Nitrate Impact Assessment
and
Water Supply Potential Assessment

5-7 Hughson Street
Branchton, Ontario

Project 10431

1. INTRODUCTION

Hydrogeology Consulting Services Inc. (HCS) was retained by Robert McMaster to conduct a nitrate impact assessment and water supply potential assessment for a proposed single-family residential lot severance at 5 Hughson Street in Branchton, Ontario. The existing lot will be divided into a retained lot with an existing single-family residential dwelling, and a severed lot for the construction of a new single-family dwelling. Site Development Plan (Abylon Engineering, December 30, 2025) is included in Appendix A.

The location of the subject property is shown on Drawing 1 in Appendix A.

This assessment has been prepared to address the typical requirements for lot severances privately serviced for water supply and sewage disposal within the Township of Dumfries.

It is noted a sewage system design will be prepared for the site by Abylon Engineering. The septic design report will include evaluation of sewage system design requirements and proposed layout of sewage effluent bed and reserve bed areas.

2. STUDY AREA PHYSIOGRAPHY AND GEOLOGY

2.1 Site Description

Proposed development of the property consists of severance of an approximately 0.235-hectare parcel from the 0.435-hectare lot, with the existing single-family residential dwelling to remain on the 0.2 ha retained parcel, as shown on Drawing 2 included in Appendix A.

As shown on the appended Drawing 1, the 0.435 ha property consists of a rural residential lot within the Township of North Dumfries. The subject property is bordered by rural residential properties to the east, west, and south, and by wetland areas to the north and further east. Agricultural fields are located further afield in all directions.

According to Grand River Conservation Area (GRCA) mapping (2026), the property is generally level at an elevation of approximately 275 meters above sea level (mASL), with a slight northward slope towards the wetland areas.

2.2 Physiography

The subject property lies within the Spillways physiographic landform (Chapman and Putnam, 2007), typically characterized by fluvial and glaciofluvial deposits of sands and gravels. The property lies within the Horseshoe Moraines physiographic region.

2.3 Geology and Hydrogeology

Quaternary Geology mapping (Ontario Geological Survey, 2003) indicates the subject property is underlain by stone-poor sandy silt to silty sand till, as would be expected for the Till Moraines region.

The soil grain size analyses from the test pits excavated on the subject property included in Appendix D illustrate generally silty till overlying gravel and sand (encountered at approximately 1.25 – 1.7 mBGS) the near surface soils. Test Pit logs are included in Appendix D for reference.

Based on the on-site and nearby well records from the MECP Water Well Records (WWR) online database included in Appendix B overburden deposits are approximately 30 m thick, generally consisting of 10-30 m of “clay” (till) deposits overlying an overburden granular aquifer deposit varying significantly in thickness. Limestone bedrock is reported at a depth of approximately 26-35 mBGS, and generally at depths of more than 30 mBGS.

Paleozoic geology mapping of Southern Ontario (Armstrong and Dodge, 2007) indicates underlying the overburden deposits is the Guelph Formation dolostone bedrock.

2.3.1 Grain Size Analysis Results

Soil samples from two test pits excavated on the subject property on January 8, 2026 were submitted to FlowSpec Engineering Ltd. for analysis of particle size distribution (grain size). As shown on the grain size analysis graphs included in Appendix C, the near-surface soil samples range from silt and clay to sand and gravel with silt and clay. The grain size analysis results were used to estimate a soil hydraulic conductivity (K) value by applying the Kaubisch, Breyer, Hazen, and Kozeny-Carman formulae where appropriate based on the limitations of each formula. The hydraulic conductivity estimates are summarized in Table 1 below:

Table 1: Calculated soil hydraulic conductivity values

Soil Sample	Sample Depth (mBGS)	Soil Type	Analysis Method	Hydraulic Conductivity (m/sec)
TP1-26	0.5 – 1.2	Silt, trace fine sand	Kaubisch	3.65×10^{-10}
TP2-26	1.7 – 2.0	Sand and gravel, some silt	Kaubisch*	1.29×10^{-6}

* - Although the Kaubisch formula is typically applied to K values less than 10^{-6}, the alternative formulae did not accurately represent the K value obtained in TP-2. As a result, the Kaubisch method was selected as the most appropriate option.

The hydraulic conductivity value of 3.65×10^{-10} m/sec indicates a very low permeability for the native silty overburden; and the hydraulic conductivity value of 1.29×10^{-6} m/sec indicates a moderate to moderately low permeability for the native sand and gravel underlying fill.

The hydraulic conductivity estimated for TP2-26 is lower than values typically associated with granular sand and gravel overburden. This lower conductivity reflects heterogeneity within the overburden materials.

The hydraulic conductivity estimate from the grain size analysis of TP1-26 correlates well with published ranges for major soil types (Freeze and Cherry, 1979).

2.3.2 Soil Infiltration Rate and T-Time Calculations

The Toronto Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) provide a method of assessing soil infiltration rate in the Low Impact Development (LID) Stormwater Management (SWM) Planning and Design Guide (TRCA and CVC, 2010). Following the methodology outlined in Appendix C of the Guide the estimated soil hydraulic conductivity value from Table 1 above was converted into the infiltration rate listed in Table 2 below. Additionally, an estimated soil "T-Time" value based on the Ontario Building Code (OBC) classifications for major soil types is provided.

Table 2: Estimated Soil Infiltration Rates from Hydraulic Conductivity Values

Estimated Hydraulic Conductivity (m/sec)	Estimated Soil Infiltration Rate – Unfactored (mm/hr)	Estimated Soil Infiltration Rate – Factored* (mm/hr)	Estimated Soil T-Time (mins/cm) (OBC)
3.65×10^{-10}	<10	<2.5	50+
1.29×10^{-6}	53	15.1	17-30

* - Factor of 3.5 applied due to the presence of sand and gravel overburden within 1.5 m of silt till soil.

As shown in the table above it is important to consider that the LID SWM Planning and Design Guide requires implementation a Safety Correction factor to calculate “Design Infiltration Rates” (e.g. for subdivision soakaway pits and infiltration galleries). The unfactored rate listed in the table is considered reasonable for comparative purposes and for design of sewage effluent leaching beds, while the factored rate would be applicable for design of high volume infiltration facilities.

As a conservative factor of safety, the soil T-time from TP1-26 will be applied in the nitrate impact assessment, based on an assumed silty overburden for the proposed leaching bed.

Soil T-Time should be considered by a septic design engineer when developing leaching bed parameters for the proposed lots.

3. PREDICTIVE NITRATE IMPACT ASSESSMENT

The proposed single family residential lot will be privately serviced for water and privately serviced for sewage disposal. The single-family residential sewage system will discharge effluent to the subsurface via a leaching bed. The leaching bed will load residential waste nutrients to the subsurface shallow groundwater system(s). The principal components of the sewage effluent will be nitrate (as nitrogen), ammonia, and phosphorus (total). As ammonia is normally aerobically converted to nitrate in the unsaturated zone, and phosphorous typically reacts with and attaches to soil particles, nitrate is the primary nutrient parameter that percolates downwards to the water table and can impact groundwater. Nitrate can persist in groundwater; however, under anaerobic conditions it is typically converted to nitrogen gas by bacteria in the process of denitrification.

Assessment of the potential impact of a subsurface sewage disposal system is performed based on nitrate loading of the shallow groundwater aquifer, as excessive amounts of nitrate can impact both drinking water (particularly for infants) and surface water (due to eutrophication and plant growth).

The Ontario Drinking Water Quality Standard (ODWQS) for nitrate-N is 10 mg/L, and this is the criteria applied to the predictive nitrate impact assessment.

For the purposes of this assessment, the Ontario Ministry of the Environment and Climate Change (MOECC, now MECP) Technical Guideline for Individual On-Site Sewage Systems Procedure D-5-4 (1996) is applied as follows:

$$C_{PB} = \frac{(SEF \times C_{SEF}) + (GR \times C_{GR}) + (GUF \times C_{GUF})}{(SEF + GR + GUF)}$$

Variables:

C_{PB} = Nitrate concentration in groundwater at the down-gradient property boundary (mg/L as nitrate-N)

SEF = Sewage effluent flow (m^3/yr)

Sewage effluent flows for the existing and proposed single-family residential dwellings (2,000 L/day[1]) have been applied to these calculations.

Existing Residential Dwelling	Proposed Residential Dwelling
= 2,000 L/day x 365 days	= 2,000 L/day x 365 days
= 730,000 L/yr	= 730,000 L/yr

C_{SEF} = Nitrate concentration of sewage effluent (mg/L)

Sewage effluent nitrate concentration of 40 mg/L for a conventional treatment system, 20 mg/L for a tertiary treatment system, and 12 mg/L for an enhanced tertiary treatment system.

GR = Groundwater recharge from infiltrating precipitation (m^3/yr)

Groundwater Recharge = Infiltration Rate[2] x Site Area[3]

Lot	Infiltration Rate m/yr	Site Area m^2	Groundwater Recharge m^3/yr	Groundwater Recharge L/yr
Proposed 0.235 ha Lot	0.135	2,350	317.25	317,250
Retained 0.200 ha Lot	0.135	2,000	270	270,000

[1] Sewage flow volume for the 4-bedroom home provided by Abylon Engineering Services (January 2026)

[2] Infiltration rate from MOEE Hydrogeological Technical Information Requirements for Land Development Application (1995) Section 4.5 Table 3, assuming a general silty soil type across the property.

[3] Site Area is taken as the total lot area, based on methodology outlined in MOEE Procedure D-5-4: Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment.

It is noted the entire site area is normally applied to the groundwater recharge calculation. Conceptually, when site-level water balance calculations using the Thornthwaite-Mather method are prepared for a property with no municipal storm sewer connection, runoff from impervious surfaces such as rooftops and driveways is assumed to flow onto adjacent pervious surfaces where, apart from significant rainfall events where the ground becomes completely saturated, it is reasonable to assume it has the opportunity to infiltrate into the ground at the same rate as precipitation falling directly on the pervious surfaces. Site-level water balance calculations prepared by HCS for properties throughout Southern Ontario with no connection to municipal storm sewers have consistently shown an infiltration surplus under post-development conditions based on this methodology – these calculations have been consistently approved by a wide variety of Conservation Authorities and municipalities. Based on this information it is concluded the application of 100% of site area to the groundwater recharge calculation is typically reasonable and appropriate for a property with no connection to municipal storm sewers. It is noted the nitrate impact assessment calculations do not assume the typical surplus of groundwater recharge under post-development conditions as a conservative factor of safety.

$\mathbf{C_{GR}}$ = Nitrate concentration of groundwater recharge (mg/L)
0.9 mg/L Nitrate concentration assumed for infiltrating precipitation.

Based on the variables described above, predictive nitrate impact calculation results for conventional and tertiary treatment systems are summarized in Table 3 below.

Table 3: Nitrate Impact Assessment Calculated Results

	Sewage Effluent Concentration (mg/L)	Total Annual Sewage volume (L/yr)	Nitrate-N Concentration at Downgradient Property Boundary (mg/L)
Proposed Lot (4-BR Home)	40	730,000	**28.16**
	20	730,000	**14.21**
	12	730,000	**8.64**
Retained Lot (4-BR Home)	40	730,000	**29.44**
	20	730,000	**14.84**
	12	730,000	**9.00**

The nitrate impact assessment calculations, which conservatively assume relatively low annual precipitation recharge for the silty subsurface deposits, show using a conventional treatment system or a tertiary (Level IV) for the proposed and retained lots would result in nitrate-N concentrations at the downgradient lot boundary exceeding the ODWQS criteria limit of 10 mg/L.

The nitrate impact assessment calculations show using an enhanced tertiary treatment system for the proposed lot and for the retained lot would result in nitrate-N concentrations at the downgradient lot boundary below the 10 mg/L ODWQS criteria limit.

3.1 Assessment of Nitrate Impact Calculations

To minimize the potential for impacts to the shallow overburden soils and overburden aquifers, enhanced tertiary treatment of sewage effluent with a maximum design effluent concentration of 12 mg/L for nitrate-N will be required for the sewage effluent disposal system for the proposed lot severance, and for the retained lot.

As an example, empirical test results provided by Waterloo Biofilter for CAN-BNQ 3680-600 testing for their Water NOx system demonstrated a six month average total nitrogen effluent concentration of 11.9 mg/L, an average nitrate + nitrite concentration of 3.4 mg/L, and an average total nitrogen reduction rate of 80.3%.

Additionally, empirical test results provided by NSF International under the US Environmental Protection Agency's Environmental Technology Verification (ETV) Program demonstrated the Water Biofilter Model 4-Bedroom system achieved an average and median effluent nitrate concentration of 10 mg/L over a thirteen-month period.

It is reasonable to conclude commercially available enhanced tertiary treatment systems can achieve the required nitrate reduction.

It is important to note that these calculations have conservatively assumed no dilution effects from groundwater underflow. Conceptually, when sewage effluent percolating vertically downwards through the unsaturated zone reaches the groundwater table, mixing of the sewage effluent with groundwater having a Nitrate-N concentration lower than the sewage effluent would result in dilution of the sewage effluent by the groundwater, and therefore result in a lower Nitrate-N concentration than if the sewage were only diluted by infiltrating precipitation. Quantifying the additional dilution from mixing of the effluent with groundwater would require a detailed site-level investigation to determine the shallow aquifer thickness, flow direction, and rate of groundwater flux beneath the property.

