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Hydrogeological Investigation & Terrain Analysis
Proposed Chicken Processing Facility
Part of Lot 7, Concession 4 (3043 Dunning Road)
Ottawa, Ontario

GEMTEC Project: 100117.056

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Submitted to:

Laplante Poultry Farms Limited
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Sarsfield, Ontario
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Hydrogeological Investigation & Terrain Analysis
Proposed Chicken Processing Facility
Part of Lot 7, Concession 4 (3043 Dunning Road)
Ottawa, Ontario

December 20, 2024
GEMTEC Project: 100117.056

experience • knowledge • integrity

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December 20, 2024 File: 100117.056 - R1

Laplante Poultry Farms Limited
3105 Dunning Road
Sarsfield, Ontario
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Attention: Robert Laplante

Re: Hydrogeological Investigation & Terrain Analysis
Proposed Chicken Processing Facility
Part of Lot 7, Concession 4 (3043 Dunning Road)
Ottawa, Ontario

Please find enclosed our hydrogeological investigation report for the above noted project, in accordance with our proposal (revision 1) dated December 19, 2023. This report was prepared by Jason KarisAllen (P.Eng.) and Sam Esenwa and reviewed by Andrius Paznekas (P.Geo).

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Enclosures
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1.0 INTRODUCTION

Laplante Poultry Farms Limited (LPF) retained GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) to prepare a hydrogeological investigation and terrain analysis for the required Zoning By-law Amendment associated with the proposed chicken processing plant at 3043 Dunning Road, Ottawa, Ontario (the site; Figure B.1). The site is currently zoned as Agricultural Resource Area by Schedule B9 of the Official Plan of the City, with proposed re-zoning to include an Agricultural (AG) Specifical Exemption to permit an abattoir as an agricultural related use.

The proposed chicken processing plant will be constructed within the existing building footprint. Parking for the facility will be located west of the building, and private well and septic services will be approximately positioned as shown in Figure B.1. The processing plant may employ up to 35 employees within three years, and up to four showers will be available for special use. Water demand will consist of chicken processing needs and employee uses (estimated to be 3,750 litres per day assuming 125 litres/employee/day). The total water taking for the proposed facility was estimated as 98,900 litres per day, which includes a 15% buffer above the reported maximum water usage of an existing operation (without showers) owned and operated by LPF in Monkland, Ontario. The 15% buffer includes more conservatism than would be needed to account for the shower facilities. Water takings are assumed to occur over a 12-hour period, 5 days a week based on the information provided to us. Four continuously operated water storage tanks will be located within the facility with a combined storage capacity of 52,000 litres for the operational security of the plant.

It is understood that an off-site treatment lagoon will manage the non-agricultural source materials (NASM) from the chicken processing plant at an off-site receiving site and is considered outside of the scope of this investigation. Furthermore, no manure or chicken processing by-products will be stored on site. Nonetheless, a summary of the NASM facility approval process is provided for consideration in Section 2.3.

The objectives of this investigation are to:

- Review available background information to assist in characterization of subsurface conditions in the vicinity of the site and develop a hydrogeological conceptual model;
- Identify and characterize the subsurface conditions on the site as they relate to the suitability of on-site septic sewage disposal systems;
- Assess the potential for impact on the receiving aquifer(s) and any nearby surface water features from on-site septic disposal systems;
- Investigate the potential quantity and quality of groundwater available from drilled test wells on the site as an industrial supply; and
- Assess the potential for interference between on-site and off-site well users.

Following a review of available background information and analysis of the results of the field investigation, conclusions and recommendations for the proposed chicken processing plant are provided. This report is subject to the *Conditions and Limitations of This Report* provided in Appendix A, which are considered an integral part of this report.

1.1 Technical Pre-consultation

A technical pre-consultation was held between GEMTEC, LPF, and the City of Ottawa on December 14, 2023; Tessa Di Iorio and Obai Mohammed were present as technical representatives of the City. The City requested that a workplan be submitted for the proposed hydrogeological investigations and that it include an assessment of vulnerable dug or bored wells in proximity of the site. The workplan was submitted to the City on December 12, 2023, and feedback was received by email on December 19, 2023. Additional feedback was received by the City on May 9, 2024. This report was prepared with consideration of the feedback and input provided by the City during the technical pre-consultation and subsequent feedback documents and email correspondence.

1.2 Existing Reports

GEMTEC has performed a geotechnical investigation and phase one and two environmental site assessment in conjunction with the hydrogeological investigation reported on herein, the results of which have been compiled in the following reports:

- GEMTEC. (October 2, 2024a). *Geotechnical Investigation, proposed chicken processing plant, 3043 Dunning Road, Sarsfield (Ottawa), Ontario* [in draft, unsubmitted]. Ottawa, Ontario.
- GEMTEC. (June 20, 2024b). *Phase One Environmental Site Assessment, proposed chicken processing plant, 3043 Dunning Road, Ottawa, Ontario*. Ottawa, Ontario.
- GEMTEC. (September 6, 2024c). *Phase Two Environmental Site Assessment, 3043 Dunning Road, Ottawa, Ontario*. Ottawa, Ontario.

2.0 PROJECT SETTING

2.1 Site Geometry and Location

The site is in Sarsfield, Ontario, a village in the Cumberland Ward in the east portion of the City of Ottawa (City). The site is rectangular and approximately 1.66 hectares (ha) in area. It is bounded by Dunning Road at the intersection of Dunning Road with Giroux Road to the west, and to the north, east and south by agricultural properties at 3085 and 3105 Dunning Road, which are also owned by LPF.

2.2 Land Use and Land Cover

The site is situated within a larger agricultural area. The existing land use designation from the City of Ottawa is general rural area (GEMTEC, 2023 [in draft]). The City of Ottawa zoning by-law is agricultural zone (AG[537r]).

The Rideau Valley Conservation Authority (RVCA) 2020 landcover summary was reviewed within approximately 500 metres of the site. RVCA (2022) indicates that 3043 Dunning Road is one of approximately twelve settlement areas designated as pervious homesteads within 500 metres of the site. A review of satellite imagery suggests that these settlement areas consist of commercial, agricultural, and residential uses. Small areas of woodland and meadows or thickets are mapped along ditches and drains, but most of the reported land cover surrounding the site consists of crops and pastures.

2.3 Non-agricultural Source Material (NASM) Facility Approval Process

GEMTEC does not proport to be a subject matter expert on NASM facilities, but offers this summary based on information provided by LFP and their consultants (primarily Hugh Metcalfe, NASM Planner) to satisfy the requests of the City. The provided information substantiates that regulatory oversight will be in place to manage risk associated with the NASM facility and no further consideration from a hydrogeological perspective is practicable at this time.

GEMTEC understands that approval and design of a NASM facility are underway at 3105 Dunning Road adjacent to the site. NASM plans must be prepared by a certified NASM Plan developer and comply with the nutrient management regulation, the nutrient management protocol, the NASM odour guide, and the sampling and analysis protocol.

The proposed NASM facility will consist of two 123-inch diameter (circle), 40-foot deep, covered, straight-walled liquid storage tanks (total capacity of 6,933,084 gallons). The tanks will be mostly surrounded by berms to increase overland flow paths to surface water features to at least 50 metres. Approval was granted for 3105 Dunning Road by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) to store and apply NASM from another chicken processing plant owned by LPF located in Monkland, Ontario. Approval cannot be granted for the proposed chicken processing plant at 3043 Dunning Road until it is operational in order to maintain waste management operations at the Monkland processing plant.

A NASM Plan amendment and updated Engineering Requirement Form will be submitted once the 3043 Dunning Road processing plant and the NASM facility are ready for operation. Any transfer system moving wash-water waste between the proposed plant and NASM facility will be regulated by OMAFRA (approval authority) and the Ontario Ministry of Environment, Conservation and Parks (MECP; enforcement) under Ontario Regulation 267/03 and the Nutrient Management Act, 2002 (or alternatively the Environmental Protection Act). An ECA will be required for the underground piping system between the chicken processing plant and NASM facility.

Furthermore, a professional engineer will be responsible for the design and implementation of the transfer systems.

2.4 Designated Areas and Permitted Water Takings

The site is located within the Becketts Creek catchment, within the Ottawa River East subwatershed, both of which are under the regulatory authority of the RVCA. RVCA-regulated unstable slopes are mapped along segments of the Rolland Dutrisac Drain found northeast of the site (RVCA, 2022).

The site was not located within a well head protection area, intake protection zone (MECP, 2022), or a flood-prone area (RVCA, 2022).

No significant groundwater recharge areas are mapped within 1.5 kilometres of the site (RVCA, 2022), which is corroborated by surrounding soils being generally mapped as low-permeability clays and silts (OGS, 2010).

No Areas of Natural and Scientific Interest (ANSI) were identified within one kilometre of the site (MNRF, 2012). The nearest ANSI is the Sarsfield-Bearbrook Esker approximately 1.4 kilometres southeast, which is reported to be non-sensitive but of provincial significance.

The Environmental Site Registry database (MECP, 2024) was reviewed and there are no active Permits to Take Water or Environmental Activity and Sector Registrations within 1.5 km of the proposed development, apart from the registration for the on-site pumping test performed as part of this investigation. The nearest active PTTW (Permit No. 5284-BMKL9W, issued to Lafarge Canada Incorporated) is reported approximately 1.9 kilometres southwest of the site associated with quarrying activities. This permit allows for a maximum water taking of up to 12,869,000 litres per day for dewatering, aggregate washing, and construction purposes.

2.5 Topography, Drainage, and Water Features

The topography of the site is relatively flat with less than 5 m of relief as shown in Figure B.1, Key Plan (Appendix B). Mapping indicates that there is a south-north trending channelized drainage feature along the eastern perimeter of the site (Jules Potvin Drain), and a west to east flowing surface water feature directly north of the site to which several channelized drainage features discharge. This surface water body appears to be the eastern continuation of the Rolland Dutrisac Drain on the west side of Dunning Road. Additionally, field reconnaissance indicates that there are drainage ditches located along the western, northern, and southern property boundaries.

There are no mapped wetlands at the site or within 500 m of the site. The nearest downgradient wetland within the same watershed is a non-evaluated swamp approximately 1.2 kilometres east of the site.

2.6 Regional Surficial and Bedrock Geology

The site is located within the Ottawa Valley Clay Plains physiographic region (Chapman and Putnam, 2007).

Mapped surficial geology from the Ontario Geological Survey (OGS) in the vicinity of the site consists of massive to well laminate fine-textured glaciomarine deposits consisting of silt and clay with minor sand and gravel (OGS, 2010). Available drift thickness mapping (Gao et al., 2006) indicates that overburden within 100 metres of the site ranges from approximately 12 to 18 metres.

The bedrock underlying the overburden consists of Lindsay Formation (Simcoe Group) limestone (Armstrong and Dodge, 2007). The bedrock is mapped sloping downward to the northeast (Gao et al., 2006).

Available karst mapping (Brunton and Dodge, 2008) does not indicate any areas of any inferred or potential karstic features within 500 metres of the site.

2.7 Ontario Ministry of Environment, Conservation and Parks Water Well Records

Public water well records (MECP, 2021, updated April 2023) reportedly within 500 m of the site were reviewed and their reported locations are shown on Figure B.2, Appendix B. Appendix C includes a copy of the public well records within 500 metres and the records of two wells owned by LPF. A summary of the information included in these well records is presented as Table C.1, Appendix C, and Table 2.1 summarizes select data from the reviewed water well records.

Table 2.1 – Summary of MECP Water Well Records

Well Use	Overburden	Bedrock	Well Depth (m)		
			Min.	Max.	Avg.
Domestic (only)	8	3	6.1	34.4	17.8
Livestock	0	2	16.9	22.9	19.9
TOTAL	**8**	**5**	-	-	-

The findings of the well record review were summarized as follows:

- Upon review of Well IDs 1513961 and 1528498, the wells were not believed to be located within 500 metres of the site based on the locations indicated.
- The remaining 11 wells records indicate the following uses:
  - Ten domestic wells and
  - One livestock well.
- Static water level measurements ranged from 0.3 m to 5.5 m below ground surface (mbgs), with a median value of 1.8 mbgs (n = 13).

- Bedrock depths are reported between 12.5 and 30.2 mbgs, with a median value of 21.9 mbgs (n = 5). This is generally consistent with geological mapping for the area suggesting overburden thicknesses between 12 and 18 metres.
- The local water supply aquifer consists of an interface aquifer composed of upper limestone bedrock and overlying gravel and sand overlain by a thick deposit of clay and silt.
- All wells identified within 200 metres of the site have 10+ metres of clay reported on their well record overlying the supply aquifer.
- No dug or bored wells were identified within at least 300 metres of the site through a review of the public well records or by a door-to-door survey of nearby property owners.

2.8 Provincial Ambient Groundwater Geochemistry

The Ontario Geologic Survey (OGS) began collecting and reporting ambient groundwater geochemical data across southern Ontario and has published the results of their work from 2007 to 2019 (Hamilton, S.M., 2021). Available data within one kilometres of the site were reviewed. Descriptions of the wells within this search radius are summarized below:

- Two drilled interface wells (public well records 1513950 and 1512438) within the glacial till or shallow bedrock (bedrock surface would likely be connected to the overburden interface aquifer).
    - Well depths ranging from 9.4 to 12.2 mbgs
    - Static water level ranging from 0.3 to 0.9 mbgs

Historical analyses of nutrient concentrations are available for these well locations and were reviewed as potential indicators of surface water influence to the groundwater supply aquifer. Significant uncertainty is associated with these data.

Dissolved organic carbon (DOC) was 3 mg/L in 1513950 (not measured in 1512438), which is above the threshold of 1 mg/L proposed by Chapelle (2022) warranting further investigation. DOC serves as a growth nutrient for bacteria and may also be an indicator of surface water influences in a supply aquifer (Chapelle, 2022). However, it is noted that this value is on the low end of reported values for dug or drilled well water samples in Southern Ontario (Hamilton, S.M., 2021).

Nitrite and nitrate concentrations were below detection limits. Ammonia and ammonium in 1513950 (not measured in 1512438) cumulatively were below the threshold typically expected for ammonia alone in groundwater of 0.2 mg/L (Bouwer & Crowe, 1988).

Phosphate concentrations were non-detect (<0.04 mg/L) within 1513950 and 0.14 mg/L in 1512438. Phosphate may originate from septic effluent, the application of fertilizers for agricultural purposes, livestock, or from natural biotic or abiotic sources. Phosphate is generally reported as elevated in this region relative to other regions of Southern of Ontario (Hamilton, S.M., 2021).

No fecal or total coliform were measured within 1513950 (not measured in 1512438).

2.9 Environmental Site Assessments

GEMTEC performed a Phase One Environmental Site Assessment (ESA) for the site that identified the presence of three areas of potential environmental concern associated with the presence of:

- Two aboveground storage tanks north of existing chicken barn;
- One off-site aboveground storage tank identified about 10m south of the site; and
- A transformer northwest of the building.

Accordingly, a Phase Two ESA was completed by GEMTEC to investigate the areas of potential environmental concern. Based on the results of the soil samples and groundwater samples submitted as part of this Phase Two ESA, no impacts were identified. The results of the Phase One and Phase Two ESA's are presented under separate covers, in reports titled:

- *"Phase One Environmental Site Assessment, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario"* prepared by GEMTEC and dated June 20, 2024 (GEMTEC, 2024a).
- *"Phase Two Environmental Site Assessment, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario"* prepared by GEMTEC and dated September 6, 2024 (GEMTEC, 2024b).

The environmental site assessment included the installation of two monitoring wells (i.e., BH24-03 and BH24-04), installed into the silty clay. The location of these wells is shown in Figure B.1.

3.0 TERRAIN ANALYSIS

Two pairs of clustered boreholes (BH), BH24-1S/D and BH24-2S/D were advanced on-site between January 4th and 8th, 2024, to investigate subsurface conditions. Drilling was undertaken by Limitless Drilling of Ontario using a CME 45B trailer drill rig. Each borehole pair consisted of a shallow (24-1S and 24-2S) and deeper (24-1D and 24-2D) well.

Soils were logged in both deeper holes and soil samples were returned to the GEMTEC Ottawa soils lab for characterisation. Descriptions of the subsurface materials encountered in the deeper boreholes are provided in Appendix D, along with the results of the laboratory classification testing.

Monitoring wells were installed in all four boreholes for water level monitoring and hydraulic testing. Wells were developed on January 9, 2024, by purging three times the calculated well volume or until gurgle dry. Test and monitoring well locations and elevations, as presented in Figure B.1, were surveyed by GEMTEC staff using a Trimble R10 global positioning system using NAD83 / UTM zone 18N for horizontal coordinates and CGVD28 as the vertical datum.

Monitoring wells were constructed with two-inch PVC pipe and ten-foot slotted screens at their base. The slotted screens were surrounded by filter sand, above which bentonite pellets were used to seal the filter pack back to surface. Well construction details (including monitoring wells installed as part of GEMTEC (2024b) are presented in the Borehole Logs of Appendix D.

Wells were instrumented with sensors to monitor well recovery after purging, measure static water levels, and infer vertical gradients across the monitoring network. Monitoring wells 24-1D, 24-2S, 24-2S were monitored between January 22 and 31, 2024, 24-1S was monitored between January 25 and 31 and MW3085 was monitored between January 24 and 31, 2024. Test well TW1 was monitored between January 9 and 22, 2024.

Single-well, in-situ hydraulic testing was performed within each on-site monitoring well on January 15, 2024. The hydraulic testing included short-term (up to 20 minutes long) falling and rising head tests involving the introduction or removal of a known volume (i.e., slug tests) and monitoring water level recovery. Well water level recovery data was recorded using a data logger and corroborated by manual measurements. Where short-term recovery was insufficient for meaningful analysis after approximately 20 minutes, purge and recovery data from well development was analysed to estimate hydraulic conductivity.

3.1 Soils Summary

The following subsections present an overview of the subsurface conditions encountered at BH24-1D and BH24-2D advanced by Limitless Drilling under the supervision of GEMTEC.

3.1.1 Topsoil

Topsoil with a thickness of about 100 millimetres was encountered at ground surface in both boreholes.

3.1.2 Silty Clay and Weathered Crust

Weathered crust, described as brown silty clay, was encountered below the topsoil in each borehole. The weathered crust is underlain by native deposits of grey silty clay, which extend to depths of about 12.95 to 15.39 mbgs.

Four grain size distribution tests were carried out on selected samples of the silty clay deposits. The results are provided in Appendix D and are summarized in Table 3.1.

Table 3.1 – Summary of Grain Size Distribution Testing

Borehole ID	Sample Number (SA)	Sample Depth (metres)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
24-1D	03	1.52 – 2.13	0.0	0.4	44.2	55.4
	15	10.67 - 11.28	0.0	0.8	43.4	55.8
24-2D	03	2.28 - 2.89	0.0	1.0	42.5	56.5
	11	8.38 – 8.99	0.0	0.7	39.9	59.4

The water content measured in four samples of the silty clay deposits ranged from about 47 to 85%.

3.1.3 Glacial Till

Glacial till was encountered below the native silty clay layer and is described as compact to dense, grey silty sand, some gravel, with cobbles and boulders. The glacial till layer extends to depths between 15.32 to 18.19 mbgs.

3.1.4 Auger Refusal

Auger refusal on inferred bedrock, described as dark grey limestone, was encountered within both boreholes at depths of 15.32 and 17.35 mbgs.

3.2 Hydraulic Conductivity

The hydraulic conductivity of the soil layers encountered within the boreholes was estimated through the characterisation of soil compositions and by single-well, in-situ hydraulic testing performed within all on-site wells.

3.2.1 Unified Soils Classification System Estimates

Soils were classified using the Unified Soils Classification System (USCS). The 2012 Building Code Compendium (MMAH, 2022) proposes representative ranges of hydraulic conductivities for each soil classification of the USCS. The USCS classifications and associated MMAH (2022) hydraulic conductivities are presented in Table 3.2. Sample IDs follow the convention of the soil lab characterisation sheets included in Appendix D. Samples SA 15 from borehole 24-1D and SA 11 from borehole 24-2D were tested for liquid limit, which is required for USCS classification of fine soils. Hydrometer results suggest comparable soil properties within the shallow samples collected.

Table 3.2 – Hydraulic Conductivity Estimates Derived from Soil Classifications

Well ID	Sample ID	Sample Depth (m)	USCS Classification	MMAH Hydraulic Conductivity Range (m/s)
24-1D	SA 15	10.67 – 11.28	CL (Lean clay)	10^{-8} or less
24-2D	SA 11	8.38 - 8.99	CL (Lean clay)	10^{-8} or less

3.2.2 Single-Well Hydraulic Testing Estimates

The Bower and Rice (1976) and Hvorslev (1951) solutions for confined aquifers were used to analyse the single-well, hydraulic testing data within Aqtesolv (version 4.50.002). The parameters and results of these analyses are presented in Appendix E. The Hvorslev solution yielded consistently more conservative estimates, which for the purpose of the terrain analysis implies a higher estimate of hydraulic conductivity, relative to the Bower and Rice solution; therefore, only the Hvorslev-estimated hydraulic conductivities are presented and discussed herein.

Table 3.3 - Hydraulic Conductivity Estimates Derived from Single-well Hydraulic Testing

Well ID	Material Screened	Falling Head Test K (m/s)	Rising Head Test K (m/s)	Purge and Recovery Test (m/s)
24-1S	Silt and Clay	5×10^{-9}	N/A	N/A
24-1D	Sand and Gravel (Glacial Till)	7×10^{-4}	5×10^{-4}	N/A
24-2S	Silt and Clay	*2×10^{-6}	*1×10^{-9}	2×10^{-8}
24-2D	Sand and Gravel (Glacial Till)	4×10^{-5}	2×10^{-5}	N/A

Notes: *Uncertainty in estimate of hydraulic conductivity due to irregular recovery. Results for falling head test are not consistent with rising head and purge/recovery monitoring, possibly due to filter pack and/or screen effects.
N/A – No data or no analysis performed.

3.3 Groundwater Conditions

The groundwater conditions were monitored in all on-site monitoring wells (i.e., 24-1S, 24-1D, 24-2S, and 24-2D), on-site test well TW1, and MW3085 (Well ID 150621, Appendix C), an offsite

livestock water supply well located approximately 246 metres south of the site. The groundwater level in the monitoring wells were measured manually between the 15th and 31st of January 2024.

Vertical gradients between shallow and deep wells indicate downwards groundwater flow, while horizontal gradients indicate local groundwater flow towards the east-southeast, generally coinciding with local topography. Groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

Table 3.4 – Overburden Groundwater Depth and Elevation

Well ID	Date of Measurement	Groundwater Depth (mbgs[1])	Groundwater Elevation (masl[1])
TW1	25-01-2024	1.33	85.02
24-1S	15-01-2024	1.46	84.64
	25-01-2024	0.81	85.28
	31-01-2024	0.74	85.35
24-1D	15-01-2024	1.09	85.09
	25-01-2024	1.19	84.99
	31-01-2024	1.20	84.98
24-2S	15-01-2024	0.89	85.59
	25-01-2024	0.79	85.69
	31-01-2024	0.63	85.85
24-2D	15-01-2024	1.39	85.14
	25-01-2024	1.49	85.04
	31-01-2024	1.51	85.02
MW3085[2]	25-01-2024	3.08	83.82
	31-01-2024	3.30	83.60

Notes:

1. mbgs = metres below ground surface ; masl = metres above mean sea level (CGVD28)
2. Refer to Section 6.1 and Figure B.1, Appendix B for details.

4.0 HYDROGEOLOGICAL CONCEPTUAL MODEL

A west-east hydrogeological cross-section (see Figure B.3 and B.4, Appendix B) was prepared based on information from on-site test wells, geological mapping (see Section 2.5), and public water well records (see Section 2.7). The framework for the hydrogeological conceptual model for the site is summarized in Table 4.1. Please note that the boundaries between zones indicated have been interpreted based on available information and may differ from on-site conditions.

Table 4.1 – Framework of Hydrogeological Conceptual Model

Stratigraphic Unit	Generalized Composition	Thickness (m)	Water Saturation
Overburden	• Topsoil • Lean Clay • Coarse Glacial Till	<1 >10 0.9 to 5	Dry Increasing with depth Saturated
Bedrock	• Upper Fractured Limestone • Lower, Less Fractured Limestone	Unknown Unknown	Saturated Saturated

It is our understanding that the hydrogeological cross-section is consistent with available background information and the site-specific geology from the on-site field investigation. In general, the site geology consists of thin topsoil, underlain by a thick clay layer (isolating unit), followed by coarse glacial till (water supply aquifer), underlain by limestone bedrock. The upper bedrock is expected to be highly fractured and hydraulically connected with the overlying glacial till layer, forming part of the water supply aquifer. The bedrock is mapped sloping downward to the northeast, and overburden is expected to pinch out to the south-west (upgradient) with increasing bedrock surface elevations.

5.0 IMPACT ASSESSMENT

The impact on groundwater and surface water resources from conventional on-site sewage disposal system are assessed in the following subsections. It is understood that any processing waters from the proposed poultry facility will be taken to an off-site receiver. The on-site septic system will include wastewater from employee washrooms only.

5.1 Class IV Conventional Sewage Disposal System

This section discusses the results of the terrain evaluation as they relate to the feasibility of installing Class IV sewage disposal systems on the site. It should be noted that the following information is provided for general guidance purposes only and that all septic systems installed on the site should be designed and installed by a Qualified Person (QP). In all cases, the septic system design must conform to Ontario Building Code (OBC) requirements.

A draft septic design plan was produced by Kollard Associates Engineers and was provided to GEMTEC by LPF for inclusion within this report (Appendix G). The design capacity of the system is less than 10,000 L/day and was proposed by Kollard Associates Engineers to accommodate the loading produced by 50 on-site employees over 5-day work weeks. Corroborating their design calculation is beyond the scope of this report.

The septic leaching bed is positioned to the front of the property, more than 18 metres away from the on-site water supply well. The proposed septic system is also located greater than 15 metres from any surface water features, including the municipal drain located east of the site.

The septic leaching bed design must ensure that the bottom of the absorption trenches is at least 0.9 metres above low permeability soils (such as clay), bedrock, and the seasonally high groundwater table. Based on the clays observed on-site, it is expected that the septic leaching bed will be fully raised.

5.2 Surface Water Impacts

The discussion provided herein, in relation to surface water impacts to adjacent surface water features, is concerned primarily with septic effluent discharging from on-site septic systems. Phosphorus is known to be the primary contaminant of concern for freshwater aquatic systems impacted by septic effluent.

Phosphorus attenuation in septic system leaching fields involves a combination of biotic and abiotic process including sorption/precipitation reactions, plant uptake, and mineralization/immobilization by microbes; however, the dominant attenuation mechanisms are sorption/precipitation mechanisms (Wilhelm, et al., 1996).

Although there remains some uncertainty in the scientific community regarding the mobility of phosphate in the subsurface, phosphate is known to be considerably reactive, is strongly adsorbed by most sediments, and is capable of combining with a number of metal cations (particularly iron, aluminum, manganese and calcium) to form a wide range of minerals that can be stable in low temperature aqueous environments (Parfitt et al, 1975; Rajan 1975; Isenbeck-Schröter et al., 1993; Roberston et al, 1998).

The minimum setback from surface water features is 15 metres, as per the Ontario Building Code. The travel path of treated effluent within and/or atop the clay would be greater than 200 metres

to the nearest mapped surface water feature (i.e., agricultural drain to the east). Despite the potential for the ditches along the property boundaries to intercept treated effluent and accelerate transport, the impact to surface water features is unlikely to be significant, especially considering the agricultural context of the catchment.

5.3 Groundwater Impacts

The potential impacts of the proposed septic loading to groundwater resources on and off the site was assessed in general accordance with Ministry of Environment Procedure D-5-4: Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment (MECP, 1996).

Water surplus is expected to be limited due to the clay materials present, hard surface area proposed, and proposed land cover, reducing the available water surplus for dilution of septic loads. As the chicken processing plant projects employing up to 50 employees, lot size exemptions were considered inadequate to substantiate the capacity of the site to accommodate the proposed development. Thus, this section presents an assessment of hydrogeological sensitivity and a review of the interpreted isolating conditions found at the site.

5.3.1 Hydrogeological Sensitivity

The hydrogeological sensitivity of the site was evaluated. Areas of thin soil cover, fractured bedrock exposed at ground surface, and karst environments contribute to the hydrogeological sensitivity of a site. Where present, these conditions may not allow for sufficient attenuative processes for on-site septic systems resulting in negative impacts to the receiving aquifer. Areas of thin soil cover, generally taken to be less than two metres, were not encountered on-site (refer to Section 3.1), and geological mapping reflects thick deposits of low-permeability overburden. As such, the site is not considered hydrogeologically sensitive terrain.

5.3.2 Assessment of Hydrogeological Isolation

The risk of sewage effluent contamination must be assessed for the proposed development. As per Procedure D-5-4, it is required to:

- Evaluate the most probable groundwater receiver for sewage effluent; and
- Define the most probable lower hydraulic or physical boundary of the groundwater receiving the sewage effluent.

Based on the hydrogeological conceptual model and as per the isolation requirements of MECP Procedure D-5-4, the groundwater receiver for the septic effluent is the upper clay overburden. This clay overburden is interpreted as an effect isolation layer for the underlying water supply aquifer. Several lines of evidence (as indexed below for Table 5.1) were explored to substantiate the merit of aquifer isolation:

1. Review of geological mapping, public well records (Appendix C) and homeowner interviews;
2. Borehole investigation program with soil sampling to infer geological layers and thicknesses;
3. Soil characterisation to corroborate field-interpreted soil types and estimate hydraulic conductivity;
4. Single-well hydraulic testing in supply aquifer and isolating unit to estimate hydraulic conductivity;
5. Water level monitoring of shallow and deep wells during regular operation of the existing test well for agricultural purposes;
6. Review of water level responses in monitoring wells during an eighteen-hour pumping test performed within TW1; and
7. Review of available water quality information for potential indications of surface water influences including tannins and lignans, nitrates, nitrites, ammonia, bacteria, phosphate, and organic carbon.

The main findings of these reviews and investigations, as pertains to the evaluation of isolation, are summarized in Table 5.1, with the Index number referring to the list above.

Table 5.1 – Summary of Findings Relating to Hydrogeological Isolation

Index	Main Findings
1	• Mapped overburden thickness within 100 metres of the site ranges from approximately 12 to 18 metres. • Mapped soil type is low-permeability offshore marine deposits. • Public well records within 100 metres of the site have 10+ metres of clay reported in their borehole log. Clay pinches out at greater distances but is still 5+ metres thick in records within 500 metres. • All nearby wells exploit the shallow fractured bedrock and/or overlying overburden interface aquifer (sand and gravel) that is capped by clay. • No homeowners interviewed reported the use of shallow dug wells, including 3016, 3094, 3128, and 3178 Dunning Road and 2570 Giroux Road.
2	• On-site conditions include a layer of clay and silt materials over a sand and gravel glacial till supply aquifer, which is underlain by limestone. • Borehole 24-1D has a clay layer that is over 15 metres thick. • Borehole 24-2D has a clay layer that is over 10 metres thick.
3	• Four soil samples of clay were submitted for characterisation via hydrometer testing and two for soil plasticity tests. Results suggest that the isolating layer

Index	Main Findings
	is lean clay (USCS group) which has a reported hydraulic conductivity of 10^{-8} m/s or less.
4	• The analysis of the single-well hydraulic tests suggests a horizontal hydraulic conductivity for the water supply aquifer between 10^{-4} and 10^{-5} m/s, whereas the overlying clay is likely 10^{-8} m/s or less.
5	• Monitoring wells screened within the water supply aquifer respond to larger withdrawals from the on-site test well, but not to smaller daily usage. • Water levels within shallow wells do not respond to regular usage from the test well over the monitoring period. • Vertical hydraulic gradients over the site are slightly downward.
6	• The on-site test well (TW1) was pumped at approximately 45.6 US gpm for 18 hours to assess the water supply aquifer. • Monitoring wells within the clay did not respond to pumping during the test. • Monitoring wells within the glacial till aquifer responded to the test approximately 131 to 141 metres away (24-1D and 24-2D), but not so far as 246 metres (MW3085).
7	• Provincial Ambient Groundwater Geochemistry data for two nearby wells (reportedly within one kilometre) reported non-detect nitrate/nitrite and coliform bacteria, but measureable concentrations of DOC and phosphate. • No conclusive water quality indicators of surface water influences were noted in the groundwater quality samples taken on site over the course of the investigation. Phosphate was non-detect (<0.5 mg/L) in water quality samples and DOC was relatively low and stable during pumping (1.3 to 1.6 mg/L).

Data from the provincial ambient groundwater geochemistry program has various sources of uncertainty; given that no compelling evidence of surface water contamination was identified during our on-site sampling program, the slightly elevated concentration of phosphate is likely associated with well installation, construction, or insufficient development before groundwater sampling was performed. Conversely, low levels of DOC were noted in both well water samples (1.3 and 1.6 mg/L) and may be indicative of ambient concentrations of the target aquifer; however, the source of the DOC in uncertain.

Downward gradients are not considered problematic for the purpose of the proposed septic design given the thickness and low permeability of the clay layer.

In short, the findings of the hydrogeological investigation support that the supply aquifer (glacial till and upper bedrock) is hydrogeologically isolated from the proposed septic system within 100 metres of the site. Thus, GEMTEC interprets that the site can accommodate the proposed septic loading in accordance with MECP Procedure D-5-4.

6.0 GROUNDWATER SUPPLY

A groundwater supply investigation was carried out in accordance with the MECP August 1996 document “Procedure D-5-5, Technical Guideline for Private Wells: Water Supply Assessment”, to determine the quantity and quality of groundwater available for the industrial water supply. The results of the groundwater supply investigation are summarized in the following subsections.

6.1 Test and Monitoring Well Construction

An existing on-site test well was utilised to evaluate if the productivity of the target water supply aquifer was sufficient to sustain the proposed use. The MECP well record (Well ID 134543; Appendix C) for the well was provide to GEMTEC by LPF. The well casing has a diameter of eight inches, the well depth is approximately 18.0 metres, and the well is currently in use as an agricultural and livestock supply well. The well record indicates that the casing is more than six metres below ground surface and was sealed from surface to 6 metres below ground surface using cement grout.

The well was inspected by GEMTEC and was found to be in good condition, with soils grading away from the well head and sufficient above-ground casing to comply with Ontario Regulation 903. It was noted that above ground oil storage tanks were located within 15 metres of the well; it is recommended that these tanks be relocated to comply with the separation distances prescribed within Ontario Regulation 903 for new wells. However, it has been confirmed with the MECP that relocation of the fuel storage tanks is not mandatory for existing wells.

Four two-inch monitoring wells were constructed on site to monitor aquifer response to pumping. Two of the monitoring wells (24-1S and 24-2S) were screened across the clay unit, whereas the other two were screened within the target water supply aquifer. An existing water supply well (Well ID 150621, Appendix C) located on an adjacent property owned by LPF was monitored during the pumping test to expand the monitoring program; this well is referred to as MW3085 (Figure A.1). The location (Figure A.1) and construction details for the monitoring and tests wells are summarized in Table 6.1.

Table 6.1 – Summary of Test and Monitoring Well Location and Construction

Well ID	Longitude[1]	Latitude[1]	Ground Elevation (masl[2])	Well Diameter (inch)	Well Depth (mbgs[2])	Casing Length (mbgs)
TW1	471332.2	5033475.1	86.4	8	18.0	18.0
24-1S	471450.0	5033521.8	86.1	2	7.9	4.9
24-1D	471454.4	5033522.8	86.2	2	18.2	15.1
24-2S	471198.1	5033421.0	86.5	2	7.9	4.9
24-2D	471201.7	5033421.0	86.5	2	15.5	12.5
MW3085	471481.5	5033279.8	86.9	8.25	16.8	7.3

Notes:
1. Coordinates provided in Nad83 / UTM zone 18N
2. mbgs = metres below ground surface; masl = metres above mean sea level (CGVD28)

6.2 Weather Station Data

Precipitation and air temperature data from the Ottawa International Airport Station located approximately 40 km east from site (Climate I.D: 6106001) were examined in conjunction with water level data over the monitoring and pumping period (Figure F.1, Appendix F). Precipitation events predominantly consisted of snowfall with a few minor rainfall events. Mean daily temperatures generally remained below freezing, with a few exceptions, presumably maintaining frozen soil conditions throughout the investigation. Rainfall was observed within the last 1.5 hours of the pumping test, as corroborated by the weather station data for January 25th and 26th, 2024 (see Figure F.1, Appendix F).

6.3 Water Level Monitoring

Water level measurements were collected from all on-site wells prior to and after the pumping test to assess water level fluctuations, water level trends, and responsiveness to precipitation. The water level monitoring data are presented in Figure F.2, Appendix F.

In addition to manual water levels (Section 3.3), continuous datalogger measurements were collected in all the wells for a nine-day period between the 22nd and 31st of January 2024. The continuous logger measurements were corrected using the first manual measurement taken within each well. Subsequent manual measurements confirmed the absence of major logger drift over the monitoring period. Water level data were corrected for atmospheric pressure using data obtained from an on-site air pressure transducer.

The general water level trends are consistent for all on-site wells, except during periods of pumping. During the monitoring period, water was periodically withdrawn from MW3085 and TW1 by LPF for agricultural and livestock purposes, with resulting maximum drawdowns of 10 and 4 m in each well, respectively. Inferred natural water level variability (unrelated to pumping) remained less than 0.3 m over the approximate three-week monitoring period.

No rapid fluctuation in groundwater levels were identified in the wells correlating with periods of precipitation (rain or snow) or possible melt events associated with temperatures above freezing (Figure F.1, Appendix F). Lack of response within the wells was attributed to on-site conditions restricting infiltration (i.e., frozen soils, low conductivity clay soils, and the presence of a snowpack). Thus, monitoring data suggests that the precipitation event that occurred towards the end of the pumping test would have had little to no impact on the results.

6.4 Pumping Tests Field Procedure

A step test was completed on the existing on-site water supply well, TW1. A licensed well technician of Aardvark Drilling Inc. (Aardvark) removed the existing pumps and installed a temporary pump for the pumping test. Aardvark completed a preliminary step test to assess the maximum well yield, which was estimated to be 172.6 litres per minute – data not presented.

An eighteen-hour constant rate pumping test was performed in TW1 on January 25th and 26th, 2024. Test well TW1 was pumped at a rate of approximately 172.6 litres per minute for eighteen hours, totaling approximately 186,400 litres. Groundwater pumping was carried out under Environmental Activity and Sector Registry (EASR) registration number R-011-1265325587 for groundwater withdraws greater than 50,000 litres per day. The pumping test design report was prepared by GEMTEC, titled “Pumping Test Design Report, Environmental Activity and Sector Registry, Proposed Chicken Processing Facility, 3043 Dunning Road, Ottawa, Ontario” dated January 19, 2024.

The pump discharge was directed to ground surface approximately fifteen metres from the test well to the ditch along the northern boundary of the property, which flowed downgradient to the northeast. Channelized flow of well discharge, low conductivity overburden, and frozen ground conditions are expected to have mitigated recharge local to the test and monitoring wells. No ponding around any of the test or monitoring wells was observed during the pumping test.

6.4.1 Water Level Measurements

During the pumping test, water level measurements were taken at regular intervals in TW1 and the monitoring wells using an electric water level tape. Electronic pressure transducers were installed in TW1 (recording at a 5-second interval) and in 24-1S, 24-2D, and MW3085 (recording at 2-minute intervals). After the pump was shut off, water level data was collected until a minimum of 95% of the drawdown in water level had recovered in the test well; 95% recovery occurred in

20 minutes in TW1. The water level measurements for the drawdown and recovery data for the pumping test are provided in Figure F.3, Appendix F.

6.4.2 Flow Rate Measurements

The wells were pumped using an electric submersible pump and portable generator supplied by Aardvark Drilling Inc. (Aardvark). The flow rate was monitored by a calibrated flow meter. Test well TW1 was pumped at a near-constant (within 5%) rate of approximately 45.6 US gallon per minute (172.6 litres per minute). Pumping rate during the test on TW1 is presented in Figure F.3, Appendix F.

6.4.3 Groundwater Sampling

Total chlorine tests were conducted in the field to ensure that chlorine levels were at non-detectable concentrations prior to bacteriological testing. The temperature, conductivity, total dissolved solids, pH, turbidity, colour, and total chlorine levels of the groundwater were measured at periodic intervals during the pumping tests and are summarized in Appendix G. The field equipment used during the pumping test was calibrated by GEMTEC and the details of the field equipment used are provided in Table 6.2.

