



July 25, 2025

PH4979-LET.01

Air Rock Drilling Company Ltd.
6659 Franktown Road
Ottawa (Richmond), Ontario
K0A 2Z0

Attention: **Jeremy Hanna**

Subject: **Scoped Hydrogeological Assessment and Terrain Analysis**
Proposed Re-Zoning and Site Plan
6659 Franktown Road, Ottawa (Richmond), Ontario

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INTRODUCTION

Further to your request, Paterson Group (Paterson) has conducted a Scoped Hydrogeological Assessment and Terrain Analysis in support of the proposed Zoning By-law Amendment and retroactive Site Plan approval of the property at 6659 Franktown Road in Ottawa (Richmond), Ontario. Please refer to the Key Plan (attached) for the approximate site location. The subject site refers to the parcel at 6659 Franktown Road. This report is a scoped assessment based on discussion with the City reviewer and uses available information for a lot severance application using the existing well at the subject site. The severance application was approved with the Gemtec Report No. 101638.001 "Hydrogeological Investigation & Terrain Analysis", dated Aug 11, 2022 (City Application numbers D08-01-21/B-00171 & D08-01-21/B-00172).

The purpose of this work has been to re-affirm the quality of the water supply aquifer underlying the site in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP) Procedure D-5-5 and septic impact assessment to support the Re-zoning and Site Plan Application for the subject site.

The Subject Site consists of a 40.2 hectares (ha) lot and is currently occupied by a residence and home-based business for water well drilling with associated private infrastructure located at the southeast end of the property. The majority of the property is undeveloped. The ground surface at the subject site is generally flat with a slight slope from northwest to southeast towards Franktown Road.



The general groundwater flow is anticipated to be towards the southeast with localized flow variations expected.

The Subject Site is situated in a rural area which is serviced by private water supplies and private on-site septic fields. The site is bordered to the northwest by treed areas, to the northeast by residential properties followed by agricultural lands, to the southwest by residential properties and undeveloped lands, and to the southeast by Franktown Road followed by a commercial property and undeveloped lands.

The south end of the subject site and surrounding lots are zoned as RU for Rural Countryside Zone which allows for home-based businesses, while the treed area in the northwest portion of the lot is zoned as EP3 for Environmental Protection Zone Type 3. The area directly southeast of the subject site is zoned as RI for Rural Institution.

Description of Subject Site

The subject site is approximately 40.22 ha in size and is currently occupied by a two-storey residential dwelling and home-based business for well drilling. The Site Plan application is to retroactively provide site plan approval for the existing development. There are no changes to the existing use or to water usage anticipated as part of this Site Plan application. Please refer to Figure-1 Key Plan and Site Plan Drawing P1.REV 8, dated July 22, 2025 by FOTENN, attached, for the subject site location and layout.

The subject site is currently serviced by two onsite sewage systems and private drilled wells. The existing site usage requires limited water capacity and the proposed site usage is being maintained within the historical site use. Therefore, there is no change in the private service capacity for this application. The existing residence has a sewage system capacity of 1,725 L/day per the approved OSSO Certificate of Compliance. A new sewage system is proposed for the home-based business to comply with Part 8 – Ontario Building Code (OBC). A septic flow calculation was completed by Paterson and resulted in a total daily water demand calculation of 2,700 L/day from a combined 1,725 L/day from the residential building and 975 L/day from the business. Please refer to Paterson Sewage System design PH4979-1 and PH4979-2, attached, for full details.

As part of this study, the water supply well was inspected and confirmed to be O.Reg.903 compliant.

Karst Mapping

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



Mississippi-Rideau Source Protection Plan

The Mississippi-Rideau Source Protection Plan (MPSPP) provides guidance as to which policies apply to a given property, municipality or specific activity and if there are specific designations that apply to the area. The subject site has been designated three of the four groundwater related vulnerable areas identified within the Clean Water Act (2006), specifically; as a Wellhead Protection Area (WHPA), a Significant Groundwater Recharge Area (SGRA), Highly Vulnerable Aquifer (HVA). The four vulnerable areas consist of Significant Groundwater Recharge Area (SGRA), Highly Vulnerable Aquifer (HVA), Intake Protection Zone (IPZ) and Wellhead Protection Area (WHPA).

The subject site has been designated as a WHPA-B, SGRA, and HVA. The WHPA-B is scored a value of 6. This rating prohibits the storage of Dense Non-aqueous Phase Liquids (DNAPLs) and a Risk Management Plan is required for the storage of Liquid Fuels, which Air Rock has completed with the Risk Management Official with the City of Ottawa. There are no current outstanding comments related to Source Water Protection. The existing site usage pre-dates the municipal supply wells constructed for the Fox Run development and surrounding area with associated extensive modeling and approvals.

HYDROGEOLOGICAL ASSESSMENT

The purpose of this work has been to determine the suitability of the water supply aquifer underlying the site to support the Application to maintain the existing usage of the aquifer. Specifically, the intent of this report is to review the availability of a safe and reliable water supply having sufficient quantity and quality to continue providing potable water for the proposed redevelopment. The area is known to have access to bedrock aquifers with good quality and quantity as evidenced by the municipal wells in the area and historical test results by others.

Fieldwork Program

Geotechnical Program

A geotechnical investigation was carried out May 5, 2022 by others on adjacent properties in support of two lot severances and consisted of a total of five test pits excavated to a maximum depth of 4.5 m below ground surface (bgs). The test pits were distributed in a manner to provide general coverage of the associated lot severances, taking into account underground utilities and site features.

Paterson completed a sewage system design for the existing home-based business. Paterson drawings PH4979-1 and PH4979-2 are attached and denote soils information in the southeast portion of the site with three hand auger holes.



Well Testing

As a means to demonstrate the adequacy of the aquifer underlying the subject lands, with respect to water quality and quantity, the existing drilled well (TW22-1 as referenced by others), hereafter referred to as TW22-1, on the subject site was tested. TW22-1 has a Water Well Record (WWR) Well ID of A079370. TW22-1 has a 150 mm diameter steel casing that extends to 7.9 m below ground surface (bgs) with a 0.60 m stick up. The well itself extends to a depth of 73.5 m bgs. Based on available geological mapping, the drift thickness at TW22-1 varies from 3 to 15 m. According to the Water Well Record (WWR) for the drilled well, the overburden generally consists of sand to a depth of 6.1 m, where limestone bedrock was encountered. Refer to the report by others for the approximate location of TW22-1.

As a means to evaluate the water supply aquifer intercepted by the well, the well was subjected to a 6-hour constant rate pumping test in support of the severance application. The pumping test was conducted on March 14, 2022 by others. The pumping test was carried out at a pumping rate of 104 L/min for a duration of 6 hours. Water level and flow rate measurements were taken at regular intervals throughout the pumping test. The pumping test withdrew a total volume of approximately 37,440 L. The volume of the test significantly exceeds the required daily sewage system flows for the residence and home-based business (1,725 L/day for the residence and 975 L/day for the business). This is approximately 13.9 times the theoretical daily flows.

Recovery data was collected from the well following the completion of the pumping by others. The well was noted to have fully recovered within 5 minutes after the end of pumping.

Groundwater samples were collected by others in accordance with MECP Procedure D-5-5 and City of Ottawa HTAG in support of the previously approved severance application.

Paterson returned to site on December 10, 2024 to obtain an additional water sample from the same water spigot sampled January 20, 2022. The spigot was sanitized and purged for 15 minutes before sampling. Field measurements including pH, total dissolved solids, conductivity, turbidity, apparent colour, and temperature were measured prior to sampling until stabilized. The water sample was submitted for comprehensive testing of bacteriological, chemical, and physical water quality parameters consistent with the standard "Subdivision Supply" suite of parameters and trace metals. The sample was placed immediately into a cooler with ice and transported directly to Eurofins Environmental Laboratory in Ottawa. A Phase II ESA investigation was completed by others and noted that no regulatory exceedances were found in the groundwater (exp Report – Phase Two Environmental Site Assessment – Project OTT-00243705-B0 dated August 11, 2023)



Well Inspection

A visual inspection of TW22-1 was performed by others and confirmed that the well is in good condition and met O.Reg. 903 minimum casing requirements. The existing well was considered to be technically representative of future supply wells and the severance application was approved by the City. Paterson agrees with the assessment and considers the well to meet requirements for this application.

Aquifer Analysis

Water Quantity

Drawdown data was measured using an electronic water level tape and an electronic datalogger unit.

Table 1: SUMMARY OF WATER SUPPLY AQUIFER CHARACTERISTICS OF TW22-1 by OTHERS	
AQUIFER PARAMETER	RESULT OF ANALYSIS
Pumping Rate (L/min)	104
Pre-test Static Water Level (m)	2.6
Post-test Static Water Level (m)	2.8
Available Drawdown (m)	70.9
% Drawdown During Pump Test (%)	0.3
Specific Capacity (L/min/m drawdown)	520

The pumping test results show that TW22-1 has a high yield to support the water demands that significantly exceeds the existing and historical use. Overall maximum drawdown at a constant pumping rate for a period of 6 hours was approximately 0.2 m (0.3% of the available drawdown). It should be noted that full recovery was achieved within 5 minutes after the end of pumping.

The total volume of water pumped during the 6-hour pumping event was approximately 37,440 L. This is approximately 13.8 times the maximum total daily design volume of water required (2,700 L/day) to support the existing development. In addition to water use for domestic usage, water is also used to fill trucks for use while drilling. This amounts to approximately 20,000 L per day. This results in a total approximate daily usage of 22,700 L/day. The total pumped in the 6-hour pumping test was approximately 1.7 times the anticipated maximum daily water demand. It should be noted that pumping this amount resulted in a drawdown of 3% which recovered within 5 minutes.