As discussed below in Section 5 the measured concentration of Nitrate-N in the groundwater accessed by the on-site water supply well is 0.408 mg/L, significantly lower than both the required effluent Nitrate concentration of 12 mg/L and the ODWQS Maximum Acceptable Concentration of 10 mg/L.

4. WATER SUPPLY POTENTIAL ASSESSMENT

Well Records from the Ministry of the Environment, Conservation, and Parks (MECP) Water Well Record (WWR) Database were reviewed to determine the number of supply wells present. As shown on the well records included in Appendix B, eighty-two wells are located within an approximate radius of 500 m from the proposed severances according to the MECP WWR Database.

Of these, seven wells are identified as monitoring wells or test holes, one well is identified as “not in use”, four wells are abandoned, and one well has no completion details; these wells have been excluded from further consideration.

Of the sixty-nine remaining wells, thirty-eight are completed in overburden at depths between 27 and 35 mBGS, thirty-one are completed in bedrock at depths between 31.2 and 52 mBGS. A copy of the MECP well records is appended for reference, and the well locations are shown on the attached Drawing 4.

Sixty-five of the wells are identified as supply wells for domestic or livestock purposes. One is identified as a commercial well, two wells are identified as municipal wells, and one is identified as a public supply well.

Pumping test results were recorded for thirty-six wells completed in overburden. Pumping test rates for the bedrock wells ranged from 34.0 to 56.7 litres per minute (L/min), averaging 47.6 L/min during pump tests that lasted 0.5 to 12 hours.

Pumping test results were recorded for thirty wells completed in bedrock. Pumping test rates for the bedrock wells ranged from 7.5 to 113 litres per minute (L/min), averaging 40 L/min during pump tests that lasted 30 minutes to 24 hours. It is noted the pumping test rates for the municipal supply wells were excluded from the average as they were pumped at high rates of approximately 750 - 1041 L/min.

It is noted that some of the wells plotted on the attached Drawing 4 are located in areas where the actual existence of a well is unlikely (they may be associated with nearby properties), and that some properties shown on the aerial imagery do not have a well associated with them; however, the MECP WWR coordinate data has been used in the absence of more reliable information.

Ministry of the Environmental, Conservation, and Parks (MECP) Procedure D-5-5 (Technical Guideline for Private Wells: Water Supply Assessment, 1996) specifies minimum per-person water requirements as 450 L/day, with a peak demand rate of 3.75 L/min per person. Assuming a likely number of persons as the “number of bedrooms plus one” the minimum sustainable pumping rate for a 4-bedroom house shall be 18.75 L/min.

Within the scope of this desktop study, the information available indicates that a sufficient supply of groundwater should be available to provide for the needs of the proposed single-family dwelling on the severed lot from either the overburden aquifer deposits or from the bedrock aquifer. However, as noted in Section 5.2 below there is some indication overburden groundwater may exhibit aesthetic issues.

Please be advised that this assessment is based on a desktop review of publicly available information. Verification of available water supply and/or water quality, and/or empirical investigation of the potential cumulative impact of groundwater extraction, would require well drilling and a pumping test to be conducted.

4.1 Municipal Wellhead Protection Areas and Sensitive Areas

According to the Ontario Source Protection Information Atlas (OSPIA) shown on the appended Drawing 3 the subject property is not located within a municipal wellhead protection area (WHPA) or within a municipal Intake Protection Zone (IPZ). The closest WHPA is located approximately 290 m southwest of the subject property.

OSPIA mapping shows the property is not located within a Highly Vulnerable Aquifer (HVA) area, and not located within a Significant Groundwater Recharge Area (SGRA). Maintenance of on-site infiltration rates (by directing runoff from impervious surfaces to adjacent pervious surfaces where it will have the opportunity to infiltrate) will be a net benefit to the natural environment.

5. WATER CHEMISTRY ANALYSIS RESULTS

A water chemistry sample was obtained from the on-site water supply well on January 8th, 2026. The sample was taken directly from a fixture in the house located upstream of existing water treatment equipment, collected in appropriate laboratory-supplied containers, placed in a cooler, and transported to ALS Environmental Laboratories (ALS) in Waterloo, Ontario for analysis of general chemistry parameters. The water chemistry analysis results are provided on the laboratory Certificate of Analysis (COA) included in Appendix D.

5.1.1 ODWQS Maximum Acceptable Concentration Exceedances

As shown on the appended laboratory COA, the water chemistry sample from the supply well did not exceed any Maximum Acceptable Concentrations (MAC) for health-related parameters. Of note, the measured concentration of Nitrate was 0.408 mg/L, and both E.coli and Total Coliforms were below detectable limits.

The water chemistry analysis results demonstrate no health-related impacts to the groundwater sourced by the on-site water supply well.

5.1.2 ODWQS Aesthetic Objectives/Operational Guidelines Exceedances

As shown on the appended laboratory COA the water chemistry sample from the supply well exceeded ODWQS Aesthetic Objectives and Operational Guidelines (AO/OG) criteria limit for Hardness. While this parameter is not health related, high concentrations may impact the taste, odour, and appearance of water; may result in corrosion and mineral deposition; and may hinder effective water treatment, disinfection, and distribution (MOE, 2006).

Readily available water treatment systems (such as a water softener) can mitigate this exceedance if desired.

5.2 Door-to-Door Well Survey

A door-to-door survey of properties within a 500 m radius of the subject property was conducted on January 12th 2026 to determine the locations and construction details of private water supply wells in the area. A copy of the survey was left along with a self-addressed stamped envelope. One-hundred-and-nine properties received surveys, with well information for eight properties returned at the time of preparation of this report.

The completed well surveys are provided in Appendix B for reference. One respondent indicated that their residence is serviced by municipal water. Two surveys did not include well construction details; however, one homeowner reported that their property is supplied by a shallow well, and the other noted a metallic taste and slight reddish tinge in the water prior to treatment. Three respondents reported being supplied by a communal system, specifically the Region of Waterloo Hughson Lane–Branchton Community Well.

The well survey received from 1623 Branchton Road reports a bedrock well completed to an approximate depth of 43 mBGS. A second survey, received from 34 King Street, identifies an overburden well completed to an approximate depth of 32 mBGS. The overburden well was reported to exhibit poor aesthetic water quality, including an unpleasant taste and cloudy appearance when untreated.

6. CLOSURE

This investigation compiled data for the subject property from existing sources and site-specific soils information collected from subject property to gain an understanding of the subsurface stratigraphy.

Nitrate impact assessment calculations using conservatively assessed values for daily sewage effluent flow and annual recharge demonstrate both the retained lot and the proposed lot will required the use of enhanced tertiary treatment with an effluent nitrate-N concentration of 12 mg/L or less for the sewage effluent disposal system in order to achieve nitrate-N concentrations at the downgradient property boundaries below the ODWQS criteria limit of 10 mg/L.

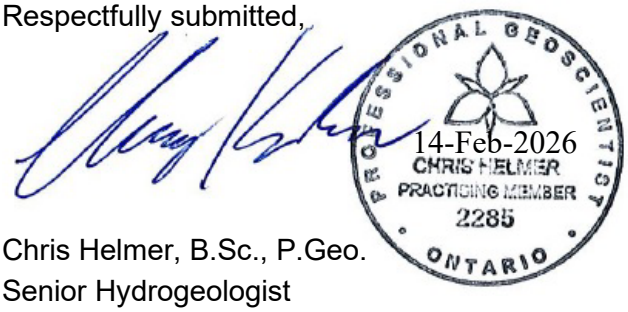
Please consider that changes to sewage system design parameters would require updated nitrate impact assessment calculations.

Within the scope of the desktop-level assessment, the information available indicates that a sufficient supply of groundwater should be available to provide for the needs of a new four-bedroom single-family residential dwelling from both the overburden aquifer(s) and the bedrock aquifer(s) beneath the property. Limited well survey results from neighbouring properties suggested the possibility of aesthetic issues from an overburden well; however, this information does not conclusively rule out the potential for a overburden water supply well to service the proposed lot.

Water chemistry analysis of the existing on-site water supply well demonstrated no exceedances of health-related parameters, and measured aesthetic parameter exceedances can be mitigated with readily available water treatment systems if desired.

We trust that this report satisfies your present requirements, and we thank you for this opportunity to be of service. If you have any questions, or require further hydrogeological consulting services, please feel free to contact me directly.

Respectfully submitted,



Chris Helmer, B.Sc., P.Geo.
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MECP Licensed Well Contractor
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7. LIMITATIONS AND USE

This report has been prepared for the exclusive use of the Client indicated in Section 1. Chris F Helmer and Hydrogeology Consulting Services Inc. (HCS) hereby disclaim any liability or responsibility to any person or party, other than the Client, for any loss, damage, expense, fines, or penalties which may arise from the use of any information or recommendations contained in this report by anyone other than the Client.

The conclusions and recommendations provided in this report are not intended as specifications or instructions to contractors. Any use contractors may make of this report, or decisions made based on it, are the responsibility of the contractors. Contractors must accept responsibility for means and methods of construction they select, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect them.

In preparing this report Chris F Helmer and HCS have relied in good faith on information provided by individuals and companies noted in this report, and assumes that the information provided is factual and accurate. No responsibility is accepted for any deficiencies, misstatements, or inaccuracies contained in this report as a result of errors, omissions, misinterpretations, or fraudulent acts in the resources referenced, or of persons interviewed or consulted during the preparation of this report.

The report and its complete contents are based on data and information collected during investigations conducted by Chris F Helmer and HCS, and pertains solely to the conditions of the site at the time of the investigation, supplemented by historical information and data as described in this report. It is important to note that the investigation involves sampling of the site at specific locations, and the conclusions in this report are based on the information gathered. Limitations of the data and information include the fact that conditions between and beyond the sampling locations may vary; that the assessment is dependent upon the accuracy of the analytical data generated through sample analysis; and that conditions or contaminants may exist for which no analyses have been conducted. Furthermore, no assurance is made regarding potential changes in site conditions and/or the regulatory regime (standards, guidelines, etc.), subsequent to the time of investigation.

The professional services provided for this project include only the hydrogeological aspects of the subsurface conditions at the site, unless otherwise stated specifically in the report. No other warranty or representation is either expressed or implied, as to the accuracy of the information or recommendations included or intended in this report.

8. REFERENCES

Armstrong, D.K. and Dodge, J.E.P. *Paleozoic Geology Map of Southern Ontario*. Ontario Geological Survey.

Chapman, L.J. and Putnam, D.F. 2007. *Physiography of Southern Ontario*. Ontario Geological Survey.

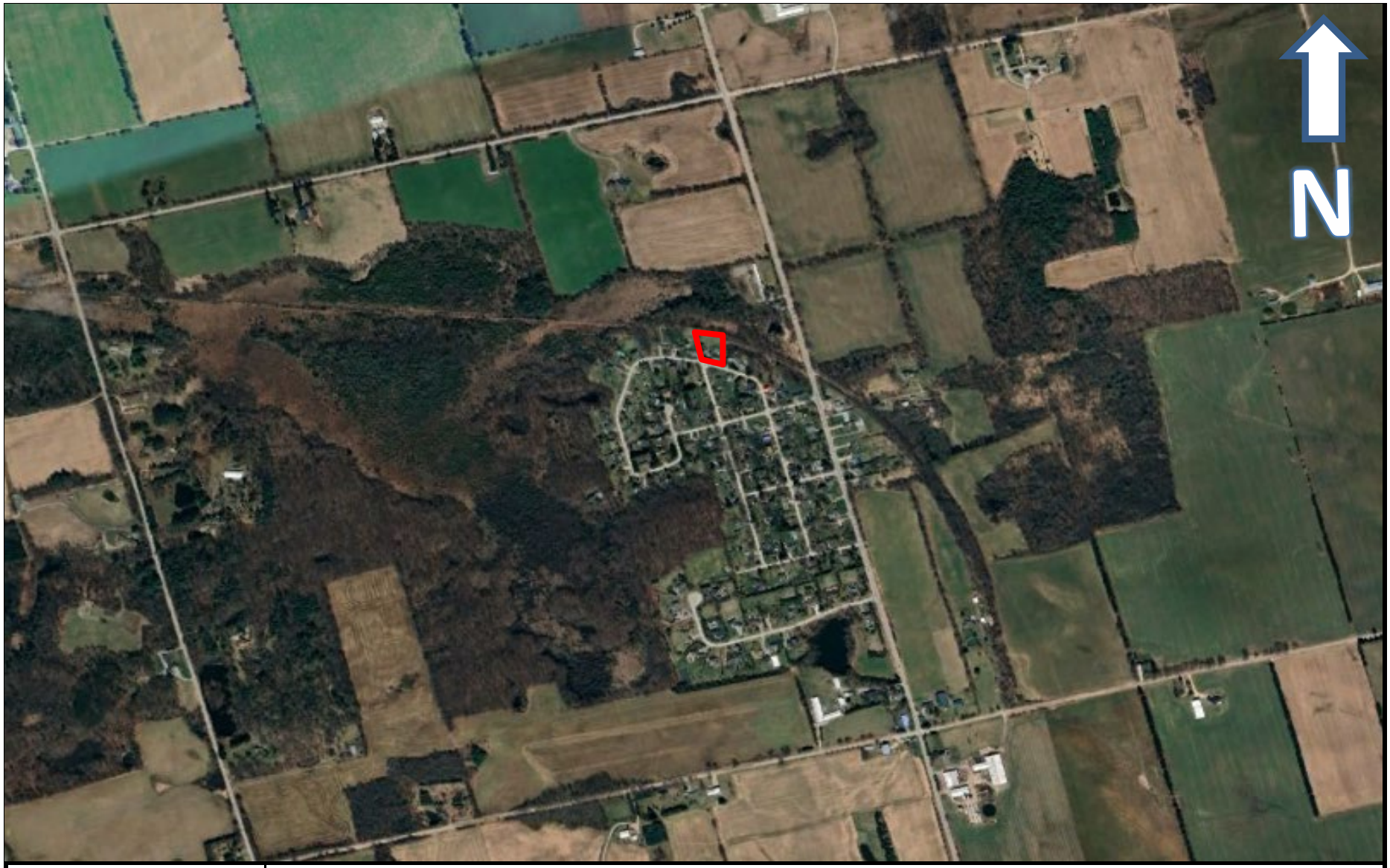
Freeze, R.A. and J.A. Cherry. 1979. *Groundwater.* Englewood Cliffs, New Jersey: Prentice-Hall.