Table 6.2 – Field Equipment Overview

Field Parameters	Manufacturer	Model No.
Total and Free Chlorine	Hach	DR 900
pH, temperature, Conductivity	Hanna	HI 98129
Turbidity	Hanna	HI 98703
Colour	Hach	DR 900

Groundwater samples for laboratory analysis were collected from TW1 after nine and eighteen hours of pumping. The groundwater samples were collected in laboratory supplied bottles and prepared/preserved in the field in accordance with the industry standard sampling, handling and preservation procedures required by the laboratory. Apart from the dissolved trace metals samples, water samples were unfiltered. The groundwater samples were submitted to Paracel Laboratories Limited in Ottawa, Ontario, for chemical, physical, and bacteriological analyses.

6.5 Test Well Water Quality

The results of the chemical, physical, and bacteriological analyses of the water samples from TW1 by Paracel Laboratories Limited and the field parameters collected by GEMTEC are summarized in Tables I.1 and I.2, Appendix I. Water samples collected at nine and eighteen hours had comparable constituent concentrations, apart from turbidity. Turbidity declined with pumping, as confirmed by field measurements and lab analyses. Preliminary water quality samples were also collected on November 13, 2023, from a pressure tank bypass located within the existing on-site barn (Laboratory Certificates of Analysis provided in Appendix I).

The following subsections discuss the results of the water quality sampling in the context of the Ontario Drinking Water Quality Standards (ODWQS; MECP, 2006 and 2008) and MECP Guideline D-5-5 (MECP, 1996).

6.5.1 Bacteriological Parameters

Total coliform, *E. coli*, fecal coliform, and heterotrophic plate count were non-detectable in both samples during the pumping test. Total and free chlorine measurements confirmed that total and free chlorine concentrations in the wells was non-detectable (<0.02 mg/L) at the time of bacteriological sampling (Tables I.1, Appendix I).

Based on the absence of ODWQS bacterial indicator species, namely total coliform, *E.coli* and fecal coliform in any of the water samples, the water in the supply wells adheres to the bacterial guidelines proposed in MECP Guideline D-5-5.

It is noted that the preliminary samples reported a total coliform count of 42 CFU/100mL; however, the samples were collected from the pressure tank bypass located within centimeters of the barn floor, which likely resulted in the elevated bacterial counts. The bacteriological results from the pumping test are considered to be representative of the groundwater supply aquifer.

6.5.2 Other Health-Related Parameters

No maximum acceptable concentration limits of the ODWQS were exceeded for the parameters measured in the water samples collected from the on-site test well. The measured parameters with ODWQS maximum allowable concentrations include fluoride, nitrate, nitrite, trace metals (mercury, antimony, arsenic, barium, boron, cadmium, chromium, lead, selenium, and uranium), and volatile organic carbons (benzene, carbon tetrachloride, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, ethylbenzene, methylene chloride, tetrachloroethylene, toluene, trichloroethylene, vinyl chloride, and total xylenes).

The warning level of 20 mg/L for sodium was exceeded in both samples. This threshold was established for persons on sodium restricted diets. Warning clauses should be addressed to people on sodium restricted diets and should be registered on title. In addition, it is recommended

that the local Medical Officer of Health be notified to alert persons in the area with relevant medical conditions.

6.5.3 Operational Guideline Exceedances – Hardness

The concentrations of hardness in the water samples were 345 and 340 mg/L as $CaCO_3$, which is higher than the operational guideline of 80 to 100 mg/L of $CaCO_3$ as specified in the ODWQS.

Water having a hardness level above 80 to 100 mg/L as CaCO3 is often softened for domestic use. The MECP Procedure D-5-5 document states that water having a hardness value more than 300 mg/L is considered "very hard". The MECP (2006) publication titled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines", states that water with hardness in excess of 500 mg/L is considered to be unacceptable for most domestic purposes. There is no upper treatable limit for hardness specified in MECP Procedure D-5-5.

The concentrations of hardness in all the test wells are below the reported threshold of 500 mg/L as CaCO3 as specified in the Technical Support Document for the ODWQS (MECP, 2006). The concentration of hardness observed in the test wells is reasonably treatable using a conventional water softener. Water supply wells within rural eastern Ontario are commonly equipped with water softeners.

Water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water that may be of concern to persons on a sodium restricted diet. The use of potassium chloride in the water softener (which adds potassium to the water instead of sodium) could be considered as a means of keeping sodium concentrations in the water at background levels. Consideration could also be given to providing a bypass of the water softener for drinking water purposes (for example, a bypass of the softener to the cold-water kitchen tap).

6.5.4 Aesthetic Objective Exceedances

Exceedances of the ODWQS aesthetic objectives include iron, turbidity, and colour in one or both samples. These exceedances are discussed in the following subsections:

6.5.4.1 Iron

The iron concentration in samples recovered from TW1 was 0.5 mg/L, which exceeds the ODWQS aesthetic objective for iron of 0.3 mg/L. Elevated concentrations of iron may cause staining of plumbing fixtures and laundry. The measured iron concentration is well within the maximum reasonably treatable limit of 5.0 mg/L using water softeners or manganese greensand filters as stated in Table 3 of MECP Guideline D-5-5.

6.5.4.2 Turbidity

The turbidity level in the water sample collected after nine hours of pumping exceeded the ODWQS aesthetic objective of 5 NTU. This concentration had declined to 3.2 NTU by eighteen hours of pumping. A similar decline was observed in field turbidity, as collected by GEMTEC.

Turbidity levels are expected to be associated with metals and dissolved organic carbon concentrations in the well, both of which are within the maximum reasonably treatable limit proposed by MECP Guideline D-5-5. Incorporating pre-treatment to reduce turbidity levels may be appropriate for certain aquifers to improve the effectiveness of treatment via UV-disinfection for bacteria.

6.5.4.3 Colour

Apparent colour was elevated in both samples submitted for lab analyses; however, apparent colour was non-detect in field samples. It is inferred that colour reported by the lab is likely associated with the oxidization of metals within the samples during sample collection and transport and may not be reflective of the water quality at the tap. Water colour can be unappealing to a consumer and may result in discolouration of fixtures and clothing. If the colour is associated with organic constituents, then chlorine disinfection may produce undesirable disinfection by-products. The true (filtered) colour of both nine-hour and eighteen-hour samples was 2 TCU, which is below the ODWQS aesthetic objective of 5 TCU.

6.6 Pumping Test Analysis

6.6.1 Pump Test Analysis Overview

The drawdown and recovery water level data from test well TW1, along with monitoring well responses are provided in Figure F.3, Appendix F. The details of the pumping test and monitoring well data is provided in Table 6.3. All depths provided are in metres below ground surface (mbgs).

Table 6.3 – Pumping Tests Details

Parameter	Pumping Well	Monitoring Wells				
	TW1	24-1S	24-1D	24-2S	24-2D	MW3085
Distance from Pumping Well (metres)	-	127	131	145	141	246
Duration (minutes)	1,080	-	-	-	-	-

Parameter	Pumping Well	Monitoring Wells				
	TW1	24-1S	24-1D	24-2S	24-2D	MW3085
Flow Rate (litres per minute)	172	-	-	-	-	-
Static Water Level (mbgs)[1]	1.33	0.81	1.19	0.79	1.49	3.08
Well Depth (mbgs)	18.0	7.93	17.98	7.93	15.54	16.76
Available Drawdown (m)	16.7	7.12	16.79	7.14	14.05	13.68
Water Level at End of Pumping (mbgs)	11.3	0.71	1.85	0.61	2.17	NA[2]
Approximate Drawdown at End of Pumping (m)	10.0	-0.10	0.66	-0.18	0.68	NA[2]
Drawdown Utilized (%)	59.3	0	3.9	0	4.8	0[2]
Specific Capacity (litres per minute/m)	17.2	-	-	-	-	-

Notes:1. Static water level on January 25, 2024

2. Water supply well in-use during pumping test, no apparent response was observed.

The water level in the pumping well decreased approximately 9 metres within the first 20 minutes of pumping and then gradually decreased another metre over the remaining 17 hours and 40 minutes of pumping. The pumping well withdrew approximately 186,400 litres over the eighteen-hour pumping test. Following cessation of pumping, the pumping well rapidly recovered to 95% within 20 minutes. The remaining 5% is inferred to have recovered in less than 6 hours. The proposed water demand for the facility (98,900 litres per day, pumping 12 hours a day, 5 days a week) is far less than the pumping test demonstrated the well can provide, so no water quantity concerns were identified.

The monitoring wells completed in the shallow overburden (i.e., 24-1S and 24-2S) did not respond to pumping, whereas the deeper overburden/bedrock monitoring wells completed in the water supply aquifer (i.e., 24-1D and 24-2D) had an immediate response to pumping. The water level

in the deep monitoring wells gradually decreased approximately 0.7 metres throughout the pumping test (refer to Appendix F). Following cessation of pumping, the water level in monitoring wells 24-1D and 24-2D recovered approximately 40% within two hours and 86% within fourteen hours; the remaining 14% of drawdown recovered within the following 24 hours. The remaining 10 cm (14%) is relatively small and could be accounted for through a combination of measurement error (e.g., barometric and manual measurement corrections), natural variability (observed to be approximately 10 to 20 cm over a week period), well screen effects, or other well users.

No drawdown was inferred 246 metres away from the test well at MW3085, and 0.7 metres of drawdown was observed approximately 140 metres from the test well at the monitoring well locations. Thus, a conservative estimate of drawdown 210 metres from the test well at the nearest homeowner well would be less than 25 cm, which is considered an acceptable degree of temporary interference. Nonetheless, actual drawdowns associated with the proposed revised water demand of 98,900 litres per day (pumping 12 hours a day, 5 days a week) are anticipated to be less than those produced by the pumping test (i.e., negligible drawdown at the nearest homeowner well).

6.6.2 Transmissivity Analysis

The transmissivity and storativity of the water supply aquifer were estimated from the pumping test drawdown data using Aqtesolv (version 4.50.002), a commercially available software program from HydroSOLVE Inc. An analysis of the pumping test data was carried out using the Theis (1935) method (results provided in Appendix H). The estimated aquifer transmissivity based on the pumping test results is 1×10^{-4} m^2/sec. The derivate analysis is a diagnostic tool to aid in the interpretation of pumping test data. The early-time derivative plot has a 1:1 ratio with pumping data indicating a finite-diameter source with wellbore storage. The derivative plot flattens out later in the test and slightly increases towards the end of the test, possibly indicating the effects of a barrier, boundary, or channelized aquifer.

Analysis of the water level recovery following pumping in MW23-2D, using the Theis Recovery (1935) method, indicates an aquifer transmissivity of 4×10^{-4} m^2/s and S/S' of 0.97. The S/S' is the storativity estimate during pumping divided by the storativity estimate of recovery, which when close to 1.0 indicates the absence of boundary effects.

Given that the aquifer thickness and extent of the sands and gravels above the limestone bedrock aquifer are expected to be variable, boundary effects may be present. The analyses of the pumping test, derivative, and monitoring well data do not indicate any significant boundary effects that would limit well yield at the rates tested.

Drawdowns in the monitoring wells completed in the water supply aquifer were small (< 0.7 metres), and analyses of distance-drawdown produced transmissivity estimates of 1×10^{-4} m/s. Analysis of the monitoring well data also allows for estimation of aquifer storativity,

which was estimated as 5 x 10^{-5} based on the distance-drawdown analysis. The results of the Aqtesolv analysis are provided in Appendix H.

6.7 Long-term Well Yield

The water supply aquifer screened by TW1 consists of coarse overburden soils and upper fractured bedrock, which is variable in thickness (Figure B.4). The pumping test analysis indicates that the well is capable of pumping 172.6 litres per minute over an eighteen-hour period, which resulted in a maximum water level drawdown of 10.0 metres. A log-linear extrapolation of the water level data over 20-year period contextualises that continuously pumping at 172.6 litres per minute would result in a drawdown of approximately 15 metres, assuming a continuous aquifer with no boundary effects. Given the total well depth of 18 metres and considering groundwater levels may be lower seasonally, the available drawdown would be less than 3 metres from the base of the well. This level of drawdown would not be considered acceptable (well cooling, potential impacts to neighbouring wells); however, it suggests that the well may be able to produce up to 250,000 L/day for 20 years before reaching this point.

The (revised) pumping rate proposed for the chicken processing plant operations is 98,900 L/day taken over a 12-hour period, 5 days a week. Based on the available data, we do not anticipate any compounding drawdown over time associated with this pumping regime. Although the risk to the aquifer and adjacent well users is considered low, the lateral extent of the water supply aquifer and the long-term recharge to the aquifer are poorly defined, so there remains some uncertainty with long-term sustainability. The proposed groundwater takings are greater than 50,000 litres per day and are subject to MECP regulation under a Category 3 Permit to Take Water (PTTW). To manage the uncertainty associated with the aquifer, long-term water level monitoring has been recommended as a provision of the PTTW. Should impacts arise, despite our interpretations suggesting that they will not, monitoring will ensure that impacts to the aquifer or other well users are mitigated effectively.

6.8 Geotechnical Considerations

Groundwater takings from the water supply aquifer at the rates tested in the pumping test have the potential to lower the groundwater levels within the overlying clays, resulting in soil settlement. The assessment of potential settlement was completed by GEMTEC, titled “Geotechnical Investigation, Proposed Chicken Processing Plant Pumping Well, 3043 Dunning Road, Sarsfield (Ottawa), Ontario” and dated October 2, 2024 (Appendix J).

The geotechnical investigation concluded that there are no significant impacts to existing neighbouring structures (i.e., neighbouring residential properties). The groundwater extraction may cause settlement to the existing on-site structure, which is located within 10 metres of the water supply well, although the level of ground settlement is anticipated to be minor and acceptable for structures in good condition. Monitoring was recommended therein when water

taking is active to assess the potential for long-term soil settlement, which are proposed to be included as conditions in the PTTW (refer to PTTW cover letter in Appendix K).

7.0 CONCLUSIONS

Based on the results of the hydrogeological investigation, the following conclusions and professional opinions are provided:

7.1 Hydrogeological Conceptual Model

- The site geology generally consists of a thin layer of topsoil underlain by lean clay (isolating layer) that covers the water supply aquifer, which consists of coarse glacial till and upper fractured limestone. The thickness of the clay within 100 metres of the site is inferred to be 10+ metres thick, and glacial till is anticipated to range from approximately 0.9 to 5 metres in thickness.
    - The water supply aquifer is interpreted to be hydrogeologically isolated due to the thick overlying clay deposit.
    - No shallow dug or bored well users were identified within at least 300 metres of the site (theoretical area of influence is anticipated to be less than 250 metres); domestic water supply wells consist of drilled wells completed in the coarse overburden atop the bedrock and / or bedrock water supply aquifer(s).

7.2 Water Quality

- The water quality available from TW1 is safe for consumption based on the absence of health-related or maximum acceptable concentration exceedances; however, treatment of aesthetic parameters may be advisable.
    - Bacteriological sampling completed in TW1 during the pumping test confirmed non-detectable total coliform, fecal coliform, and *E. coli*. It is noted that preliminary sampling from the pressure tank bypass reported a total coliform count of 48 CFU/100mL; however, the sampling point was located within centimeters of the floor, and the detectable total coliform was attributed to the sampling location.
    - The warning level of 20 mg/L for sodium was exceeded in both pumping test samples. This threshold was established for persons on sodium restricted diets only. Warning clauses should be addressed to people on sodium restricted diets and should be registered on title. In addition, it is recommended that the local Medical Officer of Health be notified to alert persons in the area with relevant medical conditions.
    - The concentrations of hardness in the TW1 water samples were 345 and 340 mg/L as CaCO3 (very hard), which is higher than the operational guideline of 80 to 100

mg/L of CaCO3 as specified in the ODWQS. No maximum treatable limited in proposed in the guidance documents.

  - The iron concentration in samples recovered from TW1 was 0.5 mg/L, which exceeds the ODWQS aesthetic objective for iron of 0.3 mg/L. The measured iron concentration is well within the maximum reasonably treatable limit of 5.0 mg/L using conventional water softeners or manganese greensand filters as stated in Table 3 of MECP Guideline D-5-5.
  - The ODWQS aesthetic objective for turbidity (5.0 NTU) was exceeded in early-time field and lab samples during the pumping test of TW1. Following additional well development, the lab-measured and field measured turbidity decreased below the aesthetic objective.
  - Apparent colour was elevated in both TW1 samples submitted for lab analyses; however, apparent colour was non-detect in field samples. It is inferred that colour reported by the lab is likely associated with the oxidization of metals within the samples during sample collection and transport and may not be reflective of the water quality at the tap. The true colour was 2 TCU, which is within the ODWQS aesthetic objective for colour.

- No significant surface water influence was noted in the water supply aquifer based on the absence of elevated surface water indicator parameters in the representative test well (non-detectable tannins and lignans, nitrate, nitrite, and phosphate, and low levels of ammonia, TKN, and DOC).

7.3 Water Quantity

- The eighteen-hour constant rate pumping test of the existing on-site test well determined that the well could supply a pumping rate of approximately 172.6 litres per minute for an eighteen-hour period. Based on information provided by LPF, the revised water demand for the proposed chicken processing facility is approximately 98,900 litres per day, over a 12-hour period (137.36 L/min), 5 days a week.
  - Storage solutions or secondary water supply wells could be considered to expand operations in the future, if required.
- Interference between neighbouring drinking water wells is expected to be minimal under the proposed usage.
  - Maximum drawdown in aquifer monitoring wells located 131 and 141 metres from the pumping well were less than 0.7 metres during the pumping test. The nearest homeowner well on Dunning Road is located a minimum of 210 metres from the pumping well, and a conservative drawdown of less than 25 cm during the pumping test was estimated. Drawdowns associated with the proposed revised water

demand of 98,900 litres per day (pumping 12 hours a day, 5 days a week) are anticipated to be less than those produced by the pumping test.

- A back-up water supply well may be considered (though hit is not required to meet demand) to allow for maintenance of the existing water supply well. Where present, the new water supply well should be drilled and screened across the overburden aquifer and upper two metres of fractured bedrock to maximize well productivity. The construction of the existing water supply well is likely resulting in decreased well efficiency, as the well is not screened across the high permeability overburden aquifer, but rather hammered into the upper fractured bedrock, thereby limiting inflow to the well through the bottom aperture of the casing.

7.4 Groundwater Impact Assessment

- Overburden thicknesses are sufficient to meet the minimum overburden thickness required for on-site septic systems. Shallow groundwater depths and low-permeability soils will likely necessitate a fully-raised septic leaching bed.
- No negative impacts to the water supply aquifer (glacial till and fractured limestone) aquifer are anticipated from the use of the proposed on-site septic systems, based on sufficiently hydrogeologically isolating conditions in accordance with MECP Procedure D-5-4 isolation criteria.
- No negative impacts to surface water features (i.e., local drains) due to phosphorous loading from the proposed septic system are anticipated due to the separation distance between the proposed septic system and nearest watercourse.
- No negative impacts from the discharge of NASM wastewaters under normal operating conditions, which are proposed to be discharging off-site to an approved and effectively maintained receiving facility. Risks associated with these facilities will be managed by OMAFRA and the MECP and are beyond the scope of this investigation.
- Based on the results of the Phase Two ESA (GEMTEC, 2024b), no impacts were identified from existing on-site areas of potential environmental concerns (above ground fuel storage tanks and pole-mounted transformer).

7.5 Rezoning

- The results of the hydrogeological investigation and terrain analysis conclude that the site can supply groundwater of sufficient quantity and quality for the proposed abattoir, which has daily water demands of approximately 98,900 litres per day. The proposed septic system is considered hydraulically isolated from the water supply aquifer and all NASM wastewaters will be discharged to an approved off-site receiving facility (once approved). For the purposes of re-zoning, GEMTEC concludes that the site meets the applicable MECP Procedure D-5-5 and D-5-4 guidelines and City of Ottawa Hydrogeological Guidelines dated March 2021.

7.6 Permit To Take Water

- Groundwater takings greater than 50,000 litres per day require a Category 3 PTTW application to the MECP. The application has a review period of 90 days. The groundwater takings will be subject to the terms and conditions of the approved PTTW. The proposed PTTW application and monitoring / contingency measures are provided in Appendix K.

8.0 RECOMMENDATIONS

The following provides recommendations regarding well construction specifications, water quality, and septic systems:

8.1 Well Ownership Recommendations

- It is recommended that the property owners construct, maintain, and test their drinking water well(s) in accordance with the Ministry of the Environment and Climate Change document "Water Supply Wells - Requirements and Best Management Practices, Revised April 2015".
- Any new on-site water supply well (if required) should be constructed by a licensed well technician in accordance with Ontario Regulation 903. It is recommended that a well grout inspection be performed by a QP at the time of casing installation.
- It is recommended that on-site storage of hydrocarbons be moved more than 15 metres away from new or existing groundwater supply wells.
    - It is noted that the *Wells Regulation* (Ontario Regulation 903), which applies to the construction of new water supply wells, stipulates that sources of contamination must be at least 15 metres from any water supply well. Because the on-site well is existing, Ontario Regulation 903 does not apply; however, the proximity of the storage remains unfavourable from an environmental perspective.
- Where a risk of vehicle collision exists, bollards or barriers should be in place to protect the well casing – the location of proposed bollards should be presented in the site development plan.
- On-site snow and salt storage (if applicable) should be strategically located to maximize distance from water supply wells and watercourses.
- Unused monitoring wells should be decommissioned according to Ontario Regulation 903.
- It should be noted that this study does not address the construction of earth energy systems, which may require approval from the MECP.
- Hardness levels may exceed the ODWQS operational guideline for hardness. Conventional water softeners may be desired to treat minor aesthetic objective and operational guideline exceedances of the ODWS such as hardness. On heating, hard

water tends to form scale deposits and can form excessive scum with regular soaps. Conversely, soft water may result in accelerated corrosion of water pipes.

- Water softening by conventional sodium ion exchange may introduce relatively high concentrations of sodium into the drinking water, which may be of concern to persons on a sodium restricted diet. The use of potassium chloride in the water softener (which adds potassium to the water instead of sodium) could be considered as a means of keeping sodium concentrations in the water at background levels. Consideration could also be given to providing a bypass of the water softener for drinking water purposes.

8.2 Septic System Construction Recommendations

- All septic systems shall maintain a minimum setback distance of 18 m or more from any surface water feature and be installed by a licensed septic system contractor ensuring that all applicable regulations are met and required permits are obtained.
- A site-specific investigation should be conducted for the design of the septic system.
    - Due to the presence of low-permeability soils and opportunity for a shallow water table, septic beds will likely be partially or fully raised.
- It is recommended that if property owners choose to install tertiary treatment septic systems, then it will be required to enter a maintenance agreement with authorized agents of the system manufacturer for the service life of the system.

8.3 Septic Ownership Recommendations

- It is recommended that the property owners construct, maintain, and check their on-site septic system in accordance with the Ontario Building Code.

9.0 CLOSURE

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

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Environmental Scientist

Jason KarisAllen, M.A.Sc., P.Eng.
Water Resources Engineer

Andrius Paznekas, M.Sc., P.Geo.
Hydrogeologist

JKA/SE/AP

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APPENDIX A

Report Conditions and Limitations

Conditions and Limitations of This Report

1. **Standard of Care:** GEMTEC has prepared this report in a manner consistent with generally accepted engineering or environmental consulting practice in the jurisdiction in which the services are provided at the time of the report. No other warranty, expressed or implied is made.
2. **Copyright:** The contents of this report are subject to copyright owned by GEMTEC, save to the extent that copyright has been legally assigned by us to another party or is used by GEMTEC under license. To the extent that GEMTEC owns the copyright in this report, it may not be copied without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of GEMTEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests.
3. **Complete Report:** This report is of a summary nature and is not intended to stand alone without reference to the instructions given to GEMTEC by the Client, communications between GEMTEC and the Client and to any other reports prepared by GEMTEC for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. GEMTEC can not be responsible for use of portions of the report without reference to the entire report.
4. **Basis of Report:** This Report has been prepared for the specific site, development, design objectives and purposes that were described to GEMTEC by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this report expressly addresses the proposed development, design objectives and purposes. Any change of site conditions, purpose or development plans may alter the validity of the report and GEMTEC cannot be responsible for use of this report, or portions thereof, unless GEMTEC is requested to review any changes and, if necessary, revise the report.
5. **Time Dependence:** If the proposed project is not undertaken by the Client within 18 months following the issuance of this report, or within the timeframe understood by GEMTEC to be contemplated by the Client, the guidance and recommendations within the report should not be considered valid unless reviewed and amended or validated by GEMTEC in writing.
6. **Use of This Report:** The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without GEMTEC's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, GEMTEC may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process.

   Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.
7. **No Legal Representations:** GEMTEC makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

8. **Decrease in property value:** GEMTEC shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
9. **Reliance on Provided Information:** The evaluation and conclusions contained in this report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations. information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations. or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
10. **Investigation Limitations:** Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions but even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions.

    The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. Accordingly, GEMTEC does not warrant or guarantee the exactness of of the subsurface descriptions.

    Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination-or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

    In addition, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.
11. **Sample Disposal:** GEMTEC will dispose of all uncontaminated soil and/or rock samples 60 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.
12. **Follow-Up and Construction Services:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.

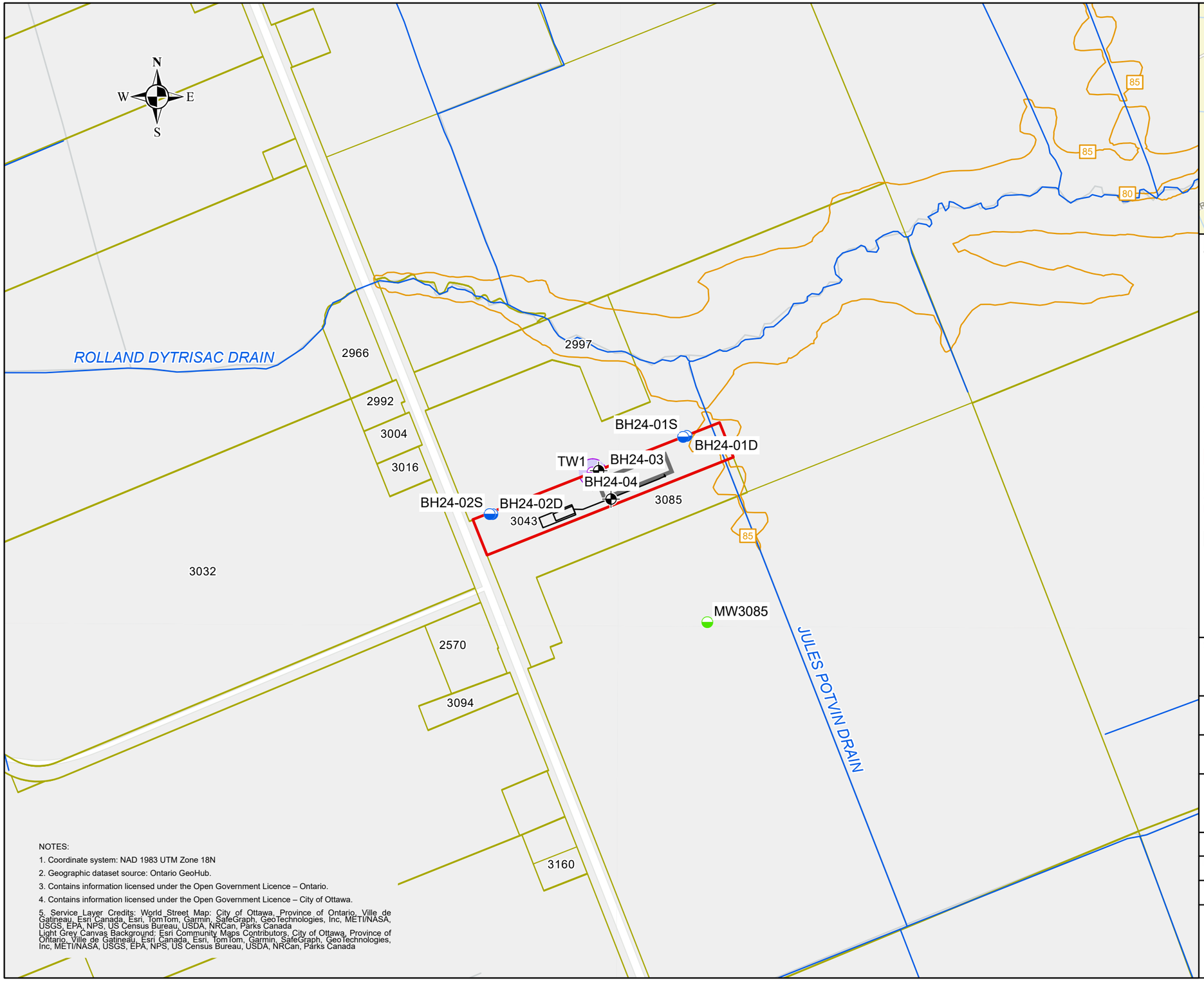
    During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not

materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing during construction are necessary for GEMTEC to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, GEMTEC's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

13. **Changed Conditions:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEMTEC be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that GEMTEC be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.
14. **Drainage:** Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. GEMTEC takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

Site Maps and Cross-section A-A’



NOTES:

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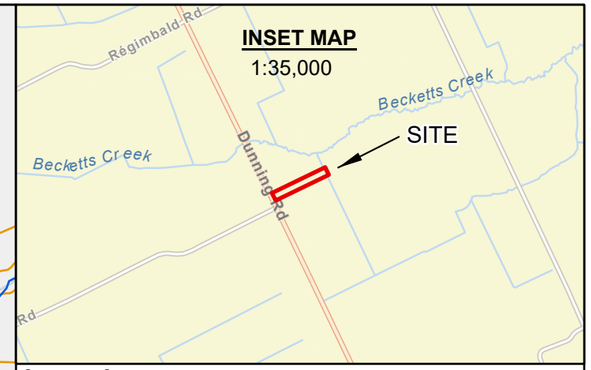
5. Service Layer Credits: World Street Map: City of Ottawa, Province of Ontario, Ville de Gatineau, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada
Light Grey Canvas Background: Esri Community Maps Contributors, City of Ottawa, Province of Ontario, Ville de Gatineau, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada



Legend

####	CIVIC ADDRESS NUMBER
BH##	NESTED WELL ID
	BOREHOLE LOCATION
	BOREHOLE/ MONITORING WELL
	TEST WELL
	PRIVATE MONITORING WELL
	ELEVATION CONTOUR (M AMSL)
	WATERCOURSE
	APPROXIMATE PROPERTY BOUNDARY
	PROPOSED CHICKEN PROCESSING PLANT
	18M BUFFER SURROUNDING TEST WELL
	SEPTIC SYSTEM

Scale:
1:5,000
0 50 100 200 300 400 Meters

Drawing
KEY PLAN

Client:
J. L. RICHARDS & ASSOCIATES LIMITED

Project
HYDROGEOLOGICAL INVESTIGATION & TERRAIN ANALYSIS
PROPOSED CHICKEN PROCESSING FACILITY
PART OF LOT CONCESSION 4 (3043 DUNNING ROAD)
OTTAWA, ONTARIO

Drwn By: S.J./S.L.	Chkd By: J.KA.
Project No. 100117.056	Revision No. 0
Date OCTOBER 2024	**FIGURE B.1**

GEMTEC
Consulting Engineers and Scientists
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Ottawa, ON, K2K 2A9
Tel: (613) 836-1422
www.gemtec.ca
ottawa@gemtec.ca

Folder: N:\Projects\100100\100117.056\06_Civil Drafting\HYD R0\

Legend

######	WELL ID
####	CIVIC ADDRESS NUMBER
BH##	NESTED WELL ID
	APPROXIMATE DOMESTIC WELL LOCATION
	APPROXIMATE LIVESTOCK WELL LOCATION
	APPROXIMATE PROPERTY BOUNDARY
	500m RADIUS FROM PROPERTY BOUNDARY
	PROPOSED CHICKEN PROCESSING PLANT
	SEPTIC SYSTEM

NOTES:

1. Coordinate system: NAD 1983 UTM Zone 18N
2. Geographic dataset source: Ontario GeoHub.
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5. Service Layer Credits:World Imagery: SDG Counties, Maxar

Scale: 1:5,000

0 50 100 200 300 400 Meters

Drawing: WELL RECORDS WITHIN 500 METRES OF SITE

Client: J. L. RICHARDS & ASSOCIATES LIMITED

Project: HYDROGEOLOGICAL INVESTIGATION & TERRAIN ANALYSIS
PROPOSED CHICKEN PROCESSING FACILITY
PART OF LOT CONCESSION 4 (3043 DUNNING ROAD)
OTTAWA, ONTARIO

Drwn By:	S.J./S.L.	Chkd By:	J.KA.
Project No.	100117.056	Revision No.	0
Date	OCTOBER 2024	**FIGURE B.2**	

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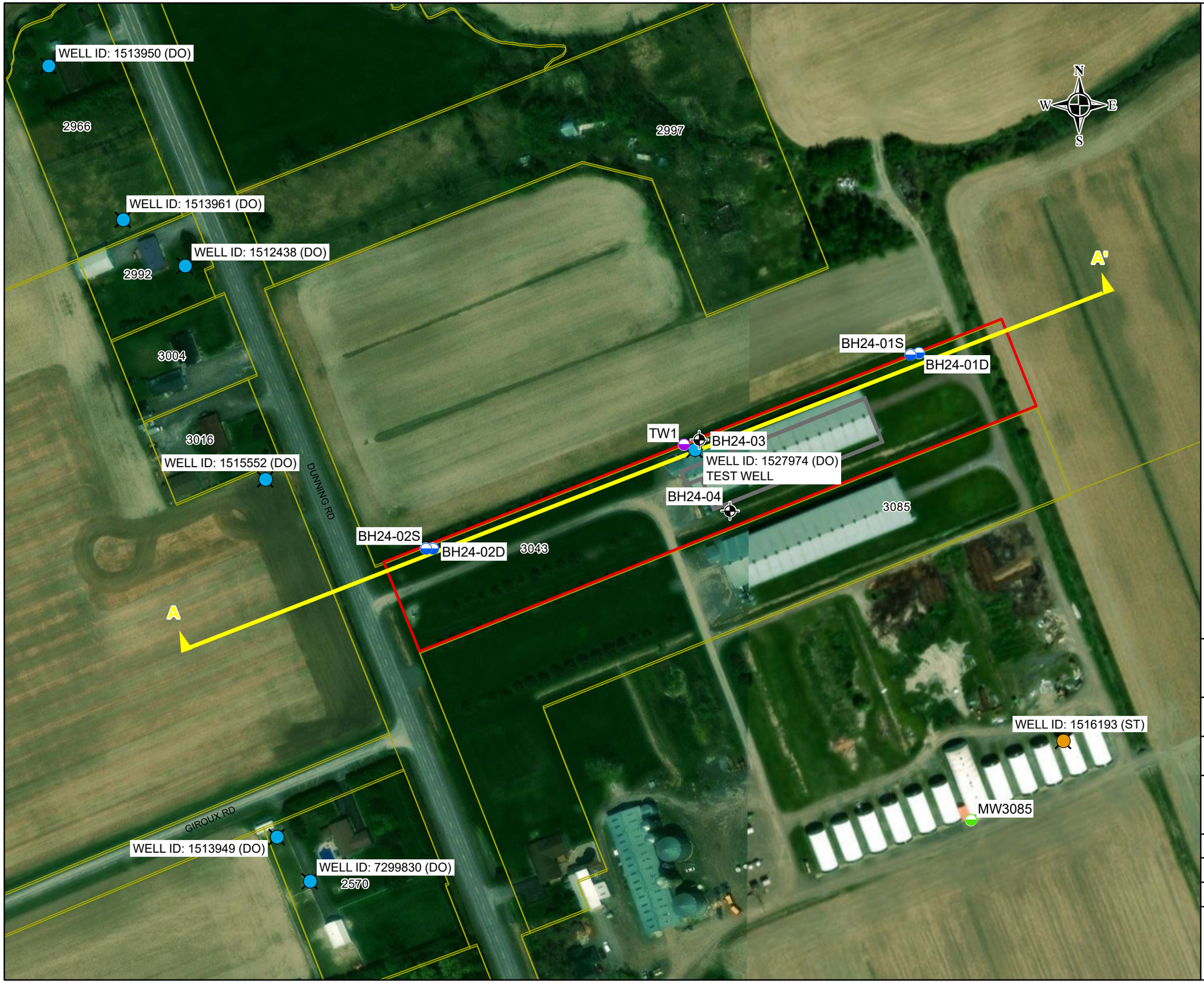

Legend

######	WELL ID
####	CIVIC ADDRESS NUMBER
BH##	NESTED WELL ID
	BOREHOLE LOCATION
	BOREHOLE/ MONITORING WELL
	TEST WELL
	PRIVATE MONITORING WELL
	DO
	ST
	APPROXIMATE PROPERTY BOUNDARY
	500m RADIUS FROM PROPERTY BOUNDARY
	PROPOSED CHICKEN PROCESSING PLANT
	CROSS SECTION LOCATION

NOTES:

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5. Service Layer Credits:World Imagery: SDG Counties, Maxar, Microsoft

Scale:

1:2,000

0 20 40 80 120 160 Meters

Drawing

CONCEPTUAL CROSS SECTION AA'

Client:

J. L. RICHARDS & ASSOCIATES LIMITED

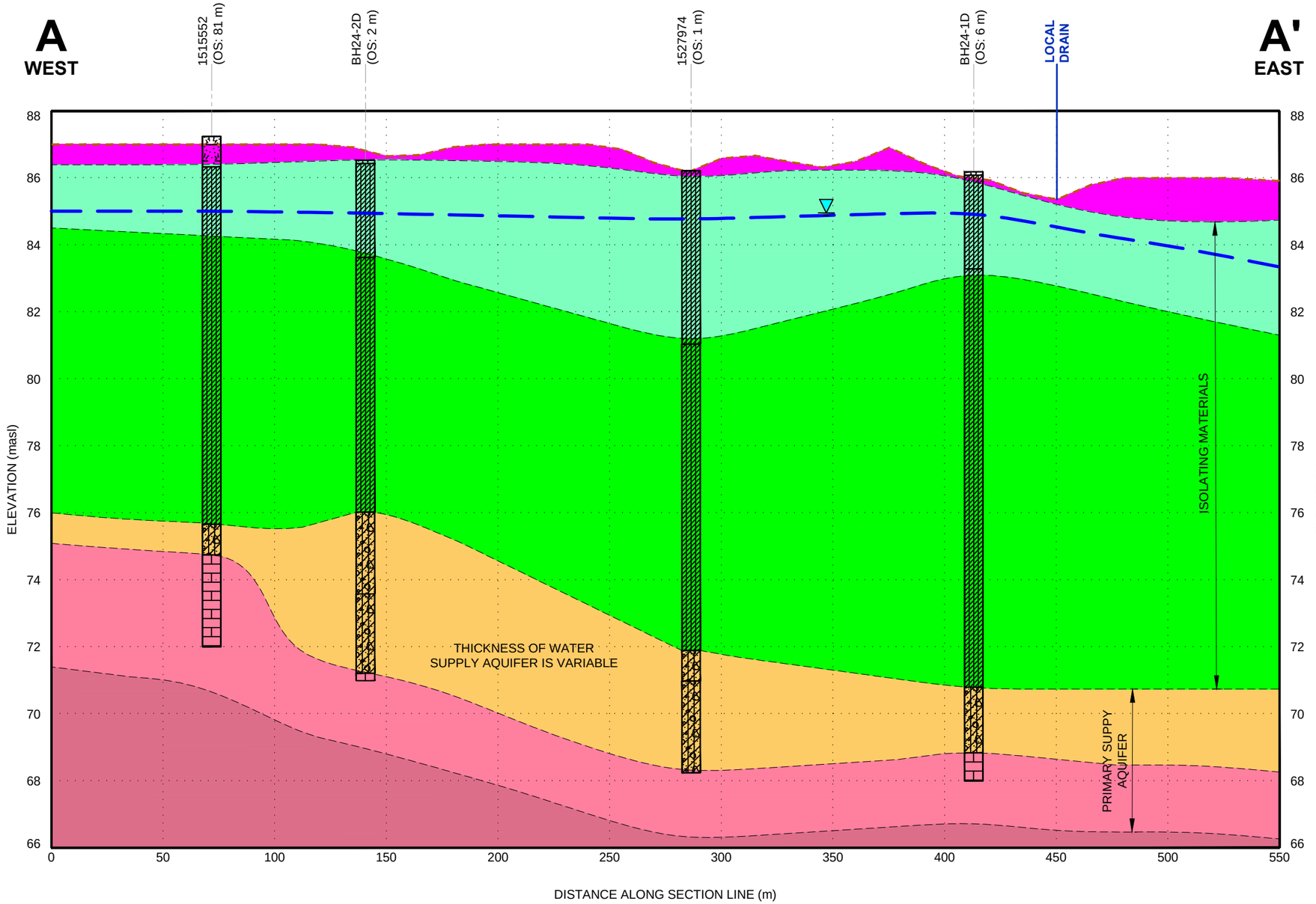
Project

HYDROGEOLOGICAL INVESTIGATION & TERRAIN ANALYSIS
PROPOSED CHICKEN PROCESSING FACILITY
PART OF LOT CONCESSION 4 (3043 DUNNING ROAD)
OTTAWA, ONTARIO

Drwn By:	S.L.	Chkd By:	J.KA.
Project No.	100117.056	Revision No.	0
Date	OCTOBER 2024		**FIGURE B.3**

GEMTEC
Consulting Engineers and Scientists
32 Steacie Drive
Ottawa, ON, K2K 2A9
Tel: (613) 836-1422
www.gemtec.ca
ottawa@gemtec.ca

Folder: N:\Projects\100100\100117.056\06_Civil Drafting\HYD R0\



LEGEND

BH	BOREHOLE
OS	OFFSET FROM SECTION LINE
	INFERRED GROUND SURFACE
	INFERRED GEOLOGIC CONTACT
	APPROXIMATE GROUNDWATER LEVEL

STRATIGRAPHY

- TOPSOIL
- LEAN CLAY (WEATHERED CRUST)
- LEAN CLAY
- COARSE GLACIAL TILL
- LIMESTONE (HIGHLY FRACTURED)
- LIMESTONE

HORIZONTAL SCALE
1:2000
0 40 80 120m

VERTICAL SCALE
15X VERTICAL EXAGGERATION

DRAWING
CONCEPTUAL CROSS SECTION A - A'

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
HYDROGEOLOGICAL INVESTIGATION & TERRAIN ANALYSIS
PROPOSED CHICKEN PROCESSING FACILITY
PART OF LOT CONCESSION 4 (3043 DUNNING ROAD)
OTTAWA, ONTARIO

DRAWN BY	CHECKED BY
S.L.	J.KA.
PROJECT NO.	REVISION NO.
100117.056	0
DATE	FIGURE NO.
FEBRUARY 2024	**FIGURE B.4**

GEMTEC
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APPENDIX C

Water Well Records

Table C.1 - MECP Online Well Database Summary (500-m Radius)

ID	Township	Completion Date (yyyy-mm-dd)	Water Use	Well Depth (m)	Bedrock Depth (m)	Minimum Casing Depth (m)	Static Water Levels (m)	Water Types and Bearing Zone Depths (ft)	Stratigraphic Layers (ft)
1512438	CUMBERLAND TOWNSHIP CON 05 007	9/29/1972	DO	12.2	-	12.2	0.9	FR 0040	BLUE CLAY 0038 GREY GRVL 0040
1512623	CUMBERLAND TOWNSHIP CON 05 008	10/17/1965	DO	27.7	27.1	27.4	0.9	FR 0091	BLUE CLAY 0035 GRVL MSND 0089 GREY LMSN 0091
1513949	CUMBERLAND TOWNSHIP CON 05 008	6/21/1973	DO	23.2	-	23.2	3.0	FR 0076	YLLW SAND 0022 BLUE CLAY 0068 GREY GRVL 0076
1513950	CUMBERLAND TOWNSHIP CON 05 007	6/22/1973	DO	9.4	-	9.4	0.3	FR 0031	BLUE CLAY 0025 GREY GRVL 0031
1513961	CUMBERLAND TOWNSHIP CON 05 007	11/26/1973	DO	6.1	-	6.1	0.9	FR 0020	BLUE CLAY 0018 GREY GRVL 0020
1514295	CUMBERLAND TOWNSHIP CON 05 008	9/5/1974	DO	15.5	-		1.8	FR 0036	GREY CLAY 0020 SAND GRVL 0036 GRVL 0051
1515552	CUMBERLAND TOWNSHIP CON 05 007	5/17/1974	DO	15.2	-	12.5	0.9	FR 0043	BRWN LOAM 0003 BLUE CLAY 0038 GREY HPAN SAND BLDR 0041 BRWN SNDS 0050
1516193	CUMBERLAND TOWNSHIP CON 04 008	8/25/1977	ST	22.9	20.1	20.1	2.4	FR 0066	GREY CLAY SOFT 0057 GREY GRVL SAND LOOS 0066 GREY LMSN SOFT 0075
1523554	CUMBERLAND TOWNSHIP CON 04 007	7/5/1989	DO	10.7	-	10.7	1.2	FR 0035	RED CLAY 0006 BLUE CLAY 0034 BLCK GRVL 0035
1527974	CUMBERLAND TOWNSHIP CON 04 008	5/25/1994	DO	18.0	-	18.0	3.4	FR 0059	BRWN CLAY SOFT 0017 GREY CLAY SOFT 0047 BLCK GRVL BLDR HARD 0050 BLCK GRVL PCKD 0059
1528498	CUMBERLAND TOWNSHIP CON 04 008	5/8/1995	ST	16.8	7.3	7.3	5.5	FR 0050	RED CLAY HARD 0015 GREY TILL BLDR HARD 0024 GREY LMSN HARD 0055
1530860	CUMBERLAND TOWNSHIP CON 04 007	10/12/1999	DO	34.4	30.2	30.2	5.5	FR 0105	RED CLAY SOFT 0007 GREY CLAY SOFT 0025 BLUE CLAY SOFT 0090 GREY GRVL SOFT 0099 GREY SHLE PORS 0113
7299830	CUMBERLAND TOWNSHIP CON 05 008	10/24/2017	DO	23.2	21.9	21.9	2.6	UT 0072	BRWN CLAY SILT HARD 0013 GREY CLAY SILT SOFT 0055 GREY GRVL SAND STNS 0072 GREY LMSN LYRD 0076

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

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

ONTARIO

1512438

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

11

MUNICIP. 15011 CON. CON 05

31660

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
Carleton	Cumberland	5	007

[redacted] Sarsfield, Ont.

