Aug 15, 2024



PM15625-LET.01

1818 Farm & Cidery 1811 Richardson Side Road Ottawa (Carp), Ontario K0A 1L0

Attention: Ken Hoppner

Subject: Hydrogeological Assessment and Terrain Analysis Zoning Bylaw Amendment 1811 Richardson Side Road Ottawa (Carp), Ontario

INTRODUCTION

Further to your request, Paterson has conducted a Hydrogeological Assessment and Terrain Analysis in support of a Re-Zoning Application for the proposed alteration to the usage for the existing commercial building located at 1811 Richardson Side Road in Ottawa (Carp), Ontario.

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site as well as determine the capacity of the site to attenuate the sewage system impacts to support the Re-Zoning Application for a zoning by-law amendment.

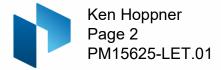
The Subject Site consists of a 11.68 ha lot and is currently occupied by a residential dwelling, located centrally near Bradley Side Road, a centrally located commercial building (Cidery), a commercial building to the south, and an agricultural area located on the northeastern portion of the property with an associated temporary tent-based greenhouse. The south-western portion of the site generally consists of treed areas. The ground surface generally slopes towards the east. There is a sharp slope from the central property to the northeastern agricultural area. The general direction of water flow is towards the Ottawa River to the north.

The Subject Site is bordered on all sides by agricultural lands, with a church and dwelling located to the south of the site. The site has frontage onto Bradley Side Road to the northwest, Huntmar Drive to the northeast and Richardson Side Road to the southeast. The subject site itself and the surrounding commercial areas are zoned AG3 for Agricultural General Subzone 3 (GeoOttawa).

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Hydrogeological Pre-consultation

A Hydrogeological pre-consultation was completed with a City of Ottawa Hydrogeologist on June 23, 2024. The City Hydrogeologist noted that water quantity and quality may be an issue. Evidence was provided from the water well hydrofracking process to increase the quantity and was to be confirmed with the pumping test. An 8-hour pumping test with the standard Subdivision Package suite of parameters, trace metals and Volatile Organic Compounds (VOC's) required by the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG) was determined to be acceptable.

DESCRIPTION OF SUBJECT SITE

The subject site is an approximately 11.68 ha lot and is currently occupied by a two-storey residential dwelling, a commercial building to the south with associated parking and storage, a commercial building (Cidery), and agricultural lands to the east, with an associated temporary tent-based greenhouse. The Re-zoning Application is for a zoning by-law amendment to increase the number of guests allowed at a new commercial building. Please refer to Figure-1 Key Plan, attached, for the proposed site location.

The residential dwelling is currently serviced by an onsite sewage system and an existing private drilled well. A newly drilled well was installed in 2022 to service the Cidery and a new sewage system will be required to service the proposed change of use . At this time no site plan has been completed.

The newly drilled well, hereafter referred to as Test Well 1 (TW1), is the well which is currently servicing the Cidery and will continue to service the building following the completion of construction. The property owner will need to ensure that protective measures are taken to protect the wellhead, such as the use of a barrier, during construction.

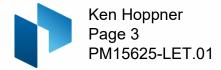
The suitability of the aquifer to supply the subject site was assessed using the methodology provided in City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG).

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

MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan (MRSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site and surrounding areas have not been designated as a Significant Groundwater Recharge Area (SGRA), Highly Vulnerable Aquifer (HVA), or Intake Protection Zones (IPZ) Zone within the MRSPP.

There are no related requirements for this site relative to the MRSPP.



FIELDWORK PROGRAM

Well Inspection

A visual inspection of TW1 was performed by Paterson personnel which confirmed that the well casing and cap are in good condition. The final grading around the well will be sufficiently graded to direct surface water away from the wellhead (as required by O.Reg 903) at the time of the new sewage system installation. The stick-up was measured to be 0.49 m above ground surface. Based on a visual inspection by Paterson personnel, the well was deemed to be in good condition.

Well Testing

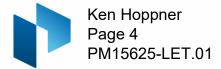
As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, TW1 was tested. TW1 has a Water Well Record (WWR) Well ID of A342224 with a 152.4 mm diameter steel casing that extends to 20.1 m below ground surface (bgs) and a 0.49 m stick-up. The well itself extends to a depth of 121.9 m bgs. Based on available geological mapping, the drift thickness at TW1 varies from 15 to 25 m.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to an 8-hour constant rate pumping test. The pumping test was conducted on June 25, 2024 under the full-time supervision of Paterson personnel. Prior to the pumping test the well was disinfected as per the MECP Disinfection Instruction Sheet, and a data-logger was installed to monitor the background groundwater levels.

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

The pumping test was carried out at a pumping rate of 30 L/min for a duration of 8 hours. During the pumping test, the pumping rate was periodically measured using the timed volume correlation method. The pumping rate was maintained within 5% of the selected pumping rate. The static water level was recorded manually and an electric datalogger (VanEssen TD-Diver) was installed in the test well prior to the start of the pumping test.

The selected rate of 30 L/min provides approximately 1.4 times the maximum total daily design volume of 10,000 L/day for the subject site during the 8-hour pumping test. The total daily design sanitary sewage flows (TDDSSF) are proposed to remain below the limit of 10,000 L/day as set out by the Ontario Building Code (OBC) not require a large-scale subsurface sewage system.



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

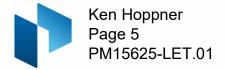
Recovery data was collected from the well following the completion of the pumping. The well was noted to have achieved 95% recovery approximately 13 hours after the completion of pumping.

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 were sampled 8 hours after the start of pumping.

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 8hour pumping test. The parameters tested at the well head included: pH, total dissolved solids, conductivity, turbidity, true colour, and temperature. Calibration / confirmation of calibration of all field-testing equipment was performed in Paterson's laboratory the day prior to the pumping test. Values are then confirmed again onsite prior to the start of the pumping test.

Due to elevated readings for turbidity, colour, and aluminum levels encountered during the pumping test, Paterson personnel returned to the site on July 19, 2024 to collect an additional untreated sample under normal operating conditions of TW1.



Aquifer Analysis

Water Quantity

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

Table 1: SUMMARY OF WATER SUPPLY AQUIFER CHARACTERISTICS OF TW1							
AQUIFER PARAMETER	RESULT OF ANALYSIS						
Transmissivity (m²/day)	1.68						
Pumping Rate (L/min)	30						
Pre-test Static Water Level (m)	4.25						
Post-test Static Water Level (m)	19.47						
Available Drawdown (m)	118.16						
% Drawdown During Pumping Test (%)	13						
Specific Capacity (L/min/m drawdown)	1.97						

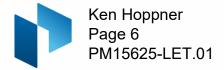
The drawdown data was analyzed using the Theis and Cooper Jacob methods of analysis. Aquifer transmissivity is estimated to be 1.68 m²/day. Refer to the Theis and Cooper Jacob methods of analysis data sheets attached to this report.

The pumping test results show that TW1 has a high yield to support the water demands that may be required. Overall maximum drawdown at a constant pumping rate for a period of 8 hours was approximately 15.22 m at approximately 8 hours into the pumping test (13% of the available drawdown). 95% recovery was achieved approximately 13 hours after the end of pumping.

The total volume of water pumped during the 8-hour pumping event was approximately 14,400 L. This is approximately 1.4 times the maximum total daily design volume of water (10,000 L/d) required to support the Re-Zoning Application for all uses on the property.

The suitability of the aquifer to supply the proposed Re-Zoning Application for the proposed commercial modification was assessed using the methodology provided in the City of Ottawa 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 maximum site requirements under OBC.

Given the analyses presented and summarized above, it is our opinion that there is an adequate supply of water to support the proposed Re-Zoning 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 WWR's are attached to this report.

Water Quality

Field Data

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

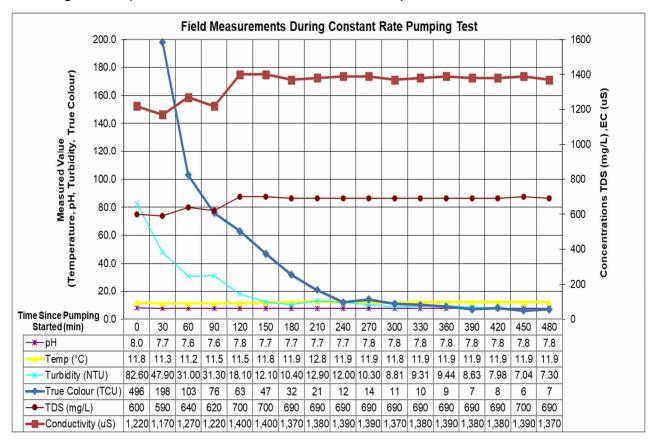
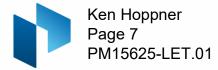


Figure 1: Field Testing Results



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 laboratory analytical testing was completed and measured to be non-detect in the sample results and is provided in Table 2c. All laboratory test results can be found attached to this report.

TABLE 2a: GROUNDWATE	R MICROBIC	DLOGY & GE	NERAL GEO	CHEMISTRY						
	LE 2a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY ODWS TW1									
PARAMETER	UNITS	LIMIT	TYPE	TW1 GW1 (4 hr) 6/25/2024	TW1 GW2 (8 hr) 6/25/2024	TW1 GW-3 7/19/2024				
MICROBIOLOGICAL										
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0	0	-				
Total Coliforms	ct/100mL	0	MAC	0	0	-				
GENERAL CHEMICAL - HE	ALTH RELAT	TED			ł					
Fluoride (F)	mg/L	1.5	MAC	1.32	1.34	-				
Ammonia (N-NH ₃)	mg/L	-	-	0.259	0.263	-				
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	-	-	1.460	0.483	-				
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	12.00	7.30	0.56				
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	11.5	7.1	3.3				
GENERAL CHEMICAL - AE	STHETIC RE	LATED								
Alkalinity (as CaCO3)	mg/L	30-500	OG	225	225	-				
Chloride (CI)	mg/L	250	AO	85	86	-				
Colour (Apparent)	TCU	5	AO	10	10	12				
Colour (Field - True)	TCU	5	AO	12	7	0				
Conductivity	uS/cm	-	-	1,350	1,370	-				
Dissolved Organic Carbon	mg/L	5	AO	1.3	1.0	-				
Hardness (as CaCO3)	mg/L	100	OG	356	360	-				
Ion Balance	unitless	-	-	1.01	1.02	-				
pН	unitless	6.5-8.5	AO	7.97	8.04	-				
Phenols	mg/L	-	-	<0.001	<0.001	-				
Sulphate (SO ₄)	mg/L	500	AO	388	394	-				
Sulphide (S2 ⁻)	mg/L	0.05	AO	0.95	1.16	-				
Tannin & Lignin	mg/L	-	-	0.20	0.30	-				
Total Dissolved Solids	mg/L	500	AO	944	959	-				

