CHUNG & VANDER DOELEN
ENGINEERING LTD.

PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
POLOCORP FERGUS SUBDIVISION – PHASE 1
968 St. David Street North
Fergus, Ontario

SUBMITTED TO:
Mr. Mike Puopolo
Polocorp Inc.
379 Queen Street South
Kitchener, ON
N2G 1W6

FILE NO: 1495 **/** January 31, 2025

CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

January 31, 2025
FILE NO.: 1495

Mr. Mike Puopolo
Polocorp Inc.
379 Queen Street South
Kitchener, ON
N2G 1W6

Dear Mr. Puopolo:

RE: Preliminary Hydrogeological Investigation
Polocorp Fergus Subdivision – Phase 1
968 St. David Street North, Fergus, Ontario

This report summarizes the preliminary results of a hydrogeological investigation completed in support of a proposed subdivision containing a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, parkland, and other environmental features located at 968 St. David Street North in Fergus, Ontario.

If you have any questions or concerns regarding the report, please contact the undersigned.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.

Peter Dao, M.Sc., P.Geo.
Manager, Environmental & Hydrogeology

TABLE OF CONTENTS

LIST OF APPENDICES AND ENCLOSURES

1.0 INTRODUCTION

Chung & Vander Doelen Engineering Ltd. (CVD) has been retained by the 'Client', Polocorp Inc., to complete a hydrogeological investigation for the property located at 968 St. David Street North in Fergus, Ontario ("Site"), as part of the Phase 1 development of the Polocorp Fergus Subdivision. The currently planned development comprises of Lot 18, Concession 16 of the Subject Lands.

The purpose of the investigation is to evaluate existing hydrogeological conditions at the Site in support of a proposal for a residential subdivision and subsequent development, comprised of a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, and park.

This report presents the preliminary findings of the ongoing hydrogeological investigation, conducted between February and September 2024 for the proposed subdivision. At the time of the writing of this report, only a Draft Plan of Subdivision (Polocorp Inc., December 10, 2024), as provided in Appendix A, was available for our review.

The 19.39±-hectare (ha) Site is currently comprised of a cultivated agricultural field, a residential dwelling fronting St. David Street North and its related structures, and a small wetland in the southeast corner of the Site. The Site is bound by St. David Street North to the west and predominantly by agricultural lands to the north, east, and south. An existing residential subdivision is situated directly southeast of the southeastern corner of the Site. Figure 1 shows the location of the subject Site in the Town of Fergus.

It is understood that the Site is to be fully municipally serviced with the water and wastewater services and will include the construction of a 2.41± ha sized stormwater management (SWM) facility within the southwest corner of the Site, and a roadway network throughout the subdivision, connecting it to St. David Street North, within the west portion of the site. This investigation characterizes the hydrogeological setting and assesses potential impacts from future servicing. Other characteristics of the future development are to include a 0.81± ha sized park (Block 25) and a 3.34± ha sized environmental feature and buffer. The existing wetland will be maintained as part of this environmental feature post-development.

The overall objectives of the hydrogeological investigation are as follows:

1. To characterize the hydrogeologic setting, using data from the current and previous investigations, with primary emphasis on the near surface hydrogeologic setting.

2. To assess the roles (or functions) that groundwater and surface water have with respect to the wetland and other environmental features at or adjacent to the property.

3. To identify and evaluate potential impacts and opportunities to enhance groundwater and surface water contribution to receptors from the proposed development, and to make recommendations to safeguard these features from the potential impacts associated with the development.

As this is a preliminary report, early in the investigation process, the objectives above cannot be fully addressed at this time. An updated report will be provided after the completion of the investigative scope of work.

2.0 INVESTIGATION SCOPE

2.1 BACKGROUND DATA REVIEW

The following background information (Section 8.0 lists the specific information), which has been considered and reviewed as part of this investigation:

- CVD Engineering Ltd.; Preliminary Geotechnical Investigation (May 28, 2024)
- Golder; Hydrogeological Investigation, 8243 and 8282 Wellington Road 19, Ontario (February 2022)
- Grounded Engineering; Hydrogeological Assessment, 350 Wellington Road 7, Elora, Ontario (October 2022)
- Government of Canada Environment and Natural Resources; Historical Data; Fergus Shand Dam Weather Station; 2024 Daily Data Reports
- Grand River Conservation Authority; ESRI; ArcGIS; Map Your Property Tool (2024)
- Karrow, P.F.; Pleistocene Geology of the Guelph Area, Southern Ontario; Geological Report 61; Map 22153, scale 1:63,360 (1968) (Figure 2)
- Matrix Solutions Inc.; Centre Wellington Scoped Tier Three Water Budget Assessment (December 2017)
- Polocorp; Draft Plan of Subdivision (December 10, 2024) (Appendix A)
- MECP Water Well Records near Site (Appendix G)
- Toporama Topographical Map (Ministry of Natural Resources, Retrieved June 11, 2024) (Figure 1)
- WSP Canada Inc.; Hydrogeological Investigation - Updated, 8243 and 8282 Wellington Road 19, Ontario (April 2023)

2.2 BOREHOLE DRILLING & MONITORING WELL INSTALLATION

As part of both the initial hydrogeological and preliminary geotechnical investigations completed between January 15 and 17, 2024, five (5) boreholes were advanced to depths of between 5.20 and 8.25 m below existing grade, and monitoring wells were installed at each borehole location (labelled BH 4 to 8). A supplemental investigation was completed, between September 9 and 12, 2024, in which eight (8) additional boreholes/monitoring wells (labelled BH 106 to 113) were drilled and installed to a depth of 6.55 m below grade. These boreholes/wells were drilled/installed to investigate the shallow subsoil and shallow groundwater table conditions at the property.

The investigation was completed using a track-mounted CME-55 drill rig, equipped with standard 83 mm inner diameter hollow stem augers (HSA) operated by Davis Drilling Ltd. of Milton, Ontario. Soil samples collected during the borehole investigation program were examined in the field and subsequently

brought to CVD's laboratory for tactile and textural examination. Moisture content determinations were performed on all retrieved soil samples from the drilling program.

The ground surface elevation of the boreholes, monitoring wells, and geomorphological features of the site were surveyed by CVD for the purpose of this report using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using the UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

2.3 DRIVE-POINT PIEZOMETER INSTALLATION

Shallow drive-point piezometers (DP) were installed at three (3) wetland/water course locations (DP1 to DP 3D, Figure 4) on November 10, 2023, and an additional (1) shallow piezometer (DP 3S) was installed on March 11, 2024, beside DP 3D. Furthermore, four (4) additional piezometers (DP 4S/4D and DP 5S/5D) were installed in other areas of the wetland as part of the September 2024 supplemental investigation. The piezometers were installed to investigate both groundwater and surface water levels (i.e., both inside and outside the piezometers) to characterize the groundwater-dependent features for the Grand River Conservation Authority (GRCA) regulated wetland, located within the southeast section of the Site. DP 1 was installed in the southern corner of the wetland at the edge of a pond connected to a stream travelling in a southern direction. DP 2 was installed roughly in the western central edge of the wetland, amongst cattails and other marsh-related vegetation, in what is likely an intermittent stream. DP 3S/3D were installed near the northwest edge of the wetland, in an area with no standing water. DP 4S/4D and DP 5S/5D were installed in the central area of the wetland – DP 4S/4D was installed in standing water (September) while the area surrounding DP 5S/D contained marsh-like vegetation but no standing water. According to the Grand River Conservation Authority (GRCA), the wetland in which DP 1, 2, 4S/D, and 5S/D are located is what is considered as a marsh, while the wetland beside DP 3S/3D is classified as a swamp. Figure 4 shows the locations of the drive-point piezometers within the wetlands and water courses.

The procedure for installing each drive-point piezometer was as follows: 1) auger a 0.85 m hole through the upper soil layers to observe the stratigraphy and groundwater conditions of the location 2) attach a 0.30-m long, 1.9-cm diameter stainless steel piezometer tip (or screen) to a length of 1.9-cm threaded steel riser pipe, 3) drive the assembled piezometer from ground surface to the depth desired using a post hammer, and 4) fill any annular space around the pipe with bentonite to prevent surface water from moving directly along the annulus to the piezometer screen.

2.3 WELL DEVELOPMENT, WATER LEVEL MONITORING, & RESPONSE TESTS

Each monitoring well was developed using Waterra™ polyethylene tubing and foot-valve hand pumps. As of the writing of this report, groundwater level monitoring was performed on five (5) occasions: on February 6, March 11, July 22, September 12, and September 18, 2024. Groundwater levels were obtained at all of the monitoring wells and piezometer locations during each occasion. Table 1 provides a summary of the groundwater levels and calculated elevations for the five monitoring events. Four (4) water level measurements were recorded from the drive point mini piezometers; DP 1 to DP 3D starting

in November 2023; however, the results have not yet been completed and will be included in future revisions of the report once more data is collected.

Well response tests (slug/bail tests) were completed at three (3) of the monitoring well locations (Boreholes 5 to 7) on March 11, 2024, to provide a more accurate estimate of the hydraulic conductivity (K) (or permeability) of the saturated aquifer subsoil strata, to assist in providing more accurate infiltration rates. The hydraulic conductivities were calculated through the Aquifer Test software utilizing the Bouwer and Rice method. The results of the tests are graphically presented in Appendix C, and a summary of the data is also included in Table 1.

Furthermore, five (5) grain size distribution analyses were carried out on representative subsoil samples to help identify and assist in providing estimates of hydraulic conductivities for the encountered groundwater-bearing subsoil deposits. The results of these tests are presented in Enclosures 22 and 28.

Additionally, to provide a more comprehensive summary of groundwater conditions at the Site, six (6) Van Essen DI801 10 m TD-Diver automated data loggers and one (1) Baro-Diver were installed in wells BH 5, 7, 101, 106, 111, and 113. Furthermore, two (2) DI601 10 m Micro-Divers were installed in DP 1 and DP 3D. The automated monitoring at these wells/piezometers using the datal loggers is currently ongoing.

3.0 SITE CHARACTERIZATION

3.1 TOPOGRAPHY, DRAINAGE & WETLAND FEATURES

The Site is within the Upper Grand River watershed and is fully encompassed within the West Montrose – Grand River subwatershed. Locally, the groundwater table and any surface water runoff traverses across the site in a generally north to south orientation, towards the southwestern corner of the property and towards the wetland, located within the southeastern corner/side of the Site.

According to the Grand River Conservation Authority (GRCA), the wetland within the southeastern corner of the Site is GRCA regulated and is split into two categories: marsh and swamp. Roughly the northern third of the wetland and a small section of the southeastern side of the area are designated as a swamp wetland, while the remainder of the wetland is designated as a marsh. The wetland extends past the southern confines of the Site and includes multiples ponds connected by perennial streams. Occasional intermittent streams can be observed travelling along the north-south axis across the wetland, towards the southern streams/ponds. Various trees, frequent cattails, and other marsh-related vegetation are present throughout most of the wetland. The GRCA mapping for the regulated lands abreast of the wetlands and water courses are shown on Figure 3.

Regionally, the surface topography decreases significantly towards Guelph and Kitchener/Waterloo, and generally increases north, towards The Grand Valley and Arthur. Elevations also decrease westward, towards Listowel, and significantly decrease eastward, towards Brampton. Currently, the topography in the area is formed from the most recent glacial activity (Wisconsin). The area around Fergus is full of

kames associated with the Orangeville Moraine (Karrow, 1968). Figure 1 shows the topographic contours across the site.

Local Site topography is considered 'rolling land', with ground elevations from north to south across the site ranging from 427± to 420± mASL. There is also generally a slight increase in surface elevation from east to west, across the Site. The current terrain on-Site is relatively even, with no major undulations, or topographical features. In general, runoff will mimic topography flowing to low elevations where water courses and wetlands are present. As a result, surface runoff from the farm fields is anticipated to be primarily controlled by topography and to drain towards the relatively lower lying south/wetland portion the property.

Excluding the wetland, most of the Site consists of a farm field with occasional minor residential/grassy areas fronting St. David Street North.

3.2 GEOLOGIC SETTING

Surface geological mapping for the area (by Karrow P.F., 1968) is presented in the Quaternary Geology map of Figure 2. According to Karrow (1968), the the Site is primarily underlain by lacustrine, kame deposits, comprising mainly outwash sands, with an underlying Wentworth till unit. Both deposits were laid down during the late Wisconsinan stage of the Pleistocene period. The local topography of the area has been largely influenced by the presence of The Wentworth Till. The entire area is underlain by dolostone bedrock of the Guelph Formation. This is confirmed through the MECP well record data for drinking water wells in the area surrounding the property, as included in Appendix G. According to the records, bedrock was encountered at depths between 24± and 32± m below existing grade (mbeg). Bedrock outcrops can be found in certain areas around Fergus and are notably present towards the southwest within the Elora Gorge.

The monitoring well-recorded data and borehole log data (Enclosures 4 to 8 and 14 to 21) collected during the Site investigation are generally consistent with Quaternary geological mapping. Based on the drilled boreholes, the surficial and subsoils encountered generally consisted of topsoil underlain by a 0.5 to 1.5 m thick layer of sandy silt to silty sand, in turn underlain by a major layer of fine sand with trace to some silt. North of the Site, fine sand deposits can extend deeper than 9.60 mbeg but only extend to 1.85 mbeg beneath the south portion (BH 7). Boreholes 109 to 113 contained only minor sand seams. The subsoil here is predominantly composed of sandy silt to silty sand and/or silt, underlain by a clayey silt till/sandy silt till deposit. Similarly, a clayey silt till with some sand content, ranging from trace sand to sandy was encountered in Boreholes 6 to 8, underlying the sand deposit. Based on the findings from the subsurface investigation, it appears that the contact depth of the clayey silt till/sandy silt till layer increases in elevation towards the south part of the property. This geological unit is probably the Wentworth Till deposit, referred to in Karrow (1968); however, is should be noted that the deposit was not encountered during this investigation anywhere in the north portion of the Site as was depicted in the geological maps. Occasional silt layers were also encountered interlayered with the clayey silt till.

3.3 HYDROGEOLOGIC SETTING

3.3.1 Water Table Depth and Configuration

The water table exists predominantly within the shallow fine to granular deposits (fine sand, sandy silt to silty sand, and silt subsoils) encountered beneath the entire Site. The encountered depth of the groundwater table greatly reduces from north to south across the property. Table 1 summarizes the groundwater level measurements collected thus far during this investigation from the period extending from February 2024 to September 2024 at all of monitoring well locations.

Figure 5 presents an interpretation of the water table configuration and shallow groundwater flow directions across the property using the groundwater elevation measurements gathered on September 18, 2024. As expected, the water table mimics the topography with shallow groundwater flowing southerly towards the southeastern portion of the Site in the direction of the wetland. Additionally, groundwater appears to also flow into the existing drainage feature located within the southwestern corner of the Site.

During the monitoring period, according to the gathered data, groundwater levels were encountered at depths ranging between 2.02 (BH 5) and 0.52 mbeg (BH 8), corresponding to elevations ranging between 423.59 and 420.50 masl according to the July 22, 2024, water levels measurements. It should be noted that these high-water levels documented during the summer season are likely caused by the abnormally high amount of precipitation experienced throughout the first half of 2024. Furthermore, groundwater level monitoring is required to understand the seasonal and yearly variability in groundwater elevations across the Site. Ongoing groundwater monitoring is being conducted on a seasonal basis to provide an evaluation of the seasonal variability of the groundwater table and its fluctuations. Appendix D includes a summary table of measured groundwater levels (Table 1) and interpreted hydrographs collected during the monitoring period. The hydrographs were plotted against monthly precipitation data sourced from the Government of Canada Environment and Natural Resources Daily Data Reports for the Fergus Shand Dam weather station, the nearest active weather station to the Site.

3.3.2 Groundwater Infiltration and Recharge

Groundwater infiltration rates are expected to vary across the Site; however, due to the general predominance of shallow fine grained sand deposits throughout the entire Site, infiltration rates are expected to be generally fast. Infiltration and recharge areas are also heavily influenced by the topographical features of the land, which in this case promotes shallow groundwater to flow towards the south.

Based on the single well response tests and physical examination of the soil deposits, the correlating estimated infiltration rates for the various surficial soils at the property range as follows:

- Fine to Medium Sand: 75 to 150 mm/hr
- Silty Sand: 15 to 30 mm/hr

- Sandy Silt to Sand and Silt: 10 to 20 mm/hr
- Silt: 3 to 5 mm/hr
- Clayey Silt Till: <1 mm/hr

According to data layers provided from the GRCA-Web GIS application, the property has a recharge rate of 320± to 370± mm/year. Recharge/infiltration should be high due to the ubiquitous presence of the fine sand deposit and its overall 'dry' condition, especially within the northern section of the Site where the water table during the peak groundwater elevation period (February to March 2024) was encountered at depths of between 2± to 3± mbeg.

During the period of higher groundwater elevations, expected during the spring and fall, infiltration is expected to be reduced in the wetland; however, considering the intermittent nature of the streams and surface water features in the marsh section of the wetland, infiltration will likely increase during the summer and fall seasons as the water table lowers. A large portion of the wetland is interpreted to promote groundwater recharge, as will be further discussed in the next section.

3.3.3 Groundwater / Surface Water / Wetland Interaction

The interactions occurring in the wetland area were examined based on both field observations and surface water/groundwater level data gathered at the five (5) mini-piezometer locations: DP1, DP2, DP3S/3D, DP 4S/4D, and DP 5S/5D (Figure 4). It is interpreted that a large portion of the wetland located on the estate is largely intermittent in nature, with more perennial surface water features located south of the property.

DP 1, which is located within a pond on the southwestern edge of the wetland, has continually exhibited a noticeable positive vertical hydraulic gradient (VHG) since installation, evidence that this is primarily a groundwater discharge area. Based on the current collected data and field observations, the surface water features in this area are some of the only perennial groundwater features found on the property and they are connected to the larger streams and ponds found south of the Site. Aside from groundwater discharge to maintain the wetland, surface water runoff also aids in maintaining these features since they are located in the relatively lowest section of the property in an area where there are fewer sand deposits, and higher amounts of clayey silt/sandy silt till deposits, and an overall higher groundwater table, all of which reduces potential infiltration of surface water and helps drive runoff towards the wetland.

The data collected at DP 2 shows a variable nature, switching from a clearly negative VHG from November to December 2023, indicating groundwater recharge, to a neutral VHG from February to July 2024. This is likely symptomatic of the conjectured intermittent nature of the marsh surface water features.

The preliminary groundwater data collected during September 2024 from both DP 4S/4D and DP 5S/5D show a clearly negative (recharging) VHG; however, it is predicted that the groundwater within these piezometers will also show intermittent behavior. More data is required to provide firm conclusions.

So far, not enough data has been collected at DP 3S/3D to provide an adequate evaluation of the conditions existing in that section of the eastern wetland. An initial comparison of the groundwater elevations (September 2024) with the mini piezometers to the groundwater elevations collected in the nearby well BH 107, potentially suggests a neutral VGH at the time of measurement. More data is required to provide firm conclusions.

3.4 SOURCE WATER PROTECTION AND GROUNDWATER USE

The entire Site is located within the Fergus Wellhead Protection Area (WHPA). Fergus currently has six (6) municipal supply wells (wells F1, F2, F4, F5, F6, F7), with the Site located in between three of these wells (F4, F6, F7). According to data provided on the GRCA-Web GIS application, most of the property is classified as WHPA-C, denoting an area in which travel time is between 2 to 5 years, and with a vulnerability score of 6. The entire eastern boundary of the Site falls with WHPA-B for the municipal well, F6, denoting an area in which the groundwater travel time to the well is 2 years or less, and having a vulnerability score of 8. Both sections are considered to have a medium vulnerability. It should also be noted that the Belwood Reservoir, where the lake levels are controlled by the Fergus Shand Dam, is located along the Grand River, upstream of Fergus.