Ontario Ministry of the Environment and Energy. 1995. *Hydrogeological Technical Information Requirements for Land Development Applications.*

APPENDIX A: DRAWINGS

Drawing 1 – Location Plan and MECP WWRs

Drawing 2 – Site Plan



LEGEND

Subject Property

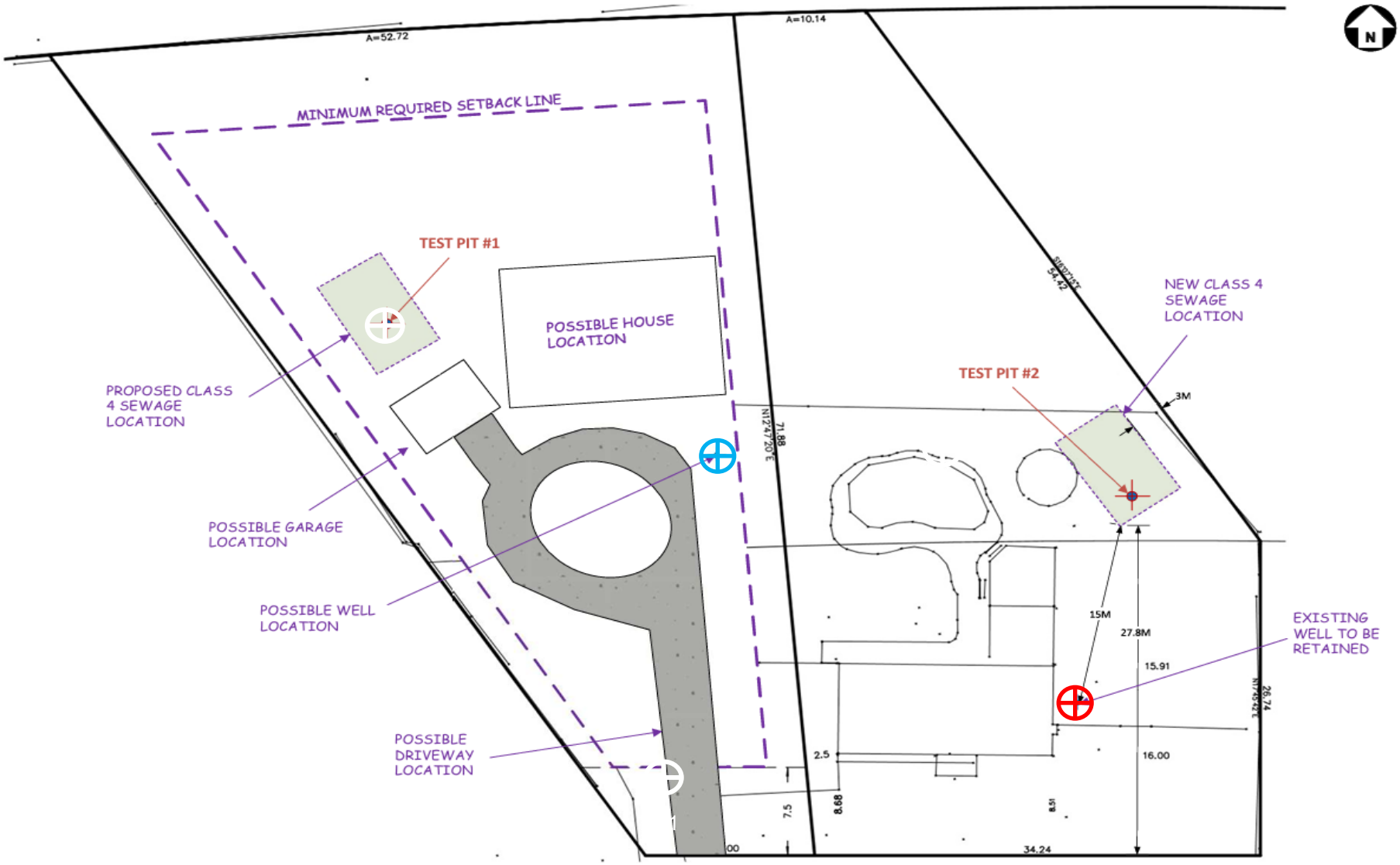
imagery from Google Earth © 2026

Drawing 1 - Location Plan

5 Hughson Street, Branchton, Ontario

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	AR
Date:	21-Jan-26

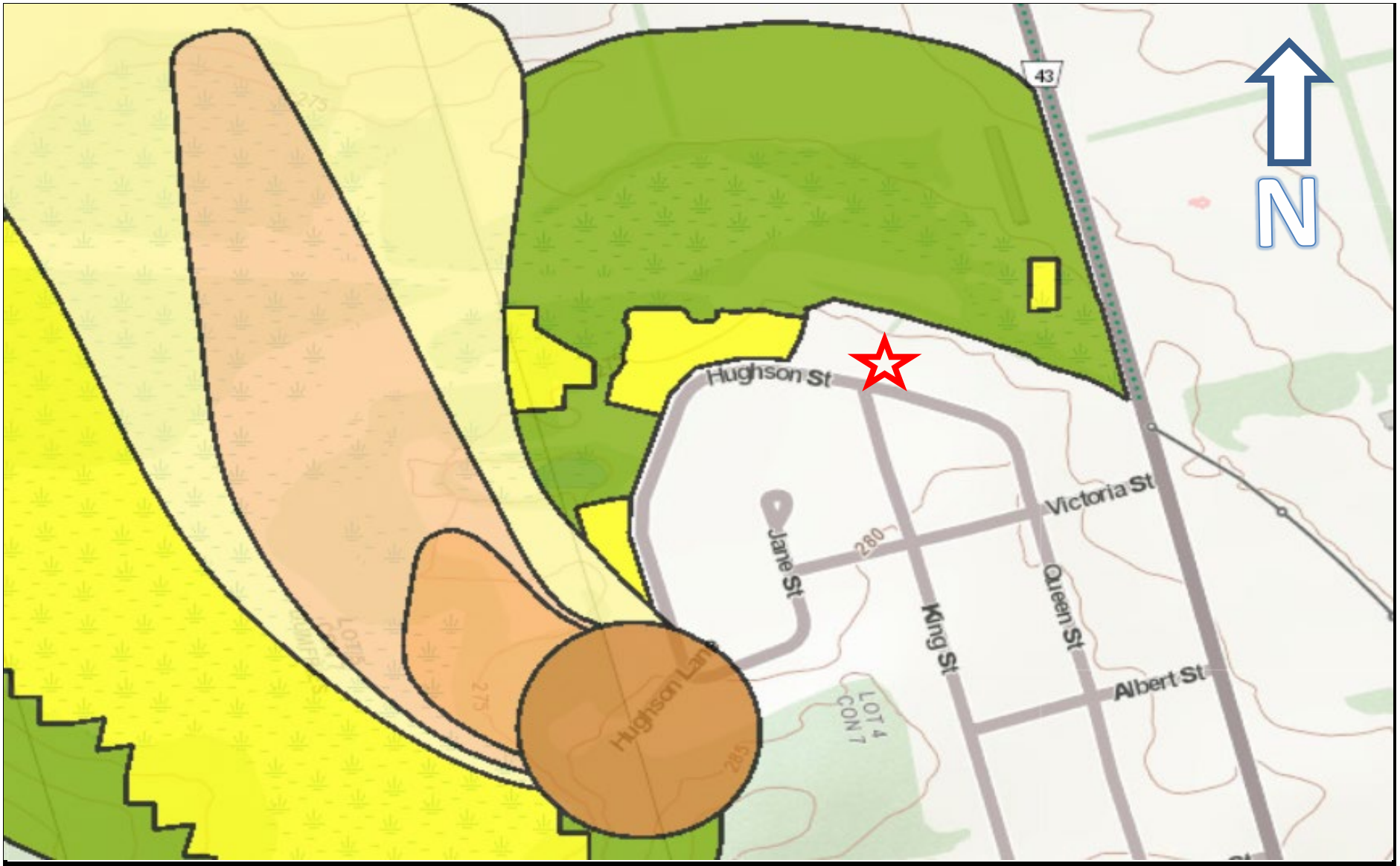


Drawing 2 - Site Plan

5 Hughson Street, Branchton, Ontario

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	AR
Date:	21-Jan-26



LEGEND

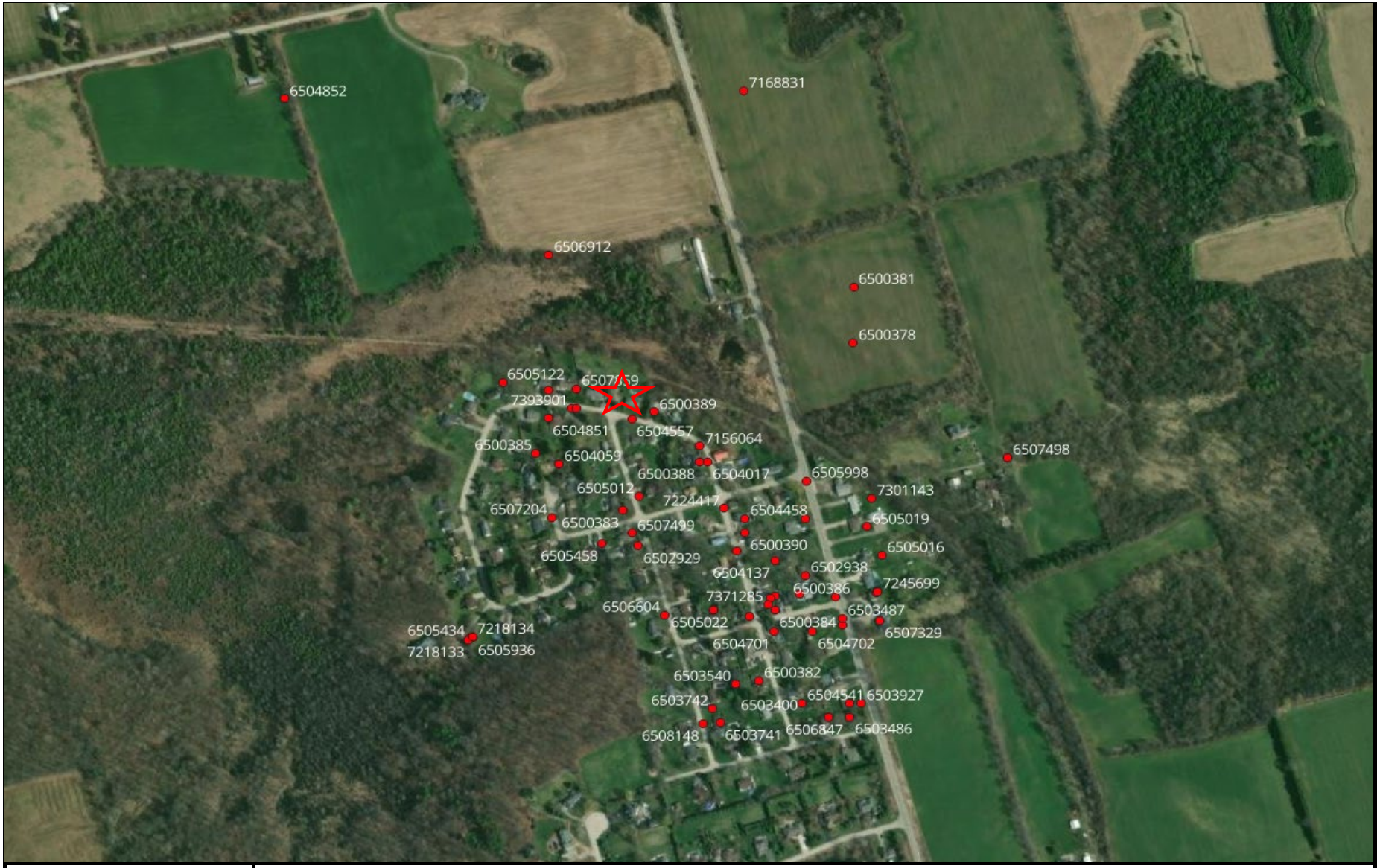
- Subject Property
- VSA 0-3.9 and IPZ3
- VSA 4-7.9 and IPZ3
- WPA A, B, C, C1 and VSA-GW

imagery from OSPIA © 2026

Drawing 3 - Ontario Source Protection Information Atlas Mapping
5 Hughson Street, Branchton, Ontario