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

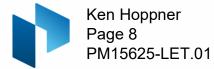


TABLE 2b: GROUNDWA		1	WS					
			1	- TW1				
PARAMETER	UNITS	LIMIT	TYPE	TW1 GW1 (4 hr) 6/25/2024	TW1 GW2 (8 hr) 6/25/2024	TW1 GW-3 7/19/2024		
METALS								
Aluminum (Al)	mg/L	0.1	OG	0.43	0.34	0.02		
Antimony (Sb)	mg/L	0.006	IMAC	< 0.0005	< 0.0005	-		
Arsenic (As)	mg/L	0.01	IMAC	< 0.001	<0.001	-		
Barium (Ba)	mg/L	1.0	MAC	0.19	0.19	-		
Beryllium (Be)	mg/L	-	-	< 0.0005	<0.0005	-		
Boron (B)	mg/L	5.0	IMAC	0.43	0.44	-		
Cadmium (Cd)	mg/L	0.005	MAC	< 0.0001	< 0.0001	-		
Calcium (Ca)	mg/L	-	-	74	75	-		
Chromium (Cr)	mg/L	0.05	MAC	0.001	<0.001	-		
Cobalt (Co)	mg/L	-	-	0.0002	<0.0002	-		
Copper (Cu)	mg/L	1.0	AO	< 0.001	<0.001	-		
ron (Fe)	mg/L	0.3	AO	0.68	0.44	-		
Lead (Pb)	mg/L	0.01	MAC	< 0.001	<0.001	-		
Magnesium (Mg)	mg/L	-	-	42	42	-		
Manganese (Mn)	mg/L	0.05	AO	0.02	0.02	-		
Mercury (Hg)	mg/L	0.001	MAC	< 0.0001	< 0.0001	-		
Molybdenum (Mo)	mg/L	-	-	< 0.005	<0.005	-		
Nickel (Ni)	mg/L	-	-	< 0.005	<0.005	-		
Potassium (K)	mg/L	-	-	6	6	-		
Selenium (Se)	mg/L	0.05	MAC	< 0.001	<0.001	-		
Silver (Ag)	mg/L	-	-	< 0.0001	<0.0001	-		
Sodium (Na)	mg/L	200	AO	181	186	-		
Strontium (Sr)	mg/L	-	-	2.64	2.72	-		
Thallium (TI)	mg/L	-	-	< 0.0001	<0.0001	-		
Uranium (U)	mg/L	0.02	MAC	< 0.001	<0.001	-		
Vanadium (V)	mg/L	-	-	0.001	<0.001	-		
Zinc (Zn)	mg/L	5.0	AO	<0.01	<0.01	-		

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2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

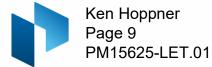


TABLE 2c: GROUNDWATER GEOCHEMISTRY - VOLATILES								
ODWS TW1								
				- IV	V1			
PARAMETER	UNITS	LIMIT	TYPE	TW1 GW1 (4 hr)	TW1 GW2 (8 hr)			
				6/25/2024	6/25/2024			
VOCs Surrogates								
1,2-dichloroethane-d4	%	-	-	122	109			
4-bromofluorobenzene	%	-	-	71	72			
Toluene-d8	%	-	-	110	113			
Volatiles								
1,1,1,2-tetrachloroethane	μg/L	-	-	<0.5	<0.5			
1,1,1-trichloroethane	μg/L	-	-	<0.4	<0.4			
1,1,2,2-tetrachloroethane	<u>μ</u> g/L	-	-	<0.5	<0.5			
1,1,2-trichloroethane	μg/L	-	-	<0.4	<0.4			
1,1-dichloroethane	μg/L	-	-	<0.4	<0.4			
1,1-dichloroethylene	μg/L	14.0	MAC	<0.5	<0.5			
1.2-dichlorobenzene	μg/L	200.0	MAC	<0.3	<0.3			
1.2-dichloroethane	μg/L	5.0	IMAC	<0.4	<0.4			
1,2-dichloropropane	μg/L μg/L	-	-	<0.2	<0.2			
1,3,5-trimethylbenzene	μg/L μg/L	-		<0.3	<0.3			
1,3-dichlorobenzene	μg/L μg/L	-	-	<0.3	<0.3			
1,3-Dichloropropylene (cis+trans)	μg/L μg/L	-	-	<0.4	<0.4			
1.4-dichlorobenzene	μg/L	5.0	MAC	<0.3	<0.3			
Acetone		5.0	IVIAC	<30	<0.4			
	μg/L	1.0	MAC	<0.5	<0.5			
Benzene Bromodichloromethane	μg/L	-	IVIAC	<0.5	<0.5			
	μg/L		-					
Bromoform	μg/L	-	-	<0.4	<0.4			
Bromomethane	μg/L	-	-	<0.5	<0.5			
c-1,2-Dichloroethylene	μg/L	-	-	<0.4	<0.4			
c-1,3-Dichloropropylene	μg/L	-	-	<0.2	<0.2			
Carbon Tetrachloride	μg/L	2.0	MAC	<0.2	<0.2			
Chloroethane	μg/L	-	-	<0.2	<0.2			
Chloroform	μg/L	-	-	<0.5	< 0.5			
Dibromochloromethane	μg/L	-	-	<0.3	<0.3			
Dichlorodifluoromethane	μg/L	-	-	<0.5	< 0.5			
Dichloromethane	μg/L	50	MAC	<4.0	<4.0			
Ethylbenzene	μg/L	140	MAC	<0.5	< 0.5			
Ethylene Dibromide	μg/L	-	-	<0.2	<0.2			
Hexane	μg/L	-	-	<5	<5			
m/p-xylene	μg/L	-	-	<0.4	<0.4			
Methyl Ethyl Ketone (MEK)	μg/L	-	-	<2	<2			
Methyl Isobutyl Ketone (MIBK)	μg/L	-	-	<5	<5			
Methyl Tert Butyl Ether (MTBE)	μg/L	15	AO	<2	<2			
Monochlorobenzene	μg/L	80	MAC	<0.5	<0.5			
o-xylene	μg/L	-	-	<0.4	<0.4			
Styrene	μg/L	-	-	<0.5	<0.5			
t-1,2-Dichloroethylene	μg/L	-	-	<0.4	<0.4			
t-1,3-Dichloropropylene	μg/L	-	-	<0.2	<0.2			
Tetrachloroethylene	μg/L	10	MAC	<0.3	<0.3			
Toluene	μg/L	60	MAC	<0.4	<0.4			
Trichloroethylene	μg/L	5	MAC	<0.3	<0.3			
Trichlorofluoromethane	μg/L	-	-	<0.5	<0.5			
Vinyl Chloride	μg/L	1	MAC	<0.2	<0.2			
Xylene; total	μg/L	90	MAC	<0.5	<0.5			

1. ODWS identifies the following types of parameters:

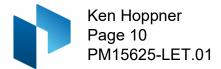
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The bacteriological test results (Certificate of Analysis – Report No. 3966666) indicated that the test samples at the 4 and 8 hour interval were non-detect (0 ct/100 mL) for E.Coli and Total Coliforms.

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

- □ Hardness (as CaCO₃)
- □ Total Dissolved Solids (TDS)
- □ Iron (Fe)
- Total Sulphides
- □ Aluminum (AI)
- □ Colour
- □ Turbidity

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

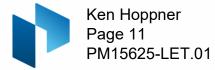
Should any water treatment be desired by the owner, it is recommended that a water treatment specialist be retained to ensure that water treatment occurs in a safe manner.

Hardness as CaCO₃

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentrations of 356 and 360 mg/L, the water is considered to be very hard, however, it is below the reasonable treatable limit of 500 mg/L specified in Table 3 of the MOECC guidance document Procedure D-5-5 (1996).

The Langelier calculation provided an LSI of 0.0. Based on the evaluation of the result, the water is saturated and tends to precipitate a scale layer of calcium carbonate (scale forming and mildly corrosive). Based on the range of stability, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

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



conditions; major contributors to hardness (calcium and magnesium) are not of direct public health concern".

Total Dissolved Solids (TDS)

TDS refers to the concentration of inorganic substances dissolved in water. The main constituents are typically chloride, sulphates, calcium, magnesium, and bicarbonates. The TDS concentration of 944 and 959 mg/L, at the 4- and 8-hour points, respectively, exceeds the Aesthetic Objective of 500 mg/L. At concentrations above 500 mg/L, some consumers may find the taste objectionable, however, as the objective is an aesthetic objective, no treatment is required. It is recommended that a point of use reverse osmosis unit be installed, if the owner desires, for drinking purposes. As such, no taste problems will occur when the system is used.

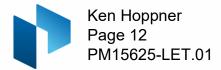
The Langelier calculation provided an LSI of 0.0. Based on the evaluation of the result, the water is saturated and does not tend to precipitate a scale layer of calcium carbonate (non-scale forming and non-corrosive). Based on the range of stability in the positive direction, there are no mitigative measures needed. See Langelier Saturation Index Calculation attached for calculation details.

Iron

Concentrations of iron above 0.3 mg/L can contribute to staining of fixtures and a metallic taste at higher concentrations. Precipitation of iron can promote the growth of iron bacteria in pipes. The concentration of iron in the groundwater in TW1 was measured to be 0.68 and 0.44 mg/L. The concentration of iron in the groundwater in the test well is considered to be reasonably treatable in accordance with Procedure D-5-5. It is recommended that 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.

Total Sulphides

Total sulphides were reported to be present within the water supply aquifer at concentrations of 0.95 and 1.16 mg/L. These can present as compounds such as iron sulphide or hydrogen sulphide. The value noted is for the total sulphides within the sample as there is no laboratory test for only hydrogen sulphide. Hydrogen sulphide is a gas that is heavier than air and has a very distinct "rotten egg" odour. Through the latter portion of the test, a faint odour was detected periodically. The aesthetic objective for hydrogen sulphide, which is incidentally also the threshold of the average human olfactory detection, is 0.05 mg/L. Field testing noted values in the range of 0 to 0.1 mg/L, which is in line with the minor olfactory observation. MECP Procedure D-5-5 does not indicate a maximum treatable limit for sulphide. One method to remove hydrogen sulphide, if desired, is a chlorine feeder and filter through oxidation or equivalent method recommended by a water treatment professional.



Aluminum

Aluminum was reported to be present within the water supply aquifer at concentrations of 0.43 and 0.32 mg/L at the 4- and 8-hour marks, respectively. Aluminum has an OG of 0.1 mg/L where an exceedance may cause coating of pipes in the distribution system and flocculation in the distribution system. Aluminum has a federal health related guideline MAC of 2.9 mg/L, which was not exceeded. During a revisit to the subject site and resample, the aluminum concentration was 0.02 mg/L, indicating that TW1 operating under normal usage meets the required guidelines.

Colour

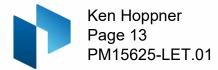
Colour may occur in drinking water for several reasons. It may be due to organic substances from the decay of vegetation, or the presence of metals such as iron, manganese, and copper, which are abundant in nature. The provincial aesthetic objective for colour in drinking water is 5 True Colour Units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

During the field pumping test, a DR900 colorimeter was used to measure true colour in the groundwater at regular intervals. Field testing for colour had values of 12 and 7 TCU. Laboratory testing showed colour values of 10 TCU during the field test and 12 TCU from the revisit. True colour in the groundwater was measured as 0 TCU during regular usage which is below the aesthetic objective of 5 TCU. The elevated apparent colour levels detected in the lab samples is attributed to the precipitation of iron and manganese out of the groundwater.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 11.5 and 7.1 NTU at the 4 hour and 8 h mark of the pumping test, and at 3.3 NTU during regular usage. Field testing of turbidity showed values of 12, and 7.3 NTU at the 4- and 8-hour mark of the pumping test and 0.56 NTU during regular usage. The test during regular usage was completed during the resample visit. Continued pumping showed a gradual decrease towards the end of the pumping test. The rented pump would have disturbed any precipitate in the water column during its installation and removal of the existing pump. This is demonstrated by the reduction in turbidity and iron during the pumping test, further corroborated by the reduction in turbidity under normal usage.

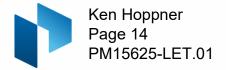
The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU. In accordance with Procedure D-5-5, Table 2 does not reflect a maximum concentration considered reasonably treatable for Turbidity. Rather,



Procedure D-5-5 indicated that "particular care must be taken during testing to ensure that the bacteria requirements of Table 1 are met." Based on the test results, the bacteria requirements of Table 1 of D-5-5 have been met (E.Coli = 0 and Total Coliforms = 0).

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at concentrations of 181 and 186 mg/L, which does not exceed the ODWS aesthetic objective of 200 mg/L. Although sodium is not toxic and no maximum acceptable concentration has been set, concentrations above 20 mg/L require that the Medical Officer of Health be notified of the water quality results, so that this information may be passed on to local physicians for use in treatment of those requiring a sodium-restricted diet. It should be noted that some water treatment technologies, such as water softeners, can increase the sodium concentration so care should be given if such treatment technologies are used.



Terrain Analysis

Surficial Geology

The subsurface conditions are mapped to be fine-textured glaciomarine deposits, mainly consisting of silt and clay, underlying the eastern side of the property; while the western side of the property is mapped to be underlain by stone-poor sandy-silt to silty-sand textured till (OGS MRD218, 2022). The bedrock geology is mapped to be limestone and shale of the Verulam formation of the Simcoe Group (OGS MRD219).