The suitability of the aquifer to supply the Re-Zoning and Site Plan Application for the existing site usage was assessed using a scoped methodology provided in discussion with the City of Ottawa and based on the Hydrogeological and Terrain Analysis Guidelines (HTAG).



Based on the information summarized in Table 1, it is readily apparent that the water supply well has intercepted an adequately strong water supply aquifer which has sufficient quantity to continue to service the existing usage and has adequately serviced the site for an extended period of time.

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

Water Quality

Field Data

Turbidity, electrical conductivity, total dissolved solids (TDS), pH, apparent color and temperature were measured at the wellhead during the pumping test by others and by Paterson for the subsequent quality sampling. No chlorine residual was detected in the discharge water prior to the collection of the water samples as reported by others and for the Paterson sample.

Table 2: Field Measurements	
Sampled Parameter	Measured Value
Turbidity (NTU)	0.88
Apparent Colour (TCU)	0
pH	6.6
Total Dissolved Solids (mg/L)	340
Conductivity (µs/L)	680
Temperature (°C)	9.3
Free Chlorine (mg/L)	0.0

Laboratory Data

A sample was taken from an outdoor spigot of the residential dwelling on January 20, 2022 by others. The Subdivision Package suite of parameters and heavy metals laboratory water quality obtained from the pumping test by others on March 14, 2022 from TW22-1 is appended to the report.

Paterson visited site on December 10, 2024 to obtain an additional sample to confirm water quality. The sample was taken after sanitizing the spigot and running the tap for 15 minutes. The laboratory results can be found below in Tables 2a and 2b. The laboratory results indicate that the water quality is consistent between the 2022 and 2024 sampling events.



TABLE 3a: GROUNDWATER MICROBIOLOGY & GENERAL GEOCHEMISTRY				
PARAMETER	UNITS	ODWS		TW1
		LIMIT	TYPE	TW22-1 2024-12-10
MICROBIOLOGICAL				
Escherichia Coli (E.Coli)	ct/100mL	0	MAC	0
Total Coliforms	ct/100mL	0	MAC	0
GENERAL CHEMICAL - HEALTH RELATED				
Fluoride (F)	mg/L	1.5	MAC	0.46
Ammonia (N-NH ₃)	mg/L	-	-	0.09
Nitrite (N-NO ₂)	mg/L	1	MAC	<0.1
Nitrate (N-NO ₃)	mg/L	10	MAC	<0.1
Total Kjeldahl Nitrogen	mg/L	-	-	0.25
Turbidity (Field)	NTU	1.0 (5.0)	MAC/AO	0.88
Turbidity (Laboratory)	NTU	1.0 (5.0)	MAC/AO	1.1
GENERAL CHEMICAL - AESTHETIC RELATED				
Alkalinity (as CaCO3)	mg/L	30-500	OG	256
Chloride (Cl)	mg/L	250	AO	49
Colour (Apparent - Field)	TCU	5	AO	0
Colour (Apparent - Lab)	TCU	5	AO	9
Conductivity	uS/cm	-	-	671
Dissolved Organic Carbon	mg/L	5	AO	2.4
Hardness (as CaCO3)	mg/L	100	OG	282
Ion Balance	%	-	-	97
pH@25°C	unitless	6.5-8.5	AO	7.7
Phenols	mg/L	-	-	<0.001
Sulphate (SO ₄)	mg/L	500	AO	41
Sulphide (S ₂ ⁻)	mg/L	0.05	AO	<0.01
Tannin & Lignin	mg/L	-	-	<0.1
Total Dissolved Solids	mg/L	500	AO	436

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 3b: GROUNDWATER GEOCHEMISTRY - METALS

PARAMETER	UNITS	ODWS		TW1
		LIMIT	TYPE	TW22-1
				2024-12-10
METALS				
Aluminum (Al)	mg/L	0.1	OG	<0.001
Antimony (Sb)	mg/L	0.006	IMAC	<0.0005
Arsenic (As)	mg/L	0.01	IMAC	<0.001
Barium (Ba)	mg/L	1.0	MAC	0.08
Beryllium (Be)	mg/L	-	-	<0.0005
Boron (B)	mg/L	5.0	IMAC	0.15
Cadmium (Cd)	mg/L	0.005	MAC	<0.0001
Calcium (Ca)	mg/L	-	-	69
Chromium (Cr)	mg/L	0.05	MAC	<0.001
Cobalt (Co)	mg/L	-	-	<0.0002
Copper (Cu)	mg/L	1.0	AO	<0.001
Iron (Fe)	mg/L	0.3	AO	0.14
Lead (Pb)	mg/L	0.01	MAC	<0.001
Magnesium (Mg)	mg/L	-	-	27
Manganese (Mn)	mg/L	0.05	AO	<0.01
Mercury (Hg)	mg/L	0.001	MAC	<0.0001
Molybdenum (Mo)	mg/L	-	-	<0.005
Nickel (Ni)	mg/L	-	-	<0.005
Potassium (K)	mg/L	-	-	4
Selenium (Se)	mg/L	0.05	MAC	<0.001
Silver (Ag)	mg/L	-	-	<0.0001
Sodium (Na)	mg/L	200	AO	32
Strontium (Sr)	mg/L	-	-	2.47
Thallium (Tl)	mg/L	-	-	<0.001
Uranium (U)	mg/L	0.02	MAC	<0.001
Vanadium (V)	mg/L	-	-	<0.001
Zinc (Zn)	mg/L	5.0	AO	0.02

1. ODWS identifies the following types of parameters:

MAC = Maximum Acceptable Concentration

IMAC = Interim Maximum Acceptable Concentration

AO = Aesthetic Objective

OG = Operational Guideline

2. Shaded Concentration Indicates an Exceedance of the ODWS Objective

The bacteriological test results (Certificate of Analysis – Report No. 2205352; and 2212093) indicated that the test samples by others were non-detect (0 ct/100 mL) for



E.Coli and Total Coliforms. These values are consistent with Paterson's analysis with non-detect values found for the December 10, 2024 sample event.

The water quality of the subject water supply well meets all the Ontario Drinking Water Standards maximum acceptable concentrations (MAC) and has values consistent with the historical sampling by others. This shows that the available quality, which was approved by the City for the previous severance application, is consistent over an extended period of time. Furthermore, the water meets all of the Aesthetic Objectives (AO) and Operational Guidelines (OG) with the exception of the following.

- ☐ Hardness (as CaCO_3)
- ☐ Colour
- ☐ Turbidity

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

Hardness as CaCO_3

Hardness, expressed as calcium carbonate, is an operation guideline and does not appear in the ODWS. Rather, it appears in the Technical Support Documents for Ontario Drinking Water Standards, Objectives and Guidelines as a parameter with an operational guideline at 100 mg/L. At the measured concentration of 282 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 hardness concentration can be treated using conventional softening technologies, if desired by the owner. This value is consistent with the sample results by others.

Colour

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

During the field pumping test by others, apparent colour was measured in the groundwater to be <5 TCU. Whereas true colour and apparent colour from laboratory measurements was 2 and <2 TCU and 8 and 10 TCU, respectively. Furthermore, Paterson's sample in the field measured apparent colour of 0 TCU, while the laboratory reading was 9 TCU. The apparent colour in the lab is above the guideline, while the field parameters are within the appropriate range of <5 TCU. The elevated colour levels detected in the lab sample is attributed to the precipitation of minerals out of the groundwater, such as calcium-based hardness and iron. The apparent colour values are consistent with the previously measured values by others for the approved severance



application. As the field measurements are below the aesthetic objective, colour is considered to meet the appropriate objectives and will not require treatment.

Turbidity

Turbidity, which is generally an aesthetic parameter, was detected in the laboratory test samples at values of 0.9, 0.3, and 1.1 NTU in the January 2022, March 2022, and December 2024 samplings, respectively. Field testing of the samples detected values of 0.88 NTU in the December 2024 field tests. It is expected that ongoing use of the well would further reduce turbidity values as evidenced by the turbidity result of 0.3 NTU after 6 hours of pumping by others.

The ODWS maximum acceptable concentration for turbidity in drinking water entering the distribution system is 1 NTU. The Aesthetic Objective for turbidity in drinking water reaching the consumer is 5 NTU. The field test parameters are below the 5 NTU objective. Furthermore, total coliforms and E.Coli were non-detect (0 ct/100 mL) in all of the samples. Therefore, treatment for turbidity is not required.

Sodium

Sodium (Na), an aesthetic parameter, was detected in the laboratory test sample at concentrations of 31.6, 33.8 and 32 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. This recommendation was noted in the severance application by others. As such, the Medical Officer of Health should be aware of the sodium values in the area.



TERRAIN ANALYSIS

The purpose of this study is to determine the site's attenuation capacity for the existing usage and the suitability for private on-site wastewater systems. Specifically, the intent of this report is to assess the existing design details for private septic servicing.

Surficial Geology

A geotechnical investigation by others on May 5, 2022, where five test pits were extended in a manner to provide general coverage of the adjacent lots, with specific consideration to the lot severances occurring at 6695 and 6707 Franktown Road were excavated to a maximum depth of 4 m bgs. The general overburden was observed to be a layer of topsoil to a maximum depth of 1.17 m, except in TP22-4 where the top layer consists of a clay-based fill material. The topsoil/fill layer was followed by clay in TP22-1 to a depth of 2.7 m, and silty sand in the other test pits, to a maximum depth of 1.6 m. The silty sand or clay layer was further underlain by sandy silt with variable amounts of clay, to the depth of the test pits. TP22-3 had an additional silty sand layer underneath the sandy silt. The results of the geotechnical program are generally consistent with available geological mapping provided by the Ontario Geological Survey (OGS MRD128) and with the available historical surrounding Water Well Records (WWR). Further details can be found in the GEMTEC Hydrogeological Investigation and Terrain Analysis Report (File No. 1016638.001), dated August 11, 2022.