DATE COMPLETED 48-53 DAY 29 MO. 09 YR. 72

...HING 333360 RC. 4 ELEVATION 0275 RC. 5 BASIN CODE 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
blue	clay			0	38
grey	gravel			38	40

31 0038305 0040211

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0040	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
02	1 ☐ STEEL 2 ☒ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	STD	0	0040
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) — DIAMETER INCHES — LENGTH FEET

MATERIAL AND TYPE — DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER
PUMPING RATE: 0010 GPM.
DURATION OF PUMPING: 02 HOURS 00 MINS.

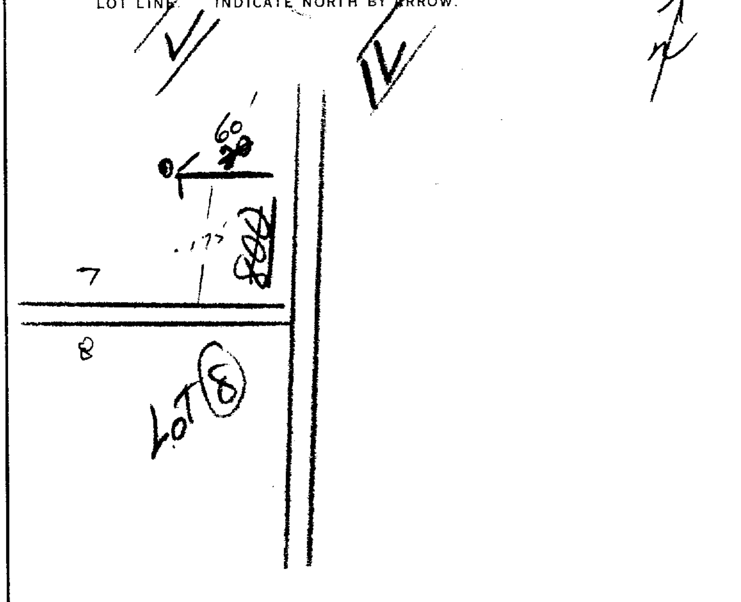
STATIC LEVEL: 003 FEET
WATER LEVEL END OF PUMPING: 015 FEET
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES: 010 FEET; 30 MINUTES: 015 FEET; 45 MINUTES: 015 FEET; 60 MINUTES: 015 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 20 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: 020 FEET
RECOMMENDED PUMPING RATE: 0006 GPM.
000.8 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☒ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: G. Charbonneau, Diamond & Cable Drilling — LICENCE NUMBER: 055
ADDRESS: R. R. 2, Box 194, Orleans, Ont.
NAME OF DRILLER OR BORER: R. Wolfe — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: [signature]
SUBMISSION DATE: DAY 29 MO. 9 YR. 72

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 1504 — DATE RECEIVED: 240473
DATE OF INSPECTION — INSPECTOR
REMARKS:
P — WI

MINISTRY OF THE ENVIRONMENT COPY

FORM

UTM [illegible] Z 4|7|1|1|5|0 E

15 R 5|0|3|2|8|5|0 N

Elev 15 R 0|2|7|6

Basin 2|5

1512623 56 No. 424

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Russell 31G/6W Township, Village, Town or City Cumberland

Con. 5 V Lot 8 8 Date completed 17th, October, 1965. (day month year)

[redacted]dress Sarsfield, Ont.

Casing and Screen Record	
Inside diameter of casing	2"
Total length of casing	90'
Type of screen	
Length of screen	
Depth to top of screen	
Diameter of finished hole	2"

Pumping Test	
Static level	3'
Test-pumping rate	12 G.P.M.
Pumping level	20'
Duration of test pumping	2 hrs.
Water clear or cloudy at end of test	clear
Recommended pumping rate	6 G.P.M.
with pump setting of	20 feet below ground surface

Well Log / **Water Record**

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
blue clay	0	35	91	fresh
gravel & sand	35	89		
grey limestone	89	91		

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

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

Drilling or Boring Firm G. Charbonneau, Diamond & Cable Drilling,

Address R.R. #1, Box 194, Orleans, Ont.

Licence Number 1631

Name of Driller or Borer Roland Wolfe

Address Clarence Creek, Ont.

Date 17th, October, 1965

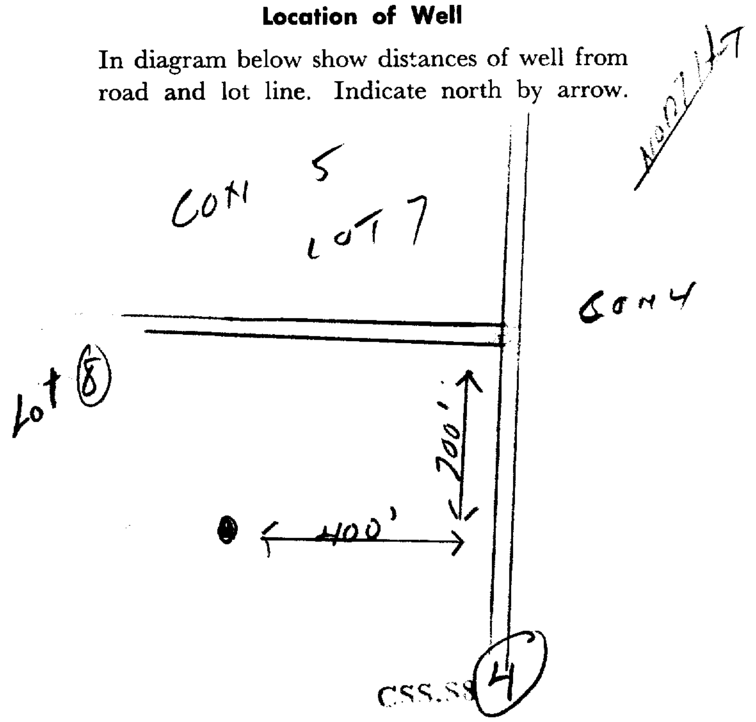
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

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



CSS.SS 4

56 Russell B-21

316/6W.

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

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(11) 1513949 | MUNICIP. 15011 | CON. CON 06

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Cumberland	5	008

[redacted] van, Ont.

DATE COMPLETED: DAY 21 MO. 06 YR. 73

[redacted] 033049 | RC. 4 | ELEVATION 0280 | RC. 5 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
yellow	sand			0	22
blue	clay			22	68
grey	gravel			68	76

OWRC D-5

(31) 0022528 0068305 0076211

32

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0076	☒ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
02	☐ STEEL ☒ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	.250	0	~~76~~ 0076
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0008 GPM.

DURATION OF PUMPING: 01 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
010 FEET	030 FEET	025 FEET	020 FEET	015 FEET	010 FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY

IF FLOWING, GIVE RATE: GPM.

PUMP INTAKE SET AT: 30 FEET

WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP

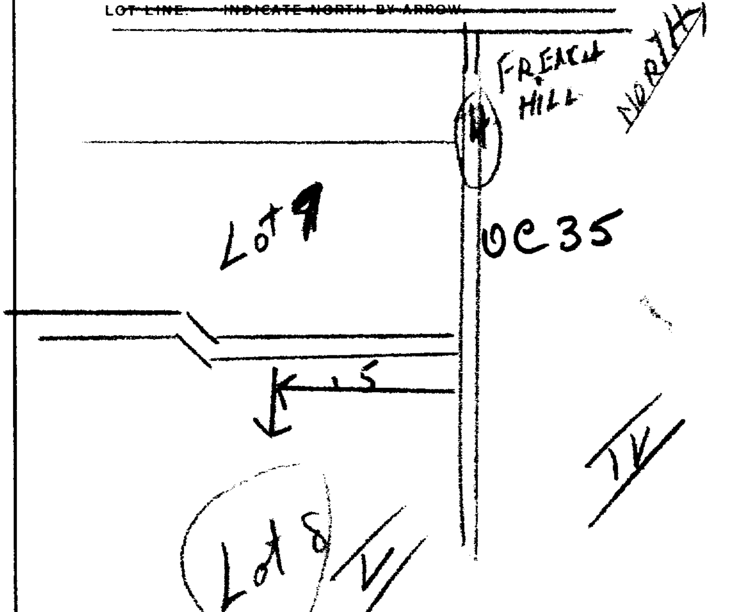
RECOMMENDED PUMP SETTING: 030 FEET

RECOMMENDED PUMPING RATE: 0008 GPM.

000.4 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 7133

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



DRILLERS REMARKS:

FINAL STATUS OF WELL: 1

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED

WATER USE: 01

1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING: 7

1 ☐ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☒ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: G. Charbonneau, Diamond & Cable Drilling — LICENCE NUMBER: 1504

ADDRESS: R. R. 2, Box 194, Orleans, Ont.

NAME OF DRILLER OR BORER: Roland Wolfe — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: [signature]

SUBMISSION DATE: DAY 21 MO. 6 YR. 73

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1504 | DATE RECEIVED: 180374

DATE OF INSPECTION: | INSPECTOR: K

REMARKS:

P

WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

31G/6W

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

11 | 1513950 | MUNICIP. 15011 | CON. Con 105

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Cumberland	5	007

[redacted] Sarsfield, Ont.

DATE COMPLETED: DAY 22 MO. 06 YR. 73

[redacted] 033470 | RC. 4 | ELEVATION 0275 | RC. 5 | BASIN CODE 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
blue	clay			0	25
grey	gravel			25	31

31 | 0025305 | 0031211

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0031	☒ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
02	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE	.250	0	0031
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

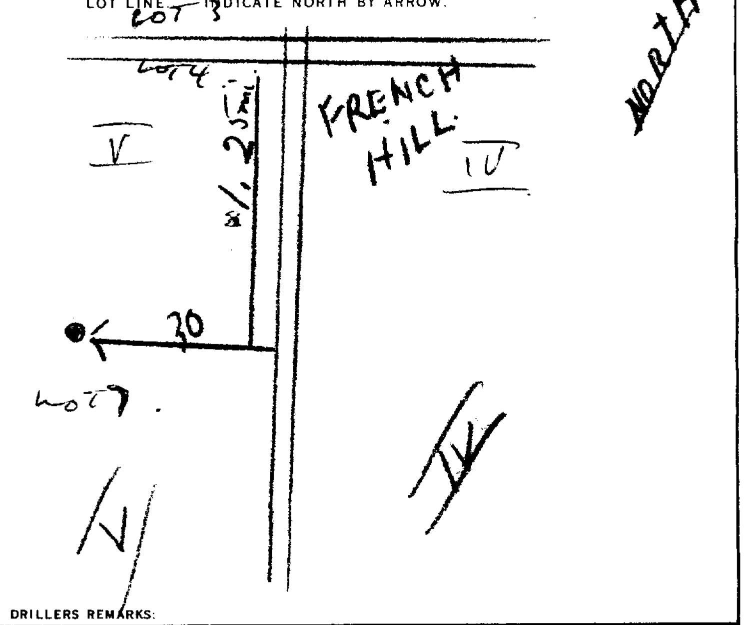
- PUMPING TEST METHOD: ☒ PUMP ☐ BAILER
- PUMPING RATE: 0006 GPM
- DURATION OF PUMPING: 02 HOURS 00 MINS
- STATIC LEVEL: 001 FEET
- WATER LEVEL END OF PUMPING: 010 FEET
- WATER LEVELS DURING: ☐ PUMPING ☒ RECOVERY

15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
001 FEET	001 FEET	001 FEET	001 FEET

- IF FLOWING, GIVE RATE: GPM
- PUMP INTAKE SET AT: 25 FEET
- WATER AT END OF TEST: ☒ CLEAR ☐ CLOUDY
- RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP
- RECOMMENDED PUMP SETTING: 025 FEET
- RECOMMENDED PUMPING RATE: 0006 GPM
- 000.7 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED

WATER USE

01

☒ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF DRILLING

☐ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☒ DIAMOND ☐ JETTING ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: G. Charbonneau, Diamond & Cable Drilling | LICENCE NUMBER: 1504

ADDRESS: R. R. 2, Box 194, Orleans, Ont.

NAME OF DRILLER OR BORER: Roland Wolfe | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Gerard Charbonneau | SUBMISSION DATE: DAY 22 MO. 6 YR. 73

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1504 | DATE RECEIVED: 180373

DATE OF INSPECTION: | INSPECTOR: K

REMARKS: | P R | WI

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FORM 7 07-091

MINISTRY OF THE ENVIRONMENT

The Ontario Water Resources Act

WATER WELL RECORD

Ontario

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11 | 1513961 | MUNICIP. | CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Carleton	Cumberland,	5	007

[redacted] umberland, Ont.

DATE COMPLETED: DAY 26 MO. 11 YR. 73

HING 03330 | RC 4 | ELEVATION 0276 | RC ST | BASIN CODE 25T

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
blue	clay			0	18
grey	coarse gravel			18	20

31 | 0018305 | 0020211

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
20	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
02	1 ☐ STEEL 2 ☒ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	STD	0	20
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0010 GPM | DURATION OF PUMPING: 01 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
003 FEET	030 FEET	15 MINUTES: 010 FEET	30 MINUTES: 003 FEET	45 MINUTES: 003 FEET	60 MINUTES: 003 FEET

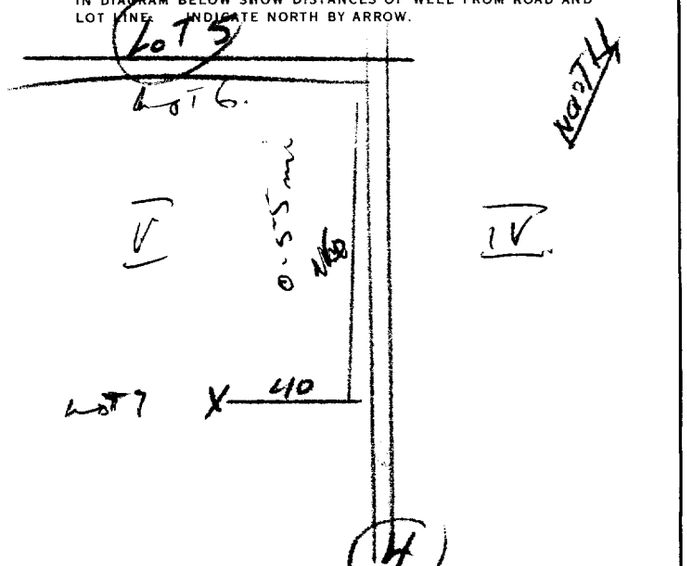
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM.	30 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	030 FEET	0010 GPM.

50-53: 000.7 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☒ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: G. Charbonneau, Diamond & Cable Drilling | LICENCE NUMBER: 1504

ADDRESS: R. R. 2, Box 194, Orleans, Ont. K0A 2W0

NAME OF DRILLER OR BORER: Roland Wolfe | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: [signature] | SUBMISSION DATE: DAY 26 MO. 11 YR. 73

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 1504 | DATE RECEIVED

DATE OF INSPECTION | INSPECTOR: K

REMARKS:

P R

WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

Cty-56 Russell B-25-Z-18 3/6/6w

Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 1514295 | MUNICIP. 15011 | CON. CON 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
CARLETON	CUMBERLAND	CON. 5	008

[redacted] BOX 190 NAVAN, ONTARIO — DATE COMPLETED DAY 05 MO. 09 YR. 74

[redacted] 3,27,23 | RC. 4 | ELEVATION 0285 | RC. 5 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
GREY	CLAY			0	20
	SAND & GRAVEL			20	36
	GRAVEL			36	51

31 | 0020205 | 0036 2811 | 0051 11

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0036	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

OWRC

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE 0010 GPM | DURATION OF PUMPING 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
006 FEET	006 FEET	FEET	FEET	FEET	FEET

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY

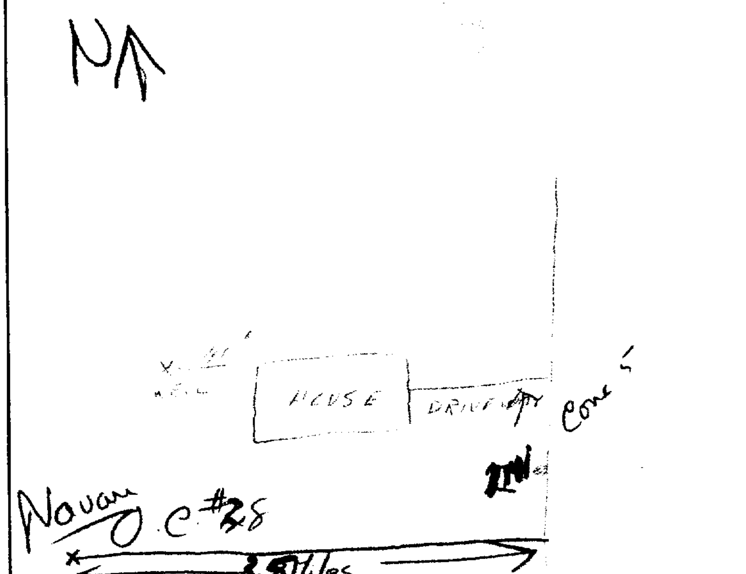
IF FLOWING GIVE RATE — GPM | PUMP INTAKE SET AT 25 FEET | WATER AT END OF TEST 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE ☒ SHALLOW ☐ DEEP | RECOMMENDED PUMP SETTING — FEET | RECOMMENDED PUMPING RATE 0010 GPM

020.0 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 7032

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 1: 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01: 1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 4: 1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: HAWTHORNE DRILLING LTD. | LICENCE NUMBER 2557

ADDRESS: P.O. BOX, 4218, STATION "E" ~~XXXXXXXXXX~~, OTTAWA, ONTARIO

NAME OF DRILLER OR BORER: ALFRED EMOND | LICENCE NUMBER 2557

SIGNATURE OF CONTRACTOR: [signature] | SUBMISSION DATE DAY 6 MO. 9 YR. 74

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 2557 | DATE RECEIVED 190974

DATE OF INSPECTION | INSPECTOR

REMARKS: | P ✓ | WI

FORM 7 07-091

MINISTRY OF THE ENVIRONMENT COPY

Cty 56 - Russell - B25 - Z-18
5601743 31-G/6-W

Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

MINISTRY OF ENVIRONMENT

APR 29 1975

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

11 | 515552 | MUNICIP. 15011 | CON. CON | 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
~~RUSSELL~~ OTTAWA CARLTON	CUMBERLAND	C5	007

[redacted]

DATE COMPLETED: OTTAWA DAY 17 MO. 05 YR. 74

RC 4 | ELEVATION 0280 | RC 5 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	TOP SOIL			0	3
BLUE	CLAY	SOFT		3	38
GREY	HARD PAN	SAND BOULDERS		38	41
BROWN	SAND STONE	HARD		41	50

OWRC P-5

31 | 0003602 | 0038305 | 0041214 2813 | 005061B

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0043	1 ☑ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
05	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	~~47~~ 0041
05	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			0050
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER | PUMPING RATE 0025 GPM | DURATION OF PUMPING 01 HOURS 10 MINS

STATIC LEVEL 003 FEET | WATER LEVEL END OF PUMPING 005 FEET | WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

15 MINUTES 005 FEET | 30 MINUTES ~~005~~ 5 FEET | 45 MINUTES 005 FEET | 60 MINUTES ~~005~~ 5 FEET

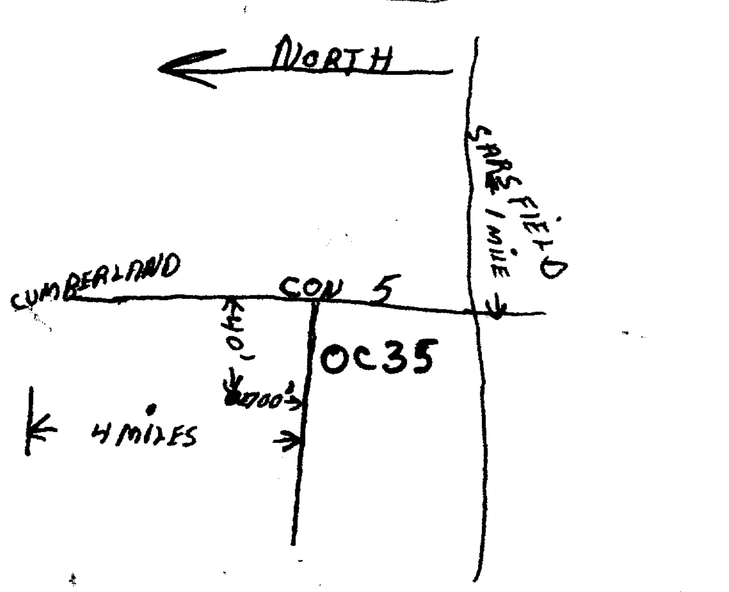
IF FLOWING, GIVE RATE GPM. | PUMP INTAKE SET AT 20 FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY

RECOMMENDED PUMP TYPE: ☑ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING 020 FEET | RECOMMENDED PUMPING RATE 0020 GPM

012.5 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 7133

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



DRILLERS REMARKS:

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

CONTRACTOR

NAME OF WELL CONTRACTOR: CAYER WELL DRILLING | LICENCE NUMBER: 1517

ADDRESS: CASSELMAN ONT

NAME OF DRILLER OR BORER: YVON GENIER | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Maurice Cayer | SUBMISSION DATE DAY ___ MO. ___ YR. ___

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 1517 | DATE RECEIVED 120874

DATE OF INSPECTION | INSPECTOR K

REMARKS:

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MINISTRY OF THE ENVIRONMENT COPY

FORM 7 07-091

Ministry of the Environment

Ontario

The Ontario Water Resources Act

316 GW

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
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11 | 1516193 | MUNICIP. 15011 | CON. CON | 04

COUNTY OR DISTRICT: Ottawa

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Cumberland / Marsfield

CON., BLOCK, TRACT, SURVEY, ETC.: Con 4

LOT: 008

DATE COMPLETED: DAY 25 MO 08 YR. 77

[redacted]

033099 | RC 5 | ELEVATION 0250 | RC 5 | BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Gray	Clay		Soft	0	57
Gray	Gravel	Sand	Coarse	57	66
Gray	Limestone		Soft	66	75

MOE VF-18

31 | 0057 | 20585 | 0066 | 21128 | 77 | 0075 | 21585

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0066	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6.0	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0066
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE		66	75
06	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			0075
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE:

DEPTH TO TOP OF SCREEN FEET:

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0050 GPM

DURATION OF PUMPING: 02 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
008 FEET	030 FEET	030 FEET	030 FEET	030 FEET	030 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY

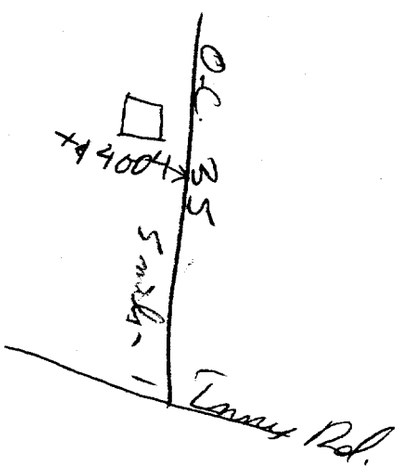
RECOMMENDED PUMP TYPE: ☒ SHALLOW ☐ DEEP

RECOMMENDED PUMP SETTING: 030 FEET

RECOMMENDED PUMPING RATE: 0005 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL: 1

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE: 02

1 ☐ DOMESTIC 2 ☒ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 5

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☒ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Bryson Maple Leaf | LICENCE NUMBER: 1365

ADDRESS: 877 Ridley Blvd

NAME OF DRILLER OR BORER: R Bryson | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: R Bryson | SUBMISSION DATE DAY 15 MO 7 YR. 77

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 1365 | DATE RECEIVED: 190977

DATE OF INSPECTION: | INSPECTOR:

REMARKS:

CSS.58

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506--4--77

Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 | 1523554 | MUNICIP 15011 | CON. CON 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	BERLAND	4	7

[redacted] DATE COMPLETED: DAY 5 MO 7 YR 89

ELEVATION | RC | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
RED	CLAY			0	6
BLUE	CLAY			6	34
BLACK	GRAVEL			34	35

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
35	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6 1/4	1 ☑ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	35
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☑ BAILER
PUMPING RATE: 60 GPM
DURATION OF PUMPING: 1 HOURS 00 MINS

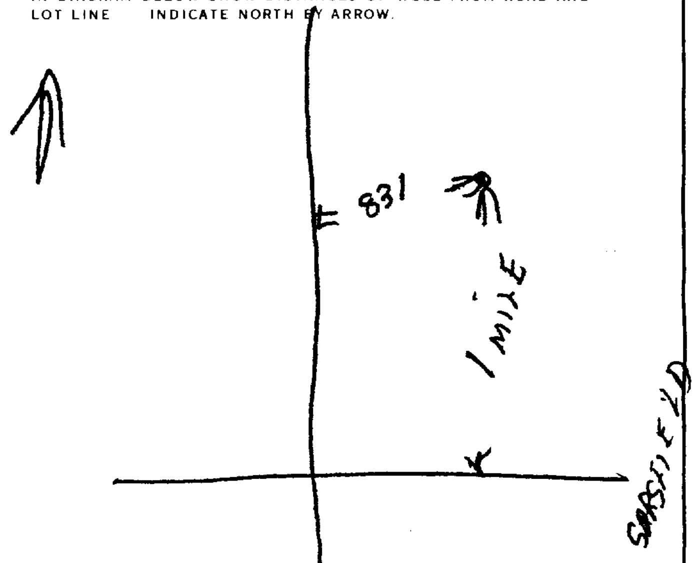
STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
4 FEET	20 FEET	20 FEET	20 FEET	20 FEET	20 FEET

WATER LEVELS DURING: 1 ☑ PUMPING 2 ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 30 FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP
RECOMMENDED PUMP SETTING: 30 FEET
RECOMMENDED PUMPING RATE: 15 GPM

LOCATION OF WELL

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



37614

DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING

WATER USE

1 ☑ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☑ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: GENIER WELL DRILLING
WELL CONTRACTOR'S LICENCE NUMBER: 2351
ADDRESS: BOX A-7 CASSELMAN, ONT K0A-1M0
NAME OF WELL TECHNICIAN: ARVON GENIER
WELL TECHNICIAN'S LICENCE NUMBER: T-0389
SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]
SUBMISSION DATE: DAY 5 MO 7 YR 89

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 2351 | DATE RECEIVED JUL 21 1989
DATE OF INSPECTION | INSPECTOR
REMARKS

CSS.6S

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FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario
OTTAWA - CARLETON

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 1527974 | MUNICIP 15011 | CON. CON | LOT 24

COUNTY OR DISTRICT: [redacted]
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Cumberland
CON. BLOCK, TRACT, SURVEY, ETC.: Conc 4
LOT: 8
ADDRESS OF WELL LOCATION: Spesfield Ontario
DATE COMPLETED: DAY 25 MO 05 YR 94

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay		Soft	0	17
Grey	Clay		Soft	17	47
Black	Gravel	Boulder	Hard	47	50
Black	Gravel		Packed	50	59

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
59	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	1.88	0	59
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	20	Cement grout

71 PUMPING TEST

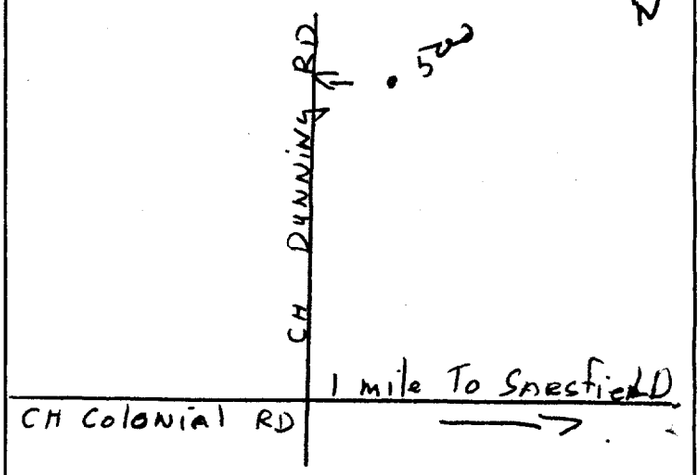
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 80 + GPM
DURATION OF PUMPING: 1 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
11 FEET	35 FEET	11 FEET	11 FEET	11 FEET	11 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 59 FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 50 FEET
RECOMMENDED PUMPING RATE: 20 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 134543

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Raymond Well Drilling
WELL CONTRACTOR'S LICENCE NUMBER: 6589.
ADDRESS: St-Albert Ontario
NAME OF WELL TECHNICIAN: Marcel Raymond
WELL TECHNICIAN'S LICENCE NUMBER: T-0522
SIGNATURE OF TECHNICIAN/CONTRACTOR:
SUBMISSION DATE: DAY 25 MO. 05 YR. 94

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 6587 | DATE RECEIVED JUN 14 1994
DATE OF INSPECTION | INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

OTTAWA-CARLETON

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 1528498 | MUNICIP. 15011 | CON. CON 04

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Cumberland	Con 4	8

[redacted] Sarsfield ont

DATE COMPLETED: DAY 08 MO 5 YR 95

NORTHING | RC | ELEVATION | RC | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Red	Clay		Hard	0	15
Grey	fill	boulders	Hard	15	24
grey	limestone		Hard	24	55

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
50	☑ 1 FRESH ☐ 2 SALTY ☐ 3 SULPHUR ☐ 4 MINERALS ☐ 6 GAS
	☐ 1 FRESH ☐ 2 SALTY ☐ 3 SULPHUR ☐ 4 MINERALS ☐ 6 GAS
	☐ 1 FRESH ☐ 2 SALTY ☐ 3 SULPHUR ☐ 4 MINERALS ☐ 6 GAS
	☐ 1 FRESH ☐ 2 SALTY ☐ 3 SULPHUR ☐ 4 MINERALS ☐ 6 GAS
	☐ 1 FRESH ☐ 2 SALTY ☐ 3 SULPHUR ☐ 4 MINERALS ☐ 6 GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
8 1/4	☑ 1 STEEL ☐ 2 GALVANIZED ☐ 3 CONCRETE ☐ 4 OPEN HOLE ☐ 5 PLASTIC	1.88	0	24
8	☐ 1 STEEL ☐ 2 GALVANIZED ☐ 3 CONCRETE ☑ 4 OPEN HOLE ☐ 5 PLASTIC		24	55
	☐ 1 STEEL ☐ 2 GALVANIZED ☐ 3 CONCRETE ☐ 4 OPEN HOLE ☐ 5 PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER (INCHES)	LENGTH (FEET)

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
5	35	Cement Grout

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ 1 PUMP ☑ 2 BAILER	45 GPM	1 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☑ 1 PUMPING ☐ 2 RECOVERY: 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
18 FEET	35 FEET	25 FEET	35 FEET	35 FEET	35 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☐ 1 CLEAR ☑ 2 CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	35 FEET	15 GPM

FINAL STATUS OF WELL

☑ 1 WATER SUPPLY
☐ 2 OBSERVATION WELL
☐ 3 TEST HOLE
☐ 4 RECHARGE WELL
☐ 5 ABANDONED, INSUFFICIENT SUPPLY
☐ 6 ABANDONED, POOR QUALITY
☐ 7 UNFINISHED
☐ DEWATERING

WATER USE

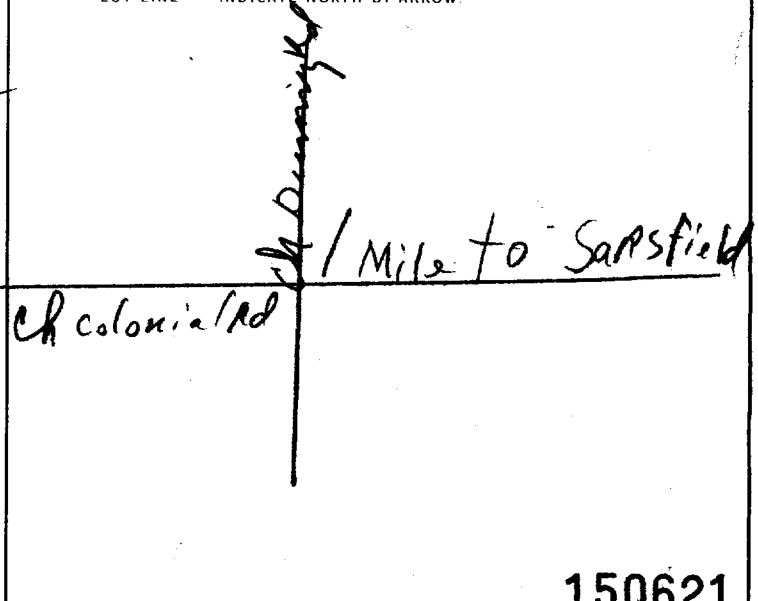
☐ 1 DOMESTIC
☑ 2 STOCK
☐ 3 IRRIGATION
☐ 4 INDUSTRIAL
☐ OTHER
☐ 5 COMMERCIAL
☐ 6 MUNICIPAL
☐ 7 PUBLIC SUPPLY
☐ 8 COOLING OR AIR CONDITIONING
☐ 9 NOT USED

METHOD OF CONSTRUCTION

☑ 1 CABLE TOOL
☐ 2 ROTARY (CONVENTIONAL)
☐ 3 ROTARY (REVERSE)
☐ 4 ROTARY (AIR)
☐ 5 AIR PERCUSSION
☐ 6 BORING
☐ 7 DIAMOND
☐ 8 JETTING
☐ 9 DRIVING
☐ DIGGING
☐ OTHER

LOCATION OF WELL

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



DRILLERS REMARKS

150621

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Gilles Bourgeois	1414

ADDRESS: St Albert ont

NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER
S A m	

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]

SUBMISSION DATE: DAY 08 MO 5 YR 95

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
	1414	MAY 12 1995

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 1530860 Municipality 1501 1 Con. CON 04

County or District: OTTAWA Carleton
Township/Borough/City/Town/Village: Cumberland
Con block tract survey, etc.: Conc 4
Lot: 7
Address: 2922 Chemin Sawsfield
Date completed: 12/10/99 (day/month/year)
Northing / RC / Elevation / RC / Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Red	Clay		Soft	0	7
Grey	Clay		Soft	7	25
Blue	Clay		Soft	25	90
Grey	Gravel		Soft	90	99
Grey	Shale		Porous	99	113

41 WATER RECORD

Water found at - feet	Kind of water
105	1 ☑ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
6 5/8	1 ☑ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	188	0	99
6	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☑ Open hole 5 ☐ Plastic		99	113
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type: | Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	20	Cement Grout

PUMPING TEST

71 Pumping test method: 1 ☑ Pump 2 ☐ Bailer
Pumping rate: 25 GPM
Duration of pumping: 2 Hours 00 Mins
Water levels during: 1 ☐ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
18 feet	20 feet	20 feet	20 feet	20 feet	20 feet