Drift thickness is mapped to be 15 to 25 m bgs, which coincides with neighbouring water well records. The WWR for TW1 showed an overburden thickness of 18m.

Hydrogeological Sensitivity of the Site

The subject site currently contains a two-storey residential dwelling, a commercial building to the south with associated parking and storage, a commercial building (Cidery), and agricultural lands to the east. The subject site is bordered on all sides by agricultural lands, with a church and dwelling located to the south of the site. The site fronts onto Bradley Side Road to the north-west, Huntmar Drive to the north-east and Richardson Side Road to the south-east. All surrounding properties are on private services. The adjacent properties are serviced by private wells and septic systems.

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

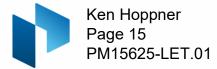
To corroborate our position in this matter, the water quality of the bedrock aquifer accessed by the onsite drilled potable supply well shows no indication of surface water or surface impacts from sewage system effluent.

Conceptual Lot Development

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

Sewage System Design and Total Daily Design Sewage Flow

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



include the existing residence. Any associated flows with the residence will be counted towards the total site capacity in the site plan application.

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

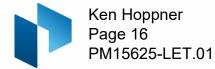
Predictive Nitrate Impact Assessment

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

A detailed impact assessment is required due to the proposed zoning of the site. In order to demonstrate that private services would adequately support the proposed Re-zoning Application, a predictive nitrate impact assessment for the subject site was completed. This calculation was completed to determine the maximum sewage flow volume which could be applied to the subject site with the current site conditions and without the use of tertiary treatment systems (nitrate reducing systems). The values shown in the Predictive Nitrate Impact Assessment calculation attached to this report are summarized below:

□ Site area	11.68 ha
□ Impervious area (%)	7 %
 Concentration of nitrate in effluent (Value based on typical effluent concentration) 	40 mg/L
Surplus Water (The surplus water value was estimated based on Environm values with a soil type comprised of a mixture between clay (Mature Forest) and anthropogenic sources.)	
 Combined infiltration factor based on: Topography infiltration factor Soil texture infiltration factor Cover infiltration factor 	0.45 0.10 0.20 0.15

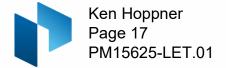
The topography infiltration factor of 0.10 is based upon a hilly land with an average slope of 28 to 47 m/km. The soil texture infiltration factor was based upon "medium combinations of clay and loam" with a value of 0.2 which is a reasonable generalization based upon the site investigations and available geological mapping. The "cover



infiltration factor" was calculated at 0.15 based upon the mix of tree cover and cultivated land.

The predicted nitrate concentration calculation for a conventional sewage system (system without nitrate reduction) results in a maximum of **14.16** m^3/day of an effluent using a nitrate concentration of 40 mg/L. This maximum is significantly more than the proposed maximum daily usage of 10 m^3/d .

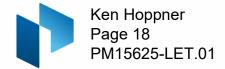
Based on the results of the predicted nitrate impact assessment, it is our opinion that the property can adequately support the proposed re-zoning without having an adverse impact on the underlying bedrock aquifer.



CONCLUSIONS

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

- 1. The water supply aquifer intercepted by the existing well is considered to be adequate to support the water quantity demands for the proposed building addition.
- 2. Based on a visual inspection performed by Paterson personnel, the well casing, stickup, and well cap are in compliance with O.Reg 903. The final grading around the well will be sufficiently graded to direct surface water away from the wellhead at the time of the new sewage system installation.
- 3. The preferred water supply intercepted by TW1 contains a water supply that is potable, and contains only elevated concentrations of hardness, TDS, and iron. The noted parameters can be treated with current readily available water conditioning equipment.
- 4. Colour, turbidity, and aluminum were measured to be elevated in initial laboratory testing. A resample was completed at a later date. The field testing of the resample showed 0 TCU for colour and 0.56 NTU for turbidity. Laboratory testing for aluminum was under the operational guideline at the resample. These values represent typical usage of TW1.
- 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. If desired, a point-of-use reverse osmosis system can be used to provide a drinking tap source without increasing sodium levels.
- 6. The sodium concentration was measured to be above the 20 mg/L reporting limit and, as such, the Medical Officer of Health for the City of Ottawa should be informed to assist area physicians in the treatment of local residents on sodium reduced diets. It should be noted that some water treatment equipment may further increase the sodium concentration.
- 7. The predicted nitrate concentrations at the property boundary is calculated to be below the required 10 mg/L threshold when a conventional treatment system is used for greater than 10,000 L/day.



- 8. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction.
- 9. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed rezoning application with respect to water quality, quantity and sewage system effluent (>10k L/day) attenuation within the property boundary.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Michael S. Killam, P.Eng.

Alexander Schopf, PhD, EIT

Attachments:

- Key Plan
- MECP Water Well Records
- Eurofins Certificate of Analysis
- AQTESOLV Pumping Test Analysis Reports
- Nitrate Impact Assessment Calculations
- □ Langelier Saturation Index (LSI) Calculation



Ottawa Head Office 9 Auriga Drive Ottawa – Ontario – K2E 7T9 Tel: (613) 226-7381 Ottawa Laboratory 28 Concourse Gate Ottawa – Ontario – K2E 7T7 Tel: (613) 226-7381 Northern Office and Laboratory 63 Gibson Street North Bay – Ontario – P1B 8Z4 Tel: (705) 472-5331





FIGURE 1

KEY PLAN



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	7-18 1 🖸 STEEL 19 2 🔲 GALVANIZED	20-23 DEPTH SE	TAT - FEET	AL AND TYPE (CEMENT GROUT) LEAD PACKER, ETC.)
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30-33 _ FRESH 3 _ SULPHUR 34 80 2 _ SALTY 4 _ MINERAL	2 🔲 GALVANIZED 3 🗔 CONCRETE	27-30 18-2		
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PUMPING 19-21 22-24 15 MINUTES 30 MIN 26-28 26-28 26-28 15 MINUTES 30 MIN	24 RECOVERY	LOT LINE. INDIC	ATE NORTH BY ARROW.	ALL THOM ROAD AND
T IF FLOWING, GIVE RATE 38-41 PUMP INTAKE SET AT	29-31 32-34 35-37 FEET 075 FEET 075 FEET WATER AT END OF TEST 42		,	
U FEET 65 FEET 55 IF FLOWING, 38-41 PUMP INTAKE SET AT GIVE RATE GPM RECOMMENDED PUMP TYPE RECOMMENDED PUMP	FEET 1 CLEAR 2 CLOUDY		el .	110, 12"
C SHALLOW DEEP SETTING OSO	43-45 RECOMMENDED 46-49 PUMPING FEET RATE 0005 GPM		K	462
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STATUS	ABANDONED, POOR QUALITY	¥		
55-56 1 COMESTIC 5 C	OMMERCIAL	0.0	4	
WATER 0 3 IRRIGATION 7 PI	UNICIPAL UBLIC SUPPLY DOLING OR AIR CONDITIONING	\sim	Ŕ	
57 OTHER	9 🔲 NOT USED	Richards	on Side 1	Road.
METHOD Image: Cable tool 2 Image: Conventional 2 Image: Conventional 0F 3 Image: Conventional	6 [] BORING 7 [] DIAMOND 8 [] JETTING			
DRILLING 4 D ROTARY (AIR) 5 D AIR PERCUSSION	9 C DRIVING	ILLERS REMARKS.	P	
ADDRESS	LICENCE NUMBER	DATA 58 CONT		EIVED 3010 75 63-68 80
	LTO 1558	DATE OF INSPECTION	INSPECTOR	0100
BOY 490 STITTSUILL NAME OF DRILLER OR BORER		22/05/79 REMARKS:	1 Kn7	1
SIGNITURE OF CONTRACTOR	SUBMISSION DATE		\	
MINISTRY OF THE ENVIRONMENT				5.58
MINISTRY OF THE ENVIRONMEN	11 COPY			FORM NO. 0506-4-77

Ministry of the			Water Resources		55d
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	LOG OF OVERBURDEN AND BEDROCK	MATERIALS (SEE IN	(STRUCTIONS)	DEPTH	· FEET
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Grup Haulpan	boulders		king	32	34
Hree Limestone	,	0	lum	34	115-
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NAME OF WELL CONTRACTOR LICENCE NUMBER Capital Water Supply Ltd. 1558 ADDRESS APR 1 1 1988 Dox 490: Stittsville, Ont. KOA 3CO NAME OF WELL TECHNICIAN'S J. MOORE Signat/Le of Technician/Contractor Submission Date Or Mathematical And Contractor Submission Date Out of the of th		S AIR PERCUSSION	·····						SZ DATE RECEIN	£0	63-68
Box 490: Stittsville, Ont. KOA 3G0 NAME OF WELL YECHNICIAN SUBMISSION DATE J. MOORE SIGNAT/REOF TECHNICIAN/CONTRACTOR MULL ALCONTRACTOR SUBMISSION DATE O CGC.ES FORM NO ORDE 11/20100 CGC.ES			LIC	CENCE NUMBER		SOURCE		·	APF		1
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Altrelarant mo CZ VR. ST 5 Coc. BS				ELL TECHNICIAN'S CENCE NUMBER		REMARKE					
	Signaty			\rightarrow \sim	OFFI					Cor	. B.S
	MINI	STRY OF THE ENVIRO		1R/2¥	┙┗╼┵				F	ORM NO. 0506 ((11/86) FORM

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Mini:				ntario Water Resourc	
of th Envi	ronment	WAT	ER	WELL	RECORD
Ontario	1. PRINT ONLY IN SPAC	ces provided	15260	23 150,05	
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Ottawa C	ST) 24-47	West Carleton	<u> </u>	1	DATE COMPLETED 46-53
	Whitford Ltd.	C-20 2285 St.Lauren	eLEVATION	RE MASIN CODE	DAY 21 NO 10 YR 91
21	ZONE EASTING T L L L L L M 10 12	K4G H# 426 PC.			
	LOG	OF OVERBURDEN AND BEDROC	K MATERIAI	S (SEE INSTRUCTIONS)	DEPTH - FEET
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50-53	54		(nunderbird well
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OF WELL	SS-56 I 20 DOMESTIC			5	CUL X + 185
WATER	2 STOCK 3 I IRRIGATION	6 MUNICIPAL 7 DE PUBLIC SUPPLY	-	Y	
USE	4 🗍 INDUSTRIAL	COOLING OR AIR CONDITIONING D NOT USED	6	5	
метнор	57 1 CABLE TOOL 2 ROTARY (CONVENTIO	6 DORING 7 DIAMOND			
OF CONSTRUCT	3 C ROTARY (REVERSE)	I JETTING DRIVING		Richardson	$^{\text{Side}}$ 100188
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	L Water Supply Lt	LICENCE NUMBER	DATE OF INS	1558	JAN 1 3 1992
U) Stittsville, C		R.		
Box 490 NAME OF WE OS Mill SIGNATURE O	ler	WELL TECHNICIAN'S LICENCE NUMBER TO096			
SIGNATURE O	OF TECHNICIAN / CONTRACTOR	SUBMISSION DATE DAY 25 MO. 10 YR.91	OFFICE		CSSIED
MINIST	RY OF THE ENVIRON		t		FORM NO. 0506 (11/86) FORM 5

Mini	strv		Th	e Ontar	io Water Resour	ces Act		
of th	ie	WA			/ELL		CO	RD
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Jacques	Whitford Ltd.	C-20 2285 St. La	AUTENT BIV	d Otta	Wa, Ontario	DAY	<u>ин на на</u>	<u> </u>
21				<u> </u>		<u> </u>		
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-		9 DRIVING	DRILLERS F	EMARKS			113	303
NAME OF WELL	CONTRACTOR	WELL CONTRACTO				DATE RECEIVED		63-68 80
Capital	Water Supply L		z	INSPECTION	1558	APR	3 0 1997	2
	Stittsville,	Ontario K2S 1A6]SE					
151	er/ J. Moore	WELL TECHNICIA LICENCE NUMBER		S.				
NNV	TECHNICIAN/CONTRACTOR	SUBMISSION DATE					250	- Fr
	RY OF THE ENVIRO					FO	ORM NO. 0506 (1	

