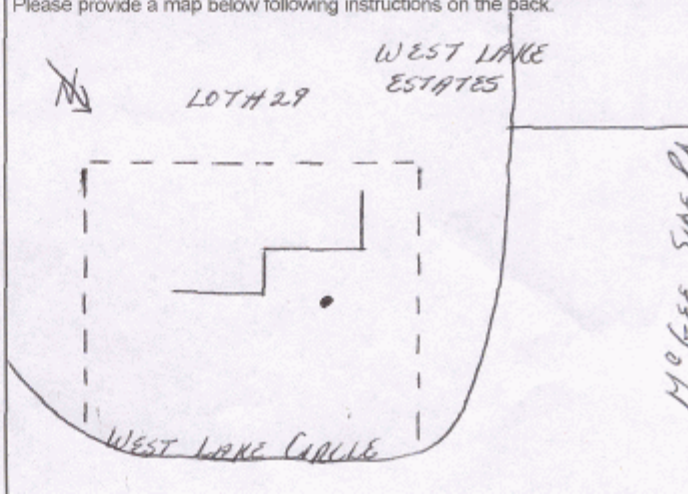
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		3.65		
1		4.74	1	5.04
2		5.13	2	4.29
3		5.38	3	3.98
4		5.56	4	3.87
5		5.68	5	3.82
10		5.96	10	3.76
15		6.02	15	3.71
20			20	3.68
25		6.03	25	
30		6.42	30	
40		6.76	40	
50		6.78	50	
60		6.79	60	

Map of Well Location

Please provide a map below following instructions on the back.



Mailing Address (Street Number/Name)	Municipality			
P.O. Box 569	Stittsville	Ontario	K2S 1A6	613 831 9041

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Lot 6 West Lake Circle	West Carleton - Huntley		

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421781	5018130		

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 & Boulders	Loose	0	6.09
Grey	Limestone	Dark Layers	Medium	6.09	75.58

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
9.75	0	Grouted Cement & Bentonite	.928m^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
15.86	Steel	.48	+.45	9.75

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

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	9,75	15.86
9.75	75.58	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

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): 60.95

Pumping rate (l/min / GPM): 36.40

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 11.77

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

Recommended pump depth (m/ft): 30.47

Recommended pump rate (l/min / GPM): 36.40

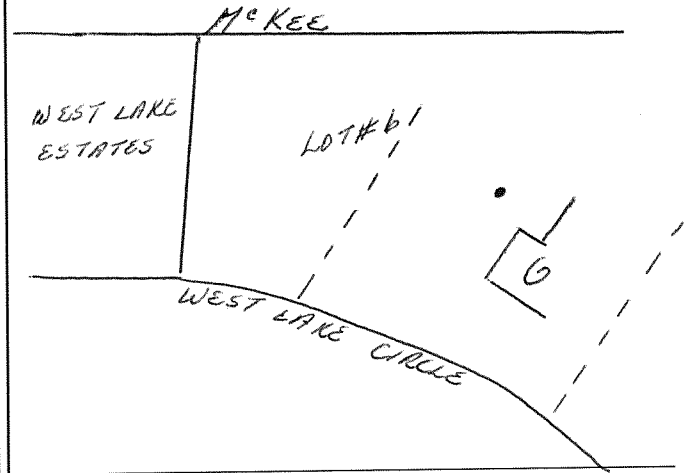
Well production (l/min / GPM):

Disinfected? [X] Yes [ ] No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		6.60		
1		8.30	1	9.50
2		9.05	2	8.50
3		9.50	3	8.00
4		9.81	4	7.59
5		10.10	5	7.20
10		10.91	10	6.89
15		11.36	15	6.59
20		11.54	20	
25			25	
30			30	
40			40	
50			50	
60		11.77	60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

9094 Cavanagh Road | Ashton | Ont | K0A1B0 | 6132529118

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
305 West Lake Circle	West Carleton - March 28		

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	421941	5017942	4M1316	

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
			Fill, sand, gravel & boulders	0	5.66

MW 1 was the only well drilled. It was tagged.

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	2.31	hole plug	2 bags
2.31	5.66	Filter sand	2 bags

Method of Construction

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

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
5.2	plastic	0.4	0	2.62

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
6.0	plastic	10	2.62	5.66

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)	Gas	Kind of Water	Fresh	Untested	Other, specify
1.02	☐		☐	☐	
	☐		☐	☐	
	☐		☐	☐	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	1.37	22
1.37	5.66	9

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
OGS INC	6964

Business Address (Street Number/Name)	Municipality
5518 Appleton Side Road	Almonte

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.

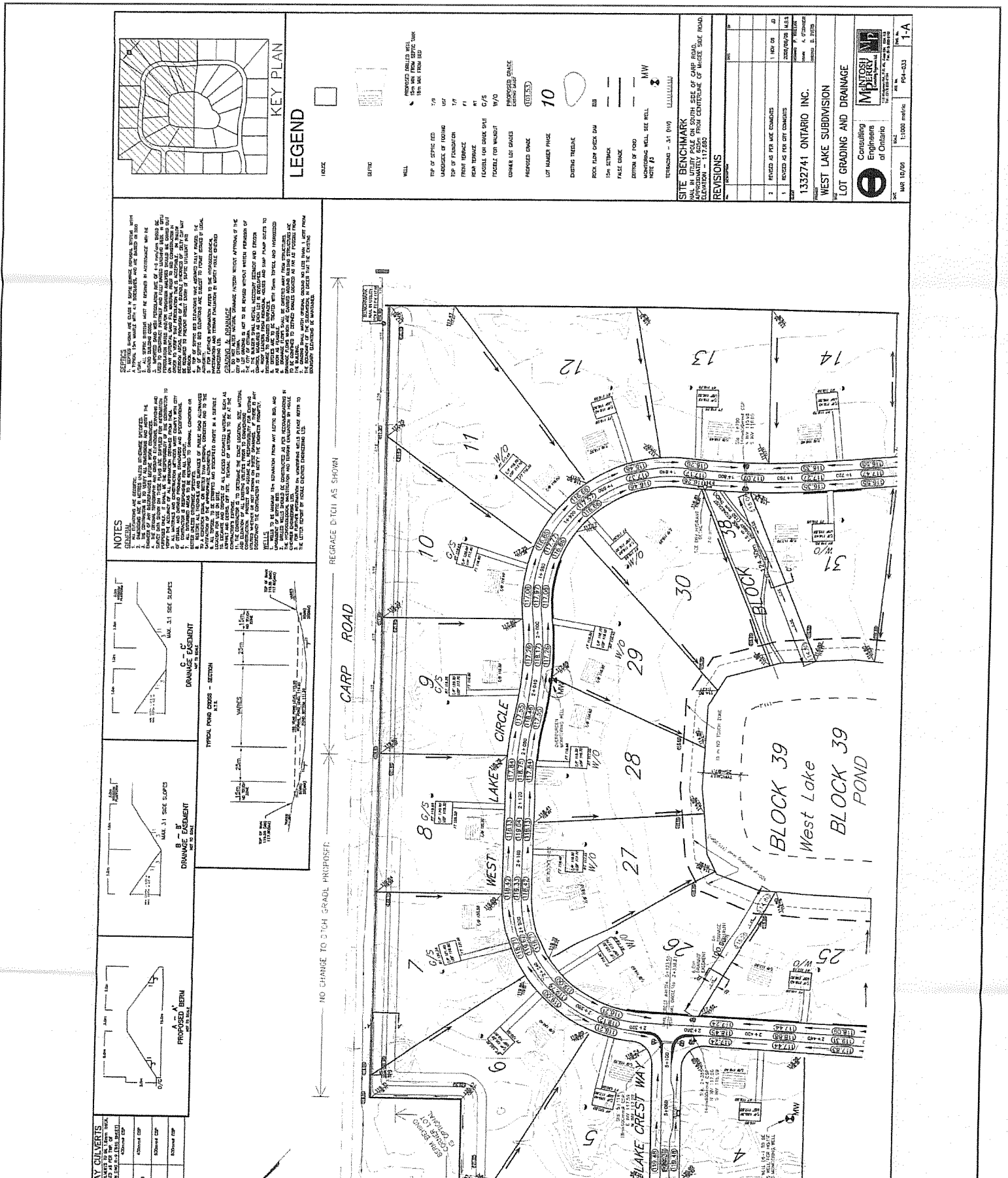
Site plan and area map are enclosed.

Comments:

Note: This **Well Record for Well Cluster Part 3 - Detailed Drawing of all Well Locations,** must be attached to Parts 1 and 2. The drawing must include all property boundaries, an arrow indicating the North direction, all named roads and sufficient measurements to locate all wells in the cluster in relation to fixed points. The drawing must show the location of each well and each well must be numbered on the drawing to match number used for that well on the **Well Record for Well Cluster Parts 1 and 2.** The well with the well tag must be clearly identified on the Drawing.
UTM coordinates should appear beside each well, if space permits. Additional comments on wells can be included on the drawing

Well Tag Number: # A137237

"Well Record for Well Cluster" Form Audit Number: # Z 163946



Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Dear Oliver Blume:

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:

APPROVAL: Addrine Thomas 2022.03.30 13:55:02 -04'00'

Addrine Thomas, Inorganics Supervisor

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: http://www.cala.ca/scopes/2602.pdf.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

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.

eurofins | Environment Testing

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1615821 GW 2022-03-22 GW1	1615822 GW 2022-03-22 GW2
Anions	Cl	1	mg/L	AO 250		135	142
	F	0.10	mg/L	MAC 1.5		<0.10	<0.10
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		3.15	3.02
	SO4	1	mg/L	AO 500		182	175
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		251	243
	Colour (Apparent)	2	TCU	AO 5		<2	<2
	Conductivity	5	uS/cm			1180	1180
	DOC	0.5	mg/L	AO 5		2.4	2.4
	pH	1.00		6.5-8.5		7.95	7.93
	Phenols	0.001	mg/L			<0.001	<0.001
	S2-	0.01	mg/L	AO 0.05		<0.01	<0.01
	TDS (COND - CALC)	1	mg/L	AO 500		767*	767*
	Turbidity	0.1	NTU	AO 5		0.5	0.5
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100		454*	451*
Indices/Calc	Ion Balance	0.01				0.97	0.97
Mercury	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001
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		0.04	0.04
	Ba	0.01	mg/L	MAC 1.0		0.12	0.12
	Be	0.0005	mg/L			<0.0005	<0.0005
	Ca	1	mg/L			162	161
	Cd	0.0001	mg/L	MAC 0.005		<0.0001	<0.0001