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	AR
Date:	21-Jan-26



LEGEND

Subject Property

Supply Well

imagery from Google Earth Pro © 2026

Drawing 4 - MECP WWRs

5 Hughson Street, Branchton, Ontario

HCS HYDROGEOLOGY CONSULTING SERVICES INC

Drawn:	AR
Date:	21-Jan-26

APPENDIX B: MECP WATER WELL RECORDS AND WELL SURVEYS

Water Well Records

Monday, January 19, 2026

1:03:27 PM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
NORTH DUMFRIES TOWNS	17 559914 4795635 W	2010/11 4207	6.25	UT 0080	24/25/12/1:0	DO		7156064 (Z113537) A098934	BRWN CLAY STNS BLDR 0020 BRWN CLAY SILT 0078 BRWN GRVL 0080
NORTH DUMFRIES TOWNS	17 559615 4795371 W	2014/04 7238	2	UT 0032		MT	0028 10	7219911 (Z182541) A161840	BRWN SAND SILT 0004 BRWN SAND SILT 0015 BRWN SAND 0018 BRWN SILT SAND WBRG 0038
NORTH DUMFRIES TOWNS	17 559624 4795621 W	2014/04 7238	2			MO	0104 10	7220537 (Z182518) A161811	BRWN LOAM LOOS 0002 BRWN SILT SAND 0011 GREY SAND SILT STNS 0038 GREY CSND SILT BLDR 0102 GREY LMSN ROCK 0115
NORTH DUMFRIES TOWNS	17 559624 4795619 W	2014/04 7238	2			MO	0015 10	7220536 (Z182515) A161810	BRWN LOAM LOOS 0002 BRWN SILT SAND 0011 BRWN SILT SAND 0021 BRWN SAND SILT 0025
NORTH DUMFRIES TOWNS	17 559626 4795623 W	2014/04 7238	2			MO	0074 10	7220535 (Z182520) A161812	BRWN LOAM LOOS 0018 BRWN SILT SAND 0018 GREY SAND SILT CLAY 0070 GREY SILT SAND SAND 0084
NORTH DUMFRIES TOWNS	17 559656 4795429 W	2014/04 7238	2	UT 0036		MT	0111 10	7219913 (Z182540) A161841	BRWN SAND SILT 0004 BRWN SAND SILT GRVL 0024 BRWN SILT SAND 0080 GREY SILT 0113 GREY LMSN ROCK 0121
NORTH DUMFRIES TOWNS 02	17 559654 4795434 W	2002/06 1129	2			NU	0075 20	6509626 (54319)	BRWN CLAY SAND SILT 0003 BRWN SILT STNS LOOS 0022 BRWN CLAY SILT SAND 0072 GREY SAND SILT FCRD 0095
NORTH DUMFRIES TOWNS CON 07 003	17 560134 4795523 W	1979/08 4208	6	FR 0087	12/80/40/1:0	DO		6505019 ()	GREY CLAY SNDY 0080 GREY GRVL 0087
NORTH DUMFRIES TOWNS CON 07 003	17 560114 4795783 W	1962/11 4208	6 6	FR 0120	55/120/6/1:0	ST DO		6500378 ()	PRDG 0038 STNS CLAY 0048 CLAY 0105 CLAY MSND 0115 LMSN 0130
NORTH DUMFRIES TOWNS CON 07 003	17 560154 4795483 W	1979/08 4208	6	FR 0090	14/90/30/1:0	DO		6505016 ()	GREY CLAY 0086 GREY LMSN 0090
NORTH DUMFRIES TOWNS CON 07 003	17 560152 4795390 W	1992/09 4552	6	FR 0080	15/20/10/5:0	DO		6507329 (093429)	BRWN FILL LOOS 0004 BRWN SILT SAND LOOS 0025 BRWN CLAY SAND LOOS 0040 BRWN CLAY BLDR LOOS 0078 GREY GRVL SAND 0080
NORTH DUMFRIES TOWNS CON 07 003	17 560318 4795623 L	1993/09 4552	6	FR 0079	14/45/20/1:0	DO		6507498 (124181)	BRWN LOAM STNS LOOS 0002 BRWN CLAY FILL LOOS 0014 BRWN CLAY SAND HARD 0047 BRWN CLAY GRVL SOFT 0075 GREY GRVL SAND SILT 0080
NORTH DUMFRIES TOWNS CON 07 003	17 560318 4795623 L	1993/04 4207	6	FR 0090	11/85/30/1:0	DO		6507524 (093900)	BRWN CLAY STNS 0010 GREY CLAY SILT 0082 GREY STNS GRVL CLAY 0089 GREY GRVL 0090
NORTH DUMFRIES TOWNS CON 07 003	17 560149 4795431 W	2015/06 6178	6	0088	17/21/15/2:0	DO		7245699 (Z213659) A187156	BRWN SAND CLAY HARD 0040 GREY CLAY SILT HARD 0082 GREY SAND GRVL SOFT 0085 GREY GRVL SOFT 0088

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
NORTH DUMFRIES TOWNS CON 07 003	17 560141 4795563 W	2017/12 7578	6.25			DO		7301143 (Z269423) A235060	
NORTH DUMFRIES TOWNS CON 07 003	17 560148 4795430 W	2015/07 6178						7245697 (Z213661) A	
NORTH DUMFRIES TOWNS CON 07 004	17 560114 4795253 W	1971/09 5417	6	FR 0102	34/90/10/1:30	DO		6503486 ()	BRWN CLAY STNS MSND 0038 GREY CLAY MSND 0097 GREY CLAY GRVL 0102 GREY LMSN 0103
NORTH DUMFRIES TOWNS CON 07 004	17 560104 4795393 W	1971/10 5417	6	FR 0069	30/50/20/1:0	CO		6503487 ()	BRWN CLAY MSND 0025 GREY CLAY MSND 0069 GREY GRVL 0081
NORTH DUMFRIES TOWNS CON 07 004	17 559964 4795298 W	1972/01 4208	6	FR 0106	40/42/20/1:0	DO		6503540 ()	BRWN CLAY 0025 GREY CLAY SAND 0100 GREY CLAY GRVL HPAN 0105 GREY SHLE LMSN 0107
NORTH DUMFRIES TOWNS CON 07 004	17 559914 4795223 W	1972/09 4208	6	FR 0099	40/60/20/1:0	DO		6503686 ()	BRWN CLAY STNS 0030 GREY CLAY SAND 0095 GREY GRVL 0099 GREY LMSN 0100
NORTH DUMFRIES TOWNS CON 07 004	17 559964 4795203 W	1972/12 2309	6	FR 0100	33/38/20/2:0	DO		6503740 ()	BRWN CLAY 0004 BRWN CLAY SAND BLDR 0020 BRWN CLAY SAND 0040 GREY FSND CLAY 0080 GREY SAND SILT 0092 GREY CSND GRVL SILT 0099 GREY HPAN 0100
NORTH DUMFRIES TOWNS CON 07 004	17 559944 4795243 W	1972/12 2309	6	FR 0110	37/40/20/2:0	DO		6503741 ()	BRWN CLAY SAND BLDR 0016 BRWN CLAY SAND 0075 BRWN CLAY 0103 GREY CSND SILT 0109 GREY GRVL SAND 0110
NORTH DUMFRIES TOWNS CON 07 004	17 559714 4795713 W	1971/08 4208	6	FR 0102	12/20/25/1:0	DO		6503470 ()	PRDG 0005 GREY CLAY STNS 0020 GREY CLAY 0095 GREY LMSN 0104
NORTH DUMFRIES TOWNS CON 07 004	17 559950 4795221 W	1973/04 2309	6	FR 0115	36/41/20/2:0	DO		6503792 ()	BRWN CLAY SAND BLDR 0018 BRWN CLAY SAND 0045 GREY CLAY SILT 0080 GREY FSND SILT 0112 GRVL CSND 0115
NORTH DUMFRIES TOWNS CON 07 004	17 560054 4795453 W	1968/03 4208	6 6	FR 0105	27/30/30/1:0	DO		6502938 ()	CLAY STNS GRVL 0027 CLAY 0070 MSND 0104 SHLE 0105
NORTH DUMFRIES TOWNS CON 07 004	17 560014 4795423 W	1973/06 5417	6	FR 0100	48/80/20/1:0	DO		6503920 ()	BRWN SAND 0038 GREY CLAY GRVL 0099 GREY LMSN GRVL 0101
NORTH DUMFRIES TOWNS CON 07 004	17 560129 4795273 W	1973/05 2309	6	FR 0096	39/39/8/2:0	DO		6503927 ()	BRWN CLAY SAND BLDR 0017 BRWN GRVL CLAY 0029 GREY CLAY SILT 0080 GREY FSND 0094 FSND GRVL 0096
NORTH DUMFRIES TOWNS CON 07 004	17 559924 4795613 W	1973/10 5417	6	FR 0085	40/55/10/1:30	DO		6504017 ()	BRWN SAND CLAY 0040 GREY CLAY SILT 0082 GREY SAND GRVL 0085
NORTH DUMFRIES TOWNS CON 07 004	17 560014 4795473 W	1974/06 1905	6	FR 0103	40/90/5/9:0	DO		6504137 ()	PRDG 0003 CLAY BLDR 0030 GREY CLAY GRVL 0083 GREY HPAN 0090 GREY CLAY 0103 GREY GRVL SAND 0105
NORTH DUMFRIES TOWNS CON 07 004	17 559974 4795533 W	1976/06 5417	6	FR 0110	30/98/9/1:0	DO		6504458 ()	BRWN SAND 0030 GREY CLAY 0090 GREY CLAY GVLY 0098 GREY LMSN 0111
NORTH DUMFRIES TOWNS CON 07 004	17 560114 4795273 W	1976/10 5469	5	MN 0112	32//10/12:0	DO		6504541 ()	BRWN CLAY 0005 GREY BLDR 0018 BRWN CLAY 0030 BRWN QSND 0070 BLCK BLDR 0077 GRVL 0112
NORTH DUMFRIES TOWNS CON 07 004	17 559934 4795263 W	1972/12 2309	6 6	FR 0115 FR 0117	36/40/20/2:0	DO		6503742 ()	BRWN CLAY SAND BLDR 0027 GREY CLAY SAND 0095 GREY SAND SILT GRVL 0113 GREY LMSN 0117
NORTH DUMFRIES TOWNS CON 07 004	17 559914 4795613 W	1963/12 2309	6 6	FR 0106	33/60/7/1:0	DO		6500388 ()	PRDG 0025 SILT 0090 GRVL 0097 GREY ROCK 0108