All six (6) of the existing municipal supply wells pump groundwater from the dolostone bedrock aquifers of the Guelph, Gasport, and Goat Island Formations. They are both primarily cased and open in the Guelph Formation dolostone. One of these six wells (F2), which is now inactive, is a well with groundwater under the direct influence of surface water (GUDI). Transmissivity values of the Fergus wells range between 52 to 395 m^2/day (Matrix Solutions Inc., 2017). The wells were drilled to depths of between 76.5 mbeg (F2) and 138.7 mbeg (F7).

Regarding the water quality at the Site, three (3) groundwater samples were submitted from monitoring wells at BH 5, 6, and 7 for analysis of general chemistry, nutrients, and metals. These samples were submitted to the AGAT Laboratories of Mississauga for testing/analysis, with results being provided in Appendix F. No major concerns were identified. Elevated levels of iron were present which exceed the aesthetic drinking water objectives; however, this is naturally occurring within the shallow groundwater of the area. Minor amounts of cadmium, cobalt, copper, vanadium, and zinc were also detected. Slightly elevated amounts of sulphate were also detected in the monitoring wells BH 5 and 7, and slightly higher amounts of nitrate were detected in BH 6, likely caused by on-going agricultural activity. Nitrate and nitrite levels measured at BH 7, in the proposed area for the SWM facility, met Ontario Drinking Water Standard criteria. No chemical threats to groundwater at the Site were detected.

4.0 WATER BUDGET ASSESSMENT

Pre-Development Water Balance

Precipitation ultimately becomes split into three ‘water budget’ components: evapotranspiration, runoff, and recharge, with the latter two often referred to together as ‘the water balance’ (i.e., the remainder after evapotranspiration is removed). Groundwater recharge rates will vary at a given site

based on the permeability of the surficial deposits but will also depend on topography and type of vegetative cover. Most of the subject property has been historically agricultural and has had different types of crops depending on the year, with no crop planted at all during certain portions of the year. During fall to summer 2024, winter wheat was being grown.

A pre-development water balance for the property has been estimated using the Water Balance Method (WBM) of Thornthwaite and Mather (1957), a method cited in the MECP document "Stormwater Management Planning and Design Manual" (March 2003) to estimate evapotranspiration. The calculations utilize the 1981-2010 'Climate Normals' from the closest weather station located at the Fergus Shand Dam (gives an annual precipitation rate of 946 mm/yr) and considers a combination of cultivated land use with moderately deep-rooted crops (e.g. wheat), pasture & lawns, wetland, and impervious surfaces. Using these conditions, the subject site has an average evapotranspiration rate of about 56.5% (or 536 mm/yr) and remaining 'water balance' of about 43.5% (410 mm/yr) is estimated. The 2003 MECP document also provides a methodology for estimating the proportions of the water balance that ultimately become runoff vs. recharge, based on applicable infiltration factors for soil, vegetative cover, and topography.

The overall water balance and water budget calculations are included in Appendix E. In summary, the pre-development average annual water budget for the 19.39± ha property is as follows:

A) Pervious Cultivated Land of 14.35 ha

Precipitation	946 mm/yr	135,737 m^3/yr
Evapotranspiration	536 mm/yr	76,876 m^3/yr
Water Balance	410 mm/yr	58,861 m^3/yr
Recharge	**287 mm/yr**	**41,202 m^3/yr**
Runoff	123 mm/yr	17,658 m^3/yr

B) Pervious Pasture & Lawns of 1.50 ha

Precipitation	946 mm/yr	14,189 m^3/yr
Evapotranspiration	536 mm/yr	8,036 m^3/yr
Water Balance	410 mm/yr	6,153 m^3/yr
Recharge	**308 mm/yr**	**4,615 m^3/yr**
Runoff	103 mm/yr	1,538 m^3/yr

C) Pervious Woodland & Wetland of 3.34 ha

Precipitation	946 mm/yr	31,593 m^3/yr
Evapotranspiration	536 mm/yr	17,893 m^3/yr
Water Balance	410 mm/yr	13,700 m^3/yr
Recharge	**328 mm/yr**	**10,960 m^3/yr**
Runoff	82 mm/yr	2,740 m^3/yr

D) Impervious Rooftops to Pervious Areas of 0.20 ha

Precipitation	946 mm/yr	1,892 m^3/yr
Evapotranspiration	95 mm/yr	189 m^3/yr
Water Balance	851 mm/yr	1,703 m^3/yr
Recharge	**213 mm/yr**	**426 m^3/yr**
Runoff	638 mm/yr	1,277 m^3/yr

Assuming that the wetland area is to remain undeveloped, the target recharge quantity for matching in post-development is 46,243 m^3/yr. Recharge can likely be met through a stormwater management design utilizing enhanced infiltration facilities as Low Impact Development (LID) infrastructure for the developed site.

5.0 SITE SERVICING REQUIREMENTS & IMPACT ASSESSMENT

5.1 WASTEWATER SYSTEMS & POTENTIAL IMPACT OF EFFLUENT

The proposed subdivision will be connected to municipal sanitary sewers. No private wastewater treatment system requirements are anticipated for the proposed subdivision.

5.2 WATER SUPPLY & POTENTIAL IMPACT OF WATER TAKING

The proposed subdivision will be serviced by municipal water services. No private water supply service requirements are anticipated.

5.3 STORMWATER MANAGEMENT & POTENTIAL IMPACT TO GROUNDWATER RECHARGE

The proposed subdivision will be serviced by municipal stormwater management works; however, at the time of the writing of this report, aside from an overall concept, no specific design drawings/plans were available. As the realization of the project proceeds, addendums addressing stormwater management and any theoretical impacts to groundwater recharge including proposed LID infrastructure at the Site may be provided during the detailed design stage.

It is understood that a 2.41± ha SWM facility is to be constructed in the southwestern area of the Site. The general shallow groundwater gradient travels towards the proposed location of the SWM facility. The fine sand deposits generally thin out while simultaneously, the clayey silt till deposits rise in elevation towards the south of the property. Groundwater levels in the area ranged from the depths of 0.2± to 0.5± mbeg (elevations 420.6± to 421.4± mASL) during the winter to spring 2023-2024, corresponding to the high-water table. Since it is recommended that the base of any infiltration facilities be situated no less than 1 m above the seasonally high-water table to ensure reliable infiltration functionality, the SWM facility will likely have to be raised or redesigned in a way to avoid the

near-surface shallow groundwater table.

Further groundwater monitoring is being performed to better understand the water table and its seasonal variations to support development design.

Due to the abundance of 'dry' and highly permeable sands throughout much of the Site, infiltration galleries, open ditches and/or swales, and or soak away pits can be constructed into the sandy soils to maintain pre-development recharge rates. Further recommendations may be provided once a more detailed plan is available.

It is important to ensure that the adjacent regulated wetland east of the proposed SWM facility is not negatively impacted following development. The current conceptual plan (July 2024) proposes a 10 m buffer zone between the wetland and the remainder of the Site. During the design of the stormwater facilities, it is critical that water balance and quality of water are maintained throughout the property, and any potential effects associated with erosion and sedimentation control to the topographical /environmental features are properly designed and controlled.

The Stormwater Management Planning and Design Manual (March 2003) provided by the Ministry of Environment may be used as a reference to the planning of the stormwater systems. Additionally, the Township of Centre Wellington Sewer Use By-Law No. 2022-66 should be consulted.

6.0 CONCLUSIONS & RECOMMENDATIONS

Based on the results of the hydrogeological investigation described in this report, the following conclusions and recommendations are provided.

1. The subject property is predominantly underlain by fine sand deposits of the late Wisconsin stage of the Pleistocene period, which reduces in thickness from north to south across the property. A clayey silt till/sandy silt till deposit, likely the Wentworth Till, underlies the fine granular deposits and generally increases in contact elevation to the south. During the spring to early summer 2024 period, the groundwater table depth depths ranged between 0.25 (BH 8) and 2.10 mbeg (BH 5) across the property, corresponding to elevations between 423.62 (BH 5) and 420.76 (BH 8) masl.

2. Topography decreases in elevation from north to south with ground surface elevations approximately ranging from between 427± to 420± mASL. Shallow groundwater generally mimics the topography of the Site and flows towards the southwestern corner of the property and towards the southeastern wetland.

3. Due to the predominance of the underlying fine sand deposits with a high infiltration rate (100 mm/hr), and the relatively deeper lying groundwater table beneath the north section of the site (2± to 3± mbeg, March 2024), infiltration/recharge opportunities throughout the Site should be abundant. Based on the calculated pre-development water balance, the Site has an average evapotranspiration rate of about 56.5% (or 536 mm/yr) and a remaining 'water balance' of about

43.5% (410 mm/yr) is estimated. Assuming that the wetland area is to remain undeveloped, the target recharge quantity for matching in post-development is 46,243 m^3/yr.

4. The wetland area is split into two categories: swamp and marsh. Currently, the available data suggests that much of the wetland area is considered to have intermittent surface water features which are primary involved in groundwater recharge and infiltration. However, perennial swamps and streams do exist within the southern portion of the wetland at the southwestern edge of the Site, where an upward vertical hydraulic gradient and an overall groundwater discharge condition has been observed.

5. The property falls within the Fergus Wellhead Protection Area (WHPA) and is currently classified as WHPA-C and WHPA-B with an overall medium vulnerability rating between 6 and 8. The property is located between three (3) of the six (6) Fergus municipal supply wells. No chemical threats or concerns were identified within the property bounds.

6. Site servicing (wastewater, water supply, stormwater management) for the development is to be fully municipally supplied. At the time of the writing of this report, aside from a general concept plan showing the location of the proposed SWM facility, no specific design drawings / plans were available. It is also recommended that as design plans are updated and information becomes available, addendums be added to address the specific site servicing issues. Furthermore, groundwater monitoring should be completed to aid in the design and location of the proposed SWM facility and any proposed LID, infiltration infrastructure.

7. Seasonal groundwater monitoring is incomplete and is ongoing at the Site to better characterize the hydrogeological setting and groundwater/surface water interactions.

8. It is recommended that once finished floor elevations and a site grading plan are available, that CVD be retained to review the final design and provide updates to the recommendations and conclusions provided in this report. Based on the final design, additional boreholes/monitoring wells might be required to delineate the extent of the water table and provide additional information.

7.0 CLOSING

This hydrogeological investigation report has been prepared for the exclusive use of the Client and their assigns for specific application to this project property.

The assessment was conducted in accordance with the verbal and written requests from the Client, and generally accepted assessment practices. Performance of this assessment is intended to reduce, but not eliminate, uncertainty regarding the hydrogeological conditions encountered at the project site, given reasonable limits of time and cost. No other warranty, expressed or implied, is made.

We trust this report is sufficient for your immediate requirements. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
CHUNG & VANDER DOELEN ENGINEERING LTD.

Yaroslav Chudin, EIT
Geotechnical Engineering Intern

Gavin R O'Brien

PROFESSIONAL GEOSCIENTIST
GAVIN R. O'BRIEN
PRACTISING MEMBER
1267
ONTARIO

Gavin R. O'Brien M.Sc., P.Geo.
Senior Hydrogeologist

PROFESSIONAL GEOSCIENTIST
PETER DAO
PRACTISING MEMBER
2543
ONTARIO

Peter Dao, M.Sc., P.Geo.
Manager, Environmental & Hydrogeology

8.0 REFERENCES

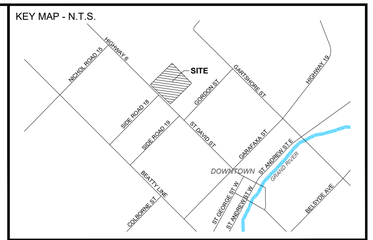
The following documents, maps, or other publications have been used in the preparation of this report.

- "Centre Wellington Scoped Tier Three Water Budget Assessment", Matrix Solutions Inc. (December 2017).
- "Draft Plan of Subdivision", Polocorp (December 10, 2024).
- "Historical Data; Fergus Shand Dam Weather Station; 2024 Daily Data Reports" Government of Canada Environment and Natural Resources; Retrieved October 1, 202
- "Preliminary Geotechnical Investigation: Proposed Residential Subdivision", Project No.: 1495, CVD Engineering Ltd. (May 28, 2024)
- "Hydrogeological Assessment, 350 Wellington Road 7, Elora, Ontario", Grounded Engineering (October 2022)
- "Hydrogeological Investigation, 8243 and 8282 Wellington Road 19, Ontario", Golder (February 2022)
- "Hydrogeological Investigation - Updated, 8243 and 8282 Wellington Road 19, Ontario", WSP Canada Inc. (April 2023)
- "Map Your Property Tool", Grand River Conservation Authority; ESRI; ArcGIS (2024)
- "Pleistocene Geology of the Guelph Area, Southern Ontario; Geological Report 61", Map 22153, scale 1:63,360, Karrow, P. F. (1968).
- Toporama Topographical Map, Ministry of Natural Resources (Retrieved June 11, 2024)

APPENDIX A

Conceptual Subdivision Plan (Polocorp, December 10, 2024)

KEY MAP - N.T.S.



DRAFT PLAN OF SUBDIVISION

PT OF LOT 17, CONCESSION 16
IN THE FORMER GEOGRAPHIC TWP OF NICHOL
CENTRE WELLINGTON

POLOCORP INC.

20 0 20 40 60 80 100
SCALE = 1:1400 (metric)

LAND USE SCHEDULE

DESCRIPTION	LOTS/BLKS.	UNITS	AREA (ha.)
Single Detached	1-10	62-88	8.006
Street Townhouses	11-18	80-118	6.185
Medium Density	19, 20	71-102	1.617
Mixed Use	21	8-14	0.338
Existing House	22	-	0.330
Stormwater Management Facility	23	-	2.412
Trail	24	-	0.417
Parkland	25	-	0.806 (5.2%)
Pedestrian Walkway	26, 27	-	0.077
Environmental Feature & Buffer	28	-	3.340
MTO Allowance	29, 30	-	0.527
Roads	-	-	3.502
TOTAL		221-323	19.389

SALEABLE FRONTAGE	LENGTH	UNIT SMALL	UNIT LARGE
Single Detached	1,014.5m	36' (11.0m)	50' (15.2m)
Street Townhouses	830.0m	18' (5.5m)	27' (8.3m)
TOTAL	1,844.5m		

DENSITY	
Gross Area (ha)	19.389 ha (47.91 ac)
Developable Area (ha)	15.477 ha (38.25 ac)
Net Density (upha)	14.3 - 20.9 upha
Net People-Jobs (3.05 per unit)	43.6 - 63.8 P/J pha

LEGEND

Wetland Limit
Wetland 30m Buffer

INFORMATION REQUIRED

UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990, c.P.13 AS AMENDED

INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g, j AND I ARE AS SHOWN ON THE DRAFT PLAN.

(h) Municipal Water Supply
(i) Sandy Loam
(k) Municipal Sanitary and Storm Sewers

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

O.L.S.
Surveying Inc.

XX XX, 2024
DATE

OWNER'S CERTIFICATE

I HEREBY CONSENT TO THE FILING OF THIS PLAN BY POLOCORP INC., IN DRAFT FORM

MIKE PUOPOLO
Polocorp Inc.

DATE

APPROVALS

REGIONAL MUNICIPALITY OF
WATERLOO APPROVAL BLOCK

DRAFT
FOR DISCUSSION
PURPOSES ONLY

APPROVED: DATE:

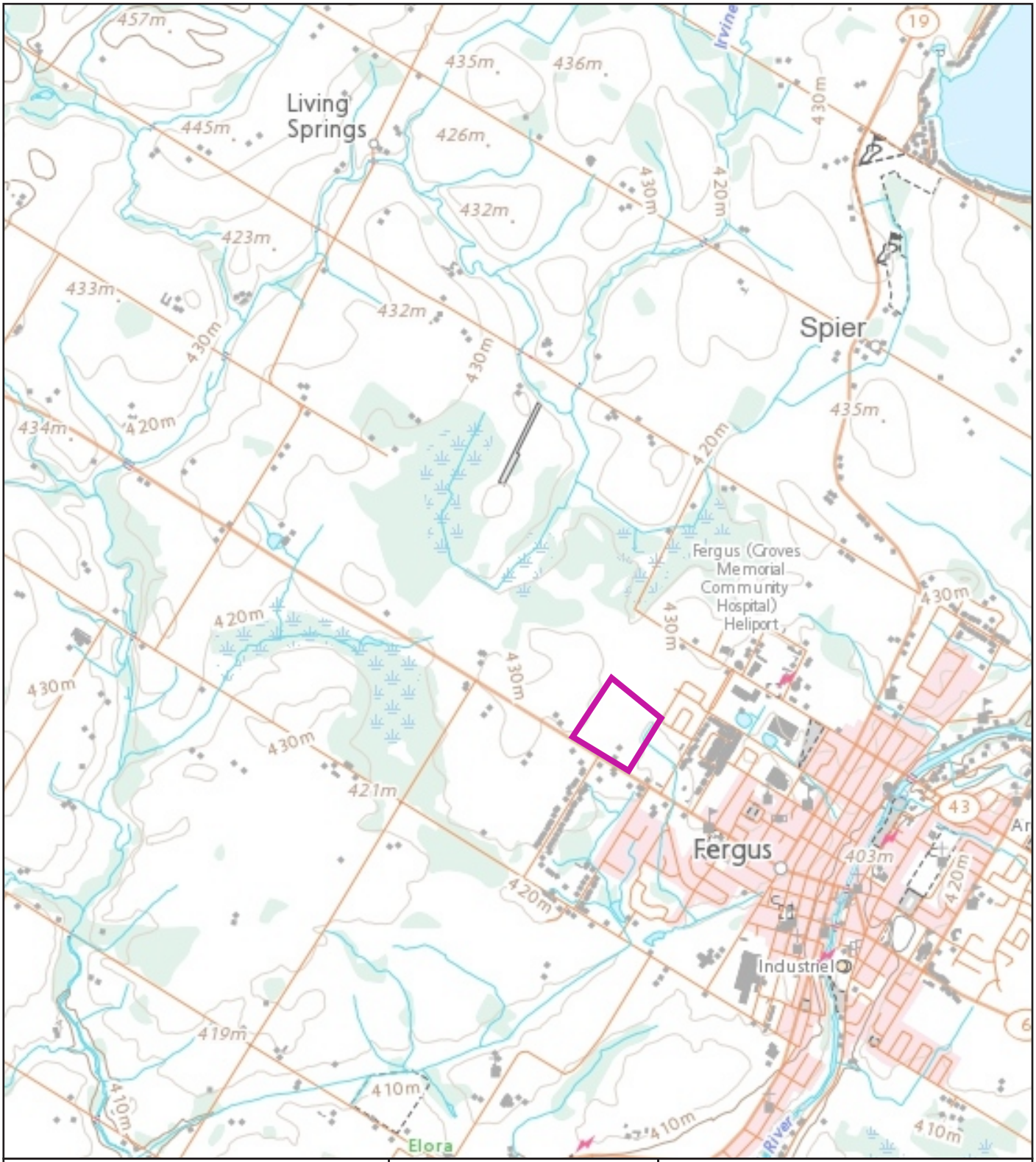
REVISIONS		
DATE	BY	DESCRIPTION

POLOCORP
379 Queen Street South, Kitchener | N2T 1W6 | 519-745-3249 | polocorpinc.com