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

eurofins | Environment Testing

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Group	Analyte	MRL	Units	Guideline	1615821 GW 2022-03-22 GW1	1615822 GW 2022-03-22 GW2
	Lab I.D.				1615821	1615822
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2022-03-22	2022-03-22
	Sample I.D.				GW1	GW2
Metals	Co	0.0002	mg/L		<0.0002	<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001
	Cu	0.001	mg/L	AO 1	<0.001	<0.001
	Fe	0.03	mg/L	AO 0.3	<0.03	<0.03
	K	1	mg/L		2	2
	Mg	1	mg/L		12	12
	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	77	75
	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		0.879	0.876
	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	19*	23*
Nutrients	N-NH3	0.010	mg/L		<0.010	<0.010
	Total Kjeldahl Nitrogen	0.100	mg/L		0.252	0.477
Subcontract	Tannin & Lignin	1	mg/L			1
		1.0	mg/L		1.0	
VOCs Surrogates	1,2-dichloroethane-d4	0	%		100	119

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Group	Analyte	MRL	Units	Guideline	1615821 GW 2022-03-22 GW1	1615822 GW 2022-03-22 GW2
	Lab I.D.				1615821	1615822
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2022-03-22	2022-03-22
	Sample I.D.				GW1	GW2
VOCs Surrogates	4-bromofluorobenzene	0	%		71	76
	Toluene-d8	0	%		91	98
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	0.2	ug/L	IMAC 5	<0.2	<0.2
	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)	0.3	ug/L		<0.3	<0.3
	1,4-dichlorobenzene	0.4	ug/L	MAC 5	<0.4	<0.4
	Acetone	30	ug/L		<30	<30
	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	0.2	ug/L		<0.2	<0.2
	Carbon Tetrachloride	0.2	ug/L	MAC 2	<0.2	<0.2
	Chloroethane	0.2	ug/L		<0.2	<0.2
	Chloroform	0.5	ug/L		<0.5	<0.5

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Group	Analyte	MRL	Units	Guideline	1615821 GW 2022-03-22 GW1	1615822 GW 2022-03-22 GW2
	Lab I.D.				1615821	1615822
	Sample Matrix				GW	GW
	Sample Type					
	Sampling Date				2022-03-22	2022-03-22
	Sample I.D.				GW1	GW2
Volatiles	Dibromochloromethane	0.3	ug/L		<0.3	<0.3
	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)	10	ug/L		<10	<10
	Methyl Isobutyl Ketone (MIBK)	10	ug/L		<10	<10
	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	0.2	ug/L		<0.2	<0.2
	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

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 418950 **Analysis/Extraction Date** 2022-03-23 **Analyst** AaN **Method** C SM2130B			
Turbidity	<0.1 NTU	99	70-130
Run No 418958 **Analysis/Extraction Date** 2022-03-24 **Analyst** DRA **Method** AMBCOLM1			
Escherichia Coli			
Total Coliforms			
Run No 418995 **Analysis/Extraction Date** 2022-03-24 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	95	90-110
Potassium	<1 mg/L	96	87-113
Magnesium	<1 mg/L	95	76-124
Sodium	<1 mg/L	102	82-118
Run No 419016 **Analysis/Extraction Date** 2022-03-24 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.010 mg/L	113	80-120
Run No 419027 **Analysis/Extraction Date** 2022-03-24 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	110	70-130

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 419078 **Analysis/Extraction Date** 2022-03-24 **Analyst** YH **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	92	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	88	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	114	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	104	60-130
Dichloroethane, 1,1-	<0.4 ug/L	94	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	93	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	104	60-130
Dichloroethane, 1,2-	<0.2 ug/L	115	60-130
Dichloropropane, 1,2-	<0.5 ug/L	106	60-130
1,3,5-trimethylbenzene	<0.3 ug/L	97	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	96	60-130
Dichloropropene,1,3-	<0.3 ug/L		
Dichlorobenzene, 1,4-	<0.4 ug/L	97	60-130
Acetone	<30 ug/L		60-130
Benzene	<0.5 ug/L	100	60-130
Bromodichloromethane	<0.3 ug/L	108	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Bromoform	<0.4 ug/L	104	60-130
Bromomethane	<0.5 ug/L	93	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	98	60-130
Dichloropropene,1,3-cis-	<0.2 ug/L	103	60-130
Carbon Tetrachloride	<0.2 ug/L	93	60-130
Chloroethane	<0.2 ug/L	91	60-130
Chloroform	<0.5 ug/L	100	60-130
Dibromochloromethane	<0.3 ug/L	96	60-130
Dichlorodifluoromethane	<0.5 ug/L	86	60-130
Methylene Chloride	<4.0 ug/L	113	60-130
Ethylbenzene	<0.5 ug/L	85	60-130
Ethylene dibromide	<0.2 ug/L	98	60-130
Hexane (n)	<5 ug/L	110	60-130
m/p-xylene	<0.4 ug/L	93	60-130
Methyl Ethyl Ketone	<10 ug/L	100	60-130
Methyl Isobutyl Ketone	<10 ug/L		60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	110	60-130
Chlorobenzene	<0.5 ug/L	93	60-130

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

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
o-xylene	<0.4 ug/L	84	60-130
Styrene	<0.5 ug/L	90	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	89	60-130
Dichloropropene,1,3-trans-	<0.2 ug/L	112	60-130
Tetrachloroethylene	<0.3 ug/L	91	60-130
Toluene	<0.4 ug/L	96	60-130
Trichloroethylene	<0.3 ug/L	82	60-130
Trichlorofluoromethane	<0.5 ug/L	87	60-130
Vinyl Chloride	<0.2 ug/L	88	60-130
Run No 419082 **Analysis/Extraction Date** 2022-03-25 **Analyst** YH **Method** EPA 8260			
Xylene Mixture			
Run No 419088 **Analysis/Extraction Date** 2022-03-25 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	50	50-120
Run No 419093 **Analysis/Extraction Date** 2022-03-25 **Analyst** AsA **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	111	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 419123 **Analysis/Extraction Date** 2022-03-28 **Analyst** AsA **Method** C SM2120C			
Colour (Apparent)	<2 TCU	106	90-110
Run No 419127 **Analysis/Extraction Date** 2022-03-28 **Analyst** AaN **Method** SM 4110			
Chloride	<5 mg/L		90-110
N-NO2	<0.10 mg/L	103	90-110
N-NO3	<0.10 mg/L	104	90-110
SO4	<5 mg/L	105	90-110
Run No 419170 **Analysis/Extraction Date** 2022-03-25 **Analyst** AET **Method** SUBCONTRACT-A			
Tannin & Lignin	<1.0 mg/L	106	
Run No 419184 **Analysis/Extraction Date** 2022-03-28 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	98	90-110
Conductivity	<5 uS/cm	101	90-110
F	<0.10 mg/L	99	90-110
pH		100	90-110

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 419188 **Analysis/Extraction Date** 2022-03-28 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	102	80-120
Run No 419190 **Analysis/Extraction Date** 2022-03-25 **Analyst** R K **Method** SUBCONTRACT-A			
Tannin & Lignin	<1.0 mg/L	106	
Run No 419203 **Analysis/Extraction Date** 2022-03-29 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 419228 **Analysis/Extraction Date** 2022-03-29 **Analyst** SD **Method** EPA 200.8			
Silver	<0.0001 mg/L	82	80-120
Aluminum	<0.01 mg/L	111	80-120
Arsenic	<0.001 mg/L	97	80-120
Boron (total)	<0.01 mg/L	116	80-120
Barium	<0.01 mg/L	102	80-120
Beryllium	<0.0005 mg/L	105	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Cadmium	<0.0001 mg/L	101	80-120
Cobalt	<0.0002 mg/L	99	80-120
Chromium Total	<0.001 mg/L	94	80-120
Copper	<0.001 mg/L	106	80-120
Iron	<0.03 mg/L	99	80-120
Manganese	<0.01 mg/L	104	80-120
Molybdenum	<0.005 mg/L	99	80-120
Nickel	<0.005 mg/L	101	80-120
Lead	<0.001 mg/L	102	80-120
Antimony	<0.0005 mg/L	83	80-120
Selenium	<0.001 mg/L	108	80-120
Strontium	<0.001 mg/L	97	80-120
Thallium	<0.0001 mg/L	102	80-120
Uranium	<0.001 mg/L	99	80-120
Vanadium	<0.001 mg/L	98	80-120
Zinc	<0.01 mg/L	108	80-120

Run No 419288 **Analysis/Extraction Date** 2022-03-30 **Analyst** AaN
Method M SM3112B-3500B

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Mercury	<0.0001 mg/L	96	76-123

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

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

Report Number: 1973843
Date Submitted: 2022-03-23
Date Reported: 2022-03-30
Project: PH4484
COC #: 887701

Sample Comment Summary

Sample ID: 1615821	GW1	Cl & SO4 MRL elevated due to matrix interference (dilution was done). Sediments not included for Hg analysis.
Sample ID: 1615822	GW2	Cl & SO4 MRL elevated due to matrix interference (dilution was done). Sediments not included for Hg analysis.

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

Certificate of Analysis

eurofins | Environment Testing

Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#: 32614
Invoice to: Paterson Group

Report Number: 1974461
Date Submitted: 2022-04-04
Date Reported: 2022-04-05
Project: PH4484
COC #: 889009

Dear Oliver Blume:

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:

Dragana Dzeletovic 2022.04.05 16:55:16 -04'00'

APPROVAL: _____

Dragana Dzeletovic-Andric, Microbiology Team Lead

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: http://www.cala.ca/scopes/2602.pdf.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

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

eurofins | Environment Testing

Client: Paterson Group
154 Colonnade Rd. South
Nepean, ON
K2E 7T7
Attention: Mr. Oliver Blume
PO#: 32614
Invoice to: Paterson Group

Report Number: 1974461
Date Submitted: 2022-04-04
Date Reported: 2022-04-05
Project: PH4484
COC #: 889009

				Lab I.D.	1617476
				Sample Matrix	GW
				Sample Type	
				Sampling Date	2022-04-04
				Sample I.D.	GW1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0
	Total Coliforms	0	ct/100mL	MAC 0	4*

Guideline = ODWSOG *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Analytical Method: AMBCOLM1
additional QA/QC information available on request.