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
NORTH DUMFRIES TOWNS CON 07 004	17 560114 4795863 W	1960/11 2414	4 4	FR 0103	30/40/10/1:30	DO		6500381 ()	BRWN CLAY MSND 0016 BLDR CLAY STNS 0040 BRWN FSND 0078 CLAY STNS 0080 BLDR 0090 GRVL 0103 ROCK 0106
NORTH DUMFRIES TOWNS CON 07 004	17 559994 4795303 W	1961/11 2309	5	FR 0109	37/87/8/2:0	DO		6500382 ()	PRDG 0025 GRVL CLAY 0035 CLAY MSND 0100 GRVL 0109
NORTH DUMFRIES TOWNS CON 07 004	17 559814 4795543 W	1962/05 2414	5	FR 0108	46/60/10/2:30	DO		6500383 ()	PRDG 0041 BLUE CLAY 0088 HPAN 0105 GRVL 0108
NORTH DUMFRIES TOWNS CON 07 004	17 560014 4795403 W	1962/12 2309	6	FR 0077	35/60/20/1:0	DO		6500384 ()	PRDG 0020 CLAY MSND 0050 SILT 0068 GRVL 0075 CSND 0077
NORTH DUMFRIES TOWNS CON 07 004	17 559699 4795623 W	1963/09 2309	6 6	FR 0114 FR 0120	20/100/8/1:0	DO		6500385 ()	PRDG 0016 SILT CLAY 0100 FSND 0113 ROCK 0122
NORTH DUMFRIES TOWNS CON 07 004	17 560052 4795271 W	1971/05 2309	6 6	FR 0113	32/40/20/2:0	DO		6503400 ()	BRWN CLAY MSND BLDR 0030 GREY CLAY MSND SILT 0087 GREY MSND GRVL 0113 GREY LMSN 0115
NORTH DUMFRIES TOWNS CON 07 004	17 560104 4795383 W	1963/09 2309	6	FR 0090	30/70/9/1:0	DO		6500387 ()	CLAY STNS 0015 FSND 0050 SILT 0080 CSND 0090
NORTH DUMFRIES TOWNS CON 07 004	17 559824 4795673 W	1976/05 4208	6	FR 0103	18/100/12/1:0	DO		6504557 ()	GREY STNS GRVL 0025 GREY CLAY SNDY 0100 GREY LMSN 0105
NORTH DUMFRIES TOWNS CON 07 004	17 559854 4795683 W	1964/11 4208	6	FR 0107	22/40/20/1:0	DO		6500389 ()	PRDG 0006 CLAY SILT LOAM 0025 CLAY MSND 0090 MSND GRVL 0105 GRVL SHLE 0107
NORTH DUMFRIES TOWNS CON 07 004	17 559974 4795513 W	1967/01 4208	6	FR 0105	30/80/20/1:0	DO		6500390 ()	STNS CLAY 0015 SILT CLAY 0085 STNS GRVL CLAY 0104 GRVL 0105
NORTH DUMFRIES TOWNS CON 07 004	17 560144 4795213 W	1968/07 4208	6	FR 0107	32/80/15/1:0	DO		6502927 ()	BRWN CLAY GRVL STNS 0045 GREY CLAY 0100 HPAN 0106 GRVL 0107
NORTH DUMFRIES TOWNS CON 07 004	17 559834 4795493 W	1968/06 5417	6	FR 0114	30/101/10/1:0	DO		6502929 ()	BRWN CLAY STNS 0025 GREY CLAY 0105 MSND GRVL CLAY 0109 GREY CLAY 0114 GRVL 0115
NORTH DUMFRIES TOWNS CON 07 004	17 560064 4795373 W	1977/04 4208	6	FR 0113	35/100/30/1:0	DO		6504702 ()	BRWN CLAY SAND GRVL 0020 GREY CLAY 0112 GREY LMSN 0115
NORTH DUMFRIES TOWNS CON 07 004	17 560054 4795533 W	1971/06 5417	6	FR 0086	17/25/30/1:0	DO		6503380 ()	BRWN CLAY MSND SILT 0020 GREY CLAY SILT 0084 GREY GRVL 0086
NORTH DUMFRIES TOWNS CON 07 004	17 560094 4795423 W	1963/09 4208	6	FR 0082	25/40/30/0:30	DO		6500386 ()	PRDG 0026 GRVL CLAY 0070 STNS CLAY 0079 GRVL 0082
NORTH DUMFRIES TOWNS CON 07 004	17 559922 4795242 W	1997/08 4207	6	FR 0106	38/100/50/1:0	DO		6508148 (186191)	BRWN SILT CLAY STNS 0050 GREY SILT CLAY 0102 GREY GRVL 0106
NORTH DUMFRIES TOWNS CON 07 004	17 560074 4795223 W	1976/06 4208	6	FR 0115	36/100/30/1:0	DO		6504558 ()	BRWN CLAY STNS 0015 GREY CLAY SNDY 0105 GREY GRVL 0115
NORTH DUMFRIES TOWNS CON 07 004	17 559713 4795905 W	1990/06 4552	6	FR 0128	30/80/10/1:30	DO		6506912 (61221)	BRWN BLDR SAND 0012 BRWN SAND LOOS 0018 GREY CLAY SOFT 0086 GREY SAND SOFT 0106 GREY LMSN HARD 0130
NORTH DUMFRIES TOWNS CON 07 004	17 559720 4795532 W	1991/12 4552	5 5	FR 0114	25/30/15/1:0	DO		6507204 (104496)	GREY SILT SAND LOOS 0015 GREY CLAY GRVL LOOS 0080 GREY CLAY GRVL PCKD 0108 GREY LMSN HARD 0115

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
NORTH DUMFRIES TOWNS CON 07 004	17 560008 4795420 W	2020/08 6178	6 42		///:			7366948 (Z339306) A	
NORTH DUMFRIES TOWNS CON 07 004	17 559618 4795353 W	2018/11 7643	24		///:	NU		7329351 (Z286096) A	
NORTH DUMFRIES TOWNS CON 07 004	17 559870 4795395 W	1989/05 4207	6 6	FR 0125	40/120/100/1:0	DO		6506604 (42585)	BRWN CLAY STNS 0030 GREY CLAY 0090 GREY STNS GRVL CLAY 0125 GREY LMSN 0126
NORTH DUMFRIES TOWNS CON 07 004	17 559751 4795715 W	1995/08 4207	6 6 5	FR 0108	18/108/30/1:0	DO		6507859 (163646)	BRWN STNS CLAY 0018 GREY SILT CLAY 0095 GREY SAND GRVL SILT 0099 GREY LMSN 0113
NORTH DUMFRIES TOWNS CON 07 004	17 560046 4795427 W	1987/10 4207	6	FR 0076	28/70/50/1:0	DO		6506252 (15572)	BRWN CLAY 0015 GREY CLAY SOFT 0060 GREY CLAY STNS GVLY 0073 GREY GRVL 0076
NORTH DUMFRIES TOWNS CON 07 004	17 559967 4796140 W	2011/01 2663	6.25	UT 0068	34/35/30/1:0			7168831 (Z133397) A117772	BRWN CLAY GRVL SAND 0036 GREY CLAY SAND STNS 0052 GRVL 0054 BLDR 0055 GRVL 0057 BLDR 0065 GRVL 0068
NORTH DUMFRIES TOWNS CON 07 004	17 559613 4795358 W	2011/11 3406	6.11 6.11	UT 0121 UT 0135 UT 0210	39/41/16/1:0	TH		7178799 (Z127321) A112248	BRWN SAND 0032 RED SAND SILT 0048 RED SAND GRVL LYRD 0075 BRWN SAND GRVL 0122 BRWN LMSN LYRD 0380
NORTH DUMFRIES TOWNS CON 07 004	17 559981 4795395 W	2012/11 2663	6.25	UT 0106	39/39/15/1:	DO		7194846 (Z163476) A138666	BRWN CLAY 0089 BRWN GRVL CLAY BLDR 0095 GREY GRVL BLDR 0106
NORTH DUMFRIES TOWNS CON 07 004	17 559613 4795358 W	2013/01 3406	8.61 8.61	UT 0134	36/76/198/24:0	MN		7218133 (Z153350) A133901	BRWN SAND 0032 RED SAND SILT 0048 RED SAND GRVL LYRD 0075 BRWN SAND GRVL 0122 BRWN LMSN STNS LYRD 0380
NORTH DUMFRIES TOWNS CON 07 004	17 559618 4795362 W	2013/01 3406						7218134 (Z153352) A133901	
NORTH DUMFRIES TOWNS CON 07 004	17 559947 4795547 W	2014/07 7221	6.30 6.13	UT 0138 UT 0154 UT 0167	44/144/5/1:	DO		7224417 (Z178348) A118980	BRWN FILL 0004 BRWN CLAY SNDY 0015 GREY CLAY SLTY 0091 GREY SAND SLTY 0103 GREY LMSN 0169
NORTH DUMFRIES TOWNS CON 07 004	17 559826 4795511 L	1993/09 4552	6	FR 0079	14/49/20/1:0	DO		6507499 (124180)	BRWN LOAM STNS LOOS 0003 BRWN CLAY BLDR LOOS 0012 BRWN CLAY SAND HARD 0045 BRWN CLAY GRVL SOFT 0074 GREY GRVL SAND LOOS 0080
NORTH DUMFRIES TOWNS CON 07 004	17 560005 4795411 W	2020/07 7343	6.25 6.25	FR 0076	35/65/6/:	DO	0074 4	7371285 (Z344682) A297734	BRWN SAND GRVL 0006 GREY CLAY 0074 GREY GRVL 0078 GREY CLAY 0079
NORTH DUMFRIES TOWNS CON 07 004	17 560014 4795373 W	1977/04 4208	6	FR 0150	60/150/4/1:0	DO		6504701 ()	BRWN CLAY GRVL SAND 0015 GREY CLAY 0123 GREY LMSN 0153
NORTH DUMFRIES TOWNS CON 07 004	17 559714 4795673 W	1978/02 4208	6	FR 0112	18/20/30/1:0	DO		6504851 ()	BRWN CLAY STNS 0020 GREY CLAY 0102 GREY LMSN 0114
NORTH DUMFRIES TOWNS CON 07 004	17 559364 4796123 W	1978/05 4208	6	FR 0137	52/130/30/1:0	DO		6504852 ()	GREY CLAY STNS GRVL 0060 GREY CLAY SNDY 0133 GREY LMSN 0140

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
NORTH DUMFRIES TOWNS CON 07 004	17 560114 4795223 W	1978/05 4208	6	FR 0115	32/115/30/1:0	DO		6504853 ()	BRWN CLAY SNDY LOAM 0015 GREY CLAY 0100 GREY CLAY STNS GRVL 0115 GREY LMSN SHLY 0116
NORTH DUMFRIES TOWNS CON 07 004	17 560086 4795252 W	1990/05 4552	6	FR 0115	35/45/20/1:30	DO		6506847 (61195)	BRWN SAND SOFT 0040 GREY CLAY SOFT 0105 BRWN GRVL HARD 0116
NORTH DUMFRIES TOWNS CON 07 004	17 559746 4795687 W	2021/07 7221	6.11 5.11 6.11		20/22/10/1:0	DO		7393901 (Z362872) A310456	BLCK LOAM SOFT 0001 BLCK GRVL STNS ---- 0012 BLCK SAND FGVL 0025 GREY CLAY SILT HARD 0094 GREY TILL STNS HARD 0102 GREY LMSN HARD 0106 GREY SAND STNS HARD 0110 GREY LMSN 0117
NORTH DUMFRIES TOWNS CON 07 004	17 559834 4795563 W	1979/09 4208	6	FR 0090	15/90/30/1:0	DO		6505012 ()	GREY CLAY GRVL 0015 GREY CLAY SNDY 0085 GREY GRVL 0090
NORTH DUMFRIES TOWNS CON 07 004	17 559751 4795687 W	2021/08 6231			///:			7395838 (Z318458) A	---- 0018 GRVL 0006 BLCK ---- 0005 PRDG 0000
NORTH DUMFRIES TOWNS CON 07 004	17 559934 4795403 W	1979/09 4208	6	FR 0145	45/150/2/1:0	DO		6505022 ()	BRWN CLAY SNDY 0025 GREY CLAY 0122 GREY LMSN 0150
NORTH DUMFRIES TOWNS CON 07 004	17 559654 4795723 W	1980/09 4208	6	FR 0110	12/110/50/1:0	DO		6505122 ()	BRWN CLAY SNDY 0015 GREY CLAY SNDY 0105 GREY LMSN 0112
NORTH DUMFRIES TOWNS CON 07 004	17 559614 4795360 W	1983/07 1737	8 8	FR 0096	32/41/150/24:0	PS		6505434 ()	LOAM 0001 BRWN SAND GVLY SOFT 0012 GREY SAND GVLY SOFT 0042 GREY SAND BLDR 0059 GREY SAND BLDR LYRD 0081 GREY LMSN GRVL SOFT 0092 GREY LMSN HARD 0095 GREY LMSN GRVL LOOS 0096
NORTH DUMFRIES TOWNS CON 07 004	17 559787 4795496 W	1983/01 4208	6	FR 0107	17/25/40/1:0	DO		6505458 ()	BRWN CLAY SAND 0015 GREY CLAY 0106 GREY LMSN LMSN 0110
NORTH DUMFRIES TOWNS CON 07 004	17 559618 4795360 W	1986/11 1737	10 10	FR 0112	32/49/275/24:0	MN		6505936 (05664)	BRWN SAND SILT SOFT 0016 GREY SAND GVLY SOFT 0053 GREY SAND SOFT 0079 LMSN BLDR HARD 0112
NORTH DUMFRIES TOWNS CON 07 004	17 560054 4795587 W	1986/11 4207	6 6	FR 0087 FR 0118	34/120/4/1:0	DO		6505998 (NA)	BRWN CLAY GRVL 0004 BRWN GRVL STNS SILT 0025 GREY SILT 0075 GREY GRVL SAND SILT 0082 GREY LMSN 0120
NORTH DUMFRIES TOWNS CON 07 006	17 559964 4795487 W	1998/11 2336	6	FR 0102	36/66/10/1:0	DO		6508311 (196578)	BRWN CLAY STNS 0010 BRWN CLAY SAND GRVL 0035 GREY CLAY 0097 GREY CGVL 0102
NORTH DUMFRIES TOWNS GR E 07 004	17 559729 4795608 W	1973/11 5417	6	FR 0102	30/40/20/1:0	DO		6504059 ()	GREY SAND CLAY 0095 GREY GRVL 0102
TOWNSEND TOWNSHIP	17 559613 4795370 W	2014/04 7238	2	UT 0032		MT	0072 5	7219912 (Z182545) A161842	BRWN SAND SILT 0004 BRWN SAND SILT 0015 BRWN SAND 0018 BRWN SILT SAND WBRG 0048 GREY SILT 0070 GREY SILT GRVL 0078

TOWNSHIP CON LOT | UTM | DATE CNTR | CASING DIA | WATER | PUMP TEST | WELL USE | SCREEN | WELL | FORMATION

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: .Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL (AUDIT #) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MRBL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDN	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDYOAPSTONE		

2. Core Color

Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Well Use

Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial	MT	Monitoring TestHole
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

WATER WELL SURVEY

Houghton Street Date Jan 12/06

PROPERTY INFORMATION

Rick Deacon & Nancy Ondrusek Previous Owner (if known) 23 Houghton St.

