HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

Project No: CCO-25-1134 (previously CP-17-0503)

Prepared for:

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Original: July, 2018
Addendum 1: February 13, 2025
Revision 1: June 6, 2025

Executive Summary

Egis Canada Ltd (Egis, formerly identified as McIntosh Perry) was retained by International Buddhist Progress Society of Ottawa-Carleton ('the Client') to conduct a Hydrogeological Assessment in support a Site Plan Application for the property located at 6688 Franktown Road in Ottawa, Ontario ('the Site'). It is our understanding that the Client intends to convert the interim facility into a community building with classrooms when the construction of the proposed additional development (a permanent place of worship) is complete. Therefore, as part of the Site Plan Application, proposed building addition, a Hydrogeological Assessment is required from the City of Ottawa.

The original Hydrogeological Assessment was completed in July of 2018. It is important to note that the original assessment was completed before the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (March, 2021) were developed. An Addendum update was completed and dated February 13, 2025. Both of these reports have been combined, and this report (Revision 1) is considered the most up to date Hydrogeological Assessment for 6688 Franktown Road.

This report has been prepared using data collected by Egis staff in 2018 as well as December 18, 2024, from an existing on-Site well ('TW1') located at the Site. Hydrogeological data from this well is considered representative of the Site.

To satisfy the requirements of this Hydrogeological Assessment, Egis is relying on the water quality and quantity data that was collected from an existing drilled on-site water supply well (Test Well 1, TW1) as part of the original report completed in 2018. TW1 was pumped for approximately six (6) hours and was sampled twice in 2018. The pumping rate during the pumping test (approximately 92 L/min) is considered more than sufficient to supply the proposed development. The water quality at this test well was resampled on December 18, 2024, to ensure that there has been no change in water quality since the previous Hydrogeological Assessment was completed in 2018.

All analytical results were compared to the Ontario Drinking Water Standards, Objectives, and Guidelines (ODWSOG) and MECP Procedure D-5-5 Maximum Concentration Considered Reasonably Treatable (MCCRT). Based on the analytical results from samples collected during the tests at TW1 in 2018 and 2024, the following exceedances of ODWSOG were noted:

- **Colour** (Aesthetic Objective (AO) of 5 TCU and MCCRT of 7 TCU): TW1 (10 TCU); and
- **Hardness** (Operational Guideline (OG) of 80-100 mg/L): TW1-1 (259 mg/L), TW1-2 (327 mg/L) and TW1 (309 mg/L).

On-site soils in the area of the proposed development appear to consist of a thick layer of sand with some areas of silt and clay. Overburden was observed to generally become coarser with depth, and limestone bedrock was encountered between 4.9 – 5.7 m below ground surface (bgs). Based on the general characterization of overburden in the vicinity of the proposed septic leaching bed, imported fill materials are likely necessary to provide the required vertical separation from groundwater. Further investigation of soil will likely be required to support the MECP Sewage Works application process.

Based on the analyses performed for this hydrogeological assessment, Egis is of the opinion that the aquifer for which the test well intersects can adequately supply the proposed development in terms of quantity and quality.

It is further noted that the proposed development will have no adverse impact on the reasonable use of groundwater on existing and future adjacent properties.

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1.0 INTRODUCTION

Egis Canada Ltd (Egis, formerly identified as McIntosh Perry) was retained by International Buddhist Progress Society of Ottawa-Carleton ('the Client') to conduct a Hydrogeological Assessment in support a Site Plan Application for the property located at 6688 Franktown Road in Ottawa, Ontario ('the Site'). It is our understanding that the Client intends to convert the interim facility into a community building with classrooms when the construction of the proposed additional development (a permanent place of worship) is complete. Therefore, as part of the Site Plan Application, proposed building addition, a Hydrogeological Assessment is required from the City of Ottawa.

The Site location is shown on Figure 1 (Site Location) and an outline of the Site showing the neighbouring properties and an aerial photograph with the proposed development is presented on Figure 2 (Site Layout). A Site Plan of the proposed development has been included in Appendix A.

The original Hydrogeological Assessment was completed in July of 2018. An Addendum update was completed and dated February 13, 2025. Per the comments of the City of Ottawa, both of these reports have been combined, and this report (Revision 1) is considered the most up to date Hydrogeological Assessment for 6688 Franktown Road.

This report has been prepared using data collected by Egis staff in 2018 as well as December 18, 2024, from an existing on-Site well ('TW1') located at the Site. Hydrogeological data from this well is considered representative of the Site.

This Hydrogeological Evaluation addresses the following:

- Well Record search and evaluation;
- Background hydrogeological evaluation;
- Oversight of a six-hour pumping test (TW1) in 2018;
- Water level and flow monitoring, field water quality analyses;
- Sampling and analysis – includes two (2) samples analyzed for the 'Subdivision Supply Suite' of parameters in 2018, and one (1) updated groundwater sample analyzed for 'Subdivision Supply Suite' including trace metals and Volatile Organic Compounds (VOCs) in December 2024; and
- Data Evaluation and Report.

1.1 Consultation

On June 4, 2024, Egis completed a pre-consultation with the City of Ottawa Peer Reviewer to discuss this Hydrogeological Assessment, as it was previously completed in June of 2018. The following items were discussed:

- The existing well (well tag #A252856 – previously tested in 2018) can be used to support the proposed on-Site development if an updated groundwater quality sample is collected for the

parameters outlined within the *City of Ottawa Hydrogeological and Terrain Analysis Guidelines (March, 2021)* (HTAG, 2021), including Volatile Organic Compounds (VOCs);

- If the existing above noted well is used for the proposed development, a pumping test will not be required as the pumping test data collected in 2018 was at a flow rate of approximately 92 L/min, indicating there are no issues with the proposed flow rate, given that the proposed development has a water demand less than the previously selected pumping rate; and
- Egis (previously McIntosh Perry) completed a Reasonable Use Assessment in 2018. However, Egis will not be completing the Reasonable Use Assessment or Septic Impact Analysis as part of this submission. It is understood by Egis that others are preparing an amendment for the existing Environmental Compliance Approval (ECA) for the septic system and this amendment application will include a Reasonable Use Assessment for the future proposed septic system.

1.2 Site Setting

At the time of the original investigation, the Site consisted of forested land with a cleared portion that would be utilized for the future development of a place of worship. The total area of the Site is approximately 39.89 hectares (ha). Since 2018, a one-storey interim place of worship and associated paved parking lot has been constructed and exists on-Site (Figure 2). It is our understanding that the Client intends to convert the interim facility into a community building with classrooms when the construction of the proposed additional development (a permanent place of worship) is complete.

Based on a review of aerial photographs of the Site, only a gravel driveway existed in 2017 surrounded by forested area. At the time of the Site visit completed in 2018, the Site was undergoing tree clearing for future construction. Therefore, the existing Site building was constructed sometime within 2018.

It is Egis' understanding that groundwater is used for potable purposes at the Site.

1.3 Neighbouring Properties and Land Uses

The Site has frontage on Franktown Road to the north. At the time of the most recent Site visit, Site conditions consisted primarily of forested land surrounding the existing Site Building and paved parking areas.

Land uses within 500 m of the Site consists primarily of rural residential land use, forested/undeveloped lands.

While MECP Water Well Information System (WWIS) records for the area do not provide the detailed locations of most wells, all dwellings developed surrounding the Site are assumed to be privately serviced with wells and on-site sewage systems.

Figure 4 – MECP Wells Record Summary, presents the MECP Well Tag numbers and approximate well locations, where available, for wells within approximately 500 m of the Site.

1.4 Hydrology

Ground surface elevation at the Site varies between 106 and 113 m asl (above sea level). Drainage in the area of proposed development is interpreted to reflect surface topography and is likely controlled by permeable grassed areas and ditches along Franktown Road. Other areas of the Site likely drain to the south, toward the Richmond Fen.

Topography was reviewed on the Atlas of Canada–Toporama website. The Site elevation varies between 106 and 113 m asl (above sea level). Ground surface at the Site is generally relatively flat. Regional relief appears to be sloped toward the Richmond Fen (Non-Sensitive Provincially Significant Wetland), which is located approximately 685 m south of the Site.

Surface drainage is interpreted to reflect surface topography and is likely controlled via areas of permeable ground surface. Other areas of the Site likely drain to the south, toward the Richmond Fen. Regional groundwater is interpreted to flow to the south and east, toward the Jock River.

1.5 Geology and Hydrogeology

The surficial geology at the Site consists of coarse-textured glaciomarine deposits, including sand, gravel, and minor silt and clay, as listed by the Ontario Geological Survey (OGS). Further, Well Records within 500 m of the Site indicate an average overburden thickness of 6 m bgs. Accordingly, overburden depth across the Site is anticipated to be greater than 2.0 m.

On-site bedrock is generally characterized as limestone, dolostone, shale, arkose, and sandstone of the Ottawa Group, Simcoe Group, and/or of the Shadow Lake Formation (OGS, 2019). Well records within 500 m of the Site characterize bedrock primarily as limestone.

Review of a map on Karst Topography indicates that the Site is not located within an area identified as potential or known karst formation. No karst topography was observed during the test pitting program and pumping test.

Based on surrounding topography and a review of Well Records, regional bedrock groundwater is interpreted to flow to the south and east, toward the Jock River.

1.5.1 Recharge and Discharge Areas

Based on a review of topographic data, geological maps, and a site visit, it is our interpretation that the Site is predominantly a groundwater discharge zone. Site drainage appears to be relatively poor in and around the area of proposed development; while no areas of ponded water were directly observed in the proposed building or laneway footprint, the Site was generally waterlogged during hand auger and drilling activities in 2018.

1.5.2 Hydrogeologically Sensitive Areas

The Site has soil thicknesses generally exceeding 4.5 m and there were no observed areas of bedrock outcrop or karst conditions. While the proposed development area appears to be poorly drained, there were no areas of groundwater upwelling or significant discharge noted. The Site is therefore not considered to be a hydrogeologically sensitive area.

1.5.3 Potential Sources of Contamination and Potential Impacts to Hydrogeological Conditions at the Site

The Site is located in a predominantly rural residential area. This does not appear to pose any significant source of contamination to the proposed development. No other potentially contaminating activities (waste disposal sites, fuel outlets, improperly maintained bulk fuel storage, salt storage, presence of livestock, manure piles) were observed in the vicinity of the Site at the time of inspection.

The Site and surrounding properties are not connected to municipal services. As such, there are likely private on-site sewage systems at all nearby residences.

Based on land uses within 500 m consisting primarily of rural residential properties and forested/undeveloped areas, these land uses are not expected to impact hydrogeological conditions (including groundwater quality) at the Site. No other activities within 500 m of the Site have the potential to negatively affect hydrogeological conditions or which could impact groundwater yield for the proposed development.

1.5.4 Water Well Record Review

The MECP's WWIS database indicated 44 water wells that are located within 500 m of the Site. Thirty-eight (38) of these wells are listed as being used solely for domestic purposes, one (1) for livestock, three (3) test holes, one (1) abandoned, and one (1) for deepening an existing well (A0144460). MECP WWIS records are shown on Figure 3, and data are summarized in Appendix B.

Forty-three (43) water supply wells were completed in bedrock at final depths ranging from 15.5 – 85.3 m below ground surface (bgs) with the average depth to bedrock reported to be 5.98 m bgs. One (1) water supply well was completed in the overburden, with a depth of 6.71 m bgs. Driller-reported static water levels were recorded at depths ranging from 0.9 – 58.8 m bgs. Driller-recommended well pumping rates ranged from 11.36 – 344.47 L/min.

TW1 (well tag #A252856), located at 6688 Franktown Road, was used as part of the water supply assessment. Based on the Well Record, TW1 was constructed with 6.71 m of casing, with a total well depth of 60.96 m. The depth to bedrock was reported as 3.05 m and the well yield was reported as 75.71 L/min.

2.0 METHODOLOGY – HYDROGEOLOGICAL ASSESSMENT

Egis conducted a hydrogeological investigation at the Site to assess the feasibility of servicing the proposed development. The work generally followed the guidance of MECP Procedure D-5-5: Technical Guideline for Private Wells: Water Supply Assessment. It is important to note that the original investigation was completed in 2018, in advance of the City of Ottawa "Hydrogeological and Terrain Analysis Guidelines" dated March 2021 (HTAG).

Egis tested a newly drilled, on-site water supply well (Test Well 1, TW1), which is believed to be representative of the hydrogeological conditions across the proposed development area. According to the MECP well record, the well extends approximately 61.0 m bgs, with a 0.159 m (6 ¼ inch) diameter casing extending approximately 6.1 m bgs. The Well Record for TW1 is included in Appendix C.

The initial estimation of TW1 yield was made based on a 1-hour pumping test completed by the driller (>55 L/min). Egis personnel pumped the well at a rate of approximately 92 L/min during a 360-minute pumping test.

The pumping test was conducted at TW1 by Egis staff on July 13, 2018. During the testing period, water levels in the well were measured using an electronic water level tape. Water quality (pH, temperature, conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential) was also monitored and recorded in the field during the test, and two samples (TW1-1 and TW1-2) were collected for the 'subdivision supply' suite of parameters, in addition to a select suite of metals.

During the pumping test, turbidity was observed to decrease from 7.36 FNU to 0.0 FNU within the first hour of the test. Initial high turbidity measurements are considered to be a result of drilling the well.

The groundwater samples (TW1-1 and TW1-2) were collected unfiltered and unchlorinated, directly into clean bottles supplied by the analytical laboratories (Paracel Laboratories Ltd., Ottawa, ON). Chlorine indicator strips were used to ensure no chlorine residual remained in the sampled water. The samples were kept on ice and shipped directly to Paracel under strict chain of custody procedures. All of the samples were received by the laboratory within 12 hours of collection.

Paracel is fully accredited by SCC/CALA and has accreditation for Ontario Safe Drinking Water Act (OSDWA) testing.

During the pumping test, water level monitoring consisted of manual readings of drawdown and recovery made with an electronic water level tape. Following pump shutoff, water levels were measured in TW1 until approximately 100% recovery was achieved (approximately 10 min post-shutoff).

Drawdown and recovery data from the pumping test were plotted and analyzed using the Cooper-Jacob and Theis Recovery methods, respectively. The hydraulic conductivity (K, m/s) and transmissivity (T, m^2/d) of the aquifer were estimated. Storativity cannot be assessed properly without the use of an additional observation well, which was not available at the time of the test.

2.1 Updated Groundwater Sample

On December 18th, 2024, Egis collected an updated groundwater sample from the existing on-Site well ('TW1'). Previously, groundwater quality samples were collected from TW1 during the pumping test on July 13, 2018, as noted above.

The updated groundwater sample was taken from an untreated tap connected to the existing pressure tank. Approximately 1,200 L of groundwater was purged from the well before the field parameters stabilized. Therefore, the groundwater sample collected is representative of a fresh groundwater sample.

Water quality (pH, temperature, conductivity, turbidity, dissolved oxygen, total dissolved solids, residual chlorine) were also monitored and recorded in the field during the test using calibrated instruments (general parameters – Horiba U-52 multimeter and residual chlorine - Hach DR900). The calibration certificate for the Horiba U-52 is saved to Appendix D of this report. Additional visual and olfactory water quality observations of colour and odour were made and are presented in Table 1 appended to this report.

Prior to sample collection, the untreated tap was disinfected with a bleach solution. Residual chlorine was measured using a Hach DR900 colorimeter; the Hach DR900 was zero standardized prior to collecting samples. The instrument was zero standardized prior to reading each sample. Based on instrument calibration and specifications, the value of "0.02 mg/L" is the minimum detection limit for this instrumentation. No residual chlorine was detected within the groundwater sample taken from this well (TW1).

The updated groundwater sample (TW1) was collected unfiltered and unchlorinated, directly into clean bottles supplied by the analytical laboratories (Eurofins, Ottawa, ON). The sample was kept on ice and delivered to Eurofins under strict chain-of-custody procedures. The sample was received by the laboratory within 24 hours of collection. Eurofins is fully accredited by the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA).

3.0 RESULTS

A drawdown curve and tabular data from the pumping tests conducted at the Site is available in Appendix E. A summary of groundwater quality data and the official Laboratory Certificates of Analysis are available in Tables 1 and 2 and Appendix F, respectively.

3.1 Static Conditions

Prior to the initiation of the pumping test in 2018, water levels were measured in TW1. The static groundwater level was recorded at 4.365 m below top of casing (btoc) at the beginning of the pumping test (t=0). Assigning an arbitrary site benchmark of 100.00 m to the top of the casing, the static water elevation in the well was 95.635 m (local).

No evidence of groundwater discharge was observed in the development area at the time of the pumping test.

Prior to the collection of the groundwater sample in December 2024, an updated water level was measured in the test well (TW1). The static groundwater level was recorded in metres below top of casing (m btoc). This level was recorded as 4.050 m btoc. Assigning an arbitrary site benchmark of 100.00 m (local) to the top of the casing, the static water elevation in the well was 95.95 m above datum (ad).

3.2 Pumping Test

The pumping test was conducted at TW1 (Well Tag # A252856) under the supervision of Egis on July 13, 2018.

3.2.1 Specifics - Test Well 1 (TW1)

The pumping test was conducted at TW 1 under the supervision of Egis personnel. Water was pumped directly from the test well using a pump and tubing supplied by Air Rock Drilling. The water discharge was directed away from the well, and was allowed to flow overland across the Site. At the time of the pumping test, the weather was approximately 25°C and clear.

All water level measurement data are presented in Appendix E.

Based on a short-term pumping test completed by Air Rock Drilling upon completion of the well, it was estimated that a pumping rate exceeding 90 L/min would be sustainable at the well.

On July 13, 2018, following installation of the pumping equipment by Air Rock Drilling, a static water level of 4.365 m btoc was measured in the well. At approximately 08:07, the pump was turned on and the flow rate adjusted to approximately 92 L/min. This pumping rate was maintained with minimal variation for the duration of the test (360 minutes total).