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

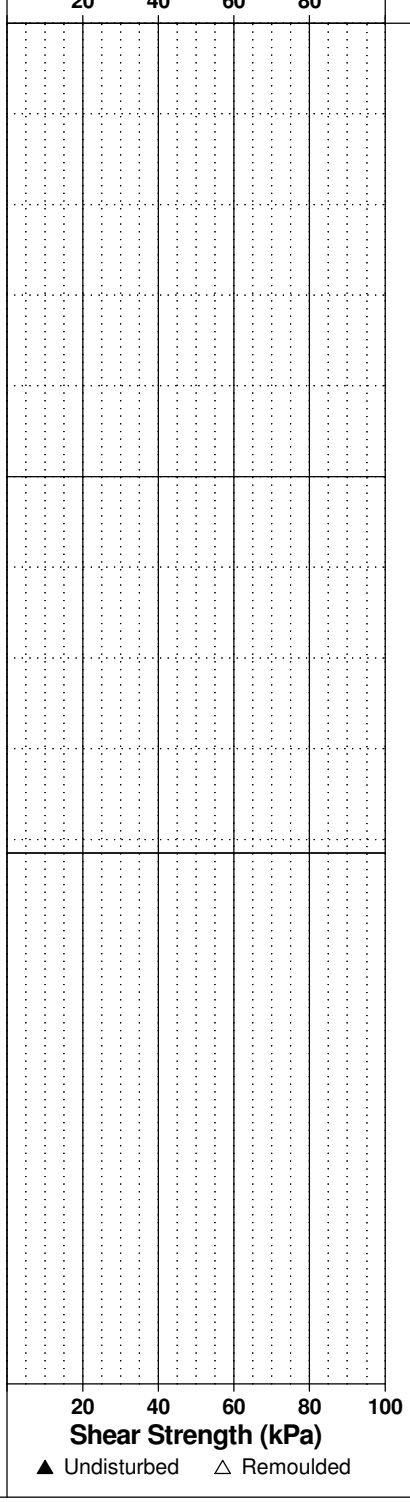
FILE NO. PG3834

REMARKS

HOLE NO. TP 1-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	120.05
TOPSOIL 0.15		G	1				
FILL: Brown silty sand with gravel 0.40		G	2				
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay		G	3			1	119.05
1.25							
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		G	4				
1.83							
End of Test Pit							
TP terminated on fractured bedrock surface at 1.83 m depth							
(TP dry upon completion)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

FILE NO. PG3834

REMARKS

HOLE NO. TP 2-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	120.05		
TOPSOIL 0.15		G	1						
FILL: Brown silty sand trace gravel, organics and metallic debris 0.50		G	2						
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay		G	3						
		G	4			1	119.05		
		G	5						
1.90 Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock 2.10		G	6			2	118.05		
End of Test Pit									
TP terminated on fractured bedrock surface at 2.1 m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

FILE NO. PG3834

REMARKS

HOLE NO. TP 3-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.10		G	1			0	119.19		
Brown **SILTY SAND** with gravel, cobbles and boulders		G	2						
		G	3			1	118.19		
1.20									
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock 1.45		G	4						
End of Test Pit									
TP terminated on fractured bedrock surface at 1.45 m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

FILE NO. PG3834

REMARKS

HOLE NO. TP 4-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15		G	1			0	118.33		
Brown **SILTY SAND** with gravel, cobbles and boulders		G	2						
		G	3						
1.00						1	117.33		
End of Test Pit TP terminated on possible boulder ot inferred fractured bedrock surface at 1.0 m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

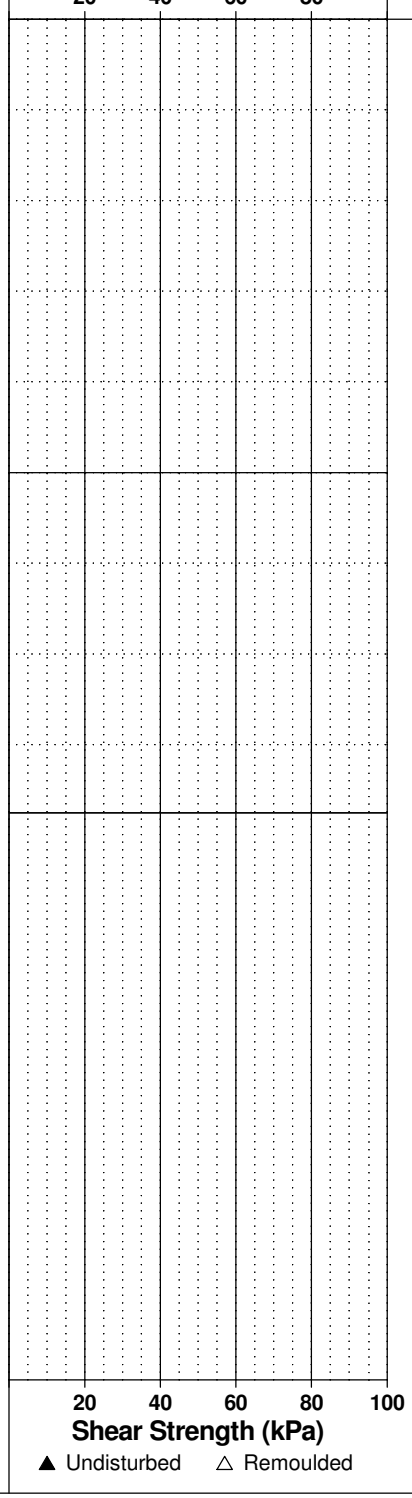
FILE NO. PG3834

REMARKS

HOLE NO. TP 5-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	117.88
TOPSOIL		G	1				
0.15							
Brown **SILTY SAND** with gravel, cobbles and boulders		G	2				
0.65							
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		G	3			1	116.88
1.75							
End of Test Pit							
TP terminated on fractured bedrock surface at 1.75 m depth							
(TP dry upon completion)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

FILE NO. PG3834

REMARKS

HOLE NO. TP 6-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
BEDROCK						0	118.91		
0.10		G	1						
FILL: Brown silty sand with brick fragments, concrete and gravel		G	2						
		G	3			1	117.91		
		G	4						
1.75									
End of Test Pit									
TP terminated on fractured bedrock surface at 1.75 m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Office Building
2966 Carp Road - Ottawa, Ontario

DATUM Geodetic

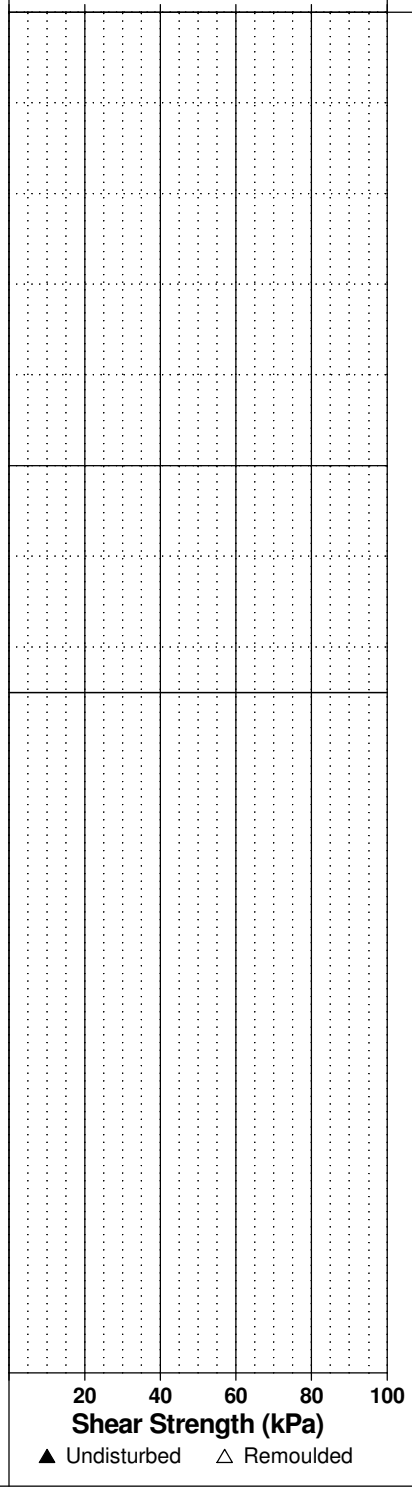
FILE NO. PG3834

REMARKS

HOLE NO. TP 7-22

BORINGS BY Backhoe **DATE** 2022 February 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	118.67		
TOPSOIL 0.15		G	1						
FILL: Brown silty sand with gravel some clay		G	2						
		G	3						
1.05						1	117.67		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		G	4						
1.50									
End of Test Pit TP terminated on fractured bedrock surface at 1.50 m depth (TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.08						0	118.24		
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 0.76		SS	1	75	50+	1	117.24		
		SS	2	80	50+	2	116.24		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	80	50+	3	115.24		
		SS	4	75	71	4	114.24		
		SS	5	75	50+				
4.95		SS	6		50+				
End of Borehole Practical split spoon refusal at 4.95m depth (GWL @ 4.2m depth based on field observations)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	118.42
TOPSOIL 0.10							
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics		SS	1	92	51	1	117.42
1.45		SS	2	25	50+	2	116.42
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	50	50+	3	115.42
4.80		SS	4	67	50+	4	114.42
End of Borehole							
Practical split spoon refusal at 4.80m depth							
(BH dry - June 6, 2016)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

Piezometer Construction

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

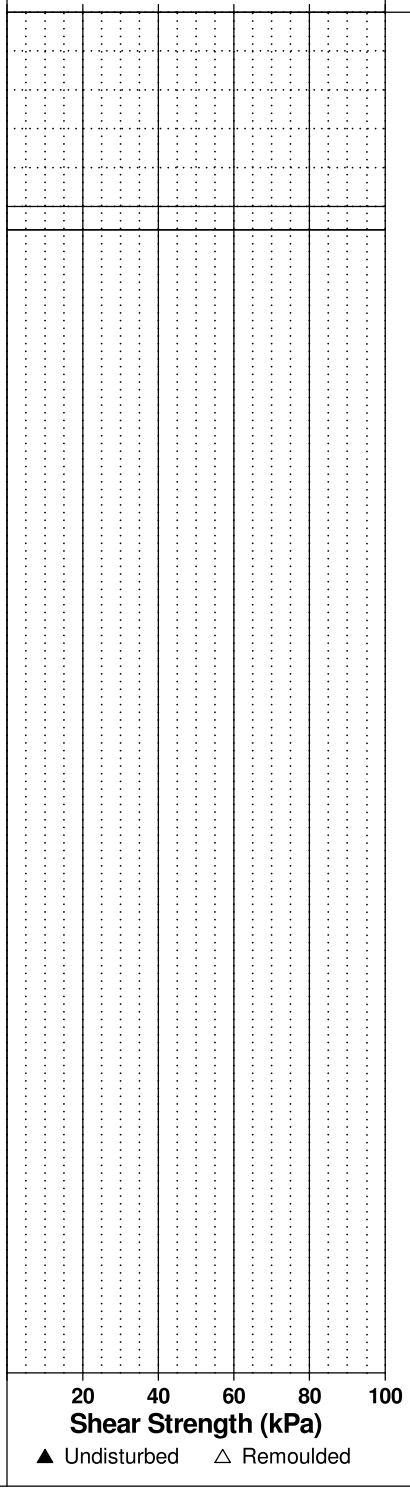
FILE NO. PG3834

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15						0	118.29		
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 0.91									
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock 1.12		SS	1		50+	1	117.29		
End of Borehole									
Practical refusal to augering at 1.12m depth									
(BH dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 3A

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15						0	118.29		
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics						1	117.29		
1.80		SS	1	58	54	2	116.29		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	2	75	50+	3	115.29		
						4	114.29		
4.65		SS	3	67	50+				
End of Borehole Practical split spoon refusal at 4.65m depth (GWL @ 4.3m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.08						0	118.03		
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 0.66		SS	1	50	46	1	117.03		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	2		68	2	116.03		
2.59									
End of Borehole									
Practical refusal to augering at 2.59m depth									
(BH dry upon completion)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