DATE: December 10, 2024	SCALE 1:4000 (metric)
PROJECT: 1012 (Fergus)	DRAWN BY: GFE

APPENDIX B

Figures 1 to 5



LEGEND

Subject Development Property

Map Ref.: Toporama; Natural Resources Canada; GeoGratis; Retrieved June 6, 2024

0 m 500 1000

Scale 1:40,000

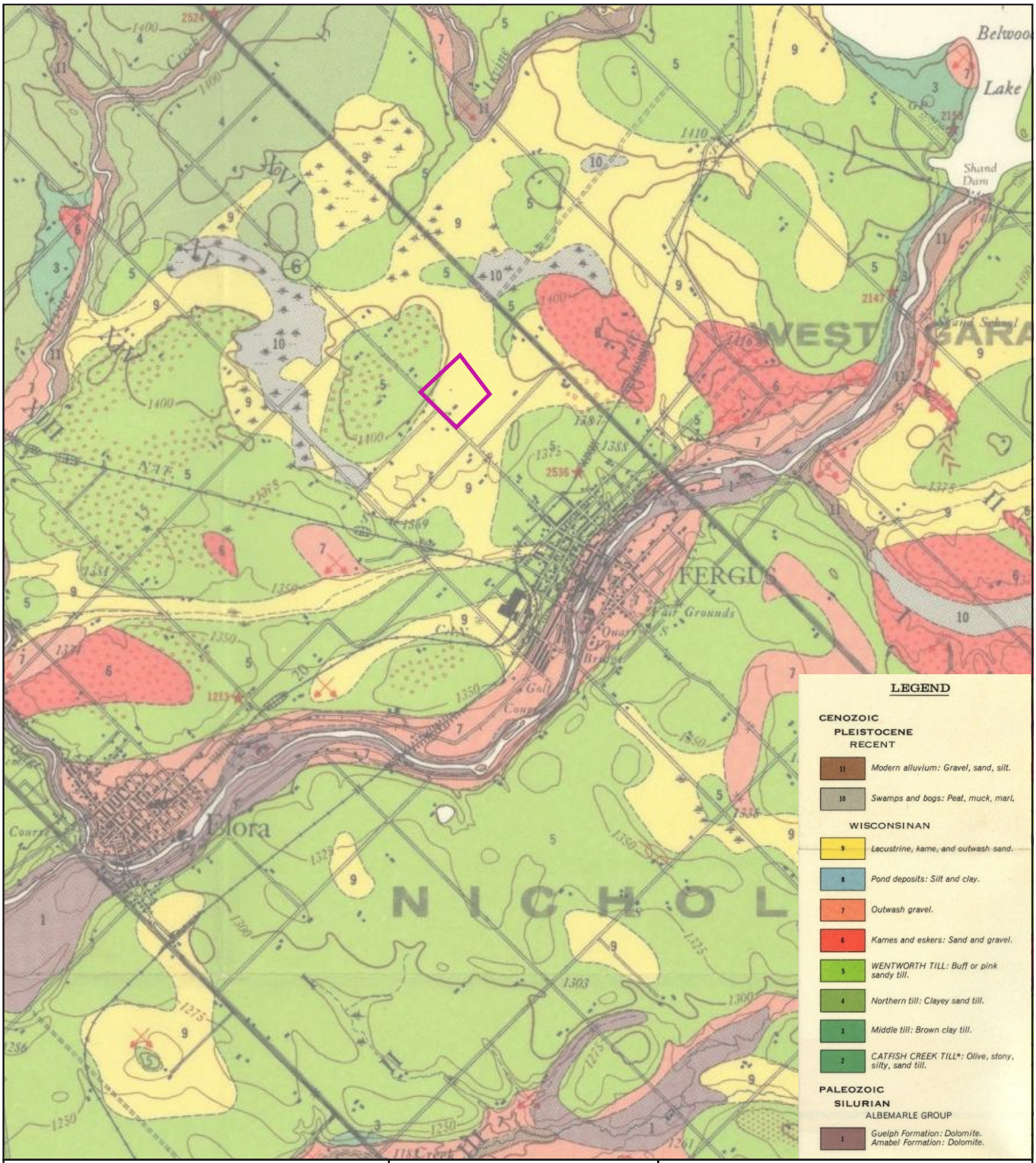
Figure 1 - Site Location

Hydrogeological Assessment

968 St. David Street North
Fergus, ON

Drawn By: YC	Date: Jan. 30/24	File No. 1495

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND

Subject Development Property

Map Ref.: Karrow, P.F.; Pleistocene Geology of the Guelph Area, Southern Ontario (Map 2153); 1968.

N

0 m 1000 2000

Scale 1:50,000

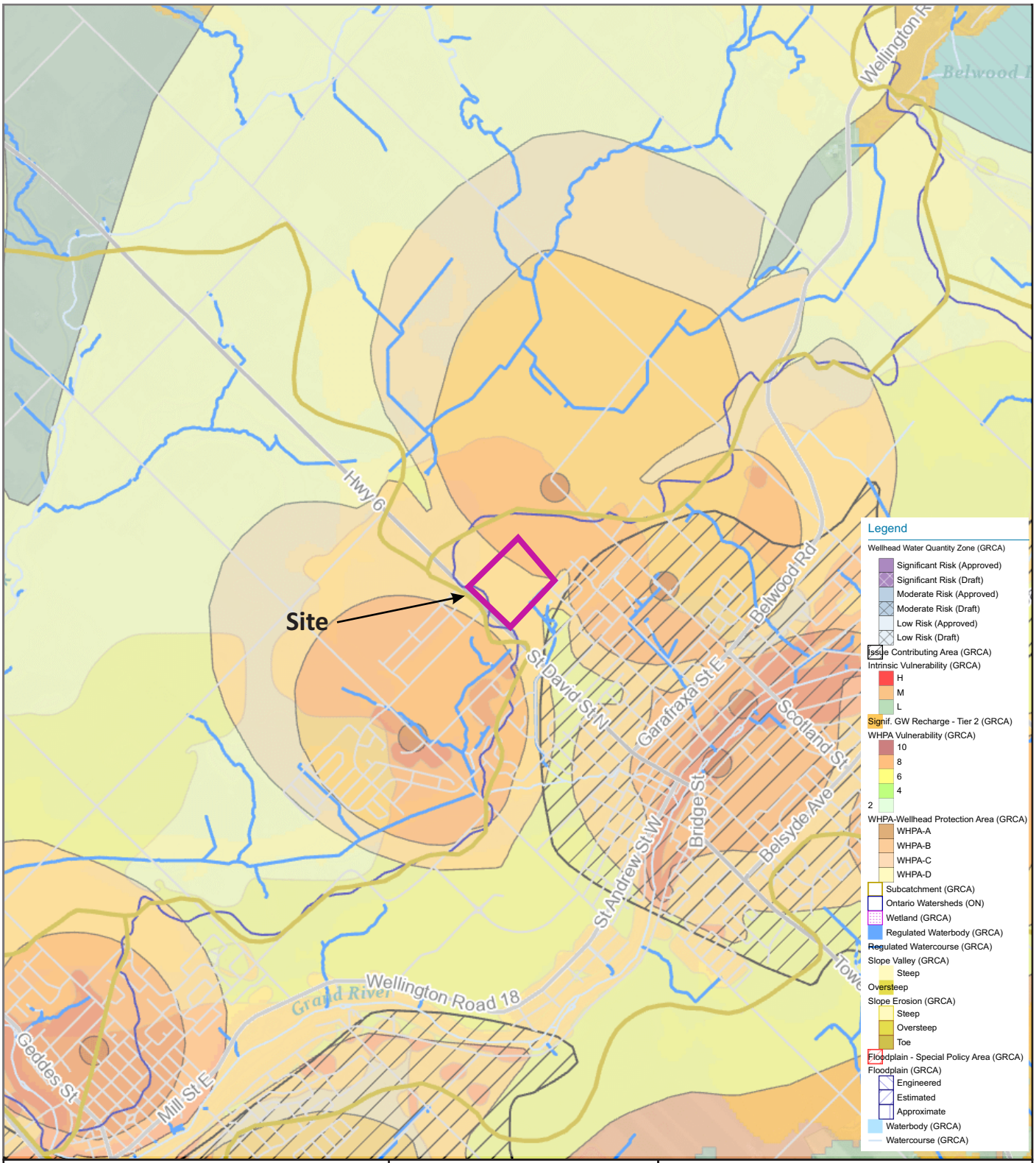
Figure 2 - Quaternary Geology

Hydrogeological Assessment

968 St. David Street North
Fergus, ON

Drawn By: YC	Date: Sept. 30/24	File No. 1495

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND

Subject Development Property

Map Ref.: Grand River Conservation Authority; GRCA Web-GIS; Retrieved September 30, 2024

N

0 m 500 1000

Scale 1:40,000

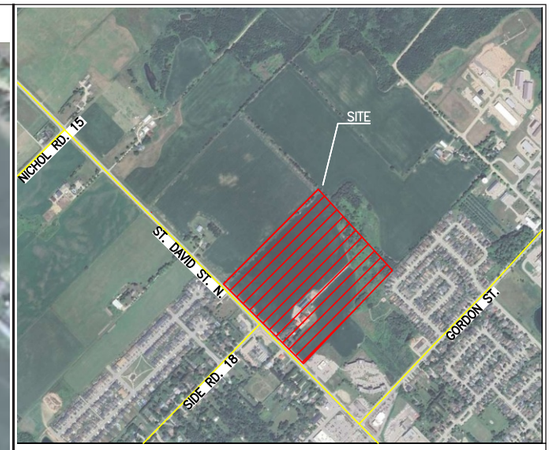
Figure 3 - Watershed Mapping

Hydrogeological Assessment

968 St. David Street North
Fergus, ON

Drawn By: YC	Date: January 30/24	File No. 1495

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND

- Property Boundary
- CVD Monitoring Well Location
- CVD Drive-Point Piezometer Location
- (422.93, *423.89*) Ground Surface, Top of Well/Piezometer Pipe Elevation (m)

N

0 50 100 m

Scale 1:4000

Image Reference: Google Earth; Retrieved: May 1, 2024

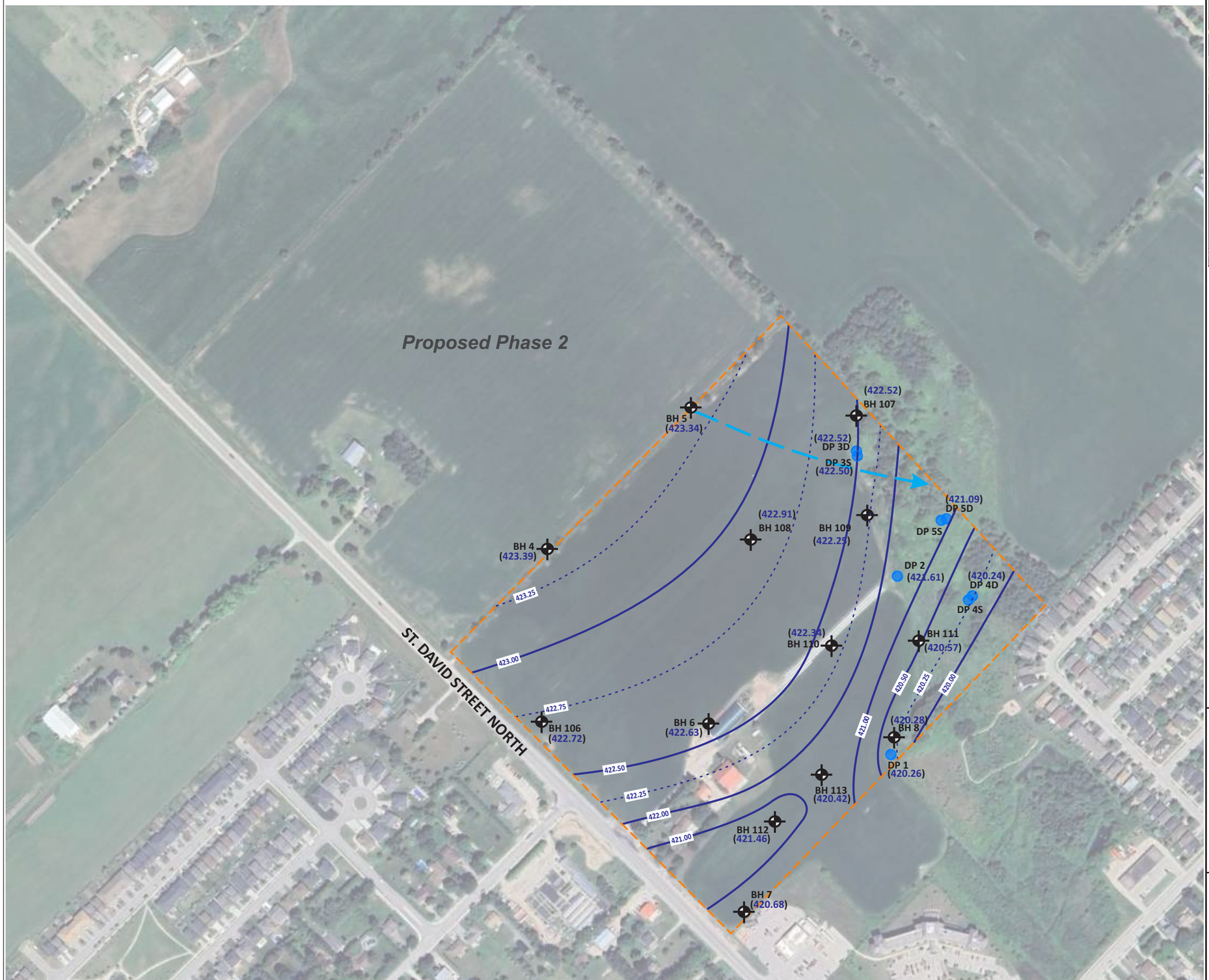
Figure 4:
Monitoring Well and Piezometer Locations

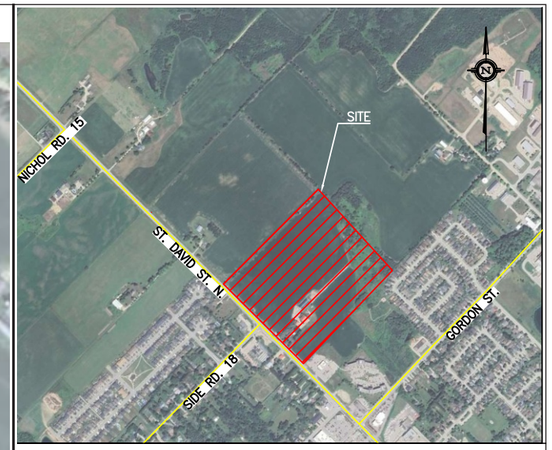
Hydrogeological Assessment
Polocorp Fergus Subdivision - Phase 1

968 St. David Street North & 6581 Highway 6
Fergus, ON

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

Drawn By: YC	Date: Janaury 2025	File No.: 1495





LEGEND

- Property Boundary
- CVD Monitoring Well Location
- CVD Drive-Point Piezometer Location
- (424.19) Water Table Elevation (mASL) - September 18, 2024
- 424.50 Interpreted Groundwater Contour (mASL)
- Interpreted Shallow Groundwater Flow Direction

0 50 100 m

Scale 1:4000

Image Reference: Google Earth; Retrieved: May 1, 2024

Figure 5:
Water Table Interpretation (September 18, 2024)

Hydrogeological Assessment
Polocorp Fergus Subdivision - Phase 1

968 St. David Street North & 6581 Highway 6
Fergus, ON

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

Drawn By: YC / PD	Date: Janaury 2025	File No.: 1495

APPENDIX C

Well Response Test Analysis Charts

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Project: Polocorp Fergus Subdivision

Number: 1495

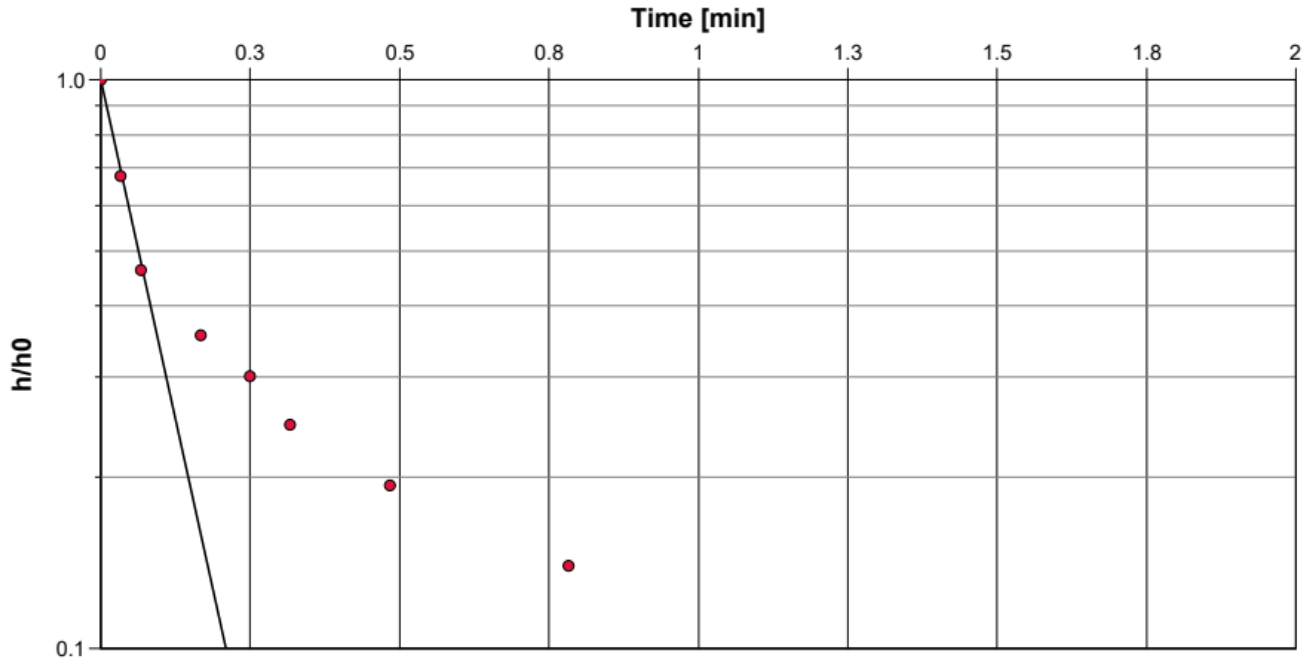
Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON | Response Test: BH 5

Test Conducted by: Y.C. | Test Date: 2024-03-11 | Aquifer Thickness: 6.20 m

Water level at t=0 [m]: 2.09 | Static Water Level [m]: 1.99 | Water level change at t=0 [m]: 0.09

	Time [min]	Water Level [m]	WL Change [m]
1	0	2.087	0.093
2	0.0333	2.057	0.063
3	0.0667	2.037	0.043
4	0.1667	2.027	0.033
5	0.25	2.022	0.028
6	0.3167	2.017	0.023
7	0.4833	2.012	0.018
8	0.7833	2.007	0.013
9	1.1167	2.002	0.008
10	1.55	2.00	0.006



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 5	8.69×10^{-5}	

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Project: Polocorp Fergus Subdivision

Number: 1495

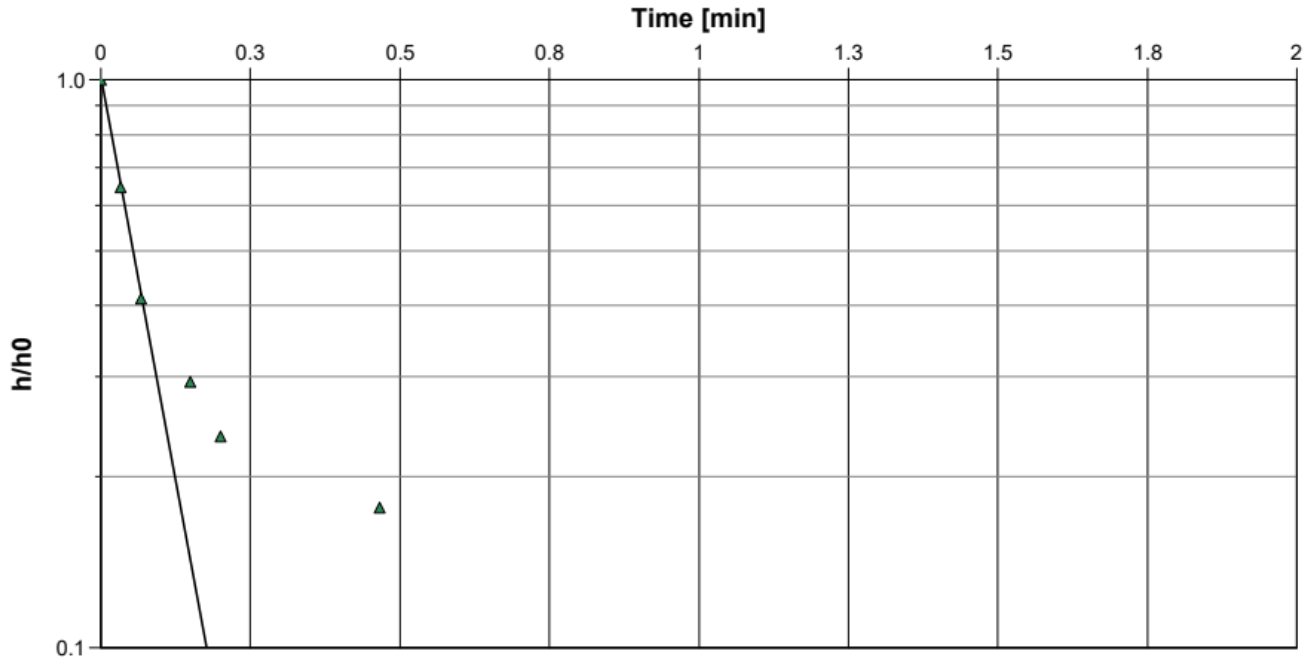
Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON | Response Test: BH 6

Test Conducted by: Y.C. | Test Date: 2024-03-11 | Aquifer Thickness: 3.10 m

Water level at t=0 [m]: 1.65 | Static Water Level [m]: 1.56 | Water level change at t=0 [m]: 0.08

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.646	0.085
2	0.0333	1.616	0.055
3	0.0667	1.596	0.035
4	0.15	1.586	0.025
5	0.2	1.581	0.02
6	0.4667	1.576	0.015



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 6	8.91×10^{-5}	

CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Project: Polocorp Fergus Subdivision

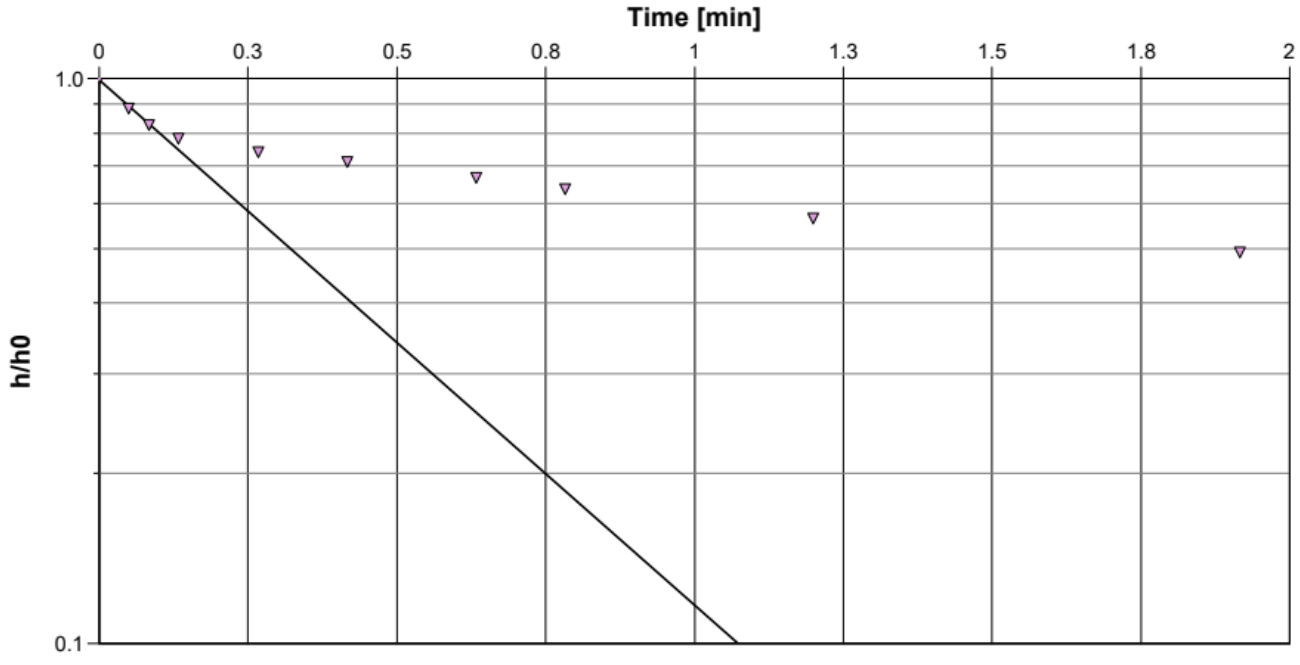
Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON | Response Test: BH 7

Test Conducted by: Y.C.	Test Date: 2024-03-11	Aquifer Thickness: 1.50 m
Water level at t=0 [m]: 1.20	Static Water Level [m]: 0.51	Water level change at t=0 [m]: 0.69

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.199	0.69
2	0.05	1.119	0.61
3	0.0833	1.079	0.57
4	0.1333	1.049	0.54
5	0.2667	1.019	0.51
6	0.4167	0.999	0.49
7	0.6333	0.969	0.46
8	0.7833	0.949	0.44
9	1.2	0.899	0.39
10	1.9167	0.849	0.34
11	2.6333	0.819	0.31
12	3.3833	0.799	0.29
13	3.9667	0.789	0.28
14	4.5167	0.779	0.27
15	5.1333	0.769	0.26



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]
BH 7	2.81×10^{-5}

APPENDIX D

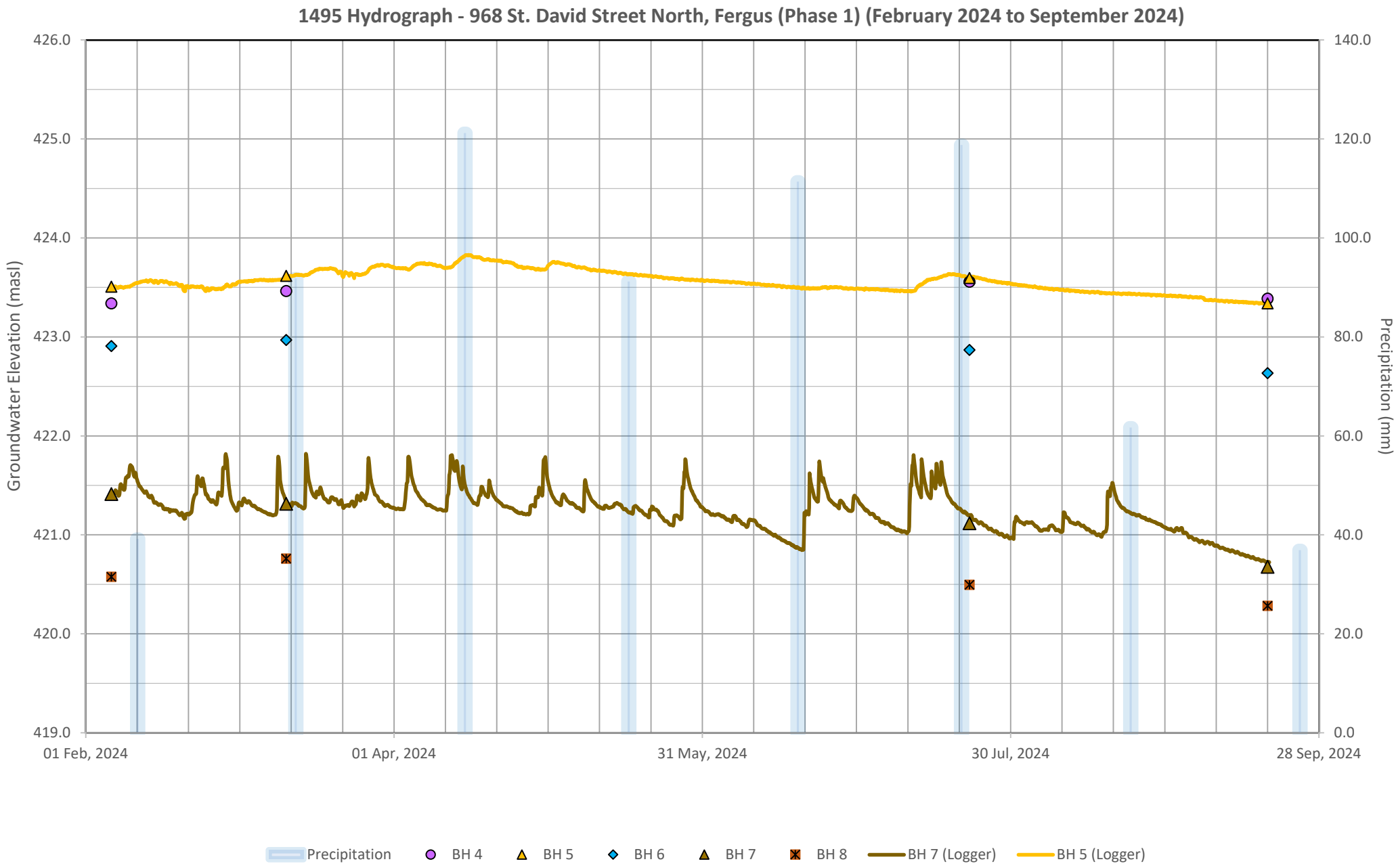
Table 1 – Water Level Measurements & Hydrograph (February 2024 to September 2024)

Table 1 - Summary of Water Levels, Elevations & Fluctuations

968 St. David Street North, Fergus
CVD Engineering Ltd.
Project: 1495

Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Pipe Length (m)	Hydraulic Conductivity (m/s)	Water Level (m Below Ground)							Water Elevation (m Above Sea Level)							Fluctuation Relative to February 6, 2024 (m)			
					10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24
BH 4	426.94	428.13	1.18	-			3.61	3.48	3.39		3.56			423.34	423.46	**423.56**		423.39	0.13	0.22		0.05
BH 5	425.61	426.87	1.26	9×10^{-5}			2.10	1.99	2.02		2.27			423.51	**423.62**	423.59		423.34	0.11	0.09		-0.17
BH 6	424.53	425.53	1.00	9×10^{-5}			1.62	1.56	1.66		1.90			422.91	**422.97**	422.87		422.63	0.06	-0.04		-0.27
BH 7	421.82	422.97	1.15	3×10^{-5}			0.41	0.51	0.71		1.14			**421.41**	421.31	421.12		420.68	-0.10	-0.30		-0.74
BH 8	421.01	422.12	1.11	-			0.44	0.25	0.52		0.73			420.58	**420.76**	420.50		420.28	0.18	-0.08		-0.29
BH 106	424.80	425.74	0.94	-						2.07	2.08						**422.73**	422.72				
BH 107	422.93	423.89	0.96	-						0.40	0.41						**422.53**	422.52				
BH 108	424.74	425.68	0.94	-						1.82	1.83						**422.92**	422.91				
BH 109	422.66	423.64	0.98	-						0.40	0.41						**422.26**	422.25				
BH 110	422.92	423.97	1.05	-						0.57	0.58						**422.35**	422.34				
BH 111	421.24	422.19	0.95	-						0.60	0.67						**420.64**	420.57				
BH 112	422.30	423.29	0.99	-						0.74	0.83						**421.56**	421.46				
BH 113	422.02	422.87	0.85	-						1.53	1.60						**420.49**	420.42				
DP 1 In	420.06	421.62	1.56	-	-0.33	-0.38	-0.34	-0.39	-0.36		-0.20	420.39	420.44	420.40	**420.45**	420.42		420.26				
DP 1 Out	420.06	421.62	1.56	-	-0.23	-0.20		-0.27	-0.23		-0.17	420.28	420.26		**420.32**	420.29		420.22				
DP 2 In	421.71	423.09	1.37	-	1.69	0.45	-0.01	-0.06	-0.06		0.10	420.02	421.26	421.73	421.77	**421.78**		421.61				
DP 2 Out	421.71	423.09	1.37	-	-0.08	-0.06		-0.08	-0.06			421.79	421.77		**421.79**	421.78						
DP 3S In	422.86	424.48	1.62	-					0.27		0.36					**422.59**		422.50				
DP 3S Out	422.86	424.48	1.62	-																		
DP 3D In	422.88	424.42	1.54	-	0.57	0.29	0.26	1.23	0.27		0.36	422.31	422.59	**422.62**		422.61		422.52				
DP 3D Out	422.88	424.42	1.54	-					-1.54							**424.42**						
DP 4S In	421.27	422.54	1.28	-						-0.15	-0.14						**421.42**	421.41				
DP 4S Out	421.27	422.54	1.28	-						-0.16	-0.16						**421.43**	421.43				
DP 4D In	421.29	422.71	1.42	-						1.28	1.05						420.01	**420.24**				
DP 4D Out	421.29	422.71	1.42	-						-0.11	-0.11						**421.41**	421.41				
DP 5S In	421.64	422.77	1.13	-						0.39							**421.25**					
DP 5S Out	421.64	422.77	1.13	-																		
DP 5D In	421.60	423.00	1.39	-						0.48	0.51						**421.13**	421.09				
DP 5D Out	421.60	423.00	1.39	-																		

Notes:
1) All Elevations Referenced to Geodetic Survey by CVD.
2) Bolded elevations represent the maximum water table aquifer elevation measured at each monitoring well throughout all seasons.
3) Negative water level indicates that water level is above ground.
4) : Monitoring well/piezometer dry
5) Negative fluctuation indicates drop in water level relative to baseline.


1495 Hydrograph - 968 St. David Street North, Fergus (Phase 1) (February 2024 to September 2024)
Groundwater Elevation (masl)
Precipitation (mm)
426.0
425.0
424.0
423.0
422.0
421.0
420.0
419.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
01 Feb, 2024
01 Apr, 2024
31 May, 2024
30 Jul, 2024
28 Sep, 2024
Precipitation
BH 4
BH 5
BH 6
BH 7
BH 8
BH 7 (Logger)
BH 5 (Logger)

APPENDIX E

Water Balance Calculation

Pre-Development Water Budget Calculations - 968 St. David Street North, Fergus **January 2025**

Pervious Areas (Cultivated Land and Grassed Pasture, with Trees and Shubs)

Determination of Evapotranspiration and Water Balance Components - by Water Balance Method (Thornthwaite & Mather, 1957)

Precipitation: Fergus Shand Dam (1981-2010), Vegetation: Moderately-Deep Crops, Mature Grasses with Trees/Shubs, Soil: Fine Sand and Clay

	Units	Annual	% Total	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temperature	deg C	**6.68**		-7.4	-6.3	-1.9	5.7	12.2	17.5	20.0	19.0	14.9	8.3	2.1	-3.9
Heat Index (i)	-	**35.09**		0.00	0.00	0.00	1.22	3.86	6.66	8.16	7.55	5.22	2.15	0.27	0.00
Unadjusted PET (UPET)	mm/day	**1.038**		0.00	0.00	0.00	0.87	1.91	2.78	3.20	3.03	2.35	1.28	0.31	0.00
latitude correction (r)	-			24.3	24.5	30.6	33.6	37.9	38.5	38.8	36	31.2	28.5	24.2	23
Potential Evapotranspiration (PET)	mm	**559.3**		0.0	0.0	0.0	29.2	72.5	107.1	124.0	109.1	73.5	36.5	7.4	0.0
Precipitation (P)	mm	**945.9**	**100.0**	67.9	55.9	59.6	74.1	86.9	83.8	89.2	96.6	93.1	77.2	93	68.6
P - PET	mm			67.9	55.9	59.6	44.9	14.4	-23.3	-34.8	-12.5	19.6	40.7	85.6	68.6
Accum. Water Loss	mm							0.0	-23.3	-58.1	-70.6				
Soil Moisture Retention (Storage - ST)	mm			75.0	75.0	75.0	75.0	75.0	54.0	34.0	28.0	47.6	75.0	75.0	75.0
Storage Change (ΔST)	mm			75.0	0.0	0.0	0.0	0.0	-21.0	-20.0	-6.0	19.6	27.4	0.0	0.0
Actual Evapotranspiration (AE)	mm	**535.7**	**56.6**	0.0	0.0	0.0	29.2	72.5	104.8	109.2	102.6	73.5	36.5	7.4	0.0
Water Balance as Surplus/Deficit	mm	**410.2**	**43.4**	67.9	55.9	59.6	44.9	14.4	-21.0	-20.0	-6.0	19.6	40.7	85.6	68.6
Determination of Water Balance as 'Combined-Runoff' (Recharge + Direct Runoff) - (using WBM Assumptions)															
Soil Moisture Surplus (SMS)	mm	**158.2**		0.0	0.0	0.0	44.9	14.4	0.0	0.0	0.0	0.0	13.3	85.6	0.0
Water Balance from SMS (Assumption 1)	mm	**144.8**		10.8	5.4	2.7	23.8	19.1	9.6	4.8	2.4	1.2	0.6	43.1	21.5
				0.03	0.01	0.00	0.00	7.20	3.60	1.80	0.90	0.45	0.22	0.11	0.06
				0.04	0.02	0.01	22.47	11.23	5.62	2.81	1.40	0.70	0.35	0.18	0.09
				10.69	5.35	2.67	1.34	0.67	0.33	0.17	0.08	0.04	0.02	42.78	21.39
Accumulated Snow (Assumption 2)	mm	**252.0**		0.0	0.0	0.0	252.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Balance from Snow (Assumption 3)	mm	**252.0**		0.5	0.3	0.1	25.2	113.4	56.7	28.4	14.2	7.1	3.5	1.8	0.9
Water Balance as 'Combined-Runoff'	mm	**396.8**	**42.0**	11.3	5.7	2.8	49.0	132.5	66.3	33.1	16.6	8.3	4.1	44.8	22.4

Assumptions for Monthly 'Combined-Runoff' Estimations (from WBM):

1 - Combined 'Runoff' from the Soil Moisture Surplus is assumed to be 50% in the first month and then 50% of the remaining soil surplus each following month.

2 - All Snow is Accumulated and Stored throughout Winter Sub-Zero Months (i.e. No melt until first above-zero month)

3 - Combined 'Runoff' from Snowmelt is assumed to be 10% of the Accumulated Snow in the first month and then 50% of the remaining snowmelt in each following month.

Determination of Recharge + Direct Runoff Components - using MOE Infiltration Factor Method (MOE 1995, 2003)

Catchment Area (m^2)	MOE Infiltration Factors (0 to 1.00)							Annual Rates				Annual Rates			
								EvapoT	Balance	Recharge	Runoff	EvapoT	Balance	Recharge	Runoff
	Topography		Soil		Cover		Sum	(mm)	(mm)	(mm)	(mm)	(m^3/yr)	(m^3/yr)	(m^3/yr)	(m^3/yr)
Pervious, Cultivated Land	Rolling	0.2	Sand	0.4	Cultivated	0.1	0.7	535.7	410.2	287.1	123.1	76,876	58,861	41,202	17,658
143,500 m2								56.6%	43.4%	30.4%	13.0%	56.6%	43.4%	30.4%	13.0%
Pervious, Pasture & Lawns	Rolling	0.2	Sand	0.4	Pasture	0.15	0.75	535.7	410.2	307.6	102.5	8,036	6,153	4,615	1,538
15,000 m2					& Lawns			56.6%	43.4%	32.5%	10.8%	56.6%	43.4%	32.5%	10.8%
Pervious, Woodland/Wetland	Rolling	0.2	Sand	0.4	Woodland	0.2	0.8	535.7	410.2	328.1	82.0	17,893	13,700	10,960	2,740
33,400 m2					& Wetland			56.6%	43.4%	34.7%	8.7%	56.6%	43.4%	34.7%	8.7%
Impervious Rooftops to Pervious Areas							0.25	94.6	851.3	212.8	638.5	189	1,703	426	1,277
2,000 m2								10.0%	90.0%	22.5%	67.5%	10.0%	90.0%	22.5%	67.5%
Total Site												102,994	80,416	57,203	23,213
193,900 m2												56.2%	43.8%	31.2%	12.7%

Assumptions for Evapotranspiration/Recharge/Runoff Proportioning

1 - Pervious Areas - by MOE Infiltration Factor Method (MOE 1995, 2003)

2 - Impervious Areas Shed to Pervious Areas - Assume 10% Lost to Evapotranspiration and Balance Split 25/75% to Recharge/Runoff

APPENDIX F

Water Chemistry Results
(AGAT Laboratories of Mississauga, Ontario)

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: CHUNG AND VANDER DOELEN
311 VICTORIA STREET NORTH
KITCHENER, ON N2H5E1
(519) 742-8979
ATTENTION TO: Yaroslav Chudin
PROJECT: 1495
AGAT WORK ORDER: 24T129206
WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead
DATE REPORTED: Mar 22, 2024
PAGES (INCLUDING COVER): 10
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
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Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

		SAMPLE DESCRIPTION:		BH1	BH5	BH6		BH7
		SAMPLE TYPE:		Water	Water	Water		Water
		DATE SAMPLED:		2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30		2024-03-11 11:30
Parameter	Unit	G / S	RDL	5722603	5722663	5722665	RDL	5722666
Electrical Conductivity	µS/cm		2	480	497	596	2	1620
pH	pH Units	6.5-8.5	NA	7.43	7.64	7.62	NA	7.41
Saturation pH (Calculated)				6.53	6.62	6.72		6.36
Langelier Index (Calculated)				0.896	1.02	0.896		1.05
Hardness (as CaCO3) (Calculated)	mg/L		0.5	679	688	664	0.5	1260
Total Dissolved Solids	mg/L		10	224	338	412	10	706
Alkalinity (as CaCO3)	mg/L		5	291	255	206	5	271
Bicarbonate (as CaCO3)	mg/L		5	291	255	206	5	271
Carbonate (as CaCO3)	mg/L		5	<5	<5	<5	5	<5
Hydroxide (as CaCO3)	mg/L		5	<5	<5	<5	5	<5
Fluoride	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Chloride	mg/L		0.10	9.18	2.04	27.3	0.12	269
Nitrate as N	mg/L		0.05	1.48	12.8	24.9	0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Sulphate	mg/L		0.10	1.62	30.1	6.71	0.10	31.5
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	0.10	<0.10
Ammonia as N	mg/L		0.02	0.05	0.06	<0.02	0.02	0.03
Ammonia-Un-ionized (Calculated)	mg/L	0.02	0.000002	0.000774	0.00151	<0.000002	0.000002	0.000453
Total Phosphorus	mg/L	*	0.02	0.73	0.74	1.22	0.06	2.03
Total Organic Carbon	mg/L		0.5	7.6	9.2	8.4	0.5	14.4
True Colour	TCU		2.50	<2.50	<2.50	<2.50	2.50	4.55
Turbidity	NTU		0.5	92.5	192	60.3	0.5	97.6
Total Calcium	mg/L		0.20	204	209	192	0.20	394
Total Magnesium	mg/L		0.10	41.1	40.4	44.9	0.10	65.9
Total Potassium	mg/L		0.50	3.04	3.57	3.32	0.50	6.64
Total Sodium	mg/L		0.10	3.94	4.32	3.03	0.10	98.5
Aluminum-dissolved	mg/L	*	0.004	0.004	0.008	<0.004	0.004	<0.004
Total Antimony	mg/L	0.020	0.003	<0.003	<0.003	<0.003	0.003	<0.003

Certified By: Iris Verástegui

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5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

		SAMPLE DESCRIPTION:		BH1	BH5	BH6		BH7
		SAMPLE TYPE:		Water	Water	Water		Water
		DATE SAMPLED:		2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30		2024-03-11 11:30
Parameter	Unit	G / S	RDL	5722603	5722663	5722665	RDL	5722666
Total Arsenic	mg/L	0.1	0.003	0.006	0.008	0.007	0.003	0.007
Total Barium	mg/L		0.002	0.043	0.059	0.050	0.002	0.203
Total Beryllium	mg/L	*	0.001	<0.001	<0.001	<0.001	0.001	<0.001
Total Boron	mg/L	0.2	0.010	0.026	0.031	0.017	0.010	0.031
Total Cadmium	mg/L	0.0002	0.0001	**0.0003**	**0.0003**	**0.0003**	0.0001	**0.0004**
Total Chromium	mg/L		0.003	0.011	0.018	0.011	0.003	0.042
Total Cobalt	mg/L	0.0009	0.0005	**0.0066**	**0.0096**	**0.0084**	0.0005	**0.0137**
Total Copper	mg/L	0.005	0.002	**0.021**	**0.029**	**0.030**	0.002	**0.037**
Total Iron	mg/L	0.3	0.050	**12.2**	**18.0**	**15.2**	0.050	**31.5**
Total Lead	mg/L	*	0.0005	0.0224	0.0322	0.0318	0.0005	0.0249
Total Manganese	mg/L		0.002	0.651	0.860	0.991	0.002	1.03
Total Mercury	mg/L		0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Total Molybdenum	mg/L	0.040	0.002	<0.002	<0.002	<0.002	0.002	<0.002
Total Nickel	mg/L	0.025	0.003	0.012	0.019	0.018	0.003	**0.032**
Total Selenium	mg/L	0.1	0.002	<0.002	0.004	<0.002	0.002	0.004
Total Silver	mg/L	0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Total Strontium	mg/L		0.005	0.298	0.281	0.304	0.005	0.670
Total Thallium	mg/L	0.0003	0.0003	<0.0003	<0.0003	<0.0003	0.0003	<0.0003
Total Tin	mg/L		0.002	0.002	0.002	0.002	0.002	<0.002
Total Titanium	mg/L		0.010	0.199	0.325	0.302	0.010	0.832
Total Tungsten	mg/L	0.030	0.010	<0.010	<0.010	<0.010	0.010	<0.010
Total Uranium	mg/L	0.005	0.0005	<0.0005	0.0006	<0.0005	0.0005	0.0023
Total Vanadium	mg/L	0.006	0.002	**0.017**	**0.022**	**0.017**	0.002	**0.052**
Total Zinc	mg/L	0.030	0.020	**0.153**	**0.185**	**0.136**	0.020	**0.498**
Total Zirconium	mg/L	0.004	0.004	<0.004	<0.004	<0.004	0.004	0.004
Lab Filtration Aluminum Dissolved				Y	Y	Y		Y

Certified By: Iris Verástegui

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO * Variable - refer to guideline reference document
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5722603-5722666 Dilution required, RDL has been increased accordingly.
Un-ionized Ammonia detection limit is a calculated RDL. The calculation of Un-ionized Ammonia is based on lab measured parameters (ammonia as N, pH and temperature).Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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Exceedance Summary

AGAT WORK ORDER: 24T129206

PROJECT: 1495

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0066
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.021
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	12.2
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.017
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.153
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0096
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.029
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	18.0
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.022
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.185
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0084
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.030
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	15.2
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.017
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.136
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0004
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0137
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.037
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	31.5
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Nickel	mg/L	0.025	0.032
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.052
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.498

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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Quality Assurance

CLIENT NAME: CHUNG AND VANDER DOELEN

AGAT WORK ORDER: 24T129206

PROJECT: 1495

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

Water Analysis

RPT Date: Mar 22, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment - PWQO (mg/L)															
Electrical Conductivity	5722603	5722603	480	477	0.6%	< 2	104%	90%	110%						
pH	5722603	5722603	7.43	7.55	1.6%	NA	99%	90%	110%						
Total Dissolved Solids	5720157		190	168	12.3%	< 10	92%	80%	120%						
Alkalinity (as CaCO3)	5722603	5722603	291	306	5.0%	< 5	95%	80%	120%						
Bicarbonate (as CaCO3)	5722603	5722603	291	306	5.0%	< 5	NA								
Carbonate (as CaCO3)	5722603	5722603	<5	<5	NA	< 5	NA								
Hydroxide (as CaCO3)	5722603	5722603	<5	<5	NA	< 5	NA								
Fluoride	5718363		<0.05	<0.05	NA	< 0.05	105%	70%	130%	91%	80%	120%	98%	70%	130%
Chloride	5718363		153	152	0.7%	< 0.10	96%	70%	130%	91%	80%	120%	NA	70%	130%
Nitrate as N	5718363		<0.05	<0.05	NA	< 0.05	100%	70%	130%	98%	80%	120%	100%	70%	130%
Nitrite as N	5718363		<0.05	<0.05	NA	< 0.05	101%	70%	130%	101%	80%	120%	109%	70%	130%
Bromide	5718363		<0.05	<0.05	NA	< 0.05	105%	70%	130%	96%	80%	120%	95%	70%	130%
Sulphate	5718363		<0.10	<0.10	NA	< 0.10	94%	70%	130%	94%	80%	120%	94%	70%	130%
Ortho Phosphate as P	5718363		<0.10	<0.10	NA	< 0.10	101%	70%	130%	104%	80%	120%	105%	70%	130%
Ammonia as N	5724966		<0.02	<0.02	NA	< 0.02	108%	70%	130%	105%	80%	120%	103%	70%	130%
Total Phosphorus	5737950		0.05	0.05	NA	< 0.02	99%	70%	130%	99%	80%	120%	105%	70%	130%
Total Organic Carbon	5720157		1.8	1.7	NA	< 0.5	98%	90%	110%	98%	90%	110%	99%	80%	120%
True Colour	5720157		<2.50	<2.50	NA	< 2.5	100%	90%	110%						
Turbidity	5722603	5722603	92.5	144	43.6%	< 0.5	90%	80%	120%						
Total Calcium	5724836		80.1	80.4	0.4%	< 0.20	113%	70%	130%	107%	80%	120%	108%	70%	130%
Total Magnesium	5724836		6.75	6.85	1.5%	< 0.10	118%	70%	130%	111%	80%	120%	94%	70%	130%
Total Potassium	5724836		5.43	5.50	1.3%	< 0.50	113%	70%	130%	106%	80%	120%	97%	70%	130%
Total Sodium	5724836		858	817	4.9%	< 0.10	114%	70%	130%	108%	80%	120%	NA	70%	130%
Aluminum-dissolved	5722603	5722603	0.004	0.005	NA	< 0.004	104%	70%	130%	110%	80%	120%	104%	70%	130%
Total Antimony	5724836		<0.003	<0.003	NA	< 0.003	105%	70%	130%	105%	80%	120%	100%	70%	130%
Total Arsenic	5724836		<0.003	<0.003	NA	< 0.003	99%	70%	130%	105%	80%	120%	102%	70%	130%
Total Barium	5724836		0.009	0.010	NA	< 0.002	100%	70%	130%	105%	80%	120%	97%	70%	130%
Total Beryllium	5724836		<0.001	<0.001	NA	< 0.001	104%	70%	130%	115%	80%	120%	94%	70%	130%
Total Boron	5724836		0.072	0.076	5.4%	< 0.010	101%	70%	130%	112%	80%	120%	93%	70%	130%
Total Cadmium	5724836		0.0002	0.0002	NA	< 0.0001	102%	70%	130%	106%	80%	120%	98%	70%	130%
Total Chromium	5724836		0.005	0.005	NA	< 0.003	100%	70%	130%	106%	80%	120%	105%	70%	130%
Total Cobalt	5724836		0.0013	0.0015	NA	< 0.0005	101%	70%	130%	104%	80%	120%	103%	70%	130%
Total Copper	5724836		0.026	0.026	0.0%	< 0.002	99%	70%	130%	106%	80%	120%	98%	70%	130%
Total Iron	5724836		1.68	1.67	0.6%	< 0.050	102%	70%	130%	112%	80%	120%	108%	70%	130%
Total Lead	5724836		0.0079	0.0081	2.5%	< 0.0005	101%	70%	130%	98%	80%	120%	89%	70%	130%
Total Manganese	5724836		0.383	0.389	1.6%	< 0.002	103%	70%	130%	109%	80%	120%	105%	70%	130%
Total Mercury	5722014		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	97%	80%	120%	98%	70%	130%
Total Molybdenum	5724836		0.009	0.010	NA	< 0.002	106%	70%	130%	91%	80%	120%	116%	70%	130%
Total Nickel	5724836		0.030	0.028	6.9%	< 0.003	102%	70%	130%	105%	80%	120%	101%	70%	130%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: CHUNG AND VANDER DOELEN

AGAT WORK ORDER: 24T129206

PROJECT: 1495

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

Water Analysis (Continued)

RPT Date: Mar 22, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Selenium	5724836		0.004	0.006	NA	< 0.002	101%	70%	130%	108%	80%	120%	101%	70%	130%
Total Silver	5724836		0.0001	<0.0001	NA	< 0.0001	103%	70%	130%	110%	80%	120%	96%	70%	130%
Total Strontium	5724836		1.15	1.14	0.9%	< 0.005	104%	70%	130%	109%	80%	120%	99%	70%	130%
Total Thallium	5724836		<0.0003	<0.0003	NA	< 0.0003	92%	70%	130%	105%	80%	120%	94%	70%	130%
Total Tin	5724836		<0.002	<0.002	NA	< 0.002	100%	70%	130%	109%	80%	120%	105%	70%	130%
Total Titanium	5724836		<0.010	<0.010	NA	< 0.010	102%	70%	130%	110%	80%	120%	106%	70%	130%
Total Tungsten	5724836		<0.010	<0.010	NA	< 0.010	94%	70%	130%	100%	80%	120%	97%	70%	130%
Total Uranium	5724836		<0.0005	<0.0005	NA	< 0.0005	92%	70%	130%	109%	80%	120%	106%	70%	130%
Total Vanadium	5724836		0.003	0.002	NA	< 0.002	103%	70%	130%	110%	80%	120%	111%	70%	130%
Total Zinc	5724836		0.119	0.125	4.9%	< 0.020	100%	70%	130%	105%	80%	120%	93%	70%	130%
Total Zirconium	5724836		<0.004	<0.004	NA	< 0.004	101%	70%	130%	106%	80%	120%	109%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By: Iris Verástegui

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CHUNG AND VANDER DOELEN

AGAT WORK ORDER: 24T129206

PROJECT: 1495

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Saturation pH (Calculated)		SM 2320 B	CALCULATION
Langelier Index (Calculated)		SM 2330B	CALCULATION
Hardness (as CaCO3) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684,ON MOECC E3139,SM 2540C,D	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH3 H	LACHAT FIA
Ammonia-Un-ionized (Calculated)		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Turbidity	INOR-93-6000	modified from SM 2130 B	PC TITRATE
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Aluminum-dissolved	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

AGAT Laboratories

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TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: CHUNG AND VANDER DOELEN

AGAT WORK ORDER: 24T129206

PROJECT: 1495

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE:968 ST. DAVID ST. N. FERGUS

SAMPLED BY:Y.C.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tungsten	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration Aluminum Dissolved	SR-78-9001		FILTRATION

GAT Laboratories

Have feedback? Scan here for a quick survey!

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 24T129206

Cooler Quantity: 1 med.

Arrival Temperatures: 3.7 | 3.9 | 4.3

Depot Temperatures: | | |

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: courier

Report Information:

Company: CVD Engineering Ltd.