If flowing give rate: GPM
Pump intake set at: 113 feet
Water at end of test: ☑ Clear ☐ Cloudy
Recommended pump type: ☑ Shallow ☑ Deep
Recommended pump setting: 75 feet
Recommended pump rate: 10 GPM

FINAL STATUS OF WELL

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

WATER USE

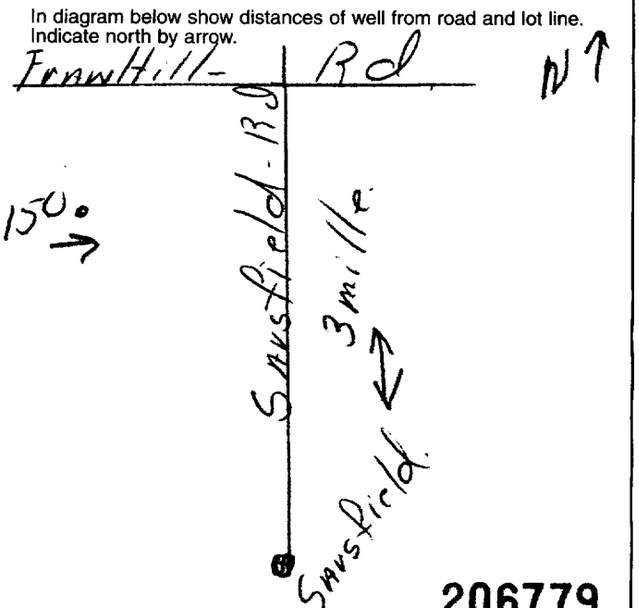
1 ☑ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION

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

LOCATION OF WELL

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



206779

Name of Well Contractor: D & R - WATER - Well Drilling
Well Contractor's Licence No.: 6006
Address: St. Albert. ont.
Name of Well Technician: Louis Desaulniers
Well Technician's Licence No.: 1-0623
Signature of Technician/Contractor:
Submission date: 12/10/99 (day/mo/yr)

MINISTRY USE ONLY
Data source | Contractor: 6006 | Date received: NOV 09 1999
Date of inspection | Inspector
Remarks: CSS.ES0

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: [X] Metric [ ] Imperial

Well Tag No. Tag#: A227515 — A227515

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
2570 Giroux Road	Cumberland	N 1/2 Lot 8	5

County/District/Municipality	City/Town/Village	Province	Postal Code
Ottawa Carleton	Sarsfield	Ontario	K0A3E0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	471138	5033248		

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

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	clay	Silt,	Hard	0	3.9
Grey	clay	Silt,	Soft	3.9	16.7
Grey	gravel	Sand, Stone	packed	16.7	21.9
Grey	limestone		layered	21.9	23.2

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	6	ciment grout	.2m³

Method of Construction

[ ] Cable Tool [ ] Diamond [ ] Rotary (Conventional) [ ] Jetting [ ] Rotary (Reverse) [ ] Driving [ ] Boring [ ] Digging [X] Air percussion [ ] Other, specify

Well Use

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

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
15.55	Steel	.48	+.6	21.9
15.55	Open Hole		21.9	23.2

Construction Record - Screen

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

Status of Well

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

Water Details

Water found at Depth	Kind of Water	
22 (m/ft) [ ] Gas	[ ] Fresh [X] Untested [ ] Other, specify	
Water found at Depth (m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify	
Water found at Depth (m/ft) [ ] Gas	Kind of Water: [ ] Fresh [ ] Untested [ ] Other, specify	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	6	24.9
6	23.2	15.55

Results of Well Yield Testing

After test of well yield, water was: [X] Clear and sand free [ ] Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft): 22

Pumping rate (l/min / GPM): 68

Duration of pumping: 1 hrs + _____ min

Final water level end of pumping (m/ft): 3.05

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 20

Recommended pump rate (l/min / GPM): 68

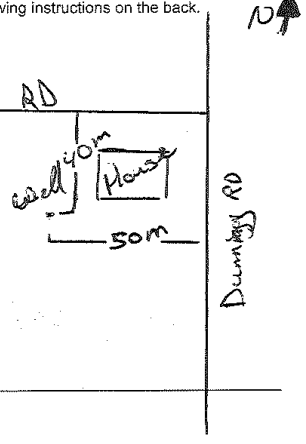
Well production (l/min / GPM): 100

Disinfected? [X] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	2.58		3.05
1	2.96	1	2.66
2	2.96	2	2.64
3	2.97	3	2.62
4	2.97	4	2.62
5	2.97	5	2.61
10	2.98	10	2.61
15	2.99	15	2.60
20	2.99	20	2.60
25	2.99	25	2.59
30	2.99	30	2.59
40	2.99	40	2.59
50	3.00	50	2.59
60	3.05	60	2.59

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Rutgers Well Drilling Ltd.	7417

Business Address (Street Number/Name)	Municipality
14245 Concession 10-11	Crysler

Province	Postal Code	Business E-mail Address
On.	K0A1R0	N/A

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6139876291	GENIER, MICHAEL

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3493		2017/10/31

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
[X] Yes [ ] No	2017/10/24	Audit No. Z259728
	Date Work Completed: 2017/10/24	NOV 27 2017 Received

0506E (2014/11) Ministry's Copy

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
PRescott-Russell	Cumberland	Con 4	8

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
LaPlante GeRald	Sarsfield ont	DAY 08 MO 5 YR 95

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Red	Clay		Hard	0	15
G.Grey	Fill	boulders	Hard	15	24
grey	limestone		Hard	24	55

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
50	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS
	☐ FRESH ☐ SALTY ☐ SULPHUR ☐ MINERALS ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
8 1/4	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	1.88	0	24
8"	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC		24	55
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
5	35	Cement Grout

PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☐ PUMP ☒ BAILER	45 GPM	1 HOURS 0 MINS

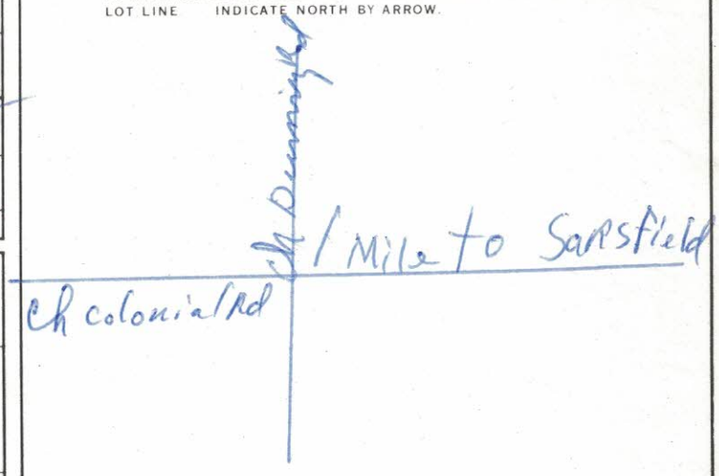
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING ☒ PUMPING ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
18 FEET	35 FEET	25 FEET	35 FEET	35 FEET	35 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	☐ CLEAR ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	35 FEET	15 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 150621

FINAL STATUS OF WELL

☒ WATER SUPPLY ☐ ABANDONED, INSUFFICIENT SUPPLY
☐ OBSERVATION WELL ☐ ABANDONED, POOR QUALITY
☐ TEST HOLE ☐ UNFINISHED
☐ RECHARGE WELL ☐ DEWATERING

WATER USE

☐ DOMESTIC ☐ COMMERCIAL
☒ STOCK ☐ MUNICIPAL
☐ IRRIGATION ☐ PUBLIC SUPPLY
☐ INDUSTRIAL ☐ COOLING OR AIR CONDITIONING
☐ OTHER ☐ NOT USED

METHOD OF CONSTRUCTION

☒ CABLE TOOL ☐ BORING
☐ ROTARY (CONVENTIONAL) ☐ DIAMOND
☐ ROTARY (REVERSE) ☐ JETTING
☐ ROTARY (AIR) ☐ DRIVING
☐ AIR PERCUSSION ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
Gillis Bourgeois	1914

ADDRESS	
St Albert ont	

NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S LICENCE NUMBER
Same	

SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE
[signature]	DAY 08 MO 5 YR 95

CONTRACTOR'S COPY

OFFICE USE ONLY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

OTTAWA - CARLETON

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

11 | 1527974 | MUNICIP. 1501 | CON. CON. 1 PA

COUNTY OR DISTRICT: [redacted]

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: CUMBERLAND

CON. BLOCK, TRACT, SURVEY ETC: CONC 4

LOT: 8

ADDRESS OF WELL LOCATION: Sarcfield Ontario

DATE COMPLETED: DAY 25 MO 05 YR 94

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	CLAY		SOFT	0	17
GREY	CLAY		SOFT	17	47
BLACK	GRAVEL	BOULDER	HARD	47	50
BLACK	GRAVEL		PACKED	50	59

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
59	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	1.88	0	59
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: | DEPTH TO TOP OF SCREEN FEET:

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	20	Cement grout

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	80 + GPM	1 HOURS 0 MINS

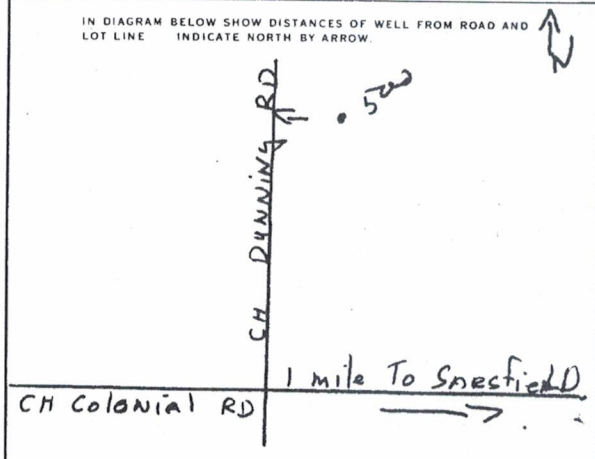
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
11 FEET	35 FEET		11 FEET	11 FEET	11 FEET	11 FEET

IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	59 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	50 FEET	20 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 134543

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

CONTRACTOR

NAME OF WELL CONTRACTOR: Raymond Well Drilling | WELL CONTRACTOR'S LICENCE NUMBER: 6589.

ADDRESS: St-Albert Ontario

NAME OF WELL TECHNICIAN: Marcel Raymond | WELL TECHNICIAN'S LICENCE NUMBER: T-0522

SIGNATURE OF TECHNICIAN/CONTRACTOR | SUBMISSION DATE: DAY 25 MO 05 YR 94

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 6587 | DATE RECEIVED JUN 14 1994

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS.GS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

APPENDIX D

Borehole Logs and Soil Characterization

ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer) test
D_R	Relative density
DS	Direct shear test
G_S	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

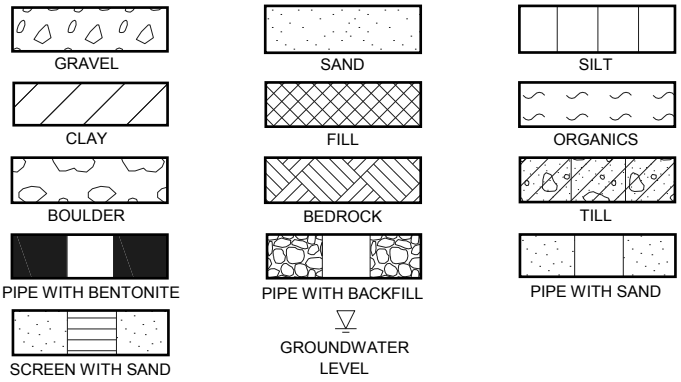
PENETRATION RESISTANCE

Standard Penetration Resistance, N
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

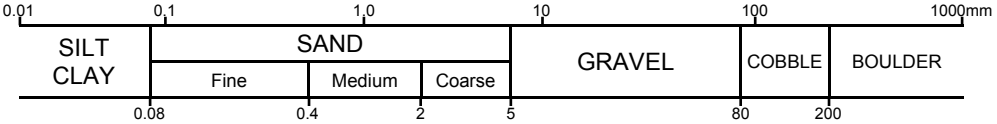
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	**Description**	**Cu, kPa**	**Description**
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard

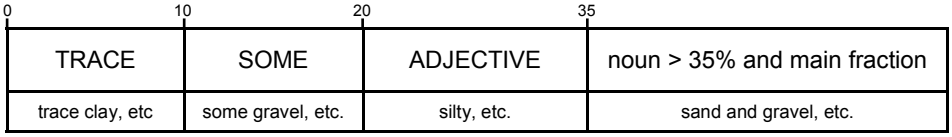


GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)



RECORD OF BOREHOLE 24-1D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 2
DATUM: CGVD2013
BORING DATE: Jan 5 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m ● / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m ▲	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED	WATER CONTENT, % W_P W W_L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		86.19									
		Topsoil		86.09									
		Stiff to very stiff, brown SILTY CLAY (WEATHERED CRUST)		0.10	1	SS	350	7	●				
1					2	SS	558	7	●				
2					3	SS	609	7	●		○	MH	
					4	SS	558	2	●				
				83.29									
3		Grey SILTY CLAY (undrained shear strength not determined)		2.90	5	SS	609	1	●				
4					6	SS	609	WH					
					7	SS	609	WH					Bentonite Seal
5					8	SS	609	WH					
6					9	SS	609	WH					
7					10	SS	609	WH					
8					11	SS	609	WH					
					12	SS	609	WH					
9					13	SS	609	WH					
10													

GEMTEC
Consulting Engineers and Scientists

LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-1D

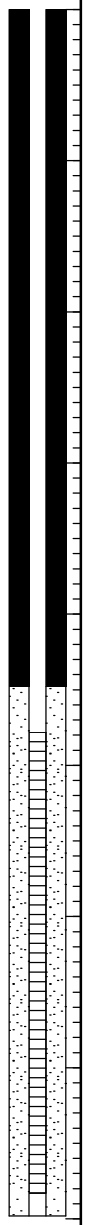
CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 2 OF 2
DATUM: CGVD2013
BORING DATE: Jan 5 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
10	Mud Rotary HW (114mm OD)			14	SS	609	WH	
11				15	SS	609	WH	MH
12				16	SS	609	WH	
13				17	SS	609	WH	
14				18	SS	609	WH	
15				19	SS	609	WH	
16				20	SS	609	WH	
17		Loose to compact, grey SILTY SANDY GRAVEL, with cobbles and boulders (GLACIAL TILL)	70.80 / 15.39	21	SS	406	12	
18	Mud Rotary HQ (89mm OD)	Dark Grey Limestone (Inferred Bedrock)	68.84 / 17.35	22	SS	356	6	
19		End of Borehole	68.21 / 17.98	23	SS	356	15	
20				24	RC	254		

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	2.3	85.0
24/01/31	2.4	85.0

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-1S

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Jan 8 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (210mm OD)	Ground Surface		86.10							
		Not Logged - See BH24-1D for details									
1											
2											Bentonite Seal
3											
4											
5											
6											Filter Sand Pack 50mm diameter PVC screen
7											
8		End of Borehole		78.17 / 7.93							
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	1.7	85.3
24/01/31	1.6	85.3

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Consulting Engineers and Scientists

LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-2D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 2
DATUM: CGVD2013
BORING DATE: Jan 9 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		86.53						
0	Power Auger Hollow Stem Auger (210mm OD)	Topsoil		86.43						
		Stiff to very stiff, brown SILTY CLAY (WEATHERED CRUST)		0.10						
1					1	SS	558	7		
					2	SS	609	7		
2					3	SS	558	2	MH	
				83.63						
3		Grey SILTY CLAY (undrained shear strength not determined)		2.90	4	SS	609	1		
4					5	SS	609	WH		
					6	SS	609	WH		Bentonite Seal
5					7	SS	609	WH		
6					8	SS	609	WH		
7	Mud Rotary HW (114mm OD)				9	SS	609	WH		
					10	SS	609	WH		
8					11	SS	609	WH	MH	
9					12	SS	609	WH		
10										

SOIL PROFILE | SAMPLES | PENETRATION RESISTANCE (N), BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m | SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED | WATER CONTENT, % W_P W W_L | 10 20 30 40 50 60 70 80 90

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

GEMTEC
Consulting Engineers and Scientists

LOGGED: SE
CHECKED: AM

RECORD OF BOREHOLE 24-2D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 2 OF 2
DATUM: CGVD2013
BORING DATE: Jan 9 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
				76.02	13	SS	609	WH
		Loose to compact, grey SANDY SILT, with trace to some gravel (GLACIAL TILL)		10.51	14	SS	609	4
					15	SS	450	9
					16	SS	540	
				73.58				
		Compact to dense, grey SILTY SAND, some gravel, with cobbles and boulders (GLACIAL TILL)		12.95	17	SS	440	13
					18	SS	580	35
	Mud Rotary HQ (89mm OD)				19	RC	720	
				71.21				
		Dark Grey Limestone (Inferred Bedrock)		15.32				
				70.99				
		End of Borehole		15.54				

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Bentonite Seal

Filter Pack 50mm diameter PVC screen

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	2.5 ▽	85.0
24/01/31	2.5 ▼	85.0

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-2S

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Jan 8 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (210mm OD)	Ground Surface		86.48					10 20 30 40 50 60 70 80 90		
		Not Logged - See BH24-2D for details									Bentonite Seal
1											
2											
3											
4											
5											
6											Filter Sand Pack 50mm diameter PVC screen
7											
8		End of Borehole		78.55 / 7.93							
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	1.7 ▽	85.7
24/01/31	1.5 ▼	85.8

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-03

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Appendix A, Figure A.1

SHEET: 1 OF 2
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE DATA: NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
0	Power Auger, Hollow Stem Auger (210mm OD)	Ground Surface		86.28									
		TOPSOIL		86.23 / 0.05									
		Stiff to very stiff, grey brown SILTY CLAY (WEATHERED CRUST)			1	SS	0	7	SA1	N/A			Bentonite seal
1					2	SS	510	8	SA2	HEX: 60 IBL: 0			Filter sand
2					3	SS	610	8	SA3	HEX: 35 IBL: 0			
					4	SS	610	4	SA4	HEX: 35 IBL: 0			
3		Firm to stiff, grey SILTY CLAY		83.38 / 2.90	5	SS	610	2	SA5	HEX: 5 IBL: 0			50 mm diameter PVC screen
4													
5					6	TO	610	PM	SA6	HEX: 5 IBL: 0			
6					7	SS	560	WH	SA7	HEX: 0 IBL: 0			Auger cuttings
7													
8					8	TO	610	PM	SA8	HEX: 0 IBL: 0			
9													

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Consulting Engineers and Scientists

LOGGED: CD
CHECKED: PS

ENV - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-09-05ENV.GPJ GEMTEC 2018.GDT 24/9/6

RECORD OF BOREHOLE 24-03

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Appendix A, Figure A.1

SHEET: 2 OF 2
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE DATA: NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
					9	SS	610	WH	SA9	HEX: 0 IBL: 0			
10				76.28									
		Firm to stiff, grey SILTY CLAY		10.00									
					10	SS	610	WH	SA10	HEX: 0 IBL: 0			
11													
	Power Auger Hollow Stem Auger (210mm OD)												Auger cuttings
12					11	SS	610	WH	SA11	HEX: 0 IBL: 0			
13				73.07									
		Dense to very dense, grey GRAVEL and SAND, some silt, trace clay, with cobbles and boulders (GLACIAL TILL)		13.21	12	SS	610	44	SA12				
14					13	SS	355	82	SA13				
		End of Borehole Auger Refusal		71.80 14.48									

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Jul. 29/24	1.52 ▽	84.76
Aug. 01/24	1.72 ▼	84.56

GEMTEC
Consulting Engineers and Scientists

LOGGED: CD
CHECKED: PS

ENV - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-09-05ENV.GPJ GEMTEC 2018.GDT 24/9/6

RECORD OF BOREHOLE 24-04

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Appendix A, Figure A.1

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE DATA: NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		Ground Surface		86.27									
0	Power Auger / Hollow Stem Auger (210mm OD)	TOPSOIL		86.22 / 0.05									
		Stiff to very stiff, grey brown SILTY CLAY (WEATHERED CRUST)			1	SS	355	5	SA1	HEX: 30 IBL: 0			Bentonite seal
1					2	SS	405	8	SA2	HEX: 15 IBL: 0			Filter sand
					3	SS	610	5	SA3	HEX: 5 IBL: 0			
2					4	SS	610	2	SA4	HEX: 5 IBL: 0			
3		Grey SILTY CLAY		83.22 / 3.05	5	SS	610	3	SA5	HEX: 5 IBL: 0			50 mm diameter PVC screen
					6	SS	610	WH	SA6	HEX: 15 IBL: 0			
4					7	SS	610	WH	SA7	HEX: 0 IBL: 0			
5					8	SS	610	WH	SA8	HEX: 0 IBL: 0			Auger cuttings
					9	SS	610	WH	SA9	HEX: 0 IBL: 0			
6		End of Borehole		79.56 / 6.71									

GROUNDWATER OBSERVATIONS

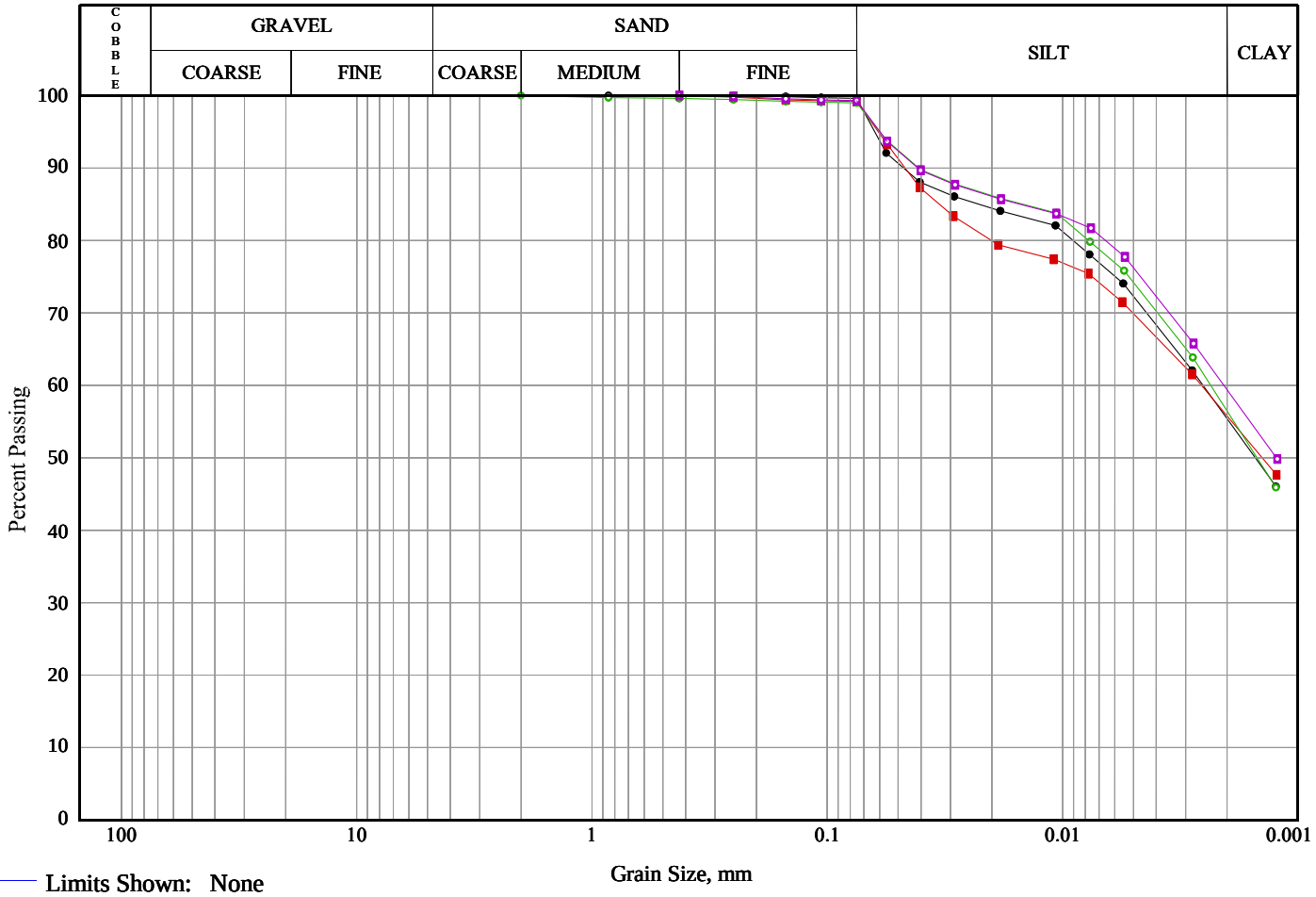
DATE	DEPTH (m)	ELEVATION (m)
Jul. 29/24	0.44 ▽	85.83
Aug. 01/24	0.27 ▼	86.00

GEMTEC
Consulting Engineers and Scientists

LOGGED: CD
CHECKED: PS

ENV - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-09-05ENV.GPJ GEMTEC 2018.GDT 24/9/6

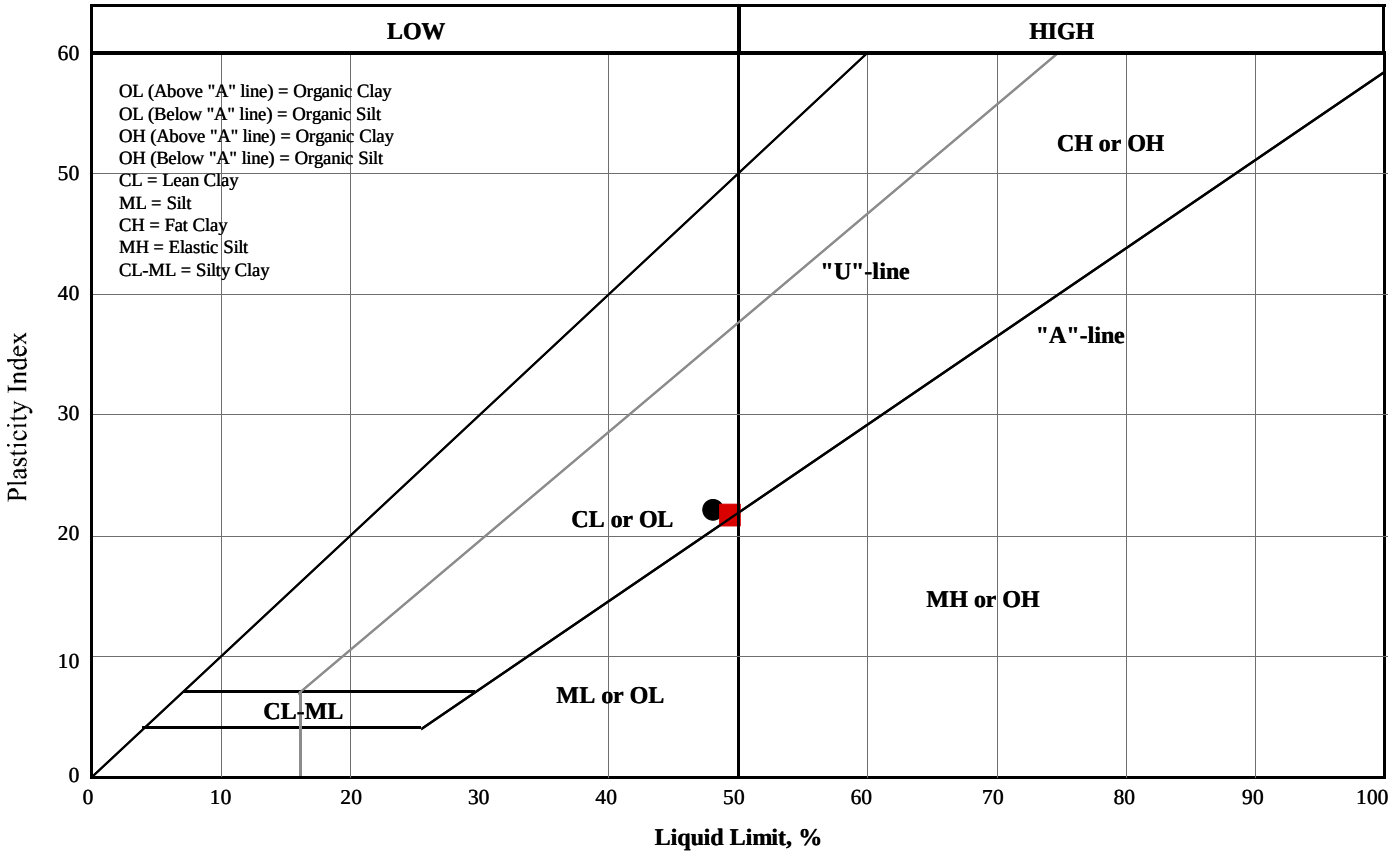
GEMTEC Consulting Engineers and Scientists	Client: J. L. Richards & Associates Limited	Soils Grading Chart (LS-702/ ASTM D-422)
	Project: 3043 Dunning Road, Zoning By-law Amendment, Propo	
	Project #: 100117056	



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
		24-01D	SA 03	1.52-2.13	0.0	0.4	44.2	55.4
		24-01D	SA 15	10.67-11.28	0.0	0.8	43.4	55.8
		24-02D	SA 03	2.28-2.89	0.0	1.0	42.5	56.5
		24-02D	SA 11	8.38-8.99	0.0	0.7	39.9	59.4

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
	Clay and silt , trace sand	-	---	---	---	0.00	0.00	0.02	44.2
	Clay and silt , trace sand	CL	---	---	---	0.00	0.00	0.03	43.4
	Clay and silt , trace sand	-	---	---	---	0.00	0.00	0.01	42.5
	Clay and silt , trace sand	CL	---	---	---	0.00	0.00	0.02	39.9

GEMTEC Consulting Engineers and Scientists	Client: J. L. Richards & Associates Limited	Plasticity Chart (D4318)
	Project: 3043 Dunning Road, Zoning By-law Amendment, Propo	
	Project #: 100117056	

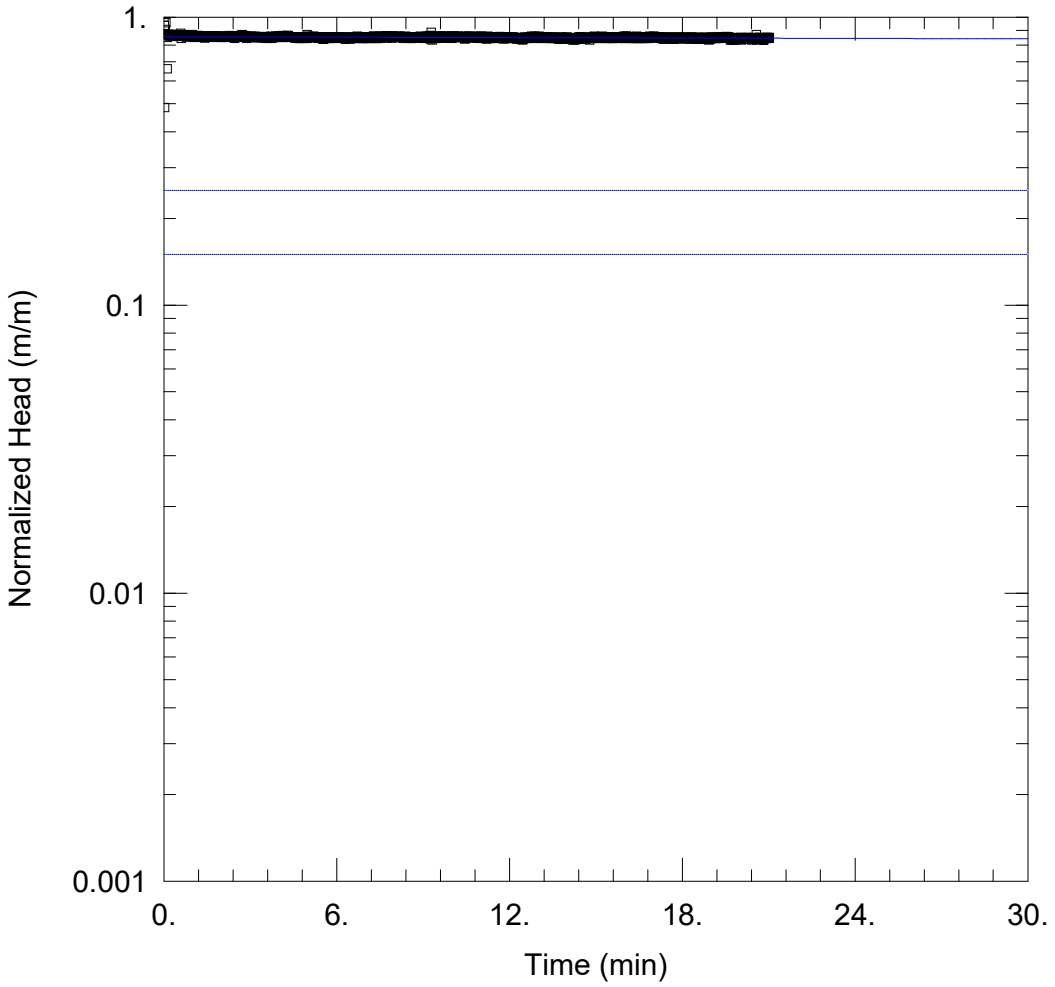


Symbol	Borehole /Test Pit	Sample Number	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Non-Plastic	Moisture Content, %
●	24-01D	SA 15	10.67-11.28	48.1	25.9	22.1	☐	85.23
■	24-02D	SA 11	8.38-8.99	49.4	27.7	21.7	☐	80.93

Note: More information available upon request

APPENDIX E

Single-Well Hydraulic Test Analyses



WELL TEST ANALYSIS

Data Set: N:\...\24-1S-FH_Hv.aqt
Date: 01/31/24 Time: 09:12:49

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-1S
Test Date: Jan 15, 2024

AQUIFER DATA

Saturated Thickness: 6.405 m Anisotropy Ratio (Kz/Kr): 0.1

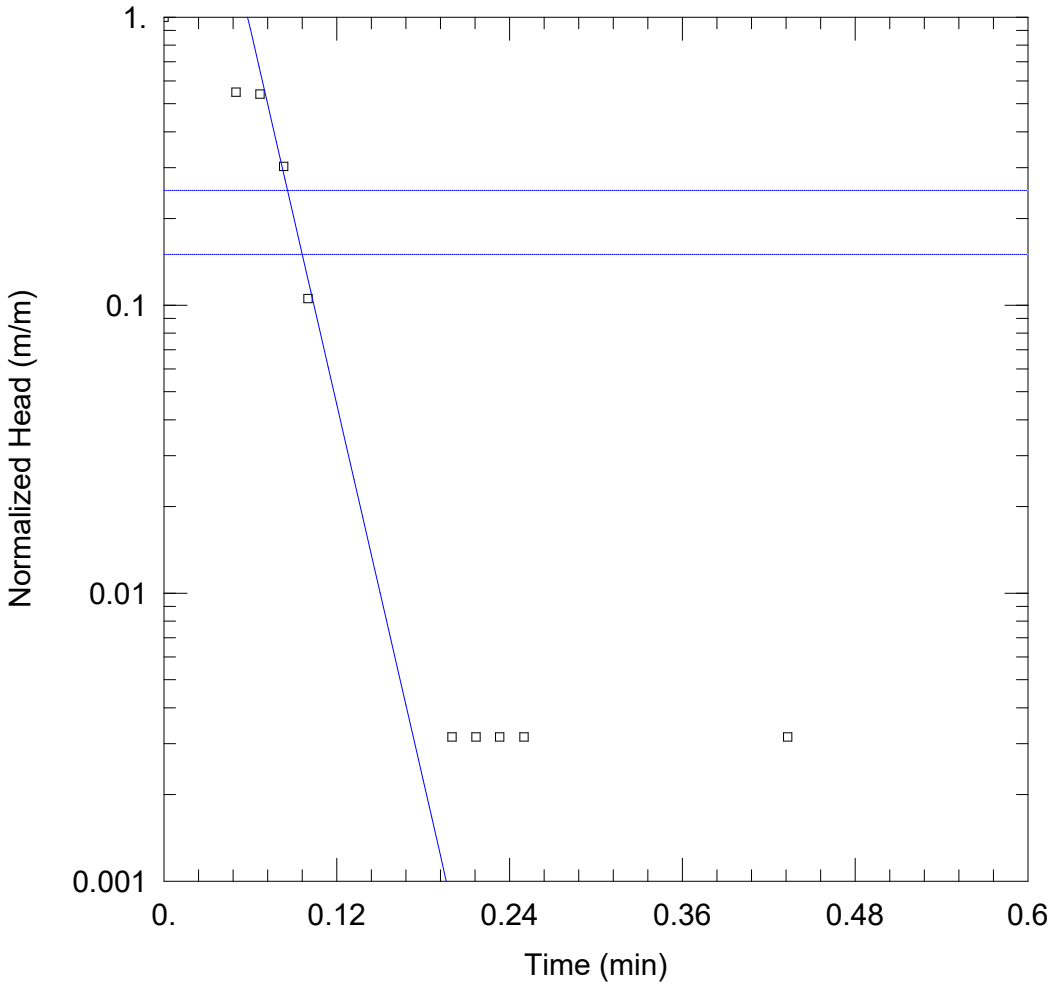
WELL DATA (BH24-1S-FH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 6.41 m
Casing Radius: 0.0255 m
Static Water Column Height: 6.405 m
Screen Length: 3.51 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 5.326E-9 m/sec y0 = 0.5128 m



WELL TEST ANALYSIS

Data Set: N:\...\24-1D-RH_Hv.aqt
Date: 01/31/24 Time: 09:11:18

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-1D
Test Date: Jan 15, 2024

AQUIFER DATA

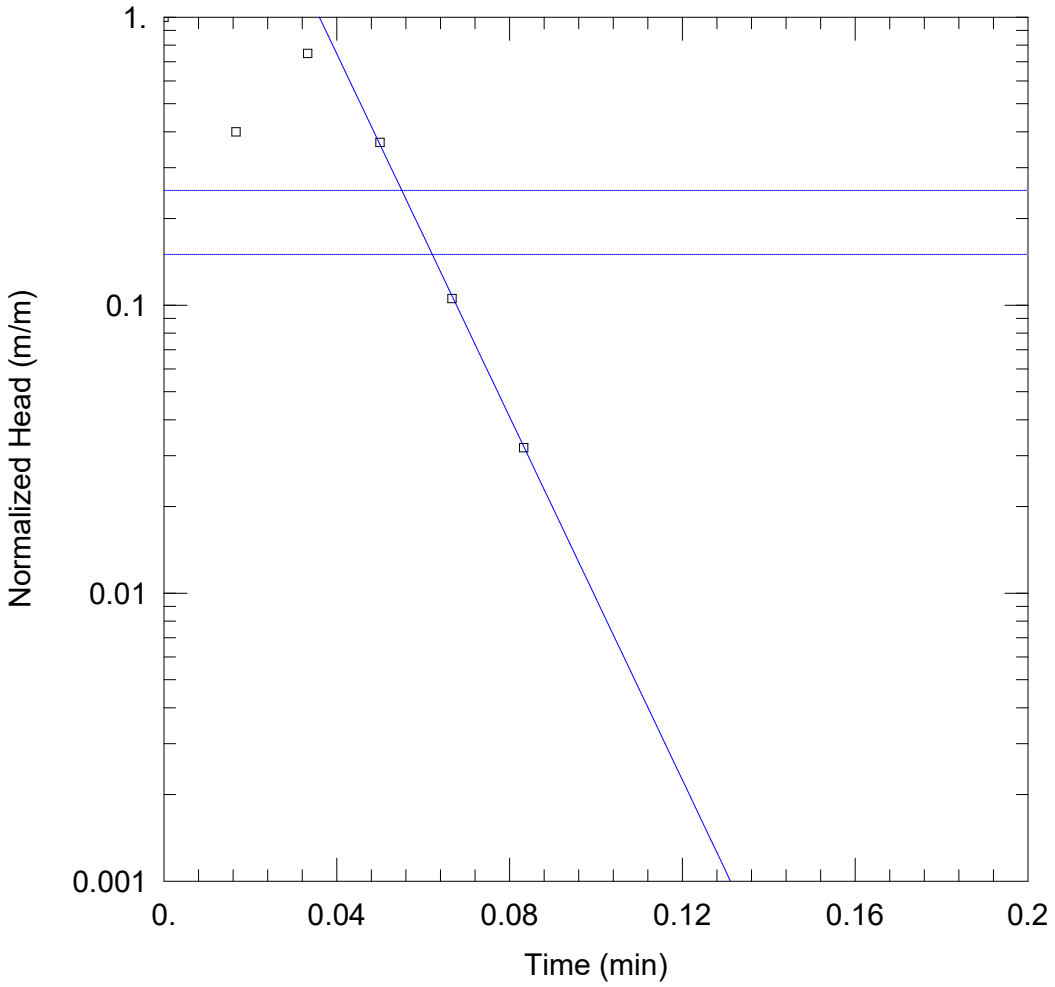
Saturated Thickness: 17.02 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-1D-H)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 17.02 m
Casing Radius: 0.0255 m
Static Water Column Height: 17.02 m
Screen Length: 3.71 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0004581 m/sec
y0 = 10.99 m