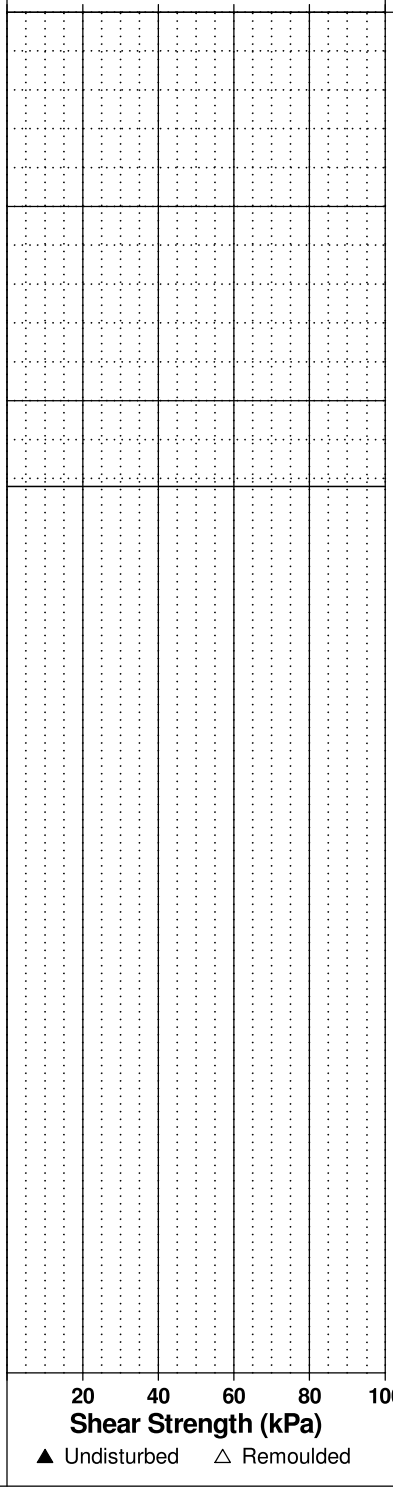
FILE NO. PG3834

REMARKS

HOLE NO. BH 5

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.08						0	117.74		
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics		SS	1	83	50	1	116.74		
1.40									
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	2	80	50+	2	115.74		
2.44									
End of Borehole									
Practical refusal to augering at 2.44m depth									
(BH dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.71		
TOPSOIL 0.10									
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 0.91		SS	1	83	55	1	116.71		
		SS	2	92	88	2	115.71		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	58	77				
		SS	4	78	50+	3	114.71		
4.70 End of Borehole		SS	5	100	50+	4	113.71		
Practical split spoon refusal at 4.70m depth									
(GWL @ 3.93m-June 6, 2016)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** June 1, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL						0	117.53		
0.30									
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics		SS	1	80	50+	1	116.53		
1.07									
		SS	2	21	51	2	115.53		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock									
		SS	3	40	50+	3	114.53		
						4	113.53		
4.65		SS	4	100	50+				
End of Borehole									
Practical split spoon refusal at 4.65m depth									
(GWL @ 3.7m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

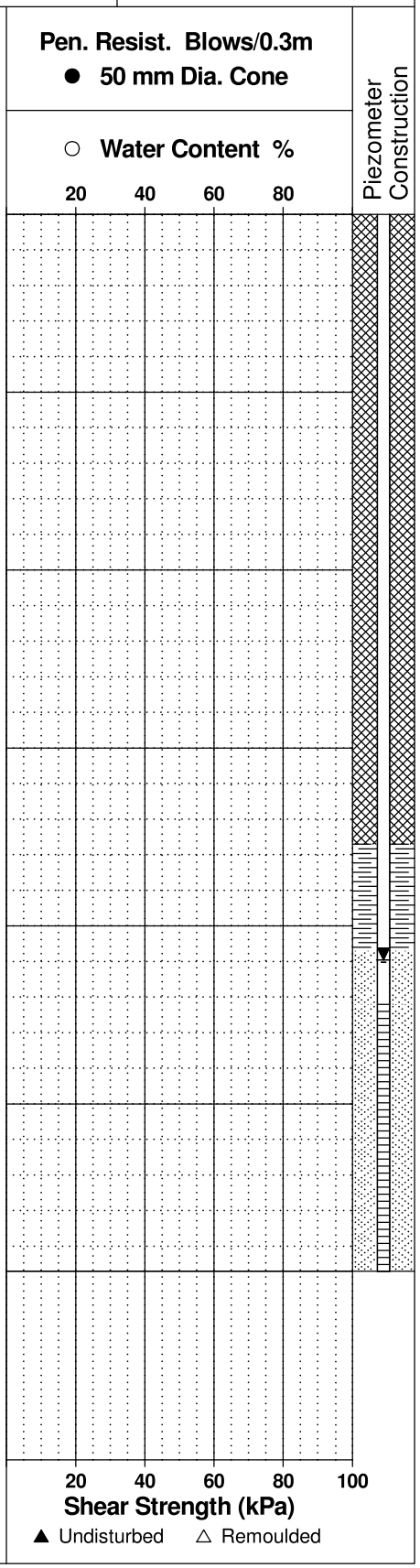
FILE NO. PG3834

REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** June 2, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	117.54
TOPSOIL 0.30							
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 0.76		AU	1				
		SS	2	67	50+	1	116.54
		SS	3	60	50+	2	115.54
		SS	4	92	58		
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	5	50	50+	3	114.54
		SS	6	76	79	4	113.54
5.94						5	112.54
End of Borehole Practical refusal to augering at 5.94m depth (GWL @ 4.19m-June 6, 2016)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

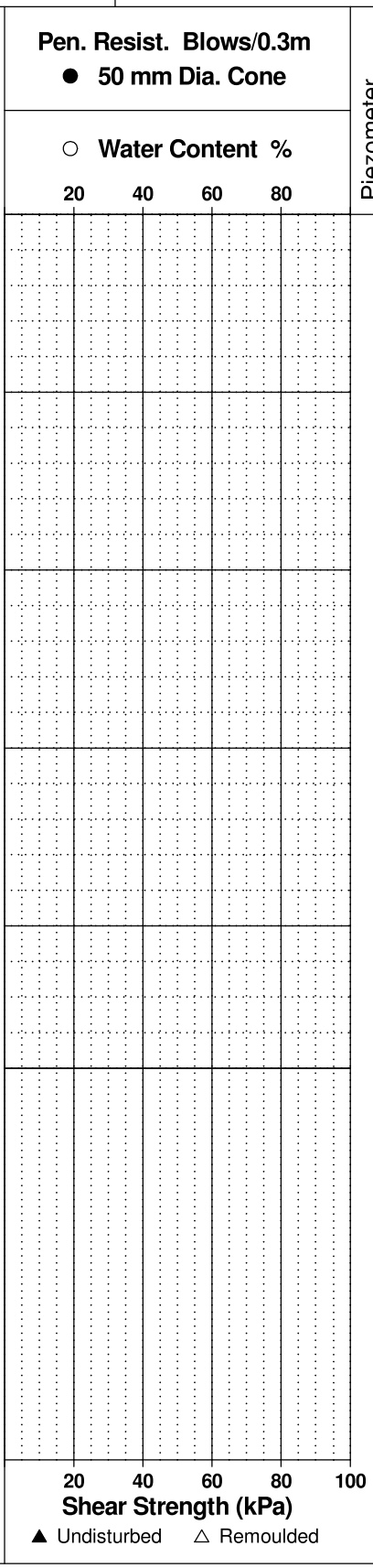
FILE NO. PG3834

REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** June 2, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	117.66
TOPSOIL							
0.30							
Loose to compact, brown **SILTY SAND,** some clay		SS	1	67	12	1	116.66
1.37							
		SS	2	71	50+	2	115.66
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	75	47	3	114.66
						4	113.66
4.80		SS	4	100	50+		
End of Borehole							
Practical split spoon refusal at 4.80m depth							
(BH dry upon completion)							



Piezometer Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

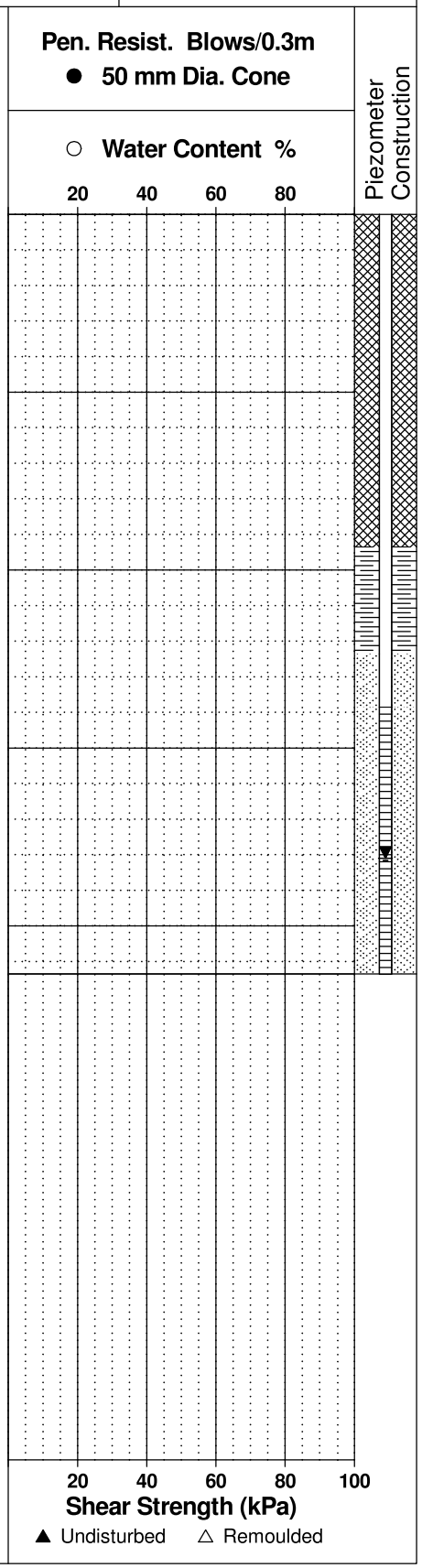
FILE NO. PG3834

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** June 2, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	117.46
TOPSOIL 0.10							
Loose to compact, brown **SILTY SAND,** some clay		SS	1	75	21	1	116.46
1.37							
		SS	2	58	49	2	115.46
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	80	50+	3	114.46
						4	113.46
4.27							
End of Borehole							
Practical refusal to augering at 4.27m depth							
(GWL @ 3.62m-June 6, 2016)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