After 180 minutes of pumping, 0.003 m of recharge was observed during the pumping test at 240 minutes. From 240 minutes to 360 minutes (when the pump was turned off), 0.034 m of recovery

occurred (see Water Level vs. Time graph in Appendix E). The pumping rate was not manually adjusted at this time by Egis staff, therefore it likely fluctuated slightly resulting in minimal recovery at that time. It is Egis' professional opinion that the 0.034 m fluctuation in water level does not pose any risk to groundwater levels during the pumping test.

The water level ranged between 95.217 m to 95.625 m local (4.375 to 4.783 m btoc), with a maximum drawdown of 0.418 m observed. 100% recovery was achieved in the well within 10 minutes of pump shut down.

All water level measurement data are presented in Appendix E, appended to this report.

3.2.2 Well Yield and Water Demand

Based on the 6-hour pumping test completed on July 13, 2018 (Appendix E), 33,120 L of groundwater was pumped from the well at a rate of 92 L/min. It is important to note that a maximum drawdown of only 0.415 m btoc was measured at the flow rate of 92 L/min, demonstrating a highly productive well in terms of yield. Additionally, the estimated total daily design sanitary sewage flow (TDDSSF) is estimated to be 34,347.4 L/day, as per Section 6.1 of the Site Servicing & Stormwater Management Report provided by EXP Services Inc. The TDDSSF exceeds the volume of groundwater pumped during the pumping test by 1,227.4 L. However, an additional 1,227.4 L would be pumped in 13.3 minutes. Given that the groundwater levels stabilized before pump shut off and approximately 0.38 m of drawdown was recorded at that time, it is Egis' professional opinion that the test well can support an additional 13.3 minutes of pumping to accommodate the TDDSF. Therefore, it is Egis' professional opinion that the water quantity of the pumping test completed in 2018 is sufficient to supply the proposed development.

As per Section 5.3 of the Site Servicing & Stormwater Management Report provided by EXP Services Inc. the total average day demand is 1.08 L/sec (64.8 L/min), the maximum day demand is 1.84 L/sec (110.4 L/min) and the peak hour demand is 3.28 L/sec (196.8 L/min) for the proposed development. Utilizing the flow rate of 92 L/min during the pumping test and the observed drawdown, and the mathematical relationship between pumping rate (Q), time (t) and drawdown (s), an additional graph in Appendix E has been presented to demonstrate this relationship at a higher flow rate (ie. max. 196.8 L/min). Utilizing the existing data, TW1 can theoretically be pumped at a continuous rate of 196.8 L/min (allowing for no recharge) for over 1,000 minutes (approx. 16.6 hours) and still maintain drawdown within the available water column. The estimated drawdown after 1,000 minutes of continuous pumping at a rate of 196.8 L/min is approximately 0.95 m. This represents a 1.6% utilization of the water column, with 40.41 m of water column remaining. It is important to note that realistically the well will be connected to a pressure tank that will cycle, turning the pump on and off, allowing for recharge between cycles.

The long-term yield calculations (Q20) were previously calculated within the 2018 report using Farvolden and Moell methods. Based on the long-term analysis, the calculated Q20 values were 6,532 L/min and 2,945 L/min, respectively (Appendix E).

Therefore, it is Egis' professional opinion that the on-Site test well (TW1) is capable of supporting the existing and proposed development.

3.3 Calculations

A summary of the well and hydrogeological properties determined during the testing work at the Site are presented in Appendix E.

3.3.1 Storativity

Storativity (S) could not be calculated as no observation wells were available for water level measurement at the time of the pumping test.

3.3.2 Transmissivity

The transmissivity for TW1 was calculated following the Cooper-Jacob method. The calculations for Transmissivity are presented in Appendix G**.** Transmissivity was calculated using the following equation:

$$T = \frac{2.3\,Q}{4\,\pi \Delta s}$$

Where:

- T is the transmissivity (m^2/day);
- Q is the pumping rate during the pumping test (L/min); and,
- Δs is the differential for residual drawdown for one log cycle (m).

Transmissivities of approximately 735 m^2/d (drawdown) and 606 m^2/d (recovery) were calculated using the Cooper-Jacob method.

3.3.3 Hydraulic Conductivity

Assuming an aquifer thickness corresponding to the interval between the bottom of the casing and the bottom of the well, the screened formation of each test well was calculated was calculated using the following equation:

$$K = \frac{T}{b}$$

Where:

- T is the transmissivity (m^2/day);
- B is the aquifer thickness (m); and,
- K is the hydraulic conductivity (m/s).

Assuming an aquifer thickness of 54.9 m (corresponding to the interval between the bottom of the casing and the bottom of the well) and fully horizontal groundwater flow, a hydraulic conductivity of 1.6 x 10^{-4} m/s (drawdown) and 1.3 x 10^{-4} m/s were calculated.

The hydraulic conductivity values are generally consistent with the standard values for limestone published by Freeze and Cherry (10^{-9} to 10^{-5} m/s).

3.3.4 Long Term Yield

The theoretical long-term safe yield was calculated using both the Farvolden and Moell methods.

Farvolden Equation

The long-term yield (Q_{20}) was calculated using the following Farvolden equation:

$$Q_{20} = 0.68\ T\ Ha\ S_f$$

Where:

- Q_{20} is the twenty-year safe yield;
- T is the transmissivity (using an average between drawdown and recovery data);
- Ha is the available water column height (above the pump); and
- S_f is a safety factor (0.7).

Based on the Farvolden Method, calculations indicate that a twenty-year safe yield is in the order of 8,291 L/min. This means that the test wells could theoretically sustain continuous pumping for 20 years at this rate.

Moell Method

The Moell Method was also used to calculate the theoretical long-term safe yield for the pumping well. The long-term yield (Q_{20}) was calculated using the following Moell equation:

$$(Q_{20}) = (Q\ Ha\ Sf) / (s100 + 5\ \Delta s)$$

Where:

- Q_{20} is the twenty-year safe yield (m^3/day);
- Ha is the available water column height (m);
- S_f is a safety factor (0.7);
- s100 is the drawdown at 100 minutes (semi-log long-term graph);
- Δs is the change in hydraulic head over one log cycle (drawdown vs. log time, see Appendix E); and
- Q is the pumping rate during the pumping test (L/min.

Using the Moell Method, calculations indicate that a twenty-year safe yield for the well is in the order of 4,352 L/min.

Accordingly, Egis is of the opinion that the aquifer of TW1 is readily capable of supplying water in support of the proposed addition at the Site.

The calculations for the Farvolden and Moell method are presented in Appendix G.

3.4 Water Quality

Laboratory Certificates of Analysis for on-site groundwater testing are presented in Appendix F. A summary of field and laboratory results from TW1 are presented in Table 1 and Table 2; for comparison purposes Table 2 also includes the analytical results for the 2018 testing. Samples were taken twice during the six-hour test on July 13, 2018. Pre- and post-test samples (TW1-1 and TW1-2, respectively) were taken directly from the on-site pump tubing.

On December 18, 2024, the groundwater sample was collected after flushing 1,200 L of water at TW1. The samples were tested for residual chlorine with a Hach DR900 colorimeter calibrated to detect chlorine residual (free chlorine). Prior to usage, the Hach DR900 was zero calibrated according to the manufacturer's printed instructions.

3.4.1 Test Well 1 (TW1) Results

All analytical results were compared to the Ontario Drinking Water Standards, Objectives, and Guidelines (ODWSOG).

Based on the analytical results from samples collected during the test at TW1 during the pumping test (TW1-1 and TW1-2) on July 13, 2018, the following exceedances of ODWSOG were noted:

- **Hardness** (Operational Guideline (OG) of 80-100 mg/L): TW1-1 (259 mg/L) and TW1-2 (327 mg/L). Hardness values in excess of 300 mg/L are considered to be very hard as per the HTAG (2021).

Based on the analytical results from sample collected from TW1 on December 18, 2024, the following exceedances of ODWSOG were noted:

- **Colour** (Aesthetic Objective (AO) of 5 TCU and MCCRT of 7 TCU): TW1 (10 TCU); and
- **Hardness** (Operational Guideline (OG) of 80-100 mg/L): TW1 (309 mg/L). Hardness values in excess of 300 mg/L are considered to be very hard as per the HTAG (2021).

It is important to note that colour concentrations were 3 TCU (TW1-1) and 4 TCU (TW1-2) in the groundwater samples collected in 2018.

3.4.2 Water Treatment

Colour exceeds the ODWSOG as outlined above, as well as the Maximum Concentration Considered Reasonably Treatable (MCCRT) of 7 TCU as per the HTAG (2021). It is noted that field measurements of turbidity were recorded at 3.2 NTU after 3 minutes of purging the groundwater and decreased to 0 NTU after 12 minutes of purging. Additionally, the laboratory measurement of turbidity was reported as 1.2 NTU, which are all below the AO of 5 NTU as per the ODWS.

The detection of colour in water can related to parameters such as dissolved organic matter (DOC) as well as, inorganic materials such as metals. However, when reviewing the analytical results, it is noted that the detected concentrations for known colour affecting metals such as iron, manganese, copper and zinc were either non-detect or below the ODWS criteria (Fe – 0.23 mg/L, criteria 0.3 mg/L). When reviewing the analytical results for DOC, it is noted that the detected concentration was 4 mg/L which is also less than the ODWS (5 mg/L).

Historically, analytical testing performed 2018, indicated results for colour at 3 and 4 TCU. The current analytical result for colour was recorded as 10 TCU.

Based on the current analytical results, Egis surmises that while less than the ODWS criteria, the detected presence of DOC and iron are possibly attributable to the elevated detected concentration for colour.

Egis does not anticipate the colour of raw water to be problematic in either the short and long-term as previous analytical results indicate concentrations less than the ODWS.

Currently, a water softener and a UV system are installed at the Site. Both hardness and colour can be treated utilizing the existing water softener.

3.4.3 Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI)

The Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI) were calculated for TW1 (Appendix G). These results indicate that scale formation is possible, though not likely at the tested temperature. This is to be expected in areas of carbonate bedrock.

4.0 TERRAIN ANALYSIS

4.1 General

A combination of hand auger probes and boreholes were advance at various locations throughout the Site to assess the geotechnical characteristics and properties for the on-site overburden and underlying bedrock. In total, seven hand auger and three boreholes were utilized for this assessment.

4.1.1 On-Site Hand Auger Program

Based on a hand auger program carried out by Egis personnel on May 2, 2018, shallow on-site soils can be generally described as coarse grained sand, with areas of silt and clay. From a surficial geology perspective, the Site can be delineated into three main zones (see Figure 4):

Zone 1: **Medium brown sand**, some to trace fines.

Zone 2: **Silt and clay**, trace sand.

Zone 3: Silty **fine sand**.

Details of the hand auger program can be found in Table 3 below:

Table 3: Summary of Hand Auger Data

Hand Auger ID	Soil Description	Depth (m bgs)	Refusal (Y/N)	Depth to Water (m bgs)
HA1	Topsoil	0.0 - 0.1	N	0.0
	Clay	0.1 - 1.1		
HA2	Topsoil	0.0 - 0.2	N	0.0
	Medium Br. Sand	0.2 - 0.5		
	Clay	0.5 - 1.1		
HA3	Topsoil	0.0 - 0.1	N	0.0
	Medium Br. Sand	0.1 - 0.9		
	Clay	0.9 - 1.0		
HA4	Topsoil	0.0 - 0.2	N	0.2
	Medium Br. Sand	0.2 - 1.2		
HA5	Topsoil	0.0 - 0.2	N	0.3
	Medium Br. Sand	0.2 - 1.2		
HA6	Topsoil	0.0 - 0.2	N	0.2
	Fine Br. Sand	0.2 - 1.2		
HA7	Topsoil	0.0 - 0.2	N	0.2
	Medium Br. Sand	0.2 - 0.8		

4.1.2 On-Site Drilling Program

In addition to hand auger holes, Egis personnel advanced three geotechnical boreholes (BH18-1, BH18-2, BH18-3) and three monitoring wells (MW18-1, MW18-2, MW18-3) at the Site on May 23-24, 2018 (see Figure 4).

Geotechnical borehole logs describe overburden in the vicinity of the proposed on-site structures as wet sand, with trace to some silt. Overburden was found to be approximately 4.6 – 5.7 m thick, after which point competent limestone bedrock was encountered.

Static water levels taken from MW18-1, MW18-2, and MW18-3 on May 29 and June 1, 2018, indicate that the on-site shallow groundwater gradient is small with groundwater flowing in a southeast direction. The static water levels were 0.3 m bgs for all three borehole locations.

5.0 SEPTIC ASSESSMENT

As part of this investigation, an assessment with respect to the Site's ability to be serviced by a private on-site septic system was undertaken. Typically, for individual sites the septic assessment will follow the provision outlined within the MECP document Procedure D-5-4 Technical Guideline for Individual On-Site Sewage System: Water Quality Risk Assessment (August 1996); however, as it is understood that the proposed development will be serviced by a septic system with a Daily Design Flow (DDF) that will be greater than 10,000 litres per day(L/d). Therefore, MECP Procedure D-5-4 is not applicable. Further to this as the DDF for the Site is greater than 10,000 L/d, the approval of the septic system will be required to follow the Environmental Compliance Approval (ECA) process regulated and administered by the MECP.

Notwithstanding, the following concerns were considered: Lot Size, System Isolation and Contaminant Attenuation.

Lot Size

The total area for the site is 39.89 ha, with approximately 2.71 ha slated for development. Accordingly, Egis is of the opinion that sufficient spatial area exists on the property to accommodate a septic system designed for DDF exceeding 10,000 litres.

System Isolation

As previously outlined Egis conducted a hand auger and borehole program to determine overburden depth and soil characterization. Based on this investigation, it was determined that the on-site overburden was 4 m in depth or greater. An unconfined water table was observed 0.2 to 0.3 m bgs in HA4 through HA7; note the supply aquifer for the area is located in the underlying bedrock.

Referencing MECP Water Well Records for down gradient users (Pinestrand Crescent) reveals that these users are over 700 m away from the proposed development with supply wells completed into the

underlying bedrock. Accordingly, Egis is of the opinion that sufficient spatial separation exists between the proposed development and the down gradient users.

Contaminant Attenuation

As the Site is proposed to be serviced with a septic system having a DDF greater than 10,000 L/d, attenuation will be governed through application of Reasonable Use Policies to the satisfaction of the MECP. It is understood through consultation with the MECP, that the septic system for the Site will be required to go through the MECP's ECA process which will require an Assessment of Reasonable Use following Guideline B-7: Incorporation of the Reasonable Use Concept into MOEE Groundwater Management. It is important to note that a Reasonable Use Assessment for this project will be submitted under a separate cover as part of the ECA application process.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Based on the analyses performed for this hydrogeological assessment, Egis is of the opinion that the aquifer for which the test well intersects can adequately supply the proposed development in terms of quantity and quality. It is further noted that the proposed development will have no adverse impact on the reasonable use of groundwater on existing and future adjacent properties.

7.1.1 Groundwater Evaluation

7.1.1.1 Well Yield

The pumping test was conducted at TW1 (Well Tag # A252856) under the supervision of Egis on July 13, 2018. Water was pumped directly from the test well using a pump and tubing supplied by Air Rock Drilling. The water discharge was directed away from the well, and was allowed to flow overland across the Site. The flow rate used was 92 L/min.

At 8:07 AM, the pump was turned on and the flow rate was recorded to be approximately 92 L/min. It is noted that pumping continued for a full 6 hours at a consistent pumping rate (92 L/min). The groundwater level ranged between 4.365 – 4.773 m btoc, with a maximum drawdown of 0.418 m observed.

Following pump shutoff, drawdown was recorded at 4.275 m btoc (95.625 m ad), representing approximately 98% recovery, 10 minutes after pumping ceased.

Calculations for long term yield indicated values of 6,352 L/min (Farvolden) and 2,945 L/min (Moell). Accordingly, Egis is of the opinion that the aquifer of TW1 is readily capable of supplying water in support of the proposed development in relation to quality and quantity.

7.1.1.2 Water Quality and Treatment

All analytical results were compared to the Ontario Drinking Water Standards, Objectives, and Guidelines (ODWSOG). Based on the analytical results from samples collected during the test at TW1, the following exceedances of ODWSOG were noted:

- **Colour** (Aesthetic Objective (AO) of 5 TCU): TW1 (10 TCU); and
- **Hardness** (Operational Guideline (OG) of 80-100 mg/L): TW1-1 (259 mg/L), TW1-2 (327 mg/L) and TW1 (309 mg/L). Hardness values in excess of 300 mg/L are considered to be very hard as per the HTAG (2021).

Both colour and hardness which are aesthetic and operational parameters can be treated to improved palatability for the water.

The Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI) were calculated for TW1 (Appendix G). These results indicate that scale formation is possible, though not likely at the tested temperature. This is to be expected in areas of carbonate bedrock.

7.2 Recommendations

Overall, this assessment indicates that the local aquifer is able to support the proposed development in terms of water quantity and quality.

The following recommendations should be followed to ensure effective development of the lots with wells and septic systems.

7.2.1 Well Construction

- The Well Record for the pumped well (TW1: A252856) shows that it is constructed per the requirements of 0.Reg. 903.
- Best Management Practices (BMP) for wells as noted in are recommended: https://www.ontario.ca/document/water-supply-wells-requirements-and-best-practices

7.2.2 Well Yields

- Calculations for long term well yields indicate that the aquifer currently utilized can provide the flow rate to support the proposed development.

7.2.3 Water Quality Treatment

- Currently, a water softener and a UV system are installed at the Site. Both hardness and colour can be treated utilizing the existing water softener and/or the incorporation of filtration techniques.
- As the water system for the establishment will be by definition through O.Reg. 170/03 supporting a public facility, the usage of the system will be controlled through the requirements specified within O.Reg. 170/03. Accordingly, annual reporting prepared by a Qualified Person for the system including water quality will be required.