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Ontario Enviro	I PRINT ONLY IN	SPACES PROVIDED	15270		
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[ZUNE EASTING	NORTHING	f & Athletie	c Club Carp, Ontario	<u>14 мо 01 ук 93</u>
			25 26	30 31	
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Gray	Hardpan	Boulders		HArd	13 36
Gray	Limestone	Black Layers		Medium	36 90
WATER FOUND AT - FEET KI 10-13 1 FRE 54 2 SAI 15-18 1 FRI 20-23 NOT FRI 20-23 NOT FRI 20-33 1 FRE 20-33 1 FRI 30-33 1 FRI 30-33 <th>LTY 4 MINERALS 6 GAS 19 4 MINERALS 19 LTY 6 GAS LTY 6 GAS LTY 6 GAS SME 4 MINERALS LTY 6 GAS SME 4 MINERALS CSME 4 MINERALS SSME 4 MINERALS SSME 4 MINERALS SSME 4 MINERALS SSH 3 SULPHUR 4 MINERALS SSH 3 SULPHUR 4 GAS SSH 3 SULPHUR 4 GAS SSH 4 MINERALS 10 GAS 5 SSH GAS Corr PUMPING RATE LTY 5 SA 1 VMPING 22:24 SS 41 SA PUMP INTAKE SI GRM 9</th> <th>6 1/4 1 STEEL 12 GALVANIZED 3 CONCRETE 4 OPPEN HOLE 5 □ PLASTIC 17.19 1 □ STEEL 19 2 □ GALVANIZED 3 □ CONCRETE 4 QOPEN HOLE 5 □ PLASTIC 24-25 24-25 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 QOPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 □ PLASTIC 1 □ STEEL 27 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 □ PLASTIC 1 □ STEEL 27 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 1 □ STEEL 27 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 4 □ OPEN 4 □ OPEN 4</th> <th>DEPTH - FEET RUM TO 0 40¹⁶ 20-23 40 90 27-30</th> <th>Islot NO , MATERIAL AND TYPE 61 PLUGGING & SI DLPTH SET AT - FEET FROM 10 10-13 14-17 40 2 26-29 30-33 26-29 30-33 ADCCATION OF W RAM BELOW SHOW DISTANCES OF WE</th> <th>ELL FROM ROAD AND</th>	LTY 4 MINERALS 6 GAS 19 4 MINERALS 19 LTY 6 GAS LTY 6 GAS LTY 6 GAS SME 4 MINERALS LTY 6 GAS SME 4 MINERALS CSME 4 MINERALS SSME 4 MINERALS SSME 4 MINERALS SSME 4 MINERALS SSH 3 SULPHUR 4 MINERALS SSH 3 SULPHUR 4 GAS SSH 3 SULPHUR 4 GAS SSH 4 MINERALS 10 GAS 5 SSH GAS Corr PUMPING RATE LTY 5 SA 1 VMPING 22:24 SS 41 SA PUMP INTAKE SI GRM 9	6 1/4 1 STEEL 12 GALVANIZED 3 CONCRETE 4 OPPEN HOLE 5 □ PLASTIC 17.19 1 □ STEEL 19 2 □ GALVANIZED 3 □ CONCRETE 4 QOPEN HOLE 5 □ PLASTIC 24-25 24-25 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 QOPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 24-25 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 □ PLASTIC 1 □ STEEL 27 4 □ OPEN HOLE 5 □ PLASTIC 1 □ STEEL 26 2 □ PLASTIC 1 □ STEEL 27 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 1 □ STEEL 27 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 2 □ PLASTIC 2 □ PLASTIC 4 □ OPEN HOLE 5 □ PLASTIC 4 □ OPEN 4	DEPTH - FEET RUM TO 0 40 ¹⁶ 20-23 40 90 27-30	Islot NO , MATERIAL AND TYPE 61 PLUGGING & SI DLPTH SET AT - FEET FROM 10 10-13 14-17 40 2 26-29 30-33 26-29 30-33 ADCCATION OF W RAM BELOW SHOW DISTANCES OF WE	ELL FROM ROAD AND
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DI MARE OF WELL TEC J. MOORE SIGNATURE OF TECH	NICIAN/CONTRACTOR	LICENCE NUMBER TOO96 SUBMISSION DATE DAY _20 MO. 01 YR.23		· · · · · · · · · · · · · · · · · · ·	CSS.65 FORM NO. 0506 (11/86) FORM 9

🕅 Ontario	Ministry of the Environment	Well Tag Number (Plac 		 A state of the sta	lation 903 Ontario	Well Record Water Resources Act
Instructions for Comple	eting Form	A 0545	ige			page <u>2 of</u> 3
 Questions regarding of All metre measurem 	ce of Ontario only. This completed in full to avo completing this applicati ents shall be reported	o delays in processin on can be directed to	n Further instruction	tions and explanation Anagement Coord	ns are available on inator at 416-235-	
 Please print clearly in Well Owner's Informati 		lell Information	MUN		nistry Use Only	LOT
First Name	Last Namo	ESBYTERA	iling Address (Stree	et Number/Name, RR	Lot,Concession)	
County/District/Municipality	Township	City/Town/Village	<u>//O</u> /V)C Province	Postal Code	, Telephone Nur	mber (include,area code)
Address of Well Location (Cou	nty/District/Municipality)	TAWA	Vnship	Kalazo	615-83	<u>36-1429</u>
RR#/Street Number/Name	RELTON		EST CAREL City/Town/Village		IT 6	1
1817 RICHARD		D .	OTTAW	9	te/Compartment/Blc	ck/Tract etc.
8 (3	Zone Easting 7255/0	5017644	Init Make/Model	Mode of Operation	Undifferentiated	Averaged
Log of Overburden and General Colour Most comm		ee instructions) Other Materials	•	General Description		Depth Metres
BROWN SAND		, STONES, BOL	Nnepe	General Description		Depth Metres
GREY CLAY	SANK), STONES, E	ROUDERS		1.	$\frac{0}{1}\frac{\sqrt{375}}{15}$
GREY LIMES	STONE BRU	WN LIMEST	ME		1 9	5-8446-63
					1	Je 5 / 1000
Hole Diameter Depth Metres Diameter	r Incida	Construction Recor			Test of Well Y	
From To Centimetre	- Giann	unickness -		tres Pumping tes	Time Water	
0 16.91 24.7		Casing	From T	o Pump intake (metres)	set at Static	
16.91 46.63 152		ibreglass	1252	Pumping rate	- 112.	09 1 16-91
Water Record		oncrete 648 (s ⁺ ^{1~5} ₹ 16.	91 (litres/min)	001	
Water found atMetres / Kind of Water		ibreglass	· · · · · · · · · · · · · · · · · · ·	hrs +	<u>U</u> min	
Gas Salty Mineral	s Cotractor d	oncrete		Final water le	metres	27 3 14,96
Other: UNTESTES		breglass		Recommende	ed pump 4 60 3	3 4 14.08
Gas Salty Mineral	s Plastic C	oncrete		Recommende	d pump 5 705	5 13.16
43.5 Fresh Sulphu	Galvanized	Screen		depth 4 3. C		
Gas Salty Mineral	s Outside Steel Fi	breglass Slot No.		rate. 36/m	15 22	58 10 9,07
After test of well yield, water was	Plastic C Galvanized	oncrete		If flowing give (litres/m	in 25 14	50 20 5 5/ 0 25 3, 50
Other, specify		No Casing or Scree	<u> </u>	If pumping dis ued, give reas	ontin- 5n. 30 77, 0 40 78-	03, 30 2.62
Chlorinated X Yes No	Open hole		6.91 46.	63 1	50 18	44 40 1.57 47 50 1.03
Plugging and S	L		ndonment		60 18 -	49 60 . 88
Death and Matrice	ype (bentonite slurry, neat ceme		Placed In diagra	m below show distances	of well from road, lot li	ne, and building.
3 16-91 BENT	ONITE SLU			north by arrow.		1.
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				1	30	
				,	11	- 1. a
Cable Tool	Method of Construction	· · · · · · · · · · · · · · · · · · ·			ev'	1
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Rotary (reverse) Boring	Driv Water Use	ing		and all	13	
Domestic Industr		ic Supply	her Side	ROSON	<u> </u>	
Irrigation Munici	pal 🗌 Coo	ling & air conditioning	Audit No	z 44855	Date Well Comple	ted
Water Supply		nished Abandoned	d, (Other) Was the	well owner's information	Date Delivered	876 1/2 PP
Test Hole Abandoned		atering	package	delivered?	 A state of the state 	26 1/21/19
Name of Well Contractor	ntractor/Technician Info		nce No. Data Sou		try Use Only	
T, SAUNDERS Business Address (street name, num	ORILLING LTD	4879	and the second		Contractor	8
RK#1 RRAE	SIDE ONT.	KOA 160	Date Rec		DD Date of Inspection	YYYY MM DD
Name of Well Technician (last name,	first name) TROY	Well Technician's Lice	nce No. Remarks		Well Record Num	ber
Signature of Technician/Contractor		Date Submitted	M 78		ŕ	
0506E (09/03)	Contractor's Copy	☐ Ministry's Copy []	Well Owner's Copy		Cette formule est dis	ponible en français



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

OFFICIAL CERTIFICATE OF ANALYSIS : 3966666

WORK REQUEST : 100292480 Report Date : 2024-07-03

Paterson Group	Reception Date :	2024-06-26
9 Auriga Dr	Project :	PM15625
Nepean, Ontario	Sampler :	NA
K2E 7T9	PO Number :	60535
Attention : Alex Schopf	Temperature :	6 °C

Analysis	Quantity	External Method
Alkalinity (Water, Automated)	2	Modified from SM 2320 B
Ammonia, Total (Water, Colorimetry)	2	Modified from EPA 350.1
Chloride (Water, IC)	2	Modified from SM 4110 B and C
Colour, Apparent (Water, Spectrophotometry)	2	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)	2	Modified from EPA 200.8
Metals Scan (Water, ICP/OES)	2	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
pH (25°C) (Water, Automated)	2	Modified from SM 4500-H+ B
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)	2	Modified from SM 2130 B
VOCs (Water, GC/MS)	2	Modified from EPA 8260

Criteria :

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

Sample status upon receipt :

7802343 7802344 Compliant

Certificate Comments :

7802344

Anions MRL increase due to matrix interference. B spike not available due to high native analyte concentration in the mother sample. B results were verified for this sample. DOC analyzed from plastic sample bottle.

7802343

Anions MRLs increased due to matrix interferences. B spike not available due to high native analyte concentration in the mother sample. B results were verified for this sample.

Notes :

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

This certificate of analysis corrects and replaces any previous version. The analysis results refer only to what was provided for testing. This certificate shall not be reproduced except in full, without the written approval of Eurofins Environment Testing Canada Inc. Method references and/or additional QA/QC information available on request.