Available bedrock geological mapping provided by the Ontario Geological Survey (MRD 219) indicates that the bedrock underlying the subject site consists of sandstone, limestone and shale of the Rockcliffe Formation. Available overburden thickness mapping shows a drift thickness of 3 to 15 m across the subject site. The onsite well (TW22-1) indicates there is 6.1 m of overburden encountered.

Hydrogeological Sensitivity of the Site

The subject site currently consists of a residential dwelling and home-based business with associated infrastructure and private servicing. The subject site is serviced by a private potable well and septic system. The site is bordered to the northwest by treed areas, to the northeast by residential properties followed by agricultural lands, to the southwest by residential properties and undeveloped lands, and to the southeast by Franktown Road followed by an institutional property and undeveloped lands. The adjacent properties are serviced by private wells and septic systems.

Based on the geotechnical investigation by others, the overburden composition consists of clay or silty sand underlain by sandy silt and/or clay. Therefore, the overburden does not consist of highly permeable soils.

According to the geotechnical investigation by others, onsite water well record, absence of any inferred or potential karst features, and available geological mapping, 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.

Lot Development Plan

The Site Plan for the existing development was produced by FOTENN Designs and is attached (Drawing P1.REV 8, dated July 22, 2025). The area shown on the site plan is only the developed portion of the site and does not display the northern portion of the subject site. The full site area is used for the Nitrate Impact Assessment.

Sewage System Volumes

The existing residence has an approved sewage system design with a capacity of 1,725 L/day per the Certificate of Compliance (attached). The home-based business has an existing sewage system that is undersized for the theoretical Part 8 – Ontario Building Code (OBC) calculations. Paterson has completed a design (PH4979-1 and PH4979-2) for a replacement sewage system. The maximum TDDSSF for the additional sewage system was calculated based on Ontario Building Code (OBC) section 8.2.1.3 and is outlined below:

- ❑ Office Area; the maximum of either;
 - 3 employee shifts per day x 75 L/day = 225 L/day; or
 - $87.3 \text{ m}^2 \times 75 \text{ L/day per } 9.3 \text{ m}^2 = \mathbf{675 \text{ L/day}}$
- ❑ Warehouse / Mechanic area
 - 2 loading bay doors x 150 L/day per loading bay door = **300 L/day**
- ❑ Total = 675 L/day + 300 L/day = **975 L/day**

The maximum TDDSSF for the office and warehouse is 975 L/day. The TDDSSF for the subject site was determined to be 2,700 L/day. An approved Ottawa Septic System Office (OSSO) permit will be submitted with the Site Plan Application.

In addition to the above volumes, approximately 20,000 L/day of water is drawn for the use of well drilling and is only used offsite. There is no contribution to the sewage system volumes.

Predictive Nitrate Impact Assessment

In order to demonstrate that private services would adequately support the proposed Site Plan application, a Predictive Nitrate Impact Assessment (NIA) for the subject site was completed due to the residential and home-based business. If the Lot Size assessment was completed, the subject site significantly exceeds the average lot size requirement of 1.0 ha. The values shown in the Predictive NIA attached to this report are summarized below.



☐ Site area	40.23 ha
☐ Impervious area (%)	1 %
☐ Daily sewage flow	2.70 m ³ /d
☐ Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
☐ Surplus Water (The surplus water value was estimated based on Environment Canada Climate Office values with a soil type comprised of a fine sandy loam (Urban lawns / Shallow Rooted Crops) and anthropogenic sources.)	292 mm/yr
☐ Combined infiltration factor based on:	0.65
• Topography infiltration factor	0.20
• Soil texture infiltration factor	0.30
• Cover infiltration factor	0.15

The topography infiltration factor of 0.20 is based upon a generally rolling land with an average slope between 2.8 to 3.8 m/km. The soil texture infiltration factor was based upon a mix between “open sandy loam” with a value of 0.4 and “medium combinations of clay and loam” with a value of 0.3 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 a mix of cultivated land type cover and treed areas.

The calculation for a conventional septic system results in a predicted nitrate concentration of **0.52 mg/L** nitrate for the subject site, using a value of 40 mg/L nitrate concentration within the effluent. This value was based upon a daily sewage flow of 2,700 L/day. It is expected that the actual usage is much lower.

Based on the results of the predictive NIA, it is our opinion that the property can adequately support the proposed Site Plan application without having an adverse impact on the underlying bedrock aquifer, using a conventional sewage system. The updated septic system design for the home-based business will be submitted to the OSSO at the time of the Site Plan application. Due to the costs associated with the application and the 1-year permit duration that begins upon permit approval, it is recommended to delay the submittal.



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 existing development.
2. The well construction is considered to meet O.Reg 903 requirements based on visual inspection by Paterson and previous review by others.
3. The preferred water supply intercepted by TW22-1 contains a water supply that is potable, and contains only elevated concentrations of hardness, colour, and turbidity. Colour and turbidity were below limits in field testing. The noted parameters can be treated with current readily available water conditioning equipment if desired by the owner.
4. A residential grade water softener is recommended to facilitate the reduction of the hardness concentration. If a water softener is in use for the existing residence, 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 also used to provide a drinking tap source.
5. 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.
6. The site is not considered hydrogeologically sensitive due to the available overburden in excess of 2 m.
7. The predicted nitrate concentrations at the property boundary is calculated to be well below the required 10 mg/L threshold when a conventional sewage system is used.
8. Paterson completed a sewage system design to support the site plan application. The sewage system application will be completed at the time of the Site Plan application due to the costs and permit expiry timeline. Due to the available space on site, there will be no issues receiving an approval for the designed system.
9. The results of the Hydrogeological Assessment and Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed redevelopment with respect to water quality, quantity and sewage system impact assessment.



We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, PhD, EIT

Michael Killam, P.Eng

Attachments:

- ☐ Key Plan
- ☐ FOTENN Design- Drawing P1.Rev.8, dated July 22, 2025
- ☐ MECP Water Well Records
- ☐ Eurofins Certificate of Analysis
- ☐ Nitrate Impact Assessment Calculations
- ☐ Gemtec Report excerpts from "Hydrogeological Investigation & Terrain Analysis; Proposed Severance - D08-01-21/B-00171 and D08-01-21/B-00172", dated August 11, 2022
- ☐ Paterson Sewage System Design Drawings – PH4979-1 and PH4979-2



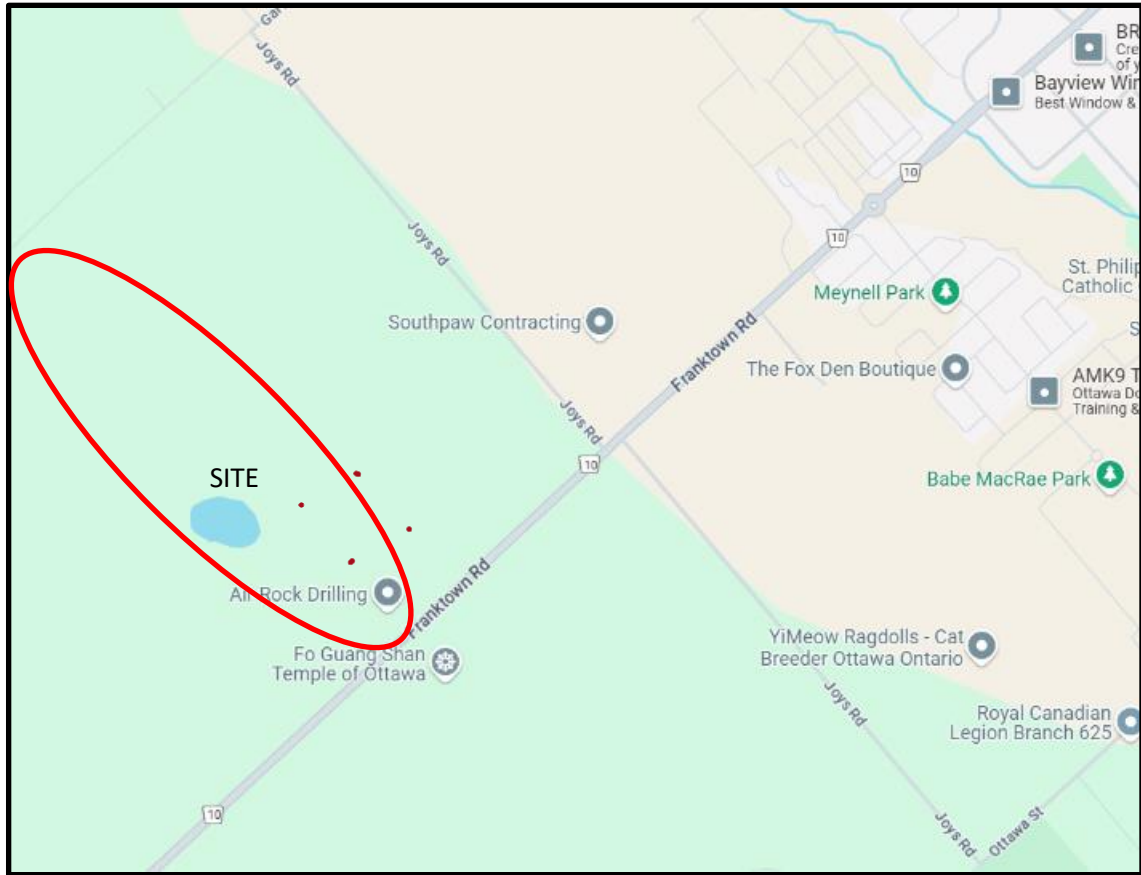
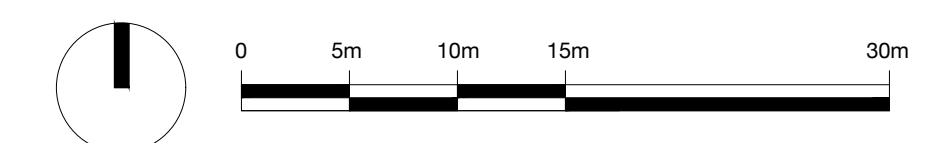