WELL TEST ANALYSIS

Data Set: N:\...\24-1D-FH_Hv.aqt
Date: 01/31/24 Time: 09:09:37

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-1D
Test Date: Jan 15, 2024

AQUIFER DATA

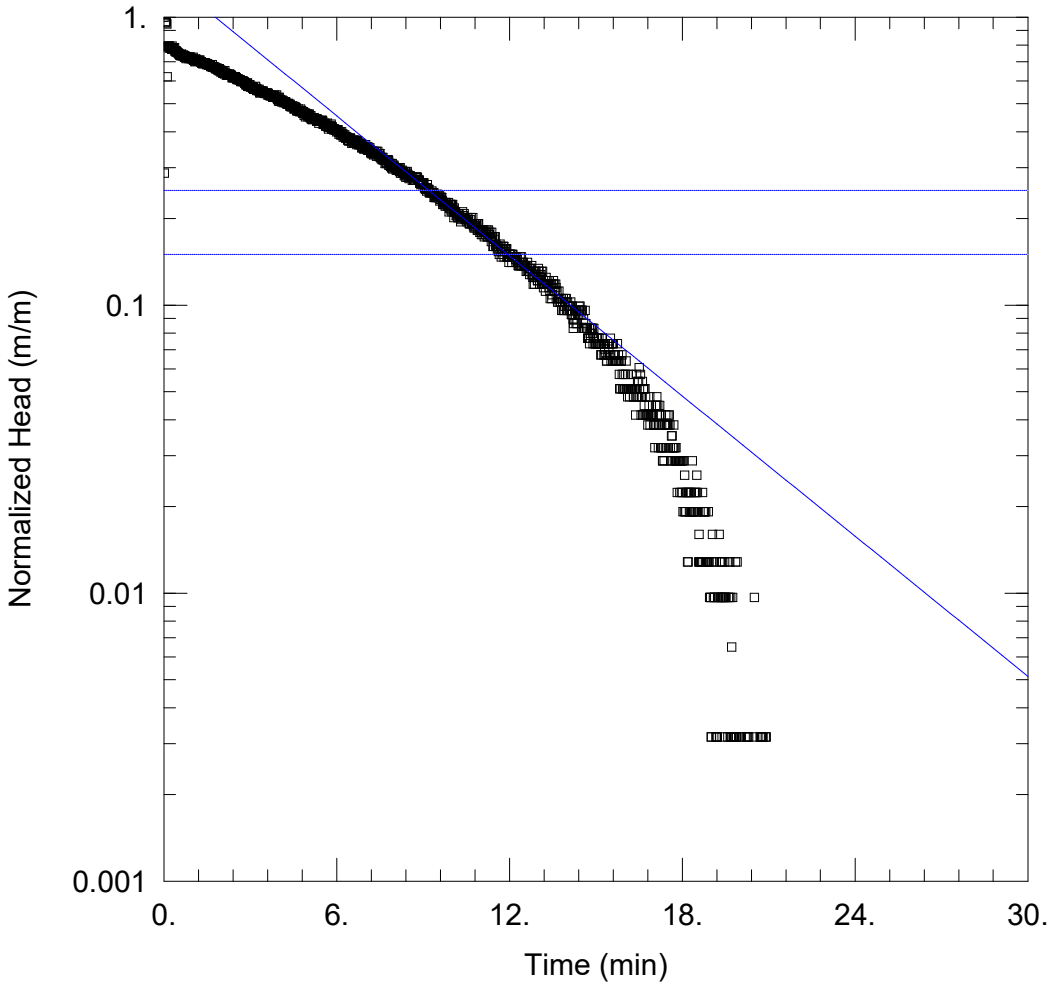
Saturated Thickness: 17.02 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-1D-FH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 17.02 m
Casing Radius: 0.0255 m
Static Water Column Height: 17.02 m
Screen Length: 3.71 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0006644 m/sec
y0 = 8.156 m



WELL TEST ANALYSIS

Data Set: N:\...\24-2S-FH_Hv.aqt
Date: 01/31/24 Time: 09:19:29

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-2S
Test Date: Jan 15, 2024

AQUIFER DATA

Saturated Thickness: 6.965 m Anisotropy Ratio (Kz/Kr): 0.1

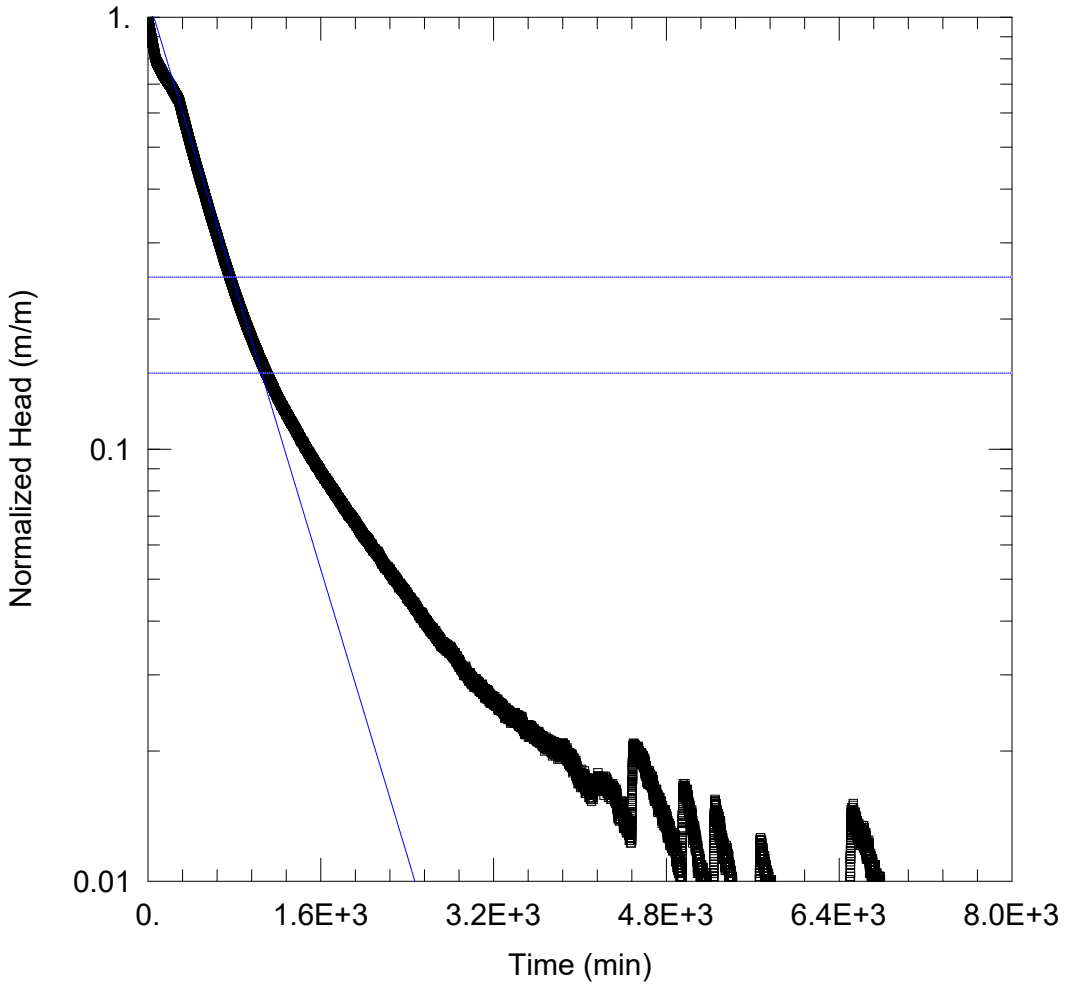
WELL DATA (BH24-2S-FH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 6.97 m
Casing Radius: 0.0255 m
Static Water Column Height: 6.965 m
Screen Length: 3.51 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 1.791E-6 m/sec y0 = 0.8356 m



WELL TEST ANALYSIS

Data Set: N:\...\24-2S-R_Hv.aqt
Date: 02/08/24 Time: 09:40:59

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-2S
Test Date: Jan 9, 2024

AQUIFER DATA

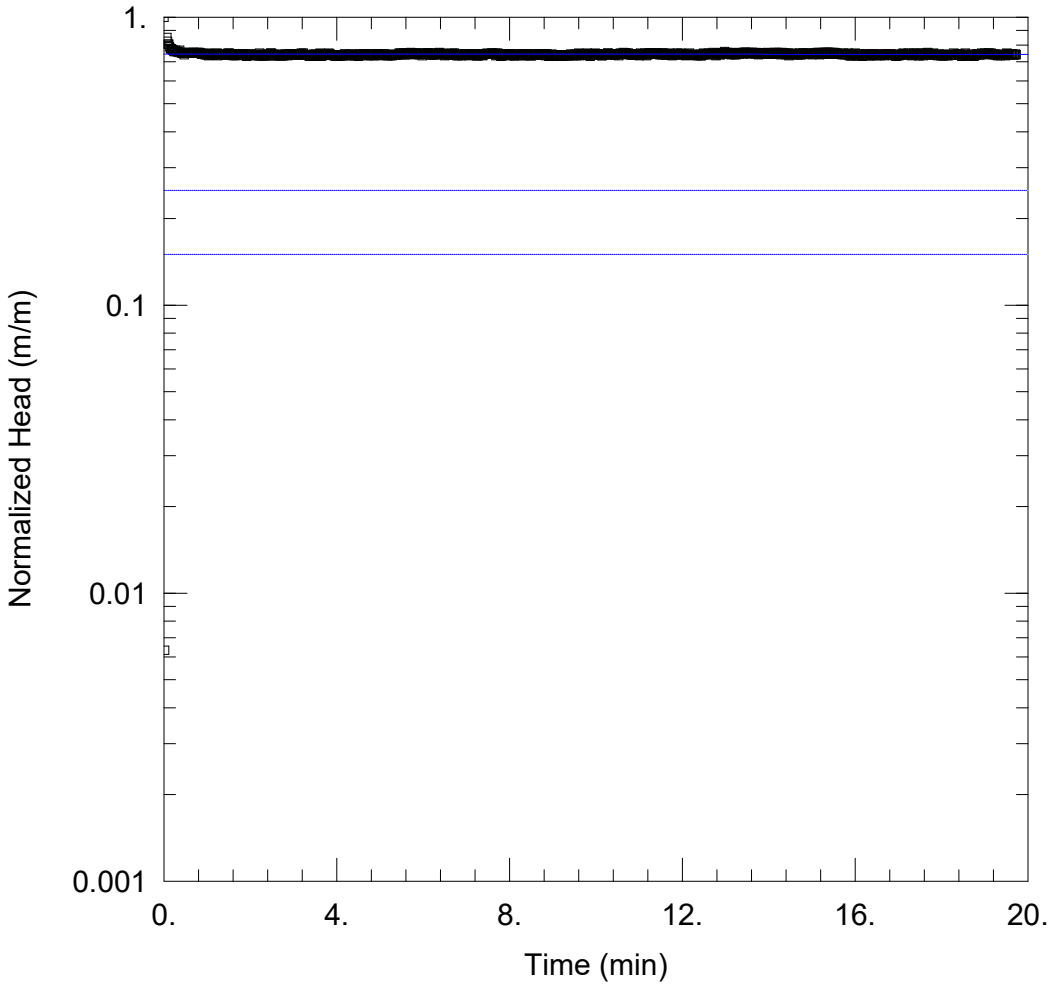
Saturated Thickness: 7.275 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-2S-R)

Initial Displacement: 5.95 m
Total Well Penetration Depth: 7.28 m
Casing Radius: 0.0255 m
Static Water Column Height: 7.275 m
Screen Length: 3.51 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 1.827E-8 m/sec
y0 = 6.598 m



WELL TEST ANALYSIS

Data Set: N:\...\24-2S-RH_Hv.aqt
Date: 01/31/24 Time: 09:22:47

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-2S
Test Date: Jan 15, 2024

AQUIFER DATA

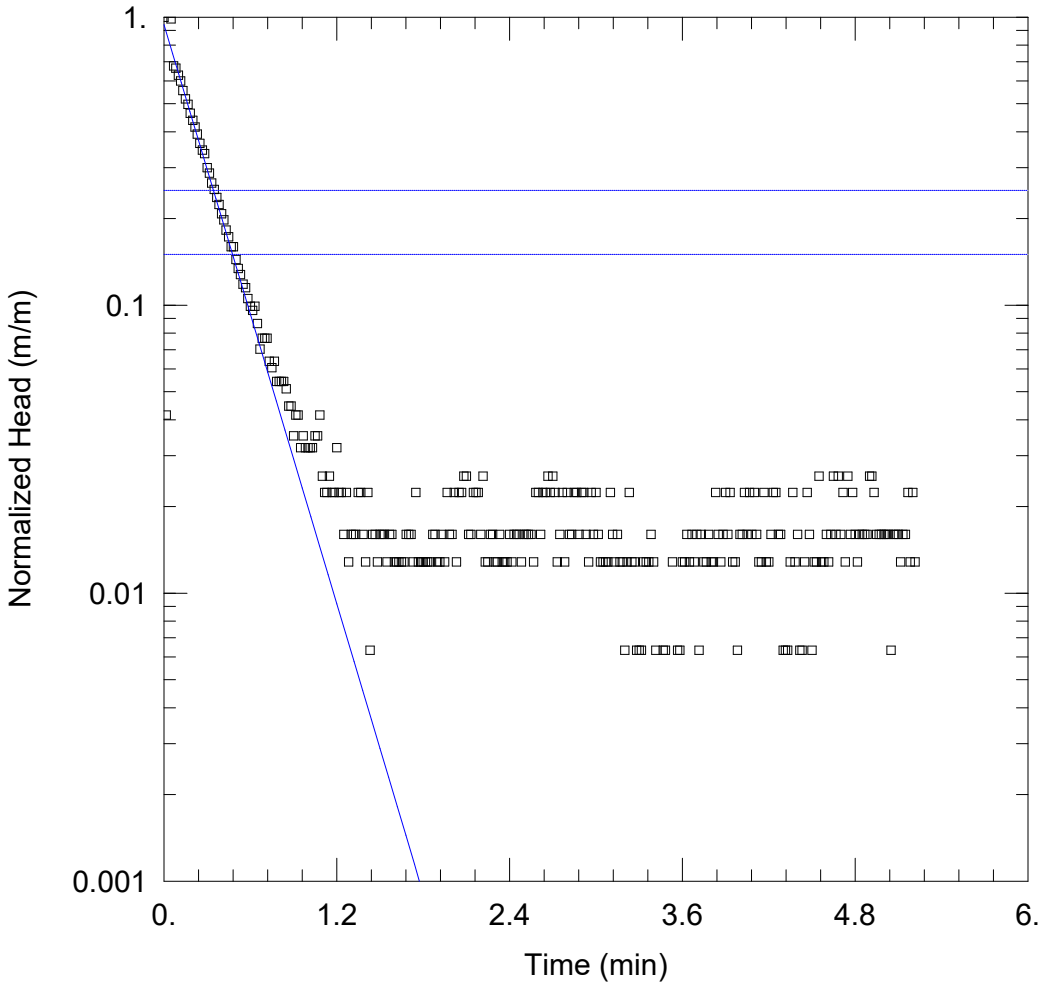
Saturated Thickness: 6.965 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-2S-RH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 6.97 m
Casing Radius: 0.0255 m
Static Water Column Height: 6.965 m
Screen Length: 3.51 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 1.067E-9 m/sec
y0 = 0.4466 m



WELL TEST ANALYSIS

Data Set: N:\...\24-2D-FH_Hv.aqt
Date: 01/31/24 Time: 09:15:37

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-2D
Test Date: Jan 15, 2024

AQUIFER DATA

Saturated Thickness: 14.07 m Anisotropy Ratio (Kz/Kr): 0.1

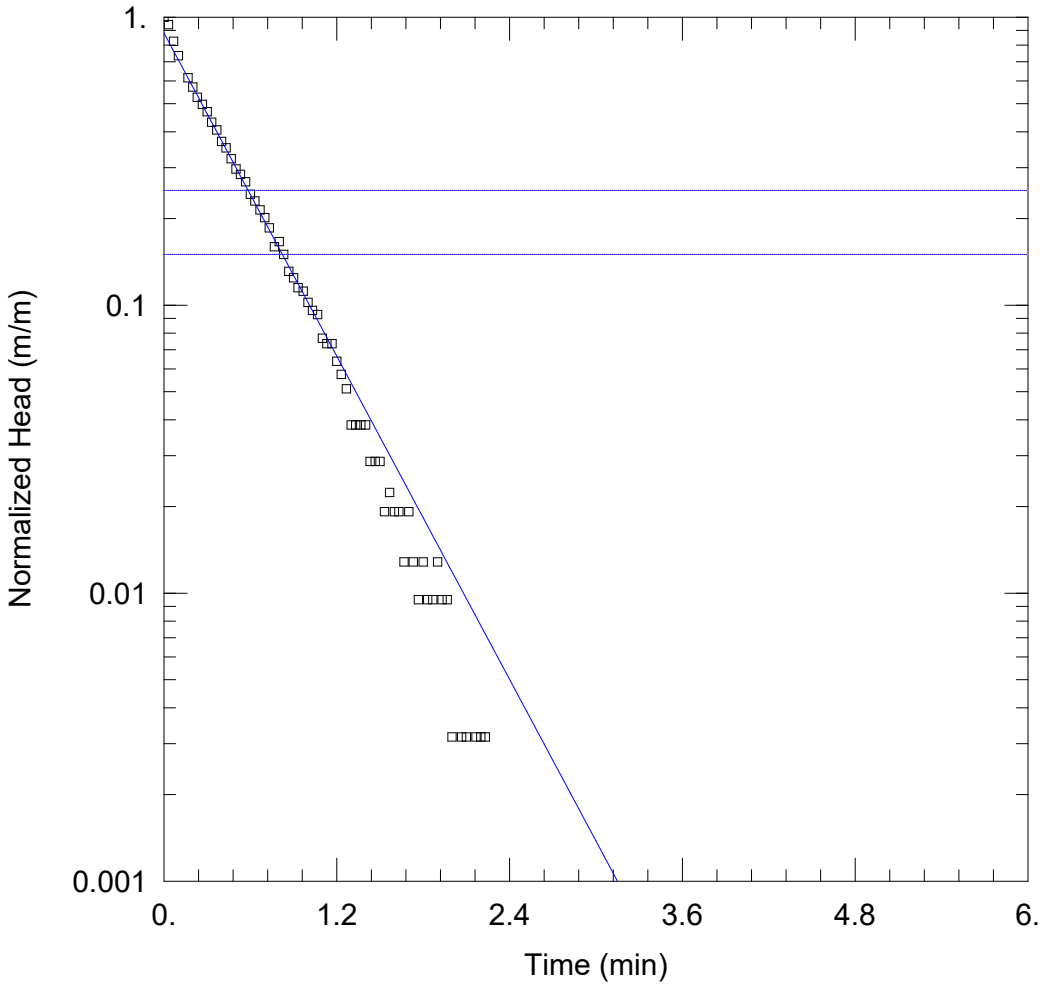
WELL DATA (BH24-2D-FH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 14.07 m
Casing Radius: 0.0255 m
Static Water Column Height: 14.07 m
Screen Length: 3.353 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 3.844E-5 m/sec y0 = 0.5647 m



WELL TEST ANALYSIS

Data Set: N:\...\24-2D-RH_Hv.aqt
Date: 01/31/24 Time: 09:17:23

PROJECT INFORMATION

Company: GEMTEC
Client: Robert Laplante
Project: 100117.056
Location: 3043 Dunning Road
Test Well: BH24-2D
Test Date: Jan 15, 2024

AQUIFER DATA

Saturated Thickness: 14.07 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BH24-2D-RH)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 14.07 m
Casing Radius: 0.0255 m
Static Water Column Height: 14.07 m
Screen Length: 3.353 m
Well Radius: 0.0445 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 2.146E-5 m/sec
y0 = 0.5282 m

APPENDIX F

Weather, Water Level Monitoring, and Pumping Test Data

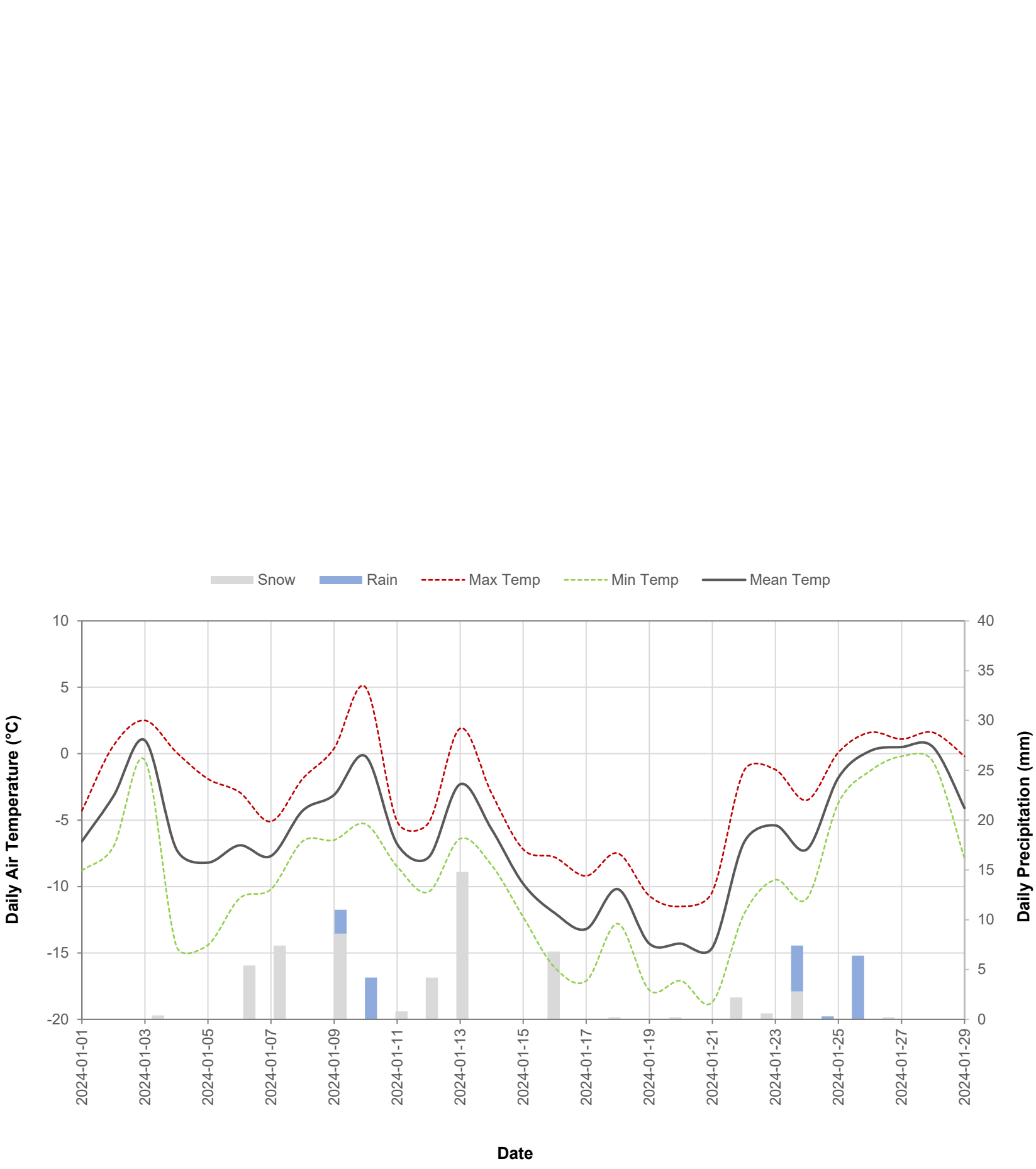
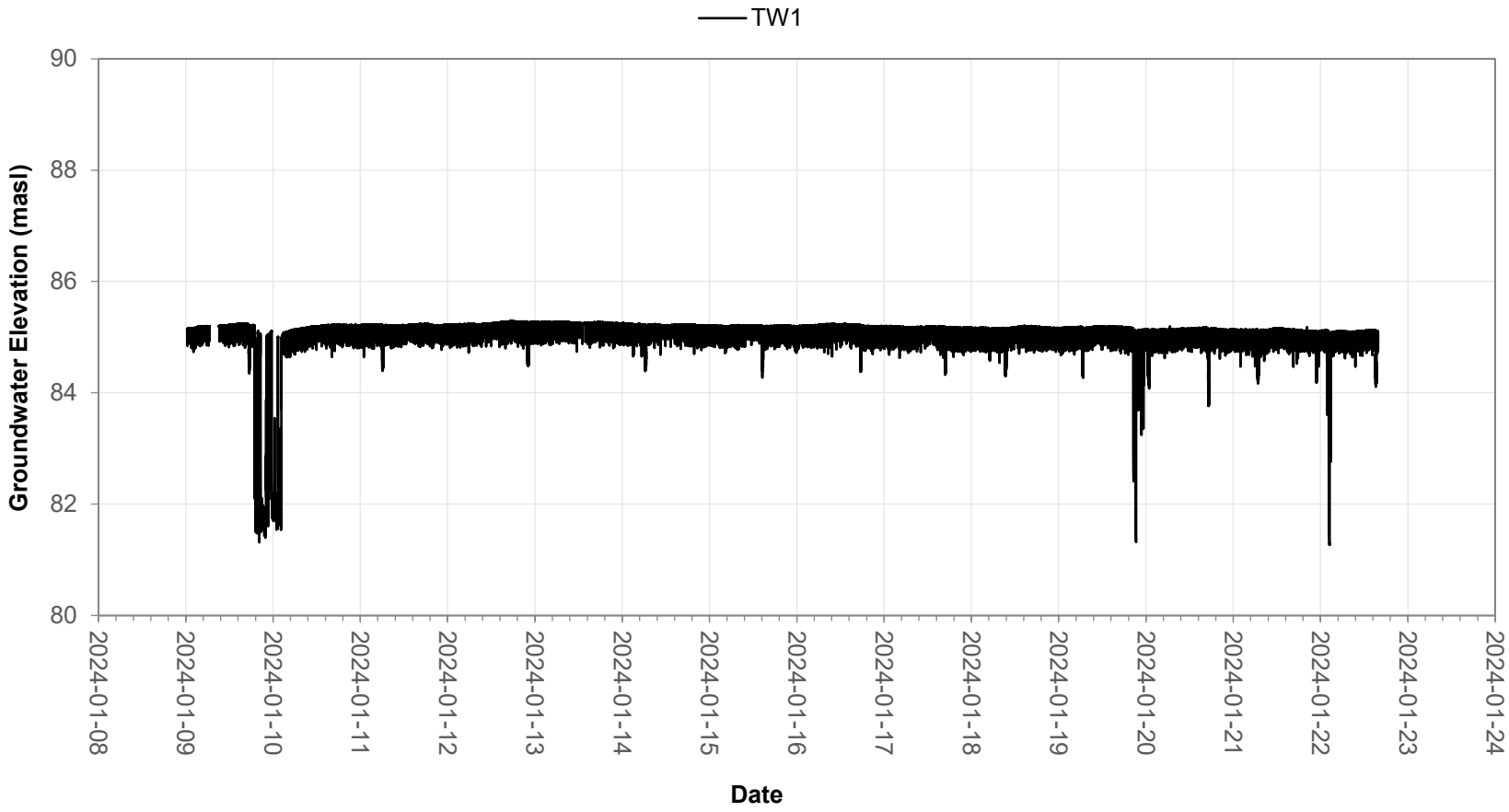


Figure F.1 – Weather Station Data from Ottawa International Airport (Temperature and Precipitation)

a)



b)

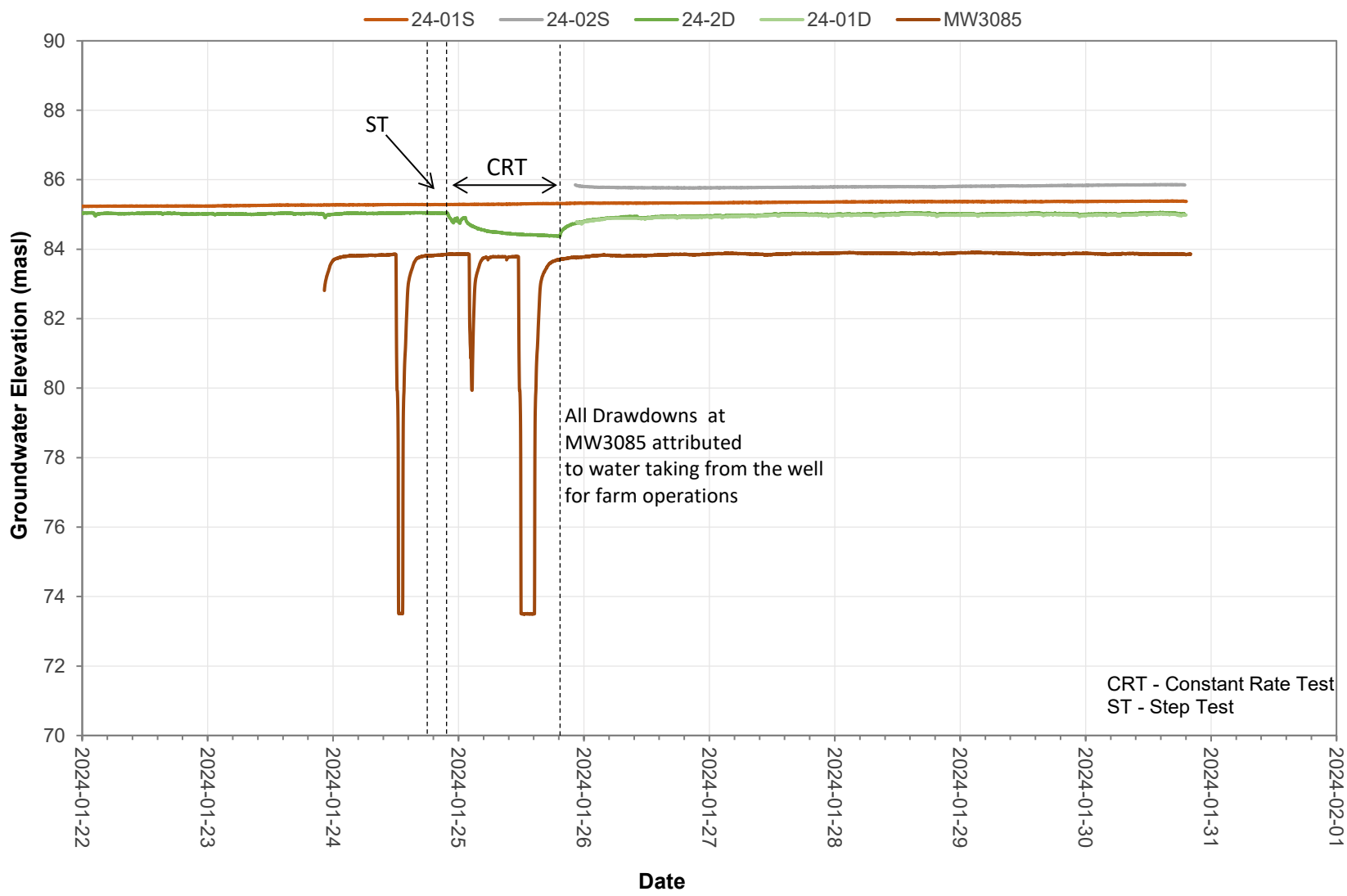
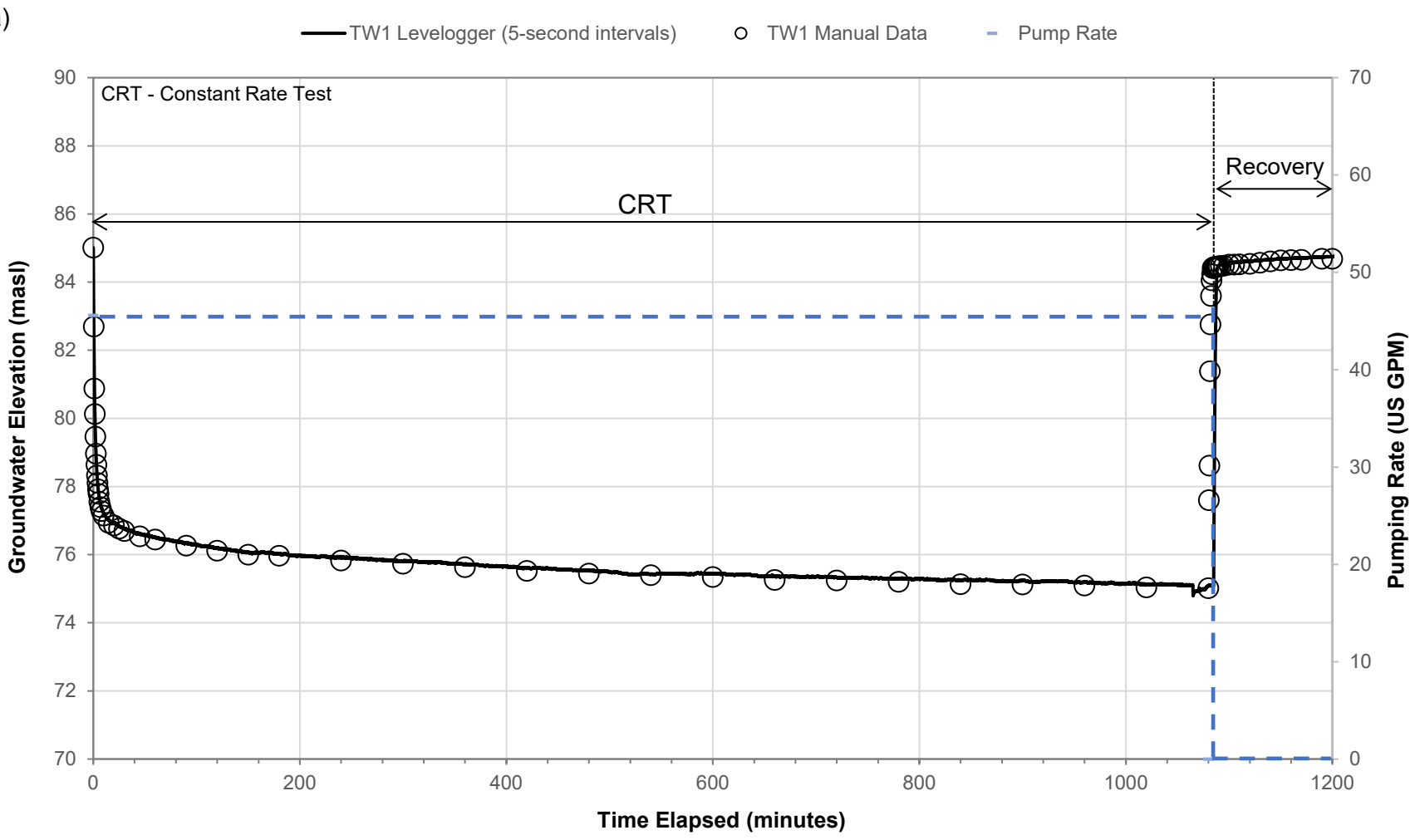


Figure F.2 – Long-term Water Elevation at (a) TW1 and (b) Monitoring Wells

a)



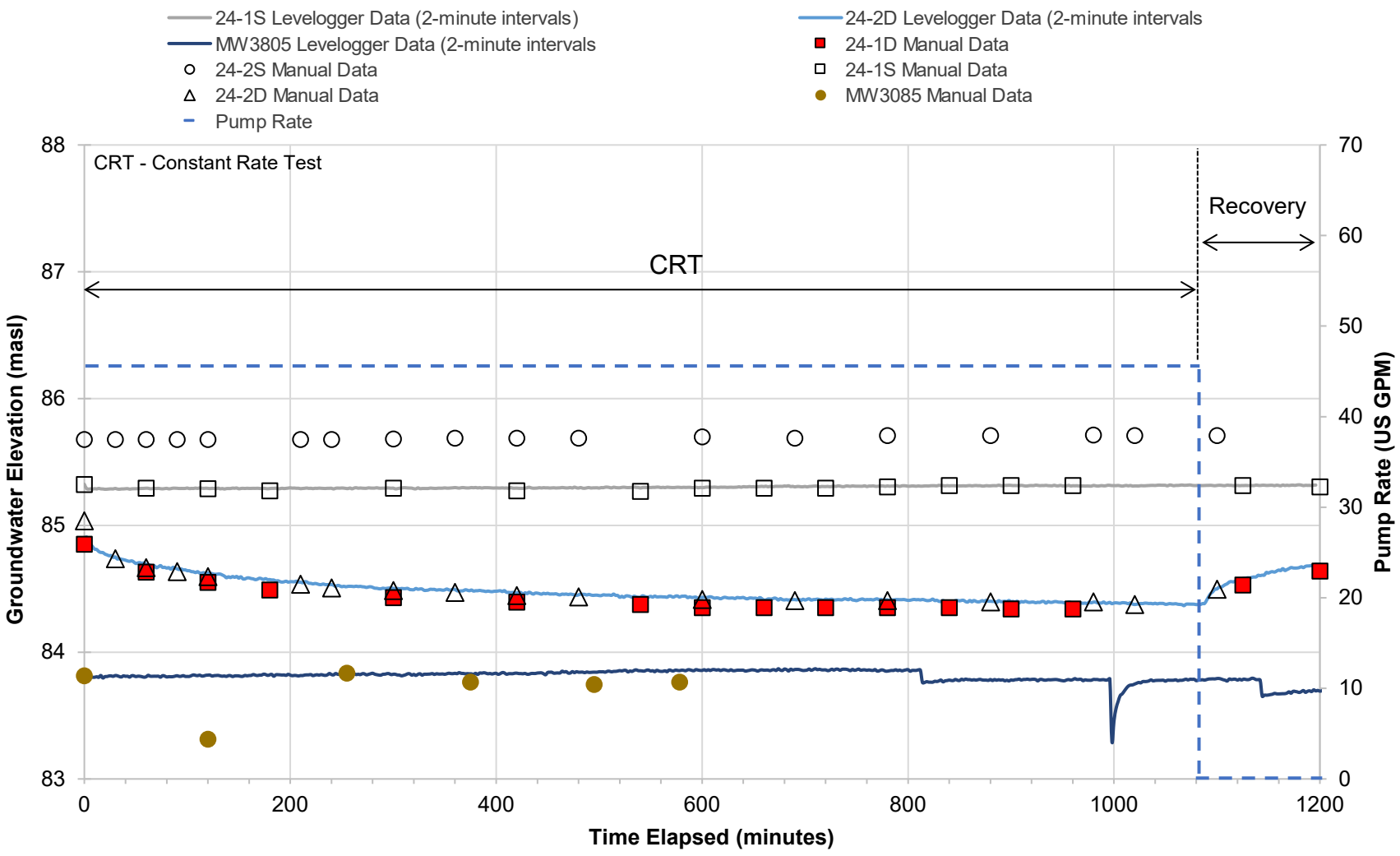
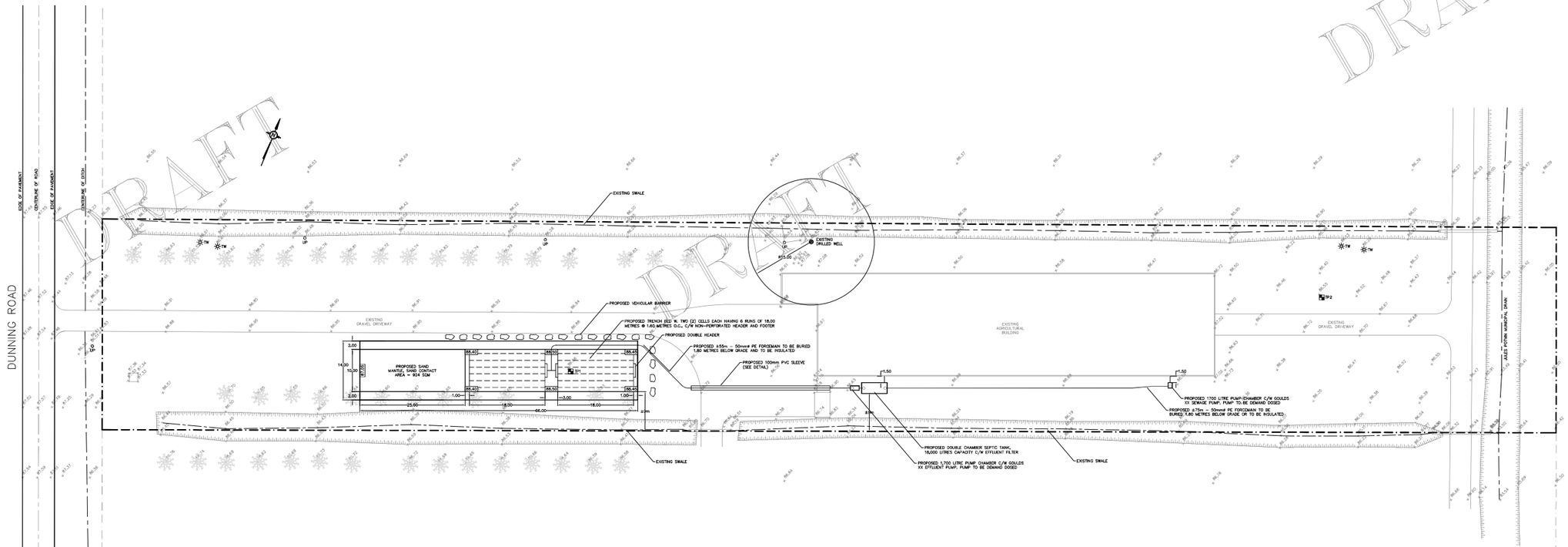