8.0 LIMITATIONS

This report has been prepared, and the work referred to in this report has been undertaken by, Egis for the Client. It is intended for the sole, and exclusive use of the Client with respect to the stated purpose of the work carried out by Egis.

The report may not be relied upon by any other person or entity without the express written consent of Egis. Any use which a third party makes of this report, or any reliance on decisions made based on it, without a Reliance Letter, are the responsibility of such third parties. Egis accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, or the information contained within it.

The investigation undertaken by Egis with respect to this report and any conclusions or recommendations made in this report reflect Egis's judgment based on the Site conditions observed at the time of the Site investigations, inspections, and/or sampling on the date(s) set out in this report, and on information available at the time of the preparation of this report. Conditions such as ground cover, weather, physical obstructions, etc. may influence conclusions or recommendations made in this report. Egis does not certify or warrant the environmental status of the property.

This report has been prepared for specific application to this Site and it may be based, in part, upon visual observation of the Site, subsurface investigation at discrete locations and depths, and/or specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future Site conditions, portions of the Site which were unavailable for direct investigation, Site locations, subsurface or otherwise, which were not investigated directly, or chemical parameters, materials, or analysis which were not addressed or performed. Substances other than those addressed by the investigation described in this report may exist at the Site, substances addressed by the investigation may exist in areas of the Site not investigated, and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If Site conditions or applicable standards change, or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

9.0 CLOSURE

We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,
Egis

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Ref.: U:\Infrastructure\2025\CCO-25-1134 IBPS_6688 Franktown Road Richmond_SPA\15 - Hydrogeology\05 Report\CCO-25-1134 6688 Franktown Road_Hydro G Report_6June2025.docx

10.0 REFERENCES

EXP Services Inc., Site Servicing & Stormwater Management Report, IBPS Temple – 6688 Franktown Road, Ottawa ON, dated June 6, 2025.

MECP, 1995. Procedure D-5-4 Technical Guideline for Individual On-site Sewage Systems: Water Quality Impact Risk Assessment.

MECP, 1996. Procedure D-5-5 Technical Guideline for Private Wells: Water Supply Assessment.

MECP, 2021. Water Supply Wells: Requirements and Best Practices. (online)

MECP (Ontario Ministry of the Environment, Conservation and Parks). 2023. MECP Water Well Record Database (queried November 2023).

OGS Earth, 2010. Ontario Ministry of Northern Development, Mines and Forestry, - Ontario Geological Survey Earth – for Google Earth. Overburden classification data for Eastern Ontario.

OGS Earth, 2011. Ontario Ministry of Northern Development, Mines and Forestry, - Ontario Geological Survey Earth – for Google Earth. Bedrock classification data for Eastern Ontario.

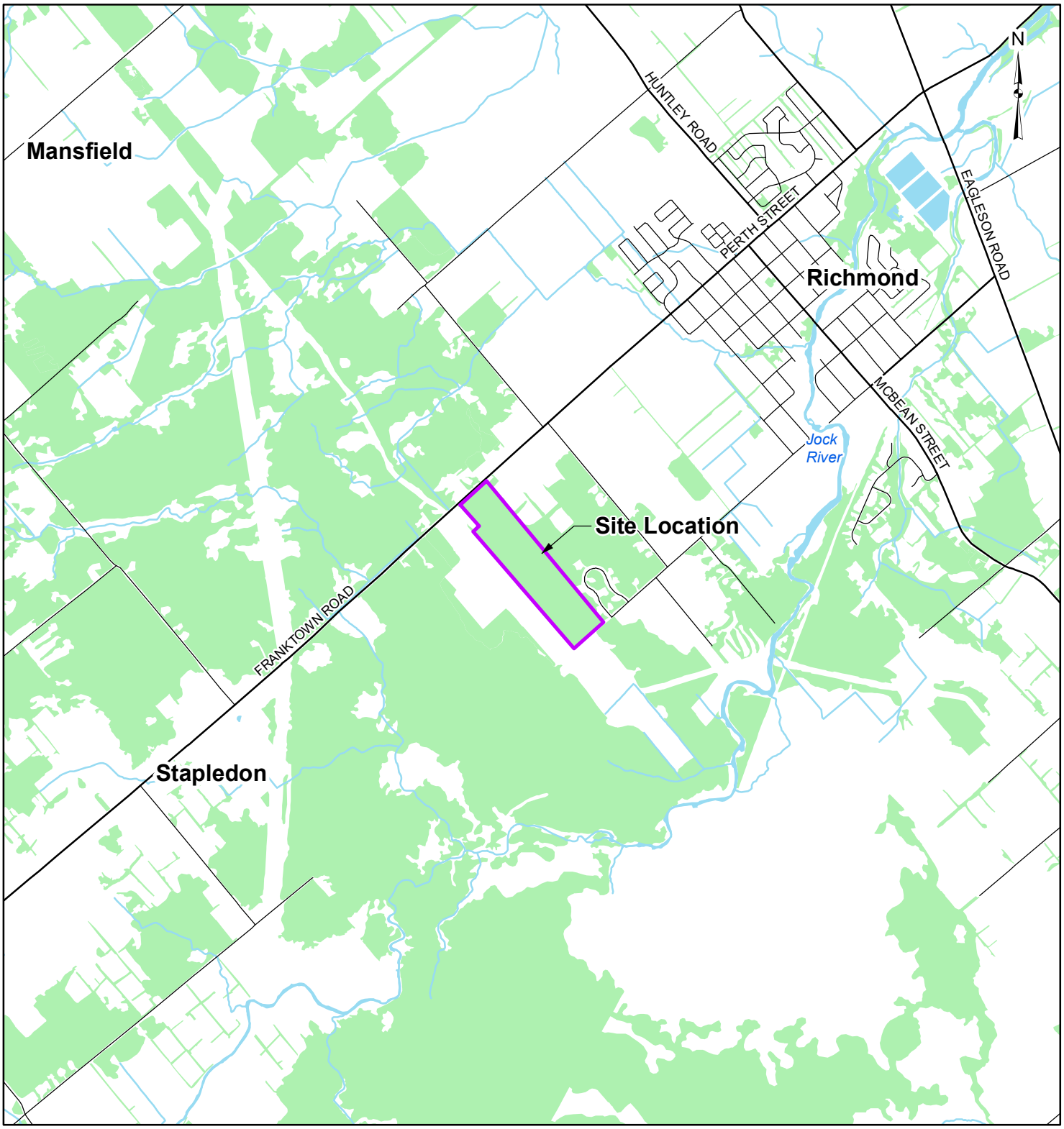
OGS Earth, 2008. Ontario Ministry of Northern Development, Mines and Forestry, - Ontario Geological Survey Earth – for Google Earth. Karst Study for Southern Ontario.

OMAFRA, 2022. Ministry of Agriculture, Food and Rural Affairs: Septic Smart (online)

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

FIGURES

egis



1,100 550 0 1,100

Scale 1:40,000 Metres

LEGEND

- Approximate Property Boundary
- Local Road
- Major Road
- Watercourse
- Waterbody
- Wooded Area

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2018.

CLIENT: BING PROFESSIONAL ENGINEERING

PROJECT: HYDROGEOLOGICAL STUDY
6688 FRANKTOWN ROAD

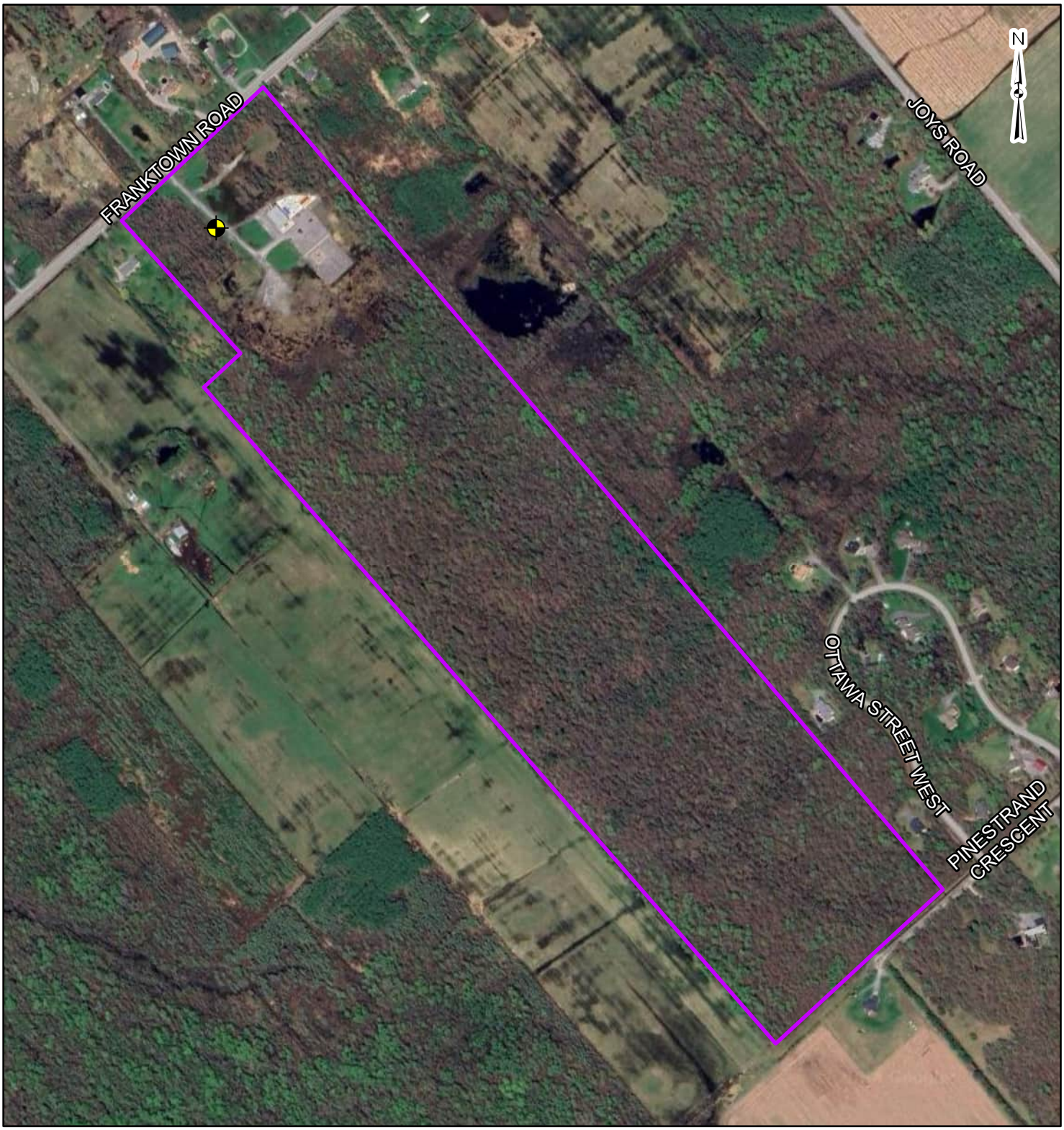
TITLE: SITE LOCATION

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO:	CP-17-0503
Date	Jul., 17, 2018
GIS	JD
Checked By	JB

FIGURE: 1

H:\01 Project - Proposals\2017 Jobs\CP\0CP-17-0503 Bing Proffesional Eng Inc_Proposed Temple SPA_6688 Franktown Road\15 - GIS\mxd\HydroGl\0CP-17-0503_01_SiteLocation6688Franktown.mxd



150 75 0 150

Scale 1:7,000 Metres

LEGEND

Approximate Property Boundary

TW1 (A252856)

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2024.

CLIENT: BING PROFESSIONAL ENGINEERING

PROJECT: HYDROGEOLOGICAL STUDY
6688 FRANKTOWN ROAD

TITLE: SITE LAYOUT

egis
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742

PROJECT NO:CCO-25-1134		FIGURE:
Date	Dec., 18, 2024	2
GIS	AH	
Checked By	MB	

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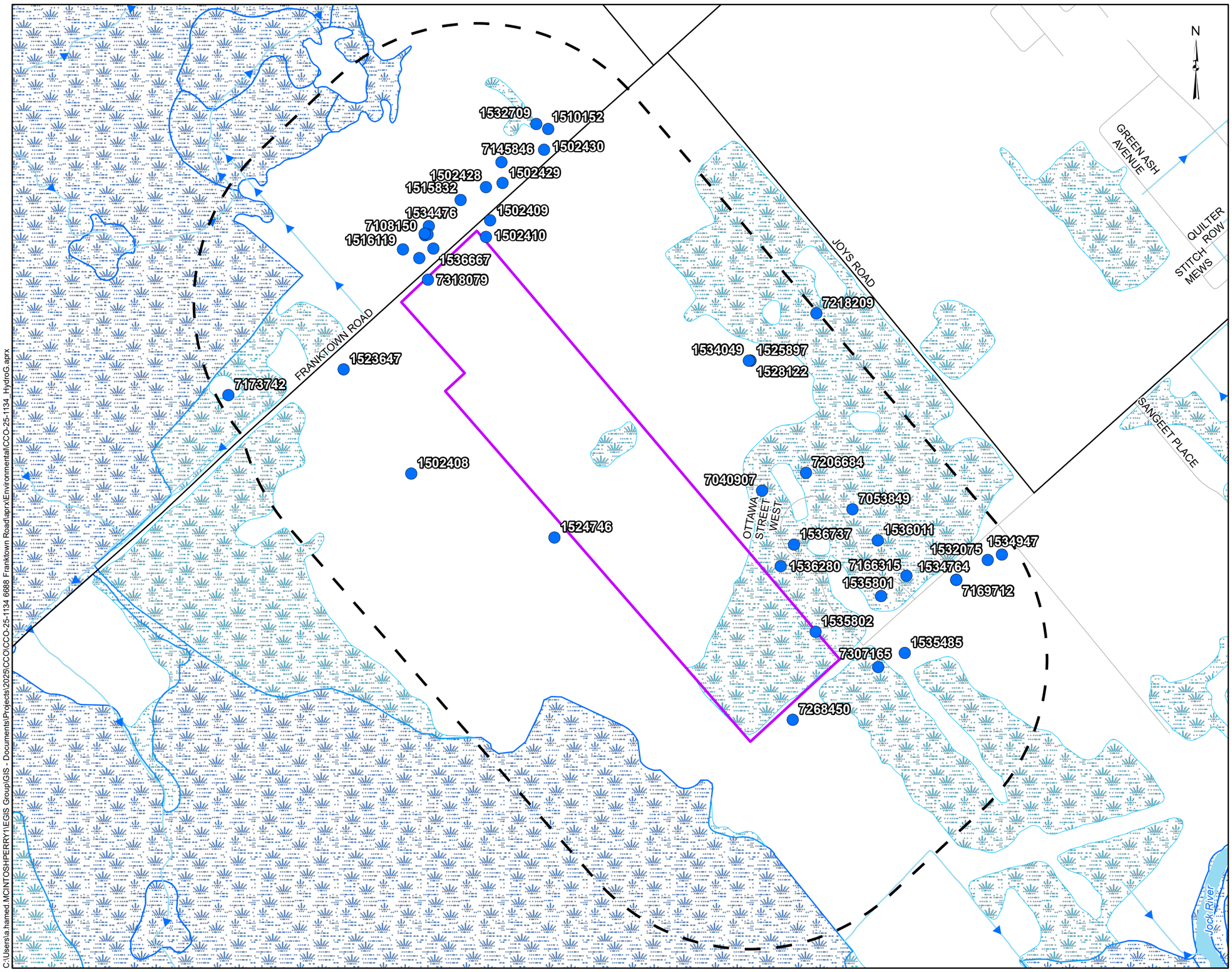

LEGEND

- MECP Well Location
- Approximate Property Boundary
- Buffer500m
- Local Road
- Major Road
- Watercourse
- Waterbody
- Unevaluated Wetland
- Provincially Significant Wetland

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2024.

