

August 1, 2025

PH4991-LET.02.REV.01

Titan Environmental Management 777 Quest Boulevard lle de Chenes, Manitoba R0A 0T1

Attention: Lucky Montierro

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

Subject: Hydrogeological Assessment and Terrain Analysis

Proposed Commercial Development 541 Somme Street, Ottawa, Ontario

INTRODUCTION

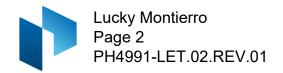
Further to your request, Paterson has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Site Plan Control Application (hereby referred to as a Site Plan application) for the proposed commercial development located at 541 Somme Street in Ottawa. Please refer to the Figure 1 - 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 to support the Site Plan Application for a new commercial building.

The Subject Site consists of a 0.80 ha lot and which is mostly grass covered with a treed area on the far east portion of the site. The ground surface is generally flat with a downward slope towards the eastern end of the site.

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

The following Assessment is for a non-drinkable water supply source, due to the manganese concentration encountered in the test well which exceeded the Ontario Drinking Water Standards and Operational Guidelines (ODWSOG) Maximum Acceptable Concentration (MAC).



HYDROGEOLOGICAL PRE-CONSULTATION

A Hydrogeological pre-consultation was completed with a City of Ottawa Hydrogeologist on December 3, 2024. The City Hydrogeologist suggested that additional sampling be completed during the 8-hour pumping test for Polycyclic Aromatic Hydrocarbons (PAH's) in addition to the standard Subdivision Package suite of parameters, trace metals and Volatile Organic Compounds (VOCs) required by the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

DESCRIPTION OF SUBJECT SITE

The subject site is an approximately 0.80 ha lot, generally infilled with fill material. The Site Plan application is for a proposed commercial development. Please refer to Figure-1 Key Plan and Novatech Drawing No. 1241111-SP Site Plan dated February, 2025 attached for the proposed site location and site layout.

The subject site is currently vacant, and will be serviced by a private water supply and sewage system. A new drilled well was installed onsite, hereafter referred to as Test Well 1 (TW1), is the well which will service the new building.

The site is bordered by vacant land to the north and south, by agricultural lands to the east and by Somme Street to the west. The subject site itself and the surrounding commercial areas are zoned RH for Rural Heavy Industrial Zone (GeoOttawa).

POTENTIAL KARST

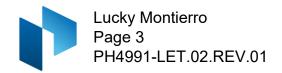
Based on available Ontario Geological Survey (OGS) mapping (GRS005), the subject site is not within an area of known, potential or inferred karst.

RAISIN-SOUTH NATION SOURCE PROTECTION PLAN

The Raisin-South Nation Source Protection Plan (RSNSPP) 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 and surrounding areas have been designated as a Highly Vulnerable Aquifer (HVA within the RSNSPP) and is identified as one of four groundwater related vulnerable areas identified within the Clean Water Act (2006). The four vulnerable areas consist of Significant Groundwater Recharge Area (SGRA), HVA, Intake Protection Zone (IPZ), and wellhead protection area (WHPA).

Based upon the designation, the RSNSPP provides a list of activities that are prohibited, managed or encouraged to change/educate dependent upon the vulnerable area type. There is no restrictions of land uses on the subject site based upon its proposed usage.

Therefore, there are no related requirements for an HVA at this location.



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, TW1 was installed and submitted to a pumping test. TW1 has a Water Well Record (WWR) Well ID of A421912. TW1 has a 152.4 mm diameter steel casing that extends to 12.1 m below ground surface (bgs) with a 0.65 m stick up. The well itself extends to a depth of 42.67 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 0 to 1 m. Refer to Novatech Drawing 124111-SP Site Plan, dated February 2025, attached, for the approximate location of TW1.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on March 4, 2025 under the full-time supervision of Paterson personnel. Prior to the pumping test the well was disinfected, and a data-logger was installed to monitor the background groundwater levels.

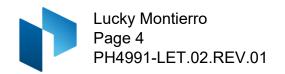
A submersible pump was installed by Air Rock Drilling Co Ltd and used for the 8-hour pumping test. The pumping test was carried out at a pumping rate of 57 L/min for a duration of 8 hours. The water was discharged at surface towards the northwest portion of the site. During the pumping test, the pumping 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 selected rate of 57 L/min provides approximately 27.2 times the maximum total daily design volume of 1,005 L/day for the septic system during the 8-hour pumping test. The total daily design sanitary sewage flows (TDDSSF) were calculated as per the Ontario Building Code Section 8.2.1.3. The TDDSSF calculation was performed by Novatech and the approved Ottawa Septic System Office (OSSO) Sewage System Installation Permit (SSIP) is available under separate cover. The rate was determined to be representative of a flow rate which would be in excess of what the development would require.

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

Recovery data was collected from the well following the completion of the pumping. The well was noted to have achieved 95% recovery approximately 15 minutes 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, VOCs, and PAHs.

Due to elevated field parameters, after completing the 8-hour pumping test of 57 L/min, the flow rate was reduced to 24 L/min for an additional hour, where additional field sampling was performed and additional laboratory samples were obtained for colour and turbidity.

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, hydrogen sulfide, 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.

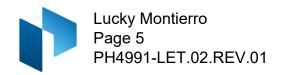
Aquifer Analysis

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 O							
AQUIFER PARAMETER	RESULT OF ANALYSIS						
Transmissivity (m²/day)	52						
Storativity	3.44E-04						
Pumping Rate (L/min)	57						
Pre-test Static Water Level (m)	6.7						
Post-test Static Water Level (m)	9.0						
Available Drawdown (m)	36.0						
% Drawdown During Pumping Test (%)	6						
Specific Capacity (L/min/m drawdown)	24.9						

The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 52 m²/day. The aquifer storativity is



estimated to be 3.44E-04. Refer to the Theis and Cooper Jacob methods of analysis data sheets attached to this report.

The water level varied over the constant-rate pumping test, with a trend of decreasing with time. The variance in drawdown can be attributed to the development of the well during the pumping test.

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 2.3 m (6% of the available drawdown). Full Recovery was attained within 15 hours after pumping ceased.

The total volume of water pumped during the 8-hour pumping event was approximately 27,360 L. This is approximately 27.2 times the maximum total daily design volume of water (1,005 L/d) required to support the Site Plan Control Application.

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

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

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

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, apparent color and temperature were measured at the wellhead during the pumping test. The measurements and time intervals for each of these parameters are summarized on the graphical representation (Figure 1) below. In addition, a HACH Pocket Colorimeter II chlorine reader was used to measure the free chlorine residual level. No chlorine residual was detected in the discharge water prior to the collection of the water samples.

Hydrogen sulfide was detected olfactorily during the pumping test. Hydrogen sulfide was measured using the HACH Hydrogen Sulfide Test Kit, Model HS-C, (# 2537800) when it was detected. Hydrogen sulfide was measured in the range of 0-0.1 mg/L at each point.

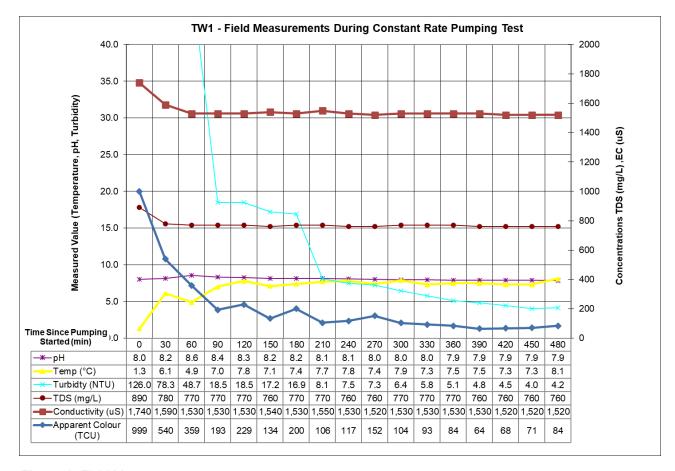


Figure 1: Field Measurements

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 and 2b below, and the laboratory analyses reports can be found attached. VOC and PAH laboratory analytical testing were completed and measured to be non-detect in the sample results. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATE	R MICROBIC	DLOGY & GE	NERAL GEO	CHEMISTRY		
		OD	ws		TW1	
PARAMETER	AMETER UNITS LIMIT		TYPE	GW1 (4 hr) 3/4/2025	GW2 (8 hr) 3/4/2025	GW3 (9 hr) 3/4/2025
MICROBIOLOGICAL		•	•		•	•
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	-
Total Coliforms	ct/100mL	0	MAC	4	3	-
GENERAL CHEMICAL - HE		TED				
Fluoride (F)	mg/L	1.5	MAC	0.16	0.18	-
Ammonia (N-NH ₃)	mg/L	-	-	0.80	0.83	-
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.5	<0.5	-
Nitrate (N-NO ₃)	mg/L	10	MAC	<0.5	<0.5	-
Total Kjeldahl Nitrogen	mg/L	-	-	1.24	1.10	-
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	7.5	4.20	2.38
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	16.4	17.0	18.3
GENERAL CHEMICAL - AE	STHETIC RE	LATED				•
Alkalinity (as CaCO3)	mg/L	30-500	OG	578	570	-
Chloride (CI)	mg/L	250	AO	116	115	-
Colour (Apparent - Lab)	TCU	5	AO	97	86	116
Colour (Apparent - Field)	TCU	5	AO	117	84	76
Conductivity	uS/cm	-	-	1,530	1,530	-
Dissolved Organic Carbon	mg/L	5	AO	7.70	7.20	-
Hardness (as CaCO3)	mg/L	100	OG	708	704	-
Ion Balance	unitless	-	-	1.01	1.02	-
рН	unitless	6.5-8.5	AO	7.91	7.72	-
Phenols	mg/L	-	-	<0.001	<0.001	-
Sulphate (SO ₄)	mg/L	500	AO	185	185	-
Sulphide (S ₂)	mg/L	0.05	AO	<0.01	<0.01	-
Tannin & Lignin	mg/L	-	-	0.70	0.70	-
Total Dissolved Solids	mg/L	500	AO	995	993	-

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									
		OD	ws		TW1				
PARAMETER	UNITS								
AVAMETER	Julio	LIMIT	TYPE	GW1 (4 hr)	GW2 (8 hr)	GW3 (9 hr)			
				3/4/2025	3/4/2025	3/4/2025			
Volatiles									
Aluminum (AI)	mg/L	0.1	OG	0.07	0.03	0.03			
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005	<0.0005	<0.0005			
Arsenic (As)	mg/L	0.01	IMAC	<0.001	<0.001	<0.001			
Barium (Ba)	mg/L	1.0	MAC	0.22	0.21	0.214			
Beryllium (Be)	mg/L	-	-	<0.0005	<0.0005	<0.0005			
Boron (B)	mg/L	5.0	IMAC	0.10	0.11	0.11			
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001	<0.0001	<0.0001			
Calcium (Ca)	mg/L	-	-	190	188	188			
Chromium (Cr)	mg/L	0.05	MAC	<0.001	<0.001	<0.001			
Cobalt (Co)	mg/L	-	-	0.0002	0.0002	0.0002			
Copper (Cu)	mg/L	1.0	AO	<0.001	<0.001	<0.001			
Iron (Fe)	mg/L	0.3	AO	2.22	2.19	2.29			
Lead (Pb)	mg/L	0.01	MAC	<0.001	<0.001	<0.001			
Magnesium (Mg)	mg/L	-	-	57	57	57			
Manganese (Mn)	mg/L	0.05	AO	2.89	2.87	2.89			
Mercury (Hg)	mg/L	0.001	MAC	<0.0001	<0.0001	<0.0001			
Molybdenum (Mo)	mg/L	-	-	0.001	0.01	0.009			
Nickle (Ni)	mg/L	-	-	<0.005	<0.005	<0.005			
Potassium (K)	mg/L	-	-	11	11	11			
Selenium (Se)	mg/L	0.05	MAC	<0.001	<0.001	<0.001			
Silver (Ag)	mg/L	-	-	<0.0001	<0.0001	<0.0001			
Sodium (Na)	mg/L	200	AO	100	101	101			
Strontium (Sr)	mg/L	-	-	4.5	4.56	4.62			
Thallium (TI)	mg/L	-	-	<0.0001	<0.0001	<0.0001			
Uranium (U)	mg/L	0.02	MAC	0.001	0.001	0.001			
Vanadium (V)	mg/L	-	-	<0.001	<0.001	<0.001			
Zinc (Zn)	mg/L	5.0	AO	<0.01	<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

The bacteriological test results (Certificate of Analysis – Report No. 4259100) indicated that the test samples at the 4- and 8-hour interval were non-detect (0 ct/100 mL) for E.Coli. Total coliforms were detected in concentrations of 4 and 3 ct/100 mL at the 4-hour and 8-hour marks, respectively. According to the City of Ottawa HTAG, a total coliform concentration of less than 6 ct/100 mL is deemed acceptable.

The water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC) with the exception of Manganese. As there is an exceedance of a health-related parameter and the exceedance is above the Maximum Concentration Considered Reasonably Treatable (MCCRT), the water source can only be used as a non-drinking water source. The water meets all of the

Aesthetic Objectives (AO) and Operational Guidelines (OG) with the exception of the following:

Hardness (as CaCO₃)
Alkalinity (as CaCO ₃)
Dissolved Organic Carbon (DOC)
Colour
Turbidity
Total Dissolved Solids (TDS)
Iron (Fe)

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.

As the water is considered to be a non-drinking water source, there will be **no consumption** of the non-drinking water supply, and signs will be posted to indicate that there should be no consumption from the available faucets. The public will not have access to the proposed bathroom facilities. Drinking water will need to be brought in from external sources such as water coolers.

Hardness as CaCO₃

Hardness, expressed as calcium carbonate, is an operational guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 708 and 704 mg/L, the water is considered to be extremely hard, and it is above the reasonably treatable limit of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996).

The Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines sets the MCCRT of hardness at 500 mg/L as, at concentrations removed above this limit, the salt exchange would make the water unpalatable and unsuitable for domestic use (i.e. consumption). As the water well is being used as a non-drinking water source (i.e. not used for consumption), the MCCRT does not apply in this case.

The Langelier Saturation Index (LSI) calculation provided an LSI of 0.6. 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, there are no mitigative measures needed to prevent corrosion, however, hardness reduction technologies can be implemented to prevent scaling which may inhibit boilers and cause staining. See Langelier Saturation Index Calculation attached for calculation details.

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

Alkalinity

Alkalinity, expressed as calcium carbonate, is a measure of the resistance of the water to the effects of acids added to water. Alkalinity 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 500 mg/L. At concentrations above the operational guideline, scaling may form on service pipes and water heaters. The alkalinity concentration in the groundwater was 578 and 570 mg CaCO₃/L at 4 and 8 hours, respectively. As there is no MCCRT or health related effects related to alkalinity, no treatment is required. It is anticipated that the treatment of hardness would reduce alkalinity to within acceptable limits.

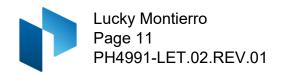
The Langelier calculation provided an LSI of 0.6. Based on the evaluation of the result, the water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed to prevent corrosion, however, hardness reduction technologies can be implemented to prevent scaling which may inhibit boilers and cause staining. See Langelier Saturation Index Calculation attached for calculation details.

Dissolved Organic Carbon

Dissolved Organic Carbon (DOC) is a key indicator of potential water quality deterioration, as it can serve as a nutrient source that promotes bacterial growth. Furthermore, DOC can react with chlorine to create disinfection by-products which may be harmful. DOC was found in the groundwater at concentrations of 7.7 and 7.2 mg/L at the 4- and 8-hour marks, respectively. The DOC concentrations found in the groundwater exceed the aesthetic objective of 5 mg/L. As the water is to be used as a non-drinking water source, there will be no consumption of the water and, therefore, the aesthetic objective exceedance is not anticipated to be an issue.

Total Dissolved Solids (TDS)

Total Dissolved Solids (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 993 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 and the water will be used for non-drinking water sources, no treatment is required.

The Langelier calculation provided an LSI of 0.6. 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, there are no mitigative measures needed for TDS specifically. See Langelier Saturation Index Calculation attached for calculation details.

Iron

Concentrations of iron above 0.3 mg/L can contribute to staining of fixtures and a metallic taste at higher concentrations. Precipitation of iron can promote the growth of iron bacteria in pipes. The concentration of iron in the groundwater in TW1 was measured to be 2.19 to 2.29 mg/L. The concentration of iron in the groundwater is considered to be reasonably treatable in accordance with Procedure D-5-5. It is recommended that a water softener or manganese greensand filter be used to reduce the levels of iron and reduce the potential for excessive precipitate occurring in the water supply system, if desired by the property owner. If treatment is not used, negative impacts such as discolouration of water fixtures, precipitation of iron and staining may occur.

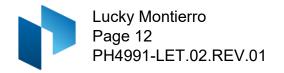
Manganese

The manganese concentration results from the laboratory test samples yielded a value of 2.89 mg/L in the onsite well, which is above the aesthetic objective in the ODWSOG of 0.05 mg/L and the health related MAC of 0.12 mg/L. As the manganese concentration is well above the MAC of 0.12 mg/L and the MCCRT of 1 mg/L, the water is considered not safe to consume. Therefore, the water source will be considered only as a non-drinking water source.

Manganese, like iron, can stain fixtures at concentrations above 0.05 mg/L. Procedure D-5-5 gives a maximum concentration considered reasonably treatable for manganese as 1.0 mg/L. It is recommended that a reverse osmosis system, ion exchange / water softeners and / or an oxidizing filter be used to reduce the manganese concentration, if desired by the owner.

As the concentration of manganese is elevated above the Health Canada Federal Drinking Water Guidelines, a notice regarding the elevated levels of manganese in the aquifer accessed by TW1 is recommended to be registered on title so that future owners are made aware.

The City of Ottawa (Ottawa Public Health) has prepared a Manganese in drinking Water Factsheet, which can be found attached to this report.



Colour

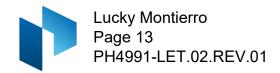
Colour may occur in drinking water for several reasons. It may be due to organic substances from the decay of vegetation, or the presence of metals such as iron, manganese, and copper, which are abundant in nature. The provincial aesthetic objective for colour in drinking water is 5 True Colour Units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

During the field pumping test, a DR900 colorimeter was used to measure apparent colour in the groundwater at regular intervals. Apparent colour in the groundwater was measured as 86 TCU at the end of the 8 hour pumping test which is above the aesthetic guidelines of 5 TCU and above the MCCRT of 7 TCU. The elevated apparent colour levels detected in the lab samples and field samples is attributed to the precipitation of iron and manganese out of the groundwater. Due to the elevated concentrations of iron and manganese in the groundwater, rapid discolouration can occur when exposed to oxygen. It is anticipated that the colour concentration will decrease with the treatment of other parameters such as iron and manganese.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 16.4 to 18.3 NTU in pumping test. Field testing detected the samples at values of 7.48, 4.15 and 2.38 NTU in the 4, 8, and 9-hour field tests, respectively. Continued pumping showed a decrease towards the end of the test. It is expected that continued use of the well would further reduce turbidity values. The elevated turbidity in the laboratory analyzed samples is attributed to the precipitation of iron and manganese. Therefore, it is anticipated that turbidity levels will also decrease due to treatment of other constituents, if treatment is desired by the owner.

During the pumping test, a Hanna Instruments HI98703 Fast Tracker Turbidity Meter was used to measure the turbidity in the groundwater at regular intervals. The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU. The field test parameters are below the 5 NTU objective. As turbidity was detected above 1 NTU, particular care must be taken during testing to ensure that the bacteria requirements of Table 1 are met. The bacteriological test results indicated that the test samples at the 4 and 8 hour interval were non-detect (0 ct/100 mL) for E.Coli, and Total Coliforms was below 6 ct/100 mL which is considered acceptable.



Terrain Analysis

Surficial Geology

A series of boreholes were put down on the subject parcel to delineate the subsurface soil conditions as part of the Geotechnical Investigation (Paterson Report PG7327-1 dated November 25, 2024). On November 11, 2024 three (3) boreholes were excavated on the property for the design of the proposed building and its associated infrastructure. The boreholes were advanced to a maximum depth of 1.3 m below ground surface (bgs). Additionally, one borehole (Paterson Report PE4828-1R, 2019) and one test pit (Paterson Report PG6452-1, 2022) were excavated at the site during previous investigations. The boreholes were distributed in a manner to provide general coverage of the subject site, taking into consideration underground services and available site access. The locations of the test pits on the property are delineated on the Test Hole Location Plan, drawing PG7327-1, attached.

The borehole 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.

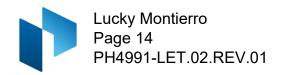
Generally, the subsurface profile at the borehole locations were observed to consist of imported fill material to a depth of 0.6 to 1.3 m. The fill material was generally observed to consist of loose to compact, grey to brown silty sand to sandy silt with traces of topsoil and gravel. Practical refusal to augering was encountered on inferred bedrock at depths ranging from 0.6 to 1.3 m bgs. No groundwater was observed within the boreholes.

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

Reference should be made to the test pit 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.

Hydrogeological Sensitivity of the Site

The subject site is currently vacant and undeveloped. The subject site is to be serviced by a private well and septic system. The site is bordered by vacant land to the north and south, by agricultural lands to the east and by Somme Street to the west. All surrounding properties are on private services.



The overburden at the test hole locations generally consists of a fill overlying bedrock. Refusal was encountered between 0.6 to 1.3 m bgs. According to available geological mapping, the drift thickness within the site varies from 0 to 1 m bgs.

According to the geotechnical field investigation, the overburden thickness was observed to be less than 2 m. Due to the shallow nature of the inferred bedrock, the site is considered to be hydrogeologically sensitive and, therefore, mitigating measures are recommended. It is recommended that any sewage system be located a minimum of 30 m from the water supply well, and that the sewage system is lined with a **100 mm** clay seal.