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

- 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 :		
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 : PN	115625				Recep	otion Date :	2024-06-
Eurofins	Client Sample		D <i>I</i>			Exceeded Criter	
Sample No	Identification	Analyte	Result	Units	Α	В	С
Colour, Appar	ent (Water, Spectrophoto	ometry)					
7802343	TW1 - GW1	Colour (Apparent)	10	TCU	5		
7802344	TW1 - GW2	Colour (Apparent)	10	TCU	5		
Hardness (Wa	ter, Calculation Only)						
7802343	TW1 - GW1	Hardness as CaCO3 (Calculation)	356	mg/L	80-100		
7802344	TW1 - GW2	Hardness as CaCO3 (Calculation)	360	mg/L	80-100		
Metals Scan (Water, ICP/MS)						
7802343	TW1 - GW1	Aluminum	0.43	mg/L	0.1		
7802344	TW1 - GW2	Aluminum	0.34	mg/L	0.1		
7802343	TW1 - GW1	Iron	0.68	mg/L	0.3		
7802344	TW1 - GW2	Iron	0.44	mg/L	0.3		
Sulphide (Wat	er, Colorimetry)						
7802343	TW1 - GW1	Sulphide (S2-)	0.95	mg/L	0.05		
7802344	TW1 - GW2	Sulphide (S2-)	1.16	mg/L	0.05		
TDS (Estimate	ed)						
7802343	TW1 - GW1	TDS (Estimated)^	944	mg/L	500		
7802344	TW1 - GW2	TDS (Estimated)^	959	mg/L	500		
Turbidity (Wat	er, Turbidimeter)						
7802343	TW1 - GW1	Turbidity	11.5	NTU	5		
7802344	TW1 - GW2	Turbidity	7.10	NTU	5		



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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client :	Paterson Group
Project :	PM15625

Reception Date: 2024-06-26

Eurofins Sample No :							7802344	
Matrix :							Drinking water	
				:	Sampling Date :	2024-06-25	2024-06-25	
			Client Sa	ampl	e Identification :	TW1 - GW1	TW1 - GW2	
Anions				Crit				
	RL	Unit	Α		3 C			
Chloride	0.5	mg/L	250			84.9	86.4	
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			388	394	
	F (
	Eurofins 8	Sample No :	7802343		7802344			
		Matrix :	Drinking water		Drinking water			
	Sam	pling Date :	2024-06-2	25	2024-06-25			
Cli	ent Sample Id		TW1 - GV		TW1 - GW2			
Calculations	RL	Unit	101-00	V I	101-002			
Ion Balance (Calculation)^	0.1	Unit	1.01		1.02			
	0.1				I		1	
			E	Eurofi	ns Sample No :	7802343	7802344	
					Matrix :	Drinking	Drinking	
						water	water	
					Sampling Date :	2024-06-25	2024-06-25	
					e Identification :	TW1 - GW1	TW1 - GW2	
General Chemistry				Criteria				
	RL	Unit		ł	3 C			
Alkalinity (as CaCO3)	5	mg/L	500			225	225	
Colour (Apparent)	2	TCU	5			10	10	
Conductivity @ 25°C	5	µS/cm	_			1350	1370	
Dissolved Organic Carbon	0.5	mg/L	5			1.3	1.0	
Fluoride	0.1	mg/L	1.5			1.32	1.34	
Hardness as CaCO3 (Calculation)	1	mg/L	80-100			356	360	
			6.5-8.5			7.97	8.04	
pH @ 25°C	1					.0.004	-0.004	
Phenols-4AAP	0.001	mg/L				<0.001	<0.001	
Phenols-4AAP Sulphide (S2-)	0.001	mg/L	0.05			0.95	1.16	
Phenols-4AAP Sulphide (S2-) Tannin and Lignin	0.001 0.01 0.1	mg/L mg/L	0.05			0.95 0.2	1.16 0.3	
Phenols-4AAP Sulphide (S2-)	0.001	mg/L				0.95	1.16	



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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client :	Paterson Group
Project :	PM15625

Reception	Date:	2024-06-2	6
reception	Date.	202	U

				Eurofins Sar	mple No :	7802343	7802344		
Matrix :						Drinking water	Drinking		
							water		
	Sampling Date :						2024-06-25 TW1 - GW2		
Client Sample Identification :						2024-06-25 TW1 - GW1			
Metals			Criteria						
	RL	Unit	Α	В	С				
Metals Scan (Water, ICP/MS)									
Aluminum	0.01	mg/L	0.1			0.43	0.34		
Antimony	0.0005		0.006			<0.0005	<0.0005		
Arsenic	0.001	mg/L	0.01			<0.001	<0.001		
Barium	0.001	mg/L	1			0.191	0.190		
Beryllium	0.0005					<0.0005	<0.0005		
Boron	0.01	mg/L	5			0.43	0.44		
Cadmium	0.0001	mg/L	0.005			<0.0001	<0.0001		
Chromium	0.001	mg/L	0.05			0.001	<0.001		
Cobalt	0.0002					0.0002	<0.0002		
Copper	0.001	mg/L	1			<0.001	<0.001		
Iron	0.03	mg/L	0.3			0.68	0.44		
Lead	0.001	mg/L	0.01			<0.001	<0.001		
Manganese	0.01	mg/L	0.05			0.02	0.02		
Mercury	0.0001	mg/L	0.001			<0.0001	<0.0001		
Molybdenum	0.005	mg/L				<0.005	<0.005		
Nickel	0.005	mg/L				<0.005	<0.005		
Selenium	0.001	mg/L	0.05			<0.001	<0.001		
Silver	0.0001	mg/L				<0.0001	<0.0001		
Strontium	0.001	mg/L				2.64	2.72		
Thallium	0.0001	mg/L				<0.0001	<0.0001		
Uranium	0.001	mg/L	0.02			<0.001	<0.001		
Vanadium	0.001	mg/L				0.001	<0.001		
Zinc	0.01	mg/L	5			<0.01	<0.01		
Metals Scan (Water, ICP/OES)									
Calcium	1	mg/L				74	75		
Magnesium	1	mg/L				42	42		
Potassium	1	mg/L				6	6		
Sodium	1	mg/L	200			181	186		
				Eurofina Cor		7000040	7900044		
				Eurofins Sar		7802343	7802344		
					Matrix :	Drinking water	Drinking water		
				Sampli	ng Date :	2024-06-25	2024-06-25		
			Client			TW1 - GW1	2024-00-23 TW1 - GW2		
Microbiology			Client Sample Identification : Criteria				1001-0002		
	RL	Unit	Α	В	С				
Escherichia coli (DC)	0	CFU/100mL	0			0	0		
Total Coliforms (DC)	0	CFU/100mL	0			0	0		

This certificate of analysis corrects and replaces any previous version. The analysis results refer only to what was provided for testing. This certificate shall not be reproduced except in full, without the written approval of Eurofins Environment Testing Canada Inc. Method references and/or additional QA/QC information available on request.



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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client :	Paterson Group
Project :	PM15625

Reception Date: 2024-06-26

Eurofins Sample No :			7802343	7802344			
	Drinking	Drinking					
			water	water			
Sampling Date : Client Sample Identification :			2024-06-25	2024-06-25			
			TW1 - GW1	TW1 - GW2			
Nutrients	RL	Unit					
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.259	0.263			
Total Kjeldahl Nitrogen	0.1	mg/L	1.46	0.483			



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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client :	Paterson Group
Project :	PM15625

Reception Date: 2	2024-06-26
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				Eurofins Sar	nple No :	7802343	7802344	
					Matrix :	Drinking water	Drinking water	
				Sampli	ng Date :	2024-06-25	2024-06-25	
			Client	Sample Ident	ification :	TW1 - GW1	TW1 - GW2	
Volatile Organic Compounds				Criteria				
	RL	Unit	Α	в	С			
OCs (Water, GC/MS)								
1,1,1,2-Tetrachloroethane	0.5	ug/L				<0.5	<0.5	
1,1,1-Trichloroethane	0.4	ug/L				<0.4	<0.4	
1,1,2,2-Tetrachloroethane	0.5	ug/L				<0.5	<0.5	
1,1,2-Trichloroethane	0.4	ug/L				<0.4	<0.4	
1,1-Dichloroethane	0.4	ug/L				<0.4	<0.4	
1,1-Dichloroethene	0.4	ug/L	14			<0.4	<0.4	
1,2-Dibromoethane	0.2	ug/L				<0.2	<0.2	
1,2-Dichlorobenzene	0.4	ug/L	200			<0.4	<0.4	
1,2-Dichloroethane	0.2	ug/L	5			<0.2	<0.2	
1,2-Dichloropropane	0.5	ug/L				<0.5	<0.5	
1,3,5-Trimethylbenzene	0.3	ug/L				<0.3	<0.3	
1,3-Dichlorobenzene	0.4	ug/L				<0.4	<0.4	
1,4-Dichlorobenzene	0.4	ug/L	5			<0.4	<0.4	
Acetone	5	ug/L				<5.0	<5.0	
Benzene	0.5	ug/L	1			<0.5	<0.5	
Bromodichloromethane	0.3	ug/L				<0.3	<0.3	
Bromoform	0.4	ug/L				<0.4	<0.4	
Bromomethane	0.5	ug/L				<0.5	<0.5	
Carbon tetrachloride	0.2	ug/L	2			<0.2	<0.2	
Chloroethane	0.2	ug/L				<0.2	<0.2	
Chloroform	0.5	ug/L				<0.5	<0.5	
Chloromethane	0.2	ug/L				<0.2	<0.2	
cis-1,2-Dichloroethene	0.4	ug/L				<0.4	<0.4	
cis-1,3-Dichloropropene	0.2	ug/L				<0.2	<0.2	
Dibromochloromethane	0.3	ug/L				<0.3	<0.3	
Dichloromethane	4	ug/L	50			<4.0	<4.0	
Diethyl ether	5	ug/L				<5	<5	
Ethylbenzene	0.5	ug/L	140			<0.5	<0.5	
m/p-Xylene	0.4	ug/L				<0.4	<0.4	
Methyl ethyl ketone (MEK)	2	ug/L				<2.0	<2.0	
Methyl isobutyl ketone (MIBK)	5	ug/L				<5.0	<5.0	
Methyl tert-butyl ether (MTBE)	2	ug/L				<2	<2	
Monochlorobenzene	0.5	ug/L	80			<0.5	<0.5	
o-Xylene	0.4	ug/L				<0.4	<0.4	
Styrene	0.5	ug/L				<0.5	<0.5	
Tetrachloroethylene (PCE)	0.3	ug/L	10			<0.3	<0.3	
Toluene	0.4	ug/L	60			<0.4	<0.4	
trans-1,2-dichloroethene	0.4	ug/L				<0.4	<0.4	
trans-1,3-dichloropropene	0.2	ug/L				<0.2	<0.2	
Trichloroethylene (TCE)	0.3	ug/L	5			<0.3	<0.3	
Trichlorofluoromethane	0.5	ug/L				<0.5	<0.5	

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OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group Project : PM15625

Reception Date: 2024-06-26

				Eurofins Sa	ample No :	7802343	7802344		
					Matrix :	Drinking water	Drinking water		
			ling Date :	2024-06-25 2024-06-25					
			TW1 - GW1	TW1 - GW2					
Volatile Organic Compounds	olatile Organic Compounds Criteria								
	RL	Unit	A	В	С				
Vinyl chloride	0.2	ug/L	1			<0.2	<0.2		
Xylene (Total)	0.5	ug/L	90			<0.5	<0.5		
1,2-dichloroethane-d4 (surrogate)	0	%				122	109		
4-bromofluorobenzene (surrogate)	0	%				71	72		
Toluene-d8 (surrogate)	0	%				110	113		

Approved by :

Emma-Dawn Ferguson, M.Sc. Environmental Chemist

Approved by :

Jason Kennedy

Project Manager

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OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