FIGURE 1

KEY PLAN

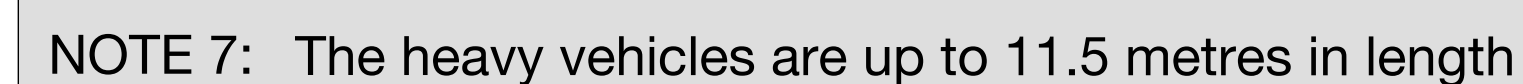
	EXISTING BUILDINGS
	EXISTING LANDSCAPED AREAS
	REINSTITATED LANDSCAPED AREAS
	GRAVEL / DIRT AREAS
	1.5m HIGH BERM
	PROPERTY BOUNDARY
	4.5m HIGH ACOUSTIC BARRIER



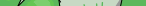
CLIENT
AIR ROCK DRILLING

396 Cooper Street, Suite 300, Ottawa ON K2P 2H7
613.730.5709 www.fotenn.com

P1



REINSTATED
GREEN SPACE
A:975m²



473

316/4F



WATER RESOURCES
DIVISION
15 No. 2407
AUG 31 1964
ONTARIO WATER
RESOURCES COMMISSION

UTM 1182 43211710E

5R 510029510N

Elev. 4R 013215

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 25
County or District Carleton

Township, Village, Town or City Goulbourn

Con 3 Lot 20

Date completed 15th August 1964
(day month year)

Address Richmond Ont.

Casing and Screen Record

Inside diameter of casing 6 1/4"
Total length of casing 10'
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole 6"

Pumping Test

Static level 4'
Test-pumping rate 10 G.P.M.
Pumping level 28'
Duration of test pumping 30 min
Water clear or cloudy at end of test clear
Recommended pumping rate 5' G.P.M.
with pump setting of 5'2 feet below ground surface

Well Log

Overburden and Bedrock Record

clay loam
sandstone rock

From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
----------	--------	----------------------------------	---------------------------------------

0	8	60'	fresh
8	65		

Water Record

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

NEW house

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

Drilling or Boring Firm Melville M. Langdon

Address Oakton Ont

Licence Number 1241

Name of Driller or Borer Melville M. Langdon

Address Oakton Ont

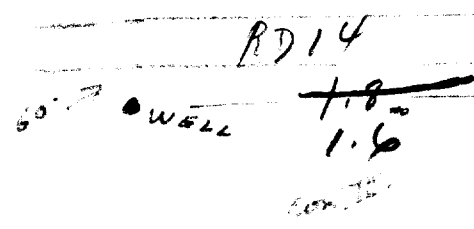
Date August 15 1964

Melville M. Langdon

(Signature of Licensed Drilling or Boring Contractor)

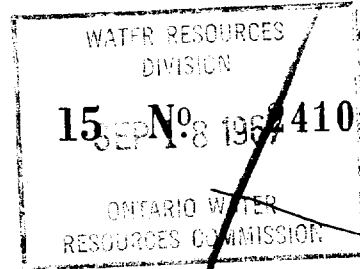
Location of Well

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



RICHMOND
M. LANGDON
116 MAIN ST.
Goulbourn

316/4f.



UTM 11E 2 43211610E

5R 50029110N

The Ontario Water Resources Commission Act

Elev. 4R 0325

WATER WELL RECORD

Basin 25

CARLETON

Township, Village, Town or City

GOULBOURN

County or District

3

Lot

20

Date completed

12

JUNE 67

(day)

month

year)

Address

RICHMOND

Casing and Screen Record

Inside diameter of casing 5
 Total length of casing 22
 Type of screen
 Length of screen
 Depth to top of screen
 Diameter of finished hole 5

Pumping Test

Static level 8
 Test-pumping rate 5 G.P.M.
 Pumping level 12
 Duration of test pumping 1 Hr
 Water clear or cloudy at end of test CLEAR
 Recommended pumping rate 5 G.P.M.
 with pump setting of 18 feet below ground surface

Well Log

Overburden and Bedrock Record

101m + BOULDER
 GRAVEL

From
ft.To
ft.Depth(s) at
which water(s)
foundKind of water
(fresh, salty,
sulphur)

0

20

20

22

22

FRESH

Location of Well

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

HOUSE

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

Drilling or Boring Firm

M. MEAGHER

Address

OTTAWA

Licence Number

2673

Name of Driller or Borer

SAME

Address

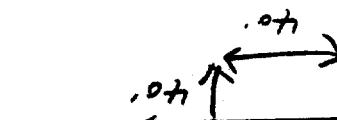
Date

SEP 11/67

(Signature of Licensed Drilling or Boring Contractor)

M. Meagher

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



15 ft from 210

QUEEN ST.

North

UTM *File* *18* *2* *4* *3* *2* *1* *6* *0* *E*
9 *R* *5* *0* *0* *3* *0* *3* *0* *N*
Elev. *9* *R* *0* *3* *2* *5*
Basin *2* *8*

316/4F



RECEIVED
DEC 21 1949
GEOLOGICAL BRANCH
DEPARTMENT OF MINES

2428
X

The Well Drillers Act
Department of Mines, Province of Ontario

Water Well Record

Source *4* *Lot* *20* *Pt. Lot*
Richmond *Acres* *1 acre*
Date Completed *June 16/49* Cost of Well (not including pump) *200.00*

Pipe and Casing Record	Pumping Test
Casing diameter(s) <i>4"</i>	Date <i>June 16/49</i>
Length(s) of casing(s) <i>30'</i>	Developed Capacity <i>200 G.P.H.</i>
Length of screen <i>no screen</i>	Duration of Test <i>1 hr</i>
Type of screen	Pumping Rate
Type of pump <i>no pump</i>	Drawdown
Capacity of pump	Static level of completed well <i>15'</i>
Depth of pump setting	Is well a gravel-wall type? <i>gravel</i>

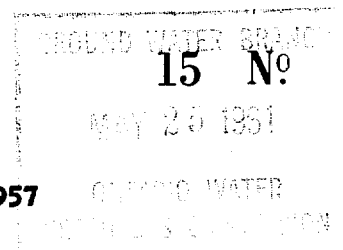
Water Record			
Kind (fresh or mineral)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
<i>fresh</i>	<i>50'</i>	<i>Good</i>	<i>35'</i>
Quality (hard, soft, contains iron, sulphur etc.) <i>hard</i>	<i>60</i>		<i>45'</i>
Appearance (clear, cloudy, coloured) <i>clear</i>			
For what purpose(s) is the water to be used? <i>house</i>			
How far is well from possible source of contamination? <i>200 ft</i>			
What is source of contamination? <i>barn</i>			
Enclose a copy of any mineral analysis that has been made of water			

Well Log			Location of Well
Drift and Bedrock Record	From	To	
<i>gravel</i>	0 ft.	<i>30</i> ft.	In diagram below show distances of well from road and lot line <i>Richmond</i> <i>From Richmond to Bells Corner</i> <i>East</i> <i>South</i>
<i>limestone rock</i>	<i>30</i>	<i>60</i>	

Situation: Is well on upland, in valley, or on hillside? *flat*
Drilling Firm *F.P. Sparks*
Address *Stittsville Ont*
Recorded by *F.P. Sparks* Address *Stittsville*
Date *Dec 8/49* Licence Number *Ont*

UTM 182 432300E
5R 5003120N

319/4f.



2430

Elev. 4325

The Ontario Water Resources Commission Act, 1957

Basin 25

WATER WELL RECORD

County or District Carleton Township, Village, Town or City Goulbourn

Con. 4 Lot 20 Date completed 24 Nov 1960

Address Richmond Ont.

Casing and Screen Record

Inside diameter of casing 4"
Total length of casing 17'
Type of screen -
Length of screen -
Depth to top of screen -
Diameter of finished hole 4"

Pumping Test

Static level 15'
Test-pumping rate 5 G.P.M.
Pumping level 20'
Duration of test pumping 2 hr
Water clear or cloudy at end of test clear
Recommended pumping rate 5 G.P.M.
with pumping level of 20'

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
Red Sand	0	17'			
Gray lime stone	17'	60	60	50'	fresh

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

House

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

valley

Drilling Firm F. P. Sparks

Address Stittsville

Ont.