Conceptual Lot Development Plan

A one-storey warehouse with a mezzanine and an office along with associated parking and infrastructure is proposed to be constructed onsite. The location of the proposed structure can be found on the attached Novatech Drawing 124111-SP, Site Plan dated February, 2025. The proposed private sewage servicing and site grading design is provided by Novatech.

Proposed Sewage System

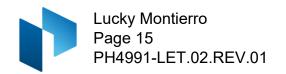
A sewage system design was completed by Novatech. Novatech provided a total daily design sewage flow (TDDSF) of 1,005 L/day and a sewage system capacity of 1,100 L/day.

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's HTAG, including the annotated MECP Procedure D-5-4 applies for the proposed development. For the purpose of this guideline, the Ontario Drinking Water Objective of 10 mg/L of nitrate is used as an indicator of groundwater impact potential.

Under this guideline, where the average lot size is one hectare or larger and the minimum lot size is 0.8 ha or greater, a detailed impact assessment may not be required. It has been the City of Ottawa's policy that where the lot size of 0.8 ha or larger, a detailed assessment is typically not required since it is considered to be a low-risk development.

The subject site is located within the Hawthorne Industrial Park industrial subdivision (Golder Associates 08-1122-0215-3, September 2011). The subject site is 0.8 ha in size, while the industrial subdivision has an average lot size of 3.15 ha, with lot sizes ranging from 0.8 – 11.04 ha. As such, a detailed nitrate impact assessment (NIA) would not typically be necessary. An NIA was completed below to corroborate our opinion that the property can adequately support the proposed development without having adverse impacts on the underlying bedrock aquifer should the minimum separation distances, well construction, and septic system be completed as per the recommendations of this report and the OBC. The values shown in the Predictive Nitrate Impact Assessment attached to



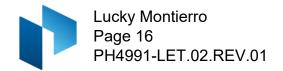
this report are summarized below. To be conservative, the maximum sewage system capacity of 1,100 L/day was used for the assessment.

☐ Site area	0.8 ha
☐ Impervious area (%)	56 %
☐ Daily sewage flow	1.1 m ³ /d
☐ Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
☐ Concentration of nitrate in effluent with treatment (Value based on nitrate reduction system (Ecoflo ECDn Series) with 5	20 mg/L 0 % nitrate reduction)
☐ Surplus Water (The surplus water value was estimated based on Environment Canac values with a soil type comprised of fine sandy loam (Urban Lawns) a sources.)	
 Combined infiltration factor based on: Topography infiltration factor Soil texture infiltration factor Cover infiltration factor 	0.70 0.30 0.30 0.10

The topography infiltration factor of 0.30 is based upon a flat land with an average slope of 0.6 m/km. The soil texture infiltration factor was based upon a silty sand-based fill which is approximated to be between "open sandy loam" and "medium combinations of loam and clay" with a value of 0.3. This is a reasonable generalization of the overburden. The "cover infiltration factor" was calculated at 0.10 based upon a conservative cultivated land type cover.

There are numerous tertiary treatment technologies that are NSF/ANSI 245 and/or BNQ certified for 50% nitrate reduction, resulting in an effluent nitrate concentration of 20 mg/L. When using an effluent nitrate concentration of 20 mg/L, the predicted nitrate concentration at the property boundary is **5.97 mg/L**. This is below the limit of 10 mg/L of nitrate at the property boundary.

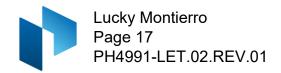
Based on the results of the predicted nitrate impact assessment, it is our opinion that the property can adequately support the proposed building addition without having an adverse impact on the underlying bedrock aquifer, provided that a NSF/ANSI 245 and/or BNQ certified 50% nitrate reduction technology is used in the septic system.



CONCLUSIONS

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

- The water supply aquifer intercepted by the existing well is considered to be adequate to support the water quantity demands for the proposed commercial development.
- 2. The property owner will need to ensure that protective measures are taken to protect the wellhead, such as the use of a barrier, when constructing the proposed commercial development.
- 3. The groundwater contains elevated concentrations of hardness, alkalinity, DOC, TDS, colour, turbidity, iron, and manganese. The noted parameters can be treated to functional concentrations with current readily available water conditioning equipment.
- 4. Elevated concentrations of manganese were encountered in the water supply intercepted by TW1. The manganese concentration was recorded to be 2.29 mg/L in the groundwater, which exceeded the MAC of 0.12 mg/L and the MCCRT of 1.0 mg/L. Therefore, as there is a health-related risk, the water is considered not suitable to consume and can only be used for non-drinking water sources such as toilet flushing. As the manganese exceedance is health related, a notice regarding the elevated levels of manganese in the aquifer accessed by TW1 is recommended to be registered on title so that future owners are made aware. Manganese treatment is recommended to reduce staining.
- 5. 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. Note that elevated hardness is above the MCCRT, however, the MCCRT for hardness is related to aesthetic reasons, therefore, as the water is for non-drinking water purposes, the hardness can be treated. It is anticipated that alkalinity will be reduced as hardness is reduced.
- 6. If desired by the property owner, iron and manganese can be reduced using greensand filters to reduce staining. It is not anticipated that the manganese can be reduced to a concentration that would allow the water to be drinkable.
- 7. As the well water is to be used for non-drinking water purposes, DOC, TDS, colour, and turbidity do not need to be treated.



- 8. The predicted nitrate concentrations at the property boundary is calculated to be below the required 10 mg/L threshold when an NSF/ANSI 245 and/or certified BNQ system with a minimum of 50 % nitrate reduction tertiary treatment system is used.
- 9. Due to the hydrogeological sensitivity of the site, a 30 m setback between the drinking water well and sewage system is recommended. It is recommended that a 100 mm clay seal be used at the base of the sewage system.
- 10. Well water can only be used for non-drinking water purposes such as toilet flushing and/or hand washing, and drinking water will have to be obtained from offsite sources such as water coolers.
- 11.A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction on the proposed commercial building or the proposed septic system.
- 12. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed building addition with respect to water quantity and sewage system placement.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT

August 1, 2025
ERIK ARDLEY
PRACTISING MEMBER
3667

Erik Ardley, P.Geo

Attachments:

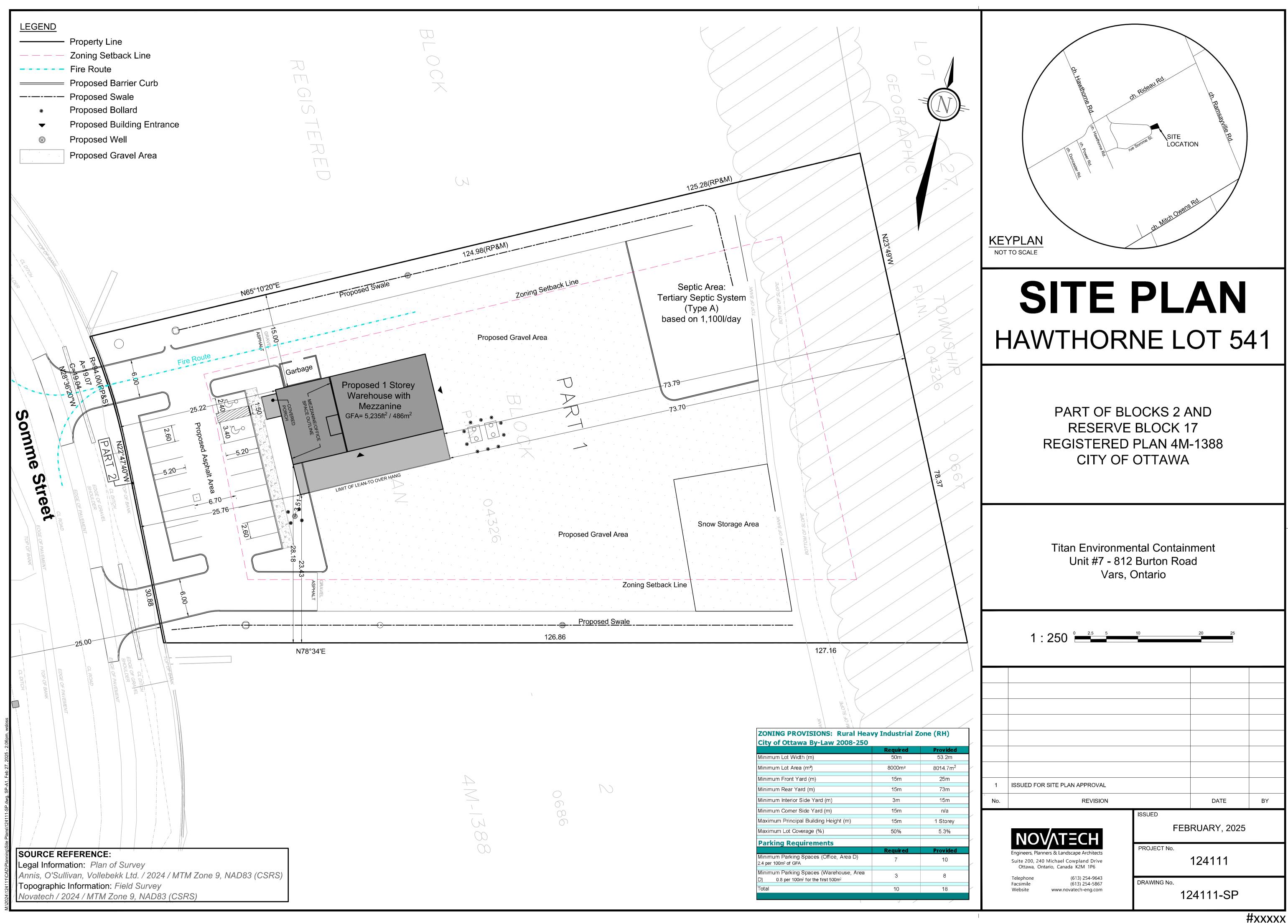
- ☐ Key Plan
- □ Novatech 124111-SP Site Plan dated February , 2025
- MECP Water Well Records
- Eurofins Certificate of Analysis
- □ Paterson Borehole Logs
- □ AQTESOLV Pumping Test Analysis Reports
- Nitrate Impact Assessment Calculations
- Langelier Saturation Index (LSI) Calculation
- ☐ Paterson Drawing PG7327-1 Test Hole Location Plan



FIGURE 1

KEY PLAN





Ontario 🔞	Ministry of the Conservation a		Tag#:A4	21912 Below)	Population 902 Ontar	Well Record
Measurements recorde	ed in: Metric	Mperial	A 421	912		Page of
12			11 /01	110		
Well Owner's Infor		me/Organization	_	, E-mail Addres	S	☐ Well Constructed
THAN E	nviconn		Obrtain me	nt Lital.		by Well Owner
Mailing Address (Street	Number/Name)	^ 1	Municipality	Province	Postal Code Teles	hone No. (inc. area code)
177 QU	rest bli	Nd 1	ledes	nerrs, IV	entrate 1	DAUNI
Well Location	(0)		Tours		Lot Cong	cession
Address of Well Location	Street Number/Na	Stree	Township Duc	oser	27 6	R.F.
County/District/Municipa		<u> </u>	City/Town/Village	,	Province	Postal Code
Ottoma-	Corlegio		(9 louc	ester	Ontario	
UTM Coordinates Zone	Easting	Northing	Municipal Plan and	Sublot Number	38 (Post	10.7
NAD 8 3 NAD Red	rock Materials/Ah	So 700	g Record (see instruction		30 (1041)	(+3)
General Colour	Most Common Ma		Other Materials		eneral Description	Depth (m/th)
	Sand	0., 01				Prom To
0.0	2 No.	W CIE	0 1/60	1 = 000	1200	0101
(gray 8	end Stone	2 1 mxee	10/01/2	ry herres	are	5' (40'
	Ann	nular Space			Results of Well Yield Te	sting
Depth Set at (m/t)	Туре	of Sealant Used	Volume Plac			
From To	(Mater	rial and Type)	(m³/f©	Clear and sar		er Level Time Water Leve m/ft) (min) (m/ft)
40 30	Next Con	ment 21	w/4 100	Other, specify		120/10
3,1 11	Bo dan:	fo Shirt	N/ 16.8	If pumping disconti	nued, give reason:	19" 20.1"
0	ten 1014	Colmi	4 100		127-	2 1 26.
				Pump intake set at	(m/tt) 2 00	5 2 05 0
				10	6	1 227
Method of Cons	struction	1	Well Use	Pumping rate (Umir	3 A .	1 3 24.7
Cable Tool	☐ Diamond		Commercial Not		4.29	6 4 24.3
Rotary (Conventional) Rotary (Reverse)	☐ Jetting ☐ Driving		Municipal Dewa Test Hole Moni	atering hm+	min 5	9 5 24
Boring			Cooling & Air Conditioning	Final water level er	d of pumping (m/ft)	8 10234
Air percussion		Industrial		32'	("	
Other, specify		Other, specify		If flowing give rate	Vmin/GPM) 15 1-	3 1523.1
	struction Record		Status of W		20 31	6 20,00.19
Inside Open Hole (Diameter (Galvanized	Fibreglass, Thicks	all Depth (m)	Poplosoment		mp depth (m/ft)) 25 21	8 25 221 9
(cmin Concrete, P			Test Hole	Recommended our	mp rate	0 00-1
5/41/ Stee	28 pe 35	3"+2"	Recharge We	(I/me/GPM)	30 31	9 30 1
64 BB	Hen	40' 1	Dewatering W		40 12	2 40 /
0 00	Troce	70 1	Monitoring Ho		502.2	50
			Alteration (Construction	Disinfected?	200	1.0
			☐ Abandoned,	Yes No	6000	60
Cons	struction Record	- Screen	Insufficient Su	Poor	Map of Well Location	
Outside Diameter /Plastic Calu		Depth (m/	ft) Water Quality	- 11	map below following instruction	ns on the back
(cm/in) (Plastic, Galva	anized, Steel)	From	To Abandoned, o	other,	In	
				Ride	m rea	-
			Other, specify			
				=1X	D. TKM.	100 FT /
	Water Details	M	Hole Diameter	1 / }	021119	100
	(ind of Water: Fr		Depth (m/ft) Dia From To (cr	meter m/h		1
	Other, specify (ind of Water: Fr	VA	1 1.103		11	
121	Other, specify	To lesied &	10	5	₱541)
Vater found at Depth K		esh Untested	0'140' 6	5	STREET	/
	Other, specify			1	211/11/1	
		Well Technician In	formation	<u> </u>	TKEE'I	
usiness Name of Well (0.	Well Centractor's Licer	ice No.		
OR Keek	DRILLIN	564	D 4768			
Business Address (Stree	t Number/Name)	P 0	Municipality	Comments:	0000	6 1 2
Province Pos	stal Code Bus	siness E-mail Address	A Co. LICAS	1 111-0	SON DOTE	DO TO
Out K	A220	Andoo L-mail Address		Well owner's Dat	e Package Delivered	Ministry Use Only
Bys. Telephone No. (inc. ar	rea code) Name of V	Nell Technician (Last	Name, First Name)	information	Audi	
613838	2170	Honne	Terem	package delivered	00000	-44334
Vell Technician's Licence N	o. Signature of Tech		ctor Date Submitted	Yes Dat	e Work Completed	
Vell Technician 3 Licence IV		1				
13632	rinter for Ontario/2023	En_	200500	28 □ No 50	DO DO Rece	ived

The Ontario Water Resources Act WATER WELL RECORD

Ontario 1. PRINT ONLY IN SPACES PROVIDED 2. CHECK © CORRECT BOX WHERE APPLICABLE TOWNSHIP, BOROUGH CITY TOWN VILLAGE Ottawa Carleton OWNER (SURNAME FIRST) Beaver Road Builders Ltd. P.O. Box 4208 st. "E" Ottawa, Ontario KIS 5B2 ONTARIO BOX 12 P.O. Box 4208 st. "E" Ottawa, Ontario KIS 5B2 ONTARIO BOX 12 P.O. BOX 13 P.O. BOX 14 P.O. BOX 15 P.O. BO	ETC LOT 25-27 DATE COMPLETED 44-53
Ottawa Carleton OWNER (SURNAME FIRST) Beaver Road Builders Ltd. P.O. Box 4208 st. "E" Ottawa, Ontario Kls 5B2 OWNER (SURNAME FIRST) P.O. Box 4208 st. "E" Ottawa, Ontario Kls 5B2 OWNER (SURNAME FIRST) RC BASIN CODE OWNER (SURNAME FIRST) P.O. Box 4208 st. "E" Ottawa, Ontario Kls 5B2	26
Beaver Road Builders Ltd. P.O. Box 4208 st. "E" Ottawa, Ontario Kls 5B2	DATE COMPLETED
ZONE EASTING NORTHING RC ELEVATION RC BASIN CODE U T	DAY 19 MO 4 YR 93
1 2 M 10 12 17 18 24 25 26 30 31	111 14
LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)	47
MOST CENSON DESCRIPTION	DEPTH - FEET
COMMON MATERIAL	FROM TO
Brown Sandy Clay Broken Rock Fill	0 9
Gray Hardpan Boulders	9 15
Gray Limestone Soft	15 33
White & Gray Sandstone Hard	33 135
31 [,,,],,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u>▗▐▗</u> ▗▗ ▗▕▕▎▗▗▗┆▍╻╽╻╿╻┃
1 2 10 14 15 21 21 32 43 54 Superior of Defining	31-33 DIAMETER 34-38 LENGTH 39-40
WATER FOUND KIND OF WATER INSIDE WALL DEPTH - FEET	INCHES FEET DEPTH TO TOP
AT - FEEL INCRES INCRES FROM 10 O MATERIAL AND TITE	OF SCREEN
56 GALVANIZED 3 CONCRETE 61 PLUGGIN	G & SEALING RECORD
2 SALTY 6 GAS 5 OPLASTIC ONDINGELAL SEEL I	MATERIAL AND TYPE (CEMENT GROUT)
2 SALTY 6 GAS C 1 /04 CONCRETE 21 75 10-13 12-17	
25-28 1 FRESH 3 SULPHUR 2 28 27:30 18-21 22:25 2 1 SALTY 6 DESE	routed - Cement (18)
30-33 1 FRESH 4 SULPHUR 34 0 6 4 GOPEN HOLE 75 135	
PUMPING TEST METHOD 16 PUMPING RATE 15-14 DURATION OF PUMPING LOCATION C	F WFII
1 GEPUMP : BAILER 15-20 GPN 1 HOURS 17-13	
STATIC WATER LEVEL BY A LOT LINE INDICATE NORTH BY A LEVEL PHINDING CARREST COVERY LOT LINE INDICATE NORTH BY A	
26-28 29-31 32-34 35-37	
	<u>Kg</u> .
ST FEET 130	
SHALLOW TO DEEP SETTING 125 FEET PARE 5 GPM	c _
FINAL STATE SUPPLY S ABANDONED, INSUFFICIENT SUPPLY	est well for
FINAL STATUS Mater Supply Grandoned, Insufficient Supply Grandoned Poor Quality Grandon	est well for opposed Industry
OF WELL 1 TEST HOLE 7 UNFINISHED 4 RECHARGE WELL DEWATERING	0 posed -
55-55 Gromestic 5 COMMERCIAL 2 STOCK 6 MUNICIPAL	rk.
USE Industrial Cooling or air conditioning	
, , , , , , , , , , , , , , , , , , ,	
METHOD CABLE TOOL 6 BORING	
CONSTRUCTION Output	130025
NAME OF WELL CONTRACTOR WELL CONTRACTOR'S DATA 58 CONTRACTOR 59-62	DATE RECEIVED 63 68 80
LICENCE NUMBER	MAY 0 6 1993
15.1	
P.O. Box 490 Stittsville, Ontario K2S 1A6 NAME OF WELL TECHNICIAN'S LICENCE NUMBER WELL TECHNICIAN'S LICENCE NUMBER WELL TECHNICIAN'S LICENCE NUMBER	
S. Miller Signature of technician/contractor Submission date Submission date	
MINISTRY OF THE ENVIRONMENT COPY	FORM NO. 0506 (11/86) FORM S