Contact: Yaroslav Chudin

Address: 311 Victoria St. N., Kitchener, N2H 5E1

Phone: Fax:

Reports to be sent to:

1. Email: yaroslav.chudin@cvdengineering.com

2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Regulation 406
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture

☐ Regulation 558

☐ CCME

☐ Sewer Use ☐ Sanitary ☐ Storm
Region

☑ Prov. Water Quality Objectives (PWQO)

☐ Other
Indicate One

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT

**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CSR

Project Information:

Project: 1495

Site Location: 968 St. David St. N, Fergus

Sampled By: Y.C

AGAT Quote #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis

Is this submission for a **Record of Site Condition (RSC)**? ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☑ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:

Contact:

Address:

Email: ap@cvdengineering.com

Legal Sample ☐

Sample Matrix Legend

GW	Ground Water	**SD**	Sediment
O	Oil	**SW**	Surface Water
P	Paint	**R**	Rock/Shale
S	Soil		

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	BTEX, F1-F4 PHCs	VOC	PAHs	PCBs: Aroclors ☐	O. Reg 406: Regulation 406 Characterization Package	pH, Metals, BTEX, F1-F4	EC, SAR	Regulation 406 SPLP Rainwater Leach mSPLP: ☐ Metals ☐ VOCs ☐ SVOCs ☐ OC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Corrosivity: ☐ Moisture ☐ Sulphide	"Routine Water Analysis" Package							Potentially Hazardous or High Concentration (Y/N)
1. PH1	Mar 11/24	11:30 AM PM	3	GW		N													✓						
2. PH5	"	12:30 AM PM	3	"		N													✓						
3. PH6	"	1:45 AM PM	3	"		N													✓						
4. PH7	"	3:15 AM PM	3	"		N													✓						
5.		AM PM																							
6.		AM PM																							
7.		AM PM																							
8.		AM PM																							
9.		AM PM																							
10.		AM PM																							
11.		AM PM																							

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Yaroslav Chudin	Mar 13/24	1:00 pm		Mar 13	1:46
Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time

Page 1 of 1

N°: T-153484

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT

APPENDIX G

MECP Well Records

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 | 6709834 | MUNICIP 67009 | CON. CON | 16

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON BLOCK, TRACT, SURVEY, ETC	LOT
Wellington	Nichol	XVI	17

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
Fergus PUC	P.O. Box 10, Fergus, Ont. N1M 2W7	DAY 15 MO 5 YR 89

21 | ZONE | EASTING | 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
Brown	Clay	Fill, Gravel Silt		0	18
Brown	Clay	Gravel		18	24
Grey	Clay	Gravel		24	84
Grey	Limestone			84	165
Brown	Limestone			165	213
Grey	Limestone			213	225
Brown	Limestone			225	232
Lt.Grey	Limestone			232	315
Brown	Limestone			315	378
Grey	Limestone			378	400
White	Limestone			400	402

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
128' - 402'	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
12	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.375	109.5 +1.5	109.5
11	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC	109.5	109.5	402
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
-	- INCHES	- 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	109.5	12" casing cemented
		in 18" dia. open hole

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	350 GPM	24 HOURS - MINS

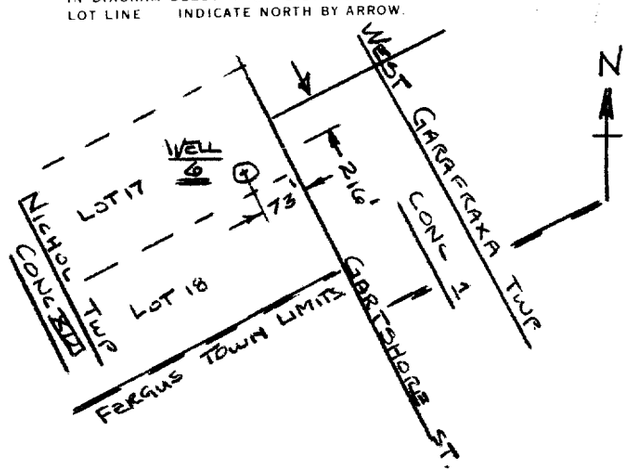
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING 1 ☐ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
57.51 FEET	153.29 FEET	109.52 FEET	112.41 FEET	- FEET	115.75 FEET

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	250 FEET	300 GPM

LOCATION OF WELL 6

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



31325

DRILLERS REMARKS

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

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
International Water Supply,Ltd.	2801
ADDRESS: 342 Bayview Dr., Barrie, Ont. L4M 4T5	
NAME OF WELL TECHNICIAN: R.C. Magee	WELL TECHNICIAN'S LICENCE NUMBER: T0117
SIGNATURE OF TECHNICIAN/CONTRACTOR	SUBMISSION DATE: DAY 14 MO 07 YR 89

OFFICE USE ONLY

DATA SOURCE	CONTRACTOR	DATE RECEIVED
	2801	JUL 20 1989
DATE OF INSPECTION	INSPECTOR	
REMARKS		

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

6710068 MUNICIP 67009 CON. CON 15

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

11

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Wellington	Nichol	XV	20

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
W. Dixon & Sons Ltd.	745 St. David St. N., Fergus, Ont. N1M 2L1	DAY 29 MO 02 YR 89

21 ZONE | EASTING | 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	TO
	Gravel	Fill		0	3
Br.	Clay	Stones		3	20
Gr.	Clay			20	30
Gr.	Clay	Stones		30	77
Br./Gr.	Limestone			77	96
Gr.	Limestone			96	125
Br.	Limestone			125	265

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
225 to 265	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	TO
6 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	85
6 1/8	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		85	265
	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.)

PUMPING TEST

71

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER — AIR

PUMPING RATE: 20 GPM

DURATION OF PUMPING: 1 HOURS 15 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
97 FEET	140 FEET	140 FEET	140 FEET	140 FEET	140 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

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

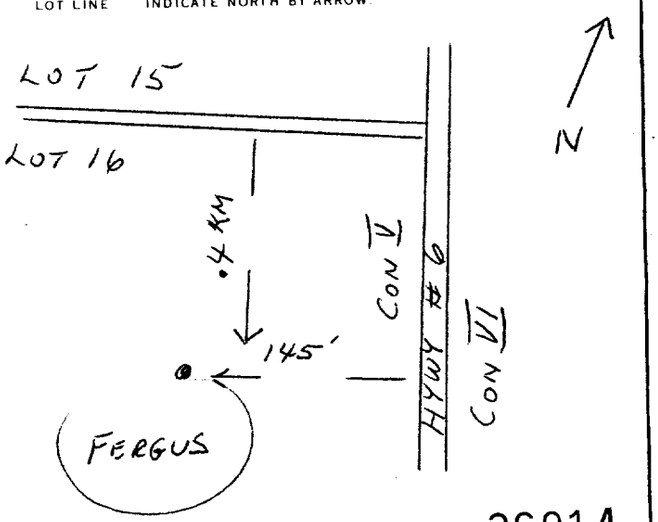
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 160 FEET

RECOMMENDED PUMPING RATE: 18 GPM

LOCATION OF WELL

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



36914

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 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☒ COOLING OR AIR CONDITIONING 9 ☐ NOT USED ☐ 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 ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Langdrill Drilling Ltd. — WELL CONTRACTOR'S LICENCE NUMBER: 3317

ADDRESS: R.R.1 Dundalk Ont.

NAME OF WELL TECHNICIAN: ROY LANG — WELL TECHNICIAN'S LICENCE NUMBER: T-0158

SIGNATURE OF TECHNICIAN/CONTRACTOR: R. Lang — SUBMISSION DATE: DAY 31 MO 10 YR 89

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 3317 | DATE RECEIVED: NOV 15 1989

DATE OF INSPECTION | INSPECTOR

REMARKS

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

25 -97

11 6712246 Municipality 67009 Con. CON 15

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	NICHOL TWP	15	18

Address: P.O. BOX 6 FERGUS, ONT N1M-2W7

Date completed: 21 day 05 month 97 year

Northing | MC | 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
BROWN	SAND			0	30
GREY	CLAY	SAND		30	50
GREY	CLAY	GRAVEL		50	94
BROWN	ROCK			94	115
GREY	ROCK			115	140
			TOTAL DEPTH	140'	
		6" DRIVE SHOE.			

41 WATER RECORD

Water found at – feet	Kind of water
	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	.188	+1	95
6"	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		95	140
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter	Length
	inches	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	25	BENTONITE

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer
Pumping rate: 3 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
44 feet	125 feet	125 feet	125 feet	125 feet	125 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 pump rate
☐ Shallow ☒ Deep	135 feet	3 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

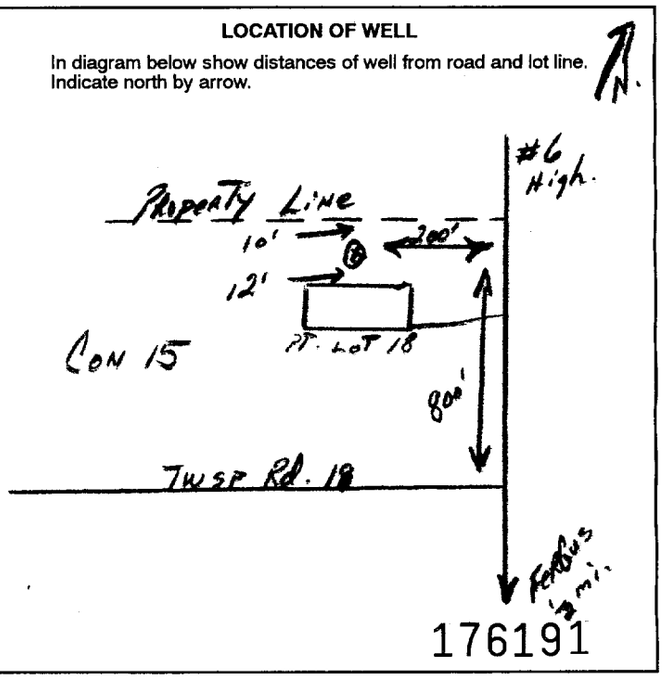
1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

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.



176191

Name of Well Contractor	Well Contractor's Licence No.
GRAHAM WELL DRILLING LTD	2336
Address: RR#5 ROCKWOOD, ONT. N0B-2K0	
Name of Well Technician: Jim Wilson	Well Technician's Licence No. T-1924
Signature of Technician/Contractor: Robert W. Graham	Submission date: 030 day 05 mo 97 yr

MINISTRY USE ONLY

Data source	Contractor	Date received
	2336	JUN 27 1997
Date of inspection	Inspector	
Remarks		

CSS. S

0506 (07/94) Front Form 9

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Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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

11 (1 2) 6713078 Municipality 67009 (10 14) Con. CON 16 (15 22 23 24)

64-99

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
WELLINGTON	NICHOL TWP	16	16

Owner's surname (28-47) First name	Address	Date completed (48-53)
1188521 ONTARIO LTD	142 South River Rd. ELORA, ONT.	26 day 08 month 99 year

21 (1 2) U T M Zone (10) Easting (12 17) Northing (18 24) RC (25) Elevation (26 30) RC Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	SAND			0	25
GREY	CLAY	STONES		25	70
GREY	CLAY	GRAVEL		70	83
BROWN	ROCK			83	115
GREY-BROWN	ROCK			115	190
			TOTAL DEPTH	190'	
		6" DRIVE SHOE			

31 (10 14 15 21) 32 (32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water
190 (10-13)	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (14)
(15-18)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (19)
(20-23)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (24)
(25-28)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (29)
(30-33)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (34) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6" (10-11)	1 ☒ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+1	84 (13-16)
6" (17-18)	1 ☐ Steel (19) 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		84	190 (20-23)
(24-25)	1 ☐ Steel (26) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			(27-30)

SCREEN

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

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0 (10-13)	25 (14-17)	BENTONITE.
(18-21)	(22-25)	
(26-29)	(30-33) (80)	

71 PUMPING TEST

Pumping test method (10)	Pumping rate (11-14)	Duration of pumping (15-16 Hours 17-18 Mins)
1 ☒ Pump 2 ☐ Bailer	7 GPM	1 Hours 0 Mins

Static level	Water level end of pumping	Water levels during (25) 1 ☒ Pumping 2 ☐ Recovery			
80 feet (19-21)	120 feet (22-24)	15 minutes (26-28)	30 minutes (29-31)	45 minutes (32-34)	60 minutes (35-37)
		93 feet	104 feet	115 feet	120 feet

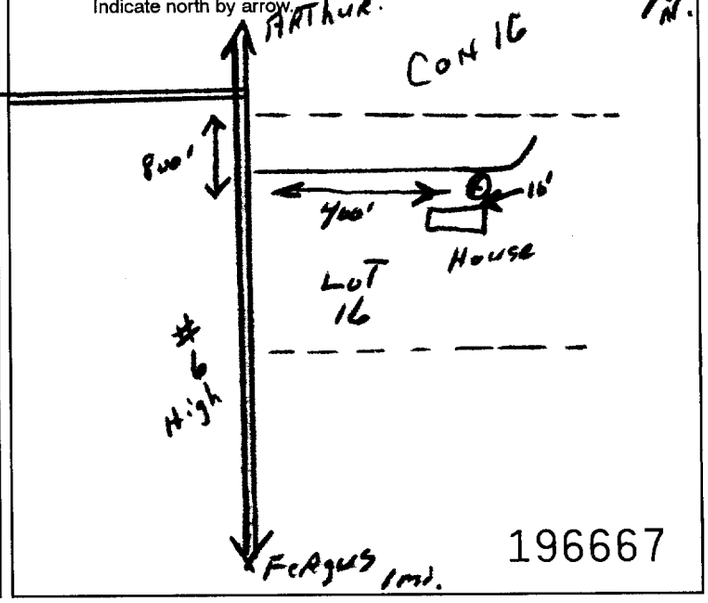
If flowing give rate (38-41)	Pump intake set at	Water at end of test (42)
GPM	feet	☒ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting (43-45)	Recommended pump rate (46-49)
☐ Shallow ☒ Deep	130 feet	7 GPM

(50-53)

LOCATION OF WELL

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



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FINAL STATUS OF WELL (54)

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 (55-56)

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

METHOD OF CONSTRUCTION (57)

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

Name of Well Contractor	Well Contractor's Licence No.
GRAHAM WELL DRILLING LTD	2336
Address: RR#5 ROCKWOOD, ONT. N0B-2K0	
Name of Well Technician: Jim Wilson	Well Technician's Licence No.: T-1924.
Signature of Technician/Contractor	Submission date: 031 day 08 mo 99 yr

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	2336	SEP 08 1999
Date of inspection	Inspector	
Remarks		

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

Ontario — Ministry of the Environment

Measurements recorded in: [x] Metric [ ] Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Tag#: A139028

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
6581 Hwy 6 N	West Garafraxa	12	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Wellington	Fergus	Ontario	N1M2M3

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	548508	4840521		

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	Sand			0	10.66
Grey	Clay & stones			10.66	29.87
Grey	Clay			29.87	32.30
Brown	limestone			32.30	54.25

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	10m	Bentonite Grout	.25

Method of Construction

[ ] Cable Tool [ ] Diamond
[x] Rotary (Conventional) [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[ ] 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
15.9	steel	188	+.50	33.2

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	
54.15 (m/ft) [ ] Gas	[ ] Fresh [x] Untested [ ] Other, *specify*	
(m/ft) [ ] Gas	[ ] Fresh [ ] Untested [ ] Other, *specify*	
(m/ft) [ ] Gas	[ ] Fresh [ ] Untested [ ] Other, *specify*	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	33.2	22.8
33.2	54.25	15.6

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): 175

Pumping rate (l/min / GPM): 5 IGPM

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 33.28

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

Recommended pump depth (m/ft): 175

Recommended pump rate (l/min / GPM): 5 IGPM

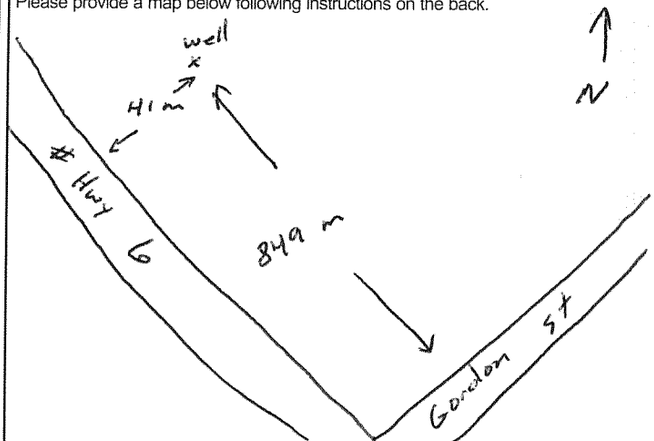
Well production (l/min / GPM):

Disinfected? [x] Yes [ ] No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	30.08		33.38
1	31.05	1	32.56
2	31.22	2	32.03
3	31.50	3	31.72
4	31.72	4	31.55
5	31.86	5	31.36
10	32.33	10	31.08
15	32.60	15	30.95
20	32.76	20	30.85
25	32.87	25	30.78
30	32.97	30	30.72
40	33.14	40	30.62
50	33.28	50	30.54
60	33.38	60	30.47

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.
Well Initiatives	7221

Business Address (Street Number/Name)	Municipality
15 Townline	Orangeville

Province	Postal Code	Business E-mail Address
ON	L9W3R4	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5198468289	Losch Kim

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T9217	Kim Losch	20130631

Well owner's information package delivered	Date Package Delivered	Date Work Completed
[ ] Yes [x] No	YYYY MM DD	20130613

Ministry Use Only

Audit No. Z159276

Receipt JUL 09 2013

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Ministry's Copy

APPENDIX H

Limitations of Report

STATEMENT OF LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.

2. The report has been prepared in accordance with generally accepted hydrogeological study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.

3. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond the control of CHUNG & VANDER DOELEN ENGINEERING LTD.

4. The objective of this report was to assess hydrogeological conditions at the site, within the context of our contract and hydrogeological assessment guidelines within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.

5. CHUNG & VANDER DOELEN ENGINEERING LTD. has relied in good faith on information and services provided by others while conducting the record search. We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omission, misinterpretation or fraudulent acts of the services used.

6. It should be noted that the observations and recommendations presented in this report are limited to the actual locations explored. The information presented in terms of the thickness and types of the subsoils encountered, groundwater levels, and chemical testing results, etc., are only applicable to the actual locations explored. Variations may be present between these locations. Should significant variation become apparent during later investigations, it may be necessary to reevaluate the findings of this report.

7. The conclusions of this report are based in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the site in locations not specifically investigated. Should such an event occur, CHUNG & VANDER DOELEN ENGINEERING LTD. must be notified in order that we may determine if modifications to our conclusions are necessary.

ENCLOSURES

Soil Abbreviations and Terms Used on Record of Borehole Sheets

TERMINOLOGY DESCRIBING COMMON SOIL TYPES:

Topsoil	-	mixture of soil and humus capable of supporting vegetation
Peat	-	mixture of visible and invisible fragments of decayed organic matter
Till	-	unstratified glacial deposit which may range from clay to boulders
Fill	-	soil materials identified as being placed anthropologically

CLASSIFICATION (UNIFIED SYSTEM)

Clay	<0.002mm		
Silt	0.002 to .075mm		
Sand	0.075 to 4.75mm		
		Fine	0.075 to 0.425 mm
		Medium	0.425 to 2.0 mm
		Coarse	2.0 to 4.75 mm
Gravel	4.75 to 75mm		
		Fine	4.75 to 19 mm
		Coarse	19 to 75 mm
Cobbles	75 to 300mm		
Boulders	>300mm		

TERMINOLOGY

Soil Composition	**% by Weight**
"traces"	<10%
"some"(eg. some silt)	10-20%
Adjective (eg. sandy)	20-35%
"and"(eg. sand and gravel)	35-50%

Standard Penetration Resistance (SPT): Standard Penetration Resistance ('N' Values) refers to the number of blows required to advance a standard (ASTM D1586) 51 mm Ø (2 inch) split-spoon sampler by the use of a free falling, 63.5 Kg (140lbs) hammer. The number of blows from the drop weight is recorded for every 15 cm (6 inches). The hammer is dropped from a distance of 0.76m (30 inches) providing 474.5 Joules per blow. When the sampler is driven a total of 45 cm (18 inches) into the soil, the standard penetration index ('N' Value) is the total number of blows for the last 30 cm (12 inches).

Dynamic Cone Penetration Resistance (DCPT): Dynamic Cone Penetration Resistance is similar to a SPT with the 474.5 Joule/blow impulse provided by the free falling hammer where the split-spoon sampler is replaced by a 51 mm Ø, 60˚ conical point and the number of blows is recorded continuously for every 30 cm (12 inches).

COHESIVE SOILS CONSISTENCY

	(kPa)	**(P.S.F.)**	**Nominal 'N' Value**
Very Soft	<12	<250	0-2
Soft	12-25	250-500	2-4
Firm	25-50	500-1000	4-8
Stiff	50-100	1000-2000	8-15
Very Stiff	100-200	2000-4000	15-30
Hard	>200	>4000	>30

RELATIVE DENSITY OF COHESIONLESS SOIL

	'N' Value
Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

MOISTURE CONDITIONS:

Cohesive Soil
DTPL- Drier than plastic limit
APL- About plastic limit
WTPL- Wetter than plastic limit
MWTPL- Much wetter than plastic limit

Cohesionless Soil
Damp
Moist
Wet
Saturated

SAMPLE TYPES AND ADDITIONAL FIELD TESTS

SS	Split Spoon Sample (obtained from SPT)	**GS**	Grab Sample	**PP**	Pocket Penetrometer
		BS	Bulk Sample	**VANE**	Peak & Remolded shear
AS	Auger Sample	**TW**	Thin Wall Sample or Shelby Tube	**DMT**	Flat Plate Dilatometer

LABORATORY TESTS

SG	Specific Gravity	**S**	Sieve Analysis	**W**	Water Content
H	Hydrometer	**P**	Field Permeability	**K**	Lab Permeability
W_p	Plastic Limit	**W_l**	Liquid Limit	**I_p**	Plasticity Index
GSA	Grain Size Analysis	**C**	Consolidation	**UNC**	Unconfined compression

CHUNG & VANDER DOELEN
ENGINEERING LTD.

Enclosure A

FILE No: 1495

BOREHOLE No. 4

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Solid Stem Auger**
Size: **152 mm O.D.**
Date: **Jan 16 - 24** TO **Jan 16 - 24**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE
	Ground Elevation: **426.94 m**					
426.64	300 mm TOPSOIL					
0.30	firm to stiff, brown CLAYEY SANDY SILT trace gravel, trace topsoil DTPL	0.5		1	SS	5
425.89		1.0		2	SS	9
1.05	loose to compact, brown Fine SAND trace gravel, trace silt moist	1.5		3	SS	14
	---------- saturated	2.0		4	SS	6
		2.5				
		3.0		5	SS	8
		3.5				
		4.0				
		4.5		6	SS	10
		5.0				
		5.5				
		6.0		7	SS	21
	---------- silt seam, trace clay	6.5				
420.24						
6.70	End of Borehole	7.0				
		7.5				
		8.0				
		8.5				
		9.0				
		9.5				
		10.0				
		10.5				

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- 3.05 m long, 50 mm I.D. PVC screen with sandpack
- water level in monitoring well measured at 3.61 m depth on February 6, 2024, and measured at 3.56 m depth on September 18, 2024

PROJECT MANAGER: **EYC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 5

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Jan 16 - 24** TO **Jan 16 - 24**

SOIL LITHOLOGY

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL
	Ground Elevation: **425.61 m**		
425.43 0.18	180 mm TOPSOIL		
	loose, orangey brown SANDY SILT trace topsoil moist to wet	0.5 1.0 1.5	
423.76 1.85	loose to compact, brown Fine SAND trace silt wet to saturated	2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5	
417.36 8.25	---------- silt seam, trace clay End of Borehole	8.0 8.5 9.0 9.5 10.0 10.5	

SAMPLE

SAMPLE ID	TYPE	N-VALUE
1	SS	5
2	SS	4
3	SS	5
4	SS	7
5	SS	9
6	SS	9
7	SS	12
8	SS	13

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- 3.05 m long, 50 mm I.D. PVC screen with sandpack
- water level in monitoring well measured at 2.10 m depth on February 6, 2024, and measured at 2.27 m depth on September 18, 2024

PROJECT MANAGER: **EYC**

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ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 6

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Jan 15 - 24** TO **Jan 15 - 24**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	SHEAR STRENGTH (kPa) / PENETRATION RESISTANCE	WATER CONTENT (%)	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **424.53 m**						FIELD VANE: Peak ⊗ Rem. ×; LAB TEST: Unc. ■ P.P. □; 50 100 150 200; STANDARD ● DYN. CONE ○; 20 40 60 80	W_P W W_L; 10 20 30			
424.28	250 mm TOPSOIL										
0.25	loose to compact, orangey brown SILTY SAND, moist	0.5		1	SS	6				0.5	above-ground steel casing set in concrete
423.58											bentonite seal/50 mm I.D. PVC riser
0.95	moist --- compact, brown Fine to Medium SAND trace gravel, trace silt saturated	1.0		2	SS	12				1.0	
		1.5		3	SS	18				1.5	water level in monitoring well measured at 1.62 m depth on February 6, 2024, and measured at 1.90 m depth on September 18, 2024
		2.0								2.0	
		2.5		4	SS	20				2.5	
		3.0								3.0	3.05 m long, 50 mm I.D. PVC screen with sandpack
		3.5		5	SS	15				3.5	
420.58											
3.95	compact to loose, brown SILT, trace to some sand trace clay, occ. sand seams saturated	4.0		6	SS	11				4.0	
419.88		4.5								4.5	
4.65	stiff, grey CLAYEY SILT trace sand, APL	5.0		7	SS	8				5.0	
419.33											
5.20	End of Borehole	5.5								5.5	
		6.0								6.0	
		6.5								6.5	
		7.0								7.0	
		7.5								7.5	
		8.0								8.0	
		8.5								8.5	
		9.0								9.0	
		9.5								9.5	
		10.0								10.0	
		10.5								10.5	

PROJECT MANAGER: **EYC**

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ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 7

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Jan 15 - 24** TO **Jan 15 - 24**

SOIL LITHOLOGY

Ground Elevation: **421.82 m**

ELEV./ DEPTH (m)	DESCRIPTION
421.59	230 mm TOPSOIL
0.23	very loose to compact, brown SANDY SILT, trace gravel trace topsoil, wet to saturated
420.92	
0.90	compact, brown Fine SAND trace gravel, trace silt saturated
419.97	
1.85	stiff to hard, grey CLAYEY SANDY SILT DTPL
416.62	
5.20	End of Borehole

SAMPLE

SAMPLE ID	TYPE	N-VALUE
1	SS	3
2	SS	11
3	SS	12
4	SS	50
5	SS	53
6	SS	29

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS

- above-ground steel casing set in concrete; bentonite seal/ 50 mm I.D. PVC riser
- water level in monitoring well measured at 0.41 m depth on February 6, 2024, and measured at 1.14 m depth on September 18, 2024
- 1.50 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 8

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Jan 15 - 24** TO **Jan 15 - 24**

SOIL LITHOLOGY

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL
	Ground Elevation: **421.01 m**		
420.71	300 mm TOPSOIL		
0.30	compact, brown SILTY SAND, trace gravel moist to wet	0.5	
419.96		1.0	
1.05	compact to very dense, brown Fine to Medium SAND trace gravel, trace silt occ. clay seams saturated	1.5	
		2.0	
418.61		2.5	
2.40	hard to very stiff, grey CLAYEY SILT some sand trace gravel occ. silt seams DTPL	3.0	
		3.5	
		4.0	
		4.5	
415.81		5.0	
5.20	End of Borehole	5.5	
		6.0	
		6.5	
		7.0	
		7.5	
		8.0	
		8.5	
		9.0	
		9.5	
		10.0	
		10.5	

SAMPLE ID	TYPE	N-VALUE
1	SS	10
2	SS	11
3	SS	19
4	SS	51
5	SS	31
6	SS	21

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete; bentonite seal/ 50 mm I.D. PVC riser
- water level in monitoring well measured at 0.44 m depth on February 6, 2024, and measured at 0.73 m depth on September 18, 2024
- 1.50 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

Enclosure No.: 14
Sheet 1 of 1

FILE No: 1495

BOREHOLE No. 106

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24** TO **Sep 09 - 24**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **424.80 m**								
424.60	200 mm TOPSOIL								
0.20	loose, brown SANDY SILT, trace clay trace topsoil, wet	0.5		1	SS	8		0.5	above-ground steel casing set in concrete
424.00									bentonite seal/50 mm I.D. PVC riser
0.80	compact to dense, brown Fine to Medium SAND trace silt moist to wet ---------- saturated ---------- gravelly seam ----------	1.0		2	SS	11		1.0	
		1.5		3	SS	17		1.5	3.05 m long, 50 mm I.D. PVC screen with sandpack
		2.0						2.0	water level in monitoring well measured at 2.08 m depth on September 18, 2024
		2.5		4	SS	24		2.5	
		3.0						3.0	
		3.5		5	SS	13		3.5	
		4.0						4.0	
		4.5		6	SS	21		4.5	
		5.0						5.0	
		5.5		7	SS	35		5.5	
		6.0						6.0	
		6.5		8	SS	16		6.5	
418.25									
6.55	End of Borehole	7.0						7.0	DCPT conducted from 6.55± to 8.10± m depth
		7.5						7.5	
		8.0						8.0	
		8.5						8.5	
		9.0						9.0	
		9.5						9.5	
		10.0						10.0	
		10.5						10.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

PROJECT MANAGER: **EYC**

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311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 107

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

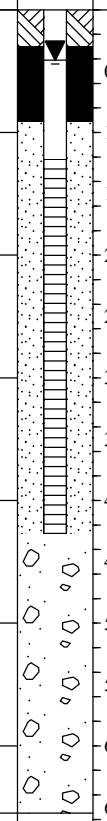
EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24** TO **Sep 09 - 24**

ELEV./ DEPTH (m)	DESCRIPTION (Ground Elevation: **422.93 m**)	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE
422.13	800 mm PEAT	0.5		1	SS	4
0.80	gravelly --- loose to compact, orangey brown SILTY SAND trace gravel, occ. silty sand seams wet to saturated	1.0		2	SS	14
		1.5		3	SS	8
420.73		2.0				
2.20	loose to compact, brown Fine to Medium SAND trace gravel, trace silt saturated	2.5		4	SS	8
		3.0		5	SS	17
418.98		3.5				
3.95	brown --- loose to compact, grey SILT trace to some sand, trace clay occ. to freq. clayey silt seams occ. cobbles saturated	4.0		6	SS	9
		4.5		7	SS	25
417.43		5.0				
5.50	hard, brown CLAYEY SANDY SILT TILL trace gravel DTPL	5.5				
		6.0		8	SS	45
416.38		6.5				
6.55	End of Borehole	7.0				
		7.5				
		8.0				
		8.5				
		9.0				
		9.5				
		10.0				
		10.5				

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30



DEPTH (m)

REMARKS

- above-ground steel casing set in concrete
- water level in monitoring well measured at 0.41 m depth on September 18, 2024
- bentonite seal/50 mm I.D. PVC riser
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 108

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24** TO **Sep 09 - 24**

SOIL LITHOLOGY

Ground Elevation: **424.74 m**

ELEV./ DEPTH (m)	DESCRIPTION
424.49	250 mm TOPSOIL
0.25	loose to compact, brown SANDY SILT occ. clay silt seams moist
423.39	
1.35	loose to compact, brown Fine to Medium SAND trace gravel, trace silt wet to saturated
419.99	
4.75	loose to compact, brown SILT trace sand, trace clay occ. clayey silt seams saturated ---------- grey
418.19	
6.55	End of Borehole

SAMPLE

SAMPLE ID	TYPE	N-VALUE
1	SS	5
2	SS	14
3	SS	14
4	SS	12
5	SS	10
6	SS	9
7	SS	14
8	SS	8

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS

- above-ground steel casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- water level in monitoring well measured at 1.83 m depth on September 18, 2024
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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311 Victoria Street North
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ph. (519) 742-8979, fx. (519) 742-7739

Enclosure No.: 17
Sheet 1 of 1

FILE No: 1495

BOREHOLE No. 109

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24** TO **Sep 09 - 24**

ELEV./ DEPTH (m)	DESCRIPTION (Ground Elevation: **422.66 m**)	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE
422.46	200 mm TOPSOIL					
0.20	compact, brown to grey SANDY SILT, trace clay trace topsoil, saturated	0.5		1	SS	10
421.86						
0.80	loose to compact, brown SAND AND SILT trace clay saturated	1.0		2	SS	13
		1.5		3	SS	8
	---------- some gravel	2.0		4	SS	7
419.76		2.5				
2.90	brown ---------- very loose to compact, grey SILT trace to some sand trace clay occ. clayey silt lenses/seams saturated	3.0		5	SS	6
		3.5				
		4.0		6	SS	3
		4.5				
		5.0		7	SS	11
417.16		5.5				
5.50	very stiff, grey CLAYEY SANDY SILT TILL trace to some gravel DTPL	6.0				
416.11		6.5		8	SS	25
6.55	End of Borehole	7.0				
		7.5				
		8.0				
		8.5				
		9.0				
		9.5				
		10.0				
		10.5				

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete
- water level in monitoring well measured at 0.41 m depth on September 18, 2024
- bentonite seal/50 mm I.D. PVC riser
- DCPT conducted from 1.50± to 4.55± m depth
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 110

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24** TO **Sep 10 - 24**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	WELL DATA	DEPTH (m)	REMARKS
	Ground Elevation: **422.92 m**								
422.62	300 mm TOPSOIL								
0.30	loose to compact, brown SANDY SILT to SAND AND SILT trace clay, trace topsoil saturated	0.5 1.0 1.5 2.0		1 2 3	SS SS SS	9 11 15		0.5 1.0 1.5 2.0	above-ground steel casing set in concrete; bentonite seal/50 mm I.D. PVC riser water level in monitoring well measured at 0.58 m depth on September 18, 2024 3.05 m long, 50 mm I.D. PVC screen with sandpack
420.77 2.15	brown --- loose to compact, grey SILT trace to some sand trace gravel, trace clay occ. clayey silt seams saturated	2.5 3.0 3.5 4.0		4 5 6	SS SS SS	9 10 10		2.5 3.0 3.5 4.0	DCPT conducted from 2.15± to 4.55± m depth
418.52 4.40	compact to very dense, grey SAND AND SILT TILL trace gravel, trace clay moist	4.5 5.0 5.5 6.0		7 8	SS SS	17 57		4.5 5.0 5.5 6.0	
416.37 6.55	End of Borehole	6.5						6.5	

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

PROJECT MANAGER: **EYC**

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ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 111

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24** TO **Sep 10 - 24**

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE
	Ground Elevation: **421.24 m**					
420.94	300 mm TOPSOIL			1	SS	10
0.30	compact, orangey brown SANDY SILT trace gravel, trace clay moist	0.5				
		1.0		2	SS	15
419.89						
1.35	stiff, brown CLAYEY SILT, trace gravel trace sand, occ. silt seams DTPL	1.5		3	SS	12
419.09		2.0				
2.15	compact, brown Fine to Medium SAND trace to some gravel trace silt saturated	2.5		4	SS	14
		3.0				
417.89				5	SS	12
3.35	brown silt seam ---------- stiff to hard, grey CLAYEY SANDY SILT TILL trace to some gravel trace sand occ. silt lenses DTPL	3.5				
		4.0		6	SS	23
		4.5				
				7	SS	25
		5.0				
		5.5				
		6.0				
414.69				8	SS	35
6.55	End of Borehole	6.5				
		7.0				
		7.5				
		8.0				
		8.5				
		9.0				
		9.5				
		10.0				
		10.5				

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete; bentonite seal/50 mm I.D. PVC riser
- water level in monitoring well measured at 0.67 m depth on September 18, 2024
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

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ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 112

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24** TO **Sep 10 - 24**

SOIL LITHOLOGY

ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL
	Ground Elevation: **422.30 m**		
422.10	200 mm TOPSOIL		
0.20	compact, orangey brown SAND AND SILT, trace gravel trace clay, wet to saturated	0.5	
421.50			
0.80	loose to compact, brown SILT trace gravel, trace sand trace clay saturated	1.0	
		1.5	
		2.0	
		2.5	
419.40			
2.90	compact to very dense, grey SANDY SILT TILL to SAND AND SILT TILL some gravel trace clay occ. clayey silt seams moist to wet	3.0	
		3.5	
		4.0	
		4.5	
		5.0	
416.80			
5.50	hard, brown CLAYEY SANDY SILT TILL trace gravel DTPL	5.5	
		6.0	
415.75			
6.55	End of Borehole	6.5	
		7.0	
		7.5	
		8.0	
		8.5	
		9.0	
		9.5	
		10.0	
		10.5	

SAMPLE

SAMPLE ID	TYPE	N-VALUE
1	SS	13
2	SS	12
3	SS	6
4	SS	13
5	SS	20
6	SS	46
7	SS	61
8	SS	35

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

DEPTH (m)

REMARKS

- above-ground steel casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- water level in monitoring well measured at 0.83 m depth on September 18, 2024
- 3.05 m long, 50 mm I.D. PVC screen with sandpack

PROJECT MANAGER: **EYC**

CHUNG & VANDER DOELEN ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

Enclosure No.: 21
Sheet 1 of 1

FILE No: 1495

BOREHOLE No. 113

Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24** TO **Sep 10 - 24**

ELEV./ DEPTH (m)	DESCRIPTION (Ground Elevation: **422.02 m**)	DEPTH (m)	SAMPLE ID	TYPE	N-VALUE
421.77 / 0.25	250 mm TOPSOIL				
	loose, brown SANDY SILT, trace gravel trace topsoil, trace clay, moist	0.5	1	SS	7
421.27 / 0.75	stiff, mottled brown CLAYEY SANDY SILT trace gravel occ. saturated sand seams	1.0	2	SS	9
		1.5	3	SS	13
419.87 / 2.15	DTPL	2.0			
	dense to very dense, grey SANDY SILT TILL to SAND AND SILT TILL trace to some gravel trace clay occ. saturated sand seams occ. clayey silt seams moist to wet	2.5	4	SS	31
		3.0	5	SS	59
		3.5			
		4.0	6	SS	69
417.62 / 4.40	hard, grey CLAYEY SANDY SILT TILL trace gravel occ. sand lenses DTPL	4.5	7	SS	61
		5.0			
		5.5			
		6.0	8	SS	36
415.47 / 6.55	End of Borehole	6.5			
		7.0			
		7.5			
		8.0			
		8.5			
		9.0			
		9.5			
		10.0			
		10.5			

SHEAR STRENGTH (kPa)
FIELD VANE: Peak ⊗ Rem. ×
LAB TEST: Unc. ■ P.P. □
50 100 150 200
PENETRATION RESISTANCE
STANDARD ● DYN. CONE ○
20 40 60 80

WATER CONTENT (%)
W_P W W_L
10 20 30

WELL DATA

REMARKS
- above-ground steel casing set in concrete
- bentonite seal/50 mm I.D. PVC riser
- 3.05 m long, 50 mm I.D. PVC screen with sandpack
- water level in monitoring well measured at 1.60 m depth on September 18, 2024

PROJECT MANAGER: **EYC**

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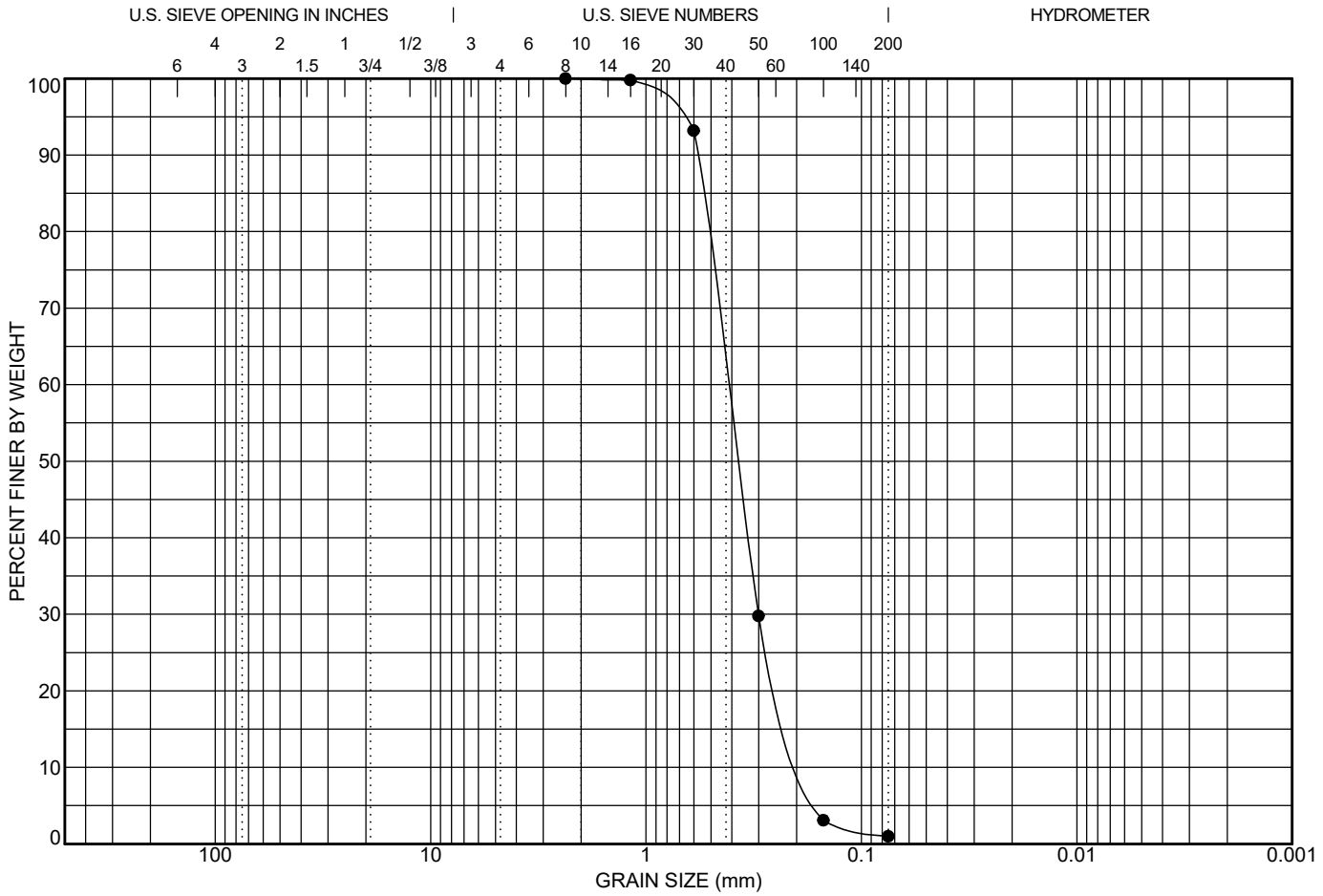