Licence Number

Name of Driller Clayton H Sparks

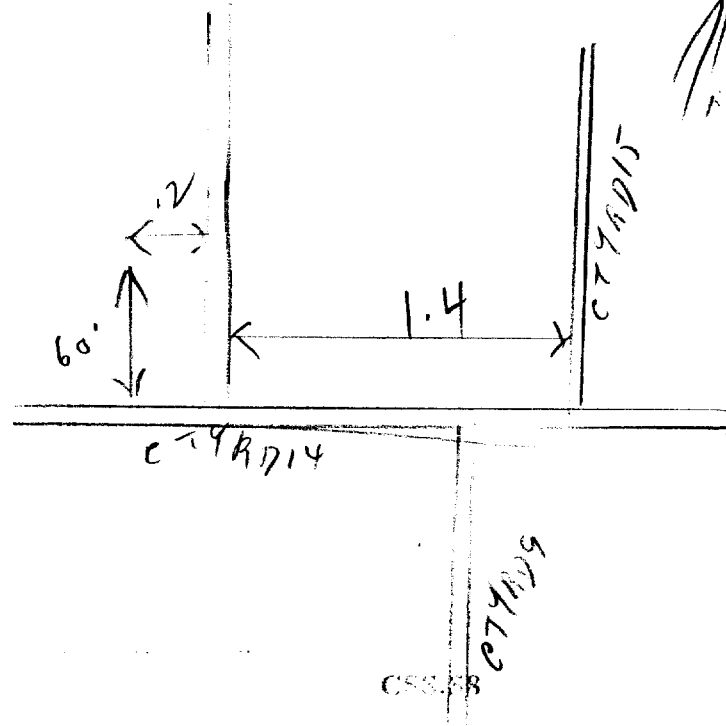
Address Stittsville Ont.

Date Nov. 24 1960

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

Location of Well

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





WATER WELL RECORD

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

11

15 15832

MUNICIP. 15003

CON.
CQ N

104

COUNTY OR DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

CON., BLOCK, TRACT, SURVEY, ETC

LOT 25-27

PR# 2, Ashton

DATE COMPLETED 18 11 76 48-53
DAY MO. YR.

THING	RC	ELEVATION	RC	BASIN CODE	II	III	IV
002999	4	0325	4	26			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

[illegible]

31	0012128	0064115				
32						

41 WATER RECORD		1	10	14	15	21
WATER FOUND AT - FEET	KIND OF WATER					
0062 10-13	1 ☒ FRESH	3 ☐ SULPHUR	14			
	2 ☐ SALTY	4 ☐ MINERAL				
15-18	1 ☐ FRESH	3 ☐ SULPHUR	15			
	2 ☐ SALTY	4 ☐ MINERAL				
20-23	1 ☐ FRESH	3 ☐ SULPHUR	24			
	2 ☐ SALTY	4 ☐ MINERAL				
25-28	1 ☐ FRESH	3 ☐ SULPHUR	25			
	2 ☐ SALTY	4 ☐ MINERAL				
30-33	1 ☐ FRESH	3 ☐ SULPHUR	34			
	2 ☐ SALTY	4 ☐ MINERAL				

CASING & OPEN HOLE RECORD				
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
06-11 6-4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	12 -188	0/025	13-16
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	19		20-23
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	26		27-30

SCREEN	SIZES OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
			INCHES		FEET	
	MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN		41-44	8
					FEET	

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

PUMPING TEST	PUMPING TEST METHOD		10	PUMPING RATE		E-14	DURATION OF PUMPING	
	1 ☒ PUMP	2 ☐ BAILER		0006		GPM	9/15-16 HOURS	17-18 MINS
	STATIC LEVEL	WATER LEVEL END OF PUMPING	25	WATER LEVELS DURING			1 ☒ PUMPING	2 ☐ RECOVERY
	19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES		
	000	050	050	050	050	050	050	
	FEET	FEET	FEET	FEET	FEET	FEET	FEET	
IF FLOWING, GIVE RATE		30-41	PUMP INTAKE SET AT		WATER AT END OF TEST		42	
		GPM			FEET	1 ☐ CLEAR 2 ☒ CLOUDY		
RECOMMENDED PUMP TYPE		RECOMMENDED PUMP SETTING	43-45	RECOMMENDED PUMPING RATE		46-49		
☐ SHALLOW ☒ DEEP		050	FEET	0005		GPM		
50-53		GPM./FT. SPECIFIC CAPACITY						

34 FINAL STATUS OF WELL 1	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED POOR QUALITY 7 ☐ UNFINISHED
55-56 WATER USE 01	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER _____	5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
57 METHOD OF DRILLING 5	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

LOCATION OF WELL

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

↑
N!

7. Side Rel.

OST ← Home
ac. Rel 10

DRILLERS REMARKS:

CONTRACTOR	NAME OF WELL CONTRACTOR		LICENCE NUMBER
	Henry Meins Well Drilling		3644
	ADDRESS		
	Box 326, Richmond Ont		
	NAME OF DRILLER OR WORMER		LICENCE NUMBER
	H. Meins		
	SIGNATURE OF CONTRACTOR		SUBMISSION DATE
			DAY 20 MO. 11 YR. 76

OFFICE USE ONLY	DATA SOURCE	58	CONTRACTOR	59-62	DATE RECEIVED	63-68
	1		3644		190177	
	DATE OF INSPECTION		INSPECTOR			
			[Signature]			
	REMARKS:					P.
						WI



Ontario

E.P.M.

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

COUNTY OR DISTRICT Carleton	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Houlbourn	CON. BLOCK, TRACT, SURVEY, ETC. Con 9,	DATE COMPLETED DAY 27 MO 07 YR 77
WELL IDENTIFICATION 0015228		ELEVATION 4 0326	BASIN CODE 4 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
grey	sand			0	15
grey	limestone			15	105

31	0015228	0105215
32		

41 WATER RECORD			
WATER FOUND AT - FEET	KIND OF WATER		
0/02	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL		

51 CASING & OPEN HOLE RECORD			
WELL DIA. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	1/8"	0 0025

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

61 PLUGGING & SEALING RECORD			
DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)		
FROM	TO		

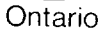
71 PUMPING TEST	PUMPING TEST METHOD 1 ☒ PUMP 2 ☐ BAILER	PUMPING RATE 0020 GPM	DURATION OF PUMPING 01 HOURS
STATIC LEVEL 006	WATER LEVEL END OF PUMPING 025	WATER LEVELS DURING 15 MINUTES 025 30 MINUTES 025 45 MINUTES 025 60 MINUTES 025	1 ☒ PUMPING 2 ☐ RECOVERY

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

FINAL STATUS OF WELL	1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED
WATER USE	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ OTHER	6 ☐ COMMERCIAL 7 ☐ MUNICIPAL 8 ☐ PUBLIC SUPPLY 9 ☐ COOLING OR AIR CONDITIONING 10 ☐ NOT USED
METHOD OF DRILLING	1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR	NAME OF WELL CONTRACTOR Henry Manns Well Drilling	LICENCE NUMBER 3644
	ADDRESS Box 326, Richmond Ont	
	NAME OF DRILLER OR BORER Henry Manns	LICENCE NUMBER
	SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY 1 MO 8 YR 77

OFFICE USE ONLY	DATA SOURCE 1	CONTRACTOR 3644	DATE RECEIVED 250877
	DATE OF INSPECTION MAY 16 1979	INSPECTOR Km. JAI	
	REMARKS WHITE FARM 100000 WITH BLACK EXTENSION		



Ministry
of the
Environment

The Ontario Water Resources Act

WATER WELL RECORD

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

11

1523647

MUNICIP. 15003

CON.
CON.

03

COUNTY OR DISTRICT

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE

CON. BLOCK TRACT. SURVEY ETC

LOT 25-32

Diagram illustrating the structure of a 12-bit data word, divided into four 3-bit fields:

- Field I (3 bits):** Labeled "NG".
- Field II (3 bits):** Labeled "RC".
- Field III (3 bits):** Labeled "ELEVATION".
- Field IV (3 bits):** Labeled "RC".

The fields are grouped into four 3-bit segments, each labeled "BASIN CODE".

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

[illegible]

31

32

41

WATER RECORD

WATER FOUND AT - FEET		KIND OF WATER	
10-13	1 ☒ FRESH 2 ☐ SALTY	3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS	14
15-18	1 ☐ FRESH 2 ☐ SALTY	3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS	19
20-23	1 ☐ FRESH 2 ☐ SALTY	3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS	24
25-28	1 ☐ FRESH 2 ☐ SALTY	3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS	29
30-33	1 ☐ FRESH 2 ☐ SALTY	3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS	34

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES		MATERIAL		WALL THICKNESS INCHES		DEPTH - FEET	
						FROM	TO
10-11 6 1/4	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	12	-188	0	53	13-16	
17-18 6	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☒ OPEN HOLE ☐ PLASTIC	19		53	75	20-23	
24-25	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	26				27-30	

SCREEN

SIZE (S) OF OPENING (SLOT NO.)	31-33	DIAMETER	34-38	LENGTH	39-40
		INCHES		FEET	
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN		41-44	50
				FEET	

61

PLUGGING & SEALING RECORD

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

PUMPING TEST

71	PUMPING TEST METHOD		10	PUMPING RATE		11-14	DURATION OF PUMPING		17-19
	1 ☐ PUMP 2 ☐ BAILER			20		GPM	15-16 HOURS		MIN
	STATIC LEVEL	WATER LEVEL END OF PUMPING	25	WATER LEVELS DURING				1 ☐ PUMPING 2 ☐ RECOVERY	
	19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES			
	6	30	30 ²⁸⁻²⁹	30 ²⁹⁻³¹	30	30			
FEET		FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
IF FLOWING, GIVE RATE			30-41	PUMP INTAKE SET AT			WATER AT END OF TEST		
GPM				FEET			1 ☐ CLEAR 2 ☒ CLOUDY		
RECOMMENDED PUMP TYPE			RECOMMENDED PUMP SETTING	43-45	RECOMMENDED PUMPING RATE			86-89	
1 ☒ SHALLOW ☐ DEEP			30	FEET	/ 0			GPM	
50-53									

LOCATION OF WELL

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

LOCATION OF WELL

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

Franktown Rd.

Joy Rd.

1/2 mi

1/4 mi

49922

DRILLERS REMARKS

DRILLERS REMARKS

CONTRACTOR

CONTRACTOR	NAME OF WELL CONTRACTOR H. Mains Well Drilling		WELL CONTRACTOR'S LICENCE NUMBER 3644	
	ADDRESS Box 326, Richmond Ont.			
	NAME OF WELL TECHNICIAN a		WELL TECHNICIAN'S LICENCE NUMBER	
	SIGNATURE OF TECHNICIAN/CONTRACTOR [Signature]		SUBMISSION DATE DAY 12 MO. 4 YR. 89	

OFFICE USE ONLY

DATA SOURCE	58	CONTRACTOR 3644	59-62	DATE RECEIVED AUG 04 1989	63-68	80
DATE OF INSPECTION		INSPECTOR				
REMARKS						



The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.

Mark correct box with a checkmark, where applicable.

11

1532709

Municipality
15003

Con.

CON

04

County or District Attawapiskat	Township/Borough/City/Town/Village Goulbourn	Con block tract survey, etc. 4	Lot 19
Address Richmond, Ont		Date completed 11 03 02 day month year	

21

1 2

U
T
M

10 12 13 14 15 16 17

Northings

18 19 20 21 22 23 24

RC

Elevation

25 26

RC

Basin Code

ii iii iv

27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

[illegible][illegible]

41		10		14		15		21	
WATER RECORD									
Water found at - feet		Kind of water							
10-13 94		1	☒ Fresh	3	☐ Sulphur			14	
		2	☐ Salty	4	☒ Minerals				
				6	☒ Gas				
15-18 210		1	☒ Fresh	3	☐ Sulphur			19	
		2	☐ Salty	4	☒ Minerals				
				6	☒ Gas				
20-23		1	☐ Fresh	3	☐ Sulphur			24	
		2	☐ Salty	4	☐ Minerals				
				6	☐ Gas				
25-28		1	☐ Fresh	3	☐ Sulphur			29	
		2	☐ Salty	4	☐ Minerals				
				6	☐ Gas				
30-33		1	☐ Fresh	3	☐ Sulphur			34	
		2	☐ Salty	4	☐ Minerals				
				6	☐ Gas				

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
10-11 6 1/4	☒ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic	188	0	24
17-18 8 3/4	☐ Steel ☐ Galvanized ☐ Concrete ☒ Open hole ☐ Plastic		0	22
24-25 6	☐ Steel ☐ Galvanized ☐ Concrete ☒ Open hole ☐ Plastic		22	220

SCREEN	54	65	75	80
	Sizes of opening (Slot No.)	31-33	Diameter 34-38 inches	Length 39-40 feet
	Material and type		Depth at top of screen 41-44 feet	30

61	PLUGGING & SEALING RECORD			
☒ Annular space		☐ Abandonment		
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)		
From	To			
2 ¹³	24 ¹⁷			
18-21	22-25			
26-29	30-33			
		80		

PUMPING TEST	Pumping test method 10 1 ☒ Pump 2 ☐ Bailer		Pumping rate 30 11-14 GPM		Duration of pumping 1 15-16 Hours 17-18 Mins	
	Static level 19-21		Water level end of pumping 25		Water levels during 1 ☐ Pumping 2 ☒ Recovery	
	6 19-21 feet	100 22-24 feet	15 minutes 26-28 6 feet	30 minutes 29-31 6 feet	45 minutes 32-34 6 feet	60 minutes 35-37 6 feet
	If flowing give rate 38-41 GPM		Pump intake set at feet		Water at end of test 42	
	Recommended pump type ☐ Shallow ☒ Deep		Recommended pump setting 43-45 100 feet		Recommended pump rate 46-49 30 GPM	

FINAL STATUS OF WELL			54
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished	
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well	
3 ☐ Test hole	7 ☐ Abandoned (Other)		
4 ☐ Recharge well	8 ☐ Dewatering		

WATER USE			55-56
1 ☒ Domestic	5 ☐ Commercial	9 ☐ Not use	
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other	
3 ☐ Irrigation	7 ☐ Public supply		
4 ☐ Industrial	8 ☐ Cooling & air conditioning		

METHOD OF CONSTRUCTION			57
1 ☐ Cable tool	5 ☒ Air percussion	9 ☐ Driving	
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging	
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other	
4 ☐ Rotary (air)	8 ☐ Jetting		

LOCATION OF WELL

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

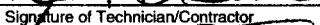
↑ N

Joy Side Rd

250' ↑ ← 3km

Franktown Rd

234278

Name of Well Contractor Airoloch Drilling Co Ltd	Well Contractor's Licence No. 1119
Address RR #2 Jasper, Ont	
Name of Well Technician Ken Desaulniers	Well Technician's Licence No. T4
Signature of Technician/Contractor 	Submission date day mo yr

MINISTRY USE ONLY	Data source	58	Contractor	59-62	Date received	63-66	80
			1119		APR 16 2002		
	Date of inspection		Inspector				
	Remarks						
	CSS.ES2						

Measurements recorded in: ☐ Metric ☒ Imperial

Page of

Well Owner's Information

First Name: Rebecca Last Name / Organization: Hanbridge E-mail Address: ☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name): 6619 Franktown Road Municipality: Richmond Ontario Postal Code: K0A2Z0 Telephone No. (inc. area code):

Well Location

Address of Well Location (Street Number/Name): #6619 Franktown Road Township: Goulbourn Lot: 20 Concession: 4
County/District/Municipality: Ottawa-Carleton City/Town/Village: Richmond Province: Ontario Postal Code:
UTM Coordinates: NAD 83 Zone: 18 Easting: 432228 Northing: 5003312 Municipal Plan and Sublot Number: Other:

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
	Brown Sand			0' 22'
	Gray limestone			22' 172'
	Gray & White Sand stone			172' 236'

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m ³)
28' 0'	Neat Cement Slurry	10.92

Method of Construction	Well Use
☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☒ Air percussion ☐ Other, specify	☐ Public ☒ Domestic ☐ Livestock ☐ Industrial ☐ Other, specify

Construction Record - Casing				Status of Well
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)	
6"	Steel	.188"	2' 28'	☒ Water Supply
6"	Open hole		28' 236'	☐ Replacement Well

Construction Record - Screen				Status of Well
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
				☐ Test Hole
				☐ Recharge Well
				☐ Dewatering Well
				☐ Observation and/or Monitoring Hole
				☐ Alteration (Construction)
				☐ Abandoned, Insufficient Supply
				☐ Abandoned, Poor Water Quality
				☐ Abandoned, other, specify
				☐ Other, specify

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft)	Diameter (cm/in)
227' (m/ft)	☐ Gas ☐ Other, specify	0' 236'	6"
229' (m/ft)	☐ Gas ☐ Other, specify		
	☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor: Air Rock Drilling Co Ltd	Well Contractor's Licence No.: 1119	Business Address (Street Number/Name): RR#1	Municipality: Richmond
Province: ONT	Postal Code: K0A2Z0	Business E-mail Address:	
Bus. Telephone No. (inc. area code): 6138382170	Name of Well Technician (Last Name, First Name): Purcell Shannon	Well Technician's Licence No.: T2122	Signature of Technician and/or Contractor: [Signature] Date Submitted: 20100510

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
☒ Clear and sand free		Time (min)	Water Level (m/ft)
☐ Other, specify		Static Level	6'6"
If pumping discontinued, give reason:		1	6'7"
Pump intake set at (m/ft): 160'		2	6'7"
Pumping rate (l/min / GPM): 20		3	
Duration of pumping: 1 hrs + 0 min		4	
Final water level end of pumping (m/ft): 6'7"		5	
If flowing give rate (l/min / GPM):		10	
Recommended pump depth (m/ft): 100'		15	
Recommended pump rate (l/min / GPM): 20		20	
Well production (l/min / GPM): 20		25	
Disinfected? ☒ Yes ☐ No		30	
		40	
		50	
		60	

Map of Well Location	
Please provide a map below following instructions on the back.	
Comments:	
Well owner's information package delivered: ☒ Yes ☐ No	Date Package Delivered: 20100319
Date Work Completed: 20100319	Ministry Use Only
	Audit No.: Z108249
	JUN 01 2010

Measurements recorded in: ☐ Metric ☒ Imperial

Page of

Well Owner's Information

First Name	Last Name / Organization International Buddhist Progress Society of Ottawa	E-mail Address	☐ Well Constructed by Well Owner
Mailing Address (Street Number/Name) 1950 Scott Street	Municipality Ottawa	Province ON	Postal Code K1Z 8L8

Well Location

Address of Well Location (Street Number/Name) 6688 Franktown Road	Township Goulbourn	Lot P/L 19	Concession 3
County/District/Municipality Ottawa-Carleton	City/Town/Village Richmond	Province Ontario	Postal Code
UTM Coordinates Zone NAD 83 18	Easting 432051	Northing 5003029	Municipal Plan and Sublot Number RP 4R-7040
			Other Part 1

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m)
	Sand y	Clay		0' 10'
Grey	Limestone			10' 73'
Grey	Limestone			73' 142'
Grey	Limestone			142' 171'
Grey	Sandstone			171' 194'
Grey	Sandstone			194' 200'

Annular Space		
Depth Set at (m)	Type of Sealant Used (Material and Type)	Volume Placed (m³)
20' 0'	Neat cement	10.8

Method of Construction	Well Use
☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☒ Air percussion ☐ Other, specify	☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring ☐ Other, specify

Construction Record - Casing			Status of Well	
Inside Diameter (cm)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm)	Depth (m)	
6 1/4"	Steel	.188"	+2' 20'	☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify
6 1/4"	Open Hole		20' 200'	

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

Water Details		Hole Diameter	
Water found at Depth 73 (m)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m)	Diameter (cm)
	☐ Gas ☐ Other, specify	From To	
Water found at Depth 2 (m)	Kind of Water: ☐ Fresh ☒ Untested	0' 20'	9 3/4"
	☐ Gas ☐ Other, specify	20' 200'	6 1/4"
Water found at Depth 94 (m)	Kind of Water: ☐ Fresh ☒ Untested		
	☐ Gas ☐ Other, specify		

Well Contractor and Well Technician Information			
Business Name of Well Contractor Air Rock Drilling Co. Ltd.		Well Contractor's Licence No. 1119	
Business Address (Street Number/Name) 6055 Franktown Road, RR#1		Municipality Richmond	
Province ON	Postal Code K0A 2Z0	Business E-mail Address air-rock@sympatico.ca	
Bus. Telephone No. (inc. area code) 6138382170		Name of Well Technician (Last Name, First Name) Hanna, Jeremy	
Well Technician's Licence No. 13532		Signature of Technician and/or Contractor 	
		Date Submitted 2018 07 31	

Results of Well Yield Testing			
After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify Not tested		Draw Down	
If pumping discontinued, give reason: ☒		Time (min)	Water Level (m)
Pump intake set at (m) 150		1	15.4
Pumping rate (l/min / GPM) 20		2	15.4
Duration of pumping 1 hrs + 0 min		3	15.4
Final water level end of pumping (m) 15.5		4	15.4
If flowing give rate (l/min / GPM) ☒		5	15.4
Recommended pump depth (m) 100		6	15.4
Recommended pump rate (l/min / GPM) 20		7	15.4
Well production (l/min / GPM) 20		8	15.4
Disinfected? ☒ Yes ☐ No		9	15.4
		10	15.4
		11	15.4
		12	15.4
		13	15.4
		14	15.4
		15	15.4
		16	15.4
		17	15.4
		18	15.4
		19	15.4
		20	15.4
		21	15.4
		22	15.4
		23	15.4
		24	15.4
		25	15.4
		26	15.4
		27	15.4
		28	15.4
		29	15.4
		30	15.4
		31	15.4
		32	15.4
		33	15.4
		34	15.4
		35	15.4
		36	15.4
		37	15.4
		38	15.4
		39	15.4
		40	15.4
		41	15.4
		42	15.4
		43	15.4
		44	15.4
		45	15.4
		46	15.4
		47	15.4
		48	15.4
		49	15.4
		50	15.4
		51	15.4
		52	15.4
		53	15.4
		54	15.4
		55	15.4
		56	15.4
		57	15.4
		58	15.4
		59	15.4
		60	15.4

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

Comments: 1 HP - 20 GPM SET @ 100 FT	
Well owner's information package delivered ☒ Yes ☐ No	Date Package Delivered 2018 07 12
Date Work Completed 2018 07 11	Ministry Use Only Audit No. 2276984 Received SEP 10 2018

OFFICIAL CERTIFICATE OF ANALYSIS : 4187002
WORK REQUEST : 100331614
Report Date : 2024-12-16
Paterson Group

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

Reception Date : 2024-12-10
Project : PH4717
Sampler : NA
PO Number : 61963
Temperature : 10 °C

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

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

Sample status upon receipt :

8264503

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

OFFICIAL CERTIFICATE OF ANALYSIS - EXCEEDENCE SUMMARY

Client : Paterson Group
Project : PH4717

Reception Date : 2024-12-10

Eurofins Sample No	Client Sample Identification	Analyte	Result	Units	Exceeded Criteria		
					A	B	C
Colour, Apparent (Water, Spectrophotometry)							
8264503	6659F	Colour (Apparent)	9	TCU	5		
Hardness (Water, Calculation Only)							
8264503	6659F	Hardness as CaCO3 (Calculation)	282	mg/L	80-100		

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4717

Reception Date: 2024-12-10

			Eurofins Sample No : 8264503						
			Matrix : Groundwater						
			Sampling Date : 2024-12-10						
			Client Sample Identification : 6659F						
Anions	RL	Unit	Criteria						
			A	B	C				
Chloride	0.5	mg/L	250			49			
Nitrate (as Nitrogen)	0.1	mg/L	10.0			<0.1			
Nitrite (as Nitrogen)	0.1	mg/L	1.0			<0.1			
Sulphate	1	mg/L	500			41			

			Eurofins Sample No : 8264503						
			Matrix : Groundwater						
			Sampling Date : 2024-12-10						
			Client Sample Identification : 6659F						
Calculations	RL	Unit							
Ion Balance (Calculation)^	0.1		0.97						

			Eurofins Sample No : 8264503						
			Matrix : Groundwater						
			Sampling Date : 2024-12-10						
			Client Sample Identification : 6659F						
General Chemistry	RL	Unit	Criteria						
			A	B	C				
Alkalinity (as CaCO3)	5	mg/L	500			256			
Colour (Apparent)	2	TCU	5			9			
Conductivity @ 25°C	5	µS/cm				671			
Dissolved Organic Carbon	0.5	mg/L	5			2.4			
Fluoride	0.1	mg/L	1.5			0.46			
Hardness as CaCO3 (Calculation)	1	mg/L	80-100			282			
pH @ 25°C	1		6.5-8.5			7.67			
Phenols-4AAP	0.001	mg/L				<0.001			
Sulphide (S2-)	0.01	mg/L	0.05			<0.01			
Tannin and Lignin	0.1	mg/L				0.2			
TDS (Estimated)^	5	mg/L	500			436			
Turbidity	0.1	NTU	5			1.1			

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4717

Reception Date: 2024-12-10

Eurofins Sample No :					8264503					
Matrix :					Groundwater					
Sampling Date :					2024-12-10					
Client Sample Identification :					6659F					
Metals	RL	Unit	Criteria							
			A	B	C					
Metals Scan (Water, ICP/MS)										
Aluminum	0.01	mg/L	0.1			<0.01				
Antimony	0.0005	mg/L	0.006			<0.0005				
Arsenic	0.001	mg/L	0.01			<0.001				
Barium	0.001	mg/L	1			0.082				
Beryllium	0.0005	mg/L				<0.0005				
Boron	0.01	mg/L	5			0.18				
Cadmium	0.0001	mg/L	0.005			<0.0001				
Chromium	0.001	mg/L	0.05			<0.001				
Cobalt	0.0002	mg/L				<0.0002				
Copper	0.001	mg/L	1			<0.001				
Iron	0.03	mg/L	0.3			0.14				
Lead	0.001	mg/L	0.01			<0.001				
Manganese	0.01	mg/L	0.05			<0.01				
Mercury	0.0001	mg/L	0.001			<0.0001				
Molybdenum	0.005	mg/L				<0.005				
Nickel	0.005	mg/L				<0.005				
Selenium	0.001	mg/L	0.05			<0.001				
Silver	0.0001	mg/L				<0.0001				
Strontium	0.001	mg/L				2.47				
Thallium	0.0001	mg/L				<0.0001				
Uranium	0.001	mg/L	0.02			<0.001				
Vanadium	0.001	mg/L				<0.001				
Zinc	0.01	mg/L	5			0.02				
Metals Scan (Water, ICP/OES)										
Calcium	1	mg/L				69				
Magnesium	1	mg/L				27				
Potassium	1	mg/L				4				
Sodium	1	mg/L	200			32				

Eurofins Sample No :						8264503				
Matrix :						Groundwater				
Sampling Date :						2024-12-10				
Client Sample Identification :						6659F				
Microbiology	RL	Unit	Criteria							
			A	B	C					
Escherichia coli (DC)	0	CFU/100mL	0			0				
Total Coliforms (DC)	0	CFU/100mL	0			0				

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Paterson Group
Project : PH4717

Reception Date: 2024-12-10

Eurofins Sample No :		8264503							
Matrix :		Groundwater							
Sampling Date :		2024-12-10							
Client Sample Identification :		6659F							
Nutrients	RL	Unit							
Ammonia (Total, as Nitrogen)	0.02	mg/L	0.087						
Total Kjeldahl Nitrogen	0.1	mg/L	0.253						

Approved by :



Patrick Jacques,
Ottawa, Environmental Chemist,

Approved by :



Dragana Dzeletovic-Andric,
Team Lead, Microbiology

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH4717

Reception Date: 2024-12-10

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Alkalinity (Water, Automated)									
Method : Alkalinity (water, titration to pH 4.5, automated). Internal method: OTT-I-AT-WI45398.									
Alkalinity (as CaCO3)	mg/L	5	<5	99	95-105				
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-16	
Ammonia, Total (Water, Colorimetry)									
Method : Ammonia (Water, Colorimetry). Internal method: OTT-I-NUT-WI46201.									
Ammonia (Total, as Nitrogen)	mg/L	0.02	<0.020	95	80-120	99	80-120	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	
Chloride (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Chloride	mg/L	0.5	<0.5	96	80-120	104	80-120	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-16 Analysis Date: 2024-12-16	
Colour, Apparent (Water, Spectrophotometry)									
Method : Colour (Water, Spectrophotometric). Internal method: OTT-I-SPEC-WI45980.									
Colour (Apparent)	TCU	2	<2	95	49-146			-	0-40
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-13	
Conductivity (Water, Automated)									
Method : Conductivity (Water, Autotitrator). Internal Method: OTT-I-AT-WI45398.									
Conductivity @ 25°C	uS/cm	5	<5	100	98-102			1	0-20
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-16	
DOC (Water, IR)									
Method : Organic carbon (water, IR, combustion). Internal method: OTT-I-DEM-WI46148.									
Dissolved Organic Carbon	mg/L	0.5	<0.5	99	84-116	86	80-120	3	0-15
Associated Samples : 8264503								Prep Date: 2024-12-12 Analysis Date: 2024-12-13	
Escherichia coli (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Escherichia coli (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 8264503								Prep Date: 2024-12-10 Analysis Date: 2024-12-11	
Fluoride (Water, Auto/ISE)									
Method : Fluoride by autotitrator, ion selective electrode. Internal method: OTT-I-AT-WI45398.									
Fluoride	mg/L	0.1	<0.10	106	90-110				
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-16	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group
Project : PH4717

Reception Date: 2024-12-10

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Metals Scan (Water, ICP/MS)									
Method : Metals (Water, ICP/MS). Internal method: AMMTFQE1.									
Aluminum	mg/L	0.01	<0.01	100	80-130	102	70-130	-	0-20
Antimony	mg/L	0.0005	<0.0005	112	80-130	89	70-130	-	0-20
Arsenic	mg/L	0.001	<0.001	96	80-130	99	70-130	-	0-20
Barium	mg/L	0.001	<0.001	90	80-130	94	70-130	0	0-20
Beryllium	mg/L	0.0005	<0.0005	105	80-130	108	70-130	-	0-20
Boron	mg/L	0.01	<0.01	100	80-130	103	70-130	-	0-20
Cadmium	mg/L	0.0001	<0.0001	101	80-130	101	70-130	-	0-20
Chromium	mg/L	0.001	<0.001	100	80-130	100	70-130	-	0-20
Cobalt	mg/L	0.0002	<0.0002	100	80-130	97	70-130	-	0-20
Copper	mg/L	0.001	<0.001	100	80-130	85	70-130	1	0-20
Iron	mg/L	0.03	<0.03	100	80-130	95	70-130	-	0-20
Lead	mg/L	0.001	<0.001	110	80-130	96	70-130	-	0-20
Manganese	mg/L	0.01	<0.01	100	80-130	95	70-130	-	0-20
Mercury	mg/L	0.0001	<0.0001	103	80-120	100	70-130	-	0-20
Molybdenum	mg/L	0.005	<0.005	100	80-130	94	70-130	-	0-20
Nickel	mg/L	0.005	<0.005	100	80-130	95	70-130	-	0-20
Selenium	mg/L	0.001	<0.001	96	80-130	98	70-130	-	0-20
Silver	mg/L	0.0001	<0.0001	100	80-130	101	70-130	-	0-20
Strontium	mg/L	0.001	<0.001	100	80-130	91	70-130	0	0-20
Thallium	mg/L	0.0001	<0.0001	105	80-130	95	70-130	-	0-20
Uranium	mg/L	0.001	<0.001	100	80-130	99	70-130	-	0-20
Vanadium	mg/L	0.001	<0.001	100	80-130	99	70-130	-	0-20
Zinc	mg/L	0.01	<0.01	100	80-130	98	70-130	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	
Metals Scan (Water, ICP/OES)									
Method : Metals (Water, ICP/OES). Internal method: OTT-I-MET-WI48491.									
Calcium	mg/L	1	<1	97	86-115	96	70-130	1	0-20
Magnesium	mg/L	1	<1	95	91-109	97	70-130	1	0-20
Potassium	mg/L	1	<1	101	87-113	99	70-130	-	0-20
Sodium	mg/L	1	<1	98	85-115	99	70-130	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-10	
Nitrate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrate (as Nitrogen)	mg/L	0.1	<0.1	95	80-120	102	80-120	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-16 Analysis Date: 2024-12-16	
Nitrite (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Nitrite (as Nitrogen)	mg/L	0.1	<0.1	105	80-120				
Associated Samples : 8264503								Prep Date: 2024-12-16 Analysis Date: 2024-12-16	
pH (25°C) (Water, Automated)									
Method : pH (Water, Automated Meter). Internal method: OTT-I-AT-WI45398.									
pH @ 25°C		1	6.92	101	97-103			1	0-20
Associated Samples : 8264503								Prep Date: 2024-12-13 Analysis Date: 2024-12-16	

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Paterson Group

Project : PH4717

Reception Date: 2024-12-10

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Phenols (Water, Colorimetry)									
Method : Phenols (Water, Colorimetry). Internal method: OTT-I-4AAP-WI46150.									
Phenols-4AAP	mg/L	0.001	<0.001	110	75-125	110	70-130	-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	
Sulphate (Water, IC)									
Method : Anions (Water, Ion Chromatography). Internal method: OTT-I-IC-WI45985.									
Sulphate	mg/L	1	<1	98	90-110	106	80-120	0	0-20
Associated Samples : 8264503								Prep Date: 2024-12-16 Analysis Date: 2024-12-16	
Sulphide (Water, Colorimetry)									
Method : Sulphide, S2- (Water, Colorimetry). Internal method: OTT-I-SPEC-WI45931.									
Sulphide (S2-)	mg/L	0.01	<0.01	87	80-120			-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-12 Analysis Date: 2024-12-12	
Tannin and Lignin (Water, Spec)									
Method : Tannin and Lignin (Water, Spec), Internal method: OTT-I-SPEC-WI57693.									
Tannin and Lignin	mg/L	0.1	<0.1	102	80-120			-	0-20
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	
Total Coliforms (DC Plate)									
Method : Total Coliforms and E.Coli by MF (Water, DC plate). Internal method: OTT-M-BAC-WI45296.									
Total Coliforms (DC)	CFU/100mL	0	0					-	0-30
Associated Samples : 8264503								Prep Date: 2024-12-10 Analysis Date: 2024-12-11	
Total Kjeldahl Nitrogen (Water, Colorimetry)									
Method : TKN (Water, colorimetry). Internal method: OTT-I-NUT-WI46201.									
Total Kjeldahl Nitrogen	mg/L	0.1	<0.100	105	70-130	103	70-130	5	0-20
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	
Turbidity (Water, Turbidimeter)									
Method : Turbidity (Water, Turbidimeter). Internal method: OTT-I-TUR-WI46288.									
Turbidity	NTU	0.1	<0.1	101	80-120			3	0-30
Associated Samples : 8264503								Prep Date: 2024-12-11 Analysis Date: 2024-12-11	

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

CLIENT INFORMATION

INVOICE INFORMATION

100331614

INFORMATION: YES ☒ NO ☐

Company: Paterson Group

Company:

Contact: Alex Schopf

Contact:

Address: 9 Auriga Drive

Address:

Telephone: 613-218-3444

Telephone:

Email: #1: eardley@patersongroup.ca, mlaflamme@patersongroup.ca

Email:

Email: #2: aschopf@patersongroup.ca, mklilliam@patersongroup.ca

Email:

Project: PH4717

Project:

TURN-AROUND TIME (Business Days)

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Sample Analysis Required

RNH (Lab Use Only)

Field Filtered ->

of Containers

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganics

Metals only

See attached paper

Subdivision Supply Bact 2 (Ec/TC only)

TSS

pH

Total Metals

Hg

Sample ID 6659F

Date/Time collected December 10, 2024

GW

8

PRINT

SIGN

DATE/TIME

TEMP (°C)

December 10, 2024

December 10, 2024

10

Sampled By: Alex Schopf

Received By: Alex Schopf

S.S. St

401 Magnetic Drive, Unit #1, North York, ON M3J 3H9 • Telephone: 416-661-5287 • 380 Varsity Road, Unit #630, St. Catharines, ON L2S 0B5 • Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2G9 • Telephone: 613-634-9307

ASTDCOC5

Printed On: 2024-12-10 15:29:04

PO #: 61963

REGULATION/GUIDELINE REQUIRED

O. Reg 153

Table # Course / Line, Surface / subsurface.

Type: Core/Incl / Res-Park / Agri / GW / All Other / Sediment

Excess Soil, Table: Type:

The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O. Reg. 153/04

Yes ☐ No ☐

Customer Seal: YES ☐ NO ☐

Comments: Total and Trace Metals

Yes ☐ No ☐

Page 1 of 1

Copies: White - Laboratory, Yellow - Sampler

PREDICTIVE NITRATE IMPACT ASSESSEMENT		
Infiltration Factors		
Topography	0.20	
Soil	0.30	
Cover	0.15	
Total	0.65	
Site Characteristics		
Area of Site :	402275	m ²
Total of roof areas:	990	m ²
Total area of paved driveway areas:	4748	m ²
Roof + paved driveway areas	5738	m ²
Impervious Area	5738	m ²
Percent Impervious Area =	1	%
Infiltration Area =	396537	m ²
Septic Effluent		
Concentration of Effluent (Cs) =	40	mg/L
Infiltration Calculation		
Nitrate concentration in precipitation (C _i) =	0	mg/L
Surplus Water (Environment Canada)	292	mm/yr
Factored Water Surplus =	190	mm/yr
Infiltration % due to stormwater management measures	-	%
Infiltration rate from stormwater management measures =	0	mm/yr
Infiltration Flow Entering the System (Q _i) =	206	m ³ /day
Mass Balance Model (MOEE, 1995)		
$C_T = (Q_b C_b + Q_e C_e + Q_i C_i) / (Q_b + Q_e + Q_i)$ = Cumulative Nitrate Concentration		
Q _b = flow entering the system across the upgradient area	0	m ³ /day
C _b = background nitrate concentration	0	mg/L
Q _e = flow entering the system from the septic drainfield	2.725	m ³ /day
C _e = concentration of nitrates in the septic effluent	40	mg/L
Q _i = flow entering the system from infiltration	206	m ³ /day
C _i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	0.52	mg/L
Maximum Allowable Sewage Flow Volume		
Daily Sewage Flow (Q _s)=	2.725	m³
Notes: Site characteristic values were measured as approximate values from the available site plans and GeoOttawa.		