				QC	、	Matrix S	Spiko	Dupl	icato
Parameter	Unit	RL	Blank	Recovery %	-	Recovery %		RPD %	Range %
Alkalinity (Water, Automated)									
	Method : Alkalinity (water, tit	ration to pH	4.5, automated	l). Internal metho	od: OTT-I-A	T-WI45398.			
Alkalinity (as CaCO3)	mg/L	5	<5	100	95-105			-	0-20
	Associated Sam	ples : 78023	43, 7802344				,	Prep Date: Analysis Date:	: 2024-06-28 : 2024-07-02
Ammonia, Total (Water, Colorimetry	•					/			
• · · · · · · · · · · · · · · · · · · ·	Method : Ammonia (V							0	0.00
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	104	80-120	112	80-120	3	0-20
	Associated Sam	ples : 78023	43, 7802344					Prep Date: Analysis Date:	2024-06-27 2024-06-27
Chloride (Water, IC)									
	Method : Anions (Wate								
Chloride	mg/L	0.5	<0.5	96	80-120	101	80-120	-	0-20
	Associated Sam	ples : 78023	43, 7802344					Prep Date: Analysis Date:	: 2024-06-27 : 2024-06-28
Colour, Apparent (Water, Spectroph	• /								
	Method : Colour (Water,					145980.		0	0.40
Colour (Apparent)	TCU	2	<2	110	39-159			2	0-40
	Associated Sam	pies : 78023	43, 7802344					Analysis Date:	2024-07-03 2024-07-03
Conductivity (Water, Automated)									
	Method : Conductivity					398.			
Conductivity @ 25°C	uS/cm	5	<5	98	98-102			2	0-20
	Associated Sam	ples : 78023	43, 7802344				,	Prep Date: Analysis Date:	2024-06-28 2024-07-02
DOC (Water, IR)									
	ethod : Organic carbon (water				-	DEM-WI46148.			
Dissolved Organic Carbon	mg/L	0.5	<0.5	89	84-116	99	80-120	-	0-15
	Associated Sam	ples : 78023	43, 7802344					Prep Date: Analysis Date:	: 2024-06-28 : 2024-07-02
Escherichia coli (DC Plate)									
Me	thod : Total Coliforms and E.C	-		e). Internal meth	od: OTT-M-	BAC-WI45296			
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30
	Associated Sam	ples : 78023	43, 7802344					Prep Date: Analysis Date:	: 2024-06-26 : 2024-06-27
Fluoride (Water, Auto/ISE)									
	Method : Fluoride by autotitr	ator, ion sele	ective electrode	e. Internal metho	d: OTT-I-A	T-WI45398.			
	mg/L	0.1	<0.10	100	90-110				



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client :	Paterson Group
Proiect :	PM15625

Reception Date: 2024-06-26

				· · · · ·	QC	Matrix	Snike	Dun	licate
Parameter	Unit	RL	Blank		6 Range %		6 Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)				,	0	,	Ū		Ū
	Method : Me	tals (Water, IC	CP/MS). Interna	al method: AM	IMTFQE1.				
Aluminum	mg/L	0.01	<0.01	100	80-120	-	70-130	-	0-20
Antimony	mg/L	0.0005	<0.0005	89	80-120	95	70-130	-	0-20
Arsenic	mg/L	0.001	<0.001	100	80-120	100	70-130	-	0-20
Barium	mg/L	0.001	<0.001	100	80-120	-	70-130	-	0-20
Beryllium	mg/L	0.0005	<0.0005	112	80-120	113	70-130	-	0-20
Boron	mg/L	0.01	<0.01	110	80-120	119	70-130	-	0-20
Cadmium	mg/L	0.0001	< 0.0001	103	80-120	-	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	110	80-120	-	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	105	80-120	-	70-130	-	0-20
Copper	mg/L	0.001	< 0.001	110	80-120	-	70-130	-	0-20
Iron	mg/L	0.03	< 0.03	90	80-120	101	70-130	-	0-20
Lead	mg/L	0.001	< 0.001	100	80-120	-	70-130	_	0-20
Manganese	mg/L	0.01	<0.01	100	80-120	_	70-130	-	0-20
Mercury	mg/L	0.0001	< 0.0001	110	80-120	_	70-130	-	0-20
Molybdenum	mg/L	0.005	< 0.005	100	80-120	95	70-130	_	0-20
Nickel	mg/L	0.005	<0.005	110	80-120	-	70-130	_	0-20
Selenium	mg/L	0.000	<0.000	105	80-120	114	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	113	80-120	-	70-130	_	0-20
Strontium	mg/L	0.001	<0.0001	100	80-120	_	70-130		0-20
Thallium	mg/L	0.0001	<0.001	99	80-120	-	70-130	-	0-20
		0.0001	<0.0001	99	80-120	- 90	70-130	-	0-20
Uranium Vanadium	mg/L	0.001	<0.001	100	80-120	- 90	70-130	-	0-20
	mg/L mg/L	0.001	<0.001	110	80-120	-	70-130	-	0-20
Zinc	5			110	00-120	-	70-130	- Bron Doto	e: 2024-07-02
	ASSOCIALE	d Samples : 78	502343				A		: 2024-07-02 : 2024-07-03
	Method : Me	tals (Water, IC	CP/MS). Intern	al method: AM	IMTFQE1.			-	
Aluminum	mg/L	0.01	<0.01	100	80-120	117	70-130	8	0-20
Antimony	mg/L	0.0005	<0.0005	89	80-120	-	70-130	-	0-20
Arsenic	mg/L	0.001	< 0.001	100	80-120	104	70-130	-	0-20
Barium	mg/L	0.001	< 0.001	100	80-120	83	70-130	1	0-20
Beryllium	mg/L	0.0005	< 0.0005	112	80-120	-	70-130	_	0-20
Boron	mg/L	0.01	<0.01	110	80-120			1	0-20
Cadmium	mg/L	0.0001	< 0.0001	103	80-120	_	70-130	-	0-20
Chromium	mg/L	0.001	< 0.001	110	80-120	99	70-130	-	0-20
Cobalt	mg/L	0.0002	< 0.0002	105	80-120	103	70-130	_	0-20
Copper	mg/L	0.0002	<0.001	110	80-120	93	70-130	-	0-20
Iron	mg/L	0.001	< 0.001	90	80-120	100	70-130	- 4	0-20
Lead	mg/L	0.001	<0.001	100	80-120	89	70-130	-	0-20
Manganese	mg/L	0.001	<0.001	100	80-120	103	70-130	-	0-20
Manganese Mercury	mg/L	0.001	<0.001	110	80-120	103	70-130	-	0-20
Mercury Molybdenum	mg/L	0.0001	<0.0001	100	80-120	103	70-130		0-20
Nickel	-	0.005		110	80-120	109		-	0-20
	mg/L		< 0.005				70-130	-	
Selenium	mg/L	0.001	< 0.001	105	80-120	-	70-130	-	0-20
Silver	mg/L	0.0001	< 0.0001	113	80-120	-	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	100	80-120	73	70-130	1	0-20

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Thallium

Uranium

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< 0.0001

< 0.001

99

90

80-120

80-120

94

70-130

70-130

-

0.0001

0.001

mg/L

mg/L

3966666-V1

0-20

0-20



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

				QC	`	Matrix S	Sniko	Dup	licate
Parameter	Unit	RL	Blank	Recovery % Range %		Recovery %		RPD %	Range %
Metals Scan (Water, ICP/MS)									
	Method : Me	tals (Water, IC	CP/MS). Intern	al method: AMM	ITFQE1.				
Vanadium	mg/L	0.001	<0.001	100	80-120	100	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	110	80-120	-	70-130	-	0-20
	Associated	d Samples : 7	802344					•	: 2024-07-0
							A	nalysis Date	: 2024-07-0
Metals Scan (Water, ICP/OES)									
Calaium	Method : Metals (1				70 400	0	0.00
Calcium	mg/L	1	<1	107	86-115	100	70-130	0	0-20
Magnesium	mg/L	1	<1	105	91-109	104	70-130	0	0-20
Potassium	mg/L	1	<1	106	87-113	116	70-130	-	0-20
Sodium	mg/L	1	<1	104	85-115	108	70-130	0	0-20
	Associated San	nples : 780234	43, 7802344				۵	Prep Date nalysis Date	: 2024-07-0 : 2024-06-2
Nitrate (Water, IC)							,	analyoio Dato	. 2021 00 2
Nillale (Water, IC)	Method : Anions (Wate	er Ion Chrom	atography) Int	ernal method: C	TT-I-IC-W/	15985			
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	97	80-120	101	80-120		
	Associated San			01	00 120	101	00 120	Prep Date	: 2024-06-2
		10020	10, 1002011				A	nalysis Date	
Nitrite (Water, IC)									
	Method : Anions (Wate	er, Ion Chrom	atography). Int	ernal method: C	DTT-I-IC-WI	45985.			
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	93	80-120	100	80-120		
	Associated San	nples : 780234	43, 7802344						: 2024-06-2
							A	nalysis Date	: 2024-06-2
pH (25°C) (Water, Automated)									
	Method : pH (Wate					98.			
pH @ 25°C		1	5.78	100	97-103			0	0-20
	Associated San	nples : 780234	43, 7802344				4	Prep Date nalysis Date	: 2024-06-2 : 2024-07-0
							F	analysis Date	. 2024-07-0
Phenols (Water, Colorimetry)	Method : Phenols (W	Vater Colorim	etru) Internal	method: OTT I	AAAD WIAG	150			
Phenols-4AAP	mg/L	0.001	<0.001	114	75-125	111	70-130		0-20
	Associated San			117	10 120		10 100	Pren Date	: 2024-06-2
	7,5500/4/04	10020	40, 7002044				A	nalysis Date	
Sulphate (Water, IC)									
• • • • •	Method : Anions (Wate	er, Ion Chrom	atography). Int	ernal method: C	DTT-I-IC-WI	45985.			
Sulphate	mg/L	1	<1	95	90-110	95	80-120		
	Associated San	nples : 780234	43, 7802344					Prep Date	: 2024-06-2
							A	nalysis Date	: 2024-06-2
Sulphide (Water, Colorimetry)									
	Method : Sulphide, S2-	•		al method: OTT	-I-SPEC-W	45931.			
Sulphide (S2-)	mg/L	0.01	<0.01	96	80-120			-	0-20
	Associated San	nples : 780234	43, 7802344						: 2024-07-0
T errational International Contract Contract							P	nalysis Date	. 2024-07-0
Tannin and Lignin (Water, Spec)	Mothod . Torrain and I	ionin (Mater	Casa) Interne	I mothed OTT		7602			
Toppin and Lignin	Method : Tannin and L	1				07093.			0.00
Tannin and Lignin	mg/L	0.1	<0.1	96	80-120			- Data: Dof	0-20
	Associated San	10023	-0,1002044					i ich Dale	: 2024-06-2 : 2024-06-28



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group Project : PM15625							Recepti	on Date: 20	024-06-26	
_			5	QC	2	Matrix S	Spike	Dupl	icate	
Parameter	Unit	RL Blank		Recovery %	ecovery % Range %		Range %	RPD %	Range %	
Total Coliforms (DC Plate)										
Method : T	otal Coliforms and E.C	oli 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 : 78023	43, 7802344				A	Prep Date: Analysis Date:	2024-06-26 2024-06-27	
Total Kjeldahl Nitrogen (Water, Colorimetr	у)									
	Method : TKN (Wa	ter, colorime	etry). Internal me	thod: OTT-I-N	UT-WI4620	1.				
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	95	70-130	102	70-130	1	0-20	
	Associated Sam	ples : 78023	43, 7802344				A	Prep Date: Analysis Date:	2024-06-27 2024-06-28	
Turbidity (Water, Turbidimeter)										
	Method : Turbidity (W	ater, Turbidi	meter). Internal	method: OTT-I	-TUR-WI46	288.				
Turbidity	NTU	0.1	<0.1	100	80-120			2	0-30	
	Associated Sam	ples : 78023	43, 7802344				A	Prep Date: Analysis Date:	2024-06-27 2024-06-28	



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group Project : PM15625

Rece	otion	Date:	2024-06-26
1,000		Date.	