200 100 0 200
Scale 1:9,000 Metres

CLIENT: BING PROFESSIONAL ENGINEERING

PROJECT: HYDROGEOLOGICAL STUDY
6688 FRANKTOWN ROAD

TITLE: MECP WWIS SUMMARY

egis
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742

PROJECT NO: CCO-25-1134	FIGURE:
Date: Dec., 18, 2024	3
GIS: AH	
Checked By: MB	

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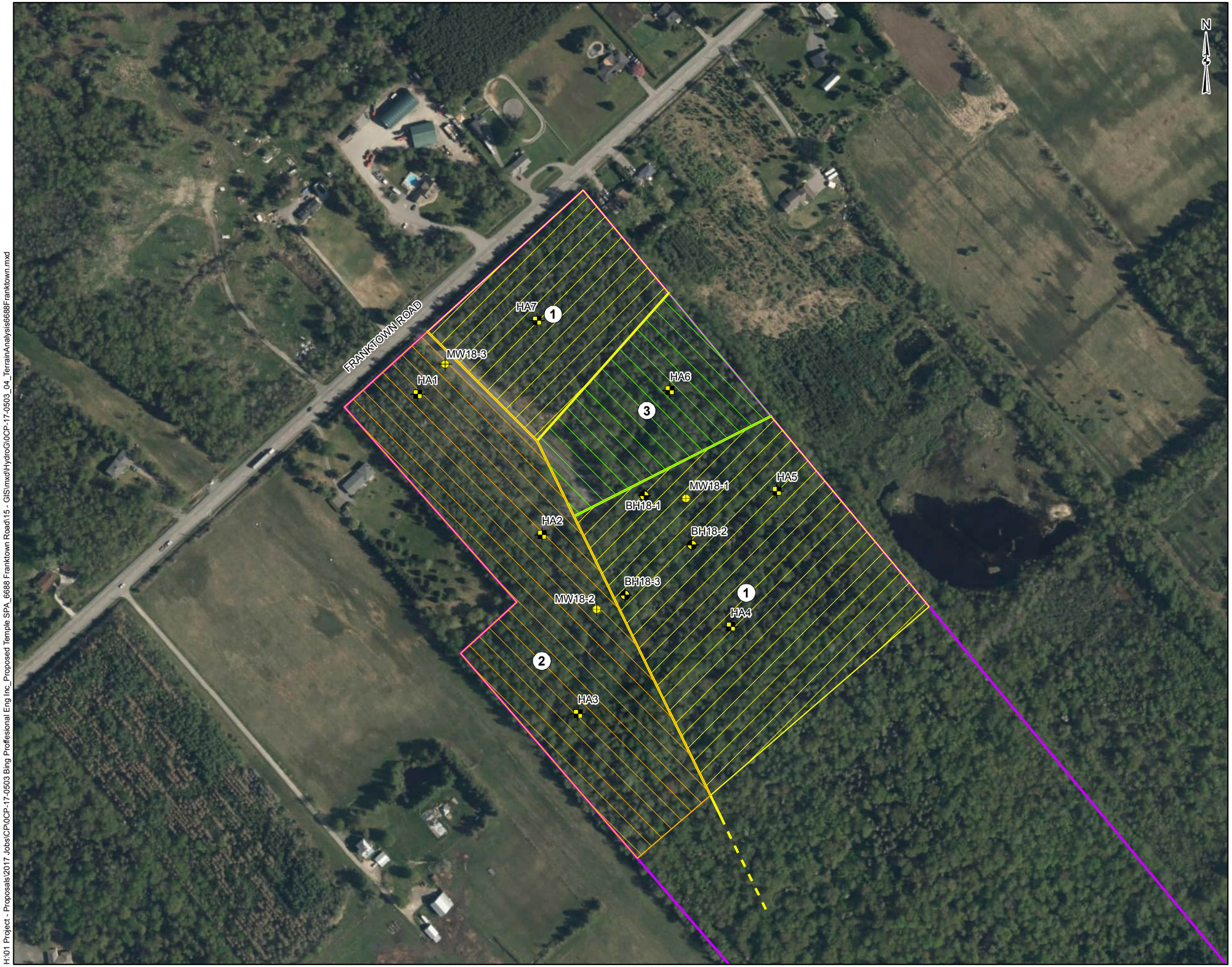


LEGEND

- Hand Auger
- Borehole
- Monitoring Well
- Site Boundary
- (1) Zone 1 - MEDIUM SAND, some to trace fines
- (2) Zone 2 - SILT and CLAY, trace sand
- (3) Zone 3 - Silty FINE SAND

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2018.

0 30 60 120

Scale 1:3,000 Metres

CLIENT: BING PROFESSIONAL ENGINEERING

PROJECT: HYDROGEOLOGICAL STUDY
6688 FRANKTOWN ROAD

TITLE: TERRAIN ANALYSIS

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO:	CP-17-0503
Date	Jul., 19, 2018
GIS	JD
Checked By	JB

FIGURE: 4

H:\01 Project - Proposals\2017 Jobs\CP\0CP-17-0503 Bing Proffesional Eng Inc_Proposed Temple SPA_6688 Franktown Road\15 - GIS\mxd\HydroG\0CP-17-0503_04_TerrainAnalysis6688Franktown.mxd

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

TABLES

Table 1
Summary of Field Water Quality Parameters

Pumping Test at:	Test Well 1 (TW1): 6688 Franktown Road			Date:	18-Dec-24						
Time Elapsed (min)	Temperature (^{o}C)	pH	ORP (ORPmv)	Conductivity (mS/cm)	Turbdity (NTU)	DO (mg/L)	TDS (g/L)	Colour	Odour	Residual Chlorine (mg/L)	Flow Rate (L/min)
3	10.71	7.78	32	0.684	3.2	5.85	439	Clear	Sulphur	-	20
12	10.01	7.83	54	0.682	0	5.7	436	Clear	Sulphur	-	-
22	10.14	7.79	37	0.649	0	7.2	415	Clear	Sulphur	-	-
32	10.11	7.97	409	0.654	0	5.2	418	Clear	Sulphur	-	-
40	10.09	7.72	160	0.653	0	5.1	418	Clear	Sulphur	<0.02	-
50	10.09	7.72	68.00	0.66	0	5.16	420	Clear	Sulphur	-	-
55	10.09	7.72	68	0.653	0	5.2	417	Clear	Sulphur	-	-
Notes:	*Flow rate measured with bucket and stop watch*										

Pumping Test at:	Test Well 1 (TW1): 6688 Franktown Road			Date:	13-Jul-18						
Time Elapsed (min)	Temperature (^{o}C)	pH	ORP (ORPmv)	Conductivity (mS/cm)	Turbdity (NTU)	DO (mg/L)	TDS (g/L)	Colour	Odour	Residual Chlorine (mg/L)	Flow Rate (L/min)
1	12.18	7.58	32	0.614	236	5.74	-	-	-	-	-
2			54				-	-	-	-	-
3							-	-	-	-	-
4							-	-	-	-	-
5							-	-	-	-	-
9	8.97	7.49		0.577	9.3	3.8	-	-	-	-	92
15							-	-	-	-	-
21	9.04	7.02		0.613	2.5	3.8	-	-	-	-	-
30	9.06	6.92		0.631	1.8	4.1	-	-	-	-	-
60	9.14	6.80		0.686	1.7	5.3	-	-	-	-	-
120	9.16	6.77		0.728	2.1	6.3	-	-	-	-	-
180	9.22	6.77		0.747	0.2	3.9	-	-	-	-	-
240	9.20	6.72		0.727	0	3.9	-	-	-	-	-
300	9.16	6.76		0.762	1.8	3.9	-	-	-	-	-
360	9.17	6.76	37	0.765	0	3.9	-	-	-	-	-
Notes:	*Flow rate measured with bucket and stop watch*										

NOTES:

min	Minutes
NTU	Nephelometric Turbidity Units
mS/cm	Millisiemens per centimetre
uS/cm	Microsiemens per centimetre
(^{o}C)	Degrees celsius
g/L	Grams per litre
ppm	Parts per million
L/min	Litres per minute
ORPmV	ORP millivolts
-	Not analyzed

Table 2
Summary of Laboratory Water Quality Results

Sample ID	Units	ODWSOG	Limit Type	MDL	TW1-1	TW1-2	MDL	TW1
Sample Date					13-Jul-18	13-Jul-18		18-Dec-24
Location					6688 Franktown Road - Test Well 1			6688 Franktown Road - Test Well 1
Parameter:								
Microbiological Parameters								
E. Coli	ct/100mL	0	MAC	1 CFU/100ml	<1*	<1*	0 ct/100ml	0
Fecal Coliforms	ct/100mL	-	-	1 CFU/100ml	<1	<1	0 ct/100ml	0
Total Coliforms	ct/100mL	0	MAC	1 CFU/100ml	<1*	<1*	0 ct/100ml	0
Heterotophic Plate Count	ct/1mL	-	-	-	-	-	10 ct/100ml	0
General Inorganics								
Alkalinity, total	mg/L	30-500	OG	5	325	328	5	279
Ammonia as N	mg/L	-	-	0.01	0.12	0.12	0.02	0.115
Dissolved Organic Carbon	mg/L	5	AO	0.5	2.9	3.2	0.5	4
Colour	TCU	5	AO	2	3	4	2	10
Conductivity	uS/cm	-	-	5	697	834	5	630
Hardness	mg/L	80-100	OG		259	327	1	309
pH	pH Units	6.5-8.5	-	0.1	7.7	7.6	1	7.91
Phenolics	mg/L	-	-	0.001	<0.001	<0.001	0.001	<0.001
Total Dissolved Solids	mg/L	500	AO	10	380	486	1	410
Sulphide	mg/L	0.05	AO	0.02	<0.02	<0.02	0.01	<0.01
Tannin & Lignin	mg/L	-	-	0.1	0.1	0.1	0.1	0.1
Total Kjeldahl Nitrogen	mg/L	-	-	0.1	0.2	0.2	0.1	0.36
Turbidity	NTU	5	AO	0.1	1.5	1.4	0.1	1.2
Anions								
Chloride	mg/L	250	AO	1	24	65	1	14
Fluoride	mg/L	1.5	MAC	0.1	0.4	0.4	0.1	0.49
Nitrate as N	mg/L	10	MAC	0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/L	1	MAC	0.05	<0.05	<0.05	0.1	<0.1
Sulphate	mg/L	500	AO 500	1	38	41	1	39
Metals								
Mercury	mg/L	0.001	MAC	-	-	-	0.0001	<0.0001
Aluminum	mg/L	0.10	OG	-	-	-	0.01	<0.01
Antimony	mg/L	0.01	MAC	-	-	-	0.0005	<0.01
Arsenic	mg/L	0.01	IMAC	-	-	-	0.001	<0.001
Barium	mg/L	1.00	MAC	-	-	-	0.01	0.1
Beryllium	mg/L	-	-	-	-	-	0.0005	<0.0005
Boron	mg/L	5.00	IMAC	-	-	-	0.01	0.21
Cadmium	mg/L	0.01	MAC	-	-	-	0.0001	<0.0001
Calcium	mg/L	-	-	0.1	55.7	75.4	1	76
Chromium	mg/L	0.05	MAC	-	-	-	0.001	<0.001
Cobalt	mg/L	-		-	-	-	0.0002	<0.0002
Copper	mg/L	1.00	AO	-	-	-	0.001	<0.001
Iron	mg/L	0.30	AO	0.1	0.1	0.1	0.03	0.23
Lead	mg/L	0.10	MAC	-	-	-	0.001	<0.001
Magnesium	mg/L	-	-	0.2	29.2	33.7	1	29
Manganese	mg/L	0.05	AO	0.005	0.006	0.006	0.01	<0.01
Molybdenum	mg/L	-	-	-	-	-	0.005	<0.005
Nickel	mg/L	-	-	-	-	-	0.005	<0.005
Potassium	mg/L	-	-	0.1	4.6	4.8	1	5
Selenium	mg/L	0.05	MAC	-	-	-	0.001	<0.001
Silver	mg/L	-	-	-	-	-	0.0001	<0.0001
Sodium	mg/L	20	AO	0.2	17.6	21.6	1	16
Thallium	mg/L	-	-	-	-	-	0.0001	<0.0001
Tin	mg/L	-	-	-	-	-	0.01	<0.01
Titanium	mg/L	-	-	-	-	-	0.01	<0.01
Tungsten	mg/L	-	-	-	-	-	0.002	<0.001
Uranium	mg/L	0.02	MAC	-	-	-	0.001	<0.001
Vanadium	mg/L	-	-	-	-	-	0.001	<0.002
Zinc	mg/L	5	AO	-	-	-	0.01	<0.01
Volatile Organic Compounds								
1,1,1,2-tetrachloroethane	ug/L	-	-	-	-	-	0.5	<0.5
1,1,1-trichloroethane	ug/L	-	-	-	-	-	0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L	-	-	-	-	-	0.5	<0.5
1,1,2-trichloroethane	ug/L	-	-	-	-	-	0.4	<0.4
1,1-dichloroethane	ug/L	-	-	-	-	-	0.4	<0.4
1,1-dichloroethylene	ug/L	14 (0.014 mg/L)	MAC	-	-	-	0.5	<0.5
1,2-dichlorobenzene	ug/L	200 (0.2 mg/L)	MAC	-	-	-	0.4	<0.4
1,2-dichloroethane	ug/L	5	IMAC	-	-	-	0.5	<0.5
1,2-dichloropropane	ug/L	-	-	-	-	-	0.5	<0.5
1,3,5-trimethylbenzene	ug/L	-	-	-	-	-	0.3	<0.3
1,3-dichlorobenzene	ug/L	-	-	-	-	-	0.4	<0.4
1,3-Dichloropropylene (cis+trans)	ug/L	-	-	-	-	-	0.5	<0.5
1,4-dichlorobenzene	ug/L	5 (0.005 mg/L)	MAC	-	-	-	0.4	<0.4
Acetone	ug/L	-	-	-	-	-	5	<5
Benzene	ug/L	1 (0.001 mg/L)	MAC	-	-	-	0.5	<0.5
Bromodichloromethane	ug/L	-	-	-	-	-	0.3	<0.3
Bromoform	ug/L	-	-	-	-	-	0.4	<0.4
Bromomethane	ug/L	-	-	-	-	-	0.5	<0.5
c-1,2-Dichloroethylene	ug/L	-	-	-	-	-	0.4	<0.4
c-1,3-Dichloropropylene	ug/L	-	-	-	-	-	0.5	<0.5
Carbon Tetrachloride	ug/L	2 (0.002 mg/L)	MAC	-	-	-	0.2	<0.2
Chloroethane	ug/L	-	-	-	-	-	0.5	<0.5
Chloroform	ug/L	-	-	-	-	-	0.5	<0.5
Dibromochloromethane	ug/L	-	-	-	-	-	0.3	<0.3
Dichlorodifluoromethane	ug/L	-	-	-	-	-	0.5	<0.5
Dichloromethane	ug/L	50 (0.05 mg/L)	MAC	-	-	-	4	<4.0
Ethylbenzene	ug/L	150 (0.15 mg/L)	MAC	-	-	-	0.5	<0.5
Ethylene Dibromide	ug/L	-	-	-	-	-	0.2	<0.2
Hexane	ug/L	-	-	-	-	-	5	<5
m/p-xylene	ug/L	-	-	-	-	-	0.4	<0.4

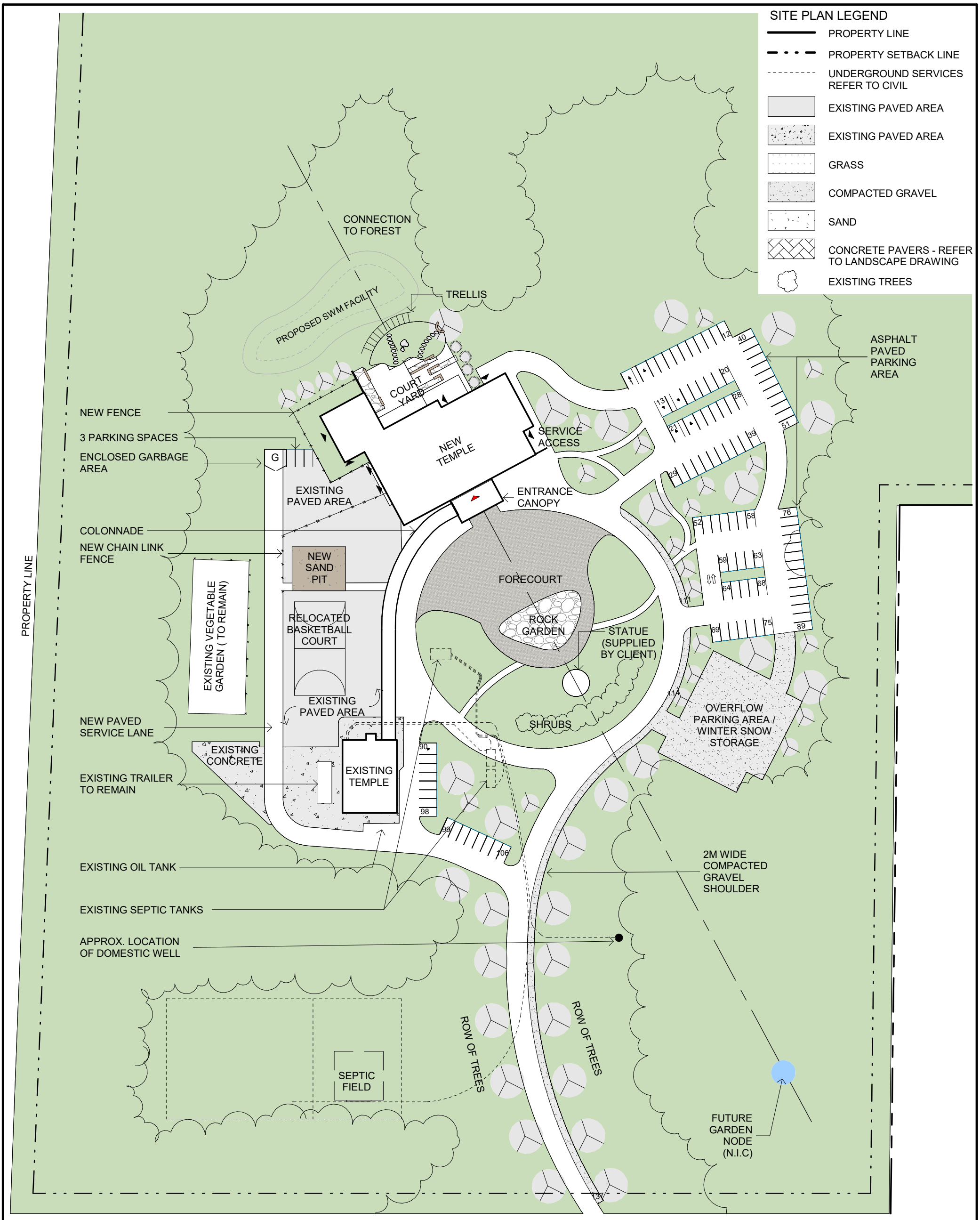
Table 2
Summary of Laboratory Water Quality Results

Sample ID	Units	ODWSOG	Limit Type	MDL	TW1-1	TW1-2	MDL	TW1
Sample Date					13-Jul-18	13-Jul-18		18-Dec-24
Location					6688 Franktown Road - Test Well 1			6688 Franktown Road - Test Well 1
Parameter:								
Methyl Ethyl Ketone (MEK)	ug/L	-	-	-	-	-	2	<2
Methyl Isobutyl Ketone (MIBK)	ug/L	-	-	-	-	-	5	<5
Methyl Tert Butyl Ether (MTBE)	ug/L	15 (0.015 mg/L)	AO	-	-	-	2	<2
Monochlorobenzene	ug/L	80 (0.080 mg/L)	MAC	-	-	-	0.5	<0.5
o-xylene	ug/L	-	-	-	-	-	0.4	<0.4
Styrene	ug/L	-	-	-	-	-	0.5	<0.5
t-1,2-Dichloroethylene	ug/L	-	-	-	-	-	0.4	<0.4
t-1,3-Dichloropropylene	ug/L	-	-	-	-	-	0.5	<0.5
Tetrachloroethylene	ug/L	10 (0.01 mg/L)	MAC	-	-	-	0.3	<0.3
Toluene	ug/L	60 (0.06 mg/L)	MAC	-	-	-	0.4	<0.2
Trichloroethylene	ug/L	5 (0.005 mg/L)	MAC	-	-	-	0.3	<0.3
Trichlorofluoromethane	ug/L	-	-	-	-	-	0.5	<0.5
Vinyl Chloride	ug/L	1 (0.001 mg/L)	MAC	-	-	-	0.2	<0.2
Xylene; total	ug/L	90 (0.090 mg/L)	MAC	-	-	-	0.5	<0.5

Notes:	
	Exceeds Ontario Drinking Water Standards, Objectives, and Guidelines
	Exceeds health warning limit for sodium (20, 000 ug/L;20 mg/L)
*	Method Detection Limit exceeds the Ontario Drinking Water Standards, Objectives and Guidelines
MDL	Method Detection Limit
ODWSOG	Ontario Drinking Water Standards, Objectives, and Guidelines
AO	Aesthetic Objective
MAC	Maximum Allowable Concentration (Health-Related Parameter)
OG	Operational Guideline
IMAC	Interim Maximum Acceptable Concentration
ND	Non detectable (below MDL)
ug/L	Micrograms per litre
mg/L	Milligrams per litre
TCU	True Colour Units
uS/cm	Microsemens per centimeter
NTU	Nephelometric Turbidity Units
CFU/100 ml	Colony Forming Units per 100ml
Ct/100 ml	Count per 100 ml

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX A: SITE PLAN



1 SITE PLAN AREA OF DEVELOPMENT

A002-EE 1 : 1050

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佛光山 F.G.S.