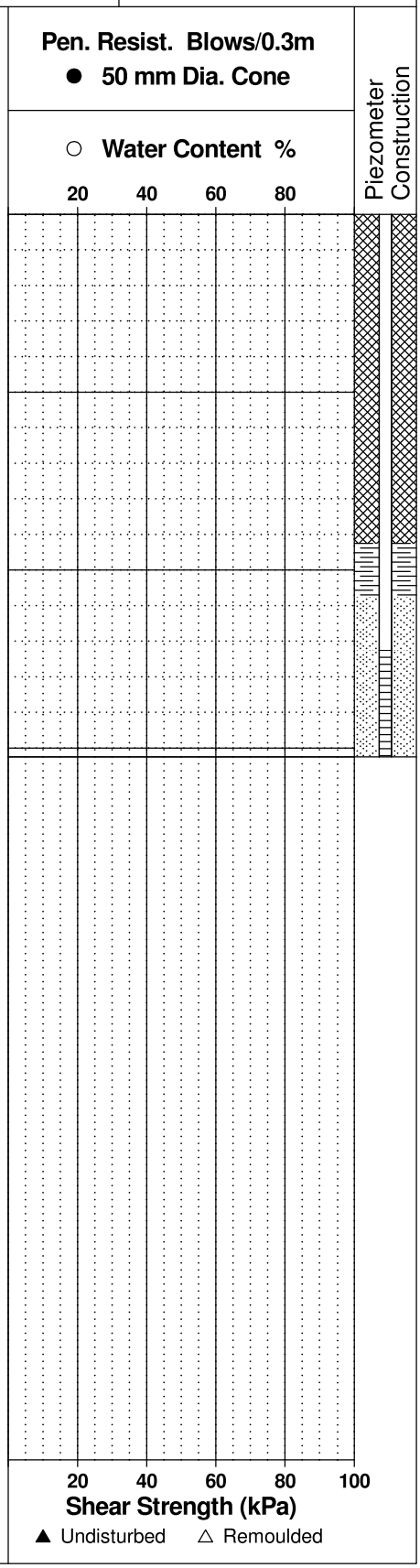
FILE NO. PG3834

REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** June 2, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	117.45
TOPSOIL 0.60		AU	1				
Brown **SILTY SAND** with gravel, cobbles and boulders, trace clay and organics 1.27		SS	2	70	11	1	116.45
Highly fractured **BEDROCK** interbedded with silty sand to sandy silt, some clay with fragmented bedrock		SS	3	75	62	2	115.45
3.05						3	114.45
End of Borehole							
Practical refusal to augering at 3.05m depth							
(Piezometer blocked at 1.72m depth - June 6, 2016)							



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

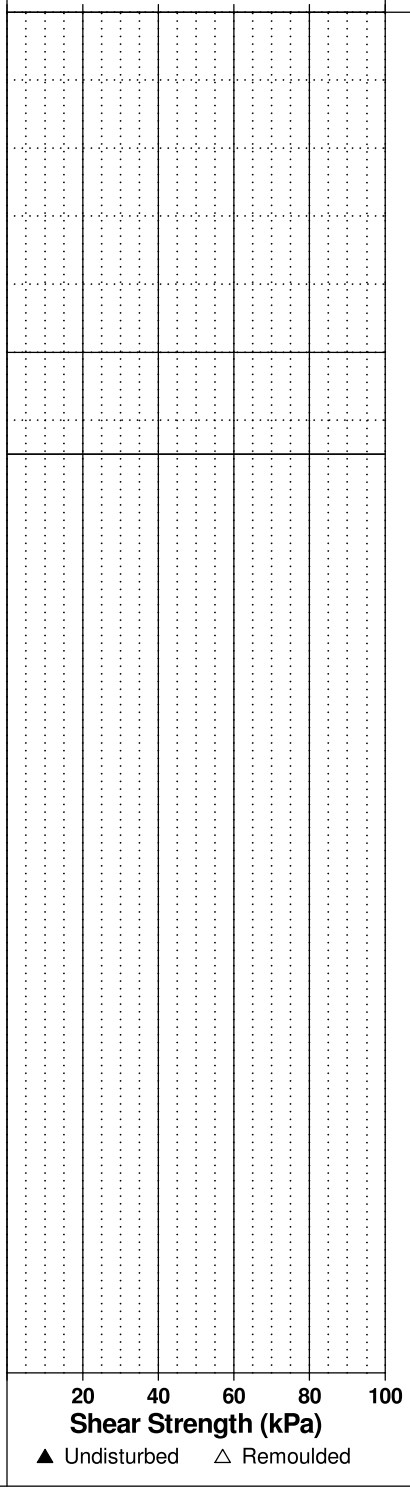
FILE NO. PG3834

REMARKS

HOLE NO. TP 1

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.20		G	1			0	117.72		
Brown **SILTY SAND to SANDY SILT,** some tree roots		G	2			1	116.72		
1.20									
Highly fractured **BEDROCK** with sandy silt, gravel, cobbles and boulders, some clay 1.30									
End of Test Pit									
TP terminated on fractured bedrock surface at 1.30m depth									
(TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

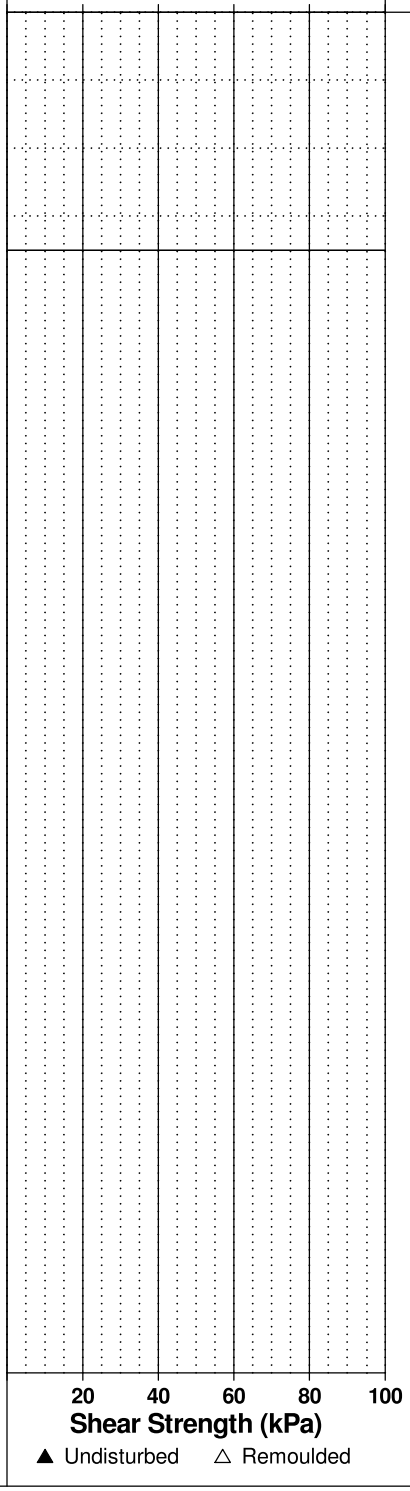
FILE NO. PG3834

REMARKS

HOLE NO. TP 2

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	118.08		
TOPSOIL 0.20									
Highly fractured **BEDROCK** with sandy silt, gravel, cobbles and boulders, some clay 0.70									
End of Test Pit TP terminated on fractured bedrock surface at 0.70m depth (TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP 3

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.47		
TOPSOIL 0.20									
Brown **SILTY SAND to SANDY SILT** 0.50									
Highly fractured **BEDROCK** with sandy silt, gravel, cobbles and boulders, some clay						1	116.47		
1.60									
End of Test Pit									
TP terminated on fractured bedrock surface at 1.60m depth									
(TP dry upon completion)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP 4

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.46	20 40 60 80	
TOPSOIL 0.30									
Brown **SILTY SAND to SANDY SILT,** some clay, gravel, cobbles and boulders - clay content increasing with depth 0.80		G	1						
End of Test Pit TP terminated on dense glacial till at 0.80m depth (TP dry upon completion)									

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

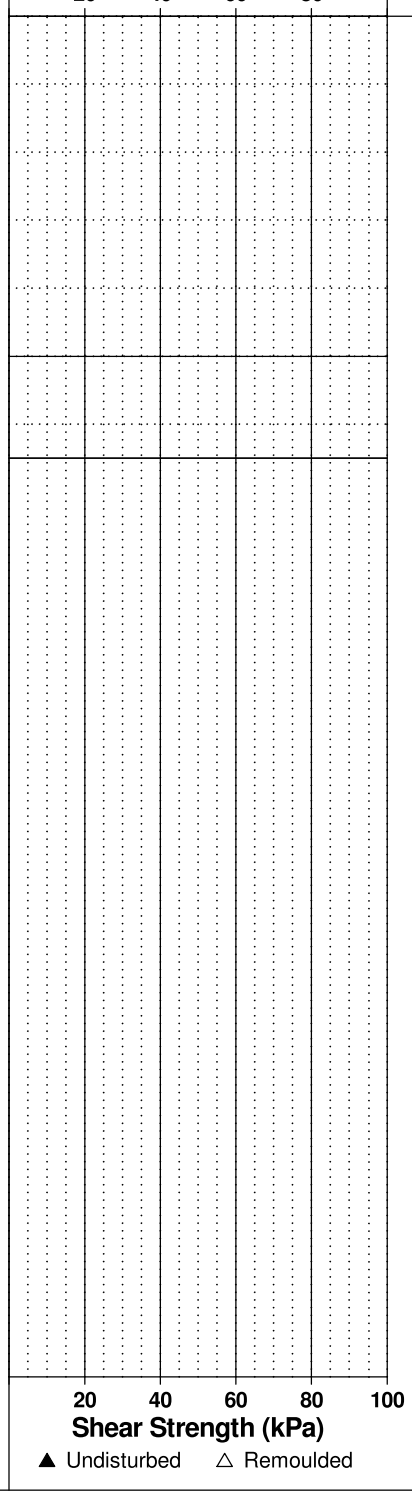
FILE NO. PG3834

REMARKS

HOLE NO. TP 5

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.20						0	118.06		
Brown **SANDY SILT** with clay to **SILTY SAND** 0.50		G	1						
Highly fractured **BEDROCK** with sandy silt, gravel, cobbles and boulders, some clay						1	117.06		
1.30									
End of Test Pit TP terminated on fractured bedrock surface at 1.30m depth (TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

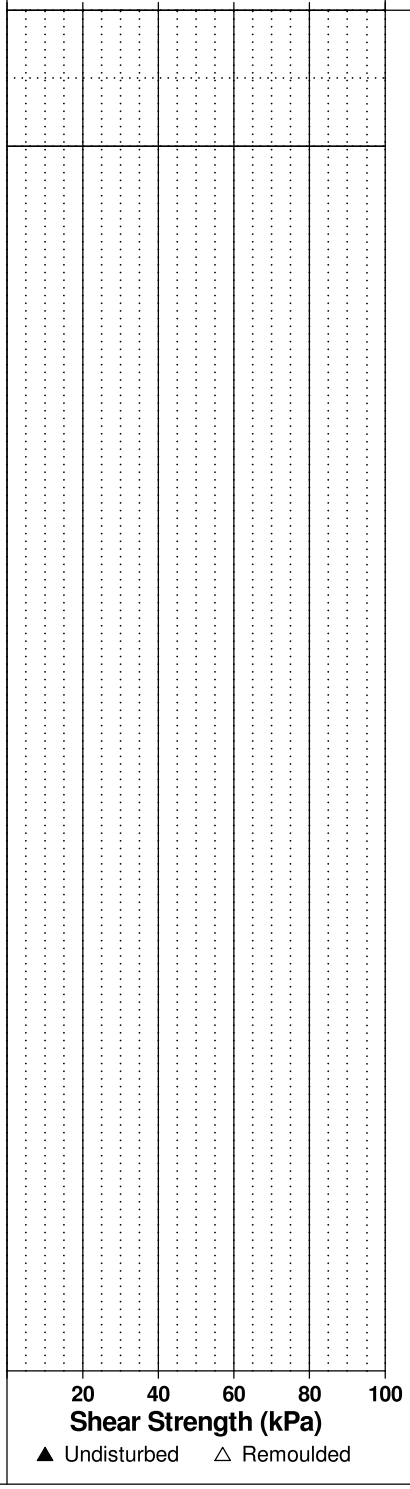
FILE NO. PG3834

REMARKS

HOLE NO. TP 6

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	118.08		
TOPSOIL 0.10									
Highly fractured **BEDROCK**									
0.40									
End of Test Pit									
TP terminated on fractured bedrock surface at 0.40m depth									
(TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP 7

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL						0	117.37		
0.15									
Brown **SILTY SAND**									
0.45		G	1						
Highly fractured **BEDROCK** with silty clay, sand, gravel, cobbles and boulders						1	116.37		
1.10									
End of Test Pit									
TP terminated on fractured bedrock surface at 1.10m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP 8

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION		STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE										
Crushed stone	0.05						0	118.54		
TOPSOIL	0.20									
Brown **SILTY SAND,** trace gravel	0.80									
Highly fractured **BEDROCK** with brown silty sand, gravel and cobbles, trace boulders			G	1			1	117.54		
End of Test Pit	1.50									
TP terminated on fractured bedrock surface at 1.50m depth										
(TP dry upon completion)										

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP 9

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL						0	118.16		
0.20									
Brown **SILTY SAND** with clay and fractured bedrock by 0.4m depth									
0.65		G	1						
Highly fractured **BEDROCK** with grey-brown silty sand, gravel, cobbles and boulders						1	117.16		
1.50									
End of Test Pit									
TP terminated on fractured bedrock surface at 1.5m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

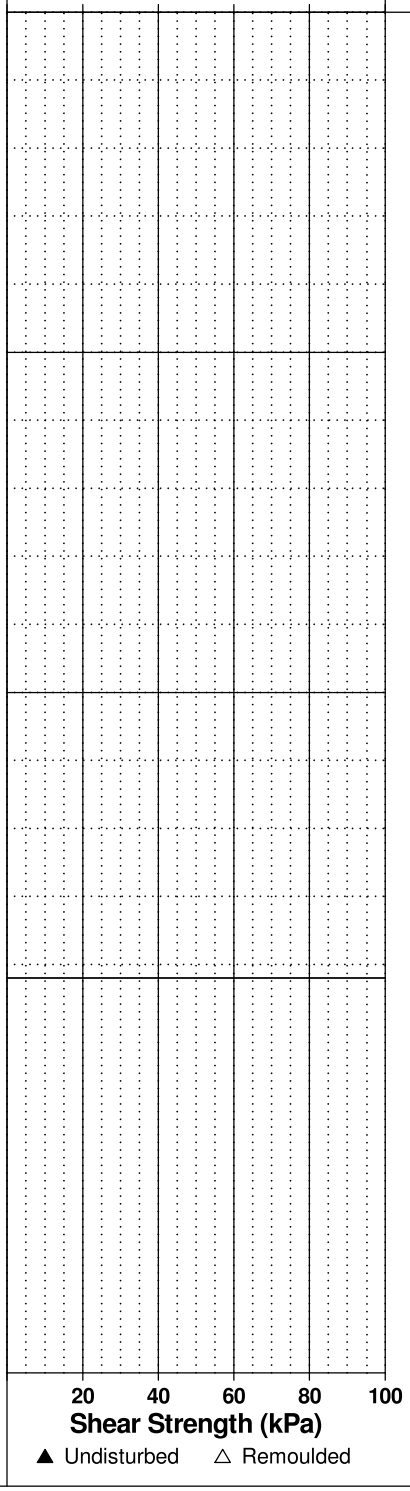
FILE NO. PG3834

REMARKS

HOLE NO. TP10

BORINGS BY Backhoe **DATE** November 3, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	118.24		
TOPSOIL 0.20									
Brown **SILTY SAND** with cobbles 0.60									
Grey **SILTY CLAY** 0.85		G	1						
Brown **SILTY SAND** 0.97		G	2			1	117.24		
High fractured **BEDROCK** with brown silty sand, cobbles and boulders		G	3			2	116.24		
2.84									
End of Test Pit TP terminated on fractured bedrock surface at 2.84m depth (TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

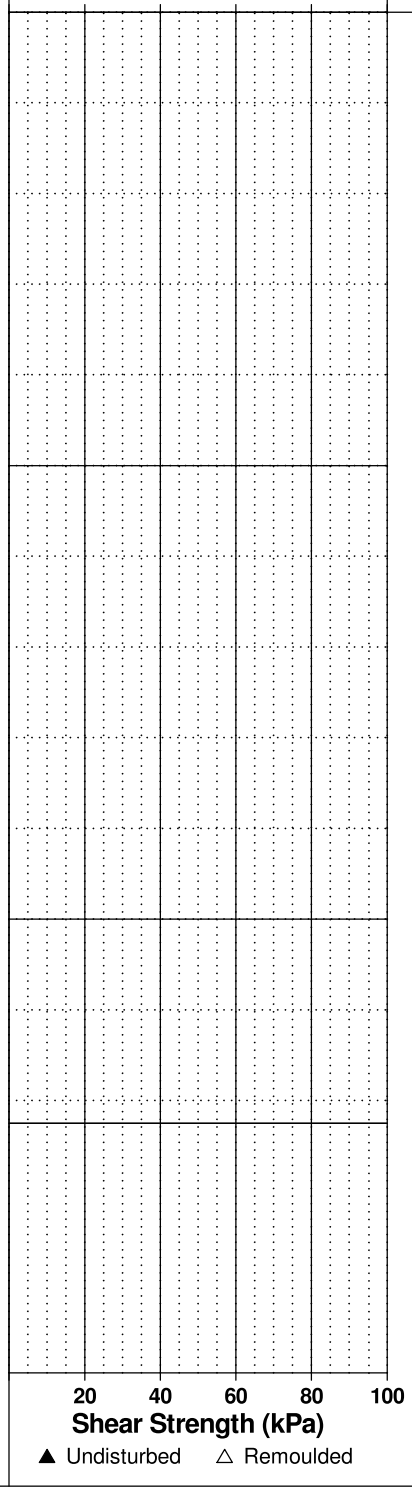
FILE NO. PG3834

REMARKS

HOLE NO. TP11

BORINGS BY Backhoe **DATE** November 8, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.97		
TOPSOIL									
0.15									
Brown **SILTY FINE SAND,** some gravel, cobbles, boulders, trace clay and organics		G	1			1	116.97		
1.20									
Highly fractured **BEDROCK** interbedded with sandy silt, some clay with fragmented bedrock throughout						2	115.97		
2.45									
End of Test Pit TP terminated on fractured bedrock surface at 2.45m depth (TP dry upon completion)									



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP12

BORINGS BY Backhoe **DATE** November 8, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.46		
TOPSOIL									
0.25									
Brown **SILTY SAND,** trace cobbles, boulders and clay - intermittent thin layers of silty clay from 1.25m depth		G	1			1	116.46		
1.50									
Highly fractured **BEDROCK** interbedded with sandy silt, some clay with fragmented bedrock throughout						2	115.46		
2.65									
End of Test Pit TP terminated on fractured bedrock surface at 2.65m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

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

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP13

BORINGS BY Backhoe **DATE** November 8, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.43		
TOPSOIL									
0.25									
Brown **SILTY SAND,** some clay and tree roots, trace gravel, cobbles and boulders		G	1						
1.00						1	116.43		
Highly fractured **BEDROCK** interbedded with sandy silt, some clay with fragmented bedrock throughout									
1.80									
End of Borehole									
TP terminated on fractured bedrock surface at 1.80m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Storage Building - 2978 & 2966 Carp Road
Ottawa, Ontario

DATUM TBM - Top of magnetic nail in utility pole on Carp Road. Geodetic elevation = 119.73m.

FILE NO. PG3834

REMARKS

HOLE NO. TP14

BORINGS BY Backhoe **DATE** November 8, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	117.91		
TOPSOIL									
0.20									
Brown **SILTY FINE SAND,** some gravel, cobbles and boulders									
0.55									
Highly fractured **BEDROCK** interbedded with sandy silt, some clay with fragmented bedrock throughout		G	1			1	116.91		
1.85									
End of Test Pit TP terminated on fractured bedrock at 1.85m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SYMBOLS AND TERMS

SOIL DESCRIPTION

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

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

The standard terminology to describe the strength of cohesionless soils is the relative density, 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.

Relative Density	'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 vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

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 is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

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 NXL size core. However, it can be used on smaller core sizes, such as BX, 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
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture 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 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

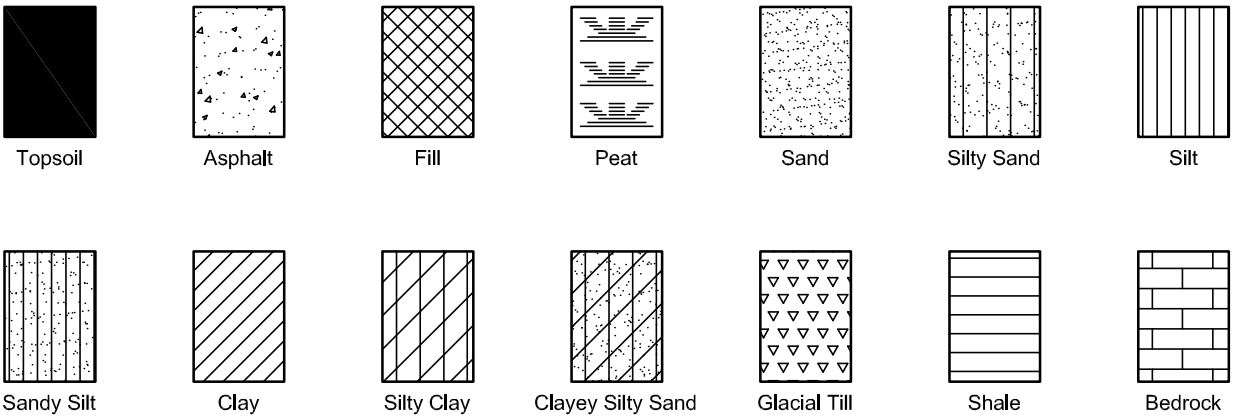
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

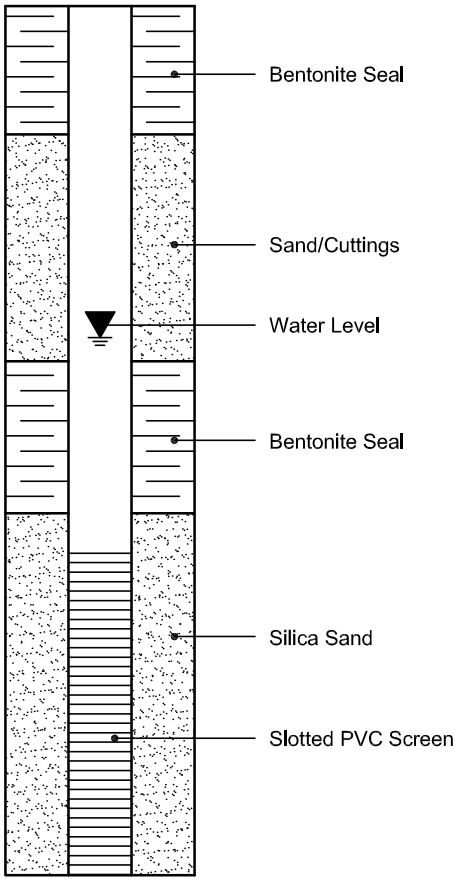
SYMBOLS AND TERMS (continued)

STRATA PLOT

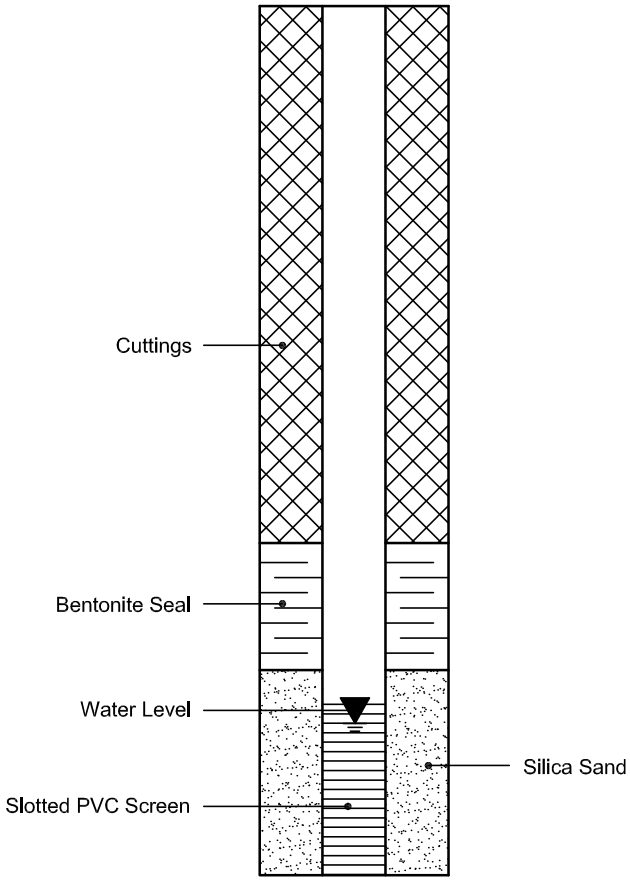


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION

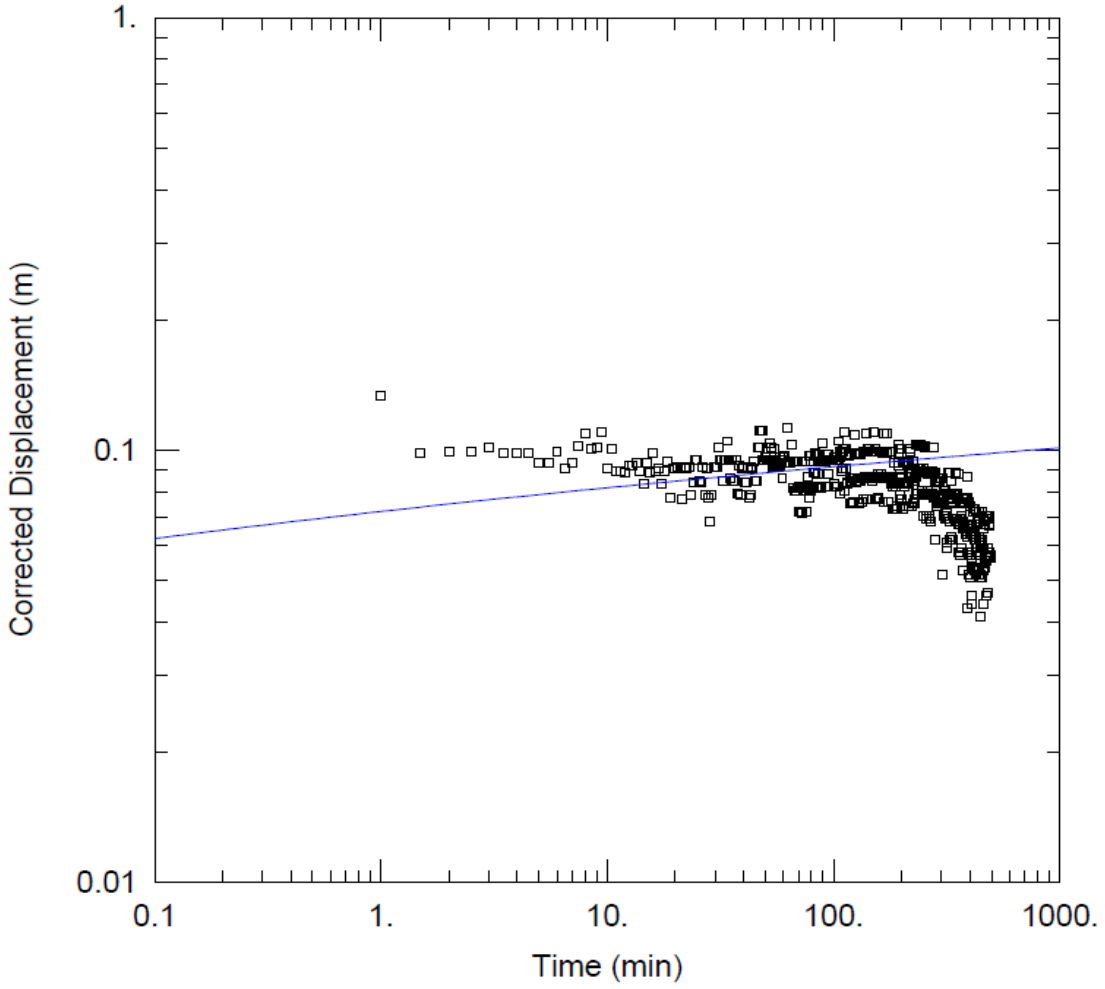


PIEZOMETER CONSTRUCTION



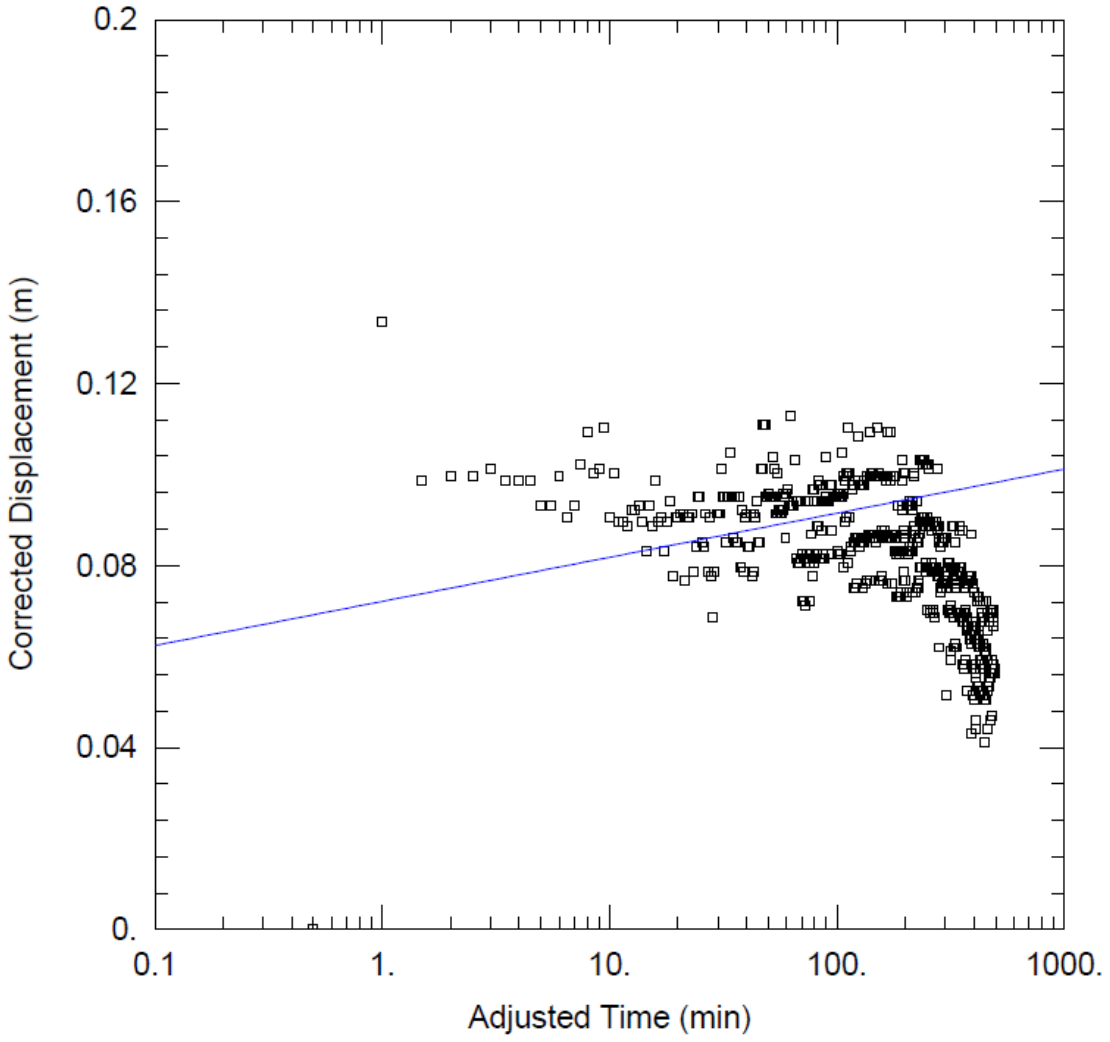
Pumping Test Analysis Report

File No.	PH4484	Well ID:	TW1
Date:	April 13, 2022	Solution Method:	**Theis**
Client:	Nautical Lands Group	Transmissitivity (m2/day):	1224.1
Site Address:	2966 Carp Road, Ottawa	Discharge Rate (L/min)	45
Project:	Site Plan Application	Analysis performed by:	EA



Pumping Test Analysis Report

File No.	PH4484	Well ID:	TW1
Date:	April 13, 2022	Solution Method:	**Cooper-Jacob**
Client:	Nautical Lands Group	Transmissitivity (m2/day):	1224.1
Site Address:	2966 Carp Road, Ottawa	Discharge Rate (L/min)	45
Project:	Site Plan Application	Analysis performed by:	EA



Pumping Test Analysis Report

File No.	PH4484
Date:	April 13, 2022
Client:	Nautical Lands Group
Site Address:	2966 Carp Road, Ottawa
Project:	Site Plan Application

Summary Table:

Solution Method:	Well ID:	Transmissitivity (m2/day):
Theis	TW1	1224.1
Cooper-Jacob	TW1	1224.1
Average:		**1224.10**

patersongroup

2966 Carp Road, Ottawa
PH4484

TW1	inputs		
pH	7.93	A	0.19
TDS	767	B	2.37
Hardness	451	C	2.25
Alkalinity	243	D	2.39
Temp.	10.8		
		pHs =	7.215174149

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 = 0.7

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).

patersongroup JOB NO. PH5103

2966-2978 Carp Road

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.25	
Soil	0.30	
Cover	0.12	
Total	**0.67**	
Site Characteristics		
Area of Site :	12832	m^2
Total of roof areas:	1713	m^2
Total area of paved driveway areas:	4051	m^2
Roof + paved driveway areas	5764	m^2
Impervious Area	5764	m^2
Percent Impervious Area =	45	%
Infiltration Area =	7068	m^2
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Infiltration Calculation		
Nitrate concentration in precipitation (C_i) =	0	mg/L
Surplus Water (Environment Canada)	378	mm/yr
Factored Water Surplus =	253	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	5	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
Cs = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	5	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**10.00**	**mg/L**
Maximum Allowable Sewage Flow Volume		
Daily Sewage Flow (Qs)=	**1.63474126**	**m^3**

Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.

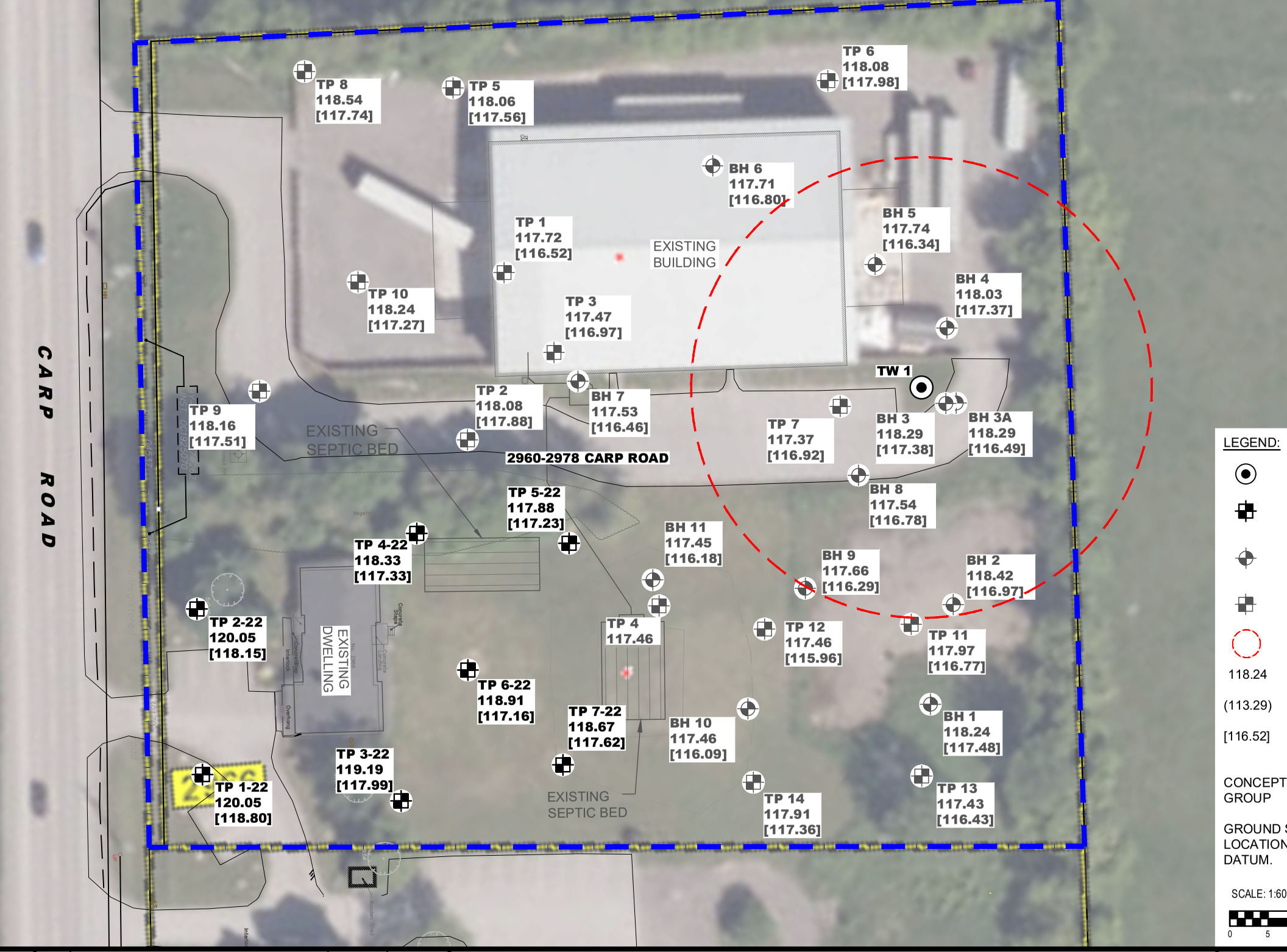
patersongroup JOB NO. PH5103

2966-2978 Carp Road

PREDICTIVE NITRATE IMPACT ASSESSEMENT

Infiltration Factors		
Topography	0.25	
Soil	0.30	
Cover	0.12	
Total	**0.67**	
Site Characteristics		
Area of Site :	12832	m^2
Total of roof areas:	1713	m^2
Total area of paved driveway areas:	4051	m^2
Roof + paved driveway areas	5764	m^2
Impervious Area	5764	m^2
Percent Impervious Area =	45	%
Infiltration Area =	7068	m^2
Septic Effluent		
Concentration of Effluent (Cs) =	17.2	mg/L
Infiltration Calculation		
Nitrate concentration in precipitation (C_i) =	0	mg/L
Surplus Water (Environment Canada)	378	mm/yr
Factored Water Surplus =	253	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	5	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
Cs = concentration of nitrates in the septic effluent	17.2	mg/L
Q_i = flow entering the system from infiltration	5	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	**10.00**	**mg/L**
Maximum Allowable Sewage Flow Volume		
Daily Sewage Flow (Qs)=	**6.811421918**	**m^3**

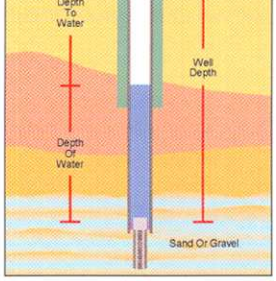
Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.



NAUTICAL LANDS GROUP

PROPOSED RE-ZONING APPLICATION

Scale:



tests and provide you with advice on what measures you can take to safeguard your drinking water.

The first step in identifying the reason for repeated adverse water quality is to conduct a visual inspection of your well. Start with a close look at your well. The area around it should be clear of any potential contaminant sources, such as pets, lawn care products, and gardens. Once you're satisfied that the area around your well is okay, take a good, close look at the well itself. If you have an older well, make sure that the cap and the sealant around the well casing isn't cracked or damaged. If it is, you need to fix or replace it right away.

If the source of the problem can't be detected, consult a licensed well contractor right away to identify the source of the problem and eliminate it. You can save yourself a lot of money by doing this instead of rushing out to buy a home treatment device that may be expensive to install, operate, and maintain. And it may not eliminate the source of your trouble.

level, then calculate the depth of water in the well.

3. Using the table on this sheet, measure out the amount of bleach needed. (The table gives the volume of bleach needed for different well sizes.) Then, pour the mixture into your well.

4. If possible, mix the water in the well. This can be accomplished by attaching a hose to a tap, running water from the well, through the hose and back into the well.

5. After adding chlorine to the well, remove or bypass any carbon filters that are in the system for water treatment. If you don't, these filters will remove the chlorine from the water, and any pipes beyond the filter will not get disinfected. Replace with new filters after chlorination to avoid reintroducing bacteria into the system.

6. Run water at every faucet in the house (and barn, if you have one) until a strong chlorine odour is detected. Be aware that your nose may lose its ability to detect chlorine.

7. If there is no chlorine smell or it is very weak, add more bleach to the well and repeat Step 6 above.

8. Drain the water heater and fill with chlorinated water.

9. Backflush the water softener and all water filters (except carbon filters).

10. Let the chlorinated water stand in the system for at least 12 hours.

11. Clear chlorine from the well by running an outside hose to the ground surface. Then, run clear water through the faucets until the water no longer smells of chlorine.

12. Avoid putting too much chlorine into the septic system because the bacteria needed for septic decomposition may be killed.

13. Do not drink the water without boiling it until test results show the water is safe to drink.

Volume of Bleach to Add for Every 3 Metres (10 Feet) of Water in the Well*

Casing Diameter		Volume of Unscented Bleach (5.25% solution)
Millimetres	Inches	Millilitres
50	2	6
100	4	30
150	6	60
200	8	100
250	10	200
300	12	250
400	16	400
500	20	650
600	24	900
900	36	2000 (2 litres)
1200	48	3600 (3.6 litres)

For example: If you have 6 metres (20 feet) of water in your well and it has a casing diameter of 100 mm or 4 inches, you would add 60 mm or 2 fluid ounces of bleach.

* For questions or more information on how to disinfect your well, contact your local health unit.

For more information

Ontario Government Ministry Abbreviations

Ministry of Health and Long-Term Care
MOHLTC (also MOH)

Ministry of the Environment
MOE (also MOEE)

Ontario Ministry of Agriculture and Food
OMAF (also OMAFRA)

Ontario Government Information Lines

MOE Public Information Centre: 1-800-565-4923

MOE Water Well Records: 1-888-396-9355

MOHLTC INFOline: 1-800-268-1154

OMAF Agricultural Information Contact Centre: 1-877-424-1300

Ontario Government Web Sites

MOE: www.ene.gov.on.ca

MOHLTC: www.health.gov.on.ca

OMAF: www.gov.on.ca/omaf

Publications available on-line

Health Canada: www.hc-sc.gc.ca

- *A Guide to Well Water Treatment and Maintenance;*
- *Water treatment devices for disinfection of drinking water.*

MOHLTC: www.health.gov.on.ca

- *How to use water safely during a "Boil Water Advisory";*
- *E. coli Bacteria;*
- List of Public Health Units in Ontario.

OMAF: www.gov.on.ca/omaf

- *Assessing the Potential for Ground Water Contamination on Your Farm*, Publication 97-017;
- *Best Management Practices: Water Wells*, OMAFRA and Agriculture and Agri-Food Canada, 2003 (to order).

MOE: www.ene.gov.on.ca

- *Important Facts About Water Well Construction,*