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.21	2.33	2.36	0.417	0.301	0.179	0.0	99.0	1.0	

Date: Sep. 25 - 2024
Client: PoloCorp Inc.
Contractor:
Source:
Sampled From: BH 106 - SA 5, 3.05 to 3.50 m depth
Sample No.: 106-5
Date Sampled: Sep. 09 - 2024
Sampled By: RS
Lab No.: 1035
Date Tested: Sep. 25 - 2024
Type of Material: Fine to Medium Sand, trace silt

Sieve Size (mm)	Percent Passing	No Specifications

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Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

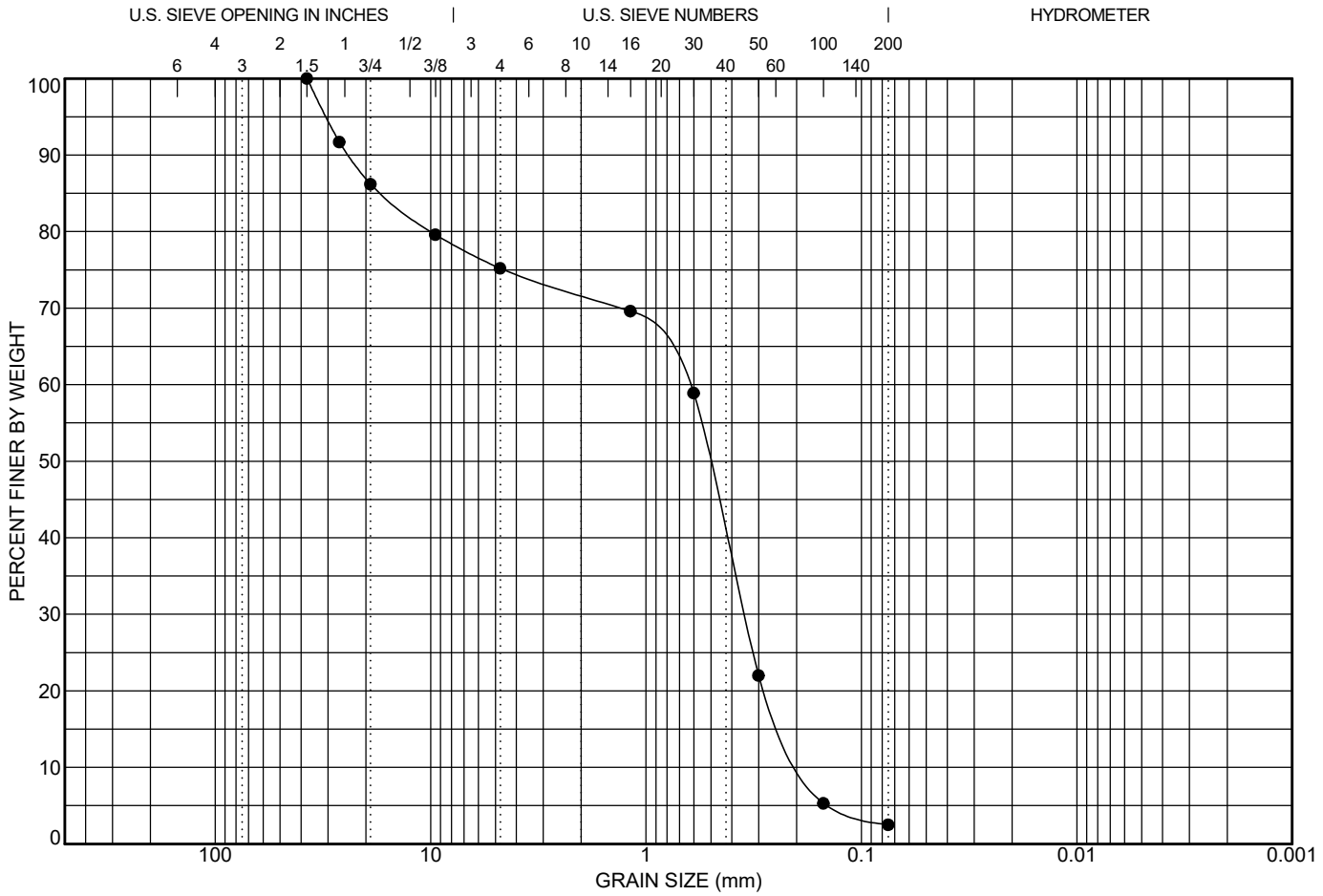
GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.04	3.53	37.5	0.643	0.349	0.182	24.8	72.7	2.5	

Date: Sep. 25 - 2024
Client: PoloCorp Inc.
Contractor:
Source:
Sampled From: BH 108 - SA 4, 2.30 to 2.75 m depth
Sample No.: 108-4
Date Sampled: Sep. 09 - 2024
Sampled By: RS
Lab No.: 1038
Date Tested: Sep. 25 - 2024
Type of Material: Gravelly Sand, trace silt

Sieve Size (mm)	Percent Passing	No Specifications

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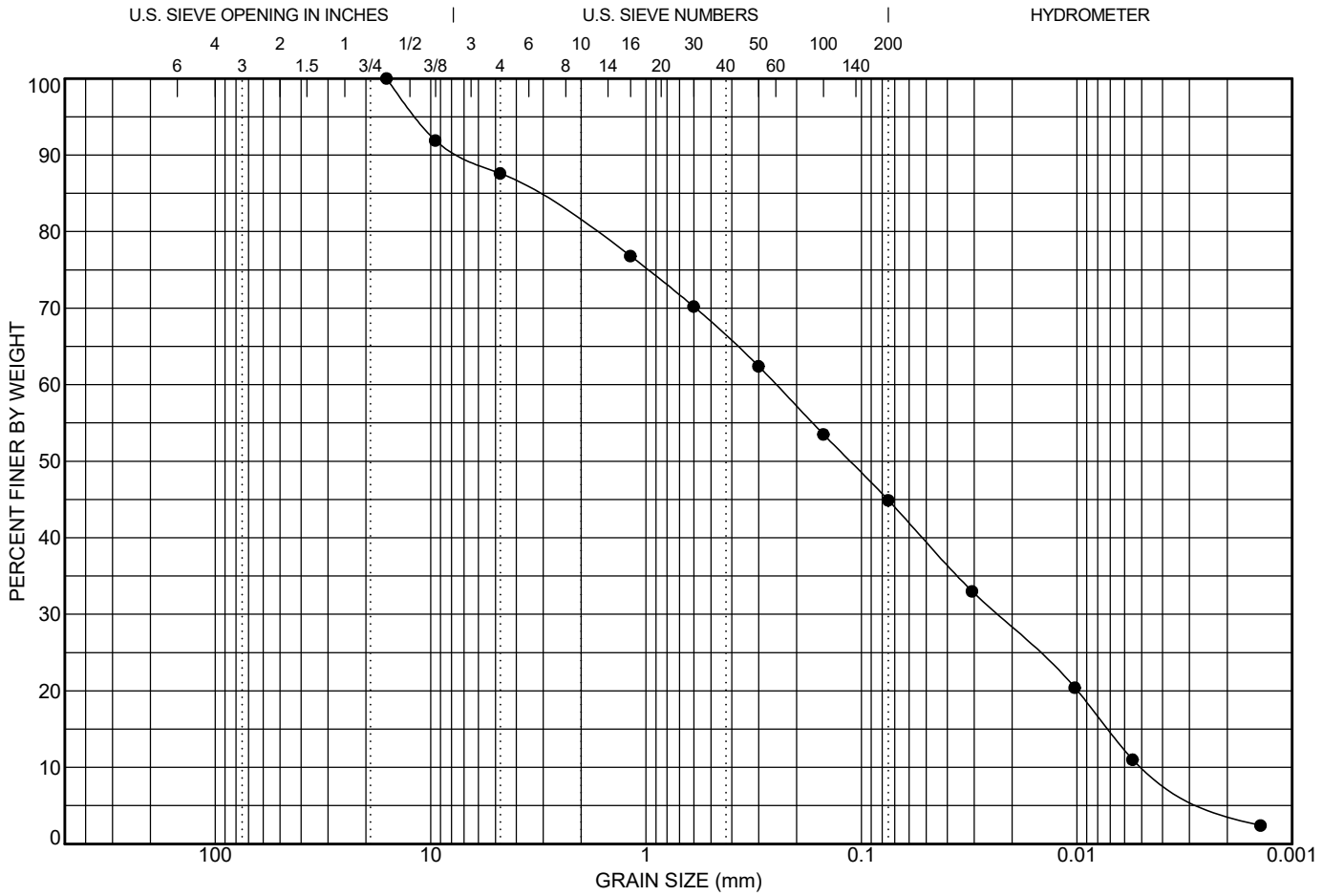
GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 25



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			0.48	53.05	16	0.249	0.024	0.005	12.4	42.7	44.9	

Date: Sep. 25 - 2024
Client: PoloCorp Inc.
Contractor:
Source:
Sampled From: BH 109 - SA 4, 2.30 to 2.75 m depth
Sample No.: 109-4
Date Sampled: Sep. 09 - 2024
Sampled By: RS
Lab No.: 1037
Date Tested: Sep. 25 - 2024
Type of Material: Sand and Silt, some gravel, trace clay

Sieve Size (mm)	Percent Passing	No Specifications

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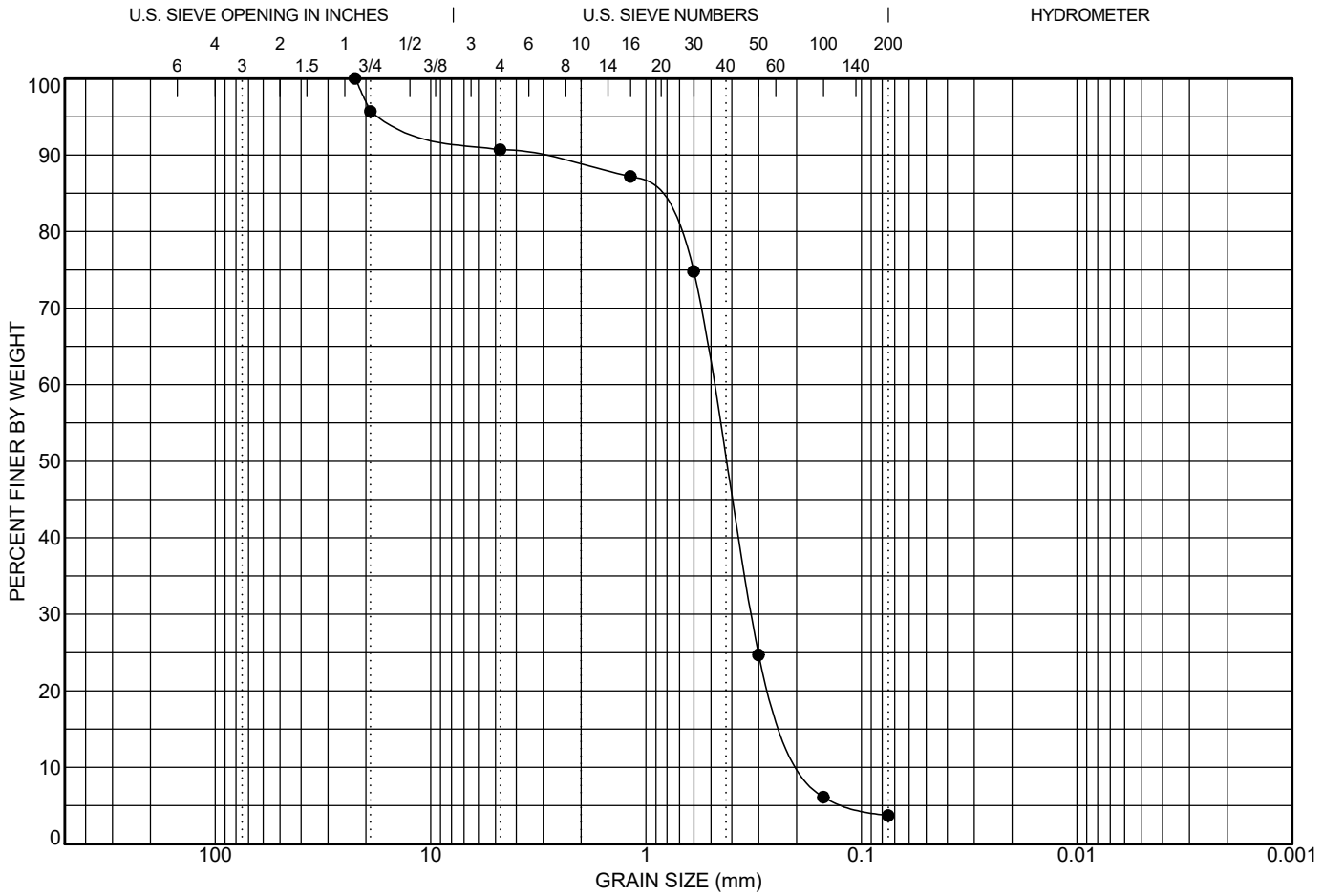
GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 26



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.23	2.82	22.4	0.489	0.323	0.173	9.3	87.0	3.7	

Date: Sep. 25 - 2024
Client: PoloCorp Inc.
Contractor:
Source:
Sampled From: BH 111 - SA 4, 2.30 to 2.75 m depth
Sample No.: 111-4
Date Sampled: Sep. 10 - 2024
Sampled By: RS
Lab No.: 1036
Date Tested: Sep. 25 - 2024
Type of Material: Fine to Medium Sand, trace gravel, trace silt

Sieve Size (mm)	Percent Passing	No Specifications

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GRAIN SIZE DISTRIBUTION

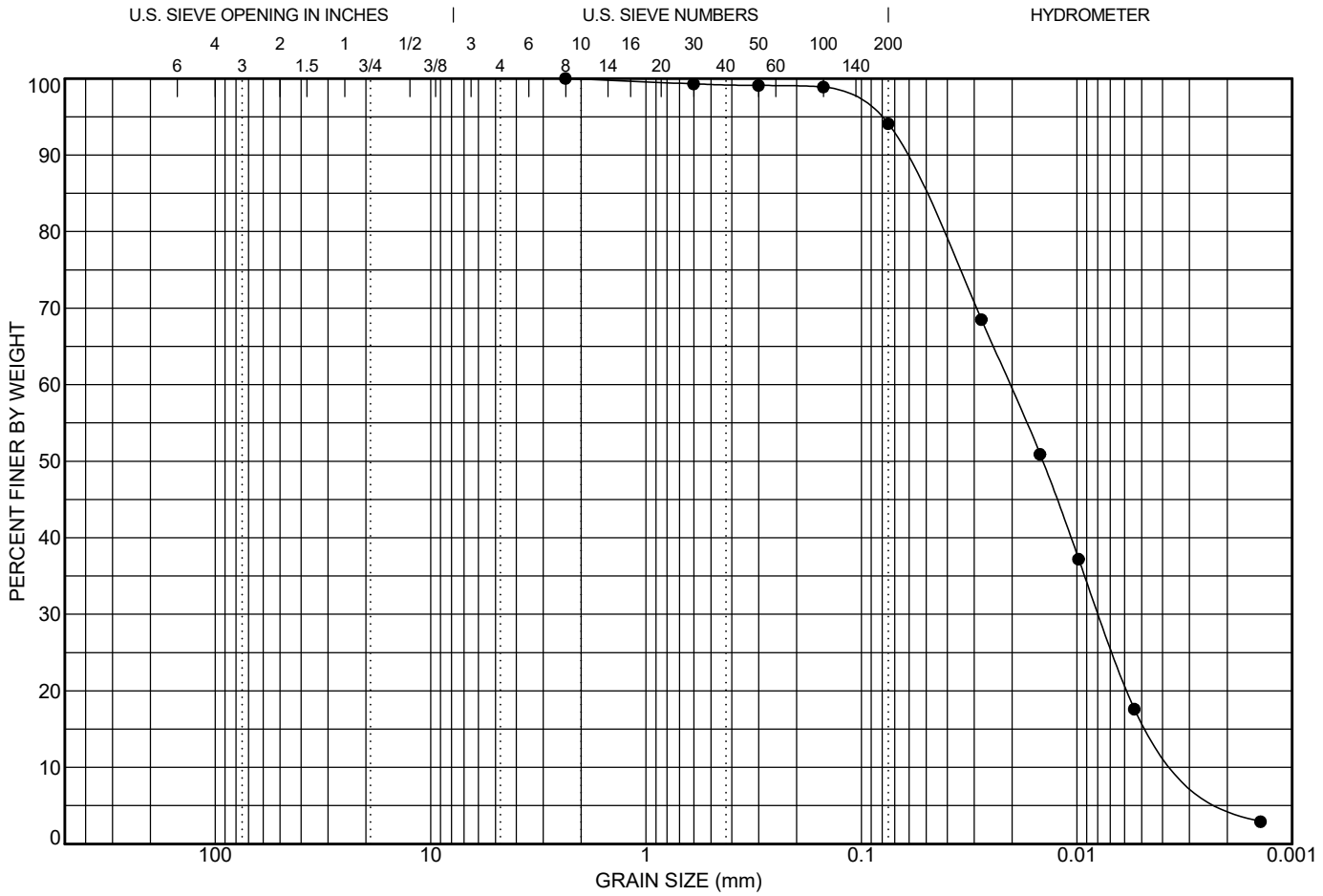
Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 27

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.13	7.62	2.36	0.02	0.008	0.003	0.0	5.9	94.1	

Date: Sep. 25 - 2024
Client: PoloCorp Inc.
Contractor:
Source:
Sampled From: BH 112 - SA 4, 2.30 to 2.75 m depth
Sample No.: 112-4
Date Sampled: Sep. 10 - 2024
Sampled By: RS
Lab No.: 1039
Date Tested: Sep. 25 - 2024
Type of Material: Silt, trace sand, trace clay

Sieve Size (mm)	Percent Passing	No Specifications

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GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 28