Phone Number: 286-3862-7321 We have lived here since Dec. 2004.

WELL INFORMATION

We are on municipal water.

Well Tag #

Depth: Well Diameter Well Use: Residential Agricultural Commercial

Date of Work

Construction Date

Is the well accessible for inspection? YES NO

Water Type: Bedrock Overburden

Issues with water supply i.e. your well going dry? (Describe)

Are you be willing to participate in a water well monitoring program? YES NO

WATER CHEMISTRY

Taste

Appearance Odour

Water treatment system? (Describe)

Any black stains on sinks/toilets?

Have you had water chemistry tests done on your well water? (Describe)

SKETCH OF PROPERTY

(Please show location of your house, your well, and your septic bed, along with your driveway and roadways.)

WATER WELL SURVEY

Project: 5 Hughson Street Date: Jan, 15, 2026

PROPERTY INFORMATION

Current Owner: Glen & Lynne Dodsworth Previous Owner (If Known): Bob & Lorna Dodsworth (parents)*

Address: 2 Queen St. Branchton

Contact Number: 519-242-0024

WELL INFORMATION

MECP Well Tag #

Well Depth: Unknown Well Diameter: Unkn Well Use: Residential Agricultural Commercial

Construction Date: 1965 Depth of Pump: Unknown

Aquifer Type: Bedrock Overburden Is the well accessible for inspection? YES (NO)

Any issues with water supply i.e. your well going dry? (Describe) NO (we don't put too much demand on it)

Would you be willing to participate in a water well monitoring program? YES (NO)

WATER CHEMISTRY

Appearance: Clear Taste: Excellent

Water treatment system? (Describe) none Odour: no odour

Rusty / black stains on sinks/toilets? no rust / black stains

Have you had water chemistry tests done on your well water? (Describe) no

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.

Any Additional Comments?

* This is a shallow well, concerned that a new septic / well may affect our water.

PLEASE RETURN TO:
Hydrogeology Consulting Services Inc.
25 Water Street West
Elora, Ontario
N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:
Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC.

WATER WELL SURVEY

Project: 5 Hughson Street Date: JAN 17/26

PROPERTY INFORMATION

Current Owner: DOROTHY GIBBONS Previous Owner (If Known): _____

Address: 34 KING STREET

Contact Number: 519 740-1543 OR 519 465-7387 +

WELL INFORMATION

MECP Well Tag #: ?

Well Depth: DRILLED TO 105' Well Diameter: ? Well Use: (Residential) Agricultural Commercial

Construction Date: 1973 Depth of Pump: 60-70' I THINK

Aquifer Type: Bedrock (Overburden) Is the well accessible for inspection? (YES) NO

Any issues with water supply i.e. your well going dry? (Describe) NO

Would you be willing to participate in a water well monitoring program? WITH MORE INFORMATION (YES) NO

WATER CHEMISTRY

Appearance: IF UNTREATED CLOUDY Taste: TERRIBLE

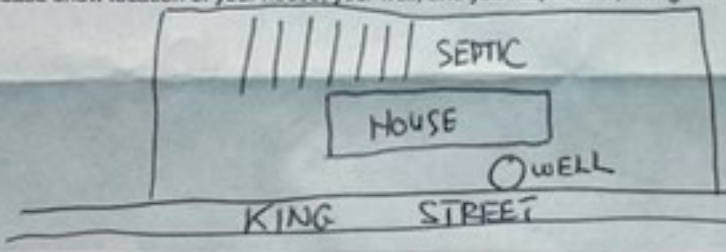
Water treatment system? (Describe) SEE PIC OF SUPPORTING EQUIP Odour: "

Rusty / black stains on sinks/toilets? IF UNTREATED YES

Have you had water chemistry tests done on your well water? (Describe) NOT RECENTLY

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.



Any Additional Comments?

ANY INFORMATION REQUIRED - CALL FLOYD GIBBONS 519 465-7387

PLEASE RETURN TO:
Hydrogeology Consulting Services Inc.
25 Water Street West
Elora, Ontario
N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
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ANY QUESTIONS? Please Contact:
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Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC

WATER WELL SURVEY

Project: 5 Hughson Street Date: _____

PROPERTY INFORMATION

Current Owner: Sylvia Stafford Previous Owner (If Known): Shirley Stafford.

Address: 1623 Brancheton Rd. Brandton Ont N0B1L0

Contact Number: 5197401501

WELL INFORMATION

MECP Well Tag # _____

Well Depth: 140' + Well Diameter: _____ Well Use: (Residential) Agricultural Commercial

Construction Date: dug well & drilled well inside Depth of Pump: _____

Aquifer Type: (Bedrock) Overburden Is the well accessible for inspection? (YES) NO

Any issues with water supply i.e. your well going dry? (Describe) No.

Would you be willing to participate in a water well monitoring program? (YES) NO

WATER CHEMISTRY

Appearance: good Taste: good.

Water treatment system? (Describe) iron filter ultra violet light. Odour: ammonia

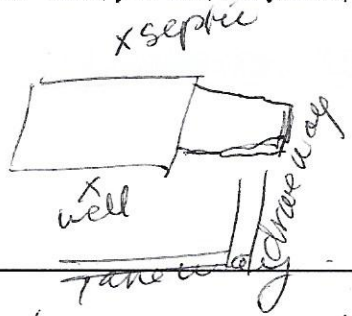
Rusty / black stains on sinks/toilets? _____

Have you had water chemistry tests done on your well water? (Describe) yes / 2025/04-02

0 coliform 0 ecoli

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.



Any Additional Comments?

well services 2 houses - used for agric. farm animals for at least 80 years.

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N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:
Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC

WATER WELL SURVEY

Project: 5 Hughson Street Date: _____

PROPERTY INFORMATION

Current Owner: Janice Rowland Previous Owner (If Known): _____

Address: 26 Hughson St Brandston N0B 1L0

Contact Number: 226-201 4964

WELL INFORMATION

N/A

MECP Well Tag # _____

Well Depth: _____ Well Diameter: _____ Well Use: Residential Agricultural Commercial

Construction Date: _____ Depth of Pump: _____

Aquifer Type: Bedrock Overburden Is the well accessible for inspection? YES NO

Any issues with water supply i.e. your well going dry? (Describe) _____

Would you be willing to participate in a water well monitoring program? community well YES NO

WATER CHEMISTRY

Appearance: _____ Taste: _____

Water treatment system? (Describe) _____ Odour: _____

Rusty / black stains on sinks/toilets? _____

Have you had water chemistry tests done on your well water? (Describe) _____

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.

Any Additional Comments?

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25 Water Street West
Elora, Ontario
N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:

Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC

WATER WELL SURVEY

Project: 5 Hughson Street Date: Jan 11/26

PROPERTY INFORMATION

Current Owner: Pilkington Previous Owner (If Known): Nann

Address: 37 Queen St Brantford

Contact Number: 5192420787

WELL INFORMATION

MECP Well Tag # _____

Well Depth: ? Well Diameter: 5 Well Use: (Residential) Agricultural Commercial

Construction Date: ? Depth of Pump: ?

Aquifer Type: Bedrock Overburden Is the well accessible for inspection? (YES) NO

Any issues with water supply i.e. your well going dry? (Describe) No

Would you be willing to participate in a water well monitoring program? YES (NO)

WATER CHEMISTRY

Appearance: slight red tinge (before treatment) Taste: metallic (before treatment)

Water treatment system? (Describe) iron/softner, uv, ro Odour: _____

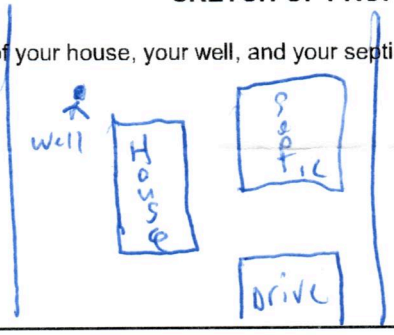
Rusty / black stains on sinks/toilets? iron buildup.

Have you had water chemistry tests done on your well water? (Describe) hardness 19.00 gpg

iron 1.44 manganese 0.00 ph 7.60 TDS 513.00

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.



Any Additional Comments? ROAD

PLEASE RETURN TO:
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25 Water Street West
Elora, Ontario
N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:
Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC.

WATER WELL SURVEY

Project: 5 Hughson Street Date: Jan 13/26

PROPERTY INFORMATION

Current Owner: BOWIE Previous Owner (If Known): _____

Address: 31 Hughson Street

Contact Number: fourbowies@gmail.com

WELL INFORMATION

N/A

MECP Well Tag # _____

Well Depth: _____ Well Diameter: _____ Well Use: Residential Agricultural Commercial

Construction Date: _____ Depth of Pump: _____

Aquifer Type: Bedrock Overburden Is the well accessible for inspection? YES NO

Any issues with water supply i.e. your well going dry? (Describe) _____

Would you be willing to participate in a water well monitoring program? YES NO

WATER CHEMISTRY

N/A

Appearance: _____ Taste: _____

Water treatment system? (Describe) _____ Odour: _____

Rusty / black stains on sinks/toilets? _____

Have you had water chemistry tests done on your well water? (Describe) _____

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.

We are serviced by Region of Waterloo Hughson Lane - Branchton Community Well

Any Additional Comments?

PLEASE RETURN TO:
Hydrogeology Consulting Services Inc.
25 Water Street West
Elora, Ontario
N0B 1S0

OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:
Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC.

WATER WELL SURVEY

Project: 5 Hughson Street Date: _____

PROPERTY INFORMATION

Current Owner: NICHOLAS CHERRI Previous Owner (If Known): _____

Address: 33 HUGHSON ST BRANTFORD

Contact Number: 519 740 1519

WELL INFORMATION

MECP Well Tag # _____

Well Depth: _____ Well Diameter: _____ Well Use: Residential Agricultural Commercial

Construction Date: _____ Depth of Pump: _____

Aquifer Type: Bedrock Overburden Is the well accessible for inspection? YES NO

Any issues with water supply i.e. your well going dry? (Describe) _____

Would you be willing to participate in a water well monitoring program? YES NO

WATER CHEMISTRY

Appearance: _____ Taste: _____

Water treatment system? (Describe) _____ Odour: _____

Rusty / black stains on sinks/toilets? _____

Have you had water chemistry tests done on your well water? (Describe) _____

SKETCH OF PROPERTY

Please show location of your house, your well, and your septic bed, along with your driveway and roadways.

contact Region of Waterloo - communal well

Any Additional Comments?

PLEASE RETURN TO:
Hydrogeology Consulting Services Inc.
25 Water Street West
Elora, Ontario
N0B 1S0

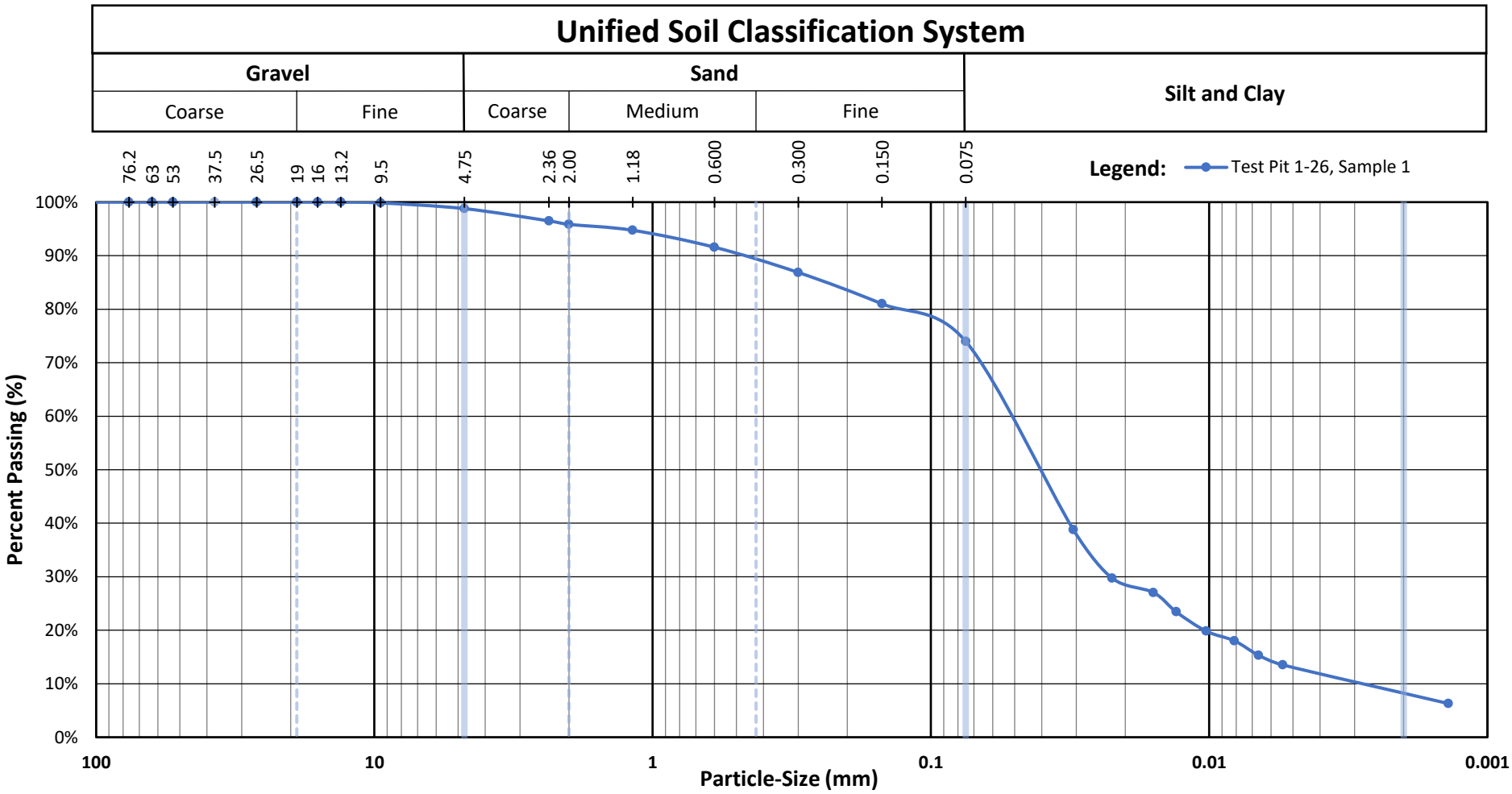
OR SCAN AND SEND VIA EMAIL OR TEXT TO:
chrishelmer@hydrog.ca
905-550-0969

ANY QUESTIONS? Please Contact:

Chris Helmer, Senior Hydrogeologist
Phone: 905-550-0969
Email: chrishelmer@hydrog.ca

HCS HYDROGEOLOGY CONSULTING SERVICES INC.

APPENDIX C: GRAIN SIZE ANALYSIS GRAPHS



Test Pit No.	Sample No.	Depth (m)	D_{60}	D_{10}	C_U	% Gravel	% Sand	% Silt and Clay
1-26	1	0.5 - 1.2				1.2%	24.8%	74.0%

FlowSpec ENGINEERING

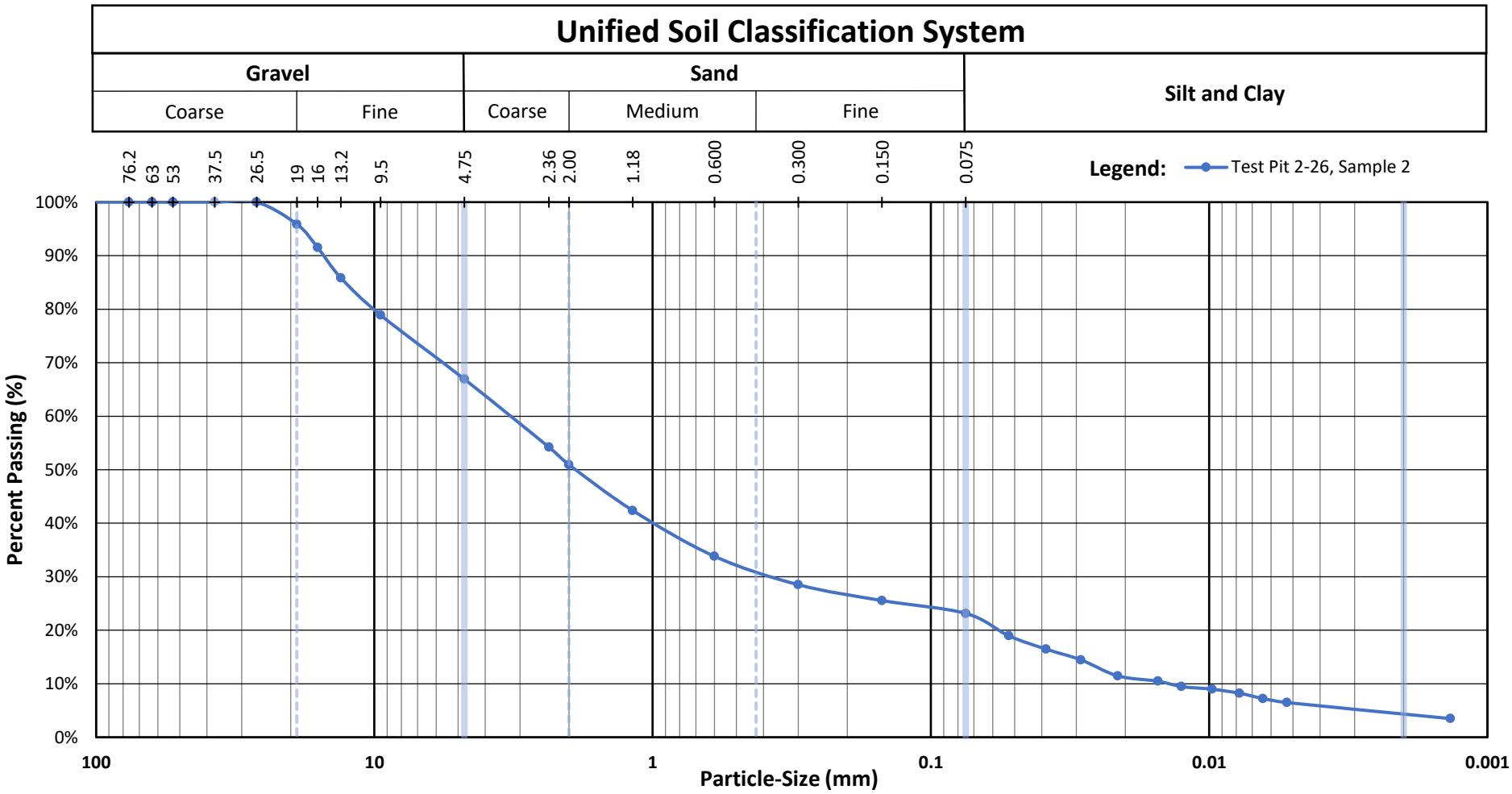
Client: Hydrogeology Consulting Services

Project: Laboratory Analysis

Location: 5 Hughson Street, Branchton
Township of North Dumfries

Particle-Size Distribution Curve

File Number: 01129-1



Test Pit No.	Sample No.	Depth (m)	D_{60}	D_{10}	C_U	% Gravel	% Sand	% Silt and Clay
2-26	2	1.7 - 2.0				33.1%	43.8%	23.1%

FlowSpec ENGINEERING

Client: Hydrogeology Consulting Services

Project: Laboratory Analysis

Location: 5 Hughson Street, Branchton
Township of North Dumfries

Particle-Size Distribution Curve

File Number: 01129-1

APPENDIX D: WATER CHEMISTRY ANALYSIS RESULTS

WT2600382

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	:	**WT2600382**			
Client	:	**Hydrogeology Consulting Services**	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Chris Helmer	Account Manager	:	Emily Smith
Address	:	25 Water Street West Elora Ontario Canada N0B 1S0	Address	:	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	905 550 0969	Telephone	:	+1 519 886 6910
Project	:	5 Hughson Street	Date Samples Received	:	08-Jan-2026 17:45
PO	:	----	Date Analysis Commenced	:	08-Jan-2026
C-O-C number	:	----	Issue Date	:	15-Jan-2026 15:36
Sampler	:	Kevin Brunner			
Site	:	----			
Quote number	:	Standing Offer 2025			
No. of samples received	:	1			
No. of samples analysed	:	1			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Jeminikumari Patel	Analyst	Microbiology, Waterloo, Ontario
Jon Fisher	Laboratory Manager - Environmental	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
Well-1 ----	Water	Hardness (as CaCO3), from total Ca/Mg	Hardness levels between 80 and 100 mg/L (as CaCO3) provide acceptable balance between corrosion and incrustation; where a water softener is used, a separate unsoftened supply for cooking and drinking purposes is recommended.	ONDWS	AO/OG	396 mg/L	80 - 100 mg/L

Key:

ONDWS	Ontario Drinking Water Regulation (JAN, 2020)
AO/OG	Aesthetic Objective/Operational Guideline (2006)
MAC	Schedule 1 (Microbiological) and 2 (Chemical) Standards (JAN,2020)

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Analytical Results

SubMatrix: **Drinking Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Well-1 ----	----	----	----	ONDWS AO/OG	ONDWS MAC	---- ----	---- ----
					Client sampling date / time: 08-Jan-2026 15:45	----	----	----				
					WT2600382-001	----	----	----				
Physical Tests												
Alkalinity, bicarbonate (as CaCO3)	----	E290/WT	1.0	mg/L	278	----	----	----	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	278	----	----	----	30 - 500 mg/L	----	----	----
Colour, true	----	E329-L/WT	2.0	CU	<2.0	----	----	----	5 CU	----	----	----
Conductivity	----	E100/WT	1.0	µS/cm	775	----	----	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L	396	----	----	----	80 - 100 mg/L	----	----	----
pH	----	E108/WT	0.10	pH units	8.04	----	----	----	6.5 - 8.5 pH units	----	----	----
Solids, total dissolved [TDS]	----	E162/WT	10	mg/L	413 DLDS	----	----	----	500 mg/L	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103A/WT	1.0	mg/L	504	----	----	----	----	----	----	----
Turbidity	----	E121/WT	0.10	NTU	2.24	----	----	----	5 NTU	----	----	----
Langelier index (@ 20°C)	----	EC105A/WT	0.010	-	0.977	----	----	----	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	0.010	-	0.730	----	----	----	----	----	----	----
pH, saturation (@ 20°C)	----	EC105A/WT	0.010	pH units	7.06	----	----	----	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	0.010	pH units	7.31	----	----	----	----	----	----	----
Anions and Nutrients												
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	<0.0050	----	----	----	----	----	----	----
Bromide	24959-67-9	E235.Br/WT	0.10	mg/L	<0.10	----	----	----	----	----	----	----
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	39.1	----	----	----	250 mg/L	----	----	----
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	0.230	----	----	----	----	1.5 mg/L	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	0.408	----	----	----	----	10 mg/L	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L	0.464	----	----	----	----	10 mg/L	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	0.056	----	----	----	----	1 mg/L	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0010	----	----	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	72.1	----	----	----	500 mg/L	----	----	----
Microbiological Tests												
Coliforms, Escherichia coli [E. coli]	----	E010.QT97/WT	1	MPN/100mL	<1	----	----	----	----	1 MPN/100mL	----	----
Coliforms, total	----	E010.QT97/WT	1	MPN/100mL	<1	----	----	----	----	1 MPN/100mL	----	----
Metals												
Sodium adsorption ratio [SAR]	----	EC102/WT	0.10	-	0.37	----	----	----	----	----	----	----
Ion Balance												
Anion sum	----	EC101A/WT	0.10	meq/L	8.20	----	----	----	----	----	----	----

SubMatrix: **Drinking Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Well-1 ----	----	----	----	ONDWS AO/OG	ONDWS MAC	---- ----	---- ----
					Client sampling date / time: 08-Jan-2026 15:45	----	----	----				
					WT2600382-001	----	----	----				
Ion Balance												
Cation sum (total)	----	EC101A/WT	0.10	meq/L	8.71	----	----	----	----	----	----	----
Ion balance (APHA)	----	EC101A/WT	0.010	%	3.02	----	----	----	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WT	0.01	%	106	----	----	----	----	----	----	----
Total Metals												
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L	<0.0030	----	----	----	0.1 mg/L	----	----	----
Antimony, total	7440-36-0	E420/WT	0.00010	mg/L	0.00016	----	----	----	----	0.006 mg/L	----	----
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L	0.00022	----	----	----	----	0.01 mg/L	----	----
Barium, total	7440-39-3	E420/WT	0.00010	mg/L	0.112	----	----	----	----	1 mg/L	----	----
Beryllium, total	7440-41-7	E420/WT	0.000020	mg/L	<0.000020	----	----	----	----	----	----	----
Bismuth, total	7440-69-9	E420/WT	0.000050	mg/L	<0.000050	----	----	----	----	----	----	----
Boron, total	7440-42-8	E420/WT	0.010	mg/L	0.016	----	----	----	----	5 mg/L	----	----
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L	0.0000098	----	----	----	----	0.005 mg/L	----	----
Calcium, total	7440-70-2	E420/WT	0.050	mg/L	88.7	----	----	----	----	----	----	----
Cesium, total	7440-46-2	E420/WT	0.000010	mg/L	<0.000010	----	----	----	----	----	----	----
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L	<0.00050	----	----	----	----	0.05 mg/L	----	----
Cobalt, total	7440-48-4	E420/WT	0.00010	mg/L	0.00035	----	----	----	----	----	----	----
Copper, total	7440-50-8	E420/WT	0.00050	mg/L	0.00761	----	----	----	1 mg/L	----	----	----
Iron, total	7439-89-6	E420/WT	0.010	mg/L	0.255	----	----	----	0.3 mg/L	----	----	----
Lead, total	7439-92-1	E420/WT	0.000050	mg/L	0.000396	----	----	----	----	0.01 mg/L	----	----
Lithium, total	7439-93-2	E420/WT	0.0010	mg/L	0.0071	----	----	----	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L	42.4	----	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L	0.0406	----	----	----	0.05 mg/L	----	----	----
Molybdenum, total	7439-98-7	E420/WT	0.000050	mg/L	0.000858	----	----	----	----	----	----	----
Nickel, total	7440-02-0	E420/WT	0.00050	mg/L	0.00292	----	----	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/WT	0.050	mg/L	<0.050	----	----	----	----	----	----	----
Potassium, total	7440-09-7	E420/WT	0.050	mg/L	1.61	----	----	----	----	----	----	----
Rubidium, total	7440-17-7	E420/WT	0.00020	mg/L	0.00097	----	----	----	----	----	----	----
Selenium, total	7782-49-2	E420/WT	0.000050	mg/L	0.000091	----	----	----	----	0.05 mg/L	----	----
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25	mg/L	15.2	----	----	----	----	----	----	----
Silicon, total	7440-21-3	E420/WT	0.10	mg/L	7.12	----	----	----	----	----	----	----
Silver, total	7440-22-4	E420/WT	0.000010	mg/L	<0.000010	----	----	----	----	----	----	----
Sodium, total	7440-23-5	E420/WT	0.050	mg/L	17.0	----	----	----	200 mg/L	20 mg/L	----	----

SubMatrix: **Drinking Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Well-1 ----	----	----	----				
					Client sampling date / time: 08-Jan-2026 15:45	----	----	----				
					WT2600382-001	----	----	----	ONDWS AO/OG	ONDWS MAC	---- ----	---- ----
Total Metals												
Strontium, total	7440-24-6	E420/WT	0.00020	mg/L	0.176	----	----	----	----	----	----	----
Sulfur, total	7704-34-9	E420/WT	0.50	mg/L	27.7	----	----	----	----	----	----	----
Tellurium, total	13494-80-9	E420/WT	0.00020	mg/L	<0.00020	----	----	----	----	----	----	----
Thallium, total	7440-28-0	E420/WT	0.000010	mg/L	0.000018	----	----	----	----	----	----	----
Thorium, total	7440-29-1	E420/WT	0.00010	mg/L	<0.00010	----	----	----	----	----	----	----
Tin, total	7440-31-5	E420/WT	0.00010	mg/L	<0.00010	----	----	----	----	----	----	----
Titanium, total	7440-32-6	E420/WT	0.00030	mg/L	<0.00030	----	----	----	----	----	----	----
Tungsten, total	7440-33-7	E420/WT	0.00010	mg/L	<0.00010	----	----	----	----	----	----	----
Uranium, total	7440-61-1	E420/WT	0.000010	mg/L	0.00128	----	----	----	----	0.02 mg/L	----	----
Vanadium, total	7440-62-2	E420/WT	0.00050	mg/L	<0.00050	----	----	----	----	----	----	----
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L	0.0218	----	----	----	5 mg/L	----	----	----
Zirconium, total	7440-67-7	E420/WT	0.00020	mg/L	<0.00020	----	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2600382**	Page	: 1 of 10
Client	: **Hydrogeology Consulting Services**	Laboratory	: ALS Environmental - Waterloo
Contact	: Chris Helmer	Account Manager	: Emily Smith
Address	: 25 Water Street West Elora ON Canada N0B 1S0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 550 0969	Telephone	: +1 519 886 6910
Project	: 5 Hughson Street	Date Samples Received	: 08-Jan-2026 17:45
PO	: ----	Issue Date	: 15-Jan-2026 15:40
C-O-C number	: ----		
Sampler	: Kevin Brunner		
Site	: ----		
Quote number	: Standing Offer 2025		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP]										
Well-1	E298	08-Jan-2026	13-Jan-2026	7 days	5 days	✓	14-Jan-2026	7 days	5 days	✓
Anions and Nutrients : Bromide in Water by IC										
HDPE [ON MECP]										
Well-1	E235.Br	08-Jan-2026	09-Jan-2026	28 days	1 days	✓	12-Jan-2026	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE [ON MECP]										
Well-1	E235.Cl	08-Jan-2026	09-Jan-2026	28 days	1 days	✓	12-Jan-2026	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE [ON MECP]										
Well-1	E378-U	08-Jan-2026	09-Jan-2026	7 days	1 days	✓	12-Jan-2026	7 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
Well-1	E235.F	08-Jan-2026	09-Jan-2026	28 days	1 days	✓	12-Jan-2026	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE [ON MECP]										
Well-1	E235.NO3	08-Jan-2026	09-Jan-2026	7 days	1 days	✓	12-Jan-2026	7 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE [ON MECP]										
Well-1	E235.NO2	08-Jan-2026	09-Jan-2026	7 days	1 days	✓	12-Jan-2026	7 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
Well-1	E235.SO4	08-Jan-2026	09-Jan-2026	28 days	1 days	✓	12-Jan-2026	28 days	1 days	✓
Microbiological Tests : Total Coliforms and E. coli (Enzyme Substrate, 97 Well Tray)										
Sterile HDPE (sodium thiosulfate) [ON MECP]										
Well-1	E010.QT97	08-Jan-2026	----	----	----		09-Jan-2026	48 hrs	23 hrs	✓
Physical Tests : Alkalinity Species by Titration										
HDPE [ON MECP]										
Well-1	E290	08-Jan-2026	09-Jan-2026	14 days	1 days	✓	10-Jan-2026	14 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (2 CU)										
HDPE [ON MECP]										
Well-1	E329-L	08-Jan-2026	08-Jan-2026	51 hrs	4 hrs	✓	09-Jan-2026	51 hrs	4 hrs	✓
Physical Tests : Conductivity in Water										
HDPE [ON MECP]										
Well-1	E100	08-Jan-2026	09-Jan-2026	28 days	1 days	✓	10-Jan-2026	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
Well-1	E108	08-Jan-2026	09-Jan-2026	14 days	1 days	✓	10-Jan-2026	14 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE [ON MECP]										
Well-1	E162	08-Jan-2026	----	----	----		12-Jan-2026	7 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE [ON MECP]										
Well-1	E121	08-Jan-2026	----	----	----		09-Jan-2026	48 hrs	17 hrs	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Well-1	E420	08-Jan-2026	09-Jan-2026	180 days	0 days	✓	09-Jan-2026	180 days	0 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Total Coliforms and E. coli (Enzyme Substrate, 97 Well Tray)	E010.QT97	2411695	1	6	16.6	5.0	✓
Conductivity in Water	E100	2411509	1	3	33.3	5.0	✓
pH by Meter	E108	2411507	1	13	7.6	5.0	✓
Turbidity by Nephelometry	E121	2410899	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	2411140	1	14	7.1	5.0	✓
Bromide in Water by IC	E235.Br	2411515	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	2411513	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	2411514	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2411511	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	2411510	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2411512	1	8	12.5	5.0	✓
Alkalinity Species by Titration	E290	2411508	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	2415478	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (2 CU)	E329-L	2410584	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2411516	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2410675	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2411509	1	3	33.3	5.0	✓
pH by Meter	E108	2411507	1	13	7.6	5.0	✓
Turbidity by Nephelometry	E121	2410899	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	2411140	1	14	7.1	5.0	✓
Bromide in Water by IC	E235.Br	2411515	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	2411513	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	2411514	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2411511	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	2411510	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2411512	1	8	12.5	5.0	✓
Alkalinity Species by Titration	E290	2411508	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	2415478	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (2 CU)	E329-L	2410584	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2411516	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2410675	1	18	5.5	5.0	✓
Method Blanks (MB)							
Total Coliforms and E. coli (Enzyme Substrate, 97 Well Tray)	E010.QT97	2411695	1	6	16.6	5.0	✓
Conductivity in Water	E100	2411509	1	3	33.3	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Turbidity by Nephelometry	E121	2410899	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	2411140	1	14	7.1	5.0	✓
Bromide in Water by IC	E235.Br	2411515	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	2411513	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	2411514	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2411511	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	2411510	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2411512	1	8	12.5	5.0	✓
Alkalinity Species by Titration	E290	2411508	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	2415478	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (2 CU)	E329-L	2410584	1	2	50.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2411516	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2410675	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC	E235.Br	2411515	1	5	20.0	5.0	✓
Chloride in Water by IC	E235.Cl	2411513	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	2411514	1	10	10.0	5.0	✓
Nitrite in Water by IC	E235.NO2	2411511	1	12	8.3	5.0	✓
Nitrate in Water by IC	E235.NO3	2411510	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	2411512	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	2415478	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	2411516	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	2410675	1	18	5.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Coliforms and E. coli (Enzyme Substrate, 97 Well Tray)	E010.QT97 ALS Environmental - Waterloo	Water	APHA 9223 (mod)	The enzyme substrate test simultaneously detects Total Coliforms and E. coli in a 100 mL sample after incubation at 35.0 ±0.5°C for either 18 or 24 hours (dependent on reagent used). This method uses the 97 well Quanti-Tray.
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Waterloo	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC	E235.Br ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (True) by Spectrometer (2 CU)	E329-L ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed as $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because hardness is a property of water due to dissolved divalent cations. In non-turbid waters, Hardness from total Ca/Mg is normally comparable to Dissolved Hardness, but may be biased high if particulate forms of Ca or Mg are present.
Ion Balance using Total Metals	EC101A ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Sodium Adsorption Ratio [SAR] from Total Metals	EC102 ALS Environmental - Waterloo	Water	CCME Sodium Adsorption Ratio (SAR)	The Sodium Adsorption Ratio (SAR) for a water sample is calculated from the Sodium, Calcium, and Magnesium concentrations of the water, using the same calculations as would be used for a sediment paste extract.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
TDS calculated from conductivity	EC103A ALS Environmental - Waterloo	Water	APHA 1030 E	Total dissolved solids (as mg/L) can be estimated by multiplying electrical conductance (in umhos/cm) by 0.65.
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2 ALS Environmental - Waterloo	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

GC-455
MM-859
N-564

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page

Environmental Division Waterloo

Work Order Reference WT2600382

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Hydrogeology Consulting Services (Kitchener)
Contact:	Chris Helmer
Phone:	905-550-0969
	Company address below will appear on the final report
Street:	25 Water Street West
City/Province:	Elora, ON
Postal Code:	N0B 1S0
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax chrishelmer@hydrog.ca
Email 2
Email 3

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax chrishelmer@hydrog.ca
Email 2

Project Information

ALS Account # / Quote #: Standing Offer 2026
Job #: 5 Hughson Street
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only): WT2600382 FH.

ALS Contact: Emily Smith **Sampler:** Kevin Brunner

Select Service Level Below - Contact your AM to co

Regular [R] ☑ Standard TAT if received by 3 pm -

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business da | Same Day, We | (Laboratory op

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected

Analysis Requ

Indicate Filtered (F), Preserved (P) or Filtered and

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Potability Package
	Well-1	8 Jan 26	15:45	Water	4	✓
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		
				Water		

SAMPLES ON HOL

SUSPECTED HAZARD (see Special Instructions

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☒ NO

Are samples for human consumption/ use? ☒ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

ODWS

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				5.6			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Kevin Brunner	Jan 8/25	17:35

INITIAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (lab use only)

Received by:	Date:	Time:
NTD	08/01/026	17:45

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX E: TEST PIT LOGS

TP 1-26 to TP 2-26

HYDROGEOLOGY CONSULTING SERVICES INC

TP1-26

PROJECT NUMBER 10431 **METHOD** Bobcat E63 mini excavator **DRILLING DATE** January 8 2026

ADDRESS 5 Hughson Street, Branchton, Ontario **TOTAL DEPTH** 1.70m

COMMENTSN/A **LOGGED BY** Adrian Rudy

CHECKED BY Chris Helmer

Depth (m)	Major Unit	Graphic Log	Material Description	Samples	Moisture
0.1	Organic soil		Surface: Grass lawn Topsoil. Dark brown/black. Organic soil, moist		moist
0.5	Silt		Brown. Silt, trace fine sand. Moist	S1 (0.5m - 1.2m) Submitted for Grainsize	
1.2	Gravel and sand		Brown. Gravel and sand, some/trace cobble, trace silt. Moist	S2 (1.25m - 1.7m)	
1.6					

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HYDROGEOLOGY CONSULTING SERVICES INC

TP2-26

PROJECT NUMBER 10431 **METHOD** Bobcat E63 mini excavator **DRILLING DATE** January 8 2026
ADDRESS 5 Hughson Street, Branchton, Ontario **TOTAL DEPTH** 1.70m

COMMENTSN/A **LOGGED BY** Adrian Rudy
CHECKED BY Chris Helmer

Depth (m)	Major Unit	Graphic Log	Material Description	Samples	Moisture
0.1	Silt fill and organic soil		Surface: Grass lawn Topsoil. Dark brown. Organic soil and silt fill. Moist		moist
0.2	Silt, fine sand and organic soil		Fill. Brown. Silt, fine sand and organic soil, trace gravel and rootlets. Moist		
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9				S1 (0.9m - 1.2m)	
1					
1.1					
1.2					
1.3	Silt and sand		Fill. Light greyish brown. Silt and sand, some gravel and bricks. Trace cobbles. Moist Old fill layer and housed debris		
1.4					
1.5					
1.6					
1.7	Gravel and sand		Native. Brown. Gravel and sand, some cobble and silt. Moist	S2 (1.7m - 2.0m) Submitted for Grainsize	
1.8					
1.9					

produced by ESlog.ESdat.net on 14 Jan 2026