DESIGN DEVELOPMENT

SITE PLAN 11x17

IBPS TEMPLE

6688 Franktown Road, Richmond, Ontario

grc architects

September 27, 2024

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX B: MECP WELL RECORDS

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WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	GEOLOGY	COLOR	FORMATION_TOP_DEPTH	FORMATION_END_DEPTH	UNITS OF MEASUREMENT
7047631	04-Jul-07	43.3	8.6	1.52	23047631	Water Supply	Domestic	CLAY,SANDY,		0	1.52	m
7047631	04-Jul-07				23047631	Water Supply	Domestic	LIMESTONE,,		1.52	43.28	m
7053849	13-Nov-07	18.3	2.8	4.27	23053849	Water Supply	Domestic	SAND,GRAVEL,		0	4.27	m
7053849	13-Nov-07				23053849	Water Supply	Domestic	LIMESTONE,,	GREY	4.27	18.29	m
1502408	10-Jan-62	18.3	2.4	7.9	10024451	Water Supply	Livestock	CLAY,,		0	2	ft
1502408	10-Jan-62				10024451	Water Supply	Livestock	MEDIUM SAND,,		2	26	ft
1502408	10-Jan-62				10024451	Water Supply	Livestock	LIMESTONE,,	GREY	26	60	ft
1502409	15-Aug-64	19.8	1.2	2.4	10024452	Water Supply	Domestic	CLAY,TOPSOIL,		0	8	ft
1502409	15-Aug-64				10024452	Water Supply	Domestic	SANDSTONE,,		8	65	ft
1502410	12-Jun-67	6.7	2.4	-	10024453	Water Supply	Domestic	TOPSOIL,BOULDERS,		0	6.10	ft
1502410	12-Jun-67				10024453	Water Supply	Domestic	GRAVEL,,		6.10	6.71	ft
1502428	16-Jun-48	18.3	4.6	9.1	10024471	Water Supply	Domestic	GRAVEL,,		0	30	ft
1502428	16-Jun-48				10024471	Water Supply	Domestic	LIMESTONE,,		30	60	ft
1502429	28-Jul-58	27.7	27.7	2.7	10024472	Water Supply	Domestic	CLAY,,		0	9	ft
1502429	28-Jul-58				10024472	Water Supply	Domestic	LIMESTONE,,		9	91	ft
1502430	24-Nov-60	18.3	4.6	5.2	10024473	Water Supply	Domestic	MEDIUM SAND,,	RED	0	17	ft
1502430	24-Nov-60				10024473	Water Supply	Domestic	LIMESTONE,,	GREY	17	60	ft
1510152	22-Jul-69	15.5	15.2	3.7	10032181	Water Supply	Domestic	MEDIUM SAND,,	BROWN	0	12	ft
1510152	22-Jul-69				10032181	Water Supply	Domestic	LIMESTONE,,	GREY	12	51	ft
1515832	18-Nov-76	19.5	18.9	3.7	10037772	Water Supply	Domestic	SAND,,	GREY	0	12	ft
1515832	18-Nov-76				10037772	Water Supply	Domestic	LIMESTONE,,	GREY	12	64	ft
1516119	27-Jul-77	32	1.8	4.6	10038054	Water Supply	Domestic	SAND,,	GREY	0	15	ft
1516119	27-Jul-77				10038054	Water Supply	Domestic	LIMESTONE,,	GREY	15	105	ft
1523647	10-Apr-89	22.9	1.8	15.2	10045421	Water Supply	Domestic	CLAY,,	GREY	0	50	ft
1523647	10-Apr-89				10045421	Water Supply	Domestic	LIMESTONE,,	GREY	50	75	ft
1524746	26-Jul-90	27.4	3	4.9	10046494	Water Supply	Domestic	SAND,PACKED,	BROWN	0	3	ft
1524746	26-Jul-90				10046494	Water Supply	Domestic	SAND,PACKED,	GREY	3	16	ft
1524746	26-Jul-90				10046494	Water Supply	Domestic	LIMESTONE,MEDIUM-GRAINED,	GREY	16	90	ft
1525897	01-Oct-91	30.5	3.4	11	10047632	Test Hole	Domestic	SAND,,	GREY	0	6	ft
1525897	01-Oct-91				10047632	Test Hole	Domestic	HARDPAN,GRAVEL,FRACTURED	GREY	6	36	ft
1525897	01-Oct-91				10047632	Test Hole	Domestic	LIMESTONE,,	GREY	36	100	ft
1525898	01-Oct-91	31.4	3.7	4.6	10047633	Test Hole	Domestic	SAND,,	GREY	0	6	ft
1525898	01-Oct-91				10047633	Test Hole	Domestic	HARDPAN,FRACTURED,GRAVEL	GREY	6	15	ft
1525898	01-Oct-91				10047633	Test Hole	Domestic	LIMESTONE,,	GREY	15	103	ft
1525899	01-Oct-91	19.2	3.7	1.2	10047634	Test Hole	Domestic	SAND,,	GREY	0	4	ft
1525899	01-Oct-91				10047634	Test Hole	Domestic	ROCK,FRACTURED,	GREY	4	8	ft

WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	GEOLOGY	COLOR	FORMATION_TOP_DEPTH	FORMATION_END_DEPTH	UNITS OF MEASUREMENT
1525899	01-Oct-91				10047634	Test Hole	Domestic	LIMESTONE,,	GREY	8	63	ft
1528122	05-Jun-94	19.2	1.8	4.6	10049661	Water Supply	Domestic	CLAY,FILL,	GREY	0	3	ft
1528122	05-Jun-94				10049661	Water Supply	Domestic	SAND,,	RED	3	6	ft
1528122	05-Jun-94				10049661	Water Supply	Domestic	HARDPAN,,	GREY	6	15	ft
1528122	05-Jun-94				10049661	Water Supply	Domestic	LIMESTONE,,	GREY	15	63	ft
1532075	25-May-01	36.6	3	2.7	10516525	Water Supply	Domestic	SAND,,		0	9	ft
1532075	25-May-01				10516525	Water Supply	Domestic	LIMESTONE,,	GREY	9	120	ft
1532709	11-Mar-02	67.1	1.8	4.9	10523837	Water Supply	Domestic	SAND,,		0	16	ft
1532709	11-Mar-02				10523837	Water Supply	Domestic	LIMESTONE,,	GREY	16	176	ft
1532709	11-Mar-02				10523837	Water Supply	Domestic	SANDSTONE,,	GREY	176	220	ft
1534049	26-Aug-03	55.2	15.2	8.2	10543164	Water Supply	Domestic	SAND,,	GREY	0	27	ft
1534049	26-Aug-03				10543164	Water Supply	Domestic	LIMESTONE,,	GREY	27	170	ft
1534049	26-Aug-03				10543164	Water Supply	Domestic	SANDSTONE,,	WHITE	170	181	ft
1535485	18-Mar-05	22.3	2.3	8.2	11316024	Water Supply	Domestic	CLAY,PACKED,	BROWN	0	1.82	m
1535485	18-Mar-05				11316024	Water Supply	Domestic	SAND,DRY,	BROWN	1.82	3.65	m
1535485	18-Mar-05				11316024	Water Supply	Domestic	SAND,BOULDERS,WATER-BEARING	GREY	3.65	8.22	m
1535485	18-Mar-05				11316024	Water Supply	Domestic	LIMESTONE,LAYERED,	GREY	8.22	22.25	m
1534476	22-Dec-03	54.9	3.8	1.8	11104751	Water Supply	Domestic	TOPSOIL,FILL,	BLACK	0	1.83	m
1534476	22-Dec-03				11104751	Water Supply	Domestic	LIMESTONE,SANDSTONE,	GREY	1.83	54.86	m
1534764	03-Jun-04	36.9	3.8	7.9	11172516	Water Supply	Domestic	SAND,GRAVEL,FILL		0	2.4	m
1534764	03-Jun-04				11172516	Water Supply	Domestic	SAND,CLAY,	GREY	2.4	7.9	m
1534764	03-Jun-04				11172516	Water Supply	Domestic	LIMESTONE,,	GREY	7.9	36.9	m
1534947	05-Jul-04	37.5	3.8	1.5	11172699	Water Supply	Domestic	TOPSOIL,STONES,PACKED	BROWN	0	1.52	m
1534947	05-Jul-04				11172699	Water Supply	Domestic	LIMESTONE,LAYERED,HARD	GREY	1.52	37.48	m
1535801	22-Aug-05	18.3	3.3	8.2	11316340	Water Supply	Domestic	SAND,GRAVEL,		0	8.23	m
1535801	22-Aug-05				11316340	Water Supply	Domestic	LIMESTONE,,	GREY	8.23	18.29	m
1535802	25-Aug-05	18.9	4.8	7.3	11316341	Water Supply	Domestic	SAND,,		0	7.31	m
1535802	25-Aug-05				11316341	Water Supply	Domestic	LIMESTONE,,	GREY	7.31	18.9	m
1536011	26-Oct-05	18.9	3.7	4	11316550	Water Supply	Domestic	SAND,,		0	4.1	m
1536011	26-Oct-05				11316550	Water Supply	Domestic	LIMESTONE,,	GREY	4.1	18.9	m
1536280	10-Mar-06	21.3	2.3	4.3	11550346	Water Supply	Domestic	SAND,CLAY,		0	4.26	m
1536280	10-Mar-06				11550346	Water Supply	Domestic	LIMESTONE,,	GREY	4.26	21.33	m
1536384	21-Apr-06	50	1.3	8.2	11550450	Water Supply	Domestic	SAND,BOULDERS,		0	8.23	m
1536384	21-Apr-06				11550450	Water Supply	Domestic	LIMESTONE,,	GREY	8.23	36.57	m
1536384	21-Apr-06				11550450	Water Supply	Domestic	SANDSTONE,,	GREY	36.57	49.98	m
1536667	22-Jun-06	26.2	-	3.7	11691761	Abandoned-Other		,,		0	26.21	m
1536737	06-Sep-06	24.7	2.3	3	11691831	Water Supply	Domestic	SAND,,		0	3.05	m

WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	GEOLOGY	COLOR	FORMATION_TOP_DEPTH	FORMATION_END_DEPTH	UNITS OF MEASUREMENT
1536737	06-Sep-06				11691831	Water Supply	Domestic	LIMESTONE,,		3.05	24.69	m
7040907	24-Dec-06	18.6	0.9	3.4	11763343	Water Supply	Domestic	SAND,BOULDERS,		0	3.35	m
7040907	24-Dec-06				11763343	Water Supply	Domestic	LIMESTONE,,	GREY	3.35	18.59	m
7108135	03-Jun-08	30.5	7.3	0.91	1001657826	Water Supply	Domestic	SAND,,		0	0.91	m
7108135	03-Jun-08				1001657826	Water Supply	Domestic	LIMESTONE,,	GREY	0.91	30.47	m
7108150	28-May-08	54.9	6.9	13.41	1001658004	Water Supply	Domestic	SAND,GRAVEL,BOULDERS		0	13.41	m
7108150	28-May-08				1001658004	Water Supply	Domestic	LIMESTONE,,	GREY	13.41	47.24	m
7108150	28-May-08				1001658004	Water Supply	Domestic	SANDSTONE,,	GREY	47.24	54.86	m
7145846	19-Mar-10	71.9	2	6.7	1002987488	Water Supply	Domestic	SAND,,	BROWN	0	22	ft
7145846	19-Mar-10				1002987488	Water Supply	Domestic	LIMESTONE,,	GREY	22	172	ft
7145846	19-Mar-10				1002987488	Water Supply	Domestic	SANDSTONE,,	GREY	172	236	ft
7166315	27-Jun-11	61.3	5.2	11.6	1003541650	Water Supply	Domestic	CLAY,STONES,PACKED	BROWN	0	6	ft
7166315	27-Jun-11				1003541650	Water Supply	Domestic	CLAY,SAND,PACKED	GREY	6	38	ft
7166315	27-Jun-11				1003541650	Water Supply	Domestic	LIMESTONE,SANDSTONE,HARD	GREY	38	184	ft
7166315	27-Jun-11				1003541650	Water Supply	Domestic	SANDSTONE,,HARD	GREY	184	201	ft
7169712	02-Aug-11	61	58.8	3.7	1003577881	Other Status		,,		0	12	ft
7169712	02-Aug-11				1003577881	Other Status		LIMESTONE,,	GREY	12	161	ft
7169712	02-Aug-11				1003577881	Other Status		SANDSTONE,,	WHITE	161	200	ft
7173742	25-Nov-11	85.3	3.7	21.9	1003622203	Water Supply	Domestic	CLAY,,	BLUE	0	48	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	SAND,,	RED	48	68	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	GRAVEL,,		68	72	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	LIMESTONE,,	GREY	72	253	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	LIMESTONE,,	GREY	253	263	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	SANDSTONE,,	WHITE	263	272	ft
7173742	25-Nov-11				1003622203	Water Supply	Domestic	SANDSTONE,,	WHITE	272	280	ft
7206684	16-Jul-13	54.9	1.5	4.3	1004535762	Water Supply	Domestic	SAND,,		0	14	ft
7206684	16-Jul-13				1004535762	Water Supply	Domestic	LIMESTONE,,	GREY	14	102	ft
7206684	16-Jul-13				1004535762	Water Supply	Domestic	LIMESTONE,,	GREY	102	154	ft
7206684	16-Jul-13				1004535762	Water Supply	Domestic	LIMESTONE,,	GREY	154	172	ft
7206684	16-Jul-13				1004535762	Water Supply	Domestic	LIMESTONE,,	GREY	172	180	ft
7218209	13-Mar-13	67	2.8	4.57	1004724784	Water Supply	Domestic	SAND,,DRY	BROWN	0	2.43	m
7218209	13-Mar-13				1004724784	Water Supply	Domestic	TOPSOIL,,SANDY	GREY	2.43	4.57	m
7218209	13-Mar-13				1004724784	Water Supply	Domestic	LIMESTONE,,HARD	GREY	4.57	42.66	m
7218209	13-Mar-13				1004724784	Water Supply	Domestic	SANDSTONE,,HARD	GREY	42.66	67.05	m
7248774	03-Aug-15	42.7	4.3	4.9	1005699380	Water Supply	Domestic	CLAY,,		0	16	ft

WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	GEOLOGY	COLOR	FORMATION_TOP_DEPTH	FORMATION_END_DEPTH	UNITS OF MEASUREMENT
7248774	03-Aug-15				1005699380	Water Supply	Domestic	LIMESTONE,,	GREY	16	100	ft
7248774	03-Aug-15				1005699380	Water Supply	Domestic	SANDSTONE,LIMESTONE,	WHITE	100	130	ft
7248774	03-Aug-15				1005699380	Water Supply	Domestic	SANDSTONE,LIMESTONE,	WHITE	130	140	ft
7268450	03-Jun-16	48.8	2.6	11.9	1006196544	Water Supply	Domestic	SAND,,		0	39	ft
7268450	03-Jun-16				1006196544	Water Supply	Domestic	SANDSTONE,LIMESTONE,	GREY	39	138	ft
7268450	03-Jun-16				1006196544	Water Supply	Domestic	SANDSTONE,LIMESTONE,	GREY	138	146	ft
7268450	03-Jun-16				1006196544	Water Supply	Domestic	SANDSTONE,LIMESTONE,	GREY	146	152	ft
7268450	03-Jun-16				1006196544	Water Supply	Domestic	SANDSTONE,LIMESTONE,	GREY	152	160	ft
7307165	02-Oct-17	35	2.9	7.01	1006998312	Water Supply	Domestic	SAND,STONES,DRY	BROWN	0	1.82	m
7307165	02-Oct-17				1006998312	Water Supply	Domestic	SAND,,WATER-BEARING	WHITE	1.82	7.01	m
7307165	02-Oct-17				1006998312	Water Supply	Domestic	LIMESTONE,,MEDIUM GRAVEL	GREY	7.01	35.05	m
7318079	11-Jul-18	61	4.3	3	1007285584	Water Supply	Domestic	CLAY,SANDY,		0	10	ft
7318079	11-Jul-18				1007285584	Water Supply	Domestic	LIMESTONE,,	GREY	10	200	ft
	MIN	6.7	0.9	0.91								
	MAX	85.3	58.8	21.9								
	AVG			6.00								

WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	PUMP TEST	PUMPING RATE	RECOM RATE	WATER STATE AFTER TEST	PUMP METHOD	PUMPING DURATION (h)
7047631	04-Jul-07	43.3	8.6	1.52	23047631	Water Supply	Domestic	8.56,24.72,36.57 m	56.78 LPM	56.78LPM	CLOUDY	PUMP	1 h
7053849	13-Nov-07	18.3	2.8	4.27	23053849	Water Supply	Domestic	2.8,6.27,12.19 m	91 LPM	91LPM	No information	PUMP	1 h
1502408	10-Jan-62	18.3	2.4	7.9	10024451	Water Supply	Livestock	8,10,20 ft	8 GPM	10GPM	CLOUDY	PUMP	1 h
1502409	15-Aug-64	19.8	1.2	2.4	10024452	Water Supply	Domestic	4,28,52 ft	10 GPM	5GPM	CLEAR	PUMP	0 h
1502410	12-Jun-67	6.7	2.4	-	10024453	Water Supply	Domestic	8,12,18 ft	5 GPM	5GPM	CLEAR	PUMP	1 h
1502428	16-Jun-48	18.3	4.6	9.1	10024471	Water Supply	Domestic	15,, ft	GPM	3GPM	CLEAR	PUMP	1 h
1502429	28-Jul-58	27.7	27.7	2.7	10024472	Water Supply	Domestic	No information	100 GPM	No information	CLEAR	PUMP	0.5 h
1502430	24-Nov-60	18.3	4.6	5.2	10024473	Water Supply	Domestic	15,20,20 ft	1 GPM	5GPM	CLEAR	PUMP	0.5 h
1510152	22-Jul-69	15.5	15.2	3.7	10032181	Water Supply	Domestic	0,20,25 ft	20 GPM	10GPM	CLEAR	BAILER	1 h
1515832	18-Nov-76	19.5	18.9	3.7	10037772	Water Supply	Domestic	0,50,50 ft	6 GPM	5GPM	CLOUDY	PUMP	1 h
1516119	27-Jul-77	32	1.8	4.6	10038054	Water Supply	Domestic	6,25,25 ft	20 GPM	10GPM	CLOUDY	PUMP	1 h
1523647	10-Apr-89	22.9	1.8	15.2	10045421	Water Supply	Domestic	6,30,30 ft	20 GPM	10GPM	CLOUDY	PUMP	1 h
1524746	26-Jul-90	27.4	3	4.9	10046494	Water Supply	Domestic	10,40,75 ft	20 GPM	5GPM	CLEAR	PUMP	1 h
1525897	01-Oct-91	30.5	3.4	11	10047632	Test Hole	Domestic	11,60,50 ft	50 GPM	50GPM	CLOUDY	PUMP	1 h
1525898	01-Oct-91	31.4	3.7	4.6	10047633	Test Hole	Domestic	12,80,80 ft	15 GPM	15GPM	CLOUDY	PUMP	1 h
1525899	01-Oct-91	19.2	3.7	1.2	10047634	Test Hole	Domestic	12,60,60 ft	6 GPM	6GPM	CLOUDY	PUMP	1 h
1528122	05-Jun-94	19.2	1.8	4.6	10049661	Water Supply	Domestic	6,40,40 ft	20 GPM	15GPM	CLOUDY	PUMP	1 h
1532075	25-May-01	36.6	3	2.7	10516525	Water Supply	Domestic	10,110,110 ft	10 GPM	10GPM	CLOUDY	PUMP	1 h
1532709	11-Mar-02	67.1	1.8	4.9	10523837	Water Supply	Domestic	6,100,100 ft	30 GPM	30GPM	CLOUDY	PUMP	1 h
1534049	26-Aug-03	55.2	15.2	8.2	10543164	Water Supply	Domestic	50,170,170 ft	5 GPM	5GPM	CLOUDY	PUMP	1 h
1535485	18-Mar-05	22.3	2.3	8.2	11316024	Water Supply	Domestic	2.31,2.98,7.61 m	54.6 LPM	45.5LPM	CLEAR	PUMP	1 h
1534476	22-Dec-03	54.9	3.8	1.8	11104751	Water Supply	Domestic	3.8,43,30.5 m	75.7 LPM	189.3LPM	CLEAR	PUMP	1 h
1534764	03-Jun-04	36.9	3.8	7.9	11172516	Water Supply	Domestic	3.82,18.33,33.5 m	68.25 LPM	68.25LPM	CLEAR	PUMP	1 h
1534947	05-Jul-04	37.5	3.8	1.5	11172699	Water Supply	Domestic	3.82,5.68,22.85 m	54.6 LPM	45.5LPM	CLEAR	PUMP	1 h
1535801	22-Aug-05	18.3	3.3	8.2	11316340	Water Supply	Domestic	3.31,3.47,10.97 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
1535802	25-Aug-05	18.9	4.8	7.3	11316341	Water Supply	Domestic	4.77,10.67,15.24 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
1536011	26-Oct-05	18.9	3.7	4	11316550	Water Supply	Domestic	3.74,9.37,15.2 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
1536280	10-Mar-06	21.3	2.3	4.3	11550346	Water Supply	Domestic	2.26,3.66,15.23 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
1536384	21-Apr-06	50	1.3	8.2	11550450	Water Supply	Domestic	1.3,2.04,42.67 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
1536667	22-Jun-06	26.2	-	3.7	11691761	Abandoned		-	-	-	No information	No information	No information
1536737	06-Sep-06	24.7	2.3	3	11691831	Water Supply	Domestic	2.34,3.95,21.33 m	30.28 LPM	30.28LPM	CLOUDY	PUMP	1 h
7040907	24-Dec-06	18.6	0.9	3.4	11763343	Water Supply	Domestic	0.86,1.86,15.24 m	91 LPM	91LPM	CLOUDY	PUMP	1 h
7108135	03-Jun-08	30.5	7.3	0.91	1001657826	Water Supply	Domestic	7.32,7.64,24.38 m	91 LPM	91LPM	No information	No information	1 h
7108150	28-May-08	54.9	6.9	13.41	1001658004	Water Supply	Domestic	6.93,17.6,30.47 m	91 GPM	91GPM	No information	No information	1 h
7145846	19-Mar-10	71.9	2	6.7	1002987488	Water Supply	Domestic	6.6,6.7,100 ft	20 GPM	20GPM	OTHER	No information	1 h
7166315	27-Jun-11	61.3	5.2	11.6	1003541650	Water Supply	Domestic	16.9,37.4,120 ft	17 GPM	10GPM	CLEAR	No information	1 h
7169712	02-Aug-11	61	58.8	3.7	1003577881	Other Status	Deepening of Existing Well	-	-	-	No information	No information	No information
7173742	25-Nov-11	85.3	3.7	21.9	1003622203	Water Supply	Domestic	12,95.333,150 ft	16 GPM	16GPM	No information	No information	1 h
7206684	16-Jul-13	54.9	1.5	4.3	1004535762	Water Supply	Domestic	4.8,8.3,100 ft	15 GPM	15GPM	No information	No information	1 h
7218209	13-Mar-13	67	2.8	4.57	1004724784	Water Supply	Domestic	2.75,5.8,15.23 m	50.05 LPM	45.5LPM	CLEAR	No information	1 h
7248774	03-Aug-15	42.7	4.3	4.9	1005699380	Water Supply	Domestic	14.25,43.67,120 ft	20 GPM	20GPM	No information	No information	1 h

WELL_ID	COMPLETED	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DEPTH TO BEDROCK (m)	BORE_HOLE_ID	FINAL STATUS	USE1	PUMP TEST	PUMPING RATE	RECOM RATE	WATER STATE AFTER TEST	PUMP METHOD	PUMPING DURATION (h)
7268450	03-Jun-16	48.8	2.6	11.9	1006196544	Water Supply	Domestic	8.583,9,100 ft	20 GPM	20GPM	No information	No information	1 h
7307165	02-Oct-17	35	2.9	7.01	1006998312	Water Supply	Domestic	2.9,4.15,15.23 m	54.6 LPM	45.5LPM	CLEAR	No information	1 h
7318079	11-Jul-18	61	4.3	3	1007285584	Water Supply	Domestic	14.2,15.5,100 ft	20 GPM	20GPM	No information	No information	1 h

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX C: WELL RECORD (TW1)

Ontario — Ministry of the Environment and Climate Change

Tag#:A252856 (or Print Below)

A252856

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	International Buddhist Progress Society of Ottawa		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
1950 Scott Street	Ottawa	ON	K1Z 8L8	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6688 Franktown Road	Goulbourn	P/L 19	3

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

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	[redacted]	[redacted]	RP 4R-7040	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/ft) From	Depth (m/ft) To
	Sand	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/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/cu yd)
20	0	Neat cement	10.8

Method of Construction

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

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	Steel	.188"	+2	20
6 1/4"	Open Hole		20	200

Construction Record - Screen

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

Status of Well

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

Water Details

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

Results of Well Yield Testing

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

If pumping discontinued, give reason: X

Pump intake set at (m/ft): 150

Pumping rate (l/min / GPM): 20

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 15.5'

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

Recommended pump depth (m/ft): 100'

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

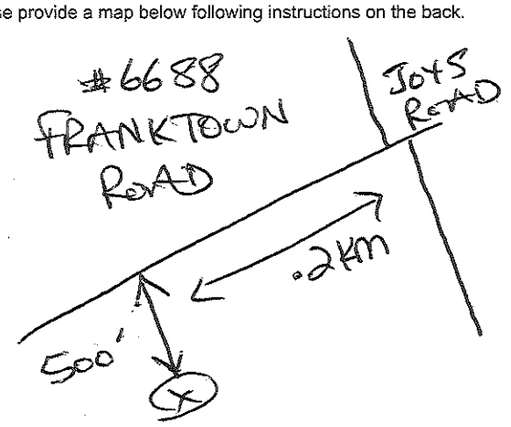
Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	14'2"		15'5"
1	15.4	1	14.2
2	15.4	2	14.2
3	15.4	3	14.2
4	15.4	4	14.2
5	15.4	5	14.2
10	15.5	10	14.2
15	15.5	15	14.2
20	15.5	20	14.2
25	15.5	25	14.2
30	15.5	30	14.2
40	15.5	40	14.2
50	15.5	50	14.2
60	15.5'	60	14'2"

Map of Well Location

Please provide a map below following instructions on the back.



Comments: 1 HP - 20 GPM SET @ 100 FT

Well Contractor and Well Technician Information

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

Business Address (Street Number/Name)	Municipality
6688 Franktown Road, RR#1	Richmond

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

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6132382170	Hanna, Jeremy

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted (Y Y Y Y M M D D)
13652		2018 07 31

Well owner's information package delivered	Date Package Delivered (Y Y Y Y M M D D)	Date Work Completed (Y Y Y Y M M D D)
☒ Yes ☐ No	2018 07 12	2018 07 11

Ministry Use Only

Audit No. Z276984

Received SEP 10 2018

0506E (2014/11) Ministry's Copy

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX D: CERTIFICATE OF CALIBRATION

egis

25-0583+ 25-1134

Maxim

CERTIFICATE OF CALIBRATION

The HORIBA Instrument listed below has been inspected and calibrated following the Manufacturer's specifications and methods.

Instrument Model: **HORIBA U-52** *Serial Number:* **X8RGLCRY** *Calibration Date:* **December 11, 2024**

2-POINT pH	*CONDUCTIVITY*	*TURBIDITY*	*DISSOLVED OXYGEN*	*OXIDIZATION-REDUCTION POTENTIAL*	*TEMPERATURE*
4.00 pH, 7.00 pH	4.49mS/cm ZERO CHECKED	0 & 100 NTU	8.26 mg/L @ 25.0 DegC SODIUM SULFITE ZERO	240mV	Fisher Scientific s/n 230606647
AutoCal 4.00 pH Solution LOT # 4GI0133	AutoCal Solution LOT # 4GI0133	AutoCal Solution LOT# 4GI0133	Oakton Zero Solution LOT# 805004	Hanna ORP LOT # 9289	
Expiry Date: September 1, 2025	Expiry Date: September 1, 2025	Expiry Date: September 1, 2025	Expiry Date: June 1, 2026	Expiry Date: October 1, 2028	
pH 7.00 LOT # 4GF0046	@25 DegC LOT # 4GI0133	Turb. 100 NTU LOT # A4152			
Expiry Date: June 1, 2026		Expiry Date: June 1, 2026			

The calibration standard used is considered to be a certified standard and is traceable to the National Institute of Standards and Technology (NIST). Certificate of Analysis is available upon request.

The instrument indicated above is now certified to be operating within the Manufacturer's specifications. This does not eliminate the requirement for regular maintenance and pre-use sensor response checks in order to ensure continued complete and accurate operating condition.

Certified By: Jason Ashe

MAXIM Environmental and Safety Inc.

sales@maximenvironmental.com
www.maximenvironmental.com

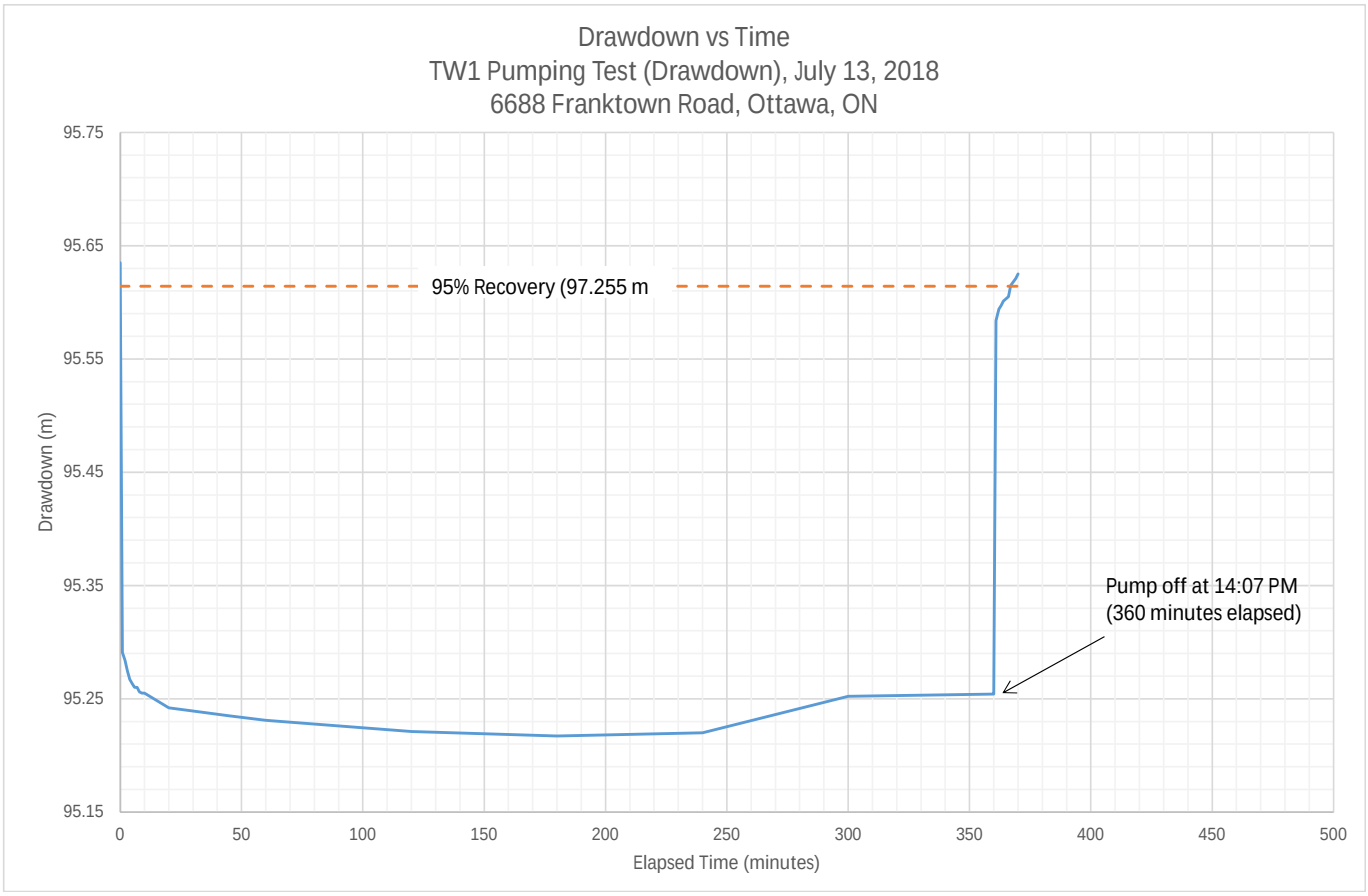
9 - 170 Ambassador Dr., Mississauga, ON L5T 2H9
(905)670-1304 | Toll Free (888)285-2324

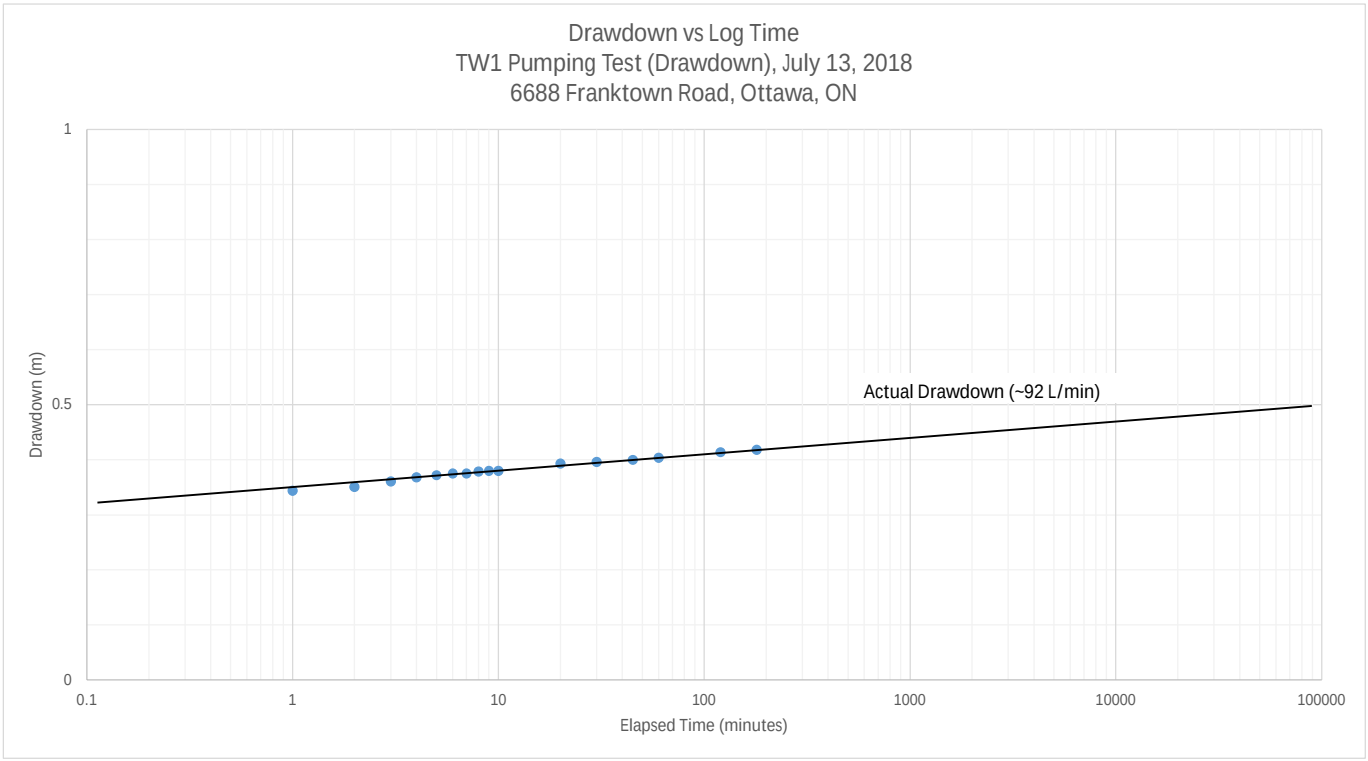
9 - 148 Colonnade Rd., Ottawa, ON K2E 7R4
(613)224-4747 | Toll Free (888)285-2324

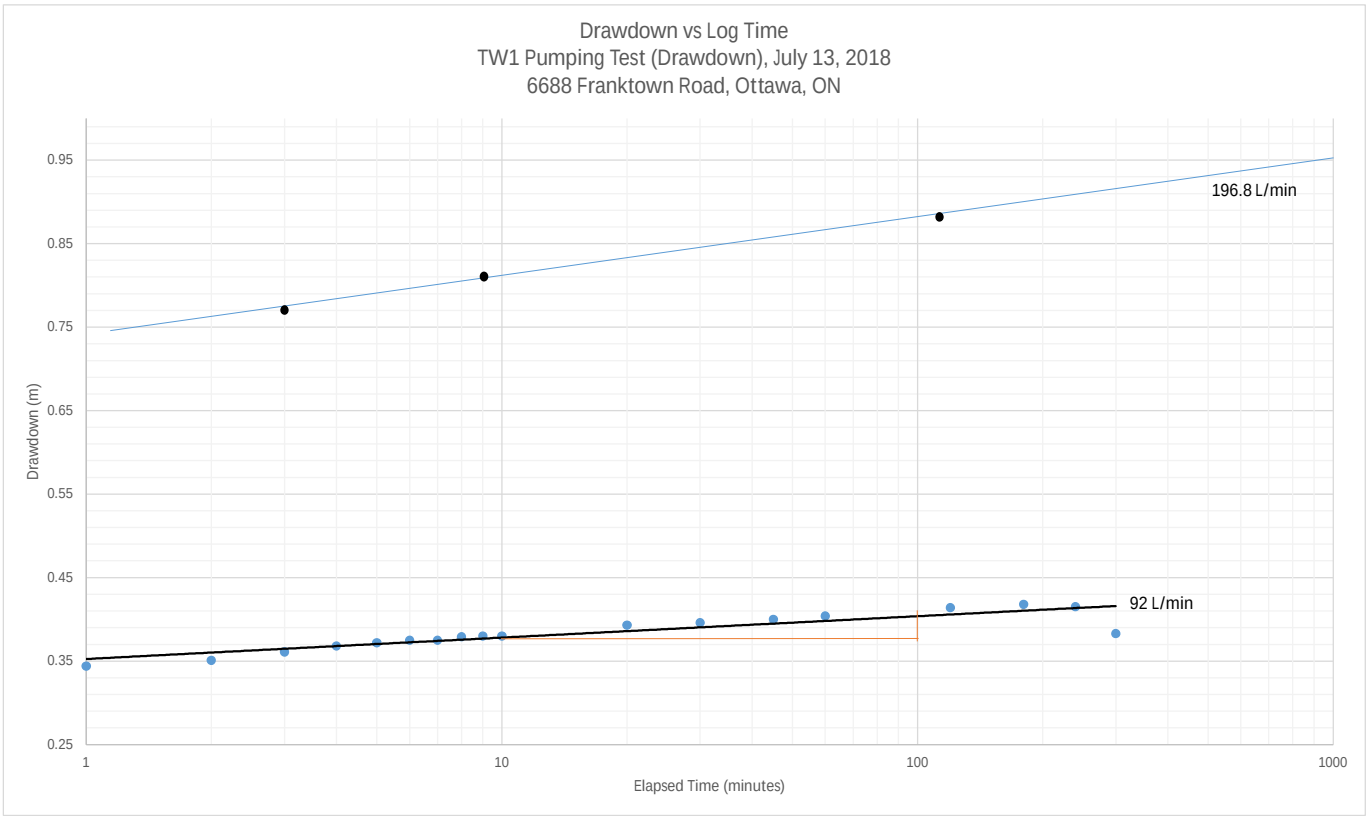
HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

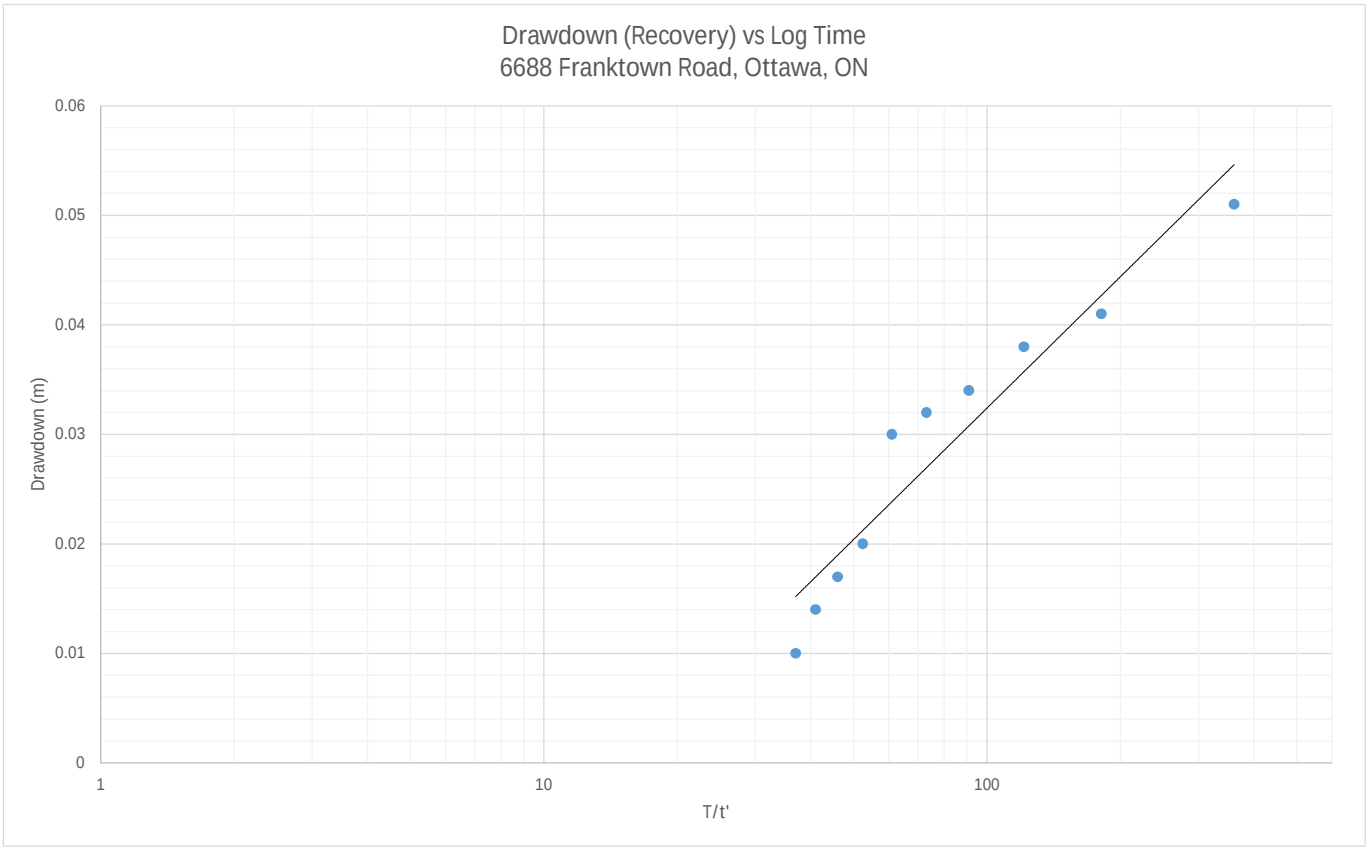
APPENDIX E: WATER LEVEL DATA AND PUMPING TEST ANALYSIS

egis


Drawdown vs Time
TW1 Pumping Test (Drawdown), July 13, 2018
6688 Franktown Road, Ottawa, ON
95.75
95.65
95.55
95.45
95.35
95.25
95.15
Drawdown (m)
95% Recovery (97.255 m
Pump off at 14:07 PM
(360 minutes elapsed)
0
50
100
150
200
250
300
350
400
450
500
Elapsed Time (minutes)


Drawdown vs Log Time
TW1 Pumping Test (Drawdown), July 13, 2018
6688 Franktown Road, Ottawa, ON
Drawdown (m)
1
0.5
0
Actual Drawdown (~92 L/min)
0.1
1
10
100
1000
10000
100000
Elapsed Time (minutes)


Drawdown vs Log Time
TW1 Pumping Test (Drawdown), July 13, 2018
6688 Franktown Road, Ottawa, ON
196.8 L/min
92 L/min
Drawdown (m)
0.95
0.85
0.75
0.65
0.55
0.45
0.35
0.25
1
10
100
1000
Elapsed Time (minutes)


Drawdown (Recovery) vs Log Time
6688 Franktown Road, Ottawa, ON
Drawdown (m)
0.06
0.05
0.04
0.03
0.02
0.01
0
1
10
100
T/t'

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX F: LABORATORY CERTIFICATE OF ANALYSIS

egis

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Ms. Rebecca Leduc
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

Dear Rebecca Leduc:

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

Report Comments:

APPROVAL: Addrine Thomas 2024.12.27 13:40:54 -05'00'

Addrine Thomas, Inorganics Supervisor

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

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

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

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

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

eurofins | Environment Testing

Certificate of Analysis

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1754616 GW 2024-12-18 TW1
Anions	Cl	1	mg/L	AO 250	14
	F	0.10	mg/L	MAC 1.5	0.49
	N-NO2	0.10	mg/L	MAC 1.0	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10
	SO4	1	mg/L	AO 500	39
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	279
	Colour (Apparent)	2	TCU	AO 5	10*
	Conductivity	5	uS/cm		630
	DOC	0.5	mg/L	AO 5	4.0
	pH	1.00		6.5-8.5	7.91
	Phenols	0.001	mg/L		<0.001
	S2-	0.01	mg/L	AO 0.05	<0.01
	Tannin & Lignin	0.1	mg/L		0.1
	TDS (COND - CALC)	1	mg/L	AO 500	410
	Turbidity	0.1	NTU	AO 5	1.2
Hardness	Hardness as CaCO3	1	mg/L	OG 80-100	309*
Indices/Calc	Ion Balance	0.01			1.03
Metals	Ag	0.0001	mg/L		<0.0001
	Al	0.01	mg/L	OG 0.1	<0.01
	As	0.001	mg/L	IMAC 0.01	<0.001
	B	0.01	mg/L	IMAC 5.0	0.21
	Ba	0.01	mg/L	MAC 1.0	0.10
	Be	0.0005	mg/L		<0.0005
	Ca	1	mg/L		76
	Cd	0.0001	mg/L	MAC 0.005	<0.0001

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

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Project: 25-1134
COC #: 918293

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1754616 GW 2024-12-18 TW1
Metals	Co	0.0002	mg/L		<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001
	Cu	0.001	mg/L	AO 1	<0.001
	Fe	0.03	mg/L	AO 0.3	0.23
	Hg	0.0001	mg/L	MAC 0.001	<0.0001
	K	1	mg/L		5
	Mg	1	mg/L		29
	Mn	0.01	mg/L	AO 0.05	<0.01
	Mo	0.005	mg/L		<0.005
	Na	1	mg/L	AO 200	16
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001
	Sb	0.0005	mg/L	IMAC 0.006	<0.0005
	Se	0.001	mg/L	MAC 0.05	<0.001
	Sn	0.01	mg/L		<0.01
	Sr	0.001	mg/L		2.60
	Ti	0.01	mg/L		<0.01
	Tl	0.0001	mg/L		<0.0001
	U	0.001	mg/L	MAC 0.02	<0.001
	V	0.001	mg/L		<0.001
	W	0.002	mg/L		<0.002
	Zn	0.01	mg/L	AO 5	<0.01
Microbiology	Escherichia Coli	0	ct/100mL	MAC 0	0
	Faecal Coliforms	0	ct/100mL		0
	Heterotrophic Plate Count	0	ct/1mL		0

Guideline = ODWSOG *** = Guideline Exceedence**

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

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

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Report Number: 3013373
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				Lab I.D.	1754616
				Sample Matrix	GW
				Sample Type	
				Sampling Date	2024-12-18
				Sample I.D.	TW1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Microbiology	Total Coliforms	0	ct/100mL	MAC 0	0
Nutrients	N-NH3	0.020	mg/L		0.115
	Total Kjeldahl Nitrogen	0.100	mg/L		0.360
VOCs Surrogates	1,2-dichloroethane-d4	0	%		103
	4-bromofluorobenzene	0	%		76
	Toluene-d8	0	%		122
Volatiles	1,1,1,2-tetrachloroethane	0.5	ug/L		<0.5
	1,1,1-trichloroethane	0.4	ug/L		<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L		<0.5
	1,1,2-trichloroethane	0.4	ug/L		<0.4
	1,1-dichloroethane	0.4	ug/L		<0.4
	1,1-dichloroethylene	0.5	ug/L	MAC 14	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 200	<0.4
	1,2-dichloroethane	0.5	ug/L	IMAC 5	<0.5
	1,2-dichloropropane	0.5	ug/L		<0.5
	1,3,5-trimethylbenzene	0.3	ug/L		<0.3
	1,3-dichlorobenzene	0.4	ug/L		<0.4
	1,3-Dichloropropylene (cis+trans)	0.5	ug/L		<0.5
	1,4-dichlorobenzene	0.4	ug/L	MAC 5	<0.4
	Acetone	5	ug/L		<5
	Benzene	0.5	ug/L	MAC 1	<0.5
	Bromodichloromethane	0.3	ug/L		<0.3
	Bromoform	0.4	ug/L		<0.4
	Bromomethane	0.5	ug/L		<0.5
	c-1,2-Dichloroethylene	0.4	ug/L		<0.4

Guideline = ODWSOG *** = Guideline Exceedence**

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Methods references and/or additional QA/QC information available on request.

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Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Ms. Rebecca Leduc
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1754616 GW 2024-12-18 TW1
Volatiles	c-1,3-Dichloropropylene	0.5	ug/L		<0.5
	Carbon Tetrachloride	0.2	ug/L	MAC 2	<0.2
	Chloroethane	0.5	ug/L		<0.5
	Chloroform	0.5	ug/L		<0.5
	Dibromochloromethane	0.3	ug/L		<0.3
	Dichlorodifluoromethane	0.5	ug/L		<0.5
	Dichloromethane	4.0	ug/L	MAC 50	<4.0
	Ethylbenzene	0.5	ug/L	MAC 140	<0.5
	Ethylene Dibromide	0.2	ug/L		<0.2
	Hexane	5	ug/L		<5
	m/p-xylene	0.4	ug/L		<0.4
	Methyl Ethyl Ketone (MEK)	2	ug/L		<2
	Methyl Isobutyl Ketone (MIBK)	5	ug/L		<5
	Methyl Tert Butyl Ether (MTBE)	2	ug/L	AO 15	<2
	Monochlorobenzene	0.5	ug/L	MAC 80	<0.5
	o-xylene	0.4	ug/L		<0.4
	Styrene	0.5	ug/L		<0.5
	t-1,2-Dichloroethylene	0.4	ug/L		<0.4
	t-1,3-Dichloropropylene	0.5	ug/L		<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 10	<0.3
	Toluene	0.4	ug/L	MAC 60	<0.4
	Trichloroethylene	0.3	ug/L	MAC 5	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5
	Vinyl Chloride	0.2	ug/L	MAC 1	<0.2
	Xylene; total	0.5	ug/L	MAC 90	<0.5

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

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Carp, ON
K0A 1L0
Attention: Ms. Rebecca Leduc
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 470279 **Analysis/Extraction Date** 2024-12-19 **Analyst** L_V **Method** AMBCOLM1			
Escherichia Coli			
Faecal Coliforms			
Heterotrophic Plate Count			
Total Coliforms			
Run No 470314 **Analysis/Extraction Date** 2024-12-19 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	109	80-120
Run No 470322 **Analysis/Extraction Date** 2024-12-19 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	105	50-120
Run No 470323 **Analysis/Extraction Date** 2024-12-19 **Analyst** M_B **Method** C SM2130B			
Turbidity	<0.1 NTU	103	70-130
Run No 470360 **Analysis/Extraction Date** 2024-12-19 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.0001 mg/L	112	80-120
Aluminum	<0.01 mg/L	113	80-120

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

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Ms. Rebecca Leduc
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Arsenic	<0.001 mg/L	99	80-120
Boron (total)	<0.01 mg/L	101	80-120
Barium	<0.01 mg/L	97	80-120
Beryllium	<0.0005 mg/L	104	80-120
Cadmium	<0.0001 mg/L	101	80-120
Cobalt	<0.0002 mg/L	109	80-120
Chromium Total	<0.001 mg/L	97	80-120
Copper	<0.001 mg/L	109	80-120
Iron	<0.03 mg/L	100	80-120
Mercury	<0.0001 mg/L	103	80-120
Manganese	<0.01 mg/L	108	80-120
Molybdenum	<0.005 mg/L	107	80-120
Nickel	<0.005 mg/L	112	80-120
Lead	<0.001 mg/L	109	80-120
Antimony	<0.0005 mg/L	82	80-120
Selenium	<0.001 mg/L	97	80-120
Sn	<0.01 mg/L	92	80-120
Strontium	<0.001 mg/L	98	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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

Certificate of Analysis

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Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Titanium	<0.01 mg/L	100	80-120
Thallium	<0.0001 mg/L	107	80-120
Uranium	<0.001 mg/L	98	80-120
Vanadium	<0.001 mg/L	102	80-120
W	<0.002 mg/L	95	80-120
Zinc	<0.01 mg/L	108	80-120
Run No 470425 **Analysis/Extraction Date** 2024-12-23 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	106	90-110
N-NO3	<0.10 mg/L	99	90-110
SO4	<1 mg/L	100	90-110
Run No 470446 **Analysis/Extraction Date** 2024-12-23 **Analyst** AsA **Method** C SM4500-S2-D			
S2-	<0.01 mg/L	87	80-120
Run No 470468 **Analysis/Extraction Date** 2024-12-23 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	98	70-130

Guideline = ODWSOG *** = Guideline Exceedence**

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Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
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K0A 1L0
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Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 470469 **Analysis/Extraction Date** 2024-12-23 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	100	90-110
F	<0.10 mg/L	107	90-110
pH		99	90-110
Run No 470472 **Analysis/Extraction Date** 2024-12-23 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	99	80-120
Run No 470473 **Analysis/Extraction Date** 2024-12-24 **Analyst** AsA **Method** C SM2120C			
Colour (Apparent)	<2 TCU	105	90-110
Run No 470478 **Analysis/Extraction Date** 2024-12-24 **Analyst** Z_S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	98	90-110
Potassium	<1 mg/L	103	87-113
Magnesium	<1 mg/L	94	76-124
Sodium	<1 mg/L	99	82-118

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 470480 **Analysis/Extraction Date** 2024-12-24 **Analyst** Z_S **Method** C SM2340B			
Hardness as CaCO3			
Ion Balance			
TDS (COND - CALC)			
Run No 470483 **Analysis/Extraction Date** 2024-12-24 **Analyst** AsA **Method** C SM5550B			
Tannin & Lignin	<0.1 mg/L	90	80-120
Run No 470537 **Analysis/Extraction Date** 2024-12-20 **Analyst** H_S **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	116	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	113	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	85	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	109	60-130
Dichloroethane, 1,1-	<0.4 ug/L	101	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	112	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	98	60-130
Dichloroethane, 1,2-	<0.5 ug/L	120	60-130
Dichloropropane, 1,2-	<0.5 ug/L	87	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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115 Walgreen Rd., R.R. #3
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K0A 1L0
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Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
1,3,5-trimethylbenzene	<0.3 ug/L	89	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	93	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	102	60-130
Acetone	<5 ug/L	103	60-130
Benzene	<0.5 ug/L	99	60-130
Bromodichloromethane	<0.3 ug/L	121	60-130
Bromoform	<0.4 ug/L	118	60-130
Bromomethane	<0.5 ug/L	88	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	99	60-130
Dichloropropene,1,3-cis-	<0.5 ug/L	76	60-130
Carbon Tetrachloride	<0.2 ug/L	120	60-130
Chloroethane	<0.5 ug/L	106	60-130
Chloroform	<0.5 ug/L	112	60-130
Dibromochloromethane	<0.3 ug/L	113	60-130
Dichlorodifluoromethane	<0.5 ug/L	99	60-130
Methylene Chloride	<4.0 ug/L	97	60-130
Ethylbenzene	<0.5 ug/L	102	60-130
Ethylene dibromide	<0.2 ug/L	119	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Ms. Rebecca Leduc
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Invoice to: EGIS Canada Ltd.

Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Hexane (n)	<5 ug/L	83	60-130
m/p-xylene	<0.4 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	110	60-130
Methyl Isobutyl Ketone	<5 ug/L	118	60-130
Methyl tert-Butyl Ether (MTBE)	<2 ug/L	109	60-130
Chlorobenzene	<0.5 ug/L	114	60-130
o-xylene	<0.4 ug/L	92	60-130
Styrene	<0.5 ug/L	103	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	93	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	91	60-130
Tetrachloroethylene	<0.3 ug/L	127	60-130
Toluene	<0.4 ug/L	104	60-130
Trichloroethylene	<0.3 ug/L	99	60-130
Trichlorofluoromethane	<0.5 ug/L	123	60-130
Vinyl Chloride	<0.2 ug/L	107	60-130
Run No 470540 **Analysis/Extraction Date** 2024-12-27 **Analyst** H_S **Method** EPA 8260			
Xylene Mixture			

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

Client: Egis Canada Ltd.
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K0A 1L0
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Report Number: 3013373
Date Submitted: 2024-12-18
Date Reported: 2024-12-27
Project: 25-1134
COC #: 918293

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 470541 **Analysis/Extraction Date** 2024-12-27 **Analyst** H_S **Method** EPA 8260			
Dichloropropene,1,3-			

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

McIntosh Perry Consulting Eng. (Carp)

115 Walgreen Rd.
RR#3 Carp, ON K0A 1L0
Attn: Jordan Bowman

Client PO:
Project: 17-0503
Custody: 6644

Report Date: 16-Jul-2018
Order Date: 13-Jul-2018

Order #: 1828639

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1828639-01	TW1-1
1828639-02	TW1-2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: McIntosh Perry Consulting Eng. (Carp)
Client PO:

Report Date: 16-Jul-2018
Order Date: 13-Jul-2018
Project Description: 17-0503

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	16-Jul-18	16-Jul-18
Ammonia, as N	EPA 351.2 - Auto Colour	16-Jul-18	16-Jul-18
Anions	EPA 300.1 - IC	16-Jul-18	16-Jul-18
Colour	SM2120 - Spectrophotometric	16-Jul-18	16-Jul-18
Conductivity	EPA 9050A- probe @25 °C	16-Jul-18	16-Jul-18
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	16-Jul-18	16-Jul-18
E. coli	MOE E3407	13-Jul-18	14-Jul-18
Fecal Coliform	SM 9222D	13-Jul-18	14-Jul-18
Metals, ICP-MS	EPA 200.8 - ICP-MS	16-Jul-18	16-Jul-18
pH	EPA 150.1 - pH probe @25 °C	16-Jul-18	16-Jul-18
Phenolics	EPA 420.2 - Auto Colour, 4AAP	16-Jul-18	16-Jul-18
Subdivision Package	Hardness as CaCO3	16-Jul-18	16-Jul-18
Sulphide	SM 4500SE - Colourimetric	16-Jul-18	16-Jul-18
Tannin/Lignin	SM 5550B - Colourimetric	16-Jul-18	16-Jul-18
Total Coliform	MOE E3407	13-Jul-18	14-Jul-18
Total Dissolved Solids	SM 2540C - gravimetric, filtration	13-Jul-18	16-Jul-18
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	16-Jul-18	16-Jul-18
Turbidity	SM 2130B - Turbidity meter	16-Jul-18	16-Jul-18

Certificate of Analysis

Client: McIntosh Perry Consulting Eng. (Carp)

Client PO:

Report Date: 16-Jul-2018

Order Date: 13-Jul-2018

Project Description: 17-0503

	Client ID:	TW1-1	TW1-2	-	-
	Sample Date:	07/13/2018 08:20	07/13/2018 14:12	-	-
	Sample ID:	1828639-01	1828639-02	-	-
	MDL/Units	Drinking Water	Drinking Water	-	-
Microbiological Parameters					
E. coli	1 CFU/100 mL	ND	ND	-	-
Fecal Coliforms	1 CFU/100 mL	ND	ND	-	-
Total Coliforms	1 CFU/100 mL	ND	ND	-	-
General Inorganics					
Alkalinity, total	5 mg/L	325	328	-	-
Ammonia as N	0.01 mg/L	0.12	0.12	-	-
Dissolved Organic Carbon	0.5 mg/L	2.9	3.2	-	-
Colour	2 TCU	3 [1]	4 [1]	-	-
Conductivity	5 uS/cm	697	834	-	-
Hardness	mg/L	259	327	-	-
pH	0.1 pH Units	7.7	7.6	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-
Total Dissolved Solids	10 mg/L	380	486	-	-
Sulphide	0.02 mg/L	<0.02	<0.02	-	-
Tannin & Lignin	0.1 mg/L	0.1	0.1	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.2	-	-
Turbidity	0.1 NTU	1.5 [1]	1.4 [1]	-	-
Anions					
Chloride	1 mg/L	24	65	-	-
Fluoride	0.1 mg/L	0.4	0.4	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	38	41	-	-
Metals					
Calcium	0.1 mg/L	55.7	75.4	-	-
Iron	0.1 mg/L	0.1	0.1	-	-
Magnesium	0.2 mg/L	29.2	33.7	-	-
Manganese	0.005 mg/L	0.006	0.006	-	-
Potassium	0.1 mg/L	4.6	4.8	-	-
Sodium	0.2 mg/L	17.6	21.6	-	-

Certificate of Analysis
Client: McIntosh Perry Consulting Eng. (Carp)
Client PO:

Report Date: 16-Jul-2018
Order Date: 13-Jul-2018
Project Description: 17-0503

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Fluoride	ND	0.1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Colour	ND	2	TCU						
Conductivity	ND	5	uS/cm						
Phenolics	ND	0.001	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Sulphide	ND	0.02	mg/L						
Tannin & Lignin	ND	0.1	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Turbidity	ND	0.1	NTU						
Metals									
Calcium	ND	0.1	mg/L						
Iron	ND	0.1	mg/L						
Magnesium	ND	0.2	mg/L						
Manganese	ND	0.005	mg/L						
Potassium	ND	0.1	mg/L						
Sodium	ND	0.2	mg/L						
Microbiological Parameters									
E. coli	ND	1	CFU/100 mL						
Fecal Coliforms	ND	1	CFU/100 mL						
Total Coliforms	ND	1	CFU/100 mL						

Certificate of Analysis
Client: McIntosh Perry Consulting Eng. (Carp)
Client PO:

Report Date: 16-Jul-2018
Order Date: 13-Jul-2018
Project Description: 17-0503

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	23.9	1	mg/L	23.8			0.4	10	
Fluoride	0.44	0.1	mg/L	0.44			1.1	10	
Nitrate as N	ND	0.1	mg/L	ND			0.0	20	
Nitrite as N	ND	0.05	mg/L	ND				20	
Sulphate	38.7	1	mg/L	38.3			0.9	10	
General Inorganics									
Alkalinity, total	319	5	mg/L	325			1.9	14	
Ammonia as N	0.103	0.01	mg/L	0.120			14.7	17.7	
Dissolved Organic Carbon	2.8	0.5	mg/L	2.9			4.8	37	
Colour	3	2	TCU	3			0.0	12	
Conductivity	691	5	uS/cm	697			0.9	11	
pH	7.8	0.1	pH Units	7.7			0.6	10	
Phenolics	ND	0.001	mg/L	ND				10	
Total Dissolved Solids	54.0	10	mg/L	54.0			0.0	10	
Sulphide	1.16	0.04	mg/L	1.18			1.5	10	
Tannin & Lignin	ND	0.1	mg/L	ND			0.0	11	
Total Kjeldahl Nitrogen	0.16	0.1	mg/L	0.17			4.4	10	
Turbidity	1.5	0.1	NTU	1.5			0.7	10	
Metals									
Iron	0.1	0.1	mg/L	0.1			9.6	20	
Magnesium	30.4	0.2	mg/L	29.2			3.9	20	
Manganese	0.007	0.005	mg/L	0.006			3.1	20	
Potassium	4.8	0.1	mg/L	4.6			2.5	20	
Sodium	17.8	0.2	mg/L	17.6			1.3	20	
Microbiological Parameters									
E. coli	ND	1	CFU/100 mL	ND				30	
Fecal Coliforms	ND	1	CFU/100 mL	ND				30	
Total Coliforms	ND	1	CFU/100 mL	ND				30	

Certificate of Analysis
Client: McIntosh Perry Consulting Eng. (Carp)
Client PO:

Report Date: 16-Jul-2018
Order Date: 13-Jul-2018
Project Description: 17-0503

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	33.1	1	mg/L	23.8	92.6	78-112			
Fluoride	1.37	0.1	mg/L	0.44	92.3	73-113			
Nitrate as N	0.97	0.1	mg/L	ND	96.6	81-112			
Nitrite as N	0.911	0.05	mg/L	ND	91.1	76-107			
Sulphate	46.8	1	mg/L	38.3	84.3	75-111			
General Inorganics									
Ammonia as N	0.370	0.01	mg/L	0.120	100	81-124			
Dissolved Organic Carbon	12.6	0.5	mg/L	2.9	97.5	60-133			
Phenolics	0.022	0.001	mg/L	ND	89.9	69-132			
Total Dissolved Solids	106	10	mg/L		106	75-125			
Sulphide	0.50	0.02	mg/L		99.6	79-115			
Tannin & Lignin	1.1	0.1	mg/L	ND	111	71-113			
Total Kjeldahl Nitrogen	2.22	0.1	mg/L	0.17	103	81-126			
Metals									
Calcium	832		ug/L		83.2	80-120			
Iron	872		ug/L		87.2	80-120			
Magnesium	1050		ug/L		105	80-120			
Manganese	49.2		ug/L		98.3	80-120			
Potassium	1160		ug/L		116	80-120			
Sodium	1040		ug/L		104	80-120			

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: TW1-1, TW1-2

Sample Qualifiers :

1 : This analysis was conducted after the accepted holding time had been exceeded.

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

HYDROGEOLOGICAL ASSESSMENT
6688 FRANKTOWN ROAD, OTTAWA ON

APPENDIX G: CALCULATIONS

Cooper-Jacob Analysis: Calculations

Pumping Rate

92 L/min

Specific Capacity

220 L/min/m

Drawdown 0.418 m

Transmissivity

TW1 (Drawdown)

T= 2.3 Q / 4π ΔS

T= 2.3 (132.5 m3/day)/4π (0.04 m)

T= 735 m2/day

8.5E-03 m2/s

Q = 92 L/min

Q=((92 L/min)/(1000L))*(60 min)(24 hour))

132.5 m3/day

Δs = 0.033 m

TW1 (Recovery)

T= 2.3 Q / 4π ΔS

T= 2.3 (132.5 m3/day)/4π (0.19 m)

T= 606 m2/day

7.0E-03 m2/s

Q = 92 L/min

Q=((92 L/min)/(1000L))*(60 min)(24 hour))

132.5 m3/day

Δs = 0.04 m

Farvolden

Q20= 0.68 T Ha Sf

Ha= the available water column height (m)
Sf= safety factor
T= Transmissivity (m2/day)

TW1 (drawdown)

Q20= 0.68 (606 m2/day)(41.36 m)(0.7)

Q20= 11,939 m3/day
Q20= 11,938,878 L/day
Q20= 8,291 L/min

Safety Factor 0.7

Rec'd Pump Settin 45.72 m
static WL 4.365 m
Ha (avail. head)= 41.36 m

Moell

Q20 = (Q Ha Sf) / (s100 + 5 **Δ**s)

Q= the pumping rate (m3/day)
Ha= the available water column height (m)
Sf= safety factor
s100= the drawdown at 100 minutes (semi-log long-term graph)
Δs= the change in hydraulic head over one log cycle (drawdown vs. long time)

TW1 (drawdown)

Q20= ((27.4 m3/day)(14.71 m)(0.7))/(0.67 m + 5(0.35 m)

Q20= 6266 m3/day
Q20= 6266499 L/day
Q20= 4352 L/min

Q= 132.5 m3/day
Ha= 41.36 m
Safety Factor 0.7
s100 0.412
Δs 0.04

Hydraulic Conductivity

b = aquifer thickness
T = transmissivity
K = hydraulic conductivity

b= 54.9 m

end of casing = 6.1 m
end of hole = 61.0 m

K=T/b

K= 1.6E-04 m/s Drawdown
1.3E-04 m/s Recovery

Comments: Aquifer thickness of X m corresponds to the interval between the bottom of the casing and the bottom of the well (casing to X m BGS, WL at X mBTOC and end of hole at X)