The Ontario Water Resources Act

WATER WELL RECORD

Ontario	1. PRINT ONLY IN : 2. CHECK 🗵 CORR	SPACES PROVIDED EECT BOX WHERE APPLICABLE	1527	383 (15002) (C	N. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
COUNTY OR DISTRICT	_	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE		CON BLOCK TRACT SURVEY ETC	LOT 25-27 26
			HEH OLL	awa, Ontario KlS 5B2	PLETED 48-53
		Box 4208 stn.		RC BASIN CODE H	
	₩ 10 12 LC	OG OF OVERBURDEN AND BEDRO		ALS (SEE INSTRUCTIONS)	47
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS		GENERAL DESCRIPTION	DEPTH - FEET FROM TO
Brown	Sand	Stone			0 5
Gray	Hardpan	Boulders			5 28
Gray	Sandstone			Hard	28 100
<u> </u>				<u> </u>	
	·				
31	<u> </u>	<u> </u>			<u> </u>
32					
	TER RECORD	51 CASING & OPEN HOLE	RECORD-	SIZE(S) OF OPENING 31-33 DIAM	
WATER FOUND AT - FEET	KIND OF WATER TATE TRESH 3 SULPHUR	DIAM MATERIAL THICKNESS	RUM TO	MATERIAL AND TYPE	DEPTH TO TOP 41-44 30 OF SCREEN
58 ' 0	SALTY 6 MINERALS 6 GAS	6 1/4 1 STEEL 2 GALVANIZED 3 CONCRETE 4 COPEN HOLE	0 39	61 PLUGGING & SEA	LING PECOPD
98 2	SALTY 6 GAS	5 ☐ PLASTIC 19 19 1 ☐ STEEL	20-2		CEMENT CROUT
2 (SALTY 6 GAS FRESH 3 SULPHUR	5 15 S GALVANIZED S CONCRETE S S PLASTIC	39 100	10-13 14-17	- Grouted
2 [SALTY 6 GAS	P625 1 □STEEL 26 2 □ GALVANIZED 3 □ CONCRETE	27-3	26-29 30-33 80	
	SALTY 6 GAS	4 OPEN HOLE 5 OPLASTIC		35.3	
71 PUMPING TEST ME		DURATION OF PUMPING 15-16 17-18 15-16 17-18 15-16 17-18 15-16 17-18		LOCATION OF WEL	
STATIC LEVEL	PUMPING	EVELS DURING PUMPING 2 RECOVERY		DIAGRAM BELOW SHOW DISTANCES OF WELL LINE INDICATE NORTH BY ARROW.	FROM ROAD AND
7 7 6 FEE	26-2	9-31 32-34 35-37		Rideau Rd	
IF FLOWING GIVE RATE RECOMMENDED PL	38-41 PUMP INTAKE	SET AT WATER AT END OF TEST 42		Rideau Rd 380 meters	
RECOMMENDED PL	PUMP	PUMPING		1	
IO-53	W TEP SETTING	50 FEET RATE 5 GPM	NG NG	1,50	o meters
FINAL	1 WATER SUPPLY 2 DESERVATION WEI	S ABANDONED, INSUFFICIENT SUPPLY			
STATUS OF WELL	3 TEST HOLE 4 RECHARGE WELL	7 UNFINISHED DEWATERING		•	
WATER	DOMESTIC 2 STOCK	5 COMMERCIAL 6 MUNICIPAL	aw thos	×	ell
USE	3 IRRIGATION 4 INDUSTRIAL OTHER	7 ☐ PUBLIC SUPPLY ■ ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED	173	× res	*2
METHOD	57 CABLE TOOL	6 BORING	=		
OF CONSTRUCTI	2 ROTARY (CONVENT 3 ROTARY (REVERSE				125046
	S AIR PERCUSSION	□ DIGGING □ OTHER	DRILLERS REM		135946
MAME OF WELL	contractor Water Supply	WELL CONTRACTOR'S LICENCE NUMBER	DATA SOURCE		2 1 1993 """
151		Ontario K25 1A6 WELL TECHNICIAN'S	SE	SPECTION INSPECTOR	
NAME OF WE	er/T. Harrison	WELL TECHNICIAN'S LICENCE NUMBER TOO97/T2251	□ REMARKS	· · · · · · · · · · · · · · · · · · ·	
h h	F TECHNICIAN/COTTRACTOR	SUBMISSION DATE DAY 18 MO 8 YR.23	OFFICE		
	OF THE ENVIRON		l <u>L</u>	F	ORM NO. 0506 (11/86) FORM 9



The Ontario Water Resources Act

WATER WELL RECORD

	1. PRINT ONLY IN : 2. CHECK 🗵 CORR	ECT BOX WHERE APPLI		152	/38	4 USO	<u> </u>	K	16
Ottawa Carlot	on	TOWNSHIP, BORO	Glouceste			CON BLOCK, TRACT	6		26
					tava (Ontario Kls	DATE COMP		
			NG	RC. ELEVATION	Cawa	RC BASIN CODE	.	MO D	IV 1V
1 2 10	LC	G OF OVERBU	IRDEN AND BEI	PROCK MAT	ERIALS	(SEE INSTRUCTIONS)			47
GENERAL COLOUR COMM	MOST ION MATERIAL		HER MATERIALS			GENERAL DESCRIPTIO	N	DEPTH	
Gray & White	Sandstone					Hard		FROM	100
									100
			,			·			
	<u>i</u>	· · · · · · · · · · · · · · · · · · ·							
					<u>. </u>				
							·		
		-		·					
31			<u> </u>				ــــا لــــــــــــــــــــــــــــــــ	ЩЩ	
41 WATER REC	ORD	51 CASIN	IG & OPEN HOL	E RECORD		SIZE(S) OF OPENING	31-33 DIAMETE	R 34-38 LE	75 80 NGTH 39-40
WATER FOUND KIND OF	WATER	INSIDE MATER	MALL THICKNESS	DEPTH - FEET	CREEN	MATERIAL AND TYPE		INCHES DEPTH TO TOP	FEET
30 SALTY 6	SULPHUR HINERALS	6 1/4 1 STEEL	112 -188		2" S			OF SCREEN	41-44 30 FEET
15-18 1 FRESH 3	SULPHUR 19 INTERALS	3 ☐ CONCR 4 ☐ OPEN F 5 ☐ PLASTI	ETE IOLE	ay, 44	6	PLUGG	ING & SEALI	NG RECOF	RD
20-23 1 NOT RESTES	MINERALS	17-18 1 OSTEEL 2 OGALVAN 3 OCONCR 5 1/16 POPEN	ETE			FROM TO	MATERIAL AND	TYPE (CEMENT LEAD PACE	
1 1. = 4	SULPHUR 29	5 ☐ PLASTI	C 26	22 10	0 2	0 8 0 18-21 22-25	Grouted o	cement (3)
4	SULPHUR 34 10 INTERALS	2 GALVAN 3 CONCRI 4 OPEN 1 5 PLASTI	ETE			26-29 30-33	•0		
71 PUMPING TEST METHOD	10 PUMPING RATE		ON OF PUMPING	7		LOCATION	OF WELL		
STATIC WATER LEVE	25 Z		15-16 17-1 HOURS MI	is	DIAGRAN	1 BELOW SHOW DISTAI	NCES OF WELL FF	ROM ROAD ANI	,
PUMPING	2-24 35 MINUTES 26-28	30 MINUTES 45	RECOVERY MINUTES 60 MINUTES 32-34 35-3		OT LINE	INDICATE NORTH BY	ARROW.		
		24 FEET 2	32-34 35-34 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1		Rideau F	coad	1	
IF FLOWING. 31 GIVE RATE RECOMMENDED PUMP TYPE		10 FEET 1 -	CLEAR 2 CLOUD					1	
SHALLOW TEDEEP	RECOMMENDED PUMP SETTING	43.45 RECOMPONENT PUMPIN RATE	MENDED 46-4	ا ا				; 	
52									
STATUS ;	WATER SUPPLY OBSERVATION WELL TEST HOLE	# ABANDONED # ABANDONED 7 UNFINISHE		1				12	50 ch
55-56	RECHARGE WELL DOMESTIC	DEWATERING		Hawthorne				1	~
WATER 3 0	STOCK I	F ☐ MUNICIPAL F ☐ PUBLIC SUPPLY		1 4				1	-
USE	OTHER	COOLING OR AIR	CONDITIONING NOT USED	Hav				V,	
METHOD 12 12	CABLE TOOL ROTARY (CONVENTIO	6 BOI]]		W		*	
CONSTRUCTION	ROTARY (REVERSE) ROTARY (AIR) LIR PERCUSSION	□ JET □ DRI □ DIG		'		\mathcal{F}		135	AAD
NAME OF WELL CONTRACTOR		L DIG	WELL CONTRACTOR			58 CONTRACTOR 52.6	2 DATE RECEIVED	T20	344
Capital Water	Supply Lt	d•	1558	SOURCE OF I	NSPECTION	1558	SEP 2	1 1993	-5.48
BOX 490 Stit	įsville, O	ntario K2	S 1A6 WELL TECHNICIAN'S			- CONTROL OR			
Capital Water ADDRESS BOX 490 Stitt NAME OF WELL TECHNICIAN S. Miller/T. I	larmison	SUBMISSION D	TOO97/T2251	O FEMARKS					
Morano	//	DAY 18	_	造					
MINISTRY OF THE	ENVIRONME	NT COPY					FORM	NO. 0506 (11/	26) 50014 0

Ministry of the Environment

Measurements recorded in: 💢 Metric 🗌 Imperial

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

A068335 A 068335

Well Record Regulation 903 O

ntario	Water	Resources	Act

TW #5 -	- Ride		реглуапте)		Cit	Glouce			26	Provinc	_{se} 6	Postal	Code
Ottawa Carleton UTM Coordinates Zone Easting Northing									Onta	rio			
				thing		Glouce unicipal Plan	and Sublo	t Number		Other			
Overburden	3 1 8 and Bed					d (see instruc	ctions on the	back of this form)		Hall		Don	th (<i>m/ft</i>)
General Cold	our	Most Commo	n Material		Othe	r Materials			General Description			From	To
Brown		Soil		St	ones			Fill				0	1.21
Gray		Sandy So	i.1	St	ones			Wet				.21	3.96
Gray		Sandstone	9					Very H	ard			3.96	29.86
									Results of We	II Viele	d Testina	0014	
Depth Set	at (m/ft)		Annular S Type of Seal	ant Used	mann and a second	Volume			l yield, water was:	Dra	aw Down	-	ecovery
From	To		(Material and			.525m		X Clear and ☐ Other, spe		(min)	(m/ft)	(min)	Water Level (m/ft)
12.80	0	Groute	ed Cemer	10		.323m		If pumping disc	ontinued, give reason:	Static Level	6.85		
										1	8.03	1	8.97
								Pump intake s		2	8.35	2	8.69
****	-1 -10	nstruction			Well Us			Pumping rate		3	8.60	3	8.55
Cable Too	_	Diamond	Pub	lic [X Commer		Not used	54. Duration of pu		4	8.76	4	8.46
Rotary (Co			X Dor		Municipa Test Hol	_	Dewatering Monitoring	6 hrs +	minmin	5	8.88	5	8.40
Boring		Digging	☐ Irrig	ation		& Air Conditio	ning		el end of pumping (m/ft)	10	9.20	10	8.23
X Air percus			3.5		Test W	ell		9. If flowing give	rate (l/min-/ GPM)	15		15	
		nstruction Re	10115/2010/15/2010	ing Depth	(m/9)	Status X Water S	of Well	Bacommende	d pump depth (m/ft)	20	9.49	20	8.04
Inside Diameter (cm/in)	(Galvanize	e OR Material ed, Fibreglass. Plastic, Steel)	Wall Thickness (cm/in)	From	To	Replace	ement Well	22.		25	9.62	25	7.99
15.86		ee1	.48	+.45	12.80	☐ Test Ho		Recommende (Vmin / GPM)	d pump rate	30	9.68	20	7.93
13.00	500	eer	.40	45	12.00	☐ Dewate		45.	5 on (Vmin / GPM)	40	9.82	40	7.84
						Monitori Alteratio	ng Hole		at (armir) Or my	50	9.91	50	7.77
						(Constr	uction)	Disinfected?	No	60	9.99	60	7.69
H120225555	C	onstruction Re	ecord - Scre	en		Insuffici	ent Supply ned, Poor		Map of W	ell Lo		HIME	
Outside Diameter		laterial Steel	Slot No.	Depth		Water 0		Please provide	a map below following	instruc	tions on the	back.	1
(cm/in)	(Plastic, Ga	alvanized, Steel)		From	То	specify					<u> </u>		+
						Other,	specify		Ride	au 1	R9		
			-11-			lole Diame	tor	1 2				×	
Water foun	d at Depth	Water Det Kind of Water		X Untested	Dep	th (m/ft)	Diameter (cm/in)						
		Other, spe		Untostad	From 0	12.80	15.86						
		Kind of Water Other, spe		Ontested	100000000000000000000000000000000000000	29.86	15.23	1 8	*				
		Kind of Water		Untested	12.00	27.00	13,23	1 3					*-
(m)		Other, spe		Technicia	n Informa	tion	BOHATO	1 4				×	#5
	ame of We	II Contractor			W	ell Contractor's							
		r Supply eet Number/Na				1 5 unicipality	5 8	Comments:					
Box 490		Dontel C-d-	Duning	s E-mail Add		tittsvi	11e						
Ontario Bus.Telepho	o K	Postal Code 2 S 1 A area code) Na	6 off	ice@ca	pitalw	Ciant Manage		Well owner's information package	Date Package Deliver		Mini Audit No.		se Only
6 1 3	8 3 6	1 7 6 6 e No. Signature	Mi11	er, Ste	phen	ate Submitted		delivered	Date Work Complete	d			7710
0 0	9	7 181	man		THE RESERVE OF THE PERSON OF T	008		No	200809	2 6	Keceiven		2 2008
0506E (12/20	07)	11/		V		Ministr	y's Copy				© Quee	's Printer	for Ontario, 200



Well Tad No. for Master Well (Place Sticker and/or Print Below)

A 074584

Master Well Record for **Cluster Well Construction**

Regulation 903 Ontario Water Resources Act

© Queen's Printer for Ontario, 2006

								rtw	0-40		Page _ or _ Z
		ner's and l	and Owner's Infor			HARRINA		HARRIE		描述是明显的	
First Name		110) Last	Name	1.			Chuironna	dole-		
Orgo	4001	ld La	nada Klal	CSta	te via	Sen	. عى زر				
Mailing Add	dress (St	reet Number			unicipality			Provi		Postal Code	
559	+ P	ower Re	ood	0	Howa			0	N	K163	NH 61 318 33 118 67
Location	and Co	onstruction	of the Master We	Il in the (Cluster	HIN	THE PARTY.		Maria di	D. L. B. B. B.	
			Number/Name, RR)	^	Townsh	nip				Lot	Concession
. 1	1.1	. 71		MII ON	a d					26:2	7 6
County/Dia	thor	ne ku	ad at Ridu	uu FD	City/To	wn/Villag	10			0 0 1 0	Province Postal Code
County/Dis	strict/iviui	licipality				- 44					
						OHa					Ontario
UTM Coord	finates	Zone Eastir	·		GPS Unit	Make	Model .		Mode of C	peration:	Undifferentiated
NAD	8 3	18145	6400501	1618161	2 GARI	min	Etr.	04	Differen	tiated, specify_	
	_	nd Bedrock	Materials (see inst				orm)		PROBLEM !	Hole	Details
General		Common	Other		eneral	_	(Metres)	Depth	h (Metres)	minimum and a section in	Diameter
Colour		aterial	Materials		cription	From	То	From	То		(Centimetres)
							10		10	-	
Caronti	Money	VOLUT	ine sand + SI	1 don	SO MAIS	0	0.8	0	17.6	20	
									1.0		Company of the second s
Roun	Fill	- San	8/Silt/Clay	grave	1	0.8	47				
Chicar	111	1	11 11	June	.1.		1				
Grey 113	rown	Jana	with silt	Convinct	OXYTIZA	4. 1	6.0	经验证			
0	-							1806 2428			
Brown	11	1-511	ly sand, gra	ve		(e.0	7.6				
Marie Co.	-9.		1			F				10/-4	
									WARRIET		er Use
								Public			Not used Other, specify
							-	Dome		_	Dewatering Monitoring
			医性性不足					Lives			
						-	1	Irriga:	tion [] I	est Hole	Cooling & Air Conditioning
									Pare III	Method of	Construction
								Cable	e Tool	☐ Air Per	rcussion Digging
	Hak								ry (Convention	nal) Diamo	
	11/186		CONTRACTOR OF THE STATE OF THE			March 18	1		ry (Reverse)	Jetting	
							1	Rotar	and the second second	Driving	HKA
											11271
								****		Status	s of Well
						15.46		Test	Hole	Aband	oned, Insufficient Supply
								Repla	acement Well	Aband	oned, Poor Water Quality
	1							Dewa	atering Well	Other,	specify
								Alter	ation (Constru	iction) Aband	oned, other, specify
								No Ca	sing and S	creen Used	Static Water Level Test
						ACC. SH	allowers in	Open Ho	ole	42	14171
	· ARTHUR	CEARING	Construction Do	talle			2270-1100		Yes -	No	Metres
Incide Die	mater		Construction De	taiis	Wall	Donth	(Metres)		Strike Livery	Sc	reen
Inside Diai		etaal nlaetic	Material fibreglass, concrete, g	alvanized)	Thickness	From	I To	Galva	anized	Steel Fibre	eglass Concrete Plastic
(October)	203/	^	noregiass, concrete, g	arranzea	Sched			Second .	Diameter (Ce	l-ud	Slot No.
51		PVC			40	0	3.0	Outside i	5 O	murretresj	SIOUNO.
2.1		110			44.1	1	0,1		5.8		10
									THE REAL PROPERTY.	Water De	otails
	1, 214					W-14 0		Water fo	ound at Dep	th Kind o	f Water
					130000000000000000000000000000000000000	district.	- 1	lı .	Metres	Gas Fre	sh Salty Sulphur Minerals
								Water fo	ound at Dep		of Water
			<u> </u>	Territopped	571951 N 1344134		A section of	water it			sh Salty Sulphur Minerals
		Annular	Space/Abandonme	nt Sealing	Record					000	
Depth Set		es)	Type of Sealant				e Used	Water fo	ound at Dep		of Water
From	То		(Material and Ty)	oe)		(Cubic	Metres)		Metres	Gas Fre	sh Salty Sulphur Minerals
5 %	2.4	L Bo	louita			1.1	· Vac	Disinfect	ed TVes I	THE If no prov	ide reason: Date Master Well Completed
D. 6	L. 1	- 12ln	Jonete			9	e Kqs		Lies [ir ito, prov	(yyyy/mm/dd)
								1	1 mila	lina li	101 ams/17/14
											Le Lacordini
											fill out the additional Cluster Well of for each parcel of land and cluster.)
									ells in Cluste		Please indicate Number of Cluster Well
								Total W	relis in Cluste	21	Information Log Sheets Submitted
								Total 10		Proports	
								11 .	ells on this f		
								11 1/		1/0	'
								1	nknor		FIM-II Olivet
										Location o	f Well Cluster
			-					Detailed	f Map must t	Location of the provided as a	an attachment no larger than legal size
								Detailed (8.5" x 1	f Map must t 14"). Sketche	Location of the provided as a se are not allow	an attachment no larger than legal size ed.
								Detailed (8.5" x 1	f Map must t 14"). Sketche	Location of the provided as a se are not allow	an attachment no larger than legal size
								Detailed (8.5" x 1	f Map must to 14"). Sketche ćk box to cor	Location of the provided as a seas are not allow firm detailed madditional info	an attachment no larger than legal size ed.
							-	Detailed (8.5" x 1 Chec	f Map must t 14"). Sketche čk box to cor t to release ector upon re	Location of the provided as a set of allow of the provided as a set of allow of the provided management of the provided managemen	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3)
								Detailed (8.5" x 1 Chec	f Map must t 14"). Sketche čk box to cor t to release ector upon re	Location of the provided as a seas are not allow firm detailed madditional info	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3)
		Woll Carrie	ractor and Well To-	hnisian I				Detailed (8.5" x 1 Chec Consen the Dire Signatur	d Map must to 14"). Sketche ck box to correct to release actor upon regent Technical transfer of Technical tra	Location of the provided as a set of allow of the provided as a set of allow of the provided management of the provided managemen	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) armation concerning the cluster to
Rupinger M	Igme of h		ractor and Well Tec	hnician Ir		rgydou'n I i'	yanca Me	Detailed (8.5" x 1 Chec	Map must to 14"). Sketcheck box to core to release ector upon rese of Technic	Location of the provided as a series are not allow infirm detailed madditional information/Contractor	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) rmation concerning the cluster to Date (yyyy/mm/dd) 2008 10 20
	_	Vell Contract	or , ,		Well Contr	ractor's Lic	pence No.	Detailed (8.5" x 1 Chec	Map must to 14"). Sketcheck box to core to release ector upon rese of Technic	Location of the provided as a series are not allow infirm detailed madditional information/Contractor	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) armation concerning the cluster to
	_	Vell Contract	or , ,		Well Contr	ractor's Lic	cence No.	Detailed (8.5" x 1 Chec	Map must to 14"). Sketcheck box to core to release ector upon rese of Technic	Location of the provided as a series are not allow infirm detailed madditional information/Contractor	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) rmation concerning the cluster to Date (yyyy/mm/dd) 2008 10 20
George Business A	Je D	Vell Contract	or og Estate D me, number, RR)	rillin	Well Control G Hernicipality	8 4	14	Detailed (8.5" x 1 Chec	Map must to 14"). Sketcheck box to core to release ector upon rese of Technic	Location of the provided as a series are not allow infirm detailed madditional information/Contractor	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) rmation concerning the cluster to Date (yyyy/mm/dd) 2008 10 20
George Business A	Je D	Vell Contract	or og Estate D me, number, RR)	rillin	Well Control G Hernicipality	8 4	14	Detailed (8.5" x 1 Chec	Map must to 14"). Sketcheck box to core to release ector upon rese of Technic	Location of the provided as a sare not allow of the provided as a sare not allow of the provided manufacture of the provided and distinct of the provided manufacture of t	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) rmation concerning the cluster to Date (yyyy/mm/dd) 2008 10 20
George Business A	_	Vell Contract	or og Estate D me, number, RR)	rillin	Well Control G Hernicipality	8 4	14	Detailed (8.5" x 1 Consenthe Dire Signatur	Map must to 14"). Sketche ck box to cont to release ctor upon report Technical Well Owner	Location of the provided as a sare not allow of the provided as a sare not allow of the provided manufacture of the provided and distinct of the provided manufacture of t	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) 2008 0 20
Business A 4/0 Province	ge D ddress (s Rue	Nell Contract	or og Sstate D me, number, RR) Cipale Gr Business E-m	rillin envilla ail Address	Well Control	8 4 a - R	ouge	Detailed (8.5" x 1 Chec	Map must to 14"). Sketche ck box to cont to release ctor upon report Technical Well Owner	Location of the provided as a sare not allow of the provided as a sare not allow of the provided manufacture of the provided and distinct of the provided manufacture of t	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) 's consept to use Cluster Form Use Only
Business A 4/0 Province	ge D ddress (s Rue	Nell Contract	or og Sstate D me, number, RR) Cipale Gr Business E-m	rillin envilla ail Address	Well Control	8 4 a - R	ouge	Detailed (8.5" x 1 Check Consenthe Direck Signatur	Map must to 14"). Sketcheck box to contact to release ector upon report Technical Well Owner	Location of the provided as a series are not allow of the provided as a series are not allow of the provided manaditional information of the provided and contractor of the provided and the prov	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) COS 10 20 's consept to use Cluster Form / Use Only Well Contractor No.
Business A 4/0 Province	Ge D Iddress (S Rue one No. (Vell Contract OWN Street No./Na Postal Coo JOV	or g Sstate D me, number, RR) Cipale Gr Business E-m Blo down Name of Well Technic	enuilla Address in a Galan (Last N	Well Control Survey	8 4 a - R rn et	ouge	Detailed (8.5" x 1 Check Consenthe Direck Signatur	Map must to 14"). Sketcheck box to contact to release ector upon report Technical Well Owner	Location of the provided as a series are not allow of the provided as a series are not allow of the provided manaditional information of the provided and contractor of the provided and the prov	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) 's consept to use Cluster Form Use Only
Business A 4/0 Province	Ge D Iddress (S Rue one No. (Vell Contract OUN Contract Street No./Na Postal Coo TOV inc. srea code,	or g Sstate D me, number, RR) Cipale Gr Business E-m BID down Name of Well Technic	enuilla Address in a Galan (Last N	Well Control Identicipality Control Identicipality Control Identicipality Identicipality	8 4 la - Ri rnet ame)	ouge t.com	Detailed (8.5" x 1 Check Consenthe Dire Signatur Master Ma	Map must to 14"). Sketcheck box to cont to release ector upon report Technical Well Owner Well Owner 10V 2 b 2	Location of the provided as a series are not allow of the provided as a series are not allow of the provided manaditional information of the provided and contractor of the provided and the prov	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) COS 10 20 's consept to use Cluster Form / Use Only Well Contractor No.
Business A 4/0 Province	Ge D Iddress (S Rue one No. (Vell Contract OUN Contract Street No./Na Postal Coo TOV inc. srea code,	or g Sstate D me, number, RR) Cipale Gr Business E-m Blo down Name of Well Technic	enuilla Address in a Galan (Last N	Well Control Identicipality C-SUC-I A P O Identicipality C-SUC-I Date Sub	8 4 la - Ri rnet ame)	ouge t. (om	Detailed (8.5" x 1 Check Consenthe Dire Signatur Master Ma	Map must to 14"). Sketcheck box to cont to release ector upon report Technical Well Owner Well Owner 10V 2 b 2	Location of the provided as a series are not allow of the provided as a series are not allow of the provided manaditional information of the provided and contractor of the provided and the prov	an attachment no larger than legal size ed. ap is provided as per Section 11.1 (3) mation concerning the cluster to Date (yyyy/mm/dd) COS 10 20 's consept to use Cluster Form / Use Only Well Contractor No.