Parameter	Unit	RL	Blank		QC	Matrix			licate
	Onit	I.L.	Dialik	Recovery %	6 Range %	Recovery %	a Range %	RPD %	Range %
VOCs (Water, GC/MS)									
	Method : Volatile Organ			,			70,400		0.20
1,1,1,2-Tetrachloroethane	ug/L	0.5	<0.5	109	70-130	91	70-130	-	0-30
1,1,1-Trichloroethane	ug/L	0.4	<0.4	92	70-130	114	70-130	-	0-30
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.5	119	70-130	86	70-130	-	0-30
1,1,2-Trichloroethane	ug/L	0.4	<0.4	118	70-130	104	70-130	-	0-30
1,1-Dichloroethane	ug/L	0.4	<0.4	97	70-130	110	70-130	-	0-30
1,1-Dichloroethene	ug/L	0.4	<0.4	99	70-130	113	70-130	-	0-30
1,2-Dibromoethane	ug/L	0.2	<0.2	96	70-130	108	70-130	-	0-30
1,2-Dichlorobenzene	ug/L	0.4	<0.4	111	70-130	87	70-130	-	0-30
1,2-Dichloroethane	ug/L	0.2	<0.2	106	70-130	100	70-130	-	0-30
1,2-Dichloropropane	ug/L	0.5	<0.5	100	70-130	94	70-130	-	0-30
1,3,5-Trimethylbenzene	ug/L	0.3	<0.3	111	70-130	103	70-130	-	0-30
1,3-Dichlorobenzene	ug/L	0.4	<0.4	110	70-130	104	70-130	-	0-30
1,4-Dichlorobenzene	ug/L	0.4	<0.4	110	70-130	107	70-130	-	0-30
Acetone	ug/L	5	<5.0	74	70-130	114	70-130	-	0-30
Benzene	ug/L	0.5	<0.5	97	70-130	107	70-130	-	0-30
Bromodichloromethane	ug/L	0.3	<0.3	96	70-130	106	70-130	-	0-30
Bromoform	ug/L	0.4	<0.4	96	70-130	106	70-130	-	0-30
Bromomethane	ug/L	0.5	<0.5	104	70-130	83	70-130	-	0-30
Carbon tetrachloride	ug/L	0.2	<0.2	97	70-130	105	70-130	-	0-30
Chloroethane	ug/L	0.2	<0.2	100	70-130	97	70-130	-	0-30
Chloroform	ug/L	0.5	<0.5	83	70-130	91	70-130	-	0-30
Chloromethane	ug/L	0.2	<0.2	83	70-130	91	70-130	-	0-30
cis-1,2-Dichloroethene	ug/L	0.4	<0.4	97	70-130	105	70-130	-	0-30
cis-1,3-Dichloropropene	ug/L	0.2	<0.2	79	70-130	119	70-130	_	0-30
Dibromochloromethane	ug/L	0.3	<0.3	95	70-130	100	70-130	-	0-30
Dichloromethane	ug/L	4	<4.0	90	70-130	91	70-130	_	0-30
Diethyl ether	ug/L	5	<5	100	70-130	100	70-130		0-30
Ethylbenzene	ug/L	0.5	<0.5	117	70-130	100	70-130	_	0-30
n/p-Xylene	ug/L	0.3	<0.3	94	70-130	98	70-130	-	0-30
	_	2	<0.4	74	70-130	93	70-130	-	0-30
Methyl ethyl ketone (MEK)	ug/L							-	
Methyl isobutyl ketone (MIBK)	ug/L	5	<5.0	90	70-130	119	70-130	-	0-30
Methyl tert-butyl ether (MTBE)	ug/L	2	<2	90	70-130	90	70-130	-	0-30
Monochlorobenzene	ug/L	0.5	<0.5	104	70-130	100	70-130	-	0-30
o-Xylene	ug/L	0.4	<0.4	117	70-130	96	70-130	-	0-30
Styrene	ug/L	0.5	<0.5	107	70-130	100	70-130	-	0-30
Tetrachloroethylene (PCE)	ug/L	0.3	<0.3	95	70-130	112	70-130	-	0-30
Foluene	ug/L	0.4	<0.4	109	70-130	92	70-130	-	0-30
rans-1,2-dichloroethene	ug/L	0.4	<0.4	90	70-130	104	70-130	-	0-30
rans-1,3-dichloropropene	ug/L	0.2	<0.2	83	70-130	113	70-130	-	0-30
Trichloroethylene (TCE)	ug/L	0.3	<0.3	102	70-130	104	70-130	-	0-30
Trichlorofluoromethane	ug/L	0.5	<0.5	97	70-130	117	70-130	-	0-30
Vinyl chloride	ug/L	0.2	<0.2	83	70-130	117	70-130	-	0-30
Kylene (Total)	ug/L	0.5	<0.5						-

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

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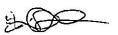
** aurofins

STANDARD CHAIN-OF-CUSTO

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Company:	Paterson Group								Company	/: [24	~		
Contact:	Alex Schopf								Contact:	Ē		=									-	
Address:	9 Auriga Drive		<u></u>			<u> </u>	<u> </u>		Address:	Printed On : 2024-06-26 17:07:06 "2:					5 _{82:}			5				
Telephone:	613-218-3444	Cell:		. <u>.</u>	<u></u>	<u></u>			Telephor	н <u>е:</u>	PO#: 6						60	535		<u>, (* 1</u>)		
Email:		ngroup.ca, mlaflamme@pate	ersongr	oup.ca			· · · ·			REGULATION/GUIDELINE REQUIRED												
Emai):	#2: aschopf@pate									Sanitary	Sewer, C	lty: Otla	wa	_		_		O. Reg	; 153			
Project:	PM15625		.	Quote #					1		ewer, City					_		Tab	le#	Course / I	Fine, Surface/su	bsurface.
	т	URN-AROUND TIME (Busines	s Days)					\checkmark	odwso	G						1				gri / GW / All Oth	
1 Da	y* (100%) 2	: Day** (50%) 3-5 i	Days (25%)			✓ 5-	7 Days (Si	tandard)		PWQO					٠			Excess 5	ioil, Table:		Type:	
	Please contact Lab in advance to determine rush availability. *For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.						2			O. Reg 3	47/558											
	**For results reported a	fter rush due date, surcharges will apply: befo	re 12:00 - 5	0%, after :	12:00 - 25	%.				Other:			<u> </u>				The s				mission will for (<u>RSC</u>) under O.R	m part of a formal
										None								Record		Yes	No	
The optimal t	The optimal temperature conditions during transport should be less than 10°C. Sample(s) report to frage upper etheratic indicated as assed upper with the Laboratory. Note Field Filtered ->					T	r	1	10.0	Sampl	e Analy:	sis Requ	lired		<u>,</u>			<u> </u>				
	annot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Not t this COC is not to be used for drinking water samples. The COC must be complete up						O.Re	g.153 par	ameters			1 -	1 -	ĩ	1	1	1	h				RN# Use Only)
	it this COC is not to be used for drinking water samples. The COC must be complete up bmission of the samples, there will be a \$25 surcharge if required information is missir							ľ	Γ	ži Z		paper	Vidq	1	1	Metals						
	(required fields are	shaded in grey).	atrix	iners	-					orga	×		on SL	1		Me		1				
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Sample ID	- 11 - 11 - 11 - 1 1	Date/Time Collected	Sample Matrix	# of C	PHC F1	втех	vocs	PAHS	PCBs	Metal	Meta	See	Subdi Bacti	TSS	H	10	БН					
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]	TW1-GW2	June 25, 2024	GW	10			\Box									\Box	÷,					44
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Sampled By:	Alex Schopf		1	Artun					June 25, 2024					ai an		race I	vieta	15				
Relinguished E	ave Alex Schopf			H.	the	11	A	\leq	June 26					1	2		-					
Received By:				20.		(1	[N.	226	6.2 6.2			CUSTO	DY SEAL:		YES		ce packs submitted	: Yes No	

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Aved, Unit Acto, St. Catharines, ON, L2S OB5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

AFSTDCOC.5





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

OFFICIAL CERTIFICATE OF ANALYSIS : 3991228

WORK REQUEST : 100298583 Report Date : 2024-07-22

Paterson Group	Reception Date :	2024-07-19
9 Auriga Dr	Project :	PM15625
Nepean, Ontario	Sampler :	NA
K2E 7T9	PO Number :	60753
Attention : Alex Schopf	Temperature :	14 °C

Analysis	Quantity	External Method
Colour, Apparent (Water, Spectrophotometry)	1	Modified from SM 2120 C
Turbidity (Water, Turbidimeter)	1	Modified from SM 2130 B

Criteria :

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

Sample status upon receipt :

7872590 Compliant

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

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3991228-V1



Environment Testing

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

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Pat Project : PM	erson Group 15625				Rece	ption Date :	2024-07-19
Eurofins	Client Sample	A	Desult	11		Exceeded C	riteria
Sample No	Identification	Analyte	Result	Units	Α	В	С
Colour, Appare	ent (Water, Spectrophoton	netry)					
7872590	TW1 - GW - 3	Colour (Apparent)	12	TCU	5		



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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group Project : PM15625

Reception Date: 2024-07-19

			7872590					
			Groundwater					
			2024-07-19					
			TW1 - GW - 3					
General Chemistry				Criteria				
	RL	Unit	Α	в	С			
Colour (Apparent)	2	TCU	5			12		
Turbidity	0.1	NTU	5			3.29		

Approved by :

Emma-Dawn Ferguson, M.Sc. Environmental Chemist

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Page 3 of 4

3991228-V1



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group Project : PM15625							Recepti	on Date: 2	024-07-19
				Q	2	Matrix S	Spike	Dupl	licate
Parameter	Unit	RL	Blank	Recovery %		Recovery %		RPD %	Range %
Colour, Apparent (Water, Spectrophoton	netry)								
Λ	Method : Colour (Water,	Spectrophot	ometric). Inter	nal method: OT	T-I-SPEC-W	145980.			
Colour (Apparent)	TCU	2	<2	102	39-159			-	0-40
	Associated	Samples : 7	872590				A	•	: 2024-07-22 : 2024-07-22
Turbidity (Water, Turbidimeter)									
	Method : Turbidity (M	/ater, Turbidi	meter). Interna	al method: OTT-I	-TUR-WI46	288.			
Turbidity	NTU	0.1	<0.1	102	80-120			2	0-30
	Associated	Samples : 7	872590				Δ	•	: 2024-07-20 : 2024-07-20

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

🔅 eurofins

STANDARD CHAIN-OF-CUSTODY

			12 IV	145 Col	onnade Ri	oad, Unit	#8, Ottav	a, ON, K2I	E 7Y1 - Pho	ne: 613-	727-5692,	Fax: 613-7	27-5222								85
		CLIENT INFORMATIO	N								ICE IN					100	2985	83		N: Y	(ES 🖌 NO 📄)
Company:	Paterson Group			_					Compar	ay:		· · · · · · · · · · · · · · · · · · ·								and the second	
Contact:	Alex Schopf								Contact	;											
Address:	9 Auriga Drive			-				<u> </u>	Address	· [Prin	ted On	: 20	24-07-	-19 17:1	13:38		
Telephone:	613-218-3444	Cell:		. <u></u>		<u> </u>			Telepho	Icphone: P0 #: 60753											
Email:	<u> </u>	ngroup.ca, mkillam@paterso	naroup	ca		17		18 - 17		REGULATION/GUIDELINE REQUIRED											
Email:	#2: aschopf@pate		<u> </u>							Sanitary Sewer, City: Ottawa O. Reg 153											
Project:	PM15625			Quote A	ł:					Storm Sewer, City: Ottawa Table #, Courso / Fine, Surface / subsurfa							Sino Surface / subsurface				
		JRN-AROUND TIME (Busine	ss Davs	1														Agri / GW / All Other / Sediment			
1 Da			Days (25%)			✓ 5-	7 Days (S	tandard)		PWQO Excess Soil, Table:						:	Түре:				
		ase contact Lab in advance to determine rush er rush due date, surcharges will apply: befor			12:00 - 50			20		O. Reg	347/558										
	1100 No. 20	iter rush due date, surcharges will apply: befo							10	Other:		<u>16</u>					The s				bmísslon will form part of a formal
					<u></u>				10	None								Record	of Site ((<u>RSC</u>) under O.Reg. 153/04 No
The ontimal t	optimal temperature conditions during transport should be less than 10°C. Sample(s) Field Filtered>									Samp	le Analy	sis Requ	ired							60 Calo	
cannot be fro	not be frozen, unless otherwise indicated or agreed upon with the Laboratory. No															 	. 7		1		RN#
	t this COC is not to be used for drinking water samples. The COC must be complete up mission of the samples, there will be a \$25 surcharge if required information is missi				<u> </u>	<u> </u>	O.Re	g.153 par	ameters	7 22	-	- la	승(음)			sla				<u> </u> E	(Lab Use Only)
Sustitission of	(required fields are			ST3						ganic		p b	livision Supply 2 (Ec/TC only)			Metals		l€1	L	2	
			Mat	Itain	Ŧ					Inort	VInc	ache	Ed sig					9.1	3	<u> </u>	
			Sample Matrix	of Containers	PHC F1	×	5	<u>ې</u>	ş	Metals + Inorganics	Vietals only	See attached pape	Subdiv Bacti 2	TSS	Hd	Total	Hg	Turbidity	Colour	Aluminum	
Sample ID		Date/Time Collected		*	H H	BTEX	voc	PAHs	PCBS	ž	ž	, w	0.00	1 <u>1</u>						A I	
 	TW1 - GW - 3	July 19, 2024	GW	1																	7872590
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Sampled By:	Alex Schopf	· · · · · · · · · · · · · · · · · · ·		-#	Sil	in	2				July 1	9, 202	4	_							
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Received By:			-			/	Y	1		JĨ	WI	4/24)j			DY SEAL:				Ice packs submitted: Yes No
	401 Magnetic Drive, Unit	#1, North York, ON, M3J 3H9 - Telephone:	416-661-5	287 •	380 Van	ilckle Roa	ad, Unit #	610, St. C	atharines,	ON, 125	085 - 161	phone: 9	05-680-88	87 •	608 Norr	is Court, I	(ingston,	ON, K7P	2R9 - Te	lephone:	613-634-9307

order#:



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

OFFICIAL CERTIFICATE OF ANALYSIS : 3993095

WORK REQUEST : 100298584 Report Date : 2024-07-24

Paterson Group 9 Auriga Dr Nepean, Ontario K2E 7T9 Attention : Alex Schopf

2024-07-19 Reception Date : PM15625 Project : NA Sampler : 60753 PO Number : Temperature : 14 °C

Analysis	Quantity	External Method
Metals Scan (Water, ICP/MS)	1	Modified from EPA 200.8

Criteria :

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

Sample status upon receipt :

7872596

Compliant

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

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3993095-V1



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

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group Project : PM15625							Re	eception Date	: 2024-07-19
				Eurofins Sa	ample No :	7872596			
					Matrix :	Groundwater			
				Samp	ling Date :	2024-07-19			
			Client S	Sample Ide	ntification :	TW1 - GW - 3			
Metals				Criteria					
	RL	Unit	Α	В	С				
Aluminum	0.01	mg/L	0.1			0.02			

Approved by :

Emma-Dawn Ferguson, M.Sc. Environmental Chemist

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Page 2 of 3

3993095-V1



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

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group Project : PM15625							Receptio	on Date: 20	024-07-19
			5	QC)	Matrix S	Spike	Dupl	icate
Parameter	Unit	RL	Blank	Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
	Method : Met	als (Water, IC	P/MS). Interna	al method: AMM	ITFQE1.				
Aluminum	mg/L	0.01	<0.01	100	80-120	106	70-130	0	0-20
	Associated	Samples : 78	372596				A	•	2024-07-21 2024-07-23

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

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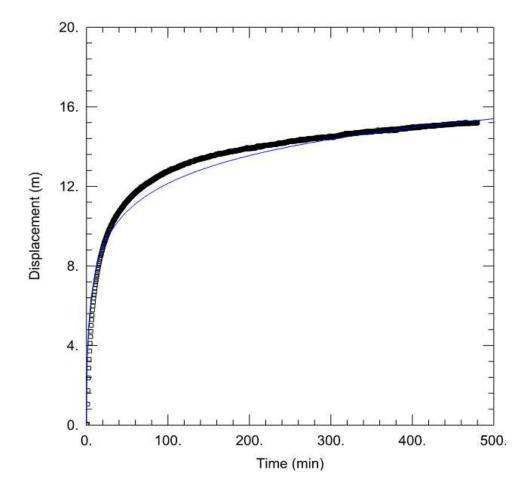
STANDARD CHAIN-OF-CUSTODY

. A				146 Co	onnade R	oad, Unit	#8, Ottaw	a, ON, K2E	E 7Y1 - Pho	ne: 613-72	7-5692. F	ax: 613-7	27-5222									
		CLIENT INFORMAT	ION		10				- - -	NVOI		2.5	2000 C	N (\$		1	10029	9858	4		YES 🗸 N	10 🗌)
Company:	Paterson Group								Compan	iy:					l			111110	Hitter	1		
Contact:	Alex Schopf				<u> </u>				Contact		<u>. </u>		<u> </u>	Ĩ							note te	
Address:	9 Auriga Drive			T.			·		Address	Address: Printed On : 2024-07-19 17:15:49						-						
Telephone:	613-218-3444		 Cell:		<u></u>			<u>_ </u>	Telepho	lephone: P0 #: 60753												
Email:	······	ngroup.ca, mkillam@pate	rsonarou	p.ca					1	REGULATION/GUIDELINE REQUIRED								·				
Email:	#2: aschopf@pate			<u> </u>						Sanitary Sewer, City: Ottawa 0. Reg 153												
Project:	PM15625			Quote	#:					Storm Sewer, City: Ottawa Table #, Course / Fine, Surface.							/Fine Surface/s	uhsurface				
		URN-AROUND TIME (Busi	iness Day	/s)					ODWSOG Type: Com-Ind / Res-Park / Agri / GW /													
1 Day			3-5 Days (25		-	🖌 5-	7 Days (S	tandard)	PWQO Excess Soil, Table:					n	Түре:							
		ease contact Lab in advance to determine er rush due date, surcharges will apply: b			12:00 - 5	0%.			0. Reg 347/558													
	and a state of the	fter rush due date, surcharges will apply:				200			Other: The sample results from this submis: Record of Site Condition (RSC													
										None	2							Record		Yes	a second a second s	leg. 153/04
The optimal temperature conditions during transport should be less than 10°C. Sample [s]						-			Samp	e Analy	sis Req	uired		chui dauba		12				8 - C		
cannot be fro	cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note Field							484	<u> </u>						5		ç			1	All and a second s	RN# Use Only)
	aat this COC is not to be used for drinking water samples. The COC must be complete upor ubmission of the samples, there will be a \$25 surcharge if required information is missing				-	1	О.не	eg.153 par.	ameters	1	1	aper	A			als				E	(600	ose only
	(required fields are			ers						ganit		See attached pape	1C Sup	li –		Total Metals		urbidity	- L	Aluminum		
			Sample Matrix	# of Containers	ä				IS .	luoi	Vina	tach	(Ec			2		ă	Colour	Ξ		
	-			Ē	PHC F1	8	20Cs	PAHs	PCBs	Metals -	Metals only	66 at	Subdiv Bacti 2	ISS	H	ota	Нg	5	ō	12		
Sample ID		Date/Time Collected		- partition						Š	ž	<u> ~</u>										- 20 1
j }	W1 - GW - 3	July 19, 2024	GV							╞╧╡											787	2596
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Sampled By: Alex Schopf						July 19, 2024																
Relinguished By	telinguished By: Alex Schopf				1_	July 19, 2024																
Received By:						1	Y	Δ_		UU		4124	N			10-04110-014-10-00-0	DY SEAL:				tce packs submitted	d: Yes N
	401 Magnetic Drive, Unit	t #1, North York, ON, M3J 3H9 - Teleph	one: 416-661	-5287 •	380 Van.	sickle Roa	ad, Uni l #	680, St. Ca	atharines,	ON, L25 0	85 - Telej	phone: 90	05-680-8	87 •	608 Norr	is Court, k	Kingston,	ON, K7P	2R9 - Te	lephone	: 613-634-9307	

H.

Pumping Test Analysis Report

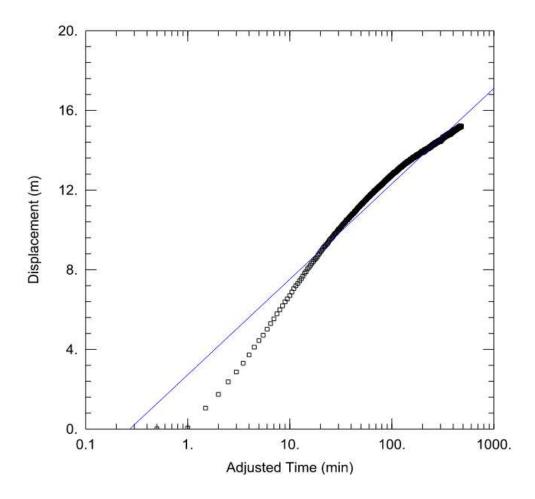
File No.	PM15625	Well ID:	TW1
Date:	Tuesday, June 25, 2024	Solution Method:	Theis
Client:	Ken Hoppner	Transmissitivity (m2/day):	1.7
Site Address:	1811 Richardson Side Road	Discharge Rate (L/min)	30
Project:	Re-zoning Application	Analysis performed by:	AS





Pumping Test Analysis Report

File No.	PM15625	Well ID:	TW1
Date:	Tuesday, June 25, 2024	Solution Method:	Cooper-Jacob
Client:	Ken Hoppner	Transmissitivity (m2/day):	1.65
Site Address:	1811 Richardson Side Road	Discharge Rate (L/min)	30
Project:	Re-zoning Application	Analysis performed by:	AS





Pumping Test Analysis Report

File No.	PM15625
Date:	Tuesday, June 25, 2024
Client:	Ken Hoppner
Site Address:	1811 Richardson Side Road
Project:	Re-zoning Application

Summary Table:						
Solution Method:	Well ID:	Transmissitivity (m2/day):				
Theis	TW1	1.7				
Cooper-Jacob	TW1	1.65				
Average:		1.68				



JOB NO.

patersongroup 1811 Richardson Side Road

PREDICTIVE NITRATE I	MPAC [*]	T ASSESSE	EMENT
Infiltration Factors			
Topography		0.10	
Soil		0.20	
Cover		0.15	
Total		0.45	
Site Characteristics			
Area of Site :		116782	m²
Total of roof areas:		2500	m²
Total area of paved driveway areas:		6215	m²
Roof + paved driveway areas		8715	m²
Impervious Area		8715	m²
Percent Impervious Area =	7		%
Infiltration Area =		108067	m²
Septic Effluent			
Concentration of Effluent (Cs) =		40	mg/L
Infiltration Calculation			
Nitrate concentration in precipitation $(C_i) =$		0	mg/L
Surplus Water (Environment Canada)		329	mm/yr
Factored Water Surplus =		148	mm/yr
Infiltration % due to stormwater management measures		-	%
Infiltration rate from stormwater management measures =	0		mm/yr
Infiltration Flow Entering the System (Q _i) =		44	m ³ /day
Mass Balance Model (MOEE, 1995) $C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$) = Cumulative	e Nitrate Concentration	
Q_b = flow entering the system across the upgradient area		0	m ³ /day
C _b = background nitrate concentration		0	mg/L
Cs = concentration of nitrates in the septic effluent		40	mg/L
Q _i = flow entering the system from infiltration		44	m ³ /day
C _i = Concentration of nitrates in the infiltrate		0	mg/L
	C _T =	10.00	mg/L
Maximum Allowable Sewage Flow Volume			
Daily Sewage Flow (Qs)=		14.61122351	m ³

patersongroup

1811 Richardson Side Road PM15625

MW1	inputs			
рН	8	А	0.20	
pH TDS	952	В	2.36	
Calcium	75	С	1.48	
Alkalinity	225	D	2.35	
Temp.	11			
		pHs =	8.03	

Langel	lier Saturation Index (LSI) Calc	ulation	(Langelier, 1936)	
	LSI = pH - pHs	A = (Log10 [TDS] - 1) / 10		
	pHs = (9.3 + A + B) - (C + D) Where:	B = -13.12 x Log10 (oC + 273) + 34.55 C = Log10 [Ca2+ as CaCO3] - 0.4		
	where.	D = Log10 [alkalinity as CaCO3]		
		LSI =	0.0	
LSI	Effect			
0.5 to 2	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (scale forming but non-corrosive)			
0 to 0.5	Water is super saturated and tends to precipitate a scale layer of calcium carbonate (slightly scale forming and corrosive).			
0	Water is saturated (in equilibrium) with calcium carbonate. A scale layer of calcium carbonate is neither precipitated nor dissolved.			
0 to -0.5	Water is under saturated and tends to dissolve solid calcium carbonate (slightly corrosivebut non-scale forming).			
	Water is under saturated and tends to dissolve solid calcium carbonate (seriously corrosive).			