Figure F.3 – Water Elevation and Pumping Rate for Pumping (a) and Monitoring (b) Wells during Pumping Test on TW1

APPENDIX G

Draft Septic Plan
(Kollard Associates Engineers)



CONSTRUCTION NOTES:

No.	REVISION	DATE	BY

Kollaard Associates Engineers
210 PRESCOTT STREET
PO BOX 189
KEMPTVILLE ONTARIO
K0G 1J0
(613) 860-0923
FAX (613) 258-0475
www.kollaard.ca
info@kollaard.ca

STAMP

DESIGN	PV
CHECKED	KL
DRAWN	PV
CHECKED	KL
APPROVED	KL

3043 DUNNING ROAD,
R.PLAN 4R-11019, PART 1
LOT 7 & 8, CONC 4
CUMBERLAND, CITY OF OTTAWA

LAPLANTE POULTRY FARMS

SEWAGE SYSTEM DESIGN

PROJECT No.	240054
DRAWING No.	240054-SD
DATE	JUL 2024
SCALE	1:500

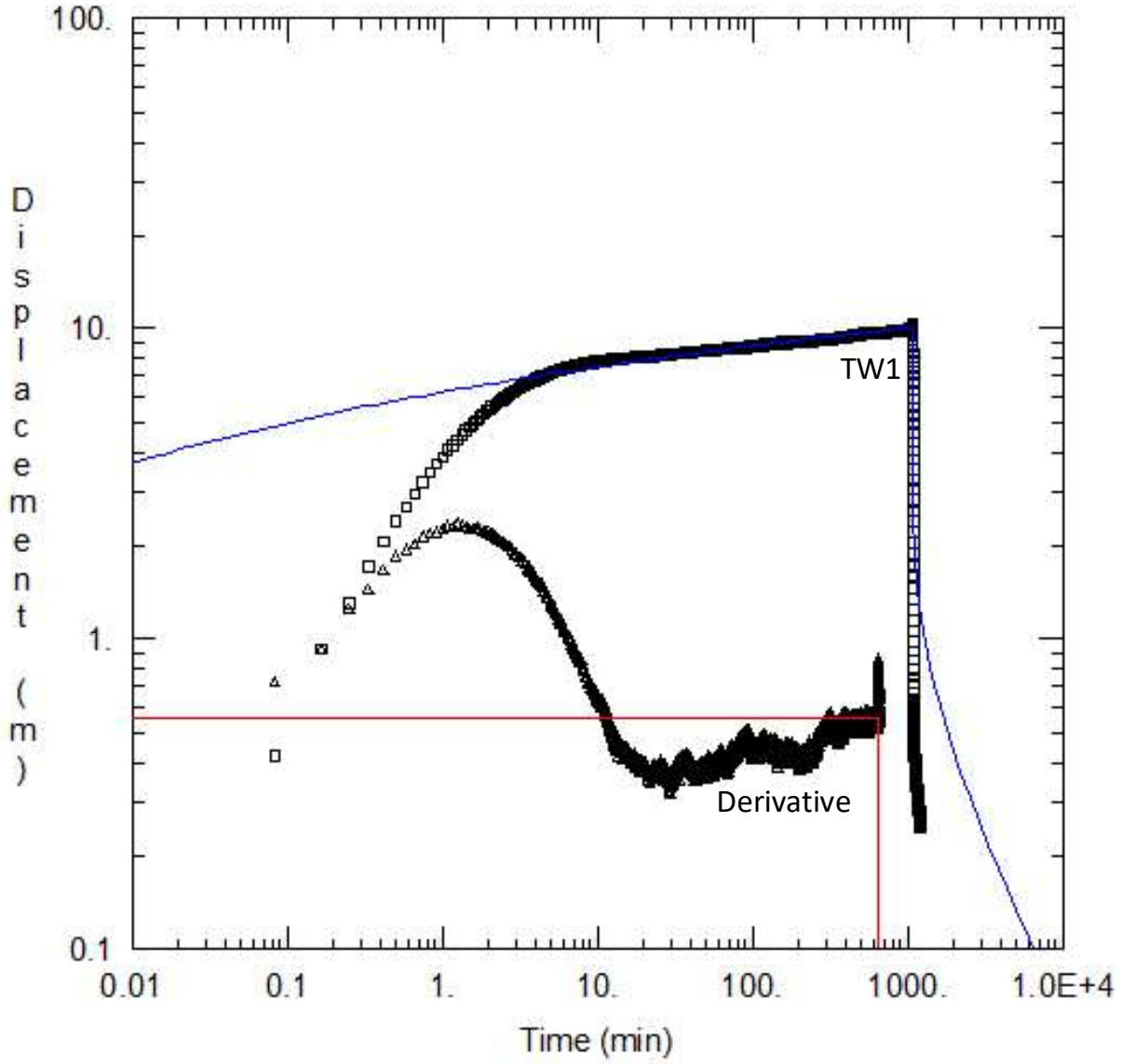
APPENDIX H

Pumping Test Data Analyses

GEMTEC Consulting Engineers and Scientists	Pumping Test Compilation Report
	Project: Hydrogeological Investigation
	Project Number: 100117.056
	Client: Laplante Poultry Farms Limited

Location: 3043 Dunning Road, Sarsfield, Ontario		
Test Conducted by: BR/SE/AP	Pumping Well: TW1	P-Test Date: Jan 25-26, 2024
Analysis Performed by: AP	Method: Theis	Discharge: Constant 172 L/min
Duration: 18 hours		

TW1: Theis (Confined Aquifer)

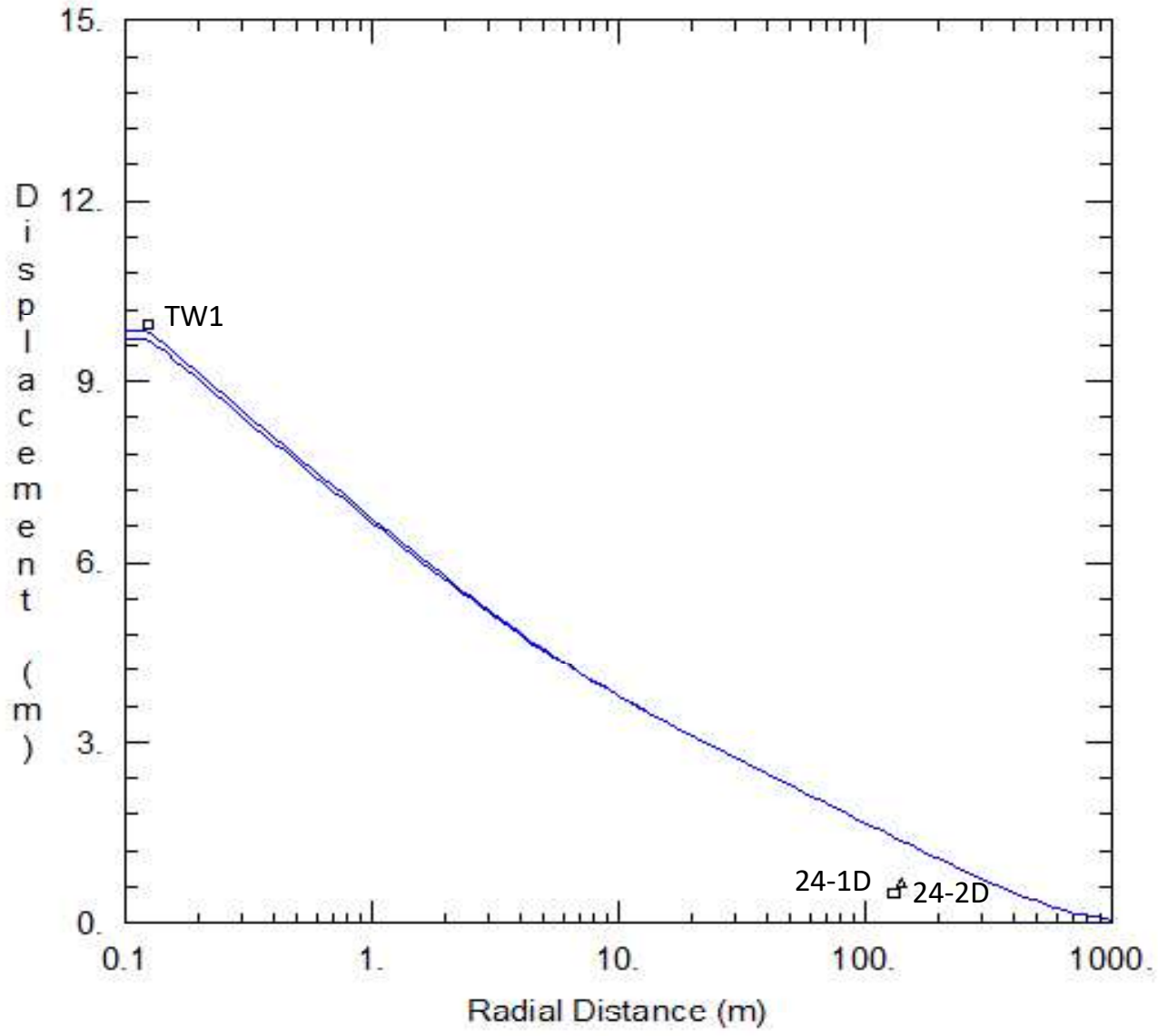


Estimated Transmissivity: 1×10^{-4} m^2/s
Estimated Storage Coefficient: 2×10^{-5}
Aquifer Thickness: 3 metres

GEMTEC Consulting Engineers and Scientists	Pumping Test Compilation Report
	Project: Hydrogeological Investigation
	Project Number: 100117.056
	Client: Laplante Poultry Farms Limited

Location: 3043 Dunning Road, Sarsfield, Ontario		
Test Conducted by: BR/SE/AP	Pumping Well: TW1	P-Test Date: Jan 25-26, 2024
Analysis Performed by: AP	Method: Theis	Discharge: Constant 172 L/min
Duration: 18 hours		

Distance Drawdown Analysis: Theis (Confined Aquifer)

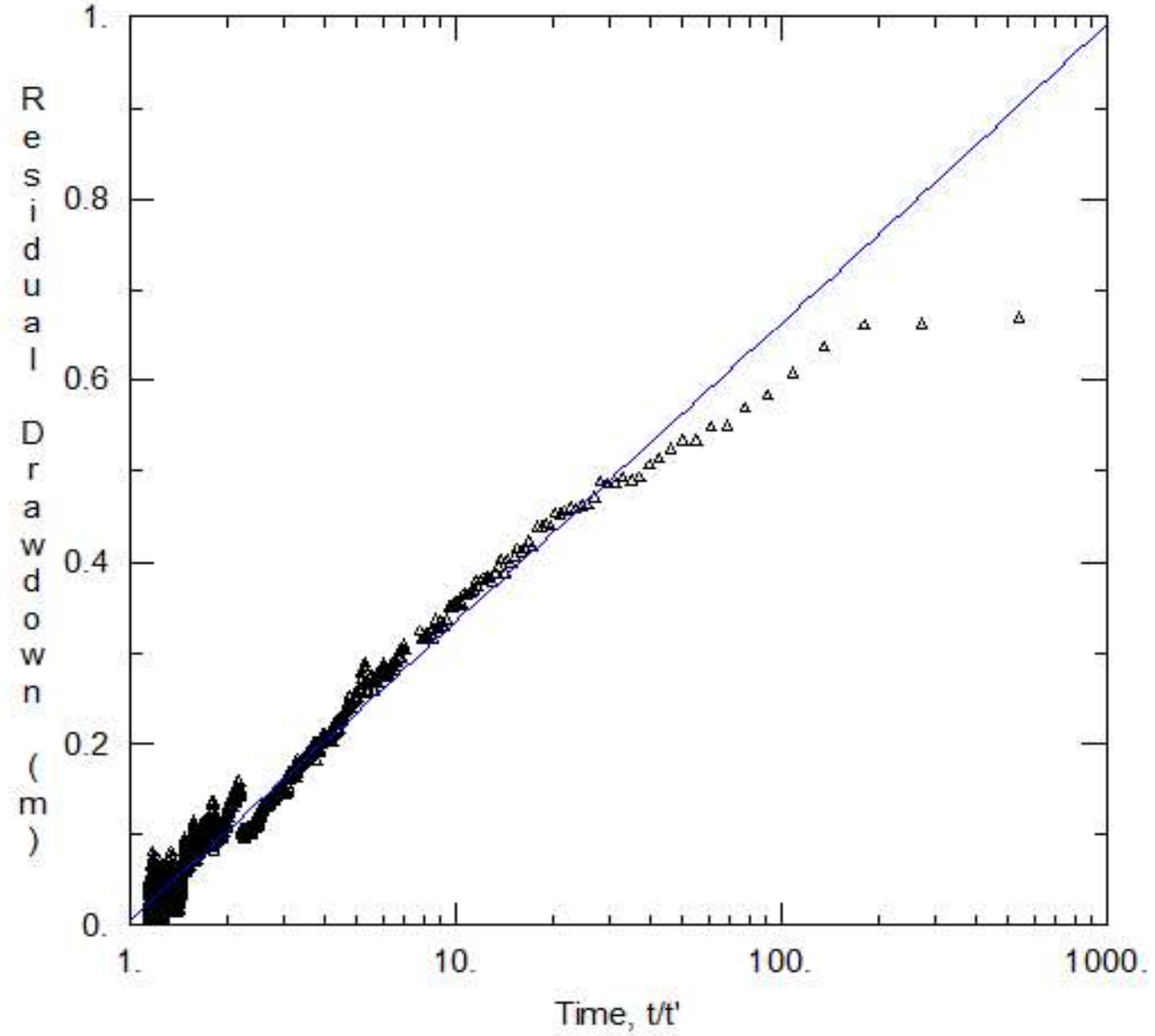


Estimated Transmissivity: 1×10^{-4} m^2/s
Estimated Storage Coefficient: 5×10^{-5}
Aquifer Thickness: 3 metres

GEMTEC Consulting Engineers and Scientists	Pumping Test Compilation Report
	Project: Hydrogeological Investigation
	Project Number: 100117.056
	Client: Laplante Poultry Farms Limited

Location: 3043 Dunning Road, Sarsfield, Ontario		
Test Conducted by: BR/SE/AP	Pumping Well: TW1	P-Test Date: Jan 25-26, 2024
Analysis Performed by: AP	Method: Theis	Discharge: Constant 172 L/min
Duration: 18 hours		

MW24-2D Recovery Analysis: Theis (Confined Aquifer)



Estimated Transmissivity: 4×10^{-4} m^2/s
S/S': 0.97
Aquifer Thickness: 3 metres

APPENDIX I

TW1 Water Quality Laboratory Results
& Field Measurements

Table I.1
TW1 Pumping Test
Summary of Field Water Quality Measurements

Elapsed Time Pumping (hours)	Temperature (°C)	pH	Electrical Conductivity (µS/cm)	Total Dissolved Solids (ppm)	Turbidity (NTU)	Apparent Colour[1] (TCU[2])	True Colour[3] (TCU)	Free Chlorine (mg/L)	Total Chlorine (mg/L)
1	9.6	7.71	721	360	29.7	-	-	-	-
2	9.3	7.61	715	358	7.4	-	-	-	-
3	9.3	7.16	760	358	2.5	-	-	-	-
4	8.8	7.55	718	370	2.0	-	-	-	-
5	9.1	7.73	712	366	2.4	-	-	-	-
6	9.0	7.50	724	357	2.3	-	-	-	-
7	9.0	7.48	717	357	2.9	-	-	-	-
8	8.9	7.49	723	358	1.5	-	-	-	-
9	9.0	7.66	717	363	3.0	<0.05	-	<0.02	<0.02
10	9.0	7.56	710	358	2.17	-	-	-	-
11	9.0	7.51	715	356	1.7	-	-	-	-
12	9.1	7.57	700	350	0.88	-	-	-	-
13	9.1	7.51	700	-	0.9	-	-	-	-
14	9.1	7.55	705	-	0.79	-	-	-	-
15	9.1	7.54	700	-	0.7	-	-	-	-
16	-	-	-	-	-	-	-	-	-
17	9.3	7.55	695	-	0.7	-	-	-	-
18	9.0	7.51	702	-	1.29	<0.05	-	<0.02	<0.02

NOTES:

1. Apparent Colour = Unfiltered sample
2. TCU = True Colour Units
3. True Colour = Sample filtered using 0.45 micron filter

Table I.2
Summary of Test Well Labratory Water Quality Measurements (1 of 2)

Parameter	Units	TW1 9hr 25-Jan-24	TW1 9hr (filtered) 25-Jan-24	TW1 18hr 26-Jan-24	TW1 18hr (filtered) 26-Jan-24	Ontario Drinking Water Standard	Type of Standard[1]
Microbiological Parameters							
E. Coli	CFU/100 mL	ND (1)	-	ND (1)	-	0	MAC
Fecal Coliforms	CFU/100 mL	ND (1)	-	ND (1)	-	0	MAC
Total Coliforms	CFU/100 mL	ND (1)	-	ND (1)	-	-	-
Heterotrophic Plate Count	CFU/mL	ND (10)	-	ND (10)	-	-	-
General Inorganics							
Alkalinity, total	mg/L	273	-	274	-	30-500	OG
Ammonia as N	mg/L	0.32	-	0.31	-	-	-
Dissolved Organic Carbon	mg/L	1.6	-	1.3	-	5	AO
Colour	TCU	2	-	2	-	-	-
Colour, apparent	ACU	**73**	-	**26**	-	5	AO
Conductivity	uS/cm	768	-	774	-	-	-
Hardness	mg/L	**345**	-	**340**	-	80-100	OG
pH	pH Units	8.4	-	8.3	-	6.5-8.5	OG
Phenolics	mg/L	ND (0.001)	-	ND (0.001)	-	-	-
Total Dissolved Solids	mg/L	412	-	420	-	500	AO
Sulphide	mg/L	ND (0.02)	-	ND (0.02)	-	0.05	AO
Tannin & Lignin	mg/L	ND (0.1)	-	ND (0.1)	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.3	-	0.3	-	-	-
Total Organic Nitrogen[4]	mg/L	-0.02	-	-0.01	-	0.15	MAC
Turbidity	NTU	**13.0**	-	3.2	-	5	AO
Anions							
Chloride	mg/L	68	-	66	-	250	AO
Fluoride	mg/L	0.4	-	0.4	-	1.5	MAC
Nitrate as N	mg/L	ND (0.1)	-	ND (0.1)	-	10[2]	MAC
Nitrite as N	mg/L	ND (0.05)	-	ND (0.05)	-	1.0[2]	MAC
Phosphate as P	mg/L	ND (0.5)	-	ND (0.5)	-	-	-
Sulphate	mg/L	45	-	46	-	500	AO
Metals							
Aluminum	mg/L	0.036	ND (0.001)	0.009	ND (0.001)	0.1	OG
Antimony	mg/L	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	0.006	MAC
Arsenic	mg/L	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	0.025	MAC
Barium	mg/L	0.186	0.197	0.198	0.197	1	MAC
Beryllium	mg/L	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	-	-
Boron	mg/L	0.13	0.13	0.12	0.13	5	MAC
Cadmium	mg/L	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	0.005	MAC
Calcium	mg/L	90.5	88.6	88.9	88.2	-	-
Chromium	mg/L	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	0.05	MAC
Cobalt	mg/L	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	-	-
Copper	mg/L	ND (0.0005)	ND (0.0005)	0.0011	ND (0.0005)	1	AO
Iron	mg/L	**0.5**	**0.5**	**0.5**	**0.5**	0.3	AO
Lead	mg/L	ND (0.0001)	ND (0.0001)	0.0012	ND (0.0001)	0.01	MAC
Magnesium	mg/L	28.8	28.7	28.6	28.6	-	-
Manganese	mg/L	0.019	0.017	0.017	0.018	0.05	AO
Molybdenum	mg/L	0.0009	0.0011	0.0009	0.0011	-	-
Mercury	mg/L	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	0.001	MAC
Nickel	mg/L	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	-	-
Potassium	mg/L	6.5	6.4	6.3	6.6	-	-
Selenium	mg/L	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	0.01	MAC
Silver	mg/L	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	-	-
Sodium	mg/L	**61.1**	**63.8**	**61.1**	**64.6**	200 (20)[3]	AO
Strontium	mg/L	5.09	5.14	4.97	5.37	-	-
Thallium	mg/L	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	-	-
Uranium	mg/L	ND (0.0001)	ND (0.0001)	ND (0.0001)	ND (0.0001)	0.02	MAC
Vanadium	mg/L	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	-	-
Zinc	mg/L	ND (0.005)	ND (0.005)	0.007	0.009	5	AO

NOTES:

1. MAC = Maximum Acceptable Concentration; OG = Operational Guideline; AO = Aesthetic Objective
2. The total of Nitrate and Nitrite should not exceed 10 mg/litre.
3. The aesthetic objective for sodium is 200 mg/litre. The local medical officer of health should be notified when the sodium concentration exceeds 20 mg/litre for persons on sodium restricted diets.
4. Total Organic Nitrogen = Total Kjeldahl Nitrogen - $N\text{-}NH_3$ and should not exceed 0.15 mg/litre.
5. '-' signifies no value provided
6. 'ND' = No concentration detected above method detection limit found within brackets

Table I.2
Summary of Test Well Labratory Water Quality Measurements (2 of 2)

Parameter	Units	TW1 9hr 25-Jan-24	TW1 9hr (filtered) 25-Jan-24	TW1 18hr 26-Jan-24	TW1 18hr (filtered) 26-Jan-24	Ontario Drinking Water Standard	Type of Standard[1]
Volatiles							
Acetone	mg/L	ND (0.0050)	-	ND (0.0050)	-	-	-
Benzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.001	MAC
Bromodichloromethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Bromoform	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Bromomethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Carbon Tetrachloride	mg/L	ND (0.0002)	-	ND (0.0002)	-	0.002	MAC
Chlorobenzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.08	MAC
Chloroethane	mg/L	ND (0.0010)	-	ND (0.0010)	-	-	-
Chloroform	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Dibromochloromethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Dichlorodifluoromethane	mg/L	ND (0.0010)	-	ND (0.0010)	-	-	-
lene dibromide (dibromoethane,	mg/L	ND (0.0002)	-	ND (0.0002)	-	-	-
1,2-Dichlorobenzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.2	MAC
1,3-Dichlorobenzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,4-Dichlorobenzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.005	MAC
1,1-Dichloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,2-Dichloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.005	MAC
1,1-Dichloroethylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.014	MAC
cis-1,2-Dichloroethylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
trans-1,2-Dichloroethylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,2-Dichloroethylene, total	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,2-Dichloropropane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
cis-1,3-Dichloropropylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
trans-1,3-Dichloropropylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,3-Dichloropropene, total	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Ethylbenzene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.14	MAC
Hexane	mg/L	ND (0.0010)	-	ND (0.0010)	-	-	-
lethyl Ethyl Ketone (2-Butanone	mg/L	ND (0.0050)	-	ND (0.0050)	-	-	-
Methyl Isobutyl Ketone	mg/L	ND (0.0050)	-	ND (0.0050)	-	-	-
Methyl tert-butyl ether	mg/L	ND (0.0020)	-	ND (0.0020)	-	-	-
Methylene Chloride	mg/L	ND (0.0050)	-	ND (0.0050)	-	0.05	MAC
Styrene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,1,1,2-Tetrachloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Tetrachloroethylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.01	MAC
Toluene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.06	MAC
1,1,1-Trichloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
1,1,2-Trichloroethane	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Trichloroethylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.005	MAC
Trichlorofluoromethane	mg/L	ND (0.0010)	-	ND (0.0010)	-	-	-
Vinyl Chloride	mg/L	ND (0.0002)	-	ND (0.0002)	-	0.001	MAC
m/p-Xylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
o-Xylene	mg/L	ND (0.0005)	-	ND (0.0005)	-	-	-
Xylenes, total	mg/L	ND (0.0005)	-	ND (0.0005)	-	0.09	MAC
Hydrocarbons						-	-
F1 PHCs (C6-C10)	mg/L	ND (0.0250)	-	ND (0.0250)	-	-	-
F2 PHCs (C10-C16)	mg/L	ND (0.1)	-	ND (0.1)	-	-	-
F3 PHCs (C16-C34)	mg/L	ND (0.1)	-	ND (0.1)	-	-	-
F4 PHCs (C34-C50)	mg/L	ND (0.1)	-	ND (0.1)	-	-	-

NOTES:

1. MAC = Maximum Acceptable Concentration; OG = Operational Guideline; AO = Aesthetic Objective
2. The total of Nitrate and Nitrite should not exceed 10 mg/litre.
3. The aesthetic objective for sodium is 200 mg/litre. The local medical officer of health should be notified when the sodium concentration exceeds 20 mg/litre for persons on sodium restricted diets.
4. Total Organic Nitrogen = Total Kjeldahl Nitrogen - $N\text{-}NH_3$ and should not exceed 0.15 mg/litre.
5. '-' signifies no value provided
6. 'ND' = No concentration detected above method detection limit found within brackets

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Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Andrius Paznekas

Client PO:
Project: 100117.056
Custody: 19050

Report Date: 17-Nov-2023
Order Date: 13-Nov-2023

Order #: 2346082

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

Paracel ID	Client ID
2346082-01	PW23-1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	15-Nov-23	15-Nov-23
Ammonia, as N	EPA 351.2 - Auto Colour	16-Nov-23	16-Nov-23
Anions	EPA 300.1 - IC	14-Nov-23	14-Nov-23
Colour	SM2120 - Spectrophotometric	13-Nov-23	14-Nov-23
Colour, apparent	SM2120 - Spectrophotometric	13-Nov-23	14-Nov-23
Conductivity	EPA 9050A- probe @25 °C	15-Nov-23	15-Nov-23
Dissolved Organic Carbon	MOE 3247B - Combustion IR	14-Nov-23	15-Nov-23
E. coli	MOE E3407	14-Nov-23	14-Nov-23
Fecal Coliform	SM 9222D	14-Nov-23	14-Nov-23
Heterotrophic Plate Count	SM 9215C	14-Nov-23	14-Nov-23
Metals, ICP-MS	EPA 200.8 - ICP-MS	14-Nov-23	14-Nov-23
pH	EPA 150.1 - pH probe @25 °C	15-Nov-23	15-Nov-23
Phenolics	EPA 420.2 - Auto Colour, 4AAP	15-Nov-23	15-Nov-23
Hardness	Hardness as CaCO3	14-Nov-23	14-Nov-23
Sulphide	SM 4500SE - Colourimetric	16-Nov-23	16-Nov-23
Tannin/Lignin	SM 5550B - Colourimetric	14-Nov-23	14-Nov-23
Total Coliform	MOE E3407	14-Nov-23	14-Nov-23
Total Dissolved Solids	SM 2540C - gravimetric, filtration	15-Nov-23	16-Nov-23
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	15-Nov-23	15-Nov-23
Turbidity	SM 2130B - Turbidity meter	14-Nov-23	14-Nov-23

PARACEL LABORATORIES LTD.

Order #: 2346082

Certificate of Analysis

Report Date: 17-Nov-2023

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 13-Nov-2023

Client PO:

Project Description: 100117.056

	Client ID:	PW23-1	-	-	-		
	Sample Date:	13-Nov-23 14:00	-	-	-	-	-
	Sample ID:	2346082-01	-	-	-		
	Matrix:	Drinking Water	-	-	-		
	MDL/Units						
Microbiological Parameters							
E. coli	1 CFU/100mL	ND	-	-	-	-	-
Total Coliforms	1 CFU/100mL	42	-	-	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	-	-	-	-	-
Heterotrophic Plate Count	10 CFU/mL	10	-	-	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	260	-	-	-	-	-
Ammonia as N	0.01 mg/L	0.29	-	-	-	-	-
Dissolved Organic Carbon	0.5 mg/L	0.6	-	-	-	-	-
Colour, apparent	2 ACU	20	-	-	-	-	-
Colour	2 TCU	<2	-	-	-	-	-
Conductivity	5 uS/cm	700	-	-	-	-	-
Hardness	mg/L	298	-	-	-	-	-
pH	0.1 pH Units	8.3	-	-	-	-	-
Phenolics	0.001 mg/L	<0.001	-	-	-	-	-
Total Dissolved Solids	10 mg/L	352	-	-	-	-	-
Sulphide	0.02 mg/L	<0.02	-	-	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	-	-	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	-	-	-	-	-
Turbidity	0.1 NTU	2.2	-	-	-	-	-
Anions							
Chloride	1 mg/L	54	-	-	-	-	-
Fluoride	0.1 mg/L	0.4	-	-	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-	-	-
Sulphate	1 mg/L	43	-	-	-	-	-

	Client ID:	PW23-1	-	-	-		
	Sample Date:	13-Nov-23 14:00	-	-	-	-	-
	Sample ID:	2346082-01	-	-	-		
	Matrix:	Drinking Water	-	-	-		
	MDL/Units						
Metals							
Calcium	0.1 mg/L	73.9	-	-	-	-	-
Iron	0.1 mg/L	0.5	-	-	-	-	-
Magnesium	0.2 mg/L	27.6	-	-	-	-	-
Manganese	0.005 mg/L	0.019	-	-	-	-	-
Potassium	0.1 mg/L	7.1	-	-	-	-	-
Sodium	0.2 mg/L	62.0	-	-	-	-	-

Method Quality Control: Blank

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

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	102	1	mg/L	102			0.2	20	
Fluoride	1.71	0.1	mg/L	1.76			2.8	20	
Nitrate as N	ND	0.1	mg/L	ND			NC	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Sulphate	210	1	mg/L	209			0.5	20	
General Inorganics									
Alkalinity, total	259	5	mg/L	260			0.4	14	
Ammonia as N	0.078	0.01	mg/L	0.085			8.7	17.7	
Dissolved Organic Carbon	1.5	0.5	mg/L	1.6			8.2	37	
Colour	ND	2	TCU	ND			NC	12	
Colour, apparent	20	2	ACU	20			0.0	12	
Conductivity	709	5	uS/cm	700			1.2	5	
pH	8.3	0.1	pH Units	8.3			0.0	3.3	
Total Dissolved Solids	636	10	mg/L	648			1.9	10	
Sulphide	0.34	0.02	mg/L	0.34			0.0	10	
Tannin & Lignin	0.5	0.1	mg/L	0.5			8.0	11	
Total Kjeldahl Nitrogen	0.36	0.1	mg/L	0.32			11.0	16	
Turbidity	2.1	0.1	NTU	2.2			3.3	10	
Metals									
Calcium	21.2	0.1	mg/L	21.4			0.7	20	
Iron	0.4	0.1	mg/L	0.4			0.2	20	
Magnesium	4.5	0.2	mg/L	4.4			1.0	20	
Manganese	0.019	0.005	mg/L	0.021			10.4	20	
Potassium	2.2	0.1	mg/L	1.9			13.7	20	
Sodium	265	0.6	mg/L	270			1.8	20	
Microbiological Parameters									
E. coli	ND	1	CFU/100mL	ND			NC	30	
Total Coliforms	38	1	CFU/100mL	42			10.0	30	
Fecal Coliforms	ND	1	CFU/100mL	ND			NC	30	
Heterotrophic Plate Count	10	10	CFU/mL	10			0.0	30	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	111	1	mg/L	102	96.9	70-124			
Fluoride	2.80	0.1	mg/L	1.76	103	70-130			
Nitrate as N	0.98	0.1	mg/L	ND	97.9	77-126			
Nitrite as N	0.932	0.05	mg/L	ND	93.2	82-115			
Sulphate	220	1	mg/L	209	107	70-130			
General Inorganics									
Ammonia as N	1.10	0.01	mg/L	0.085	102	81-124			
Dissolved Organic Carbon	10.9	0.5	mg/L	0.6	103	60-133			
Phenolics	0.027	0.001	mg/L	ND	108	67-133			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Sulphide	0.79	0.02	mg/L	0.34	89.4	79-115			
Tannin & Lignin	1.6	0.1	mg/L	0.5	107	71-113			
Total Kjeldahl Nitrogen	1.31	0.1	mg/L	0.32	98.2	81-126			
Metals									
Calcium	29100	0.1	mg/L	21400	77.5	80-120			QM-07
Iron	2640	0.1	mg/L	389	90.0	80-120			
Magnesium	13700	0.2	mg/L	4410	92.7	80-120			
Manganese	68.1	0.005	mg/L	21.2	93.7	80-120			
Potassium	11700	0.1	mg/L	1920	97.9	80-120			
Sodium	11000	0.2	mg/L	ND	110	80-120			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - All sample bottles missing the sample collection time.

Applies to Samples: PW23-1

Sample Qualifiers :

QC Qualifiers:

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

PARACE LABORATORIES LTD

Paracel ID: 2346082

Paracel Order Number	Chain Of Custody Ontario Drinking Water Samples № 19050
2346082	

Client Name:	Gemtec	Project Ref:	100117.056	Waterworks Name:		Samples Taken By:	
Contact Name:	A Paznekas	Quote #:		Waterworks Number:		Name:	A Paznekas
Address:		PO #:		Address:		Signature:	
After Hours Contact:		E-mail:	andrius.paznekas@gemtec.ca			Page ____ of ____	
Telephone:	613-295-1425	Fax:		Public Health Unit:		Turn Around Time Required: ☐ 1 day ☐ 2 day ☐ 3 day ☒ 4 day	

Samples Submitted Under: (Indicate **ONLY one**)
☐ ON REG 170/03 ☐ ON REG 319/08 ☐ Private Well
☐ ON REG 243/07 ☒ Other DReg 169/03

Have LSN forms been submitted to MOE/MOHLTC?: ☐ Yes ☐ No ☒ N/A

Are these samples for human consumption?: ☒ Yes ☐ No

All information must be completed before samples will be processed.

Sample Type: R = Raw ; T = Treated ; D = Distribution; P = Plumbing
Source Type: G = Ground Water; S = Surface Water
Reportable: Requires AWQI reporting as per Regulation - Y = Yes; N = No

	LOCATION NAME	SAMPLE ID	Sample Type: R/T/D/P	Source Type: G / S	Reportable: Y / N	Resample	SAMPLE COLLECTED DATE	SAMPLE COLLECTED TIME	# of Containers	Free/Combined Chlorine Residual mg/L	Standing / Flushed: S / F (REG 243)	Required Analyses: Total Coliform/E. Coli	HPC	Lead	THM	SUBLIN for Energy		
1	—	PW23-1	R	G	N	-	Nov 13/23	2pm	11							X		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: ~~Etc~~ - cdw MAW & TCW
- hold mercury & filtered metals + mercury

Method of Delivery: Walk In

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By: SD
Relinquished By (Print): A. Paznekas	Date/Time:	Date/Time: Nov 13/23	Date/Time: Nov 13, 2023 3:36pm
Date/Time: Nov 13/23 3:15pm.	Temperature: °C	Temperature: 12.6 °C	pH Verified: ☑ By: SD

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Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Andrius Paznekas

Client PO:
Project: 100117.056
Custody: 19821

Report Date: 1-Feb-2024
Order Date: 26-Jan-2024

Order #: 2404397

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

Paracel ID	Client ID
2404397-01	TW1 9hr
2404397-02	TW1 9hr (Filtered)
2404397-03	TW3043 18hr
2404397-04	TW3043 18hr (Filtered)

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	31-Jan-24	31-Jan-24
Ammonia, as N	EPA 351.2 - Auto Colour	29-Jan-24	29-Jan-24
Anions	EPA 300.1 - IC	29-Jan-24	29-Jan-24
Colour	SM2120 - Spectrophotometric	26-Jan-24	26-Jan-24
Colour, apparent	SM2120 - Spectrophotometric	26-Jan-24	26-Jan-24
Conductivity	EPA 9050A- probe @25 °C	31-Jan-24	31-Jan-24
Dissolved Organic Carbon	MOE 3247B - Combustion IR	30-Jan-24	31-Jan-24
E. coli	MOE E3407	26-Jan-24	26-Jan-24
Fecal Coliform	SM 9222D	26-Jan-24	26-Jan-24
Heterotrophic Plate Count	SM 9215C	27-Jan-24	27-Jan-24
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	26-Jan-24	26-Jan-24
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Jan-24	29-Jan-24
pH	EPA 150.1 - pH probe @25 °C	31-Jan-24	31-Jan-24
PHC F1	CWS Tier 1 - P&T GC-FID	26-Jan-24	27-Jan-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	26-Jan-24	27-Jan-24
Phenolics	EPA 420.2 - Auto Colour, 4AAP	29-Jan-24	29-Jan-24
Hardness	Hardness as CaCO3	26-Jan-24	29-Jan-24
Sulphide	SM 4500SE - Colourimetric	31-Jan-24	31-Jan-24
Tannin/Lignin	SM 5550B - Colourimetric	29-Jan-24	30-Jan-24
Total Coliform	MOE E3407	26-Jan-24	26-Jan-24
Total Dissolved Solids	SM 2540C - gravimetric, filtration	29-Jan-24	31-Jan-24
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	29-Jan-24	30-Jan-24
Turbidity	SM 2130B - Turbidity meter	26-Jan-24	26-Jan-24
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Jan-24	27-Jan-24

PARACEL LABORATORIES LTD.