Ministry's Copy



Ministry of the Environment

Well	Tan	Nο	for	Master Well	(Print Well	Tag No.)
A		7	4	584	A074	.5 84

Cluster Well Information for Cluster Well Construction

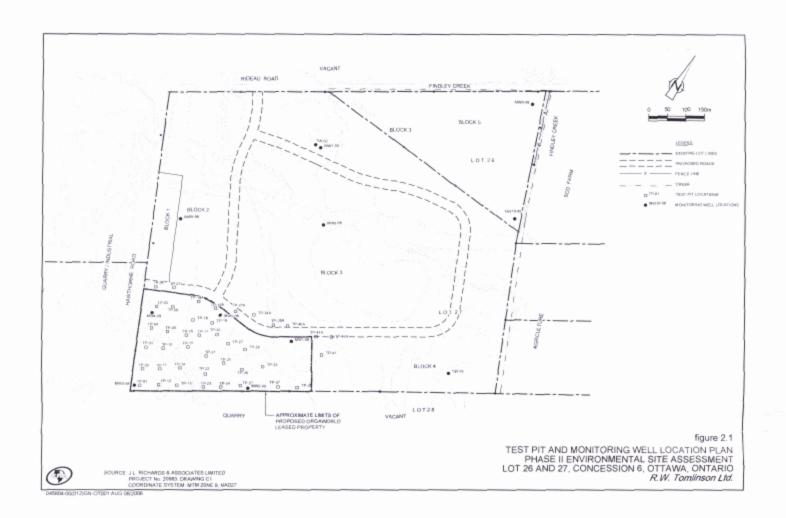
Regulation 903 Ontario Water Resources Act

of ____

Page

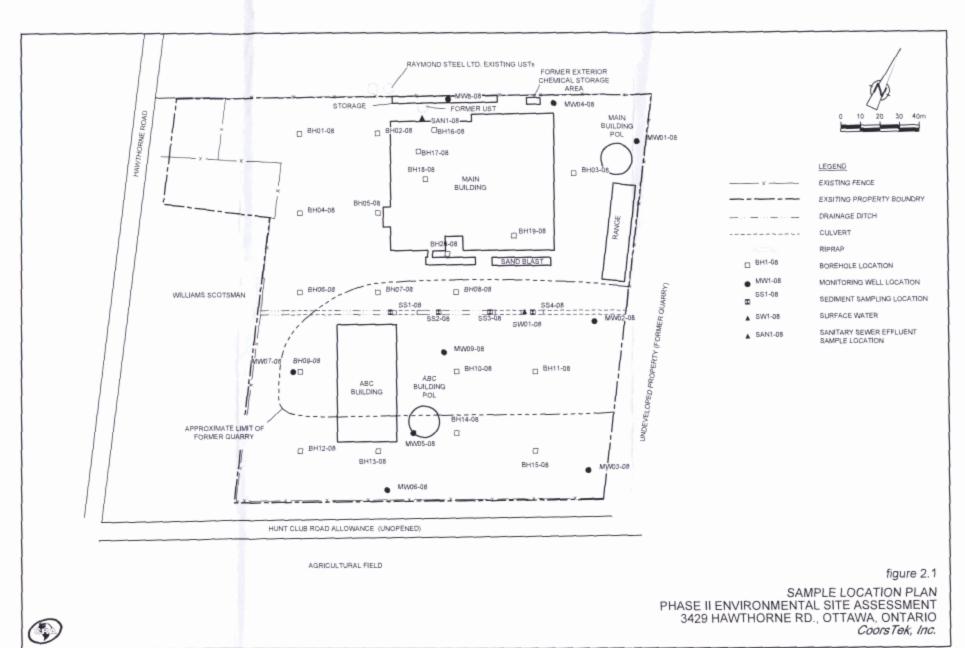
Property Owner's Information														Cc Pro		
Orgaworld Canada	Rostal Code	state "	Souk	son Envikenn as Tink. Address	Mail 55	ling Add	ress (Street No	o./Name, F	RR)		pality OHawa No. (inc. area	code)		Pro Sic		
ON4020	K 1 6	6 3 N		tomlinso	ne t	omlin	songroup	, com		6 1 3	3 8 2	9 1 8 6	7	'' r		
Cluster Well Information														Co upon request		
Address of Well Location (Street Number			Lot	127	oncession	n T	ownship			County	//District/Mun	icipality		Signature of Technician/Contr	actor	Date (yyyy/mm/dd)
Hawthothe Road at City/Town/Village	Kldeau Provin		stal Code		PS Unit N	fake N	fodel	Unit Mod	le of Opera	tion Unc	differentiated	☐ Averaged	\dashv			- 1
OHawa.	Onta	rio K	163	PM				☐ Differ	entiated, sp	ecify:				Deme Lan		2008/16/20
Well# UTM Coordinates on Sketch Zone Easting Northing		Full Depth of Hole (metres)	Hole Diameter (cm)	Method of Construction	Casing	Material	Casing Length (metres)	Screen Inte	erval (metres) To	Annular Space Sealant Used	Static Water Level (metres)	Abandonment Sealant Used		Comments		Date of Completion (yyyy/mm/dd)
MW8 194568315011	6712	7.97	20	HSA	PV	C.	1.5	1.5	2.97	Benjarte	1,3					2008/07/07
2.08 1945 67995011	6553	2.77	10	DiA			0.6	6.6	277		1.6		OVE	erburden from O	0 0.18	2008/07/08
308 184565335011	e411	17.37	10	DIA			2.13	2.13	17.37		13.2			11 4 0	10 0.30	2008/09
4.08 1845647145011	6604	2.84	10/20	HSA/MA			1.22	1.22	2.8		0.7					2008/07/08
5-08 18456598501	4675	2.77	20	HSA			1.5	1.5	2:77		1.0		- 3			2008/07/67
901 184566225015	7219	4.98	20	HSA			3.0	3.0	le.10		3.6		j.			2008/07/14
8-08 184566875011	7036	4.72	20	HSA			3.0	3.0	4.2		3.0					2008/07/15
908 18457 0865011	7625	3.66	20	HSA			1.5	1.5	3.0		1.7					2008/07/15
MW 184572045019	713103	2.90	20	HSA	4		1.37	1.37	2.90	4	1.6		1			2008/07/15
Well Contractor and Well Techn	nician Info	ormation							STATE OF					Date 1st Well in Cluster Constructe (yyyy/gmydd) 2008 07 07	d Date Last Well in	n Cluster Constructed
Business Name of Well Contractor	10	. 1	1	ness Address (S			1	^	Municipali			Province			20001	
Deorge Downing Esta Postal Code Business To	elephone No	o. (inc. area c	1+D, 4	/O Rue Well Contractor	's Licence	No. Bil	siness E-mail A	Address	Ville-	sur-la-k	louge	Qc_	-	Ministry Use Only Date Received (vvv/mm/dd)	Date Inspects	ed (yyyy/mm/dd)
JOV11808119	1/2/4		469	18	4/1				Xplor	of Technician	α			Date Received (yyyy/mm/dd) NOV 2 6 2008	Date mepodic	- 1777711111111111111111111111111111111
Name of Well Technician (First Name, Las	st Name)			Well Technician		No. Dat	e Submitted (y	yyg/mm/dd)	Signature	of Technician) .			Audit No. 01984	Remarks	207
Bruce Downing	}			0	1	5 6	008/10/2	-0	Du	ere D	en	7-		C 01304	m 02	nter for Ontario, 2006

Ministry's Copy



C-1844 mo2897 c01984

NOV 26 2008



053403-04(007)GN-OT001 AUG 20/2008

Ministry of the Environment

Measurements recorded in: X Metric Imperial

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

A 082844 ion 903 Ontario Water Resources Act A082844

Well Record

	Well Own	ner's Info		ant Nama (Omonization		HHHH		Email	Addense					
Manipulations (Street Number-Name)	First Name								E-mail /	Address					
Control Cont				me)											
Address of Well Locatine (Breek NumberName) Clourester Consequence Clourester Consequence	THE RESERVE OF THE PARTY OF THE	AND DESCRIPTION OF THE PARTY OF	Colonnad	e Road	CARREST SALES		Ottawa		Onta	rio	K2E 7J4		613 727	051	0
The PT flanchforne Road Concept/Dance/Marge Control/Polaric/Marge Control/Polaric/Marge Control/Polaric/Marge Control			on (Street Nu	mber/Name)		T	ownship	BBRDBB	auman	HEREN	Lot		Concession		
Octavision Contract Contrac							Glouces				27				
United Continue	The second secon													Postal	Code
Note				. N	orthina				ot Number				агто		
Security				Bar 15 17 11 19 9											
Solid Stones							rd (see instr	uctions on the	back of this fo	orm)					
Commercial Construction Record - Series Construction Recor	General C	olour	Most Comr	non Materia		Oth	er Materials	3		Gener	al Description				
Annular Space Type of Seasert Used Volume Placed	Brown		Soil St	ones						Packe	ed			0	4.26
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)	Grey &	White	Sandsto	ne						Very	Hard			4.26	29.86
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)															
Depth (set) at a (mill) Construction Construc															
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)															
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)															
Depth (set) at a (mill) Construction Construc															
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)															
Depth (set) at a (mill) Construction Construc															
Depth (set at currity) Type of Sealarn Used Volume Placed (milti)	Children and a		#3.450.00 page 10	Annulai	Cnace	1000000		1212511111111			anulta of Ma	II Vial	d Taating		
Canal	Depth Se	et at (m/ft)				DISTRIB	Volume	e Placed	After test of			-	-	R	ecovery
Add U Grouted Cement .21m	From	То		(Material ar	nd Type)		1				ee				
Method of Construction	6.40	0	Groute	d Cemen	t		.21m	13		10000	d dive reason:			(mmi)	(min)
Method of Construction									in pumping c	alacol till too	u, give reason.	Level			
Method of Construction												1	5.20	1	6.07
Method of Construction											v/ft)	2	5.57	2	5.68
Cable Tool Cab	Moth	had at Ca				Well He	22400000000				GPM)	3	5.78	3	5.46
Rotary (Conventional) Justing Developing Developi	-	G0 5 10 1 10 7 1 A 17 10		ПР	blic			Not used	2	27.3		4		4	
Double Display Displ	Rotary (0	Conventional) Detting	□ Do	mestic	☐ Municipa	al 🗆	Dewatering			nin.	5		5	
Industrial Other, specify Other, s		Revalajeir							-	Management					
Construction Record - Casing	Air percu			☐ Inc	dustrial	- cooming	d 7di Conditi	ormig	T III OII WOLLD'S		puriping friend	10	6.37	10	5.01
Depth (m/ft) Depth (m/ft) From To Depth (m/ft) Persister (Other, sp								If flowing given	ve rate (l/m	nin / GPM)	15	6.52	15	4.89
Construction Cons	Inside	100000000000000000000000000000000000000		NOT THE REAL PROPERTY.	The second second	(m/ft)			Bassmann	dad numan	double (m/fil)	20	6.60	20	4.81
Test Hold Recommended pump rate	Diameter	(Galvanize	ed, Fibreglass,	Thickness							deptii (mint)	25		25	
1.48									Recommen	ded pump	rate	30		30	Electric Name of the Control of the
Well Contractor and Well Technician Information Well Contractor Surfection Well Contractor Surfec	15.86	St	eel	.48	+.45	6.40		-							
Alteration (Construction Record - Screen											/ GPM)	40	6.81	40	4.65
Construction Record - Screen Country Coun							Alteration	on	Disinfected?	,		50	6.86	50	4.61
Construction Record - Screen Map of Well Location							Abando	oned,				60	6.89	60	4.58
Diameter (crevin) Water Details Water found at Depth Kind of Water: Fresh X Untested 9.14-(202), 193as Other, specify Water found at Depth Kind of Water: Fresh X Untested 9.14-(202), 193as Other, specify Water found at Depth Kind of Water: Fresh X Untested 0 6.40 15.86 18.28-20 Other, specify Water found at Depth Kind of Water: Fresh Untested (m/tt) Gas Other, specify Water found at Depth Kind of Water: Fresh Untested (m/tt) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor Capital Water Supply Ltd. Business Address (Street Number/Name) Municipality Stittsville Well contractor Date Submitted 2 0 1 0 5 2 7 Date Work Completed Vest No 1 0 5 2 5 Date Work Completed Vest No 2 0 1 0 5 2 5 Date Work Completed Vest No 2 0 1 0 5 2 5 Date Work Completed Received Presented Audit No. Received Audit No. Received Presented Audit No. Received Audit No. Received Audit No. Received Receive		Co	onstruction R	ecord - Scre	en	MINE								811,23	
Other, specify Other, specify				Slot No.					Please prov	ide a map l				ack.	2.47
Water found at Depth Kind of Water: Fresh Valuested Depth (m/tt) Diameter From To (cm/in) Diameter Depth Kind of Water: Fresh Valuested Depth Kind of Water: Fresh Untested Depth Kind of Water: Fresh Untested Depth Contractor Unitested Depth Contractor Unitested Diameter Depth Contractor Diameter Diameter Diameter Diameter Depth Contractor Diameter Depth Contractor Diameter Dia	(cm/in)	(Flasiic, Ga	Ivanized, Steel)		From	То					011000	ugh	,,,	7.0	_
Water found at Depth Kind of Water: Fresh Valuested Depth (m/tt) Diameter From To (cm/in) T							Other	snecify				i		Γ	1
Water found at Depth (m/ti) Diameter 9.14-(h2): 19as Other, specify Water found at Depth (m/ti) Diameter (cm/sin) Water found at Depth (m/ti) Diameter (cm/sin) Water found at Depth (m/ti) Diameter (cm/sin) 18.28/m2i 33as Other, specify Water found at Depth (m/ti) Gas Other, specify Water found at Depth (m/ti) Gas Other, specify Well Contractor and Well Technician Information Business Name of Well Contractor Well Contractor Well Contractor Well Contractor Supply Ltd. 1 5 5 8 Business Address (Street Number/Name) B	23							,,,,,	-		HAWT	HOR	NE		-
9.14—(m/t) 19Gas Other, specify		ASSESSED TO						_			//				
Water found at Depth Kind of Water: Fresh X Intested 15.86 18.28 m2tl 32as Other, specify O 6.40 29.86 15.23 Other, specify Well Contractor and Well Technician Information Well Contractor's Licence No. Capital Water Supply Ltd. 1 5 5 8 Business Address (Street Number/Name) Stittsville Province Postal Code Business E-mail Address Office Capital water .ca Bus. Telephone No. (Inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician and/or Contractor Date Submitted O 9 7 Well owner's information Date Work Completed Yes X No Yes X Yes X No X Yes X					X Untested		The second secon								
18.28m2il 33as					¥ VIntested	0	6.40	15.86	03	F	V				
Well Contractor and Well Technician Information Business Name of Well Contractor Capital Water Supply Ltd. Business Address (Street Number/Name) Business Address (Street Number/Name) Municipality Stittsville Province Ontario KI2S 1A6 office capitalwater.ca Bus. Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well owner's information package delivered information Well owner's information package delivered information package delivered Yes Well owner's Date Package Delivered information package delivered information package delivered Yes Well owner's Date Package Delivered information package delivered information package delivered Yes No 9 7 Date Work Completed Yes X No 2 0 1 0 0 5 2 5 Received					ALII.				1		14				
Well Contractor and Well Technician Information Business Name of Well Contractor Capital Water Supply Ltd. Business Address (Street Number/Name) Business Address (Street Number/Name) Business Address (Street Number/Name) Province Province Postal Code Business E-mail Address Ontario K2S 1A6 Office apitalwater.ca Bus.Telephone No. (inc. area code) Miller, Stephen Well owner's information package delivered infor					Untested	0.40	29.00	13.23	3						
Business Name of Well Contractor Capital Water Supply Ltd. Business Address (Street Number/Name) Business Address (Street Number/Name) Box 490 Province Ontario K2S 1A6 Office Capital Water.ca Bus. Telephone No. (Inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted O 0 9 7 O 1 0 0 5 2 5 Well owner's information package delivered celevered celevere	(m								3						
Capital Water Supply Ltd. Business Address (Street Number/Name) Box 490 Province Ontario K2S 1A6 Office capital water ca Bus. Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Well owner's information package delivered Well owner's information package delivered Well owner's information package delivered 2 0 1 0 0 5 2 7 Date Work Completed Yes X No 2 0 1 0 0 5 2 5 Received	Business Na			or and Well	Technicia			Licence No.	1						
Business Address (Street Number/Name) Box 490 Province Postal Code Ontario K2S 1A6 Office capitalwater.ca Bus. Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted 0 0 9 7 Well owner's information package delivered delivered 2 0 1 0 0 5 2 7 Date Work Completed Yes X No 2 0 1 0 0 5 2 5 Received							1 5	5 8							
Province Postal Code Business E-mail Address Ontario K2S 1A6 office@capitalwater.ca Bus.Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted O O 9 7 Date Work Completed Yes X No 2 O 1 O 0 5 2 5 Received AUG 0 4 2010			et Number/Na	me)					Comments:						
Ontario K2S 1A6 office capitalwater.ca Bus.Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted 0 0 9 7 Date Work Completed X No 2 0 1 0 0 5 2 5 AUG 0 4 2010	The second second		netal Code	Rusiness	E-mell Add	-	iittsvi	lle							
Bus.Telephone No. (inc. area code) Name of Well Technician (Last Name, First Name) 613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted 0 0 9 7 Date Work Completed 2 0 1 0 0 5 2 7 Name of Well Technician (Last Name, First Name) Date Work Completed 2 0 1 0 0 5 2 7 Audit No. 2 10 1832							tor -		Well owner's	s Date Pa	ckage Delivere	d	Minist	ry Use	Only
613 836 1766 Miller, Stephen Well Technician's Licence No. Signature of Technician and/or Contractor Date Submitted 0 0 9 7 Date Work Completed 2 0 1 0 0 5 2 8 2 0 1 0 0 5 2 5 Received	Bus.Telepho	one No. (inc.		me of Well 1	echnician (l	ast Name, F	irst Name)		information					104	
0 0 9 7 Myllin 2 0 1 0 0 5 2 8 X No 2 0 1 0 0 5 2 5 Received 0 4 2010			No Ol	liller,	Stephe	n			delivered		The state of the s	- D	4 -	LUI	.832
20100525			_ ///	of Technicia	in and/or Co	MITCHEST 27/7		015 210		2/0/	10000	2 5	AUG	04	2010
			1	your		2				20	1005	2 5	© Queen's	Printer for	r Ontario, 2007