Order #: 2404397

Certificate of Analysis

Report Date: 01-Feb-2024

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 26-Jan-2024

Client PO:

Project Description: 100117.056

	Client ID:	TW1 9hr	TW1 9hr (Filtered)	TW3043 18hr	TW3043 18hr (Filtered)	-	-
	Sample Date:	26-Jan-24 00:00	26-Jan-24 00:00	26-Jan-24 09:00	26-Jan-24 09:00		
	Sample ID:	2404397-01	2404397-02	2404397-03	2404397-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Microbiological Parameters							
E. coli	1 CFU/100mL	ND	-	ND	-	-	-
Total Coliforms	1 CFU/100mL	ND	-	ND	-	-	-
Fecal Coliforms	1 CFU/100mL	ND	-	ND	-	-	-
Heterotrophic Plate Count	10 CFU/mL	<10	-	<10	-	-	-
General Inorganics							
Alkalinity, total	5 mg/L	273	-	274	-	-	-
Ammonia as N	0.01 mg/L	0.32	-	0.31	-	-	-
Dissolved Organic Carbon	0.5 mg/L	1.6	-	1.3	-	-	-
Colour, apparent	2 ACU	73	-	26	-	-	-
Colour	2 TCU	2	-	2	-	-	-
Conductivity	5 uS/cm	768	-	774	-	-	-
Hardness	1 mg/L	345	-	340	-	-	-
pH	0.1 pH Units	8.4	-	8.3	-	-	-
Phenolics	0.001 mg/L	<0.001	-	<0.001	-	-	-
Total Dissolved Solids	10 mg/L	412	-	420	-	-	-
Sulphide	0.02 mg/L	<0.02	-	<0.02	-	-	-
Tannin & Lignin	0.1 mg/L	<0.1	-	<0.1	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	-	0.3	-	-	-
Turbidity	0.1 NTU	13.0	-	3.2	-	-	-
Anions							
Chloride	1 mg/L	68	-	66	-	-	-
Fluoride	0.1 mg/L	0.4	-	0.4	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	<0.05	-	-	-

Certificate of Analysis

Report Date: 01-Feb-2024

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 26-Jan-2024

Client PO:

Project Description: 100117.056

	Client ID:	TW1 9hr	TW1 9hr (Filtered)	TW3043 18hr	TW3043 18hr (Filtered)	-	-
	Sample Date:	26-Jan-24 00:00	26-Jan-24 00:00	26-Jan-24 09:00	26-Jan-24 09:00		
	Sample ID:	2404397-01	2404397-02	2404397-03	2404397-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Anions							
Phosphate as P	0.5 mg/L	<0.5	-	<0.5	-	-	-
Sulphate	1 mg/L	45	-	46	-	-	-
Metals							
Mercury	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001	-	-
Aluminum	0.001 mg/L	0.036	<0.001	0.009	<0.001	-	-
Antimony	0.0005 mg/L	<0.0005	<0.0005	<0.0005	<0.0005	-	-
Arsenic	0.001 mg/L	<0.001	<0.001	<0.001	<0.001	-	-
Barium	0.001 mg/L	0.186	0.197	0.198	0.197	-	-
Beryllium	0.0005 mg/L	<0.0005	<0.0005	<0.0005	<0.0005	-	-
Boron	0.01 mg/L	0.13	0.13	0.12	0.13	-	-
Cadmium	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001	-	-
Calcium	0.1 mg/L	90.5	88.6	88.9	88.2	-	-
Chromium	0.001 mg/L	<0.001	<0.001	<0.001	<0.001	-	-
Cobalt	0.0005 mg/L	<0.0005	<0.0005	<0.0005	<0.0005	-	-
Copper	0.0005 mg/L	<0.0005	<0.0005	0.0011	<0.0005	-	-
Iron	0.1 mg/L	0.5	0.5	0.5	0.5	-	-
Lead	0.0001 mg/L	<0.0001	<0.0001	0.0012	<0.0001	-	-
Magnesium	0.2 mg/L	28.8	28.7	28.6	28.6	-	-
Manganese	0.005 mg/L	0.019	0.017	0.017	0.018	-	-
Molybdenum	0.0005 mg/L	0.0009	0.0011	0.0009	0.0011	-	-
Nickel	0.001 mg/L	<0.001	<0.001	<0.001	<0.001	-	-
Potassium	0.1 mg/L	6.5	6.4	6.3	6.6	-	-
Selenium	0.001 mg/L	<0.001	<0.001	<0.001	<0.001	-	-
Silver	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001	-	-

Certificate of Analysis

Report Date: 01-Feb-2024

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 26-Jan-2024

Client PO:

Project Description: 100117.056

	Client ID:	TW1 9hr	TW1 9hr (Filtered)	TW3043 18hr	TW3043 18hr (Filtered)	-	-
	Sample Date:	26-Jan-24 00:00	26-Jan-24 00:00	26-Jan-24 09:00	26-Jan-24 09:00		
	Sample ID:	2404397-01	2404397-02	2404397-03	2404397-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Metals							
Sodium	0.2 mg/L	61.1	63.8	61.1	64.6	-	-
Strontium	0.01 mg/L	5.09	5.14	4.97	5.37	-	-
Thallium	0.001 mg/L	<0.001	<0.001	<0.001	<0.001	-	-
Uranium	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001	-	-
Vanadium	0.0005 mg/L	<0.0005	<0.0005	<0.0005	<0.0005	-	-
Zinc	0.005 mg/L	<0.005	<0.005	0.007	0.009	-	-
Volatiles							
Acetone	0.0050 mg/L	<0.0050	-	<0.0050	-	-	-
Benzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Bromodichloromethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Bromoform	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Bromomethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Carbon Tetrachloride	0.0002 mg/L	<0.0002	-	<0.0002	-	-	-
Chlorobenzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Chloroethane	0.0010 mg/L	<0.0010	-	<0.0010	-	-	-
Chloroform	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Dibromochloromethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Dichlorodifluoromethane	0.0010 mg/L	<0.0010	-	<0.0010	-	-	-
1,2-Dibromoethane	0.0002 mg/L	<0.0002	-	<0.0002	-	-	-
1,2-Dichlorobenzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,3-Dichlorobenzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,4-Dichlorobenzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,1-Dichloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,2-Dichloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-

	Client ID:	TW1 9hr	TW1 9hr (Filtered)	TW3043 18hr	TW3043 18hr (Filtered)	-	-
	Sample Date:	26-Jan-24 00:00	26-Jan-24 00:00	26-Jan-24 09:00	26-Jan-24 09:00		
	Sample ID:	2404397-01	2404397-02	2404397-03	2404397-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Volatiles							
1,1-Dichloroethylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
cis-1,2-Dichloroethylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
trans-1,2-Dichloroethylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,2-Dichloroethylene, total	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,2-Dichloropropane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
cis-1,3-Dichloropropylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
trans-1,3-Dichloropropylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,3-Dichloropropene, total	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Ethylbenzene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Hexane	0.0010 mg/L	<0.0010	-	<0.0010	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.0050 mg/L	<0.0050	-	<0.0050	-	-	-
Methyl Isobutyl Ketone	0.0050 mg/L	<0.0050	-	<0.0050	-	-	-
Methyl tert-butyl ether	0.0020 mg/L	<0.0020	-	<0.0020	-	-	-
Methylene Chloride	0.0050 mg/L	<0.0050	-	<0.0050	-	-	-
Styrene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,1,1,2-Tetrachloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,1,2,2-Tetrachloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Tetrachloroethylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Toluene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,1,1-Trichloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
1,1,2-Trichloroethane	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Trichloroethylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Trichlorofluoromethane	0.0010 mg/L	<0.0010	-	<0.0010	-	-	-
Vinyl chloride	0.0002 mg/L	<0.0002	-	<0.0002	-	-	-

Certificate of Analysis

Report Date: 01-Feb-2024

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 26-Jan-2024

Client PO:

Project Description: 100117.056

	Client ID:	TW1 9hr	TW1 9hr (Filtered)	TW3043 18hr	TW3043 18hr (Filtered)	-	-
	Sample Date:	26-Jan-24 00:00	26-Jan-24 00:00	26-Jan-24 09:00	26-Jan-24 09:00		
	Sample ID:	2404397-01	2404397-02	2404397-03	2404397-04		
	Matrix:	Drinking Water	Drinking Water	Drinking Water	Drinking Water		
	MDL/Units						
Volatiles							
m,p-Xylenes	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
o-Xylene	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Xylenes, total	0.0005 mg/L	<0.0005	-	<0.0005	-	-	-
Toluene-d8	Surrogate	103%	-	105%	-	-	-
4-Bromofluorobenzene	Surrogate	101%	-	100%	-	-	-
Dibromofluoromethane	Surrogate	95.7%	-	93.9%	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	0.0250 mg/L	<0.0250	-	<0.0250	-	-	-
F2 PHCs (C10-C16)	0.1 mg/L	<0.1	-	<0.1	-	-	-
F3 PHCs (C16-C34)	0.1 mg/L	<0.1	-	<0.1	-	-	-
F4 PHCs (C34-C50)	0.1 mg/L	<0.1	-	<0.1	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	1	mg/L					
Fluoride	ND	0.1	mg/L					
Nitrate as N	ND	0.1	mg/L					
Nitrite as N	ND	0.05	mg/L					
Phosphate as P	ND	0.5	mg/L					
Sulphate	ND	1	mg/L					
General Inorganics								
Alkalinity, total	ND	5	mg/L					
Ammonia as N	ND	0.01	mg/L					
Dissolved Organic Carbon	ND	0.5	mg/L					
Colour	ND	2	TCU					
Colour, apparent	ND	2	ACU					
Conductivity	ND	5	uS/cm					
Phenolics	ND	0.001	mg/L					
Total Dissolved Solids	ND	10	mg/L					
Sulphide	ND	0.02	mg/L					
Tannin & Lignin	ND	0.1	mg/L					
Total Kjeldahl Nitrogen	ND	0.1	mg/L					
Turbidity	ND	0.1	NTU					
Hydrocarbons								
F1 PHCs (C6-C10)	ND	0.0250	mg/L					
F2 PHCs (C10-C16)	ND	0.1	mg/L					
F3 PHCs (C16-C34)	ND	0.1	mg/L					
F4 PHCs (C34-C50)	ND	0.1	mg/L					
Metals								
Mercury	ND	0.0001	mg/L					
Aluminum	ND	0.001	mg/L					
Antimony	ND	0.0005	mg/L					
Arsenic	ND	0.001	mg/L					
Barium	ND	0.001	mg/L					
Beryllium	ND	0.0005	mg/L					
Boron	ND	0.01	mg/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Cadmium	ND	0.0001	mg/L					
Calcium	ND	0.1	mg/L					
Chromium	ND	0.001	mg/L					
Cobalt	ND	0.0005	mg/L					
Copper	ND	0.0005	mg/L					
Iron	ND	0.1	mg/L					
Lead	ND	0.0001	mg/L					
Magnesium	ND	0.2	mg/L					
Manganese	ND	0.005	mg/L					
Molybdenum	ND	0.0005	mg/L					
Nickel	ND	0.001	mg/L					
Potassium	ND	0.1	mg/L					
Selenium	ND	0.001	mg/L					
Silver	ND	0.0001	mg/L					
Sodium	ND	0.2	mg/L					
Strontium	ND	0.01	mg/L					
Thallium	ND	0.001	mg/L					
Uranium	ND	0.0001	mg/L					
Vanadium	ND	0.0005	mg/L					
Zinc	ND	0.005	mg/L					
Microbiological Parameters								
E. coli	ND	1	CFU/100mL					
Total Coliforms	ND	1	CFU/100mL					
Fecal Coliforms	ND	1	CFU/100mL					
Heterotrophic Plate Count	ND	10	CFU/mL					
Volatiles								
Acetone	ND	0.0050	mg/L					
Benzene	ND	0.0005	mg/L					
Bromodichloromethane	ND	0.0005	mg/L					
Bromoform	ND	0.0005	mg/L					
Bromomethane	ND	0.0005	mg/L					
Carbon Tetrachloride	ND	0.0002	mg/L					
Chlorobenzene	ND	0.0005	mg/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Chloroethane	ND	0.0010	mg/L					
Chloroform	ND	0.0005	mg/L					
Dibromochloromethane	ND	0.0005	mg/L					
Dichlorodifluoromethane	ND	0.0010	mg/L					
1,2-Dibromoethane	ND	0.0002	mg/L					
1,2-Dichlorobenzene	ND	0.0005	mg/L					
1,3-Dichlorobenzene	ND	0.0005	mg/L					
1,4-Dichlorobenzene	ND	0.0005	mg/L					
1,1-Dichloroethane	ND	0.0005	mg/L					
1,2-Dichloroethane	ND	0.0005	mg/L					
1,1-Dichloroethylene	ND	0.0005	mg/L					
cis-1,2-Dichloroethylene	ND	0.0005	mg/L					
trans-1,2-Dichloroethylene	ND	0.0005	mg/L					
1,2-Dichloroethylene, total	ND	0.0005	mg/L					
1,2-Dichloropropane	ND	0.0005	mg/L					
cis-1,3-Dichloropropylene	ND	0.0005	mg/L					
trans-1,3-Dichloropropylene	ND	0.0005	mg/L					
1,3-Dichloropropene, total	ND	0.0005	mg/L					
Ethylbenzene	ND	0.0005	mg/L					
Hexane	ND	0.0010	mg/L					
Methyl Ethyl Ketone (2-Butanone)	ND	0.0050	mg/L					
Methyl Isobutyl Ketone	ND	0.0050	mg/L					
Methyl tert-butyl ether	ND	0.0020	mg/L					
Methylene Chloride	ND	0.0050	mg/L					
Styrene	ND	0.0005	mg/L					
1,1,1,2-Tetrachloroethane	ND	0.0005	mg/L					
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L					
Tetrachloroethylene	ND	0.0005	mg/L					
Toluene	ND	0.0005	mg/L					
1,1,1-Trichloroethane	ND	0.0005	mg/L					
1,1,2-Trichloroethane	ND	0.0005	mg/L					
Trichloroethylene	ND	0.0005	mg/L					
Trichlorofluoromethane	ND	0.0010	mg/L					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Vinyl chloride	ND	0.0002	mg/L					
m,p-Xylenes	ND	0.0005	mg/L					
o-Xylene	ND	0.0005	mg/L					
Xylenes, total	ND	0.0005	mg/L					
Surrogate: 4-Bromofluorobenzene	*0.0804*		*%*	*101*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0786*		*%*	*98.2*	*50-140*			
Surrogate: Toluene-d8	*0.0828*		*%*	*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	66.3	1	mg/L	66.4			0.2	20	
Fluoride	0.38	0.1	mg/L	0.38			0.5	20	
Nitrate as N	ND	0.1	mg/L	ND			NC	20	
Nitrite as N	ND	0.05	mg/L	ND			NC	20	
Phosphate as P	ND	0.5	mg/L	ND			NC	20	
Sulphate	45.1	1	mg/L	46.0			2.0	20	
General Inorganics									
Alkalinity, total	270	5	mg/L	273			0.9	14	
Ammonia as N	0.234	0.01	mg/L	0.232			1.0	17.7	
Dissolved Organic Carbon	1.5	0.5	mg/L	1.6			5.2	37	
Colour	2	2	TCU	2			0.0	12	
Colour, apparent	75	2	ACU	73			2.7	12	
Conductivity	784	5	uS/cm	768			2.0	5	
pH	8.4	0.1	pH Units	8.4			0.0	3.3	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Total Dissolved Solids	96.0	10	mg/L	98.0			2.1	10	
Sulphide	ND	0.02	mg/L	ND			NC	10	
Tannin & Lignin	ND	0.1	mg/L	ND			NC	11	
Total Kjeldahl Nitrogen	0.37	0.1	mg/L	0.34			9.5	16	
Turbidity	13.1	0.1	NTU	13.0			0.8	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	0.0250	mg/L	ND			NC	30	
Metals									
Mercury	ND	0.0001	mg/L	ND			NC	20	
Aluminum	0.037	0.001	mg/L	0.036			3.6	20	
Antimony	ND	0.0005	mg/L	ND			NC	20	
Arsenic	ND	0.001	mg/L	ND			NC	20	
Barium	0.194	0.001	mg/L	0.186			4.2	20	
Beryllium	ND	0.0005	mg/L	ND			NC	20	
Boron	0.13	0.01	mg/L	0.13			0.3	20	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Cadmium	ND	0.0001	mg/L	ND			NC	20	
Calcium	95.2	0.1	mg/L	90.5			5.1	20	
Chromium	ND	0.001	mg/L	ND			NC	20	
Cobalt	ND	0.0005	mg/L	ND			NC	20	
Copper	ND	0.0005	mg/L	ND			NC	20	
Iron	0.6	0.1	mg/L	0.5			0.9	20	
Lead	ND	0.0001	mg/L	ND			NC	20	
Magnesium	31.3	0.2	mg/L	28.8			8.2	20	
Manganese	0.019	0.005	mg/L	0.019			2.3	20	
Molybdenum	0.0010	0.0005	mg/L	0.0009			9.0	20	
Nickel	ND	0.001	mg/L	ND			NC	20	
Potassium	6.8	0.1	mg/L	6.5			4.5	20	
Selenium	ND	0.001	mg/L	ND			NC	20	
Silver	ND	0.0001	mg/L	ND			NC	20	
Sodium	65.8	0.2	mg/L	61.1			7.4	20	
Thallium	ND	0.001	mg/L	ND			NC	20	
Uranium	ND	0.0001	mg/L	ND			NC	20	
Vanadium	ND	0.0005	mg/L	ND			NC	20	
Zinc	ND	0.005	mg/L	ND			NC	20	
Microbiological Parameters									
E. coli	ND	1	CFU/100mL	ND			NC	30	
Total Coliforms	ND	1	CFU/100mL	ND			NC	30	
Fecal Coliforms	ND	1	CFU/100mL	ND			NC	30	
Heterotrophic Plate Count	ND	10	CFU/mL	ND			NC	30	
Volatiles									
Acetone	ND	0.0050	mg/L	ND			NC	30	
Benzene	ND	0.0005	mg/L	ND			NC	30	
Bromodichloromethane	ND	0.0005	mg/L	ND			NC	30	
Bromoform	ND	0.0005	mg/L	ND			NC	30	
Bromomethane	ND	0.0005	mg/L	ND			NC	30	
Carbon Tetrachloride	ND	0.0002	mg/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	ND	0.0005	mg/L	ND			NC	30	
Chloroethane	ND	0.0010	mg/L	ND			NC	30	
Chloroform	ND	0.0005	mg/L	ND			NC	30	
Dibromochloromethane	ND	0.0005	mg/L	ND			NC	30	
Dichlorodifluoromethane	ND	0.0010	mg/L	ND			NC	30	
1,2-Dibromoethane	ND	0.0002	mg/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.0005	mg/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.0005	mg/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.0005	mg/L	ND			NC	30	
1,1-Dichloroethane	ND	0.0005	mg/L	ND			NC	30	
1,2-Dichloroethane	ND	0.0005	mg/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.0005	mg/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.0005	mg/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.0005	mg/L	ND			NC	30	
1,2-Dichloropropane	ND	0.0005	mg/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.0005	mg/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.0005	mg/L	ND			NC	30	
Ethylbenzene	ND	0.0005	mg/L	ND			NC	30	
Hexane	ND	0.0010	mg/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	0.0050	mg/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	0.0050	mg/L	ND			NC	30	
Methyl tert-butyl ether	ND	0.0020	mg/L	ND			NC	30	
Methylene Chloride	ND	0.0050	mg/L	ND			NC	30	
Styrene	ND	0.0005	mg/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.0005	mg/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L	ND			NC	30	
Tetrachloroethylene	ND	0.0005	mg/L	ND			NC	30	
Toluene	ND	0.0005	mg/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.0005	mg/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.0005	mg/L	ND			NC	30	
Trichloroethylene	ND	0.0005	mg/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Trichlorofluoromethane	ND	0.0010	mg/L	ND			NC	30	
Vinyl chloride	ND	0.0002	mg/L	ND			NC	30	
m,p-Xylenes	ND	0.0005	mg/L	ND			NC	30	
o-Xylene	ND	0.0005	mg/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*0.0812*		*%*		*101*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0755*		*%*		*94.4*	*50-140*			
Surrogate: Toluene-d8	*0.0835*		*%*		*104*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	76.5	1	mg/L	66.4	101	70-124			
Fluoride	1.25	0.1	mg/L	0.38	87.4	70-130			
Nitrate as N	1.00	0.1	mg/L	ND	100	77-126			
Nitrite as N	0.953	0.05	mg/L	ND	95.3	82-115			
Phosphate as P	4.98	0.5	mg/L	ND	99.5	76-130			
Sulphate	55.2	1	mg/L	46.0	92.2	70-130			
General Inorganics									
Ammonia as N	1.26	0.01	mg/L	0.232	103	81-124			
Dissolved Organic Carbon	11.3	0.5	mg/L	1.3	100	60-133			
Phenolics	0.026	0.001	mg/L	ND	106	67-133			
Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Sulphide	0.52	0.02	mg/L	ND	104	79-115			
Tannin & Lignin	0.9	0.1	mg/L	ND	94.7	71-113			
Total Kjeldahl Nitrogen	1.39	0.1	mg/L	0.34	105	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	1.86	0.0250	mg/L	ND	92.9	85-115			
F2 PHCs (C10-C16)	1.4	0.1	mg/L	ND	86.7	60-140			
F3 PHCs (C16-C34)	4.0	0.1	mg/L	ND	103	60-140			
F4 PHCs (C34-C50)	2.5	0.1	mg/L	ND	102	60-140			
Metals									
Mercury	0.0028	0.0001	mg/L	ND	92.8	70-130			
Aluminum	83.1	0.001	mg/L	35.7	94.7	80-120			
Arsenic	49.0	0.001	mg/L	0.062	97.9	80-120			
Barium	234	0.001	mg/L	186	95.1	80-120			
Beryllium	44.1	0.0005	mg/L	0.0147	88.2	80-120			
Boron	173	0.01	mg/L	128	89.4	80-120			
Cadmium	46.9	0.0001	mg/L	0.0016	93.8	80-120			
Calcium	8740	0.1	mg/L	ND	87.4	80-120			
Chromium	48.4	0.001	mg/L	0.102	96.6	80-120			
Cobalt	46.1	0.0005	mg/L	0.0299	92.1	80-120			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Copper	42.9	0.0005	mg/L	0.110	85.6	80-120			
Iron	2800	0.1	mg/L	547	90.1	80-120			
Lead	43.7	0.0001	mg/L	ND	87.3	80-120			
Magnesium	39300	0.2	mg/L	28800	105	80-120			
Manganese	66.5	0.005	mg/L	18.8	95.2	80-120			
Molybdenum	42.3	0.0005	mg/L	1.11	82.4	80-120			
Nickel	44.3	0.001	mg/L	0.165	88.2	80-120			
Potassium	15700	0.1	mg/L	6460	92.8	80-120			
Selenium	44.1	0.001	mg/L	0.027	88.1	80-120			
Silver	49.8	0.0001	mg/L	ND	99.7	80-120			
Sodium	71800	0.2	mg/L	61100	107	80-120			
Thallium	43.6	0.001	mg/L	0.017	87.1	80-120			
Uranium	47.3	0.0001	mg/L	0.0270	94.6	80-120			
Vanadium	49.4	0.0005	mg/L	0.106	98.6	80-120			
Zinc	44.0	0.005	mg/L	0.899	86.3	80-120			
Volatiles									
Acetone	0.0847	0.0050	mg/L	ND	84.7	50-140			
Benzene	0.0305	0.0005	mg/L	ND	76.3	60-130			
Bromodichloromethane	0.0398	0.0005	mg/L	ND	99.6	60-130			
Bromoform	0.0334	0.0005	mg/L	ND	83.5	60-130			
Bromomethane	0.0363	0.0005	mg/L	ND	90.8	50-140			
Carbon Tetrachloride	0.0294	0.0002	mg/L	ND	73.5	60-130			
Chlorobenzene	0.0373	0.0005	mg/L	ND	93.3	60-130			
Chloroethane	0.0307	0.0010	mg/L	ND	76.8	50-140			
Chloroform	0.0292	0.0005	mg/L	ND	73.1	60-130			
Dibromochloromethane	0.0336	0.0005	mg/L	ND	84.1	60-130			
Dichlorodifluoromethane	0.0261	0.0010	mg/L	ND	65.3	50-140			
1,2-Dibromoethane	0.0347	0.0002	mg/L	ND	86.6	60-130			
1,2-Dichlorobenzene	0.0341	0.0005	mg/L	ND	85.2	60-130			
1,3-Dichlorobenzene	0.0347	0.0005	mg/L	ND	86.7	60-130			
1,4-Dichlorobenzene	0.0350	0.0005	mg/L	ND	87.4	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1-Dichloroethane	0.0359	0.0005	mg/L	ND	89.8	60-130			
1,2-Dichloroethane	0.0307	0.0005	mg/L	ND	76.7	60-130			
1,1-Dichloroethylene	0.0309	0.0005	mg/L	ND	77.2	60-130			
cis-1,2-Dichloroethylene	0.0345	0.0005	mg/L	ND	86.3	60-130			
trans-1,2-Dichloroethylene	0.0347	0.0005	mg/L	ND	86.7	60-130			
1,2-Dichloropropane	0.0385	0.0005	mg/L	ND	96.2	60-130			
cis-1,3-Dichloropropylene	0.0288	0.0005	mg/L	ND	72.1	60-130			
trans-1,3-Dichloropropylene	0.0330	0.0005	mg/L	ND	82.5	60-130			
Ethylbenzene	0.0375	0.0005	mg/L	ND	93.8	60-130			
Hexane	0.0282	0.0010	mg/L	ND	70.5	60-130			
Methyl Ethyl Ketone (2-Butanone)	0.0660	0.0050	mg/L	ND	66.0	50-140			
Methyl Isobutyl Ketone	0.0677	0.0050	mg/L	ND	67.7	50-140			
Methyl tert-butyl ether	0.0715	0.0020	mg/L	ND	71.5	50-140			
Methylene Chloride	0.0250	0.0050	mg/L	ND	62.6	60-130			
Styrene	0.0342	0.0005	mg/L	ND	85.4	60-130			
1,1,1,2-Tetrachloroethane	0.0404	0.0005	mg/L	ND	101	60-130			
1,1,2,2-Tetrachloroethane	0.0343	0.0005	mg/L	ND	85.7	60-130			
Tetrachloroethylene	0.0412	0.0005	mg/L	ND	103	60-130			
Toluene	0.0370	0.0005	mg/L	ND	92.4	60-130			
1,1,1-Trichloroethane	0.0334	0.0005	mg/L	ND	83.5	60-130			
1,1,2-Trichloroethane	0.0329	0.0005	mg/L	ND	82.2	60-130			
Trichloroethylene	0.0368	0.0005	mg/L	ND	92.1	60-130			
Trichlorofluoromethane	0.0289	0.0010	mg/L	ND	72.2	60-130			
Vinyl chloride	0.0399	0.0002	mg/L	ND	99.8	50-140			
m,p-Xylenes	0.0735	0.0005	mg/L	ND	91.8	60-130			
o-Xylene	0.0349	0.0005	mg/L	ND	87.3	60-130			
Surrogate: 4-Bromofluorobenzene	*0.0842*		*%*		*105*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0847*		*%*		*106*	*50-140*			
Surrogate: Toluene-d8	*0.0809*		*%*		*101*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - Sample dated as Jan. 26 2024; chain of custody reads Jan. 25 2024; client confirmed sample collected Jan. 26, 2024.
Applies to Samples: TW1 9hr, TW1 9hr (Filtered)

Sample Qualifiers :

Sample Data Revisions:

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.

- F1 range corrected for BTEX.

- F2 to F3 ranges corrected for appropriate PAHs where available.

- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.

- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES

Paracel ID: 2404397

ent Blvd.
K1G 4J8
7
ellabs.com
com

Paracel Order Number: 2404397

Chain Of Custody
Ontario Drinking Water Samples
№ 19821

Client Name:	Gentec	Project Ref:	100117.056	Waterworks Name:	
Contact Name:	A Parnekas	Quote #:		Waterworks Number:	
Address:		PO #:		Address:	
After Hours Contact:		E-mail:	andrius.parnekas@gentec.ca		
Telephone:	613-295-8425	Fax:		Public Health Unit:	

Samples Taken By:
Name: A.Parnekas
Signature: [signature]
Page ____ of ____
Turn Around Time Required:
☐ 1 day ☐ 2 day ☐ 3 day ☒ 4 day

Samples Submitted Under: (Indicate **ONLY one**)
☐ ON REG 170/03 ☐ ON REG 319/08 ☐ Private Well
☐ ON REG 243/07 ☒ Other O.Reg 169/03

Have LSN forms been submitted to MOE/MOHLTC?: ☐ Yes ☐ No ☒ N/A

Are these samples for human consumption?: ☐ Yes ☒ No

All information must be completed before samples will be processed.

Sample Type: R = Raw ; T = Treated ; D = Distribution; P = Plumbing
Source Type: G = Ground Water; S = Surface Water
Reportable: Requires AWQI reporting as per Regulation - Y = Yes; N = No

	LOCATION NAME	SAMPLE ID	Sample Type: R/T/D/P	Source Type: G/S	Reportable: Y/N	Resample	SAMPLE COLLECTED DATE	SAMPLE COLLECTED TIME	# of Containers	Free/Combined Chlorine Residual mg/L	Standing / Flushed: S/F (REG 243)	Total Coliform/E. Coli	HPC	PHC	VOCs	Subdivision Package	Trace metals (Filter & unfilter)		Phosphate
1		TW1 9hr	R	G	N	–	Jan 25/24	12am	15					X	X	X	X		X
2		TW3043 18hr	R	G	N	–	Jan 26/24	9am	15					X	X	X	X		X
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments: Colour in AEV&TEV

Method of Delivery: Walk In

Relinquished By (Sign): [signature]	Received By Driver/Depot:	Received at Lab: CB 10:09	Verified By: SD
Relinquished By (Print): Sam Ratway	Date/Time:	Date/Time: Jan 26/24	Date/Time: Jan 26, 2024 10:40am
Date/Time: Jan 26/24 10:15am	Temperature: °C	Temperature: 10.8 °C	pH Verified: ☐ By: SD

APPENDIX J

Geotechnical Soil Settlement Assessment

Report to: Laplante Poultry Farms Limited
GEMTEC Project: 100117.056 (December 20, 2024)

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Ottawa, ON, Canada
K2K 2A9
613.836.1422
ottawa@gemtec.ca
www.gemtec.ca

December 20, 2024 File: 100117.056

LaPlante Poultry Farms Limited
3043 Dunning Road
Ottawa, Ontario
K0A 3E0

Attention: Jamie Batchelor, Planner

Re: Geotechnical Investigation
Proposed Chicken Processing Plant
3043 Dunning Road
Sarsfield (Ottawa), Ontario

This letter presents the results of a geotechnical investigation carried out for the proposed chicken processing plant located at 3043 Dunning Road in Ottawa, Ontario.

PROJECT AND SITE DESCRIPTION

Project Description

The LaPlante Poultry Farms Limited (LPFL) farm is located in Sarsfield, Ontario, a village in the Cumberland Ward in the east portion of the City of Ottawa. The farm has an area of approximately 1.7 hectares. It is bounded to the west by Dunning Road, just north of the intersection of Dunning Road with Giroux Road, and to the north, east and west by agricultural use properties at 3085 and 3105 Dunning Road which are also owned by LPFL. The farm is referred to further in this document as the Site.

It is understood that the existing facility at the Site is undergoing a Zoning By-law Amendment and Site Plan Approval associated with the proposed chicken processing plant. It is also understood that the existing barn at the Site will be rehabilitated and converted to a processing plant. No details of the proposed rehabilitation are known at the time of writing this letter, however, it is understood that the new water demands for the facility may lower the groundwater level resulting in settlement of the underlying silty clay deposit.

GEMTEC carried out an assessment of the potential for surficial settlement, the results were provided in the following letter:

- Letter titled “Potential for Surficial Settlement, Proposed Chicken Processing Plant Pumping Well, 3043 Dunning Road, Sarsfield (Ottawa), Ontario” dated February 7, 2024 (Project No. 100117.056)

Previous Investigations

GEMTEC completed a series of hydrogeological studies at the Site in support of an environmental activity and sector registry (EASR). As part of this work four boreholes were advanced to depths of about 7 to 18 metres below ground surface for installation of groundwater observation wells. While information on the general soil stratigraphy was obtained, measurements of soil strength and compressibility were not taken (as these boreholes were advanced for hydrogeological investigation purposes only).

The results were provided in the following reports:

- Report titled “Hydrogeological Investigation & Terrain Analysis, Proposed Chicken Processing Facility, Part of Lot 7, Concession 4 (3043 Dunning Road), Ottawa, Ontario” dated February 8, 2024 (Report No. 110117.056); and,
- Report titled “Pumping Test Design Report, Environmental Activity and Sector Registry, Proposed Chicken Processing Facility, 3043 Dunning Road, Ottawa, Ontario” dated January 19, 2024 (Report No. 100117.056).

Review of Geology Maps

Based on surficial geology maps, the Site is underlain by thick deposits of silty clay over glacial till and bedrock. Bedrock geology maps indicate that limestone bedrock of the Lindsay formation is present below the soil cover. Drift thickness mapping indicates the bedrock surface is expected at depths ranging from 10 to 25 metres, sloping down to the east.

The results of the boreholes from the hydrogeological investigation encountered silty clay overlying glacial till and limestone bedrock, which corresponds to the geology maps, however, the soil cover was found to be greater than about 15 metres in thickness.

SUBSURFACE INVESTIGATION

The fieldwork for the geotechnical investigation was carried out in two phases, the hydrogeological investigation was carried out between January 5 and 9, 2024 and the geotechnical investigation was carried out on July 22, 2024. On those days, six boreholes (numbered 24-1D, 24-1S, 24-2D, 24-2S, 24-03, and 24-04) were advanced at the approximate locations shown on the Site Plan, Figure 1. Boreholes 24-1S and 24-2S were advanced, without sampling, adjacent to

The boreholes were advanced using a track mounted, hollow stem auger drill rig supplied and operated by George Downing Estate Drilling of Grenville-sur-la-rouge, Quebec. The boreholes were advanced to depths ranging from about 6.7 to 17.4 metres below ground surface, respectively. Upon reaching the bedrock surface in boreholes 24-1D and 24-2D, the boreholes were advanced into the bedrock for a length of 0.6 and 0.2 meters using rotary diamond drilling techniques, while retrieving HQ sized bedrock core.

Standard penetration tests were carried out in the boreholes and samples of the soils encountered were recovered using a 50 millimetre diameter drive open sampler. In-situ shear vane testing was carried out in boreholes 24-03 and 24-04, where possible, to measure the undrained shear strength of the clay deposits.

A single well screens was installed in each of the boreholes to measure the groundwater levels. The groundwater levels were measured on January 15, 25, and 31 and July 29, 2024.

Following the borehole drilling fieldwork, the soil samples were returned to our laboratory for examination by the geotechnical engineer and for geotechnical laboratory testing. Selected samples of the soil were tested for Atterberg Limit, water content, and grain size distribution testing.

The borehole locations were selected by GEMTEC and positioned on site relative to existing features. The ground surface elevations at the borehole locations were determined using a Trimble R10 GPS. The elevations are referenced to geodetic datum NAD83 (CSRS) Epoch 2010, vertical network CGVD1928.

SUBSURFACE CONDITIONS

The results of the boreholes are provided on the Record of Borehole sheets in the Attachments. The approximate locations of the boreholes are shown on the Site Plan, Figure 1. The results of the laboratory classification tests on the soil samples are provided on the borehole logs and in the Attachments.

The following presents an overview of the subsurface conditions encountered in the boreholes. Boreholes 24-1D and 24-1S and boreholes 24-2D and 24-2S are referred to as 24-1 and 24-2, respectively, for simplicity.

Topsoil

A layer of topsoil was encountered at the ground surface in the boreholes with a thickness of about 100 millimetres.

Silty Clay

Native deposits of silty clay were encountered below topsoil in the boreholes. The silty clay, where fully penetrated, extends to depths ranging from about 13.2 to 15.4 metres below the existing ground surface.

The upper portion of the silty clay deposit has been weathered to a grey brown crust. The weathered silty clay crust extends to depths ranging from about 2.9 to 3.1 metres below ground surface.

Standard penetration tests carried out in the weathered crust gave N values ranging from 2 to 8 blows per 0.3 metres of penetration, which reflect a stiff to very stiff consistency.

The results of Atterberg limit testing carried out on one sample of the weathered silty clay crust are provided on Plasticity Chart in the Attachments and are summarized in Table 1. The measured water content of four samples of the weathered silty clay crust ranges from about 40 to 51 percent.

Table 1 – Summary of Atterberg Limit Testing (Weathered Silty Clay)

Borehole ID	Sample Number	Sample Depth (metres)	Water Content (%)	LL (%)	PL (%)	PI (%)
24-03	3	1.5 to 2.1	41	55	24	31

Grain size distribution tests were carried out on two samples of the weathered crust from boreholes 24-1 and 24-2. The results are provided in the Attachments and are summarized in Table 3.

Table 3 – Summary of Grain Size Distribution Test (Silty Clay)

Borehole ID	Sample Number	Sample Depth (metres)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
24-1	3	1.5 to 2.1	0	1	44	55
24-2	3	2.3 to 2.9	0	1	43	57

The silty clay below the depth of weathering is grey in colour. The grey silty clay extends to a depth of about 13.2 metres below ground surface in boreholes 24-03. The grey silty clay was not fully penetrated in borehole 24-04, but was proven to a depth of about 6.7 metres below the existing ground surface.

Standard penetration tests carried out in the silty clay gave N values ranging from ‘weight of hammer’ (WH) to 3 blows per 0.3 metres of penetration. In-situ vane testing gave undrained shear strengths ranging from about 31 to 54 kilopascals, which reflect a firm to stiff consistency.

The results of Atterberg limit testing carried out on one sample of the grey silty clay are provided on Plasticity Chart in the Attachments and are summarized in Table 2. The measured water content of seven samples of the grey silty clay ranges from about 55 to 85 percent.

Table 2 – Summary of Atterberg Limit Testing (Unweathered Silty Clay)

Borehole ID	Sample Number	Sample Depth (metres)	Water Content (%)	LL (%)	PL (%)	PI (%)
24-1D	15	10.7 to 11.3	85	48	26	22
24-2D	11	8.4 to 9.0	81	49	28	22
24-03	10	10.7 to 11.3	84	51	26	24

Grain size distribution tests were carried out on two samples of the silty clay from boreholes 24-1 and 24-2. The results are provided in the Attachments and are summarized in Table 3.

Table 3 – Summary of Grain Size Distribution Test (Silty Clay)

Borehole ID	Sample Number	Sample Depth (metres)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
24-1	15	10.7 to 11.3	0	1	43	56
24-2	11	8.4 to 9.0	0	1	40	59

Glacial Till

Native deposits of glacial till was encountered below the silty clay in boreholes 24-1, 24-2, and 24-03 at depths ranging from about 13.2 to 15.4 metres. The glacial till extends to depths of 17.4 and 15.3 metres below the existing ground surface in boreholes 24-1 and 24-2, respectively. The glacial till was not fully penetrated in borehole24-03, but was proven to a depth of about 14.5 metres.

The glacial till is considered to be a heterogeneous mixture of all grain sizes, which at this site, can be described as grey silty sand to sandy silt with varying amounts of gravel and with some clay. Although not directly encountered in the boreholes, the glacial till deposit is known to contain cobbles and boulders.

Standard penetration tests carried out within the glacial till gave N values of 4 and 82 blows per 0.3 metres of penetration, which reflects a loose to very dense relative density, and may also indicate the presence of cobble and boulder size fragments of rock in the deposit.

One grain size distribution test was undertaken on a sample of the glacial till from borehole 24-03. The results are provided in Appendix B and are summarized in Table 3. The moisture content of one sample of the glacial till was about 14 percent.

Table 3 – Summary of Grain Size Distribution Test (Glacial Till)

Borehole ID	Sample Number	Sample Depth (metres)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
24-03	13	13.7 to 14.3	37	36	20	7

Auger Refusal and Bedrock

Practical auger refusal was encountered in borehole 24-03 at a depth of about 14.5 metres below the existing ground surface.

Inferred grey limestone bedrock was encountered in boreholes 24-1D and 24-3D at depths of about 17.4 and 15.3 metres below the existing ground surface, respectively, and cored using rotary diamond drilling techniques while retrieving HQ sized bedrock core. The bedrock was cored to a depth of about 18.0 and 15.5 metres below the existing ground surface, respectively.

Groundwater Levels

Monitoring wells were installed in the boreholes to measure stabilized groundwater conditions. Table 6 summarizes the groundwater levels observed on January 15, 25, and 31 and July 29, 2024.

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

Table 6 – Summary of Groundwater Levels

Borehole ID	Ground Surface Elevation (metres)	Groundwater Depth (metres)	Groundwater Elevation (metres)	Date of Reading
24-1S	86.1	1.5	84.6	January 15, 2024
		0.8	85.3	January 25, 2024
		0.7	85.4	January 31, 2024
		0.6	85.5	July 29, 2024
24-1D	86.2	1.1	85.1	January 15, 2024
		1.2	85.0	January 25, 2024
		1.2	85.0	January 31, 2024
		1.0	85.2	July 29, 2024

Borehole ID	Ground Surface Elevation (metres)	Groundwater Depth (metres)	Groundwater Elevation (metres)	Date of Reading
24-2S	86.5	0.9	85.6	January 15, 2024
		0.8	85.7	January 25, 2024
		0.6	85.8	January 31, 2024
		0.6	85.9	July 29, 2024
24-2D	86.5	1.4	85.6	January 15, 2024
		1.5	85.7	January 25, 2024
		1.5	85.8	January 31, 2024
		1.3	85.9	July 29, 2024
24-03	86.3	1.5	84.8	July 29, 2024
24-04	86.3	0.5	85.8	July 29, 2024

DISCUSSION

Assumptions of existing conditions

No information is known about the foundation width and depth of the structures on site. As such, the following assumptions were made for the settlement assessment:

- The existing footings have a width of about 1 metre and have an underside of footing depth of about 1.5 metres;
- Based on the subsurface conditions encountered in the boreholes and the ground surface elevations at the boreholes, the existing grade was not raised at the processing plant (i.e., no additional filling has occurred);
- The existing groundwater level in the silty clay deposit is at about 0.5 metres below the existing ground surface level; and,
- The loading on the footings is up to about 100 kilopascals.