Ontario 😚	Ministry of the Environment, Conservation and Parks	_w Tag	g#:A29528	0 rint Below)	7	M	<i>l</i> ell R	ecord
	- <i>I</i>		A295280		Regulation 9	93 Ontario W a Page		ources Act of
Measurements records Well Owner's Infor	7		Salaran in S			Fage		<u> </u>
First Name	Last Name/Organization	15 12	100 101	E-mail Address	ng Hear and a suite and a	1	_	onstructed II Owner
Mailing Address (Street	Number/Name)	40~ ()	LOC //	Proyince	Postal Code	Telephone		
#5255	Albert Millich	1amp	Saint-Hul	oest W	ebec <	7 34 B	<u> </u>	
Well Location Address of Well Location	n (Street Number/Name)	Tov	wnship		Lot	Concession	n	
5123 Hawth		Cit	y/Town/Village	oucester	· Ø7	rovince	Postal	Code
Ottawa Ca	rleton		OF	taub		Ontario Other		
UTM Coordinates Zone NAD 8 3 1	Eastling Northing \$ 457054 5016	'	inicipal Plan and Sublot 4m-1388	Part 2-3-4	-/4R-32	980 B	ock	<u>a</u>
Overburden and Bed	rock Materials/Abandonment Se	aling Record			neral Description			h (n (ft))
General Colour	Most Common Material	lay	Gravel		TOTAL DOSGITPHON		From _	15 .
Grey		·					15 /	80.
Grey & White_	Limestone Sandstone						80 /	83 (
Grey & White	Sandstone						_ 83 ′	116
Grey & White	Sandstone						118	122
							<u>. </u>	
		·						
				· · · · · · · · · · · · · · · · · · ·				
	Annular Space					Yield Testing		
Depth Set at (m.n.) From To	Type of Sealant Used (Material and Type)		Volume Placed (m (ft³))	After test of well yiel		Draw Down Time Water Le		ecovery Water Level
41 / 31 /	Neat cement		18.7	Other, specify	Not tested	(min) (m/ft)	(min)	(m/ft)
31 ′ 0 ′	Bentonite slurry		16.8	If pumping discontin	ided, give reason.	evel 26.5	4	33.5
		_		Pump intake set at ((nQ T)	28	8 2	<u> 26.5</u>
				100		30	.5	<u>26.5</u>
Selection of the select	nstruction	drawn real and the state of the	iol Disturced	Pumping rate (I/min			8	<u>26.5</u>
Cable Tool Rotary (Conventional)		☐ Commerci	Dewatering	Duration of pumping	min	⁷ 31 31 31		<u>26.5</u>
☐ Rotary (Reverse) ☐ Bering	☐ Driving ☐ Livestock ☐ Digging ☐ Irrigation	☐ Test Hole ☐ Cooling &	☐ Monitoring ☐ Air Conditioning	Final water level en	h IL	10 31	10	<u>26.5</u> 26.5
Air percussion Other, specify	☐ Industrial ☐ Other, specify			33.5 "	/min/GPM)	15 32	45	26.5
Cor	nstruction Record - Casing		Status of Well			20 32	20	26.5
Diameter (Galvanize	e OR Material Wall Dept d, Fibreglass, Thickness Plastic, Steel) (cm/fb) From	th (mMD) To	Water Supply Replacement Well	Recommended pur	DO (25 32	05	26.5
7 14 11	4	447	☐ Test Hole ☐ Recharge Well	Recommended pur		30 33	20	26.5
/ n	188 +2'	122	☐ Dewatering Well ☐ Observation and/or	20 Well production (\(\frac{1}{2} \)	in/GPM)	40 33	40	26.5
6" <u>Open</u>	HOIE 41	122	Monitoring Hole Alteration	Disintected?		50 33	.5 50	26,5
		-	☐ Abandoned,	Yes No_		60 33	.5 × 60	26.5°
<u> </u>	nstruction Record - Screen		Insufficient Supply Abandoned, Poor		Map of We			
	aterial Dept Ivanized, Steel) Slot No. From	th (m/ft) To	Water Quality Abandoned, other,	Flease provide a r	nap below lollowing	y mad dedonia a	(€n)
(GIBIT)			specify ——————		1			4 pet
		>	Other, specify			1	,	,51,
131125026 30 300 400 1000 1000 1000	Water Details			业C	5123 HORNE	1 150 F	-WW	
Water found at Depth 83_(m /f 0) ☐ Gas	Kind of Water: Fresh Untested	d Depth From	(m/ff) Diameter To (cm/iff)	Fin .	ONE	2		
Water found at Depth	Kind of Water: Fresh 14Untested	<u></u>	0 / 41 /9/4	HWT	ton	150F	•	KV)
116 (m/t) Gas Water found at Depth	Other, specify	<u>. </u>	11 122 6"	K	DAT)	1	f	
(m/ft) ☐ Gas		-				-	PKN	
Business Name of Wel	ell Contractor and Well Technica Contractor		on I Contractor's Licence No.			1		
Air Rock Drilli	ng Co. Ltd.	Min	7681	Comments:	<u></u>			
Business Address (Stre 6659 Franktov		MUI	nicipality Ri chmond	3/1 10	14/20NA	Sale	210)DAQ
	ostal Code Business E-mail Ad	idress ock@symp	ation ca		re Package Delivered	Min Min	iismy Us	e Only
Bus.Telephone No. (inc.	area code) Name of Well Technician	ا (Last Name, ا	First Name)	information package Y	Y DADA M MA	Audit No	· z 34	4019
8138382170 Well Technician's Licence	Hogan, Dan No. Signature of Technician and/or C	ontractor Dat	e Submitted	00 m 00 m	te Work Completed	- San 1967 (7.5)	T 302	020
<u></u>	Janux B-	Y	A KHAH MAND DID	No Y	^ khkh M Wg	Receive	<u> </u>	
0506E (2020/06) © Quee	n's Printer for Ontario, 2020		Ministry's Copy					

_ I I Noguitate	n 903 (_		Record
Measurements recorded in: Metric Maperial A295342		Pag		_ of
Well Owner's Information First Name Last Name/Organization E-mail Address				
Paul Lalonde Holdings Inc		ļ.	by V	Constructed Veil Owner
Mailing Address (Street Number/Name) Municipality Province Postal Code 5146 Bank Street On K1)	e (1 G 8	1	No. (ind	c. area code)
Well Location	<u> </u>	<u> </u>		
Address of Well Location (Street Number/Name) Township Lot 5123 Hawthorne Road Gloucester 27		Concessi 6	n	
County/District/Municipality City/Town/Village	Provi		Post	al Code
Ottawa Carleton Ottawa UTM Coordinates Zone Easting Northing Municipal Plan and Sublot Number	Other			
NAD 8 3 18 456956 5016788 4M-1388 Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)	P	arts 2.	3.4	and the second
General Colour Most Common Material Other Materials General Description	n		De From	pth (r
Sandy Till of Boulders			0′	6 (
Grey Limestone			6′	45′
Grey & White Sandstone			45	<u> 60 ′</u>
Grey & White Sandstone Grey & White Sandstone			60	
Grey & White Sandstone			96 153	
				100
		-		
Annular Space Results of V Depth Set at (mm) Type of Sealant Used Volume Placed After test of well yield, water was:	I C	eld Testing	an deliberation of	Recovery
From To (Material and Type) (m (1) Clear and sand free	Time	Water Lev	el Time	
40 ′ 30 ′ Neat cement 9.36 ☐ Other, specify Not test 30 ′ 0 ′ Bentonite slurry 16.8 ☐ If pumping discontinued, give reason	_ Static	باحدا	(min)	32.8 "
30 ' 0 ' Bentonite slurry 16.8	Level 1	29	1	29
Pump intake set at (notice)	1 2	29.	2 2	27.5
140	3	29.	-	27.5
Method of Construction. Welf Use Cable Tool Diamond D	3 4	_	3 3	27.5 27.5
Method of Construction Well Use 20		29.	3 3	
Method of Construction Welf-Use 20 Duration of pumping D	5	29.	3 3 4 4 5 5	27.5
Method of Construction Welf-Use 20	5	29. 29.	3 3 4 4 5 5 1 10	27.5 27.5
Method of Construction Wejl*Use 20	5 10	29. 29. 29. 30.	3 3 4 4 5 5 1 10 5 15	27.5 27.5 27.5
Cable Tool	4 5 10 15	29. 29. 29. 30.	3 3 4 4 5 5 1 10 5 15	27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20	29 29 29 30 30 30	3 3 4 4 5 5 1 10 5 15 8 20 25	27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25	29. 29. 30. 30. 30.	3 3 4 4 5 5 1 10 5 15 8 20 25 3 30	27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30	29 29 30 30 30 31 31	3 3 4 4 4 5 5 1 10 5 15 8 20 25 3 30 9 40	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Public Commercial Not used Duration of pumping rate (I/min Pumping rate (4 5 10 15 20 25 30 40	29. 29. 30. 30. 31. 31.	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Well Use 20 Duration of pumping rate (l/min PM) 20 Duration of pumping 20 Duration of pumping Not used Dewatering Not used Dewatering Not yestock Test Hole Monitoring Not yestock Test Hole Not yestock Test Hole Monitoring Not yestock Test Hole Not yestock Not ye	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 "60	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 "60	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 "60	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Diamond Public Commercial Not used Dewatering Rotary (Conventional) Jetting Diamond Dewatering Dewatering Diamond Diamond Dewatering Dewatering Dewatering Industrial Dewatering Industrial Other, specify Depth (mt) Tisk Hole Monitoring Malerial Other, specify Tisk Hole Monitoring Material Other, specify Tisk Hole Monitoring Material Malerial Depth (mt) Dewatering Malerial Dewatering Dewatering Malerial Dewatering Malerial Depth (mt) Depth (mt) Depth (mt) Malerial Dewatering Malerial Dewatering Malerial Dewatering	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Diamond Public Commercial Not used Dewatering Rotary (Conventional) Jetting Diamond Dewatering Dewatering Diamond Diamond Dewatering Dewatering Dewatering Industrial Dewatering Industrial Other, specify Depth (mt) Tisk Hole Monitoring Malerial Other, specify Tisk Hole Monitoring Material Other, specify Tisk Hole Monitoring Material Malerial Depth (mt) Dewatering Malerial Dewatering Dewatering Malerial Dewatering Malerial Depth (mt) Depth (mt) Depth (mt) Malerial Dewatering Malerial Dewatering Malerial Dewatering	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Diamond Public Commercial Not used Dewatering Rotary (Conventional) Jetting Diamond Dewatering Dewatering Diamond Diamond Dewatering Dewatering Dewatering Industrial Dewatering Industrial Other, specify Depth (mt) Tisk Hole Monitoring Malerial Other, specify Tisk Hole Monitoring Material Other, specify Tisk Hole Monitoring Material Malerial Depth (mt) Dewatering Malerial Dewatering Dewatering Malerial Dewatering Malerial Depth (mt) Depth (mt) Depth (mt) Malerial Dewatering Malerial Dewatering Malerial Dewatering	4 5 10 15 20 25 30 40 50 60	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 60 60 Cell Locaring instr	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 60 60 Cell Locaring instr	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method: of Construction	4 5 10 15 20 25 30 40 60 60 Cell Locaring instr	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method: of Construction:	4 5 10 15 20 25 30 40 60 60 Cell Locaring instr	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Public Commercial Not used Rotary (Conventional) Jetting Rotary (Reverse) Driving Livestock Test Hole Monitoring Infastrial Not used Monitoring Depting Digging Infastrial Notice Monitoring Infastrial Notice Monitoring Infastrial Notice Monitoring Infastrial Notice Monitoring Infastrial Notice No	4 5 10 15 20 25 30 40 60 60 Cell Locaring instr	29 29 30 30 30 31 31 31 32 32 cation	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Diamond Public Commercial Not used Notary (Reverse) Dirthing Diamond Conference Method Notary (Reverse) Dirthing Dir	4 5 10 15 20 25 30 40 60 60 Cett Localing instr	29 29 30 30 30 31 31 31 32 32 cation ructions on	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 760	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 60 60 Cell Locating instr	29 29 30 30 31 31 31 32 32 cation ructions on	3 3 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 60 The back	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction Public Ornmercial Not used Owners	4 5 10 15 20 25 30 40 60 60 60 fing instr	29 29 30 30 31 31 31 32 32 cation ructions on	3 3 4 4 5 5 5 1 10 5 15 8 20 25 3 30 9 40 3 50 3 60 The back	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5
Method of Construction	4 5 10 15 20 25 30 40 60 60 60 60 60 60 60 60 60 60 60 60 60	29 29 30 30 30 31 31 31 32 32 cation ructions on	3 3 4 4 4 5 5 5 1 10 5 15 8 20 25 3 30 40 3 50 3 60 The back	27.5 27.5 27.5 27.5 27.5 27.5 27.5 27.5



Ministry of the Environment, Conservation and Parks

3326

Well Record for Well Cluster - Part 1 of 3

(Only for Multiple Test Holes or Dewatering Wells)

													Well T	-	f Deepest	Well: ((Print We	II Tag No	·	Dew	_	wells		R	egulatio	n 903 On	tario '	Water Resour	ces Act	,
All meas	ureme	ents r	ecol	rded	d in:	×	Met	ric	Im	peria	al		Well N	A 2° o. on Dra	₹0 2.2 I awing of De	epest \	Well:	w o = 0		Test								Dawa	÷/_	-s. f
Follow ins	orania and a	one o constant						his fo	orm.	Pri	int or Type	#2010 (SEA						104-4		No. of v	velis rep	orted 3							alaki (Arifani) arang arang arang arang	e an escribiciones antis d'altre apres es es es es
Well Clu	130 C. C. C.	36. 15.	3545					Nam	e(s) RF	⊋ if :	available)	Lot(s)		Conces	eion(s)	Geogra	phic Tow	mshin			County	/District/Upper	Tier M	lunicinality	37/307-27		STAND THE SERVE	ments/Additio	Section to the contraction	periodical de la propieta de la contraction de l
											-	Long		0011000	.o.o.n(o)	Coogic	ipilio lovi	Потпр			Ocarry	- В юм юм с ppo	1101 11	iernorpanty		7		nsent Form must ig of All Well Loca		
300 SoMME City, Town					IOE	יוק.	10 F	u (P IV)	THORA	υ€/{	OAD	Provinc		CRCII	nit Make	Model		Linit Me	ode of Or	ocration			5	7 .		- the person c	onstruc	ting the well, will p	romptly subm	it to the
Jily, IOWI												Onta									_	Undifferentlat	ted []	X Averaged				any additional infot well in the well clu		
		1T F	₹V√	T.					_					GARI	M (M)	Ετρ	£Χ	ווט 🔲 טוז	rerentiate	ed, speci	ry:					P			2021	10 122
Well De	ails												- 		Casing	_				l	_				(Section 18)		$\overline{}$	an/Contractor		y/mm/dd)
Well# on				UT	M C	oordii	nates				Hole Depth	Hole Diamele		hod of truction	Material; Diameter		sing n/ft)		Interval /ft)	Annui	ar Space (m/ft)	Material		Abandor		den/Bedroc ng Material I		ls (m/ft)	Static Water	Date of Completion
rawing Z	one	East	ing ——			No	rthing	3			(m/ft)	(cm/in)		(cm/in)	From	То	From	То	From	То	Material:			.~ 7				Level (m/ft)	(yyyy/mm/dd
109	(8	415	6	6	[9]	7 5	0	1 ₁ 7	1015	2	6.1	20.3	H	SA	5.08	0.1	3.05	3,05	6.1	0,25	2.44	BENTONITE	Sua Fe	0 - 4, LL W. SANOI		avel/Deb	AIS,	~26.1 Tiu	1-465	2021/10/05
110												20.3	н	SA	5,08	0,1	2.9	Ì	4,42			BENTONITE	ı	•	tt .	.,		У	1,681	2021/10/05
111	_					_				ľ		- <u>-</u> -			5.08		2.13		3.66		. 20 2		-	- У	LI.	LI		įΙ	1.041	2021/10/05
111	<u> </u>	را>	Ψ	0	<u> </u>	<u> </u>	0	<u>' </u>		(٥.٠	20,3	H	5A	7.55	0,1	7.17	7.''	3.40	0,0,	1."	BENTONITÉ							1.	2021/10/03
	Щ	\perp										ļ	-							ļ										
										1							ĺ													
		1	ı		l I		1 1	ı																						
	. 1			<u> </u>		1																								
_	<u> </u>		<u> </u>			<u> </u>	Ш.						+																 	
_	Щ					<u> </u>																							<u> </u>	-
	ı l	ı	1	i I	1		I I	ı		,																				
Nell Co	ntra	ctor	an	d V	Vell	Tec	hnic	ian	Infora	nati	on						<u> </u>					Cluster Cons	tructed	Date Last V				e Only		
Business		A	mall suces	100		A Terramental			The second of the second	N. S.	电影 医多种性 医多种性	Street Nu	nber/Name	, RR)	Municipalit	у		Pro	vince	or Aban	idoned (y	yyy/mm/dd)		Completed	(yyyy/mm/	^(dd) Date	£ 18.00 Cm	ed (yyyy/mm/dd)		2001
TEORGE		אואפ									UE PRIN			GREA	VILLETSU	2- LA-1	Ro U 6-E	. 6	я <u>с</u>		CALADO ANCA ANCA MERCIN	1/40/05		2021 /	10/05		1,17 19,100	OV 0 8 2021	U 3	3081
ostal Co Juliani		Q 1.				-	e No.						Busines								bando.	nment ning the Wells	2-			Comr	nents:			
lame of ۸ ماسی	' Vell Te	ارد	~ cian ((Fire	t Na	- ٦ Δ^ πe, L	<i>ن کا</i> ast N	ə I ame)) Well 1	t Tech	njelan's Li	cence No.	Signatu	ye of well	e ब्रेटिश्या Technician	Date	Submit	_ <u>(</u>	n /mm/dd)	Name of	, walled									

2021/10/22

STEPHEN DOWNING



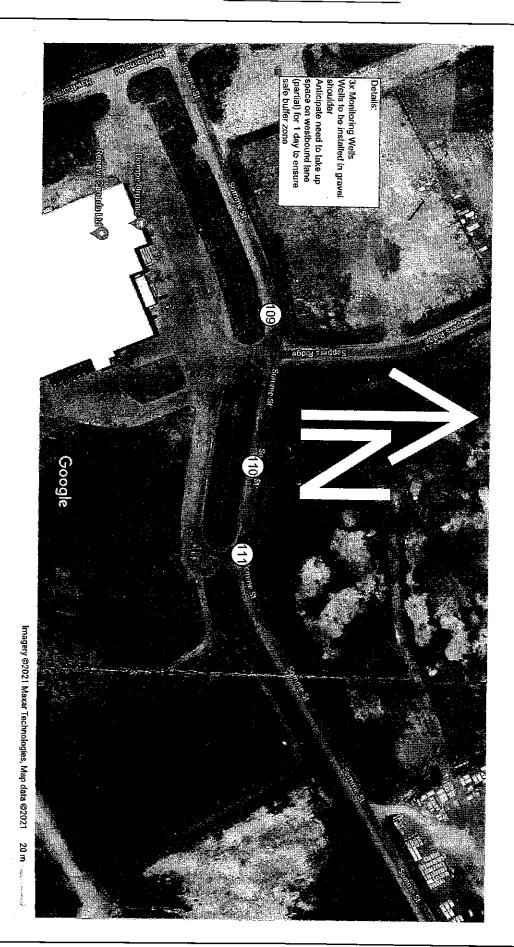
Well Record for Well Cluster - Part 3 of 3 Detailed Drawing of All Well Locations

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: # A290221

"Well Record for Well Cluster" Form Audit Number: # ____ < 5308)





Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS: 4259100

WORK REQUEST : 100341628 Report Date : 2025-03-11

Paterson Group 9 Auriga Dr Nepean, Ontario

K2E 7T9

Attention: Alex Schopf

Reception Date: 2025-03-05
Project: PH4991
Sampler: NA
PO Number: 62526
Temperature: 9 °C

Analysis	Quantity	External Method
Alkalinity (Water, Automated)	2	Modified from SM 2320 B
Ammonia, Total (Water, Colorimetry)	2	Modified from EPA 350.1
Base Neutrals (Water, GC/MS)	1	Modified from EPA 8270
Chloride (Water, IC)	2	Modified from SM 4110 B and C
Colour, Apparent (Water, Spectrophotometry)	3	Modified from SM 2120 C
Conductivity (Water, Automated)	2	Modified from SM 2510 B
DOC (Water, IR)	2	Modified from SM 5310 B
Escherichia coli (DC Plate)	2	Modified from MECP E3407
Fluoride (Water, Auto/ISE)	2	Modified from SM 4500-F A and 4500-F C
Hardness (Water, Calculation Only)	2	SM 2340 B
Ion Balance (Water, Calculation)	2	Modified from SM1030 E
Metals Scan (Water, ICP/MS)	3	Modified from EPA 200.8
Metals Scan (Water, ICP/OES)	3	Modified from SM 3120 B
Nitrate (Water, IC)	2	Modified from SM 4110 B and C
Nitrite (Water, IC)	2	Modified from SM 4110 B and C
PAH (Water, GC/MS)	1	Modified from EPA 8270
pH (25°C) (Water, Automated)	2	Modified from SM 4500-H+ B
Phenolics (Water, GC/MS)	1	Modified from EPA 8270
Phenols (Water, Colorimetry)	2	Modified from EPA 420.2
Sulphate (Water, IC)	2	Modified from SM 4110 B and C
Sulphide (Water, Colorimetry)	2	Modified from SM 4500-S2 D
Tannin and Lignin (Water, Spec)	2	Modified from SM 5550 B
TDS (Estimated)	2	Modified from SM 2510 A
Total Coliforms (DC Plate)	2	Modified from MECP E3407
Total Kjeldahl Nitrogen (Water, Colorimetry)	2	Modified from EPA 351.2
Turbidity (Water, Turbidimeter)	3	Modified from SM 2130 B
VOCs (Water, GC/MS)	1	Modified from EPA 8260

Criteria:

A: Ontario Regulation 169/03 (Non-Regulated Drinking Water)

Sample status upon receipt :

8408304 8408306 8408308

Compliant

Certificate Comments:

8408304 8408306

N-NO2 and N-NO3 MRL increased due to matrix interference.

Notes:

- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.
- Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear
 on the scope of accreditation. The scope is available at https://directory.cala.ca/
- Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Legend:



Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

RL : Reporting limit N/A : Not applicable * : Analysis conducted by external subcontracting QC : Reference material (QC) 1 : Results in annex ^ : Analysis not accredited

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client: Paterson Group

Project: PH4991 Reception Date: 2025-03-05

Eurofins	Client Sample	Austra	D	11-24-		Exceeded Cr	iteria
Sample No	Identification	Analyte	Result	Units	Α	В	С
Alkalinity (Wa	ter, Automated)						
8408304	TW1 - GW1	Alkalinity (as CaCO3)	578	mg/L	500		
8408306	TW1 - GW2	Alkalinity (as CaCO3)	570	mg/L	500		
Colour, Appar	ent (Water, Spectrophoto	ometry)					
8408304	TW1 - GW1	Colour (Apparent)	97	TCU	5		
8408306	TW1 - GW2	Colour (Apparent)	86	TCU	5		
8408308	TW1 - GW3	Colour (Apparent)	116	TCU	5		
DOC (Water, IF	₹)						
8408304	TW1 - GW1	Dissolved Organic Carbon	7.7	mg/L	5		
8408306	TW1 - GW2	Dissolved Organic Carbon	7.2	mg/L	5		
Hardness (Wa	ter, Calculation Only)						
8408304	TW1 - GW1	Hardness as CaCO3 (Calculation)	708	mg/L	80-100		
8408306	TW1 - GW2	Hardness as CaCO3 (Calculation)	704	mg/L	80-100		
Metals Scan (\	Water, ICP/MS)						
8408304	TW1 - GW1	Iron	2.22	mg/L	0.3		
8408306	TW1 - GW2	Iron	2.19	mg/L	0.3		
8408308	TW1 - GW3	Iron	2.29	mg/L	0.3		
8408304	TW1 - GW1	Manganese	2.89	mg/L	0.05		
8408306	TW1 - GW2	Manganese	2.87	mg/L	0.05		
8408308	TW1 - GW3	Manganese	2.89	mg/L	0.05		
TDS (Estimate	ed)						
8408304	TW1 - GW1	TDS (Estimated)^	995	mg/L	500		
8408306	TW1 - GW2	TDS (Estimated)^	993	mg/L	500		
Total Coliform	s (DC Plate)						
8408304	TW1 - GW1	Total Coliforms (DC)	4	CFU/100mL	0		
8408306	TW1 - GW2	Total Coliforms (DC)	3	CFU/100mL	0		
Turbidity (Wat	er, Turbidimeter)						
8408304	TW1 - GW1	Turbidity	16.4	NTU	5		
8408306	TW1 - GW2	Turbidity	17.0	NTU	5		
8408308	TW1 - GW3	Turbidity	18.3	NTU	5		



Environment Testing

146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

Project: PH4991 Reception Date: 2025-03-05

			E	Eurofi	ns Sample No :	8408304	8408306		
					Matrix:	Groundwater	Groundwater		
				;	Sampling Date :	2025-03-04	2025-03-04		
			Client S		e Identification :	TW1 - GW1	TW1 - GW2		
Anions			Ollotti O	Crit			3112		
Autono	RL	Unit	А		3 C				
Chloride	0.5	mg/L	250			116	115		
Nitrate (as Nitrogen)	0.1	mg/L	10.0			<0.5	<0.5		
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.5	<0.5		
Sulphate	1	mg/L	500			185	186		
	Curofino (Comple No.	0.40000		0.400000				
	Euroiiris	Sample No :	840830		8408306 Craundwater				
	_	Matrix :			Groundwater				
		pling Date :	2025-03-	04	2025-03-04				
Clie	nt Sample Id	entification :	TW1 - GV	N1	TW1 - GW2				
Calculations	RL	Unit							
Ion Balance (Calculation)^	0.1		1.01		1.02				
				Eurofi	ns Sample No :	8408304	8408306	8408308	
			E	Eurofi	ns Sample No :			8408308 Groundwater	
			E		Matrix :	Groundwater	Groundwater	Groundwater	
				;	Matrix : Sampling Date :	Groundwater 2025-03-04	Groundwater 2025-03-04	Groundwater 2025-03-04	
Consent Chamistre				ampl	Matrix : Sampling Date : e Identification :	Groundwater	Groundwater	Groundwater	
General Chemistry	RI	Unit	Client S	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04	Groundwater 2025-03-04	Groundwater 2025-03-04	
•	RL	Unit	Client S	ampl Crit	Matrix : Sampling Date : e Identification :	Groundwater 2025-03-04 TW1 - GW1	Groundwater 2025-03-04 TW1 - GW2	Groundwater 2025-03-04	
Alkalinity (as CaCO3)	5	mg/L	Client S A 500	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1	Groundwater 2025-03-04 TW1 - GW2	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent)	5 2	mg/L TCU	Client S	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97	Groundwater 2025-03-04 TW1 - GW2 570 86	Groundwater 2025-03-04	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C	5 2 5	mg/L TCU μS/cm	Client S A 500 5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530	Groundwater 2025-03-04 TW1 - GW2 570 86 1530	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon	5 2 5 0.5	mg/L TCU μS/cm mg/L	Client S A 500 5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97	Groundwater 2025-03-04 TW1 - GW2 570 86	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride	5 2 5 0.5 0.1	mg/L TCU μS/cm mg/L mg/L	Client S A 500 5 1.5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride Hardness as CaCO3 (Calculation)	5 2 5 0.5 0.1	mg/L TCU μS/cm mg/L	Client S A 500 5 1.5 80-100	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7 0.16	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2 0.18	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride Hardness as CaCO3 (Calculation) pH @ 25°C	5 2 5 0.5 0.1 1	mg/L TCU μS/cm mg/L mg/L	Client S A 500 5 1.5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7 0.16 708	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2 0.18 704	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride Hardness as CaCO3 (Calculation) pH @ 25°C Phenols-4AAP	5 2 5 0.5 0.1 1 1 0.001	mg/L TCU μS/cm mg/L mg/L mg/L	Client S A 500 5 1.5 80-100	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7 0.16 708 7.91	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2 0.18 704 7.72	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride Hardness as CaCO3 (Calculation) pH @ 25°C	5 2 5 0.5 0.1 1	mg/L TCU μS/cm mg/L mg/L mg/L mg/L	Client S A 500 5 1.5 80-100 6.5-8.5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7 0.16 708 7.91 <0.001	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2 0.18 704 7.72 <0.001	Groundwater 2025-03-04 TW1 - GW3	
Alkalinity (as CaCO3) Colour (Apparent) Conductivity @ 25°C Dissolved Organic Carbon Fluoride Hardness as CaCO3 (Calculation) pH @ 25°C Phenols-4AAP Sulphide (S2-)	5 2 5 0.5 0.1 1 1 0.001	mg/L TCU μS/cm mg/L mg/L mg/L	Client S A 500 5 1.5 80-100 6.5-8.5	ampl Crit	Matrix : Sampling Date : e Identification : eria	Groundwater 2025-03-04 TW1 - GW1 578 97 1530 7.7 0.16 708 7.91 <0.001 <0.01	Groundwater 2025-03-04 TW1 - GW2 570 86 1530 7.2 0.18 704 7.72 <0.001 <0.01	Groundwater 2025-03-04 TW1 - GW3	



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

				Eurofins Sa	ample No :	8408304	8408306	8408308	
					Matrix:	Groundwater	Groundwater	Groundwater	
				Samp	ling Date :	2025-03-04	2025-03-04	2025-03-04	
			Client	Sample Ider	-	TW1 - GW1	TW1 - GW2	TW1 - GW3	
Metals			Ciletit		iuncation .	TWT-GWT	1W1-GW2	1001 - 0003	
Wetais	DI.	I I mis	_	Criteria В	С				
	RL	Unit	Α] 6	C				
Metals Scan (Water, ICP/MS)									
Aluminum	0.01	mg/L	0.1			0.07	0.03	0.03	
Antimony	0.0005	mg/L	0.006			<0.0005	<0.0005	<0.0005	
Arsenic	0.001	mg/L	0.01			<0.001	<0.001	<0.001	
Barium	0.001	mg/L	1			0.219	0.212	0.214	
Beryllium	0.0005	mg/L				<0.0005	<0.0005	<0.0005	
Boron	0.01	mg/L	5			0.10	0.11	0.11	
Cadmium	0.0001	mg/L	0.005			<0.0001	<0.0001	<0.0001	
Chromium	0.001	mg/L	0.05			<0.001	<0.001	<0.001	
Cobalt	0.0002	mg/L				0.0002	0.0002	<0.0002	
Copper	0.001	mg/L	1			<0.001	<0.001	<0.001	
Iron	0.03	mg/L	0.3			2.22	2.19	2.29	
Lead	0.001	mg/L	0.01			<0.001	<0.001	<0.001	
Manganese	0.01	mg/L	0.05			2.89	2.87	2.89	
Mercury	0.0001	mg/L	0.001			<0.0001	<0.0001	<0.0001	
Molybdenum	0.005	mg/L				0.010	0.010	0.009	
Nickel	0.005	mg/L				<0.005	<0.005	<0.005	
Selenium	0.001	mg/L	0.05			<0.001	<0.001	<0.001	
Silicon	0.1	mg/L						6.5	
Silver	0.0001	mg/L				<0.0001	<0.0001	<0.0001	
Strontium	0.001	mg/L				4.50	4.56	4.62	
Thallium	0.0001	mg/L				<0.0001	<0.0001	<0.0001	
Titanium	0.01	mg/L						<0.01	
Uranium	0.001	mg/L	0.02			0.001	0.001		
Vanadium	0.001	mg/L				<0.001	<0.001	<0.001	
Zinc	0.01	mg/L	5			<0.01	<0.01	<0.01	
Metals Scan (Water, ICP/OES)	0.01					-		-	
Calcium		mg/l				190	188	188	
Magnesium	1	mg/L				57	57	57	
Potassium	1	mg/L				11	11	11	
Sodium	1	mg/L	200			100	101	101	
SouldIII	1	mg/L	200			100	101	101	
				Eurofins Sa	ample No :	8408304	8408306		
					Matrix:	Groundwater	Groundwater		
				Samo	ling Date :	2025-03-04	2025-03-04		
			Cliant	Sample Ider					
			Client	<u>'</u>	iuiication :	TW1 - GW1	TW1 - GW2		
Microbiology			_	Criteria					
	RL	Unit	Α	В	С				
Escherichia coli (DC)	0	CFU/100mL	0			0	0		
Total Coliforms (DC)	0	CFU/100mL	0			4	3		



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

	Eurofins	Sample No :	8408304	8408306			
		Matrix:	Groundwater	Groundwater			
	Sar	mpling Date :	2025-03-04	2025-03-04			
Client S	ample lo	dentification :	TW1 - GW1	TW1 - GW2			
Nutrients	RL	Unit					
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.795	0.825			
Total Kjeldahl Nitrogen	0.1	mg/L	1.24	1.10			



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

				Eurofins S	ample No :	8408306	
					Matrix:	Groundwater	
				Sam	pling Date :	2025-03-04	
			Client		entification :	TW1 - GW2	
Saminalatila Organia Communala			Ciletit		illillcation .	1001 - G002	
Semivolatile Organic Compounds	D.	11!4	_	Criteria] в	С		
	RL	Unit	A	Ь	C		
sase Neutrals (Water, GC/MS)							
1,2,4-Trichlorobenzene	0.5	ug/L				<0.5	
1,2-Dichlorobenzene^	0.4	ug/L				<0.4	
1,3-Dichlorobenzene^	0.4	ug/L				<0.4	
1,4-Dichlorobenzene^	0.4	ug/L				<0.4	
2,4 + 2,6-Dinitrotoluene	0.5	ug/L				<0.5	
2,4-Dinitrotoluene	0.3	ug/L				<0.3	
2,6-Dinitrotoluene	0.3	ug/L				<0.3	
2-Chloronaphthalene	0.2	ug/L				<0.2	
3,3'-Dichlorobenzidine	0.5	ug/L				<0.5	
4-Bromophenyl phenyl ether	0.3	ug/L				<0.3	
4-Chloroaniline	0.2	ug/L				<0.2	
4-Chlorophenyl phenyl ether	0.3	ug/L				<0.3	
Azobenzene	0.3	ug/L				<0.3	
Biphenyl	0.6	ug/L				<0.6	
bis(2-chloro-1-methylethyl)ether	0.5	ug/L				<0.5	
Bis(2-chloroethoxy)methane	0.6	ug/L				<0.6	
Bis(2-chloroethyl)ether	0.8	ug/L				<0.8	
Bis(2-ethylhexyl)phthalate	0.4	ug/L				<0.4	
Butyl benzyl phthalate	0.3	ug/L				<0.3	
Camphene [^]	3.5	ug/L				<3.5	
Diethyl phthalate	0.2	ug/L				<0.2	
Dimethyl phthalate	0.2	ug/L				<0.2	
Di-n-butyl phthalate	1.3	ug/L				<0.3	
Di-n-octyl phthalate	0.9	ug/L				<0.9	
Diphenylamine^	5	ug/L				<1	
Hexachlorobenzene		ug/L				<0.01	
Hexachlorobutadiene	0.01	ug/L ug/L				<0.01	
	0.01					<0.5	
Hexachlorocyclopentadiene^	0.5	ug/L				<0.01	
Hexachloroethane	0.01	ug/L				<1.9	
Indole^	1.9	ug/L				<0.2	
Isophorone	0.2	ug/L					
Nitrobenzene	0.2	ug/L				<0.2 <1.0	
N-Nitroso-di-n-propylamine	0.3	ug/L					
N-Nitrosodiphenylamine & Diphenylamine^	1	ug/L				<1	
Phenyl ether^	0.4	ug/L				<0.4	
Quinoline^	2	ug/L ug/L				<2	
5-Nitroacenaphthene^		ug/L ug/L				<0.3	
1-Chloronaphthalene^	0.3	ug/L ug/L				<4.3	
	4.3	ug/L %				70	
p-Terphenyl-d14 (surrogate)	0	70				70	
AH (Water, GC/MS)							
1-Methylnaphthalene	0.1	ug/L				<0.1	
2-Methylnaphthalene	0.1	ug/L				<0.1	
Acenaphthene	0.1	ug/L				<0.1	
Acenaphthylene	0.1	ug/L				<0.1	



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

				Eurofins Sa	imple No :	8408306		
					Matrix:	Groundwater		
				Samp	ling Date :	2025-03-04		
			Client	Sample Ider	ntification :	TW1 - GW2		
Semivolatile Organic Compounds				Criteria				
	RL	Unit	Α	В	С			
Anthracene	0.1	ug/L				<0.1		
Benzo(a)anthracene	0.1	ug/L				<0.1		
Benzo(a)pyrene	0.01	ug/L	0.01			<0.01		
Benzo(b)fluoranthene	0.05	ug/L				<0.05		
Benzo(g,h,i)perylene	0.1	ug/L				<0.1		
Benzo(k)fluoranthene	0.05	ug/L				<0.05		
Chrysene	0.05	ug/L				<0.05		
Dibenzo(a,h)anthracene	0.1	ug/L				<0.1		
Fluoranthene	0.1	ug/L				<0.1		
Fluorene	0.1	ug/L				<0.1		
Indeno(1,2,3-c,d)pyrene	0.1	ug/L				<0.1		
Naphthalene	0.1	ug/L				<0.1		
Phenanthrene	0.1	ug/L				<0.1		
Pyrene	0.1	ug/L				<0.1		
p-Terphenyl-d14 (surrogate)	0	%				99		
	0	70						
henolics (Water, GC/MS)						.4.0		
2,3,4,6-Tetrachlorophenol	1	ug/L	100			<1.0		
2,3,4-Trichlorophenol	1	ug/L				<1.0		
2,3,4,5 & 2,3,4,6-Tetrachlorophenol^	1	ug/L				<1.0		
2,3,4,5-Tetrachlorophenol^	1	ug/L				<1.0		
2,3,5,6-Tetrachlorophenol^	1	ug/L				<1.0		
2,3,5-Trichlorophenol	1	ug/L				<1.0		
2,4,5-Trichlorophenol	0.2	ug/L				<0.2		
2,4,6-Trichlorophenol	0.2	ug/L	5			<0.2		
2,4-Dichlorophenol	0.2	ug/L	900			<0.2		
2,4-Dimethylphenol	1	ug/L				<1.0		
2,4-Dinitrophenol	2.5	ug/L				<2.5		
2,6-Dichlorophenol	2	ug/L				<2.0		
2-Chlorophenol	1	ug/L				<1.0		
2-Methyl-4,6-dinitrophenol	2.2	ug/L				<2.2		
2-Methylphenol	1	ug/L				<1.0		
2-Nitrophenol	2	ug/L				<2.0		
3 & 4-Methylphenol	1	ug/L				<1.0		
4-Chloro-3-Methylphenol	1	ug/L				<1.0		
4-Nitrophenol	2.5	ug/L				<2.5		
Methylphenols (Total Cresols)	2	ug/L				<2.0		
Pentachlorophenol	1	ug/L	60			<1.0		
Phenol	1	ug/L				<1.0		
Tribromophenol (surrogate)	0	%				93		



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

			E	Eurofins S	Sample No :	8408306		
					Matrix:	Groundwater		
				Sam	pling Date :	2025-03-04		
			Client S		entification :	TW1 - GW2		
Volatile Organic Compounds			Oliciti			1001 - 0002		
voiatile Organic Compounds	RL	Unit	A	Criteria B	С			
	- 1/1	Onic						
OCs (Water, GC/MS)								
1,1,1,2-Tetrachloroethane	0.5	ug/L				<0.5		
1,1,1-Trichloroethane	0.4	ug/L				<0.4		
1,1,2,2-Tetrachloroethane	0.5	ug/L				<0.5		
1,1,2-Trichloroethane	0.4	ug/L				<0.4		
1,1-Dichloroethane	0.4	ug/L				<0.4		
1,1-Dichloroethene	0.5	ug/L	14			<0.5		
1,2-Dibromoethane	0.2	ug/L				<0.2		
1,2-Dichlorobenzene	0.4	ug/L	200			<0.4		
1,2-Dichloroethane	0.2	ug/L	5			<0.2		
1,2-Dichloropropane	0.5	ug/L				<0.5		
1,3,5-Trimethylbenzene	0.3	ug/L				<0.3		
1,3-Dichlorobenzene	0.4	ug/L				<0.4		
1,4-Dichlorobenzene	0.4	ug/L	5			<0.4		
Acetone	5	ug/L				<5.0		
Benzene	0.5	ug/L	1			<0.5		
Bromodichloromethane	0.3	ug/L				<0.3		
Bromoform	0.4	ug/L				<0.4		
Bromomethane	0.5	ug/L				<0.5		
Carbon tetrachloride	0.2	ug/L	2			<0.2		
Chloroethane	0.2	ug/L				<0.5		
Chloroform	0.5	ug/L				<0.5		
Chloromethane		ug/L				<0.2		
cis-1,2-Dichloroethene	0.2	ug/L				<0.4		
	0.4					<0.5		
cis-1,3-Dichloropropene	0.5	ug/L				<0.3		
Dibromochloromethane	0.3	ug/L	50					
Dichloromethane	4	ug/L	50			<4.0		_
Diethyl ether	5	ug/L				<5.0		_
Ethylbenzene	0.5	ug/L	140			<0.5		
m/p-Xylene	0.4	ug/L				<0.4		
Methyl ethyl ketone (MEK)	2	ug/L				<2.0		
Methyl isobutyl ketone (MIBK)	5	ug/L				<5.0		
Methyl tert-butyl ether (MTBE)	2	ug/L				<2.0		
Monochlorobenzene	0.5	ug/L	80			<0.5		
o-Xylene	0.4	ug/L				<0.4		
Styrene	0.5	ug/L				<0.5		
Tetrachloroethylene (PCE)	0.3	ug/L	10			<0.3		
Toluene	0.4	ug/L	60			<0.4		
trans-1,2-dichloroethene	0.4	ug/L				<0.4		
trans-1,3-dichloropropene	0.5	ug/L				<0.5		
Trichloroethylene (TCE)	0.3	ug/L	5			<0.3		
Trichlorofluoromethane	0.5	ug/L				<0.5		
Vinyl chloride	0.2	ug/L	1			<0.2		
Xylene (Total)	0.5	ug/L	90			<0.5		
1,2-dichloroethane-d4 (surrogate)	0	%				102		
4-bromofluorobenzene (surrogate)	0	%				64		



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client: Paterson Group

Project: PH4991 Reception Date: 2025-03-05

				Eurofins Sa	ample No :	8408306			
	Matrix :								
				Samp	oling Date :	2025-03-04			
			Client	Sample Ide	ntification :	TW1 - GW2			
Volatile Organic Compounds				Criteria					
	RL	Unit	Α	В	С				
Toluene-d8 (surrogate)	0	%				86			

Approved by:

Addrine Thomas,

Inorganic supervisor, Ottawa

Approved by:

Patrick Jacques,

Ottawa, Environmental Chemist,



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

Parameter	Unit	RL	Blank		QC	Matrix	-		olicate
				Recovery %	% Range %	Recovery %	Range %	RPD %	Range %
Alkalinity (Water, Automated)	hod : Alkalinity (water, tit	ration to nH /	1.5 automated	N) Internal met	thod: OTT-I-A	T-1///45308			
Alkalinity (as CaCO3)	mg/L	5	<5	97	95-105	1-11143390.		1	0-20
, and and a decopy	Associated Sam		_	0.	00 100				e: 2025-03-06
			.,				A		e: 2025-03-07
Ammonia, Total (Water, Colorimetry)									
	Method : Ammonia (\	Vater, Colorir	netry). Interna	al method: OT	T-I-NUT-WI46	3201.			
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	95	80-120	99	80-120	6	0-20
	Associated Sam	ples : 840830	04, 8408306						e: 2025-03-06
							<i>F</i>	Analysis Date	e: 2025-03-06
Base Neutrals (Water, GC/MS)									
	: Semi-volatile organic o					SEMI-WI4523	9.		
1,2,4-Trichlorobenzene	ug/L	0.5	<0.5	60	50-140				
1,2-Dichlorobenzene^	ug/L	0.4	<0.4		50-140				
1,3-Dichlorobenzene^	ug/L	0.4	<0.4		50-140				
1,4-Dichlorobenzene [^]	ug/L	0.4	<0.4		50-140				
2,4 + 2,6-Dinitrotoluene	ug/L	0.5	<0.5	87	50-140				
2,4-Dinitrotoluene	ug/L	0.3	<0.3	52	50-140				
2,6-Dinitrotoluene	ug/L	0.3	<0.3	122	50-140				
2-Chloronaphthalene	ug/L	0.2	<0.2	64	50-140				
3,3'-Dichlorobenzidine	ug/L	0.5	<0.5	34	30-130				
4-Bromophenyl phenyl ether	ug/L	0.3	<0.3	58	50-140				
4-Chloroaniline	ug/L	0.2	<0.2	46	30-130				
4-Chlorophenyl phenyl ether	ug/L	0.3	<0.3	58	50-140				
Azobenzene	ug/L	0.3	<0.3	70	50-140				
Biphenyl	ug/L	0.6	<0.6	64	50-140				
bis(2-chloro-1-methylethyl)ether	ug/L	0.5	<0.5	60	50-140				
Bis(2-chloroethoxy)methane	ug/L	0.6	<0.6	62	50-140				
Bis(2-chloroethyl)ether	ug/L	0.8	<0.8	60	50-140				
Bis(2-ethylhexyl)phthalate	ug/L	0.4	<0.4	86	50-140				
Butyl benzyl phthalate	ug/L	0.3	<0.3	68	50-140				
Camphene [^]	ug/L	3.5	<3.5		50-140				
Diethyl phthalate	ug/L	0.2	<0.2	62	50-140				
Dimethyl phthalate	ug/L	0.2	<0.2	58	50-140				
Di-n-butyl phthalate	ug/L	1.3	<0.3	66	50-140				
Di-n-octyl phthalate	ug/L	0.9	<0.9	64	50-140				
Diphenylamine^	ug/L	5	<1		50-140				
Hexachlorobenzene	ug/L	0.01	<0.01	58	50-140				
Hexachlorobutadiene	ug/L	0.01	<0.01	56	50-140				
Hexachlorocyclopentadiene^	ug/L	0.5	<0.5	54	50-140				
Hexachloroethane	ug/L	0.01	<0.01	65	50-140				
Indole^	ug/L	1.9	<1.9	50	50-140				
Isophorone	ug/L	0.2	<0.2	64	50-140				
Nitrobenzene	ug/L	0.2	<0.2	68	50-140				
N-Nitroso-di-n-propylamine	ug/L	0.3	<1.0	60	50-140				
N-Nitrosodiphenylamine & Diphenylamine^	ug/L	1	<1	30	50-140				
Phenyl ether^	ug/L	0.4	<0.4	62	50-140				
Quinoline^	ug/L	2	<2						
5-Nitroacenaphthene^	ug/L	0.3	<0.3						



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

Downwoodow	Unit	RL	Blank	Q		Matrix S		Dupl	licate
Parameter	Offic	IXL	Dialik	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Base Neutrals (Water, GC/MS)									
Metho	d : Semi-volatile organic c	ompounds (Water, GC/MS	S). Internal metho	od: OTT-O-S	SEMI-WI45239.			
1-Chloronaphthalene^	ug/L	4.3	<4.3						
	Associated	Samples : 8	3408306						: 2025-03-07
							<i>F</i>	Analysis Date	: 2025-03-07
Chloride (Water, IC)									
	Method : Anions (Water								
Chloride	mg/L	0.5	<0.5	99	80-120	107	80-120	-	0-20
	Associated Sam	ples : 84083	804, 8408306				<u> </u>		: 2025-03-07 : 2025-03-10
Colour, Apparent (Water, Spectrophoto	ometry)						,	ilalysis bate	. 2020-00-10
(Method : Colour (Water,	Spectropho	tometric). Inter	nal method: OT	T-I-SPEC-W	(145980.			
Colour (Apparent)	TCU	2	<2	108	78-116			0	0-40
,	Associated Samples :	8408304. 8	408306. 8408	308				Prep Date	: 2025-03-07
	'	, .					A		: 2025-03-10
Conductivity (Water, Automated)									
	Method : Conductivity	(Water, Au	totitrator). Inter	rnal Method: OT	T-I-AT-WI45	398.			
Conductivity @ 25°C	uS/cm	5	<5	99	98-102				
	Associated Sam	ples : 84083	04, 8408306						: 2025-03-06
							P	Analysis Date	: 2025-03-07
DOC (Water, IR)									
Metho	nd : Organic carbon (water	, IR, combu	stion). Internal	method:	OTT-I-E	DEM-WI46148.			
Dissolved Organic Carbon	mg/L	0.5	<0.5	97	84-116	111	80-120	8	0-15
	Associated Sam	ples : 84083	804, 8408306						: 2025-03-06
							A	Analysis Date	: 2025-03-07
Escherichia coli (DC Plate)									
	d : Total Coliforms and E.C			e). Internal metl	hod: OTT-M-	-BAC-WI45296			
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30
	Associated Sam	ples : 84083	804, 8408306				A		: 2025-03-05 : 2025-03-06
Fluoride (Water, Auto/ISE)								-	
Ме	ethod : Fluoride by autotitra	ator, ion sele	ective electrode	e. Internal metho	od: OTT-I-A	T-WI45398.			
Fluoride	mg/L	0.1	<0.10	97	90-110				
	A : - 4 1 C	nlag . 04000	04.0400000					Drop Data	: 2025-03-06
	Associated Sam	pies . 04003	304, 8408306						: 2025-03-06 : 2025-03-07



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

Davamatav	Unit	RL	Blank	QC		Matrix S			licate
Parameter	Offic	111	Dialik	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
A1			,	al method: AMN	-	0.5	70.400	4	0.00
Aluminum	mg/L	0.01	<0.01	100	80-120	95	70-130	1	0-20
Antimony	mg/L	0.0005	<0.0005	82	80-120	84	70-130	-	0-20
Arsenic	mg/L	0.001	<0.001	99	80-120	98	70-130	-	0-20
Barium	mg/L	0.001	<0.001	100	80-120	94	70-130	1	0-20
Beryllium	mg/L	0.0005	<0.0005	106	80-120	108	70-130	-	0-20
Boron	mg/L	0.01	<0.01	100	80-120	104	70-130	-	0-20
Cadmium	mg/L	0.0001	<0.0001	101	80-120	99	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	100	80-120	94	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	101	80-120	96	70-130	-	0-20
Copper	mg/L	0.001	<0.001	110	80-120	99	70-130	-	0-20
Iron	mg/L	0.03	<0.03	100	80-120	95	70-130	0	0-20
Lead	mg/L	0.001	<0.001	110	80-120	97	70-130	-	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	96	70-130	-	0-20
Mercury	mg/L	0.0001	<0.0001	107	80-120	97	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	90	80-120	91	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	100	80-120	100	70-130	-	0-20
Selenium	mg/L	0.001	<0.001	97	80-120	97	70-130	-	0-20
Silicon	mg/L	0.1	<0.1	100	80-120			0	0-20
Silver	mg/L	0.0001	<0.0001	111	80-120	96	70-130		0-20
Strontium	mg/L	0.001	<0.001	100	80-120	90	70-130	1	0-20
Thallium	mg/L	0.0001	<0.0001	106	80-120	96	70-130		0-20
Titanium	mg/L	0.001	<0.01	102	80-120	97	70-130	_	0-20
Uranium	-	0.001	<0.01	100	80-120	98	70-130		0-20
	mg/L							-	
Vanadium	mg/L	0.001	<0.001	90	80-120	91	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	110	80-120	102	70-130		0-20
	Associated Samples	: 8408304, 84	108306, 84083	808			4	Prep Date nalysis Date،	e: 2025-03-06 e: 2025-03-06
Metals Scan (Water, ICP/OES)							,	andryolo Bato	. 2020 00 00
wetais Scari (Water, ICP/OES)	Method : Metals (Water ICP/OF	ES) Internal m	nethod: OTT-I-M	1FT-W/14849	1			
Calcium	mg/L	1	<1 <1	101	86-115	98	70-130	0	0-20
Magnesium	mg/L	1	<1	98	91-109	98	70-130	0	0-20
Potassium		1	<1	104	87-113	103	70-130	-	0-20
Sodium	mg/L	1	<1	104	85-115	103	70-130	0	0-20
Sodium	mg/L				00-110	103	70-130		
	Associated Samples	: 8408304, 84	108306, 84083	808			A	Prep Date nalysis Date	e: 2025-03-06 e: 2025-03-05
Nitrate (Water, IC)								,	
iviliate (vvater, 10)	Method : Anions (Wate	er Ion Chroma	atography) Int	ernal method: C	OTT-I-IC-WI4	15985			
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	97	80-120	111	80-120	-	0-20
Third (do Thirogon)	Associated Sar			0,	00 120		00 120	Pren Date	e: 2025-03-07
	7.000014164 041	прісо . 040000	J-1, U-100000				A	nalysis Date	
Nitrite (Water, IC)									
	Method : Anions (Wate	er, Ion Chroma	atography). Int	ernal method: C	DTT-I-IC-WI4	15985.			
		0.1	<0.1	106	80-120				
Nitrite (as Nitrogen)	mg/L	0.1	~ 0.1	100	00-120				



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

	Unit	RL	Blank	QC		Matrix S	Spike	Dupl	icate
Parameter	Unit	KL	ыапк	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
PAH (Water, GC/MS)									
Method	: Semi-volatile organic	compounds (Water, GC/MS)	Internal metho	od: OTT-O-S	SEMI-WI45239.			
1-Methylnaphthalene	ug/L	0.1	<0.1	72	50-140				
2-Methylnaphthalene	ug/L	0.1	<0.1	72	50-140				
Acenaphthene	ug/L	0.1	<0.1	72	50-140				
Acenaphthylene	ug/L	0.1	<0.1	72	50-140				
Anthracene	ug/L	0.1	<0.1	84	50-140				
Benzo(a)anthracene	ug/L	0.1	<0.1	78	50-140				
Benzo(a)pyrene	ug/L	0.01	<0.01	67	50-140				
Benzo(b)fluoranthene	ug/L	0.05	<0.05	59	50-140				
Benzo(g,h,i)perylene	ug/L	0.1	<0.1	76	50-140				
Benzo(k)fluoranthene	ug/L	0.05	<0.05	82	50-140				
Chrysene	ug/L	0.05	<0.05	81	50-140				
Dibenzo(a,h)anthracene	ug/L	0.1	<0.1	64	50-140				
Fluoranthene	ug/L	0.1	<0.1	72	50-140				
Fluorene	ug/L	0.1	<0.1	74	50-140				
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	<0.1	62	50-140				
Naphthalene	ug/L	0.1	<0.1	70	50-140				
Phenanthrene	ug/L	0.1	<0.1	78	50-140				
Pyrene	ug/L	0.1	<0.1	74	50-140				
	Associated	Samples : 8	408306			•	Д	Prep Date nalysis Date	2025-03-07 2025-03-07
pH (25°C) (Water, Automated)									
	Method : pH (Water	r, Automated	Meter). Interna	method: OTT-	I-AT-WI453	98.			
pH @ 25°C		1	6.56	100	97-103			1	0-20
	Associated San	ples : 84083	04, 8408306				A	Prep Date nalysis Date	2025-03-06 2025-03-07



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

Darometer	Unit	RL	Blank	Q		Matrix			licate
Parameter	Offic	IVE	Dialik	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Phenolics (Water, GC/MS)									
	Semi-volatile organic					SEMI-WI45239.			
2,3,4,6-Tetrachlorophenol	ug/L	1	<1.0	73	50-140				
2,3,4-Trichlorophenol	ug/L	1	<1.0	108	50-140				
2,3,4,5 & 2,3,4,6-Tetrachlorophenol^	ug/L	1	<1.0		50-140				
2,3,4,5-Tetrachlorophenol [^]	ug/L	1	<1.0	79	50-140				
2,3,5,6-Tetrachlorophenol [^]	ug/L	1	<1.0	98	50-140				
2,3,5-Trichlorophenol	ug/L	1	<1.0	108	50-140				
2,4,5-Trichlorophenol	ug/L	0.2	<0.2	126	50-140				
2,4,6-Trichlorophenol	ug/L	0.2	<0.2	107	50-140				
2,4-Dichlorophenol	ug/L	0.2	<0.2	106	50-140				
2,4-Dimethylphenol	ug/L	1	<1.0	76	30-130				
2,4-Dinitrophenol	ug/L	2.5	<2.5	101	30-130				
2,6-Dichlorophenol	ug/L	2	<2.0	106	50-140				
2-Chlorophenol	ug/L	1	<1.0	82	50-140				
2-Methyl-4,6-dinitrophenol	ug/L	2.2	<2.2		50-140				
2-Methylphenol	ug/L	1	<1.0	56	50-140				
2-Nitrophenol	ug/L	2	<2.0	69	30-130				
3 & 4-Methylphenol	ug/L	1	<1.0	57	50-140				
4-Chloro-3-Methylphenol	ug/L	1	<1.0		50-140				
4-Nitrophenol	ug/L	2.5	<2.5	58	30-130				
Methylphenols (Total Cresols)	ug/L	2	<2.0	57	50-140				
Pentachlorophenol	ug/L	1	<1.0	121	50-140				
Phenol	ug/L	1	<1.0	67	30-130				
	Associated	Samples : 8	408306						: 2025-03-07
								Analysis Date	e: 2025-03-0 <i>7</i>
Phenols (Water, Colorimetry)	Mathad : Phanala (M	latar Calarim	otal Intornal	mathad: OTT I	44 AD W//46	150			
Phenols-4AAP	Method : Phenols (W	0.001	<0.001	110	75-125	106	70-130		0-20
FIICHOIS-4AAF	Associated San			110	73-123	100	70-130	Prop Data	e: 2025-03-07
	Associated Sail	ipies . 04003i	04, 0400300					Analysis Date	
Sulphate (Water, IC)									
	Method : Anions (Wate	r, Ion Chroma	atography). Int	ernal method: C	DTT-I-IC-WI	<i>45985.</i>			
Sulphate	mg/L	1	<1	95	90-110	108	80-120	0	0-20
	Associated Sam	ples : 840830	04, 8408306					Prep Date	: 2025-03-07
		•						Analysis Date	: 2025-03-10
Sulphide (Water, Colorimetry)									
N	lethod : Sulphide, S2-	(Water, Color	rimetry). Intern	al method: OTT	-I-SPEC-WI	45931.			
Sulphide (S2-)	mg/L	0.01	<0.01	87	80-120			-	0-20
	Associated San	ples : 840830	04, 8408306						2025-03-07
Towards and Livering (Martine County)								Analysis Date	9: 2025-03-10
Tannin and Lignin (Water, Spec)	Method : Tannin and L	ianin (Water	Snec) Interna	I method: OTT-	I-SPEC-WIF	7693			
Tannin and Lignin	mg/L	0.1	<0.1	106	80-120	,, 556.		-	0-20
· · · · · · · · · · · · · · · · · · ·	Associated Sam			700	33 120			Pren Date	e: 2025-03-06
	, losocialed Gall	.p.00 . 040001	J 1, UTUUUU						: 2025-03-06 : 2025-03-06



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

_ ,	Limit	DI	Dlank	QC		Matrix S	Spike	Dupli	icate
Parameter	Unit	RL	Blank	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Total Coliforms (DC Plate)									
Method : Total C	Coliforms and E.C	Coli by MF (V	Vater, DC plate)	. Internal meth	nod: OTT-M-	BAC-WI45296			
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30
	Associated Sam	ples : 84083	04, 8408306				P	Prep Date: Analysis Date:	2025-03-05 2025-03-06
Total Kjeldahl Nitrogen (Water, Colorimetry)									
M	ethod : TKN (Wa	ter, colorime	etry). Internal me	ethod: OTT-I-N	UT-WI46201	1.			
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	90	70-130	112	70-130	2	0-20
	Associated Sam	ples : 84083	04, 8408306				A	Prep Date: Analysis Date:	2025-03-06 2025-03-06
Turbidity (Water, Turbidimeter)									
Meth	od : Turbidity (W	ater, Turbidi	meter). Internal	method: OTT-I	-TUR-WI46	288.			
Turbidity	NTU	0.1	<0.1	105	80-120			2	0-30
Asso	ciated Samples	8408304, 8	408306, 840830)8			A	Prep Date: Analysis Date:	2025-03-06 2025-03-06



146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client: Paterson Group

Project: PH4991 Reception Date: 2025-03-05

Parameter	Unit	RL	Blank		QC 6 Range %		Spike Range %	Dup RPD %	licate Range %
VOCs (Water, GC/MS)				Recovery 7	6 Range %	Recovery 7	6 Range %	KPD %	Range %
· , ,	Method : Volatile Organi	ic Compound	s (Water GC/	MS) Internal n	nethod: AMVC	MSF8			
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	105	70-130	73	70-130	-	0-30
1,1,1-Trichloroethane	ug/L	0.4	<0.4	113	70-130	74	70-130	-	0-30
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	109	70-130	78	70-130	-	0-30
1,1,2-Trichloroethane	ug/L	0.4	<0.4	106	70-130	74	70-130	-	0-30
1,1-Dichloroethane	ug/L	0.4	<0.4	115	70-130	75	70-130	-	0-30
1,1-Dichloroethene	ug/L	0.5	<0.5	119	70-130	128	70-130	-	0-30
1,2-Dibromoethane	ug/L	0.2	<0.2	95	70-130	104	70-130	-	0-30
1,2-Dichlorobenzene	ug/L	0.4	<0.4	103	70-130	92	70-130	-	0-30
1,2-Dichloroethane	ug/L	0.2	<0.2	111	70-130	106	70-130	-	0-30
1,2-Dichloropropane	ug/L	0.5	<0.5	105	70-130	112	70-130	-	0-30
1,3,5-Trimethylbenzene	ug/L	0.3	<0.3	86	70-130	114	70-130	-	0-30
1,3-Dichlorobenzene	ug/L	0.4	<0.4	89	70-130	83	70-130	-	0-30
1,4-Dichlorobenzene	ug/L	0.4	<0.4	89	70-130	89	70-130	-	0-30
Acetone	ug/L	5	<5.0	107	70-130	78	70-130	-	0-30
Benzene	ug/L	0.5	<0.5	95	70-130	77	70-130	-	0-30
Bromodichloromethane	ug/L	0.3	<0.3	118	70-130	79	70-130	-	0-30
Bromoform	ug/L	0.4	<0.4	112	70-130	78	70-130	-	0-30
Bromomethane	ug/L	0.5	<0.5	126	70-130	117	70-130	-	0-30
Carbon tetrachloride	ug/L	0.2	<0.2	122	70-130	78	70-130	-	0-30
Chloroethane	ug/L	0.5	<0.5	116	70-130	116	70-130	-	0-30
Chloroform	ug/L	0.5	<0.5	123	70-130	81	70-130	-	0-30
Chloromethane	ug/L	0.2	<0.2	108	70-130	105	70-130	-	0-30
cis-1,2-Dichloroethene	ug/L	0.4	<0.4	118	70-130	78	70-130	-	0-30
cis-1,3-Dichloropropene	ug/L	0.5	<0.5	83	70-130	88	70-130	-	0-30
Dibromochloromethane	ug/L	0.3	<0.3	100	70-130	98	70-130	-	0-30
Dichloromethane	ug/L	4	<4.0	106	70-130	76	70-130	-	0-30
Diethyl ether	ug/L	5	<5.0	120	70-130	112	70-130	-	0-30
Ethylbenzene	ug/L	0.5	<0.5	96	70-130	78	70-130	-	0-30
m/p-Xylene	ug/L	0.4	<0.4	109	70-130	96	70-130	-	0-30
Methyl ethyl ketone (MEK)	ug/L	2	<2.0	94	70-130	76	70-130	-	0-30
Methyl isobutyl ketone (MIBK)	ug/L	5	<5.0	124	70-130	90	70-130	-	0-30
Methyl tert-butyl ether (MTBE)	ug/L	2	<2.0	140	70-130	82	70-130	-	0-30
Monochlorobenzene	ug/L	0.5	<0.5	89	70-130	108	70-130	-	0-30
o-Xylene	ug/L	0.4	<0.4	100	70-130	108	70-130	-	0-30
Styrene	ug/L	0.5	<0.5	99	70-130	124	70-130	-	0-30
Tetrachloroethylene (PCE)	ug/L	0.3	<0.3	92	70-130	82	70-130	-	0-30
Toluene	ug/L	0.4	<0.4	94	70-130	98	70-130	-	0-30
trans-1,2-dichloroethene	ug/L	0.4	<0.4	122	70-130	77	70-130	-	0-30
trans-1,3-dichloropropene	ug/L	0.5	<0.5	100	70-130	103	70-130	-	0-30
Trichloroethylene (TCE)	ug/L	0.3	<0.3	95	70-130	113	70-130	-	0-30
Trichlorofluoromethane	ug/L	0.5	<0.5	126	70-130	122	70-130	-	0-30
Vinyl chloride	ug/L	0.2	<0.2	128	70-130	94	70-130	-	0-30
Xylene (Total)	ug/L	0.5	<0.5						1

Where RPD % is reported as "-" the calculation is not available because one or both of the duplicates is within 5 times the RL.

Analysis Date: 2025-03-11

	eп	rofi	ns
4.			

STANDARD CHAIN-OF-CUSTODY

2.0	ai Oi iii s			146 Cole	nnoade 8	oad Halt	as Ottaw	ON VI	7V1 - Dhe	ne: 613-72	7.5697 F:	ar: 613.7	7.5777							100	····
		CLIENT INFORMATION		140 001	Jimoye n	oau, onit	PO, Ottan	a, On, K21	1	NVOI		100-100		N (1	1003	4162	.8	į	YES V NO)
ompany:	Paterson Group								Compar	ıy:					1						
ontact:	Alex Schopf			_===					Contact												
ddress:	9 Auriga Drive		_						Address	:				=	Printe	d On :_	202	5-03-0	5 1 <u>2</u> :0 <u>2</u>	:16 /	
elephone:	613-218-3444	Cell:	-						Telepho	ne:							PO #:	62	526		
mail:	#1:eardley@paterso	ongroup.ca, mlaflamme@paters	ongro	up.ca	;						20		R	EGUL	ATIO	v/GUI	DELI	VE RE	QUIR	ED	
mall:	#2: aschopf@paters	ongroup.ca;						}		Sanitary	Sewer, C	Ity: Otta	wa	10 100		- 10		O. Reg	153		
roject:	PH4991			Quote N	:					Storm Se	ewer, City	r:Olia	wa			-68		Tabi	ie#,	Course	/ Fine, Surface / subsurface.
	T	URN-AROUND TIME (Business	Days)				14. Su	\checkmark	opwso	G						Т	ype: co	m-Ind / Re	es-Park /	/ Agrl / GW / All Other / Sediment
1 Dav			ys (25%)			√ 5-7	7 Days (St	andard)		PWQO								Excess S	oil, Table:	<u> </u>	Туре:
		ease contact Lab in advance to determine rush av ter rush due date, surcharges will apply: before t			12:00 - 50	0%.				O, Reg 3	47/558										
-	*"For results reported a	after rush due date, surcharges will apply: before	12:00 - 50	0%, after :	12:00 - 25	5 % .				Other: _			-				The s				ubmission will form part of a formal n (RSC) under O.Reg. 153/04
			F===1-	e Details					<u> </u>	None	e	and a record to							22	Yes	No
		ransport should be less than 10°C. Sample(s) if or agreed upon with the Laboratory. Note	30000	tered>		T			T		Sampi	e Anaiy	sis Requ	Jirea	i					10	RNS
at this COC is	not to be used for drinking wat	er samples. The COC must be complete upon				÷ .	O.Rea	.153 par	ameters			Jej.	1 58			က		1	1		(Lab Use Only)
ubmission of 1	the samples, there will be a \$25 required fields are	surcharge if required information is missing e shaded in grey).	,≝	<u>r</u>						anics		eded p	Supply TC only)			Metals			≩		
	, ,	3 ,,	Sample Matrix	Containers	Σ̈́					Inorganic	늍	altached	Sign S			Ž		Colour	Turbidity	ř	
			ple		.H.	×	კ	ş	<u></u>	* S	Metals only	e aft	cl 2	ıΩ	핌	Total	护	۱ĕ۱	15	:	
ample ID		Date/Time Collected	San	70	H	BTEX	Vocs	PAHS	ã	Σ	ž	See	8.8	TSS	۵	Ľ	LI	(C)	E	<u> </u>	
	TW1 - GW1	March 4, 2025	GW	6									V			V					8408304
	TW1 - GW2	March 4, 2025	[GW]	10				1								~					06
	TW1 - GW3	March 4, 2025	GW	2												1		V			Ø B
	<u> </u>																				
	PRINT				• •	SIGN		· · · · · · · · · · · · · · · · · · ·			DATE/	TIME		TEM	P (°C)	COMME		4 Tr	000 1	m at	
impled By:	Alex Schopf	-			Ash	lan				M Z	larch 4	, 202	5			TULE	я ап	u II	ace i	пец	als, VOC, PAH
elinquished By	Alex Schopf				Ato	hy	<u> </u>			M	larch 5	, 202	5	9.	2						
ceived By:	401 140	5,70		(\triangle					Mu	CUNS	Mich	An)			CUSTOD	100110-01-0-0110-0110		2/4		Ice packs submitted: Yes No
	401 Magnetic Drive, Uni	it #1, North York, ON, M3J 3H9 - Telephone: 41	b 661-52	287 • .	380 Vani	iickle Roa	d, Unit #6	30, St. Ca	tharines,	ON, L25 0	us - Telep	none: 90	15-680-88	87 • 1	608 Norri	s Court, K	ingston,	ON, K7P	ZR9 - Tele	ephone:	: 613-634-9307





Manganese in Drinking Water Fact Sheet

WHAT IS MANGANESE?

Manganese is a naturally occurring element that is an essential nutrient for humans and animals. It is found in many foods, as well as in air, water, soil, and rocks. Manganese makes up 0.1% of the Earth's crust, and can be found as a component of other minerals like sulfides, oxides, carbonates, and silicates. Manganese is used in the manufacture of various products including iron and steel alloys, batteries, glass, fireworks, fertilizers, cosmetics, paints, and cleaning and disinfection products. Manganese can also be purchased as a nutritional supplement.

HOW DOES MANGANESE GET INTO DRINKING WATER?

Manganese is naturally occurring in many surface and ground waters. Manganese can also be dissolved from soils, sand and rocks to enter surface and ground waters. Human activities like mining, industrial discharges, or landfills may also contribute to manganese in surface and ground waters. In general, manganese can be found at higher concentrations in groundwater compared to surface water. Some lakes and reservoirs can also have higher levels of manganese due to natural water chemistry.

Permanganate, a compound that contains manganese, may also be added to water during the treatment of drinking water to remove other chemicals (e.g., for the removal of iron).^{2,3}

HOW DOES MANGANESE INTAKE AFFECT MY HEALTH?

Too much or too little manganese in your body can lead to health problems.

Manganese deficiency: Manganese deficiency is rare and symptoms are not well defined. Health effects observed in individuals with diets very low in manganese include skin rashes, slow nail growth, reduced bone density, loss of pigmentation in hair, and low cholesterol levels.²

Manganese excess: There are few reports of adverse health effects from people who ingest too much manganese from food and water. Recent evidence reviewed by Health Canada indicates that high levels of manganese in drinking water may impact memory and learning, behaviour, and fine motor control in infants and young children. Formula-fed infants may be more susceptible to health risks if water with high concentrations of manganese is used to prepare formula. This is because infant brains are rapidly developing, they drink more water in proportion to their body weight, and they absorb more manganese and are less able to remove

it from their bodies compared to other age groups.³ For adults and older children, short term exposure to manganese in drinking water at levels slightly above the guideline is unlikely to cause negative health effects.³

Health Canada notes that exposure to manganese while showering (either through breathing in water vapour or absorption through skin) is likely to be negligible.²

WHAT ARE THE LEVELS OF MANGANESE FOUND IN CANADIANS?

For most Canadians, diet is the main source of manganese. The Canadian Health Measures Survey (CHMS) is a national survey that collects information about the general health of Canadians and includes measurements of chemicals in blood and urine samples. The objective of the chemical measurements in the CHMS survey is to establish baseline levels in the Canadian population. Given that manganese is an essential trace element, its presence in the blood and urine of Canadians is expected. Manganese in blood and urine can be interpreted as an indicator of exposure, but does not necessarily mean that health effects will occur. Data collected from 2007 to 2011 for the CHMS found that the average levels of manganese measured in the blood of people in the Canadian population (aged 3 to 79) ranged from $8.8-11~\mu g/L$. More information on the CHMS and the levels of manganese in Canadians can be obtained by visiting the Canadian Biomonitoring Dashboard.

ARE THERE STANDARDS FOR MANGANESE IN DRINKING WATER?

The Ontario Drinking Water Standard (ODWS) published in 2006 sets an aesthetic objective for manganese in drinking water at 0.05 mg/L.⁷ The aesthetic objective is not intended to prevent health effects (e.g., not a health-based standard), but instead is intended to prevent the discolouration and staining of fixtures, and the undesirable taste caused by higher levels of manganese in water.

The Canadian Drinking Water Guideline for manganese developed by Health Canada stipulates a maximum acceptable concentration (MAC) in drinking water of 0.12 mg/L and an aesthetic objective of 0.02 mg/L.² The MAC is a health-based value intended to be protective of neurological effects in infants, the most sensitive population, and therefore it is also protective for chronic exposure in children and adults.²

ARE THERE OTHER STANDARDS OR GUIDELINE VALUES FOR MANGANESE?

The main source of exposure to manganese is via food, with grains, nuts and vegetables contributing the most to a person's daily intake of manganese. The average dietary intakes of manganese across all age groups according to the Canadian Total Diet Study (TDS) were estimated to range between 44.0 to 61.3 μ g/kg of bodyweight per day (based on data gathered from different Canadian cities for the TDS).² Health Canada has also established Adequate Intake Levels for manganese ranging with age or lifestage from 0.003 to 2.6 mg/day and Tolerable Upper Intake Levels ranging from 2 to 11 mg/day.8

Infant formula sold in Canada is regulated to contain a minimum of 5 μ g of manganese per 100 available kilocalories (equivalent to 3.33 μ g per 100 mL of ready-to-feed formula); a maximum amount of manganese has not been set for infant formula.

HOW CAN I TELL IF MY DRINKING WATER HAS HIGH MANGANESE LEVELS?

Water testing is the only way to know if manganese is present. Although water with elevated levels of manganese may impart a bitter metallic taste, tint water purplish brown or black (water discolouration may occur at concentrations as low as 0.005 to 0.02 mg/L), and stain laundry and plumbing fixtures;^{2,10,11} but these issues can also be caused by other chemicals.

WHAT SHOULD I DO IF A HIGH LEVEL OF MANGANESE IS FOUND IN MY WELL WATER?

For households who do not obtain their drinking water from a municipal source, a residential drinking water treatment device may be an option to reduce manganese concentrations in drinking water. Options can be explored with professionals specialized in water treatment, but examples of treatment processes effective at removing manganese include reverse osmosis, ion exchange (including water softeners and other cation exchange systems) and oxidizing filters.² As with any water treatment system, it is important to follow the manufacturer's recommendations for operation and maintenance (e.g., replacement of filter media).

REFERENCES

- 1. United States Environmental Protection Agency (US EPA). Drinking Water Health Advisory for Manganese [Internet]. 2004. Available from: https://www.epa.gov/sites/default/files/2014-09/documents/support_cc1_magnese_dwreport_0.pdf
- 2. Health Canada. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document Manganese [Internet]. 2019. Available from: https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-manganese.html
- 3. Health Canada. Water Talk Manganese in drinking water [Internet]. 2023. Available from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/water-talk-manganese.html
- 4. HealthLink British Columbia. Manganese in Drinking Water [Internet]. Available from: https://www.healthlinkbc.ca/healthlinkbc-files/manganese-drinking-water
- 5. Health Canada. Second Report on Human Biomonitoring of Environmental Chemicals in Canada: Manganese [Internet]. 2013. Available from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/environmental-



SOIL PROFILE AND TEST DATA

FILE NO.:

Geotechnical Investigation

PG7327

541 Somme Street, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 379616.40 **NORTHING:** 5018877.07 **ELEVATION:** 89.30

PROJECT: Proposed Commercial Development

BORINGS BY: CME-55 Low Clearance Drill HOLE NO.: BH1-24 **REMARKS:** DATE: November 11, 2024 PEN. RESIST. (BLOWS/0.3m) **SAMPLE** DCPT (50mm DIA. CONE) 20 40 **NATER CONTENT** CONSTRUCTION ġ RECOVERY (%) ELEVATION (m) △ REMOULDED SHEAR STRENGTH, Cur (kPa) STRATA PLOT N, No OR RQD SAMPLE DESCRIPTION PIEZOMETER PEAK SHEAR STRENGTH, Cu (kPa) **LYPE AND** DEPTH (m) 40 60 PL (%) WATER CONTENT (%) LL (%) 20 **GROUND SURFACE** 40 60 80 TOPSOIL 0.10m [89.20m] FILL: Compact, grey silty fine sand to sandy silt, SS 62 3-8-7-7 trace gravel 15 **SS 2** 60 6-50-/-/ FILL: Compact, brown silty fine sand to sandy silt, 50/0.03 topsoil, trace gravel 1.12m [88.18m] End of Borehole 88 Practical refusal to augering at 1.12 m depth

P:/AutoCAD Drawings/Test Hole Data Files/PG73xx/PG7327/data.sqlite 2024-11-14, 14:08 Paterson_Template KS

DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS COORESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

PAGE: 1/1



SOIL PROFILE AND TEST DATA

FILE NO.:

Geotechnical Investigation

PG7327

541 Somme Street, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 379637.62 **NORTHING:** 5018860.97 **ELEVATION**: 89.58

PROJECT: **Proposed Commercial Development**

BORINGS BY: CME-55 Low Clearance Drill

REMARKS:						lovemb	er 11, 2024		BH2-24		_
					SAMPLE		DCP.	RESIST. (BLOWS/0 T (50mm DIA. CON	IE)		
SAMPLE DESCRIPTION	STRATA PLOT	(E)	TYPE AND NO.	RECOVERY (%)	N, NC OR RQD	WATER CONTENT (%)	20 △ REMOULDED ▲ PEAK SHE 20	40 60 SHEAR STRENGT EAR STRENGTH, 0 40 60		MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE	STRAI	DEPTH (m)	TYPE	RECO	N, NC (WATE	PL (%) WA	TER CONTENT (% 40 60		MONIT CONS	ELEVA
TOPSOIL and organics 0.10m [89.48m] ,		0 _	200	- S 50	2-3-3-4 6		20	40 00	00		89
1.27m [88.31m] End of Borehole		- - 1— - -	8	62	4-4-50-/ 54/0.1						
Practical refusal to augering at 1.27 m depth		- - - - 2									88
		- - - - -									87
		3									
		- - - - 4									86
		- - - -									8
		5— 									
		- - - -									84

P:/AutoCAD Drawings/Test Hole Data Files/PG73xx/PG7327/data.sqifte 2024-11-14, 14:08 Paterson_Template KS DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS COORESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

PAGE: 1/1



SOIL PROFILE AND TEST DATA

FILE NO.:

Geotechnical Investigation

PG7327

541 Somme Street, Ottawa, Ontario

COORD, SYS.: MTM ZONE 9 **EASTING:** 379649.37 **NORTHING:** 5018891.13 **ELEVATION: 89.68**

PROJECT: Proposed Commercial Development

BORINGS BY: CME-55 Low Clearance Drill

HOLE NO.: BH3-24 **REMARKS:** DATE: November 11, 2024 PEN. RESIST. (BLOWS/0.3m) **SAMPLE** DCPT (50mm DIA. CONE) 20 40 **NATER CONTENT** CONSTRUCTION ġ RECOVERY (%) ELEVATION (m) △ REMOULDED SHEAR STRENGTH, Cur (kPa) STRATA PLOT N, Nc OR RQD SAMPLE DESCRIPTION PIEZOMETER PEAK SHEAR STRENGTH, Cu (kPa) TYPE AND DEPTH (m) 40 60 PL (%) WATER CONTENT (%) LL (%) 20 **GROUND SURFACE** 40 60 80 FILL: Compact, brown silty fine sand to sandy silt with gravel, trace topsoil and organics 3-7-7-6 71 SS 0.30m [89.38m] 14 FILL: Compact, grey silty fine sand to sandy silt **SS** 2 51 50-/-/-/ 0.86m [88.82m] 50/0.05 End of Borehole Practical refusal to augering at 0.86 m depth 88 87

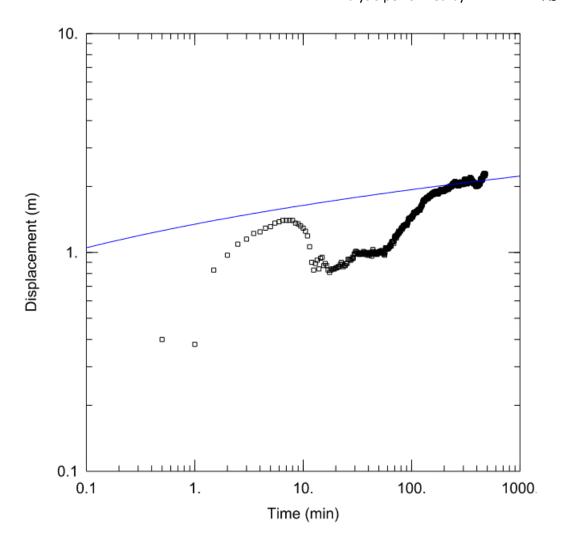
P:/AutoCAD Drawings/Test Hole Data Files/PG73xx/PG7327/data.sqlite 2024-11-14, 14:08 Paterson Template KS

DISCLAIMER: THE DATA PRESENTED IN THIS LOG IS THE PROPERTY OF PATERSON GROUP AND THE CLIENT FOR WHO IT WAS PRODUCED. THIS LOG SHOULD BE READ IN CONJUNCTION WITH ITS COORESPONDING REPORT. PATERSON GROUP IS NOT RESPONSIBLE FOR THE UNAUTHORIZED USE OF THIS DATA.

PAGE: 1/1

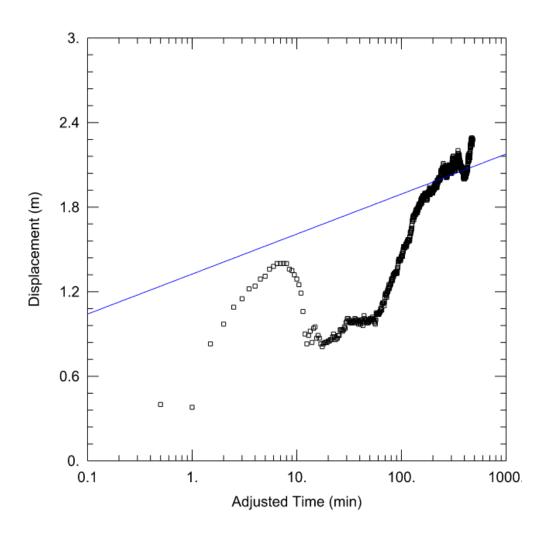
Pumping Test Analysis Report

File No.	PH4991	Well ID:	TW1
Date:	March 4, 2025	Solution Method:	Theis
Client:	Titan Environmental	Transmissitivity (m2/day):	51
Site Address:	541 Somme Street	Storativity	0.0003793
Project:	Site Plan Control Application	Discharge Rate (L/min)	57
		Analysis performed by:	AS



Pumping Test Analysis Report

File No.	PH4991	Well ID:	TW1
Date:	March 4, 2025	Solution Method:	Cooper-Jacob
Client:	Titan Environmental	Transmissitivity (m2/day):	53
Site Address:	541 Somme Street	Storativity	0.0003083
Project:	Site Plan Control Application	Discharge Rate (L/min)	57
		Analysis performed by:	AS



Pumping Test Analysis Report

File No. PH4991

Date: March 4, 2025

Client: Titan Environmental

Site Address: 541 Somme Street

Project: Site Plan Control Application

Summary Table:		
Solution Method:	Well ID:	Transmissitivity (m2/day):
Theis	TW1	51
Cooper-Jacob	TW1	53
Average:		52.00

Average:		3.44E-04	
Cooper-Jacob	TW1	3.08E-04	
Theis	TW1	3.79E-04	
Solution Method:	Well ID:	Storativity	
Summary Table:			

patersongroup541 Somme Street, Ottawa, ON

PREDICTIVE NITRATE IMP.	ACT ASSESS	EMENT
Infiltration Factors		
Topography	0.30	
Soil	0.30	
Cover	0.10	
Total	0.70	
Site Characteristics		
Area of Site :	8014	m^2
Total of roof areas:	415	m^2
Total area of paved driveway areas:	4034	m^2
Roof + paved driveway areas	4449	m^2
Impervious Area	4449	m ²
Percent Impervious Area =	56	%
Infiltration Area =	3565	m^2
Septic Effluent		
Concentration of Effluent (Cs) =	20	mg/L
Infiltration Calculation		
Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	378	mm/yr
Factored Water Surplus =	265	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q_i) =	3	m³/day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_b C_b + Q_e C_e + Q_i C_i)/(Q_b + Q_e + Q_i) = Cum$	nulative Nitrate Concentration	า
Q_b = flow entering the system across the upgradient area	0	m³/day
C _b = background nitrate concentration	0	mg/L
$\mathrm{Q_e}$ = flow entering the system from the septic drainfield	1.1	m³/day
C_e = concentration of nitrates in the septic effluent	20	mg/L
Q_i = flow entering the system from infiltration	3	m³/day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C _T	= 5.97	mg/L
Maximum Allowable Sewage Flow Volume		
Daily Sewage Flow (Qs)=	1.1	m^3

patersongroup

541 Somme Street PH4991

MW1	inputs		
рН	7.85	A	0.20
TDS	995	В	2.42
Calcium	188	С	1.87
Alkalinity	570	D	2.76
Temp.	8.1		
		pHs =	7.290695309

Langel	ier Saturation Index (LSI) Calc	ulation (L	angelier, 1936)	
	LSI = pH - pHs pHs = (9.3 + A + B) - (C + D) Where:	A = (Log10 [TDS] - 1) / 10 B = -13.12 x Log10 (oC + C = Log10 [Ca2+ as CaCC D = Log10 [alkalinity as 0	273) + 34.55 03] - 0.4	
1		LSI =	0.6	
LSI	Effect	LSI =	0.6	
LSI 0.5 to 2	Effect Water is super saturated and tends to precipitate a scale lay	-		
		rer of calcium carbonate (scale for	ming but non-corrosive)	е).
0.5 to 2	Water is super saturated and tends to precipitate a scale lay	er of calcium carbonate (scale for yer of calcium carbonate (slightly	ming but non-corrosive) scale forming and corrosiv	•
0.5 to 2 0 to 0.5	Water is super saturated and tends to precipitate a scale lay Water is super saturated and tends to precipitate a scale la	rer of calcium carbonate (scale for yer of calcium carbonate (slightly A scale layer of calcium carbonate	ming but non-corrosive) scale forming and corrosiv is neither precipitated nor	•