The above are conservative assumptions it is considered, however, if the footings are deeper or wider than assumed above, or the anticipated loading on the footings is greater than the above, the amount of settlement should be reassessed.

Assessment of Potential for Ground Settlement

An assessment of the potential for soil settlement to occur because of the groundwater extraction has been carried out.

For the existing nearfield structures i.e. those adjacent to the test well, groundwater extraction may cause some settlement in the silt and clay which may present at ground surface as settlement. The assessment of potential impact on the near field structures are subject to the assumptions described below:

- The pump will not be operated continuously.
- Minimal change in groundwater level will occur in the silt and clay layer below the structures for the duration of the pumping, similar to that observed during the monitoring of the test well, and recovery will occur in the times when the pump will not be operated.

Based on the results of the geotechnical investigation, the existing loading conditions at the site has not exceeded the preconsolidation pressure of silty clay deposit (i.e., the existing loading will not cause excessive settlements of the silty clay deposit) and therefore some capacity for additional loading exists.

Based on an assessment of the increase in stresses due to groundwater extraction, the groundwater level can be lowered to a depth of about 5 metres below the existing ground surface at the near field structures without the structures experiencing significant settlements. In other words, lowering the groundwater level 3.5 metres from the measured water level of about 1.5 metres below the existing ground surface is possible without significant effects.

It should be noted that it is not anticipated that the groundwater extraction will lower the groundwater level by 3.5 metres, but some lowering of the groundwater level will inevitably occur at the pumping well location. Correspondingly, some settlement of the near field structures will occur because of the groundwater extraction (and groundwater level lowering), however, the level of ground settlement that may occur is anticipated to be minor and may be up to 25 millimetres (for groundwater level lowering of 3.5 metres) and reduce with increasing distance from the well and with smaller magnitude of groundwater level lowering. This magnitude of settlement is typically acceptable for normal structures in good condition.

As stated above, this is based on conservative assumptions on the existing structure, noting that the level of groundwater level lowering is difficult to predict with certainty.

Additional Actions

For the existing near field structures, it is considered pragmatic to develop a monitoring plan which should be implemented for an initial period of time (say initially up to 6 months). The monitoring plan should include the following:

- Install dataloggers in the monitoring wells for continuous water level readings as well as conduct monthly measurement of the water levels installed at the site. The dataloggers should be downloaded at the same time as the water level site visits. The water levels in

the wells should be measured when the pump is in operation, and also at a time when the pump is not operational;

- A survey point (or points) should be established on the existing structure and bi-monthly readings of the point(s) should be taken for the first year of operation for indications of movement. Natural seasonal variation in the groundwater levels in the shallow wells installed is to be anticipated and may not be a cause for concern, the surveying will assist in removing uncertainty around the effects of these variations.
    - Following the first year, if the groundwater trigger level is exceeded (i.e., water level decreases to greater than 5 meres below ground surface in overburden monitoring wells in the clay), the survey points should be measured bi-monthly for a period of one year.

In the instance that evidence of groundwater level lowering in the silty clay deposits of greater than 3.5 metres (i.e., greater than 5 metres below the existing ground surface), and/or settlement of the existing nearby structure is observed on site beyond an acceptable level (i.e., settlements of greater than about 15 millimetres), and is impacting existing structures, to avoid potential damage it may be necessary to:

- Adjust the planned water taking activities. This may include changes to extraction rates, increasing rest times, increased water level and survey point monitoring frequency; and/or,
- Modifications to existing structures.

It is recommended that a Qualified Professional (QP) be retained by LPFL to review the results of the water level monitoring and surveying. Following a review of the initial data from the 6-month period further commentary can be provided.

CLOSURE

We trust that this letter is sufficient for your purposes. If you have any questions concerning this information, please feel free to contact the undersigned.

Alex Meacoe, P.Eng.
Senior Geotechnical Engineer

Daire Cummins, M.Sc.

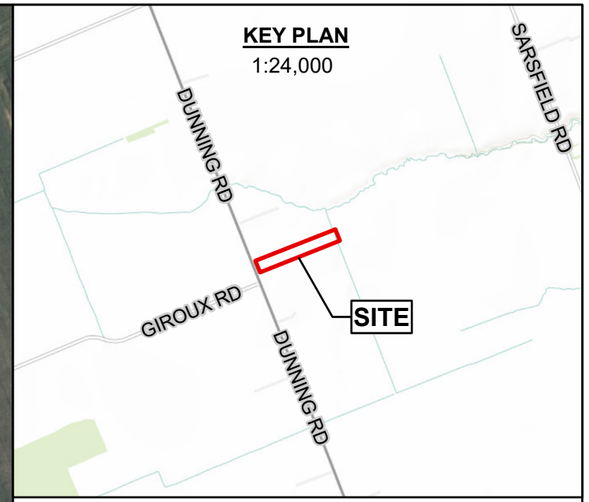
WAM/DC

Enclosures
N:\Projects\100100\100117.056\10_Deliverables\Geotech\100117.56_LTR_GEO_dunning road_Rev.1_2024-12-20.docx

ATTACHMENTS

Figure 1 – Site Plan
List of Abbreviations and Symbols
Record of Boreholes 24-01 to 24-04
Plasticity Chart
Grain Size Distribution Chart

KEY PLAN
1:24,000



LEGEND

- BH # — BOREHOLE ID
- XX.XX — GROUND SURFACE ELEVATIONS, IN METRES GEODETIC DATUM
- BOREHOLE LOCATION
- APPROXIMATE PROPERTY BOUNDARY
- WATERCOURSE

GENERAL NOTES:

1. Coordinate system: NAD83 (CSRS) UTM Zone 18N.
2. Geographic dataset source: Ontario GeoHub.
3. Contains information licensed under the Open Government Licence – City of Ottawa, Ontario.
4. Service Layer Credits: World Topographic Map: City of Ottawa, Ville de Gatineau, Province of Ontario, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA, AAFC, NRCan, World Imagery: SDG Counties, Maxar, Microsoft, Ottawa 2022 Imagery:

Scale:
1:1,500 Meters
0 20 40 80 120

Drawing: SITE PLAN

Client: J.L. RICHARDS AND ASSOCIATES

Project: GEOTECHNICAL INVESTIGATION
CHICKEN PROCESSING PLANT
3043 DUNNING ROAD
OTTAWA, ONTARIO

Drwn By:	S.L.	Chkd By:	W.A.M.
Project No.	100117.056	Revision No.	0
Date	AUGUST 2024		**FIGURE 1**

GEMTEC
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32 Steacie Drive
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www.gemtec.ca
ottawa@gemtec.ca

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ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer) test
D_R	Relative density
DS	Direct shear test
G_S	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

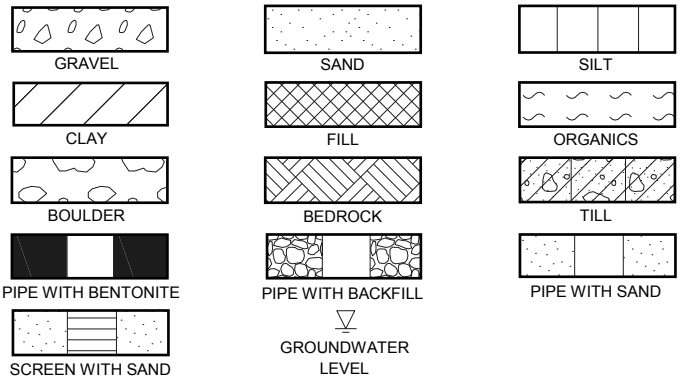
PENETRATION RESISTANCE

Standard Penetration Resistance, N
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

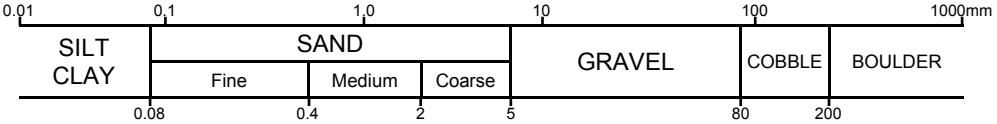
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	**Description**	**Cu, kPa**	**Description**
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard

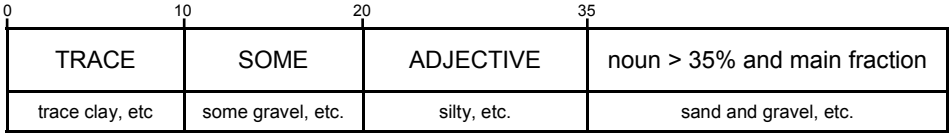


GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)



RECORD OF BOREHOLE 24-1D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 2
DATUM: CGVD2013
BORING DATE: Jan 5 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m ● / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m ▲	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED	WATER CONTENT, % W_P W W_L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		86.19									
		Topsoil		86.09									
		Stiff to very stiff, brown SILTY CLAY (WEATHERED CRUST)		0.10	1	SS	350	7	●				
1					2	SS	558	7	●				
2					3	SS	609	7	●		○	MH	
					4	SS	558	2	●				
				83.29									
3		Grey SILTY CLAY (undrained shear strength not determined)		2.90	5	SS	609	1	●				
4					6	SS	609	WH					
					7	SS	609	WH					Bentonite Seal
5					8	SS	609	WH					
6					9	SS	609	WH					
7					10	SS	609	WH					
8					11	SS	609	WH					
					12	SS	609	WH					
9					13	SS	609	WH					
10													

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-1D

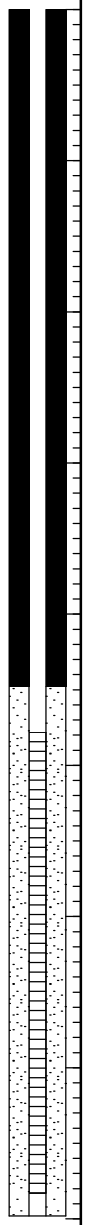
CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 2 OF 2
DATUM: CGVD2013
BORING DATE: Jan 5 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING
10	Mud Rotary HW (114mm OD)			14	SS	609	WH	
11				15	SS	609	WH	MH
12				16	SS	609	WH	
13				17	SS	609	WH	
14				18	SS	609	WH	
15				19	SS	609	WH	
16				20	SS	609	WH	
17		Loose to compact, grey SILTY SANDY GRAVEL, with cobbles and boulders (GLACIAL TILL)	70.80 / 15.39	21	SS	406	12	
18	Mud Rotary HQ (89mm OD)	Dark Grey Limestone (Inferred Bedrock)	68.84 / 17.35	22	SS	356	6	
19		End of Borehole	68.21 / 17.98	23	SS	356	15	
20				24	RC	254		

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	2.3	85.0
24/01/31	2.4	85.0

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CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-1S

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Jan 8 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (210mm OD)	Ground Surface		86.10							
		Not Logged - See BH24-1D for details									
1											
2											Bentonite Seal
3											
4											
5											
6											Filter Sand Pack 50mm diameter PVC screen
7											
8		End of Borehole		78.17 / 7.93							
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	1.7	85.3
24/01/31	1.6	85.3

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CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-2D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 2
DATUM: CGVD2013
BORING DATE: Jan 9 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		86.53						
0	Power Auger Hollow Stem Auger (210mm OD)	Topsoil		86.43						
		Stiff to very stiff, brown SILTY CLAY (WEATHERED CRUST)		0.10						
1					1	SS	558	7		
					2	SS	609	7		
2					3	SS	558	2	MH	
				83.63						
3		Grey SILTY CLAY (undrained shear strength not determined)		2.90	4	SS	609	1		
4					5	SS	609	WH		
					6	SS	609	WH		Bentonite Seal
5					7	SS	609	WH		
6					8	SS	609	WH		
7	Mud Rotary HW (114mm OD)				9	SS	609	WH		
					10	SS	609	WH		
8					11	SS	609	WH	MH	
9					12	SS	609	WH		
10										

SOIL PROFILE | SAMPLES | PENETRATION RESISTANCE (N), BLOWS/0.3m | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m | SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED | WATER CONTENT, % W_P W W_L | 10 20 30 40 50 60 70 80 90

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

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LOGGED: SE
CHECKED: AM

RECORD OF BOREHOLE 24-2D

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 2 OF 2
DATUM: CGVD2013
BORING DATE: Jan 9 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
				76.02	13	SS	609	WH
		Loose to compact, grey SANDY SILT, with trace to some gravel (GLACIAL TILL)		10.51	14	SS	609	4
					15	SS	450	9
					16	SS	540	
				73.58				
		Compact to dense, grey SILTY SAND, some gravel, with cobbles and boulders (GLACIAL TILL)		12.95	17	SS	440	13
					18	SS	580	35
	Mud Rotary HQ (89mm OD)				19	RC	720	
				71.21				
		Dark Grey Limestone (Inferred Bedrock)		15.32				
				70.99				
		End of Borehole		15.54				

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Bentonite Seal

Filter Pack 50mm diameter PVC screen

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	2.5 ▽	85.0
24/01/31	2.5 ▼	85.0

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-2S

CLIENT: Laplante Poultry Farms Limited
PROJECT: Hydrogeological Investigation and Terrain Analysis, Proposed Chicken Processing Plant, 3043 Dunning Road, Ottawa, Ontario
JOB#: 100117.056
LOCATION: 3043 Dunning Road - Refer to Figure 1 for location.

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Jan 8 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger / Hollow Stem Auger (210mm OD)	Ground Surface		86.48					10 20 30 40 50 60 70 80 90		
		Not Logged - See BH24-2D for details									Bentonite Seal
1											
2											
3											
4											
5											
6											Filter Sand Pack 50mm diameter PVC screen
7											
8		End of Borehole		78.55 / 7.93							
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/01/25	1.7 ▽	85.7
24/01/31	1.5 ▼	85.8

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LOGGED: SE
CHECKED: AM

GEO - BOREHOLE LOG 100117.056.GPJ GEMTEC 2018.GDT 2/4/24

RECORD OF BOREHOLE 24-03

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 2
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger, Hollow Stem Auger (210mm OD)	Ground Surface		86.28							
		TOPSOIL		86.28 0.00							
		Stiff to very stiff, grey brown SILTY CLAY (WEATHERED CRUST)			1	SS	0	7			Bentonite seal
1					2	SS	510	8			
											Filter sand
2					3	SS	610	8			
					4	SS	610	4			
3		Firm to stiff, grey SILTY CLAY		83.38 2.90							50 mm diameter PVC screen
					5	SS	610	2			
4											
					6	TO	610	PM			
5											
6					7	SS	560	WH			
7											Auger cuttings
					8	TO	610	PM			
8											
9					9	SS	610	WH			
10				76.28							

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CHECKED: PS

GEO - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-08-08.GPJ GEMTEC 2018.GDT 9/3/24

RECORD OF BOREHOLE 24-03

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Site Plan, Figure 1

SHEET: 2 OF 2
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Power Auger / Hollow Stem Auger (210mm OD)	Firm to stiff, grey SILTY CLAY		10.00							Auger cuttings
11					10	SS	610	WH			
12					11	SS	610	WH			
13		Dense to very dense, grey GRAVEL and SAND, some silt, trace clay, with cobbles and boulders (GLACIAL TILL)		73.07 13.21	12	SS	610	44			
14					13	SS	355	82		MH	
		End of Borehole Auger Refusal		71.80 14.48							
15											
16											
17											
18											
19											
20											

10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/07/29	1.5 ▽	84.8

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LOGGED: CD
CHECKED: PS

GEO - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-08-08.GPJ GEMTEC 2018.GDT 9/3/24

RECORD OF BOREHOLE 24-04

CLIENT: Laplante Poultry Farms Limited
PROJECT: Geotechnical Investigation, Proposed Chicken Processing Plant, 3043 Dunning Road, Sarsfield, Ontario
JOB#: 100117.056
LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Jul 22 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		86.27				
0	Power Auger / Hollow Stem Auger (210mm OD)	TOPSOIL		86.22 0.05				
		Stiff to very stiff, grey brown SILTY CLAY (WEATHERED CRUST)			1	SS	355	5
1					2	SS	405	8
2					3	SS	610	5
					4	SS	610	2
3				83.22				
		Grey SILTY CLAY		3.05	5	SS	610	3
4					6	SS	610	WH
5					7	SS	610	WH
					8	SS	610	WH
6					9	SS	610	WH
		End of Borehole		79.56 6.71				
7								
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: NATURAL, REMOULDED
WATER CONTENT, % (W_P, W, W_L)
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Bentonite seal
Filter sand
50 mm diameter PVC screen
Auger cuttings

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/07/29	0.4 ▽	85.8

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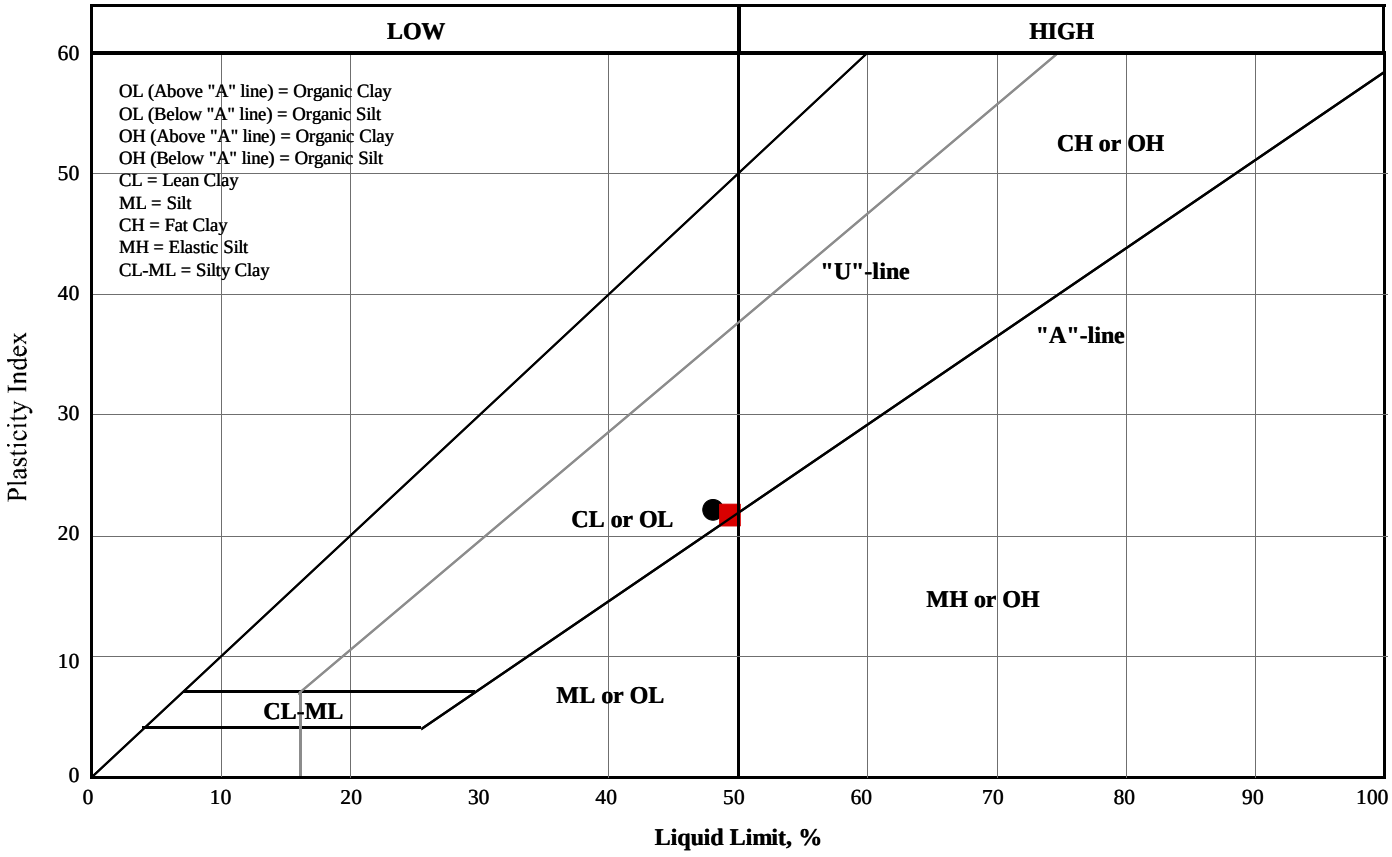
CHECKED: PS

GEO - BOREHOLE LOG 100117.056_CHICKEN FARM_BHLOGS_2024-08-08.GPJ GEMTEC 2018.GDT 9/3/24

GEMTEC Consulting Engineers and Scientists	Client: J. L. Richards & Associates Limited	Plasticity Chart (D4318)
	Project: 3043 Dunning Road, Zoning By-law Amendment, Propo	
	Project #: 100117056	



Symbol	Borehole /Test Pit	Sample Number	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Non-Plastic	Moisture Content, %
●	24-01D	SA 15	10.67-11.28	48.1	25.9	22.1	☐	85.23
■	24-02D	SA 11	8.38-8.99	49.4	27.7	21.7	☐	80.93

Note: More information available upon request

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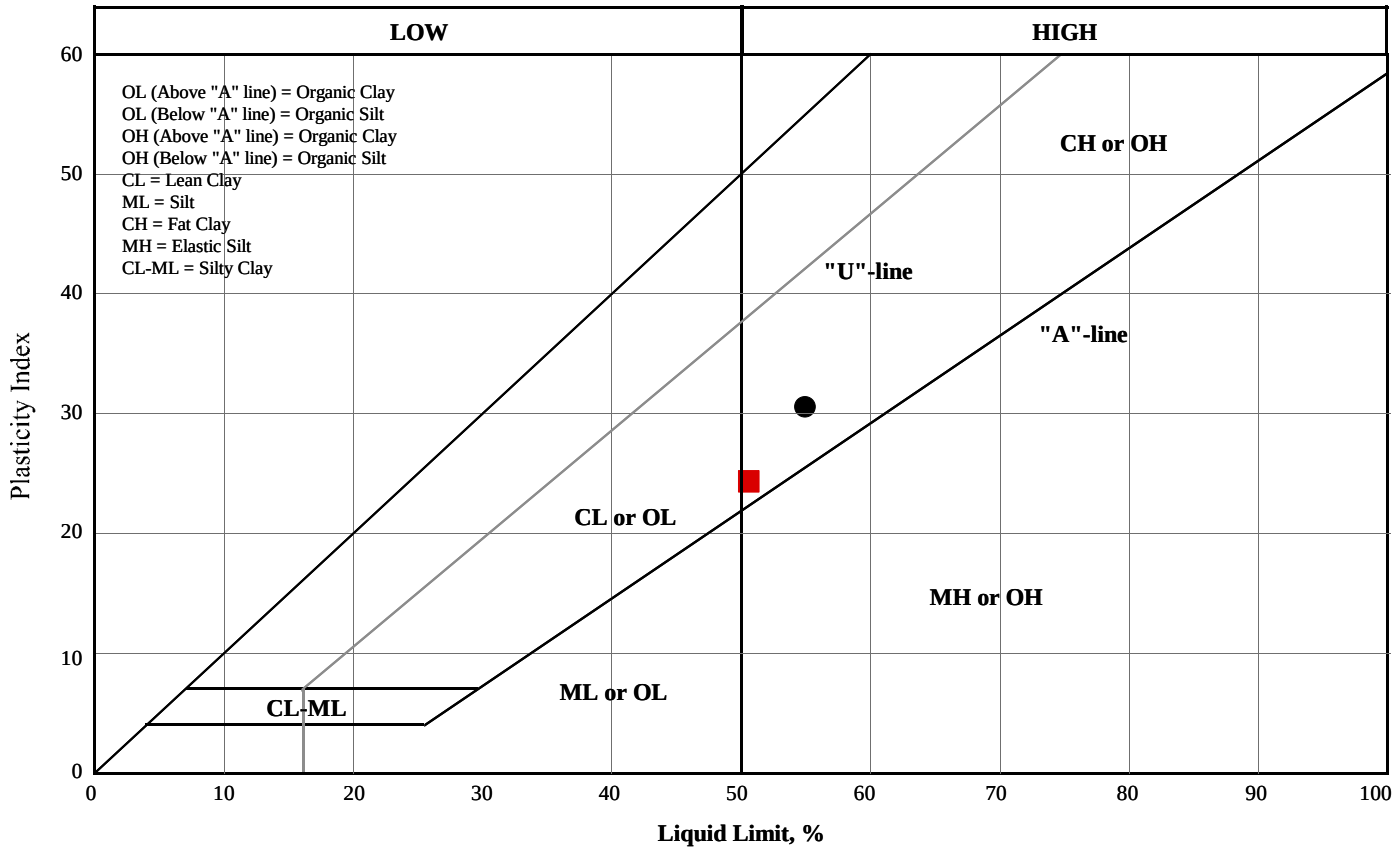
Ottawa, ON

Client:	J. L. Richards & Associates Limited
Project:	3043 Dunning Road, Zoning By-law Amendment, Propo
Project #:	100117056

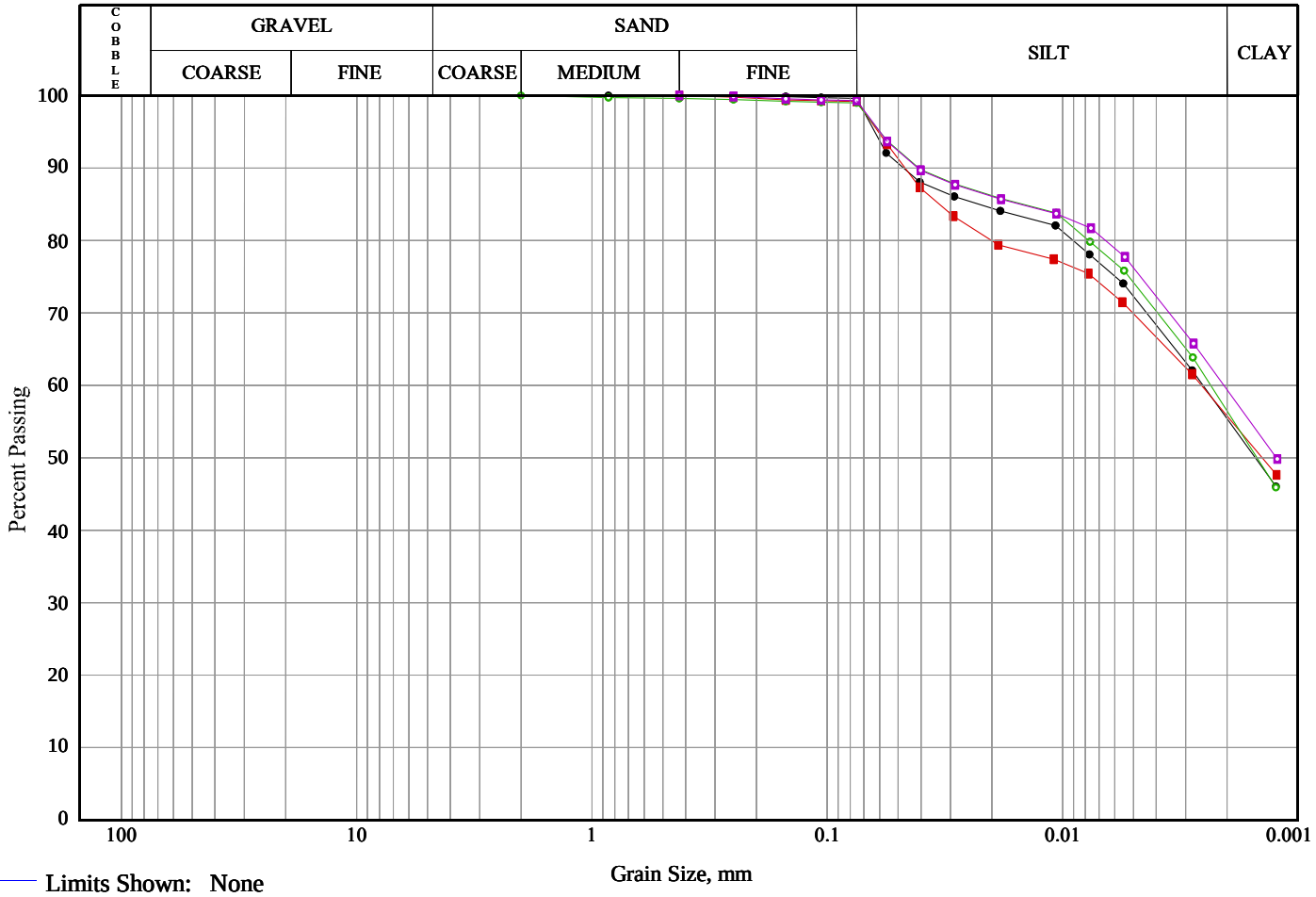
Plasticity Chart
(LS-7034/ASTM D4318)



Symbol	Borehole /Test Pit	Sample Number	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Non-Plastic	Moisture Content, %
●	24-03	SA 03	1.52-2.13	54.9	24.4	31	N/A	40.8
■	24-03	SA 10	10.67-11.27	50.6	26.2	24	N/A	83.5

Note: More information available upon request

GEMTEC Consulting Engineers and Scientists	Client: J. L. Richards & Associates Limited	Soils Grading Chart (LS-702/ ASTM D-422)
	Project: 3043 Dunning Road, Zoning By-law Amendment, Propo	
	Project #: 100117056	



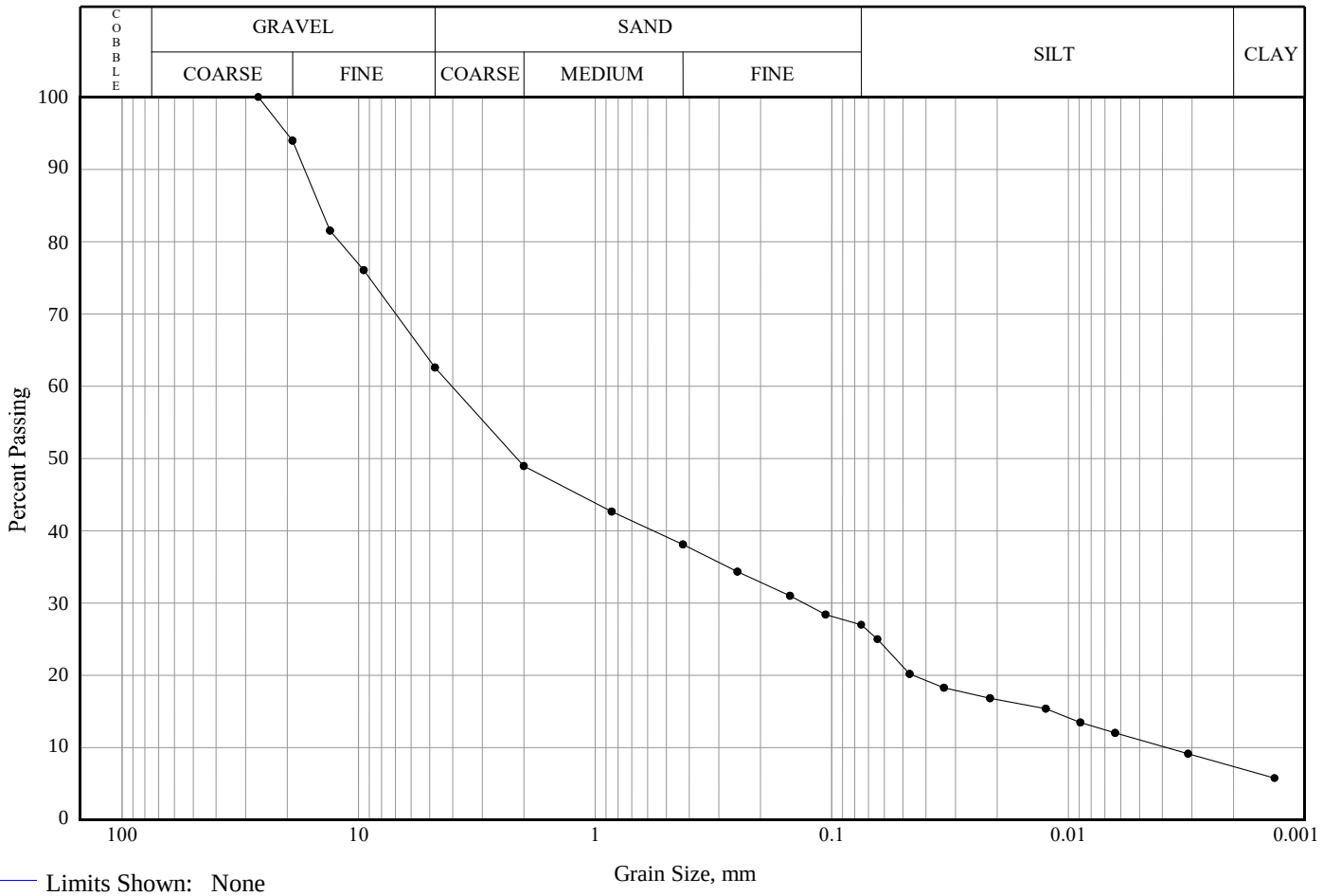
Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
		24-01D	SA 03	1.52-2.13	0.0	0.4	44.2	55.4
		24-01D	SA 15	10.67-11.28	0.0	0.8	43.4	55.8
		24-02D	SA 03	2.28-2.89	0.0	1.0	42.5	56.5
		24-02D	SA 11	8.38-8.99	0.0	0.7	39.9	59.4

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
	Clay and silt , trace sand	-	---	---	---	0.00	0.00	0.02	44.2
	Clay and silt , trace sand	CL	---	---	---	0.00	0.00	0.03	43.4
	Clay and silt , trace sand	-	---	---	---	0.00	0.00	0.01	42.5
	Clay and silt , trace sand	CL	---	---	---	0.00	0.00	0.02	39.9

GEMTEC
Consulting Engineers and Scientists

Client:	J. L. Richards & Associates Limited
Project:	3043 Dunning Road, Zoning By-law Amendment, Propo
Project #:	100117056

Soils Grading Chart (LS-702/ ASTM D-422)



Limits Shown: None

Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—	GLACIAL TILL	24-03	SA 13	13.71-14.32	37.4	35.6	19.6	7.4

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
—●—	Gravel and sand , some silt , trace clay	N/A	0.004	0.012	0.13	2.14	4.04	14.62	19.6

Note: More information available upon request

APPENDIX K

Cover Letter to the Ministry of Environment, Conservation and Parks for the Permit to Take Water Application

GEMTEC Consulting Engineers and Scientists Limited
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December 20, 2024 File: 100117.056

Ministry of the Environment, Conservation and Parks
Environmental Assessment and Permissions
Division Brownfields and Permit To Take Water
Permit To Take Water Unit, Floor 1
135 St Clair Ave W, Toronto, ON,
M4V 1P5

ATTN: Archana Uprety, Director, Environmental Permissions Branch

Re: Application for a Category 3 Permit To Take Water
Hydrogeological Study Supporting Letter
3043 Dunning Road, Ottawa, Ontario

GEMTEC Consulting Engineers and Scientists Ltd. (GEMTEC) was retained by Laplante Poultry Farms Limited (LPF) to prepare a Category 3 Permit to Take Water (PTTW) application for their industrial supply well located at 3043 Dunning Road, Ottawa, Ontario. The proposed water taking consists of a long-term water taking exceeding 50,000 L/day for a chicken processing facility.

1.1 PTTW Application Documents

The required elements of a Category 3 PTTW application include:

1. Completed MECP PTTW application form (online application);
2. Completed Schedule 1 – Implementation of Water Conservation in Accordance with Best Management Practices and Standards for the Relevant Sector (online application);
3. Scientific study completed by a qualified person that includes:
    - Appropriate mapping and figures;
    - Description of the proposed water taking activities;
    - Calculation of the water taking needs;
    - An assessment of the potential adverse impacts on existing groundwater users and/or the natural environment; and
    - Recommendations and monitoring/contingency measures for inclusion within the conditions of the PTTW.

1.2 Technical Study

A supporting hydrogeological study that serves as the third requirement of the application was completed by GEMTEC October 2, 2024 (revision 1) and is title “Hydrogeological Investigation & Terrain Analysis, Proposed Chicken Processing Facility, Part of Lot 7, Concession 4 (3043 Dunning Road), Ottawa, Ontario”. This letter should be considered jointly with the technical report and online application documents to consist of the complete submission package in support of the PTTW application. Details regarding the water taking sources, volumes, anticipated impacts, and monitoring and contingency measures are summarised in this letter to facilitate the review process.

1.3 PTTW Sources

Sources of water taking include an existing groundwater supply well for industrial purposes, as summarised in Table 1.

Table 1 Summary of Proposed Water Taking Sources

Source Name	Source: Type:	Category and Description
Source 1 – Existing Supply Well (Industrial)	Well	Food Processing – chicken processing facility (abattoir); water used for processing and sanitary facilities

Daily water taking volumes were estimated as 98,900 L/day using historical data from an existing chicken processing facility owned by LPF and a 15% buffer. Water taking will occur over a 12-hour period (137.4 L/min), 5 days a week. A summary of the water taking volumes, pumping rates, and number of days requested per year are provided in Table 2. Excluding evaporative losses, well water will be directed for human or livestock consumption, septic uses, or to an approved off-site NASM facility via an approved transfer method.

Table 2 Summary of Water Taking Volumes, Rates and Days

Source	Water Taking Volume (L/day)	Pumping Rate (L/min)	Requested Days per Year
Source 1 (Supply Well)	98,900	137.4	265

1.4 Proposed PTTW Conditions

No water quantity/quality impacts to the environment or adjacent well users are anticipated; however, some uncertainty relating to the sustainability of the water supply aquifer persists relating

to the lateral extent and thickness of the overburden and fractured rock aquifer (which is variable within 500 metres of the site) and aquifer recharge. Further, the geotechnical investigation did not identify any significant risk for soil settlement, but recommended monitoring following initial groundwater taking withdrawals. Accordingly, the following joint water quantity and soil settlement monitoring program is proposed:

- Continuous water level monitoring in on-site wells, including the supply well (TW1) and monitoring wells BH24-01S, BH24-01D, BH24-03 and BH24-04 (refer to Figure B.1 of Attachment B for monitoring well locations).
    - Continuous water level monitoring with the use of electronic dataloggers, monitoring at a minimum frequency of 6-hours.
    - Manual water levels measurements should be taken monthly.
- A survey point (or points) should be established on the existing structure and bi-monthly readings of the point(s) for the first year should be taken for indications of movement. Natural seasonal and interannual variation in the groundwater levels in the wells installed is to be anticipated and may not be a cause for concern. The surveying will assist in removing uncertainty around the effects of these variations.
    - Following the first year, if the groundwater trigger level is exceeded (i.e., water level decreases to greater than 5 metres below ground surface in the overburden monitoring wells in the clay), the survey points should be measured bi-monthly for a period of one year.
- Monitoring well groundwater quantity trigger level:
    - Trigger level: Monitoring well BH24-02D – if groundwater levels decrease below 25% of available drawdown (4.25 metres below ground surface), a QP should be retained to review water level monitoring data and assess whether the pumping operations are likely causing unacceptable impacts to the water supply aquifer.
- Soil Settlement trigger level:
    - Trigger Level: If water levels in overburden (clay) monitoring wells decrease greater than 3.5 metres (to 5 metres below ground surface) a QP should be retained to investigate the matter by surveying the settlement markers and determine if it may be necessary to:
        - Adjust the planned water taking activities. This may include changes to extraction rates, increasing rest times, increased water level and survey point monitoring frequency; and/or
        - Modifications to existing structures.

It is recommended that a QP be retained by LPF to review the results of the water level monitoring and surveying to assess whether there are unacceptable impacts from groundwater takings on groundwater quantity and soil settlement and to provide recommendations for mitigation measures to alleviate impacts (e.g., water storage, reduced water taking, supplementation of the existing

water supply with other sources), if applicable. The proposed QP review schedule is as follows: 6-months, 1-year, 2-year, 4-year, 6-year, 8-year, 10-year.

1.5 Closure

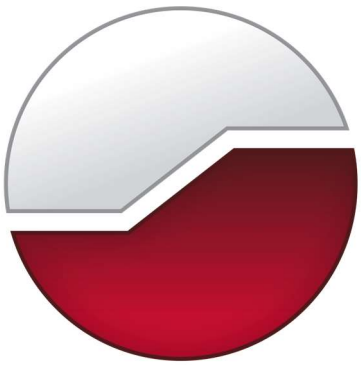
We trust this letter provides sufficient information for your present purposes. If you have any questions concerning this letter, please do not hesitate to contact our office.

Sincerely,

Jason KarisAllen, M.A.Sc., P.Eng.
Water Resources Engineer

Andrius Paznekas, M.Sc., P.Geo.
Hydrogeologist

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité