MONITORING WELLS INTALLATION AND FOLLOW-UP WORK

BIG CREEK, NORFOLK COUNTY

Prepared for: **NORFOLK COUNTY**

Prepared by: **MONTROSE ENVIRONMENTAL SOLUTIONS CANADA INC.**

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EXECUTIVE SUMMARY

Montrose Environmental Solutions Canada Inc. (Montrose; formerly Matrix Solutions Inc.) was retained by Norfolk County to drill up to six monitoring wells and seven micro-piezometers, install long-term pressure transducers in the monitoring wells, collect groundwater samples, near a previously abandoned gas well (F006207) that is thought to be associated with sulphur-rich groundwater that is discharging to ground surface on the Forestry Farm Road (FFR) property owned by Norfolk County.

The objective of this report was to present the results of the field investigation and data analysis, with the goal to improve understanding of the current and potential future conditions the subsurface near the FFR site. The work also included updating the existing numerical and conceptual models to include the new data gathered through this study.

This report outlines the methodologies used in the field and provides information on the extent and mechanisms of impact from legacy gas wells in the region.

A groundwater monitoring well network composed of six wells was successfully installed in March 2025 at three locations in the vicinity of the FFR site, enabling monitoring and detection of any significant change to the groundwater system in the future. Three have screens completed in the bedrock contact aquifer (referred to the "deep" series) and three that with shallower screens in the glacial overburden (referred to the "shallow" series).

Leveloggers were installed to measure hydraulic pressure in bedrock and overburden aquifers, and pumping tests were conducted to better characterize the contact aquifer transmissivity and its spatial distribution. In addition, the hydrochemical conditions were assessed to understand chemical variability and identify potential connections to legacy gas wells.

The numerical model was updated and redesigned using existing hydrogeological datasets and the new MNR Digital Terrain Model. This tool was deemed to have improved the representation of the measured hydraulic heads in the shallow and deep aquifers and historical gas wells. However, more calibration is required as discussed below.

The new hydrogeological information has allowed a better understanding of the nature and interrelationships between the various units existing near FFR site which are:

- Upper Interstadial Sediment (Sandy silt unit), which grades upward into the Norfolk sand exposed at surface and is hydraulically connected to it.
- Interstadial Clay. This is a major confining unit (aquitard) and was found in all three boreholes with thicknesses from 12.7 to 14.5 m. The Big Creek valley is significantly incised into this clay. Windows through the clay, filled with river alluvium, were reported in geotechnical boreholes drilled at the base of the valley during 1966 bridge construction 150 m east of the Spanjers spring site and 65 m north of the new monitoring well MW25-02.
- Lower Interstadial Sediment. This is interpreted to be a moderately thick (6.6 to 13.7 m), laterally extensive aquifer. It is important to the discussion because the hydrogen sulphide-impacted groundwaters that discharge to surface at FFR, and separately at Spanjers spring, must both transit this unit to reach surface.

At FFR the flow from the legacy borehole is thought to first travel horizontally in this unit for 10s of metres from a nearby legacy well source.

- Port Stanley Drift / Catfish Creek Drift. These are tills and related sediments and are of different ages but are considered here to represent a single hydrostratigrapic unit that represents an aquitard immediately overlying bedrock.
- Top of Bedrock. This is the contact aquifer and the well screens for all three of the deep monitoring wells installed as part of the project were completed in it.

Based on the findings of this study, it is now understood that the contact aquifer has limited transmissivity, but given its groundwater chemistry, has some degree of connectivity with the Dundee Formation karstic/fractured zone highly transmissive that was encountered in many gas wells and in the drilling for the previously attempted monitoring well on this site.

Other important determinations and outcomes include:

- Vertical gradients were determined to be upward from deeper aquifers to shallower zones, near the FFR and Spanjers spring, whereas they are downward at the McDowell Road drilling location, due to the elevated topography but also because the measurement point was above the confining clay unit.
- Conceptual and numerical model results indicate bedrock groundwater flow pathways toward FFR and Spanjers spring potentially range from north to east. The uncertainty remains high and would be reduced with a better calibration of the model against existing water levels.
- There is hydrochemical separation between shallow and deep groundwater, with deep wells (MW25-01D and MW25-02D) showing elevated sodium and chloride, and other chemistry suggesting significant impact from fluids originating in deeper bedrock formations.
- Sulphate isotopes suggest the presence of exogenic sulphate, supporting upward migration of sulphate-enriched groundwater, interpreted to be coming from the Queenston Formation.

The elevated pressures in the Lower Interstadial Sediment layer and its demonstrated connections to bedrock, which has higher pressures still, suggest that without a better understanding of the groundwater flow systems, plugging of the main FFR discharge site should be considered a high-risk activity that could result in new or increased flow of groundwater at other locations, such as the Spanjers spring. Increased flow through the shallower drift units would further complicate the ability to plug wells locally and control discharging water.

Preliminary interpretation suggests that deep, hydrogen sulphide-impacted groundwater contributing to Spanjers spring likely originates to the north or east if it travels horizontally through the bedrock contact aquifer. However, to reach surface, this groundwater must first transit the Lower Interstadial Sediment layer at FFR, Spanjers spring and the inferred groundwater discharge points in the base of Big Creek, north of MW25-02S and south or east of Spanjers spring. As a minimum, the flow must move vertically through this unit but at FFR and possibly the other surface discharge points, it may also move horizontally.

The following recommendations are made:

1. Groundwater sampling and analysis and downloading of pressure data should be carried out quarterly for one year, at the end of which should be an assessment and report detailing any changes recorded and implications thereof. As part of that scope, recommendations should be provided on the necessity and/or frequency of any future monitoring.
2. The numerical model of groundwater flow should be further calibrated with the specific intention of improving the reliability of flow directions and simulating a potentially karstic aquifer in bedrock with different hydraulic connectivity to the contact aquifer, to improve the understanding of the regional pressure responses in this aquifer.
3. To fully characterize potential additional groundwater discharge points within the Big Creek valley, we recommend that the creek be surveyed using a thermal camera 500 m prior to the bridge across Forestry Farm Road and an arbitrary point 500 m downstream of the FFR discharge site.
4. Notwithstanding possible groundwater discharge into the base of the creek, flows to surface appear to be smaller at the Spanjers spring site than at FFR by at least an order of magnitude, despite the concentrations of hydrogen sulphide being higher. Therefore, it would be significantly less risky to plug legacy gas wells that are contributing to the impact in the Spanjers spring area, if they could be located. We recommend a pivot in focus from the FFR discharge to the Spanjers spring site, first to find the legacy gas wells responsible for the source of reactants that generate hydrogen sulphide and then to prioritize them for plugging possibly as part of the Abandoned Works Program.
5. In the event that legacy wells are to be re-entered for the purpose of plugging, it would also be important to monitor, in near-real time, the effects of these activities on the local pressure regime and on the chemical composition at the known discharging sites, which include Spanjers spring and FFR locations.
6. Replace the existing culvert discharging groundwater at the FFR site and install a weir flow measurement device along with a pressure transducer that were purchased as part of this scope of work. Include data download and collection to the proposed monitoring schedule to obtain a continuous set of flow data throughout the one year of monitoring.
7. Considering the large flows at the FFR discharge site, the presence of additional groundwater discharge points, and our updated conceptual site model of the geology and hydrogeology, we do not recommend continuing attempts to plug the FFR discharge site without prior pressure mitigation in the bedrock and Lower Interstadial Sediment units, because of the risk of inducing additional or new groundwater discharge elsewhere in the Big Creek valley.

Additional recommendations that are out of the current scope are offered with respect to the long-term risk management plan of the FFR site. They are offered in good faith and without prejudice, in the hope of stimulating the discussion on the best path forward between stakeholders, on minimizing the ongoing environmental and human health concerns at this site and in the region.

We propose that in addition to the above-noted recommendations, the following proposed actions be taken in approximately this order:

1. Prioritize nearby gas wells for decommissioning as part of the abandoned works program based on their likely contributions to the impacted groundwater discharging at Spanjers spring, and based on the results of improved modelling. They should then be plugged in the order of the simulated lowest to highest risk, while carefully monitoring pressure at the monitoring wells (MW25-01 and MW24-02). Close coordination and discussions with the driller during the operations is also important to understand the system and minimize risk.
2. Contain existing flow and gas discharge with a temporary collection system and install a vacuum degasser. This could remove more than 90% of the H_2S, reduce or eliminate the off-site smell and hugely decrease the hydrogen sulphide loading on the aquatic surface environment. Such an endeavour would trigger the application of MECP air and water treatment requirements to unrealistically low standards and therefore a short-term exception should be sought from those requirements. Currently, hydrogen sulphide is entering the surface water environment at **tens of thousands of times above the regulatory limit** and reducing that by a factor of 10 in the short-term would likely be considered a worthy goal by all stakeholders.
3. Stop ongoing erosion at the current FFR discharge site by installing a nearby pressure relief well, the discharge of which should be connected to the vacuum degasser.
4. Initiate a technical working group with MNR, MOE, MOH, and Norfolk to work toward a long-term solution. With the recently increased understanding and improved tools it is now possible to consider permanent solutions. In addition to H_2S, discharging groundwater salt loading (i.e., sodium and chloride) is an important component to consider, has they should also be considered in any short-term or long-term solutions.
5. Subject to the committee's input and oversight, initiate an Environmental Assessment (EA) RFP to address the potential treatment and discharge of groundwater into Big Creek and the air and water quality requirements thereof. We recommend that the status quo be considered in the assessment as a benchmark by which to assess the outcomes of any proposed solutions.

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1 INTRODUCTION

Montrose Environmental Solutions Canada Inc. (Montrose; formerly Matrix Solutions Inc.) was retained by Norfolk County to drill and install three deep monitoring wells (approximately 50 m) and three shallow wells (approximately 25 m), collect groundwater samples, and to install seven micro-piezometers and conduct additional shallow micro-piezometer sampling near a previously abandoned gas well (F006207) that is thought to be associated with sulphur-rich groundwater that is discharging to ground surface on the Forestry Farm Road (FFR) property.

The objective of this report is to present the results of the drilling, monitoring well installation, and an additional study that analyzed data on the groundwater pressure regime; geology of the unconsolidated sediments overlying bedrock; the hydrogeological properties including hydraulic conductivity, pressure, and the chemistry of groundwater in the bedrock contact aquifer and shallow aquifer(s) in overburden.

The goal was to improve understanding of the current and potential future conditions in these aquifers near the FFR site. The work also included updating the pre-existing numerical and conceptual models of the subsurface to include the new data gathered from the monitoring wells and drilling program and additional data from surrounding oil and gas wells. This report also outlines the methodologies used for well and micro-piezometer installation and sampling and provides information on the extent and mechanisms of impact from legacy gas wells in the region.

2 BACKGROUND

At the FFR discharge site, H_2S-impacted groundwater is currently discharging from a 4 m wide hole, surrounded by a gravel and concrete pad, which is diverted through a series of pipes to a ditch to the east of the pad. Minor flow of H_2S-impacted groundwater was reported to have begun sometime after 2015 (Matrix 2021) at the FFR site and at a spring 500 m to the north on private property (Spanjers spring). It was also at this time that groundwater began discharging at ground surface at other legacy gas wells in the area, coinciding with the March 2015 decommissioning of a relief well (F020148) that had been passively discharging artesian flow into Big Creek since 1968. Contemporary flow rates at the relief well were estimated at 1,635 to 3,815 m^3/day.

Following decommissioning of the relief well, at least four gas wells or former gas wells in the region began to flow including T01245, T009949 Grant, T008725 Morrison, and T012512 Teichroeb, the latter of which had an estimated flow of 3,815 to 4,360 m^3/day, which was higher than that of the relief well. After these four wells were in turn decommissioned, the F005318 Edwards well began to flow at a reported rate of 265 m^3/day and the flow at the FFR site increased to a reported 55 m^3/day. Flow rate at the Spanjers spring also increased; however, the rate has not been characterized. The flow rate of the FFR discharge site was estimated again in 2023, after the Edwards well was initially sealed, to a value of 821 m^3/day.

3 GEOLOGY

3.1 Glacial Geological History

The glacial deposits in and around the FFR site were deposited during the last stage of glaciation that affected the region (i.e., Late Wisconsinan). The local stratigraphic sequence can be matched to a regional glacial history that

has been determined by Quaternary (surficial) mapping and investigations. The integration of the regional history with FFR site-specific data (i.e., drilling) allows an assessment of the character and lateral distribution of surficial units that influence and/or control, among other things, groundwater movement.

The oldest glacial sediments found in Norfolk County were deposited during the Nissouri Stadial, the oldest subdivision of the Late Wisconsinan. During this major glacial advance, which filled the entire Erie basin, ice deposited the Catfish Creek Till, outwash sand, and associated materials.

Warming climatic conditions during the following Erie Interstadial saw an eastward retreat of the ice and the formation of a successive series of glacial lakes in the Erie basin. Significant accumulations of clay and silt are presumed to have been deposited in these water bodies that covered southern Norfolk County.

A return to colder conditions marked the onset of the Port Bruce Stadial during which glacial ice once again occupied the Erie basin. This glacial advance deposited the Port Stanley Drift (PSD) which consists primarily of till with interbedded clay-rich units.

Following deposition of the PSD, the ice sheet receded toward the eastern end of the Erie basin during the Mackinaw Interstadial. Although glacial lake levels decreased during this warmer period the FFR site likely remained submerged.

During the latter part of the Mackinaw Interstadial, or early part of the following Port Huron Stade, the ice sheet re-entered southern Norfolk County area for the last time depositing Wentworth Till and forming the Paris Moraine. Although the Paris Moraine has been mapped on surface as far south as Lynedoch, it is a subtle, low-relief feature with little surface expression south of Delhi. The glacial lake(s) fronting the ice may have caused a floating ice-margin resulting in thin or no deposition of the Wentworth Till near the westernmost extent of this ice advance, which is placed near the position of Big Creek in the area of the FFR site.

Following deposition of the Wentworth Till the ice wasted back to the Ontario basin resulting in lower glacial lake levels in the Erie basin, although southern Norfolk County remained submerged. In the later part of the Port Huron Stade ice advanced to the eastern end of the Erie basin forming a high-level lake in which the large expanse of deltaic sand of the Norfolk Sand Plain was deposited.

Subsequent melting of the ice mass saw the final draining of glacial lakes in the Erie basin and the emergence of land across the entirety of Norfolk County. Immediately following the draining of the glacially controlled lakes a low-level lake with a water level significantly below the current Lake Erie level occupied the basin. During the existence of this low-level lake erosion by an early Big Creek cut down into the previously deposited glacial sediments to a level several metres below the current floor of the waterway.

3.2 Bedrock Geology

A sequence of Paleozoic bedrock formations underlies the study area. The Dundee Formation is the youngest bedrock unit in the area. It primarily consists of light brown-grey, fossiliferous limestone with minor dolostone, which are medium to thickly bedded and microcrystalline (Armstrong and Carter 2010) and bituminous in places. The upper surface of the Dundee Formation, which forms the bedrock-overburden interface, is interpreted to be highly fractured and potentially karstic. The thickness of this formation ranges from less than 2 m to approximately 47 m, with a thickness of about 45 metres near the FFR well (F006207), based on the well's record. A high groundwater flow zone with sulphur water was encountered in the first 5 m of the Dundee Formation during the

attempted installation of an earlier monitoring at the FFR site (Stevenson S., Bradco Drilling, February 23, 2021, pers. comm.). Similar high flow zones have been encountered in the Dundee Formation in a number of the nearby gas wells and these are interpreted to be karstic in nature.

To the west, the Dundee Formation is underlain by the Lucas Formation, but it appears that the Lucas Formation is either very thin or has pinched out entirely at the FFR site. It is composed of brown, microcrystalline limestone and dolostone with gypsum and celestite that in places has been weathered out to form karstic porosity (Armstrong and Carter 2010).

At this site, the Onondaga Formation either underlies the Dundee disconformably or underlies whatever remnant of the Lucas Formation that remains. The Onondaga Formation is laterally equivalent to the Amherstburg Formation to the west and north. It is primarily composed of cherty and fossiliferous limestone. In some areas, the formation is described as argillaceous due to the presence of clay-rich sediments (Armstrong and Carter 2010, Barnett 1982).

The Bois Blanc Formation lies below the Onondaga and consists of grey-brown, fossiliferous limestone and dolostone. These rocks are cherty, fine- to medium-grained, and display thin- to medium bedding (Barnett 1982, Armstrong and Carter 2010).

The Bass Islands Formation underlies the Bois Blanc and is predominantly made up of brown to grey dolostone. It is typically argillaceous and bituminous, with very fine to fine crystalline textures and minor fossil content. It can be significantly brecciated due to salt dissolution and collapse in the underlying Salina Group. In the study area, the formation is approximately 15 m thick (Armstrong and Carter 2010).

At the base of the sequence is the Salina Group, which consists of a sequence of evaporites (halite, gypsum, and anhydrite), shales, and carbonate rocks such as dolostone and limestone. The group has multiple salinification-upward cycles that start with carbonates, transition into gypsum/anhydrite, then salt and finally capped with shale layers (Armstrong and Carter 2010).

4 SCOPE OF WORK

The scope of this program was to:

- Develop a plan to identify and mitigate potential financial risks and safety hazards that may arise from drilling at these sites.
- Install and develop up to six monitoring wells; three deep wells in the contact aquifer and three shallow wells in an intermediate sand layer, through which groundwater may transit prior to discharge at the FFR site.
- Install seven shallow micro-piezometers on the FFR and Spanjers spring properties to facilitate groundwater sampling and to measure shallow groundwater formation pressures.
- Install down-hole leveloggers in each of the monitoring wells to measure hydraulic pressure in both bedrock and overburden aquifers.
- Collect groundwater samples from all monitoring wells and micro-piezometers to help identify the degree and nature of possible gas well impacts in the aquifers at the monitoring well locations.

- Conduct pumping and recovery testing at the three deep monitoring well locations to better characterize the contact aquifer transmissivity and its spatial distribution.
- Provide a report on the results of the program, which will include a qualitative update to the CSM and the implications thereof.

Additional scope, approved verbally by Norfolk County, involved updating existing conceptual and numerical models first presented to Norfolk County in 2021 (Matrix 2021).

5 METHODS

5.1 Drilling Program

The 2025 drilling program was completed in accordance with applicable industry standards, regulatory legislation, and Montrose health and safety standards.

Three locations close to the FFR discharge well were selected, each of which were targeted for one deep and one shallow well. The site location map is shown on Figure 1, and the regional potentiometric surface and borehole locations are shown on Figure 2. Coordinates and elevation for monitoring wells and micro-piezometers can be found in Table 1 and Table 2, respectively.

In preparation for the drilling program, Montrose initiated Ontario One Call public locate tickets and received the locate documentation for buried public utilities for the three proposed borehole locations, MW25-01, MW25-02, and MW25-03. Montrose retained Landshark Locates to complete private utility searches at the sites on February 5, 2025 and again on March 5, 2025 (due to the relocation of MW25-01 and MW25-02 after the February 5 site visit). A Montrose-prepared ground disturbance package was reviewed by Montrose field staff and a Montrose ground disturbance reviewer. One proposed borehole location, MW25-01, was deemed to be in conflict with a buried Bell cable and was moved 1.2 m off of the cable as marked in the field to be in compliance with ground disturbance safe approach limits.

Three boreholes were advanced into bedrock and three boreholes were advanced into glacial sediments (one pair of wells per location) between March 3 and 18, 2025, using a track-mounted sonic rig operated by Choice Sonic Drilling. Monitoring wells were installed in all six borehole locations in accordance with RRO 1990, Reg 903: *Wells*, as amended. Deep wells were advanced to a total depth of between 46 to 56 m, and completed between approximately 3 to 6 m into bedrock depending on what depth bedrock was encountered, and upon confirmation that water from the contact aquifer was present and rising in the borehole. Shallow wells were advanced to a total depth of between 27 to 36 m and completed in overburden sediments, targeting potential coarse-grained materials.

Each well was constructed using 51 mm inside diameter (ID), flush threaded Schedule 40 polyvinyl chloride well screen and riser pipe. The deep wells were screened across the bedrock contact aquifer, and the shallow wells were screened across an intermediate aquifer. Each well was completed with a stickup (i.e., the height the well rises aboveground) between approx. 0.6 and 1.0 m above ground surface and secured by a protective aluminum casing.

A packer capable of holding back more than 30 m of pressure head was installed in each of the six wells to prevent any potential artesian flow from reaching the surface. Water levels in the three shallow wells were below any levels that could reasonably support flowing conditions and therefore the packers were later replace with j-plugs.

A survey of all six monitoring well locations was completed by Montrose field staff on March 19, 2025 using a Trimble® R10 GPS and TSC7 controller. Top of casing and ground surface elevations were surveyed at each monitoring well. The coordinates of each monitoring well, measured in Universal Transverse Mercator (UTM) units as northing, easting and elevation, are presented on Table 1 and on the borehole logs (Appendix A).

5.1.1 Borehole Placement

Three general borehole locations were initially selected based on proximity to the FFR discharge site, elevation as it related to the regional potentiometric surface of the contact aquifer, land that is publicly owned, and accessible for a drill rig. The three general locations selected were within a public road allowance in front of 1860 12 Concession Rd (MW25-01), within a public road allowance of Forestry Farm Road, east of Forestry Farm Road and north of 1922 Forestry Farm Road (MW25-02), and on an area of public land on the northeast corner of the intersection of Forestry Farm Road and McDowell Road E (MW25-03), as shown on Figure 2. Neighboring landowners were consulted during the process.

On February 5, 2025, a field visit was conducted between Montrose, the drilling contractor, Norfolk County, neighboring property owners, and HydroOne to assess the feasibility of drilling at the proposed borehole locations. The locations of MW25-01 and MW25-03 were deemed to be suitable by all parties involved; however, the location of MW25-02 was deemed unfeasible due to proximity to a steep embankment and proximity to overhead hydro lines. A new location for MW25-02 was selected within the public road allowance of Forestry Farm Road, west of Forestry Farm Road, and north of 1925, bordering a farm field.

Exact placement of the boreholes within the generally selected areas was determined by Montrose field staff at the time of drilling based on ease of access for the drill rig, proximity to buried utilities as identified by public and private locates, and the confines of the public road allowances.

5.1.2 Borehole Logging and Sample Descriptions

Sonic drilling advances a core barrel and outer casing by means of rotation combined with high-frequency vibration and produces continuous 0.15 m (6-inch) diameter soil core throughout the depth of the borehole. Runs are typically 3.05 m (10 ft) in length, with the exception of the first run which in this case was typically 2.44 m (8 feet) due to the setup of the drill rig. When a run has been drilled the casing is removed from the hole in sections of up to 6.10 (20 feet) in length until the core barrel has been retrieved. Once the core barrel is out of the hole a plastic sleeve is fitted around the outside of the barrel and the driller vibrates the barrel, causing the soil to drop out of the bottom of the barrel into the plastic sleeve, which is cut off in 3.05 m (5 feet) lengths. The plastic sleeve is then fitted into a 6-inch diameter PVC half-shell and placed on a table for observation by Montrose field staff.

Once the soil core was placed on the table the plastic sleeve was cut open, the core was photographed, and logged in the following format:

PRIMARY CONSTITUENT: Secondary Constituents, Particle Size Range, Gradation, Particle Angularity, Plasticity, Dilatancy, Colour, Odour, Moisture, Consistency or Density, Structure, Additional Comments, Recovery

Following logging and sampling of each run the soil core was re-wrapped in plastic and taped shut, fitted with another 6-inch diameter PVC half-shell to encase the entirety of the soil core, capped and taped shut on both ends, and labelled accordingly. Soil core was delivered to a storage locker in Guelph where custody of the core was transferred to the Ontario Geological Survey (OGS).

5.1.3 Sample Intervals

One soil sample was generally collected per 3.05 m (5 feet) interval, or when changes in soil type were observed. Of these, select samples were submitted to the Bureau Veritas laboratory in Mississauga for analysis of particle size distribution, texture by hydrometer, and saturated hydraulic conductivity, as determined by the project manager upon review of the field logs.

5.1.4 Backfilling

All boreholes were completed as monitoring wells and were backfilled in accordance with RPO 1990, Reg 903: *Wells*, as amended. Generally, the annulus around the screen was backfilled with 10/20 cleaned silica sand to a minimum depth of 0.91 m (3 feet) above and below the screened interval. Bentonite chips were used to seal the screened interval above and below the sand, and a bentonite-cement grout mixture was used to backfill the majority of the well anulus above the bentonite chips. Well construction details can be found in the well logs in Appendix A.

5.1.5 Soil Cutting Disposal

As sonic drilling produces continuous soil core most soil cuttings were packaged and saved as soil core. Soil cuttings that were not packaged as soil core were spread around the ground at the drill site. As the locations of these boreholes were in virgin soil, located in rural areas, with no history of contamination, and per visual observations of the soil core, there was no indication that the soil would contain any contaminants of concern.

5.2 Well Development

5.2.1 Airlifting

Following the well installation of MW25-03, airlifting was conducted using an air compressor and 1.0-inch PVC hose to develop the well by purging drilling fluids and fine sediments from the filter pack and well casing. Development was undertaken to optimize hydraulic connection between the monitoring wells and the screened formations, and to minimize the suspended sediment load in any groundwater samples collected from the wells.

The airlifting flow rates were measured using a 20 L pail and timed using a stopwatch. Due to the surging nature of airlifting, flow rates are estimates as the flow rate was not constant during airlifting. The water was discharged to surface and not contained; therefore, the volume was not directly measured. The volume of water produced during airlifting was calculated using the estimated flow rate and time of airlifting.

Airlifting was conducted at:

- MW25-03D on March 10, 2025. The flow rate was estimated to be 6.46 L/min. The well was airlifted for 33 minutes and the calculated volume of water produced during airlifting was approx. 226 L. The water produced

contained a strong hydrogen sulphur (H_2S) odour, and a 4-gas monitor measured up to 24 ppm at the source of the spout. At a 1-metre distance from the spout H_2S was not detectable by the 4-gas monitor.

- MW25-03S on March 10, 2025. The flow rate was estimated to be 5.74 L/min. The well was airlifted for 50 minutes and the calculated volume of water produced was approx. 302 L.
- MW25-01D on March 13, 2025. However H_2S in the formation water became agitated and reached levels beyond the safe work limits at the source of the spout, so airlifting was discontinued.
- MW25-01S on March 13, 2025. For approx. 2 hours until it ran dry. Flow rate and volume were not calculated at this well.
- MW25-02S on March 18, 2025. For approx. 2 hours until it ran dry. Flow rate and volume were not calculated at this well.

Airlifting was not attempted at MW25-02D due to concerns around agitating H_2S in the formation water.

5.2.2 Hydrolift Pump Development

Due to concerns around H_2S in the formation water in bedrock wells, a Waterra Hydrolift pump with ½-inch Low-Density Polyethylene (LDPE) tubing was used to develop deep wells MW25-01D and MW25-02D instead of airlifting. The well was pumped to remove drilling fluids and fine sediments from the filter pack and casing and optimize hydraulic connection between the monitoring wells and the screened formations.

Pumping rates for the wells were estimated by timing how long it took to fill a 20 L pail. Pumping rates remained relatively consistent throughout pumping and total volume was estimated from pumping rates. Water was discharged at surface.

MW25-01D was developed on March 18, 2025. Prior to pumping, a 4-gas monitor measured up to 45 ppm at the top of casing after opening the well and removing the plug. The discharge line was set up a safe distance from the work area and H_2S levels were monitored. H_2S levels did not exceed 5 ppm at the discharge point. The flow rate was estimated to be 4.4 L/min, and the well was purged for about 1.25 hrs for a total volume of approximately 330 L.

MW25-02D was developed on March 18, 2025. Prior to pumping, a 4-gas monitor was placed at top of casing; no H_2S vapours were detected. H_2S concentrations of up to 99 ppm were measured at the discharge point. The flow rate was estimated to be 4.0 L/min. The well was developed for about 1.5 hrs for a total volume of approximately 360 L.

5.3 Well Packer and Levelogger Installation

Due to the risk of potential artesian groundwater flow and H_2S build-up in the wells, sealing devices designed to isolate and contain produced fluids and gasses in a well, commonly referred to as well packers, were installed at each well (see photographs, Appendix B). The well packers used by Montrose were designed to accommodate a direct-read cable to pass through the device to allow for data collection by a levelogger, and consist of a 2.45 m long stainless-steel tube, a locking nut, and a rubber seal at the base. Within the locking nut is a small rubber seal between two large metal washers that fit around the direct-read cable, preventing fluid or gas from moving up through the device. Once the direct-read cable and logger were in place, the packers were installed by placing

them into the well and rotating the packer to compress the rubber seal at the base. The well packers were commissioned from Well Busters Canada.

During a follow-up site visit on May 12, 2025, it was determined that there was no risk of artesian conditions in the three shallow wells and the packers were removed from MW25-01S, MW25-02S, and MW25-03S.

5.4 Hydraulic Response Testing

Hydraulic response testing was carried out on all newly constructed wells using the slug test method. A 1-metre slug (solid object to displace water) with a volume of 1.164 L was used. The Solinst leveloggers in each well were set to record at 1 second intervals for the duration of the testing and reprogrammed afterward. An initial manual water level was taken at each well and used to determine the depth to water, after which a length of string was measured to allow the slug to hang just above the waterline in the well. To start the test the slug was quickly lowered into the water so that the slug was completely submerge while remaining just below the waterline in the well. Manual water level measurements were taken, along with recorded logger data, to record the well's recovery to initial static water level. The slug was then removed, and manual water levels and logger data were recorded as water levels recovered to static levels once more.

5.5 Pumping Test

A pumping test was completed at MW25-02D on March 20, 2025. The pumping test used a Grundfos Redi-Flo 2 Submersible Groundwater Pump, set at a depth of 10 metres below top of casing (btoc). A Solinst M30 Levelogger was used to record the changes in head. The logger was hung at 17.83 m btoc and was connected to a direct-read cable to collect continuous measurements of absolute pressure readings at 5-second intervals.

The pump output was measured in Hz, and initial output was set to 201 Hz, which resulted in 10 to 11 L/min flow rates. After 25 minutes, output was increased to 211 Hz, resulting in a 12 L/min flow rate. This was done to further stress the well during testing and induce additional draw-down. The pumping test lasted a total of 55 minutes, after which the pump was shut off and the well allowed to recover.

5.6 Groundwater Elevation Data Acquisition

Manual groundwater elevation data was measured several times in each well following completion of the well installation and prior to installing leveloggers. A Solinst water level meter was lowered into the well until the meter started beeping, indicating the probe at the end of the measuring tape was in contact with water. A measurement was recorded from the top of the well casing to the depth of the water. The stickup from the ground surface to the top of the casing was also measured.

Solinist leveloggers (pressure transducers) were installed in each well, along with one barologger for the group of wells. The leveloggers were initially programmed to take water pressure and temperature measurements at a frequency of once per minute, and the barologger was programmed to take air pressure and temperature readings at the same frequency, from which water levels can be obtained through a series of calculations. After an initial period the leveloggers were reprogrammed to take measurements once every 15 minutes. The leveloggers will continue to collect data automatically until such a future time when it is decided they are no longer needed, and the data can be downloaded manually at any desired interval.

5.7 Micro-piezometer Installation

Seven micro-piezometers were installed at two separate locations, three at the Spanjers site and four at the FFR site (Figure 2), over the course of two days on March 3 and 4, 2025.

The micro-piezometers were installed in areas of presumed groundwater upwelling based on thermal imaging from previous visits at both sites. Installation of the micro-piezometers was completed when ponds at both sites were frozen, allowing access to areas of the ponds that would be inaccessible during warmer seasons. Areas of groundwater upwelling would also be easier to spot in the winter as warmer groundwater from the springs prevents ice from forming at surface, resulting in holes in the ice at the location of the upwelling.

At Spanjers site, all three micro-piezometers were installed in areas of presumed upwelling, which were free of ice. Micro-piezometers were installed approximately 30 cm into the pond bottom, and ¼-inch low flow tubing was installed for sampling.

At the Forestry Farm Road site, the upwelling was less apparent as the ponds were completely frozen over, and upwelling locations were estimated from hi-resolution thermal images. Piezometer installation at all four FFR upwelling sites required breaking through several cm of ice, and piezometers were installed to a depth of approximately 30 cm into the pond bottom. ¼-inch low flow tubing was installed for sampling.

Installation details for the micro-piezometers are available in Table 2.

5.8 Conceptual and Numerical Modelling

To update the conceptual site model, geological and hydrogeological data from the newly installed monitoring wells at locations MW25-01, MW25-02, and MW25-03 was incorporated into the existing three-dimensional (3D) geologic model (Matrix 2021). The model revision focused on a 1 km radius surrounding the new wells. Stratigraphic interpretations from these locations were used to refine the delineation of overburden hydrostratigraphic units above the bedrock surface.

Lithologic units were reclassified into six hydrogeologic layers, based on field observations and borehole logs. The Wentworth Drift, not encountered during drilling, was excluded from the revised local model but remains in the regional model where previously present. New unit boundaries were interpolated using Leapfrog Works software, and contact surfaces were generated based on interpreted depths at the boreholes. These surfaces were constrained by structural control points to ensure continuity with the existing regional model.

The ground surface topography was updated using a high-resolution (0.5 m) LiDAR-derived Ontario Digital Terrain Model. This revealed a 20 m incision of the Big Creek valley, particularly near the FFR well, and provided context for evaluating vertical hydraulic connectivity.

Historical geotechnical boreholes drilled near MW25-02 in 1966 were reviewed to further constrain unit boundaries and evaluate subsurface heterogeneity. These logs provided evidence of variable sediment textures, including sand, gravel, and alluvium, suggesting zones of higher permeability that may enhance hydraulic connectivity between shallow and deeper units beneath the creek.

Furthermore, a numerical model of groundwater flow for the FFR discharge site was previously developed by Montrose (Matrix 2021). This model was calibrated to historical groundwater flow data and was shown to

reasonably represent the groundwater flow system based on quantitative and qualitative performance criteria. Groundwater flow was simulated using the 3D FEFLOW v.7.2 simulator developed by DHI-WASY GmbH (DHI 2019).

The numerical model of groundwater flow was revised based on insights from the drilling program and associated hydraulic response testing. These revisions were conceptualized in three-dimensions using Leapfrog Works, a geologic modelling software (Seequent 2024). The updates to the 3D conceptual geologic model were ported into the FEFLOW groundwater flow model. The groundwater flow model was run in steady-state under present-day conditions to assess long-term groundwater flow directions to and from Spanjers Spring and the FFR discharge site. Hydrogeologic parameters in the updated model were assigned based on laboratory results and hydraulic testing and were not calibrated to historical data.

An unresolved limitation with the numerical model is that the interpreted karstic flow zones in the Dundee Formation that were encountered in nearby gas wells and during the attempted installation of an earlier monitoring at the FFR site (Stevenson S., Bradco Drilling, February 23, 2021, pers. comm.) have not been included in the model at this point in time.

5.9 Groundwater Sampling

Sampling was conducted at seven micro-piezometers, one spring in FFR, and in the six groundwater monitoring wells.

Attempts were made to collect samples directly from the micro-piezometers by inserting tubing in the micro-piezometers; however, fine sediments that comprised the pond's subsurface rapidly clogged the screens of the micro-piezometers, preventing the transmission of water into the piezometer. Therefore samples were collected directly from the pond, with tubing set at the bottom of pond using a light cloth wrapped around the tubing opening to act as a primary filter.

Prior to sampling monitoring wells, it is necessary to purge the water in the well to ensure water being sampled is a true reflection of groundwater conditions and not stagnant water that has been sitting in the well for an extended period of time. While purging the well, field parameters including temperature, electrical conductivity, pH, dissolved oxygen, oxidation-reduction potential (redox), and turbidity were monitored using a YSI® (model 600LXM) sonde with a handheld PC interface. The sondes are encased in a flowthrough-chamber system, which is submerged in a bucket containing the groundwater being pumped out of the well. Field parameters are continuously monitored, and purging continues until these parameters stabilize, indicating the pump is drawing fresh groundwater.

Once parameters stabilized, samples were collected by pumping groundwater through ½-inch diameter polyethylene tubing into laboratory supplied bottles. All samples were filtered using a high capacity 0.45 µm Waterra® filter, with the exception of the sample for bacterial analysis, which was not filtered. Some bottles contained preservatives dependent on the analysis to be conducted. Observations of the physical properties of the water (i.e., gaseous, colour, turbidity, odours etc.) and the field-measured parameters were recorded at the time of sampling. Samples were stored in a cooler with ice until delivered to the laboratory. Samples were submitted to ALS laboratories in Waterloo within 48 hours for general hydrochemistry analysis, and standard chain-of-custody procedures were followed.

Four additional groundwater samples were collected and stored for potential submission to the OGS for analysis of anions, metals, dissolved inorganic carbon (DIC), and dissolved organic carbon (DOC).

Additionally, a 1 L graduated glass sample bottle was used to collect a methane sample at each site by filling the bottle with groundwater to the 600 mL line, securely sealing the bottle, and storing separately from the other bottle sets, unrefrigerated. Methane (CH_4), hydrogen sulphide (H_2S), carbon-dioxide (CO_2), and oxygen (O_2) gas concentrations in the headspace were measured 24 hours after sampling, allowing for gas temperatures to equilibrate, using an RKI Eagle 2 multigas meter. The headspace measurements were used along with temperature measurements to calculate the methane concentrations according to protocols developed by the OGS (McIntosh et al., 2014, 2015).

H_2S concentrations were measured in the field using the methylene-blue method and a HACH model 2238-01 test kit on non-turbid (or filtered) water. This test involves matching a graduated colour wheel to the colour of the test solution, with darker blue colours indicating greater concentrations of H_2S. The lower detection limit of this measurement method is 0.01 ppm and its upper limit is 11 mg/L. If concentrations exceed this limit the solution becomes a pale blue or lilac colour, indicating dilution and re-testing of the solution is required. Field dilution reduces the precision of the method.

Three laboratories were selected to analyze the samples collected during this program, with specific types of analyses done by each laboratory:

- ALS (Waterloo, Ontario) - general hydrochemistry
- Isotope Tracer Technologies (Waterloo, Ontario) – Sulphur isotopes, Hydrogen and Oxygen isotopes (deuterium, tritium, and ^{18}O)
- Mundle Laboratories (Windsor, Ontario) – dissolved gas composition (methane, hydrogen sulphide), and methane isotopes

6 RESULTS

6.1 Drilling Program

6.1.1 Geological Description

All deep boreholes were completed in the Dundee Formation, described as a medium-bedded, brown, fine- to coarse-grained, weakly cherty, poorly fossiliferous limestone. Cores of the formation emitted a strong hydrocarbon (bituminous-like) odour.

Till overlies bedrock in all boreholes. The oldest material recovered was 4.8 m of Nissouri aged Catfish Creek Till (CCT) in borehole MW25-02D. The till appears as a dark grey, cobble and boulder rich unit with a silty sand matrix. A thin basal unit of similar texture was recovered at MW25-01D but due to limited thickness its assignment as CCT is uncertain.

Port Stanley Drift (PSD; Port Bruce Stadial) rests on bedrock in boreholes MW25-01D and -03D, and on CCT in MW25-02D. This grey coloured till predominantly consists of silty clay, with a low to moderate clast content and a high plasticity. In borehole MW25-03D till layers were interbedded with sub-metre thick beds of grey

glaciolacustrine silty clay suggesting deposition in an ice shelf environment. Thickness of the PSD ranged from 1.3 to 6.1 m. The clay-rich texture of the till indicates the depositing glacial ice overrode and incorporated significant amounts of fine-grained sediments deposited during the Erie Interstadial.

The PSD is capped by a moderately thick (6.6 to 13.7 m) sequence of silty sand to sandy silt. Thin clay beds, varying between approximately 2 and 5 cm thick, occurred at regular intervals in the lower portion of the unit. The texture and regularity of the sand-clay couplets suggests at least part of this unit was deposited in a near ice glaciolacustrine environment as proximal varves as the glacier retreated from the area.

In all boreholes the silty sand unit is overlain, and may grade into, a thick glaciolacustrine sequence that displays a generally upward fining succession of sandy silt to clayey silt to silty clay, the latter of which constitutes the majority of the unit. The unit ranges in thickness from 12.7 m at MW25-01D to 14.5 m at MW25-02D. The unit represents deposition in a deep lake environment and indicates the sediment source (i.e., glacial ice) was some distance away.

Resting on the clay is a silty sand to sandy silt unit; occasional thin, silty clay beds were noted in some cores. Sand in the unit is mainly restricted to fine to very fine size range. Unit thickness at MW25-01 and -02, the northern two boreholes, was 4.7 and 3.8 m, respectively. The thickening of the unit to 21.9 m at MW25-03, located approximately 1.5 km to the south of the other boreholes, may be due to the increased depth to bedrock of a shallow localized basin.

The sand-silt unit is believed to have been deposited during the latter part of the Mackinaw Interstadial, or early part of the Port Huron Stade, as the ice sheet advanced into the Erie basin, likely contemporaneously with the deposition of the Wentworth Till. The fact that Wentworth Till was not encountered in any of the boreholes indicates its distribution is largely restricted to the east of Big Creek in the area of the drill program.

The uppermost unit recognized in the drill core is the fine to very fine sand forming the regionally extensive Norfolk Sand Plain. The lower contact of this unit is arbitrarily set at the occurrence of an increased silt content. Using this criterion the unit ranges in thickness from 3.3 to 5.8 m. Deposition of the deltaic sand took place in the last high-level lake to occupy the Erie basin during the latter part of the Port Huron Stade.

6.2 Conceptual Site Model Revision

The 3D conceptual geologic model was updated using interpretations from MW25-01, -02, and -03 in an area extending to a 1 km buffer around the three locations. Table A shows the updated hydrogeologic unit structure in the study area from ground surface to the top of bedrock. No changes were made below the top of bedrock surface.

TABLE A Conceptual Site Model Hydrogeologic Unit Updates

Layer	Previous Model Hydrogeologic Unit	Study Area Hydrogeologic Unit	Regional Description [a]
1	Norfolk Sand Plain	Norfolk Sand Plain	Fine- to medium-grained sand with trace gravel deposited in large proglacial lake. Blanket of sand at surface across the study area.
2	Wentworth Drift	*Not present within study area*	Laminated clay and silt with ice-rafted debris, debris flow deposits, fine-grained lodgement till. Forms the core of the Paris and Galt moraines.
3	Upper Interstadial Sediment	Interstadial Sandy Silt	Coarse-grained glaciolacustrine sediment deposits in a shallow preglacial lake. Dips toward the Lake Erie basin
4	Interstadial Clay (Port Stanley Drift)	Interstadial Clay	Fine-grained package of laminated silty clay to sand (with common ice-rafted debris) interbedded with clay-rich diamict. Forms core of recessional moraines west of Big Creek valley.
5	Lower Interstadial Sediment	Interstadial Silty Sand	Very fine- to medium-grained sand with variable silt content.
6	Port Stanley Drift / Catfish Creek Drift	Lower Till	Interlaminated silty clay, clayey silt, sandy silt, and silty sand layers (with ice-rafted debris) interbedded with clay-rich diamict beds. These include the combined Port Stanley Drift / Catfish Creek Drift, which are considered one unit for the model.
7	Top of Bedrock	Top of Bedrock	

(a) From *Norfolk Gas Well Management* (Matrix 2021)

Overlying bedrock, the Port Stanley and CCT or drift are combined into one unit. The silty sand, clay, and sandy silt units observed in the study area are interpreted as interstadial (deposited during glacial recession). The PSD was previously modelled in Layer 4, based on regional interpretations for the Long Point Tier 3 model (Matrix 2015), but in the revised conceptualization this is interpreted as other fine-grained sediments within the model domain. As the Wentworth Drift was not encountered during drilling, this unit is absent in the updated study area but remains where it was present in the rest of the model domain.

Using meshing tools within Leapfrog Works, contact surfaces for each unit were generated using points assigned at interpreted depths at each well location. Surfaces were constrained with control points to enable a smooth transition between the updated surfaces near the wells and the existing 3D model surfaces outside the study area.

The ground surface topography was updated to the high-resolution (0.5 m), LiDAR-derived Ontario Digital Terrain Model (MNRF 2023). The Digital Elevation Model (DEM) indicates that the Big Creek valley is significantly incised (20 m) in the study area and near the FFR discharge site, with the creek thalweg typically located within hydrogeologic unit 4 (interstadial clay). Conceptual hydrogeologic units interpolated between the new boreholes do not include geologic data within the creek valley, but heterogeneity of sediments would likely exist beneath the present and past creek courses. Nine geotechnical boreholes were completed in 1966 for bridge construction near MW25-02 (TROW 1966). These extend from hydrogeologic unit 3 (interstadial sandy silt) through unit 4 (interstadial clay) and into unit 5 (interstadial silty sand) to a maximum depth of 18.8 m, and borehole logs are highly heterogeneous, including sand, silt, clay, gravel, and alluvial sediments. These boreholes provide evidence that there is likely higher conductivity sediments present beneath the creek thalweg in at least some locations that may connect the present creek with deeper aquifers such as hydrogeologic unit 5 (interstadial silty sand).

The updated conceptual geologic model is shown in cross-section on Figure 3 and 4, and in 3D on Figure 5.

6.3 Hydrogeological Conditions / Laboratory Results

Manual groundwater levels were measured to determine the depth to the water table, assess horizontal and vertical groundwater gradients, and groundwater flow direction. The groundwater level monitoring data collected in the monitoring wells and micro-piezometers is summarized in Tables 2 and 3 and hydrographs for each monitoring well are presented on Figures 6 to 8. Figure 9 provides the hydrograph for the 24-AG-176 water well that is not currently in use. Further discussion is provided in the following sections.

6.3.1 Monitoring Well Water Levels

Initial groundwater level measurements were collected at MW25-01, MW25-02, and MW25-03 prior to airlifting and well development activities. At MW25-01, water levels recorded on March 13, 2025, were 0.75 m below ground surface (bgs) in the deep well (MW25-01D) and 10.14 m bgs in the shallow well (MW25-01S), with subsequent readings confirming stable levels and an upward hydraulic gradient. Leveloggers (SN: 005-2206117 and 005-2206118) were installed at 20.28 mbtoc in both wells later that day. Additional manual measurements taken on March 18 and 20 showed minor variations in water levels, with MW25-01D remaining around 0.64 m bgs and MW25-01S at 10.62 m bgs.

At MW25-02, initial water level readings indicated 0.58 m bgs in the deep well (March 18) and 12.81 m bgs in the shallow well (March 19), also showing an upward gradient. Leveloggers (SN: 005-2206128 and 005-2206124) were installed at 20.28 mbtoc in both wells, with water levels in MW25-02D showing a gradual decline to 0.27 m bgs by March 20. For MW25-03, initial post-installation readings on March 7 showed a downward gradient, with MW25-03S at 3.88 m bgs and MW25-03D at 13.13 m bgs. These levels remained consistent on March 10, just before airlifting.

At MW25-03, leveloggers were installed in each well on March 7, with SN: 005-2206121 placed 10 m below the water level in MW25-03S, and SN: 005-2206120 positioned 6.09 m below the water level in MW25-03D (limited by cable length). A barologger (SN: 001-2206254) was also installed just below the surface in MW25-03S, so that long-term hydraulic response can be corrected for barometric pressure variations.

At MW25-01 and MW25-02, upward vertical hydraulic gradients were measured. MW25-01D had an average water elevation of 206.0 m asl, while MW25-01S average water elevation was 196.1 m asl. MW25-02D had an average water elevation of 206.8 m asl, while MW25-02S average water elevation was 193.2 m asl.

Shallow monitoring well MW25-03S, near McDowell Road, has the highest average water elevation at 217.4 m asl, whereas its deep counterpart (MW25-03D) had an average elevation of 207.0 m asl showing downward vertical hydraulic gradients and indicating this area is a recharge area for the contact aquifer.

Average groundwater elevations for the monitoring wells MW25-01S 196.1 m asl and MW25-02S 193.2 m asl, are higher than the approximate DTM elevations for the Spanjers spring mound (191.9 m asl) and the Big Creek water level at the location of the Spanjers spring (191.0 m asl). This indicates that the groundwater within the shallow sandy silt aquifer has the potential for also discharging at to Spanjers spring and Big Creek.

The groundwater elevation difference between MW25-01S and MW25-02S is notable considering they are completed in the same, apparently confined, hydrostratigraphic unit and that they are only 400 m apart. This suggests that there may either be pressure relief (discharge) or recharge points in the aquifer, and both are possible. A 1966 geotechnical report (TROW 1966) on the Big Creek bridge construction indicates there are

"windows" through the confining layer, apparently where earlier river erosion has removed it to be replaced by coarser sand alluvium. One borehole (Ontario Geotechnical Borehole ID 856435) located 65 m north of the MW25-02 location was drilled to 15.6 m depth and encountered only 1.7 m of clay and a second (ID 856429) drilled 80 m north and immediately adjacent to the creek encountered no clay and, in its place, alluvium to 17 m depth. Considering the proximity of these boreholes to MW25-02S, it is possible that the lower water level result from hydraulic connectivity (i.e., groundwater discharge) from the Lower Interstadial Sediment unit into the creek bed.

Pressure recharge points to the Lower Interstadial Sediment unit are also a possibility due to hydraulic cross-connections with the contact aquifer via legacy petroleum wells. The water level elevations at MW25-01D and 02D are 206.01 and 206.78 m asl, respectively. These demonstrate much more lateral consistency in bedrock water levels than exists in the Lower Interstadial Sand unit. They also show hydraulic pressures that are 10 and 13 m higher than those of the respective shallow monitoring wells. The corresponding upward vertical hydraulic gradients between the deep and shallow well screens at the two monitoring well sites are 0.86 and 0.83 m/m, respectively, which are very high. Even a small hydraulic connection, for example via an un-sealed legacy gas well, would result in transmission of some of this pressure, and a lot of sulphur water between the bedrock aquifer and the Lower Interstadial Sediment unit.

The OGSRL database shows there are six legacy gas wells within 500 m of each of the monitoring wells and most of these have no effective seal between the bedrock and ground surface, having been typically backfilled with "stones" or "cuttings". A legacy gas well (F006353) exists 65 m west-northwest of MW25-02S, almost directly in line with the Spanjers spring site, which is an additional 150 m away on the north side of Big Creek. If this borehole was a conduit for bedrock groundwater entering into the Lower Interstadial Sediment unit, it is possible that discharge to surface either into the creek bed or from the Spanjers spring would direct flow in the Lower Interstadial Sediment westward or northward. Capture of groundwater from the Lower Interstadial Sediment by these known or inferred discharge areas could account for the lack of hydrogen sulphide impact at either MW25-01S and 02S, despite very highly impacted water transiting that unit nearby in the Spanjers Spring area.

6.3.2 Laboratory Grainsize Distribution

Sixteen representative soil samples from the drilling program were submitted to Bureau Veritas laboratory in Mississauga for grainsize analysis. This data was reviewed to characterize the surficial sediments and estimate the hydraulic conductivity of the soils encountered. Grain size analysis results are provided in Table 4.

6.3.3 Hydraulic Conductivity Testing

The hydraulic responses of hydraulic conductivity testing were processed using AQTESOLV software. Slug testing used the Bower-Rice solution, while the pumping test used both Theis and Theis-Recovery analytical solutions.

The hydraulic conductivity results for the deep wells were consistent, ranging from 1.0×10^{-5} m/s to 6.56×10^{-6} m/s. A pumping test was conducted on MW25-02D, and the representative hydraulic conductivity value was similar to those of the slug test.

The shallow wells had lower hydraulic conductivity due to their installation in finer-grained sediments and ranged from 1.2×10^{-6} m/s to 5.8×10^{-8} m/s.

During installation of MW25-01S and MW25-02S a well sock was attached to the well screen in an attempt to limit fine-grained sediments from entering the wells, after noting fine sediments in the previously constructed MW25-03S. Following installation, the well sock became clogged with fine material, artificially lowering the hydraulic conductivity for MW25-01S and MW25-02S as determined by in-well testing. Hydraulic conductivity testing results for in-well pump and slug tests are available in Table B.

TABLE B Hydraulic Conductivity Testing Results

Well	Test Type	Solution	K (m/s)
MW25-01D	Slug Test	Bower-Rice	3.2×10^{-5}
MW25-01S[1]	Slug Test	Bower-Rice	5.9×10^{-8}
MW25-02D	Slug Test	Bower-Rice	6.6×10^{-5}
	Pumping Test	Theis	4.2×10^{-5}
	Pumping Test	Theis-Recovery	5.0×10^{-5}
MW25-02S[1]	Slug Test	Bower-Rice	9.3×10^{-8}
MW25-03D	Slug Test	Bower-Rice	1.1×10^{-5}
MW25-03S	Slug Test	Bower-Rice	1.2×10^{-6}

1: These wells were fitted with a well sock that appears to have become silted and is affecting K-values. The K-values for these wells are not representative of the formation.

6.4 Groundwater Geochemistry

A geochemical characterization of groundwater was undertaken to evaluate potential impacts from legacy gas wells within the study area. Groundwater results from the six monitoring wells installed in 2025, and from the recently installed micro-piezometers, were analyzed in order to investigate hydrochemical variability and identify potential connections to legacy gas wells. The chemistry of the new wells and recently installed micro-piezometers was compared against historical data from known gas-impacted wells (Spanjers Spring, Spanjers Well, FFR groundwater, and gas well sample 24-AG-176). The chemistry results are presented in Tables 5 to 9.

6.4.1 General Hydrochemistry

A Piper diagram (Figure A) illustrates distinct geochemical signatures between shallow and deep wells. Shallow wells (MW25-01S, MW25-02S, and MW25-03S) exhibit calcium-bicarbonate dominated facies with low total dissolved solids (TDS), consistent with ambient background groundwaters in the local area. Concentrations of calcium, magnesium, sodium, and potassium are variable within the shallow monitoring wells. In contrast, the deep wells (MW25-01D, MW25-02D, and MW25-03D) plot within the sodium-chloride type, and show distinct chemistry between them. While groundwater from well MW25-02D and, to a lesser extent, well MW25-01D, are similar to known gas-impacted wells such as the Spanjers Springs and FFR, well MW25-03D is similar to the chemistry of the shallow wells and the ambient groundwater of the region (Hamilton 2021).

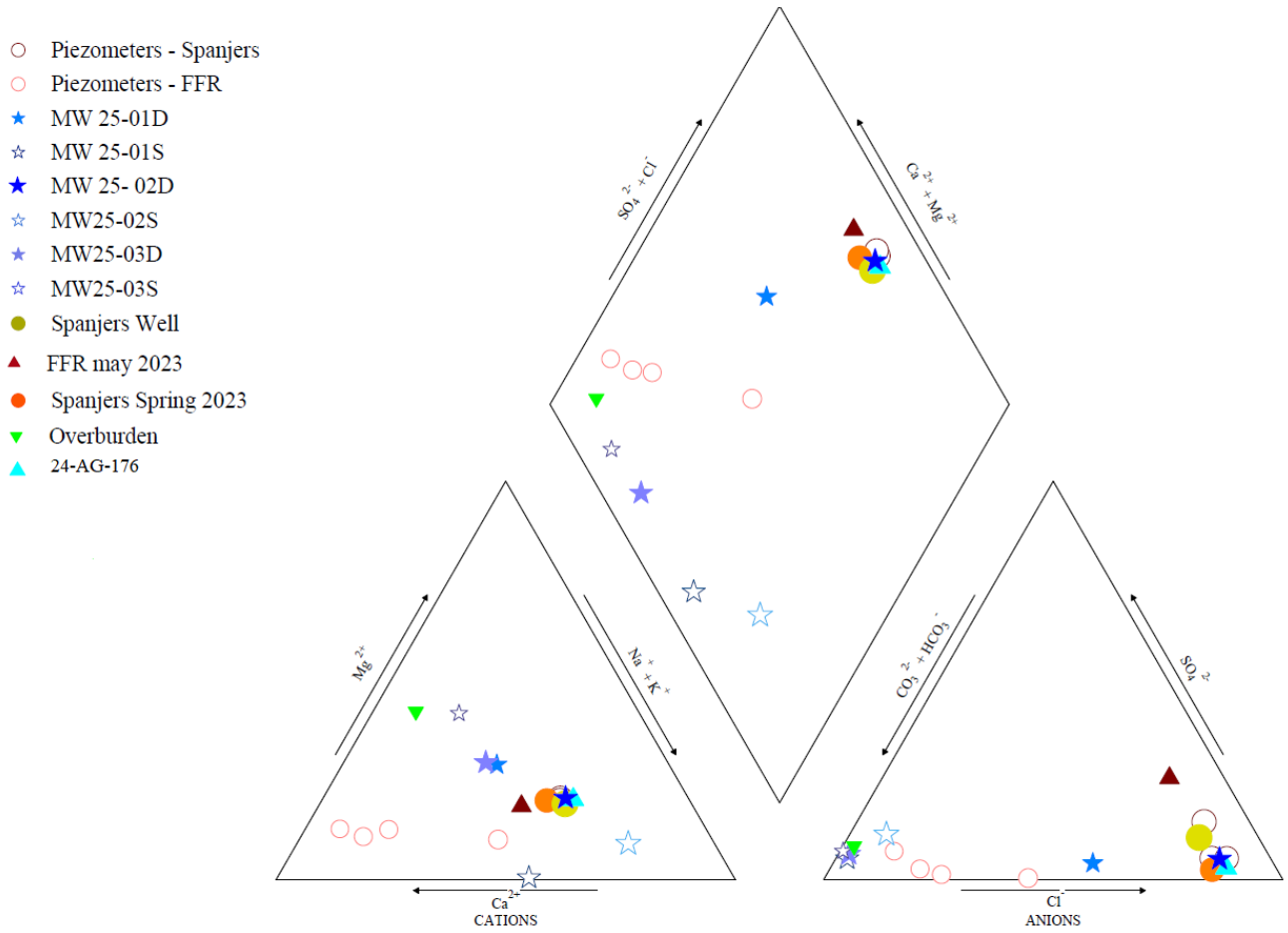

FIGURE A Piper Diagram Representing the Recently Drilled Wells and Historical Chemistry Data for Known Impacted Areas (Spanjers Well, FFR, Spanjers Spring, Sample 24-AG-176) and Overburden Samples

Note: the symbol size is proportional to the total dissolved solids (TDS) of the samples. Overburden Samples are non-published groundwater data representative of the shallow aquifer in the Big Creek region.

Dissolved hydrogen sulphide (H_2S) concentrations were consistently higher in the deep monitoring wells compared to the shallow wells. Among the deep wells, the highest sulphur concentrations were recorded in MW25-02D, with dissolved sulphide and sulphate concentrations of 245 mg/L and 124 mg/L, respectively. The deep well MW25-01D also presented high concentrations of dissolved sulphide and sulphate (79.5 mg/L and 54 mg/L, respectively), though to a lesser extent than MW25-02D. In contrast, MW25-03D showed the lowest concentrations of both sulphide (3.05 mg/L) and sulphate (17.9 mg/L).

A bivariate plot of (Ca + Mg)/(Na + K) vs. Cl^- (Figure B) supports the hypothesis of salinization in deep wells. Shallow wells plot at higher ratios (>1.0) and lower Cl^- molar mass (<20), consistent with the natural groundwater geochemistry of the area. In contrast, the deep wells plot at lower (Ca + Mg)/(Na + K) ratios (<0.6) and higher Cl^- (30–40), consistent with sodium enrichment from mixing with deep formation brines.

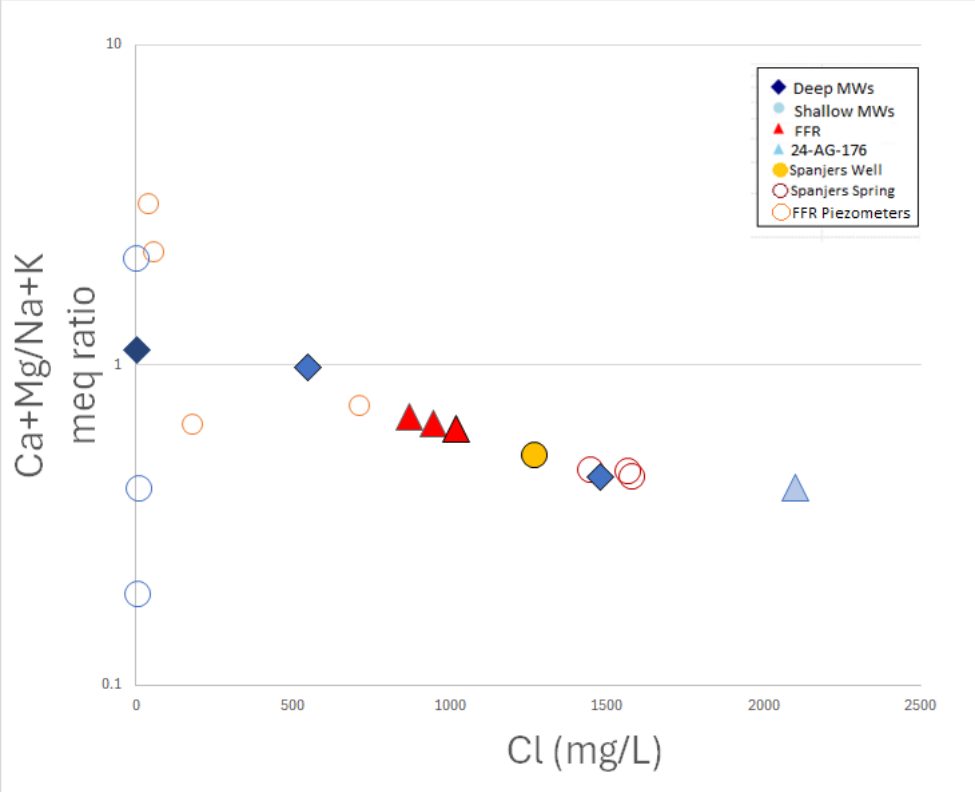

FIGURE B Plot of the Molar Ratios of (Ca +Mg)/ (Na+K) Versus Cl (mg/L) for the Newly Installed Wells and the Historical Samples

Notably, the deep MW25-01D and MW25-02D wells show similar hydrochemical characteristics to the Spanjers Springs, suggesting that the processes leading to the distinct chemistry and H_2S production in these areas are similar.

Concentrations of Na^+ vs. Cl^- reveal that groundwater from Spanjers Springs exhibits increasing concentrations of both ions when compared to the samples previously collected in the same area, implying progressive salinization, which suggests that a greater component of the brine is being discharged in the aquifer over time. The consistent Na/Cl ratio over time suggests a conservative mixing process, rather than ion exchange or mineral dissolution. Chloride and bromide mass ratios were also evaluated to infer the origin of salinity in groundwater samples using a Cl^- concentrations vs. Cl/Br plot (Figure C). This plot is effective in distinguishing salinity sources, such as halite dissolution, seawater, and influence of septic systems or petroleum well brines. The wells MW25-01D and MW25-02D exhibit elevated chloride concentrations and low Cl/Br mass ratios, closely aligning with the petroleum well brine mixing line. This suggests a dominant influence from deep, brine-rich fluids, possibly mobilized from the Queenston Formation or other saline bedrock units. The well MW25-03D presented bromide concentrations below the detection limit, and therefore, a value equal the half of the Br^- detection limit was applied to estimate a representative value for this sample.

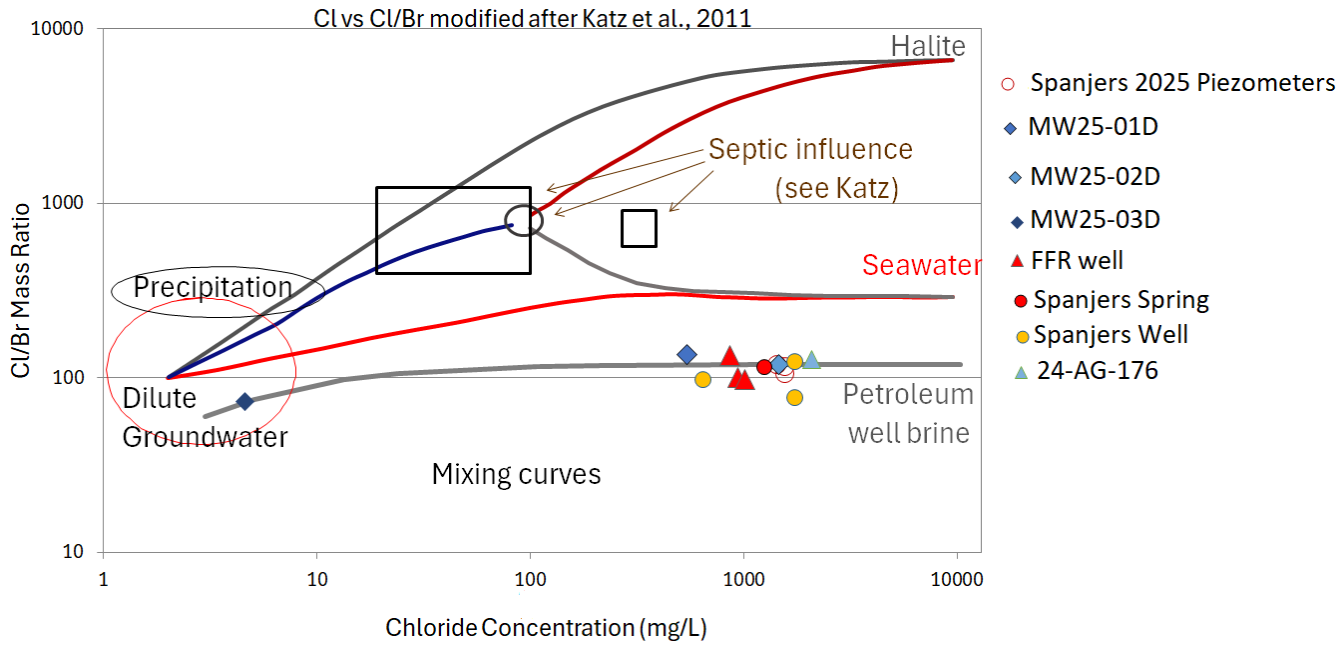

FIGURE C Cl:Br Mass Ratio vs. Chloride Concentrations in the Deep Wells MW25-01D, MW25-02D, and MW25-03D

Note that the MW25-03D well presented Br concentrations below the detection limit and therefore, a value equal to half of the Br- detection limit was applied to estimate a more representative value for this sample.

6.4.2 Isotope Geochemistry

The isotopic composition of dissolved sulphate, represented by $\delta^{34}S(SO_4)$ and $\delta^{18}O(SO_4)$, provides information as to the sources of the sulphur species in groundwater. In this study, sulphate isotopic data from the deep wells MW25-01D and MW25-02D were compared to previously analyzed samples (Spanjers well, Spanjers Springs, FFR discharge site, sample 24-AG-176) in order to identify sulphate sources and the extent of the sulphate reduction in the area. The sample from the MW25-03D did not present SO_4 concentrations high enough to be analyzed isotopically.

The plot of $\delta^{18}O(SO_4)$ versus $\delta^{34}S(SO_4)$ (Figure D) shows that the deep wells MW25-02D and MW25-01D are characterized by enriched $\delta^{34}S$ and $\delta^{18}O$ values. Based on data from various sources, this isotopic signature is consistent terrestrial gypsum of the Queenston Formation, which is an Ordovician red shale that is present in the deep strata and terminal unit drilled to in many of the legacy gas wells in the region.

The $\delta^{13}C$ and $\delta^{2}H$ values were analyzed for methane ($\delta^{13}C_1$, $\delta^{2}H_1$) and ethane in select samples ($\delta^{13}C_2$, $\delta^{2}H_2$), along with $\delta^{13}C$ values for CO_2 ($\delta^{13}C\text{-}CO_2$) in order to distinguish between thermogenic and biogenic gas sources. The $\delta^{13}C_1$ ranged from −66.6‰ to −51.5‰ across the MW25 deep wells. MW25-03D exhibited the most depleted $\delta^{13}C_1$ value (−66.6‰), consistent with biogenic methane production via CO_2 reduction. In contrast, the $\delta^{13}C_1$ value in MW25-02D (−51.5‰), combined with relatively higher ethane (C_2) concentrations and a $\delta^{13}C_2$ value of −28.5‰, suggests a thermogenic origin to the methane, consistent with the data previously obtained for thermogenic methane in the Norfolk Petroleum Pool by Skuce et al (2018), that documented $\delta^{13}C_1/\delta^{2}H_1$ values ranging from

−47.9‰/−271‰ (T002374), −39.8‰/−184‰ (T003188), and −47.1‰/−274‰ (T011814). Deuterium isotope values (δ^2H_1) for methane in MW25-02D further support the thermogenic origin. The well MW25-01D shows intermediate characteristics, with $\delta^{13}C_1$ and δ^2H_1 of -58.7 and -318.13, respectively. These isotopic signatures may suggest a thermogenic component; however, they remain inconclusive and could also reflect biogenic contribution.

Free gas from the three deep wells (MW25-01D, MW25-02D, and MW25-03D) was analyzed for concentrations of methane, ethane, propane, and gas dryness. Methane concentrations were higher in MW25-01D and MW25-03D (72.4% and 70.2%, respectively), while MW25-02D presented a value of 44.6%. The gas dryness was 42 in MW25-02D, 300 in MW25-01D and 1,269 in MW25-03D. These values suggest that MW25-03D contains predominantly biogenic methane, whereas the gas in MW25-02D may be influenced by a thermogenic component. Methane from the deep well MW25-01D exhibits intermediate characteristics but is mostly thermogenic.

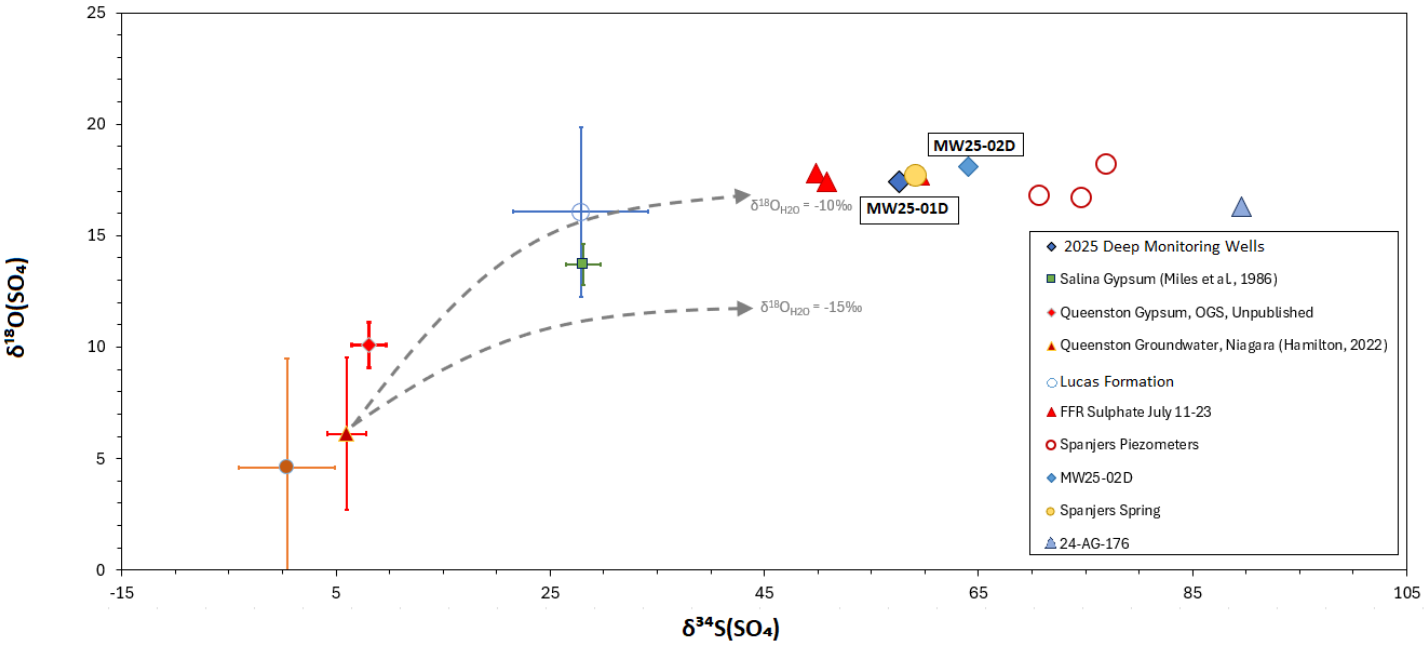

FIGURE D Isotopes of $\delta^{18}O$ and $\delta^{34}S$ of Sulphate (‰ VSMOW and ‰ VCDT, respectively) for Samples from Wells MW25-01D and MW25-02D, and the Historical Samples

Isotopes of hydrogen (δ^2H and δ^3H) and oxygen ($\delta^{18}O$) in water were also analyzed for the deep and shallow wells. As expected, tritium values were below the detection limit in the samples MW25-01D, MW25-03D, and MW25-03-S. However, tritium values were above 1 TU for the samples from wells MW25-02S/D, and well MW25-01S, suggesting possible influence of drilling fluids.

The Simcoe Meteoric Water Line (Desaulniers et al. 1986, δ^2H = 7.5 ($\delta^{18}O$) +12.6), based on precipitation for Simcoe, Ontario was used to represent local values. The $\delta^{18}O$ and δ^2H isotopic compositions for groundwater samples collected in this study are aligned with the historical samples collected in the area, and plot slightly below the local meteoric water line (Figure E).

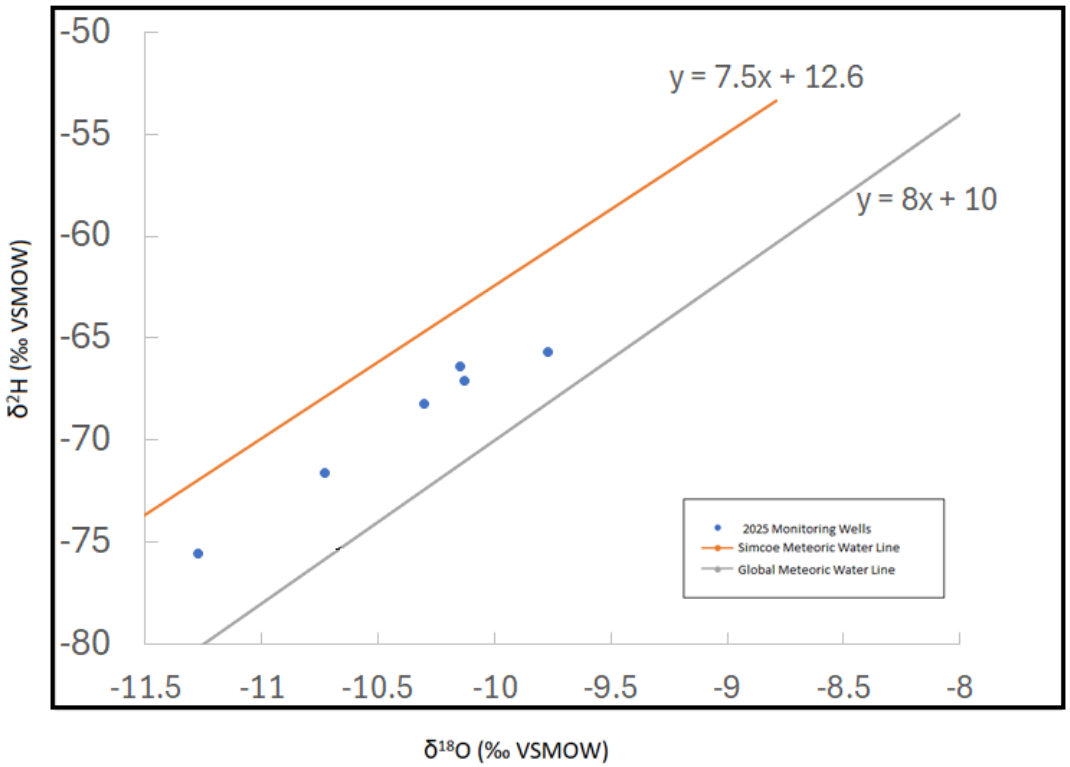

FIGURE E Isotopes of Hydrogen (δ^2H) and Oxygen ($\delta^{18}O$) in Water in the Deep and Shallow Wells

6.4.3 Baseline Water Chemistry Monitoring

At the request of the well owner, a nearby reference domestic well (7117306) was sampled both before and after the drilling program to assess whether drilling activities influenced groundwater geochemistry in the surrounding area. The first sample was collected in February 2025 (sample 31976250205001), prior to drilling, the second in March 2025 (Sample 31976250310101), during the drilling operations, and the last one in May 2025 (sample 31975250515001) following the completion of drilling operations. This approach was adopted to monitor any geochemical changes after the installation of the new wells.

The baseline water quality data showed no significant changes in major ion and trace metal concentrations between the pre- and post-drilling sampling events (Figure F), indicating the drilling program did not alter water quality. The water samples collected on March 2025 and on May 2025 were also submitted for total oil and grease analysis, and presented values below the detection limit for both the sampling events.

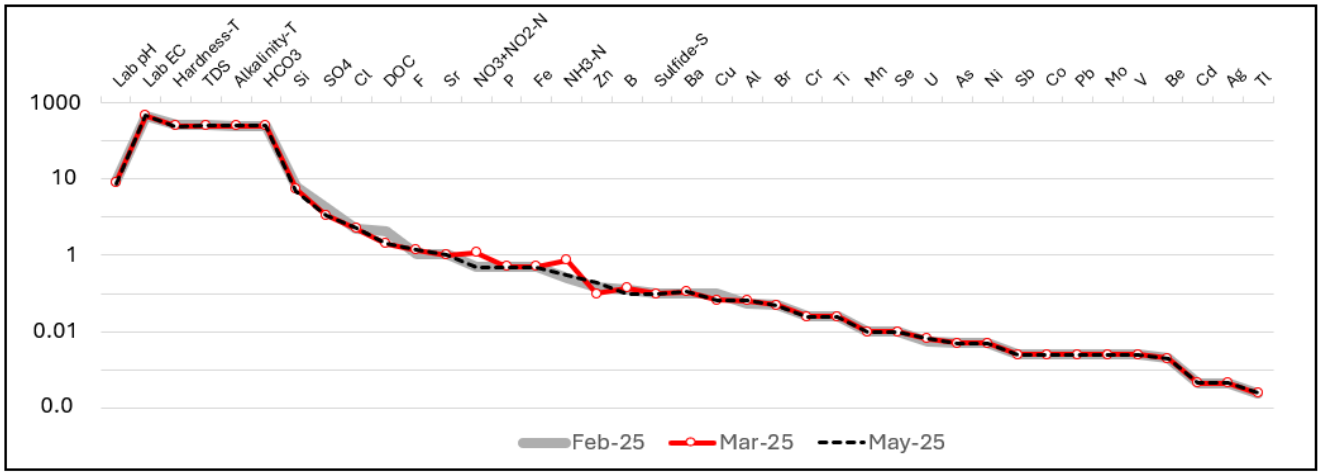

FIGURE F Comparison of Water Quality Parameters (EC in mS/cm; major ions and metals in mg/L) in the Domestic Well 7117306 before (Feb 2025), during (Mar 2025), and after (May 2025) the Drilling Program

7 DISCUSSION

7.1 Physical Hydrogeology

The updated groundwater flow regime, based on recent water level measurements and hydraulic conductivity testing, generally aligns with the previously interpreted and simulated groundwater flow conditions presented in Matrix (2021). The overall flow directions and gradients remain consistent with the simulated results, confirming the general validity of the interpreted flow regime. Furthermore, data from the newly installed monitoring wells provides additional support for the simulated flow patterns, improving the existing conceptual/numerical model.

Groundwater in the bedrock aquifer remains at consistent hydraulic head, as evidenced by the hydrographs for the deep monitoring wells. Even when a deep monitoring well was pumped (for development, sampling, and hydraulic conductivity testing), there was no significant change in head recorded in the other deep monitoring wells. The shallow monitoring wells had some variation, particularly MW25-03S, which has a significantly higher hydraulic head than all other monitoring wells. This is likely due to MW25-03S being screened across a different sediment layer than the other shallow monitoring wells or other reasons described in Section 6.3.1. A significant rain event occurred at the beginning of April 2025, which was seen on the hydrograph for well 7117306 as a significant increase in head. This change in hydraulic head was absent in the monitoring wells, which showed consistent head values throughout the monitoring period.

The vertical gradient was calculated at monitoring well locations by comparing water levels in the deep and shallow wells in relation to discharge areas (Spanjers Springs and FFR Springs). The gradient results indicate groundwater discharge from the deeper zones to the shallower aquifer, confirming the overall direction of vertical flow. The relationship between the wells and the nearby upwelling areas (where the micro-piezometers are located) indicates that groundwater is moving toward the surface.

The hydraulic conductivity testing results reveal differences between the deep and shallow wells. For the deep wells (MW25-01D, MW25-02D, and MW25-03D), the hydraulic conductivity ranged from 6.5×10^{-6} to 1.0×10^{-5} m/s, reflecting of an aquifer. These values were consistent with the pumping test, which has a higher radius of influence, suggesting continuity in the hydraulic conditions (i.e., no-flow boundary conditions have not been seen). In contrast, the shallow wells (MW25-01S, MW25-02S, and MW25-03S) exhibited potentially lower hydraulic conductivities, ranging from 5.8×10^{-8} m/s to 1.2×10^{-6} m/s, which is consistent with finer-grained sediments. However, for MW25-01S and MW25-02S, lowest reported values should be ignored due to clogging of the well socks, which were intended to prevent fine sediment in the pump. This issue has likely led to an underestimation of the true hydraulic conductivity in these wells. Hydraulic response to the aquifer might be muted, but the well is still adequate for monitoring the groundwater quality.

The samples from fine-grained units either between the two silty/sand materials identified at MW25-01 and MW25-02 or overlying the contact aquifer was tested for hydraulic conductivity in the laboratory and results are presented in Table 4. The reported hydraulic conductivity ranged from 1.0×10^{-10} to 1.4×10^{-9} m/s. This range of values is supporting the important hydrogeological role of these fine-grained units that is acting as an aquitard (i.e., a barrier to groundwater flow).

7.2 Conceptual Model Revision

The updated conceptual site model incorporates new geological and hydrogeological data from recently installed monitoring wells, providing a more refined understanding of the stratigraphy in the study area (Figure 10).

The revised model reveals a more accurate distribution of sediments and highlights potential zones of vertical hydraulic connectivity beneath the Big Creek valley. This improved framework supports more accurate numerical modelling and risk assessments for well abandonment and groundwater flow and pressure management in the Big Creek region.

It highlights the presence of multiple aquifers and aquitards, which were previously not known, which is an important knowledge improvement.

7.3 Numerical Simulation of the Groundwater Flow System

A numerical model of groundwater flow was previously constructed and calibrated to represent the study area (Matrix 2021). The numerical model was updated using the revised conceptual model summarized in Section 5.2, including updates to the simulated ground surface elevation and hydrostratigraphic units. The hydraulic conductivity of new units was assigned based on laboratory analysis and hydraulic testing summarized in Section 5.3. Vertical hydraulic conductivity was assumed to be one hundred times lower than horizontal hydraulic conductivity for new model units. The assigned hydraulic conductivity values were not calibrated. A summary of new model units and assigned hydraulic conductivity is provided in Table C.

TABLE C Numerical Model Hydrogeologic Unit Updates

Layer	Previous Model Hydrogeologic Unit	Previous Simulated Horizontal Hydraulic Conductivity (m/s)	Previous Simulated Vertical Hydraulic Conductivity (m/s)	Study Area Hydrogeologic Unit	Simulated Horizontal Hydraulic Conductivity (m/s)	Simulated Vertical Hydraulic Conductivity (m/s)
3	Upper Interstadial Sediment	5.83E-05	6.43E-07	Interstadial Sandy Silt	2.20E-06	2.20E-08
4	Interstadial Clay (Port Stanley Drift)	4.32E-07	1.24E-07	Interstadial Clay	2.10E-10	2.10E-12
5	Lower Interstadial Sediment	4.00E-05	1.17E-05	Interstadial Silty Sand	2.20E-06	2.20E-08
6	Port Stanley Drift / Catfish Creek Drift	2.77E-06	1.80E-06	Lower Till	2.10E-10	2.10E-12
7	Top of Bedrock	2.03E-06	2.56E-06	Top of Bedrock	6.00e-05	6.00e-07
1-4	-	-	-	Alluvial River Sediments	1.00e-05	1.00e-07

Table C illustrates the greater than three order of magnitude changes in simulated hydraulic conductivity in layers 4 and 6. The revision of the Port Stanley Drift/Catfish Creek Drift Unit on Layer 6 to a low conductivity till notably creates a distinct hydraulic regime in the updated model as compared to the previous model. Simulation of this confining unit disconnects the overburden units, which generally discharge water towards Big Creek, from the bedrock, which now simulates a north-south hydraulic gradient (Figure 11). However, the simulated heads within the bedrock are generally too high compared to current conditions, and calibration of the new model units is recommended before final conclusions can be drawn.

Notwithstanding the need for additional model calibration, the potential influence of poorly sealed legacy oil and gas wells was evaluated by defining non-pumping well features from the top of bedrock to ground surface at 45 oil and gas wells near site. These wells directly link the bedrock to the overburden across the confining till unit, and the simulated hydraulic heads were sensitive to these wells (Figure 12).

The two sets of preliminary model results constrain potential flow pathways to FFR and Spanjers through bedrock toward the north and east. However, additional simulation of the legacy oil and gas wells is recommended to reduce the uncertainty in flow pathways, including refining the number of simulated wells and the nature of their simulated hydraulic connection between the bedrock and overburden.

As discussed in Section 5.8, the potential inclusion of a highly transmissive karstic zone within the Dundee Formation has not been integrated into the simulator due to the lack of understanding on its spatial extent and hydrogeological parameters. These zones may explain the very high transmissivity and low aquifer storage that would be required to account for the wide area of observed water level changes reported over the last decade. The implementation of this feature and analysis of the sensitivity of model results to this regional feature is recommended.

7.4 Groundwater Geochemistry

The results suggest hydrochemical separation between shallow and deep groundwater. The deep MW25-01D and MW25-02D wells are likely influenced by more evolved water with elevated sodium and chloride, indicative of

mixing with deeper formation fluids. The increasing trend in Cl^- and Na^+ in the FFR groundwater samples previously collected aligns with the hypothesis of brine migration from deeper units, possibly sourced from legacy gas well conduits. The proximity of MW25 "deep" well groundwaters to the "Petroleum Brine" trend line on the chloride-bromide plots supports the sulphur isotopic data suggesting hydraulic connectivity to the deeper strata.

The isotope trends, when integrated with the hydrochemical data (e.g., H_2S and anomalous sulphate concentrations), support the conclusion that sulphate reduction is occurring in an aquifer system that is closed to the input of sulphate. This means the mixing of methane with sulphate could occur in the gas reservoir, shallow aquifers in bedrock or overburden, or the borehole connecting them, but not in gypsiferous formation(s) that supplied the sulphate-rich fluids. Furthermore, the sulphate isotope trends confirm the presence of "exogenic sulphate" (Smal 2016), suggesting a non-local sulphate input, mostly likely originating in the Queenston Formation and migrating upward into shallower strata, via legacy well conduits. Thermogenic methane originates from the Silurian gas well target formations that are shallower than the Queenston Formation and one or more of the scenarios just described result in mixing of sulphate and methane generating hydrogen sulphide as a byproduct.

8 CONCLUSIONS

The main objectives for this project were to install six monitoring wells surrounding the FFR discharge site in Norfolk County, to collect geological data during the drilling, to build a monitoring well network capable of measuring temporal evolution of water levels and changes in groundwater chemistry. The purpose is to support the improvement of our understanding of the hydrogeological conditions resulting in flowing sulphur-rich groundwater in Big Creek valley, particularly at the FFR and Spanjers spring discharge sites, while enabling detection of any significant change to the groundwater system due to anthropogenic activities in the area. Related objectives were to update an existing conceptual site model and a numerical model that may support the assessment of potential future remediation options.

Six monitoring wells were installed and developed in March 2025, three with screens completed in the bedrock contact aquifer and three that were shallower in the glacial overburden. The screens for MW25-01S and 02S were installed in the Lower Interstadial Sediment unit (formerly the "Shallow sand" layer, see below). The screen for MW25-03S was installed in the Upper Interstadial Sediment unit, which is much thicker at that location (McDowell Road).

Leveloggers were installed to measure hydraulic pressure in bedrock and overburden aquifers, and pumping tests were conducted to better characterize the contact aquifer transmissivity and its spatial distribution. In addition, the hydrochemical conditions were assessed to understand chemical variability and identify potential connections to legacy gas wells. The numerical model was updated and redesigned using existing hydrogeological datasets and the new MNR Digital Terrain Model. This tool was deemed to have improved the representation of the measured hydraulic heads in the shallow and deep aquifers and historical gas wells. However, more calibration is required as discussed below.

The physical and chemical data were combined in order to refine the existing conceptual model and to characterize the groundwater flow and the source of the anomalies. From this hydrogeological assessment, the following conclusions can be made regarding the hydrogeological and hydrochemical conditions in the FFR and Spanjers Springs areas.

There are five dominant hydrostratigraphic units in the conceptual site model that were used in the numerical model, and which were recognized in the previous conceptual model. The new information has allowed a better understanding of the nature and interrelationships between these, has refined their stratigraphic boundaries, and provided new estimates of hydraulic conductivity that are orders of magnitude different than the earlier estimates. The pressure data collected in the new monitoring wells and several other wells has allowed quantification of hydraulic gradients, which are upward from bedrock. The five units are:

- Upper Interstadial Sediment (Sandy silt unit), which grades upward into the Norfolk sand exposed at surface and is hydraulically connected to it.
- Interstadial Clay. This is a major confining unit (aquitard) and was found in all three boreholes with thicknesses from 12.7 to 14.5 m. The Big Creek valley is significantly incised into this clay. Windows through the clay, filled with river alluvium, were reported in geotechnical boreholes drilled at the base of the valley during 1966 bridge construction 150 m east of the Spanjers spring site and 65 m north of the new monitoring well MW25-2.
- Lower Interstadial Sediment. This is interpreted to be a moderately thick (6.6 to 13.7 m), laterally extensive aquifer. It is important to the discussion because the hydrogen sulphide-impacted groundwaters that discharge to surface at FFR, and separately at Spanjers spring, must both transit this unit to reach surface. At FFR the flow from the legacy borehole that is thought to first travel horizontally in this unit for 10s of metres from a nearby legacy well source.
- Port Stanley Drift / Catfish Creek Drift. These are tills and related sediments and are of different ages but are considered here to represent a single hydrostratigrapic unit that represents an aquitard immediately overlying bedrock.
- Top of Bedrock. This is the contact aquifer and the well screens for all three of the deep monitoring wells installed as part of the project were completed in it.

A sixth hydrostratigraphic unit that is inferred to exist but has not been considered so far in the simulations is a highly transmissive zone (or interconnected zones) in bedrock that is interpreted to be karstic and has been encountered in many gas wells and in the drilling for the previously attempted monitoring well on this site. This was known to exist and conceptualized to be in strong hydraulic connection with the contact aquifer. Based on the findings of this study, it is now understood that the contact aquifer has limited transmissivity, but given its groundwater chemistry, has some degree of connectivity with the Dundee Formation karstic/fractured zone.

Other important determinations and outcomes include:

- Vertical gradients were determined to be upward from deeper aquifers to shallower zones, near the FFR and Spanjers spring, whereas they are downward at the McDowell Road drilling location, due to the elevated topography but also because the measurement point was above the confining clay unit.
- Conceptual and numerical model results indicate bedrock groundwater flow pathways toward FFR and Spanjers spring potentially range from north to east. The uncertainty remains high and would be reduced with a better calibration of the model against existing water levels.

- There is hydrochemical separation between shallow and deep groundwater, with deep wells (MW25-01D and MW25-02D) showing elevated sodium and chloride, and other chemistry suggesting significant impact from fluids originating in deeper bedrock formations.
- Sulphate isotopes suggest the presence of exogenic sulphate, supporting upward migration of sulphate-enriched groundwater from deeper hydrostratigraphic units.

The elevated pressures in the Lower Interstadial Sediment layer and its demonstrated connections to bedrock, which has higher pressures still, suggest that without a better understanding of the groundwater flow systems, plugging of the main FFR discharge site should be considered a high-risk activity that could result in new or increased flow of groundwater at other locations, such as the Spanjers spring. Increased flow through the shallower drift units would further complicate the ability to plug wells locally and control discharging water.

Preliminary interpretation suggests that deep, hydrogen sulphide-impacted groundwater contributing to Spanjers spring likely originates to the north or east if it first travels horizontally through the bedrock aquifer. However, to reach surface, this groundwater must first transit the Lower Interstadial Sediment layer at FFR, Spanjers spring and inferred groundwater discharge points in the base of Big Creek, north of MW25-02S and south or east of Spanjers spring. As a minimum, the flow must move vertically through this unit but at FFR and possibly the other surface discharge points, it may also move horizontally. Therefore the flow direction is more complicated in this unit and additional model calibration and hydrogeological interpretation is required to estimate flow direction in the Lower Interstadial Sediment and to infer which legacy gas wells are potentially contributing to the hydrogen sulphide and methane impacts discharging at surface.

The current pressure regime and historic hydraulic data remain difficult to reconcile in the numerical model. To improve the accuracy of the groundwater flow model and the particle, tracking additional calibration using data from oil and gas wells data may be required. This will also require that the influence of he highly conductive karstic layers need to be investigated and included in the model, so that the effect of long-term possible solutions be explored.

9 RECOMMENDATIONS

1. Groundwater sampling and analysis and downloading of pressure data should be carried out quarterly for one year, at the end of which should be an assessment and report detailing any changes recorded and implications thereof. As part of that scope, recommendations should be provided on the necessity and/or frequency of any future monitoring.
2. The numerical model of groundwater flow should be further calibrated with the specific intention of improving the reliability of flow directions and simulating a potentially karstic aquifer with different hydraulic connectivity to the contact aquifer, to improve the understanding of the regional pressure responses in this aquifer. This assessment should constrain the directions from which methane and H_2S impacted water originate in bedrock and may help identify which legacy gas well or wells are contributing the discharge at the Spanjers spring and FFR sites. The pressure data from the monitoring wells are not as proximal to the FFR as to the Spanjers spring site so the uncertainty will be higher at FFR unless additional wells are drilled and completed.

3. To fully characterize potential additional groundwater discharge points within the Big Creek valley, we recommend that the creek be surveyed using a thermal camera 500 m prior to the bridge across Forestry Farm Road and an arbitrary point 500 m downstream of the FFR discharge site. This survey should be conducted in summer, when springs and groundwater discharge points are negative thermal anomalies on the imagery. A UAV survey would be a fast and effective way to better understand the extent of groundwater discharge in the valley. A follow-up survey with a hand-held thermal camera should be performed, possibly by boat, to ground truth the thermal anomalies and to collect groundwater discharge samples for laboratory analysis. This information would help characterize the distribution and quality of groundwater discharge, which is critical to understand if the conditions observed at FFR and Spanjers spring are unique in the Big Creek area.
4. Notwithstanding possible groundwater discharge into the base of the creek, flows to surface appear to be smaller at the Spanjers spring site than at FFR by at least an order of magnitude, despite the concentrations of hydrogen sulphide being higher. Therefore, it would be significantly less risky to plug legacy gas wells that are contributing to the impact in the Spanjers spring area, if they could be located. We recommend a pivot in focus from the FFR discharge to the Spanjers spring site, first to find the legacy gas wells responsible for the source of reactants that generate hydrogen sulphide and then to prioritize them for plugging, possibly as part of the Abandoned Works Program. Many of these legacy oil and gas wells had seals of varying degrees of effectiveness installed in their bedrock portions, but few have any seal in overburden, making them efficient conduits to transmit impacted water that then transits the Lower Interstadial Sediment layer and reaches surface.
5. In the event that legacy wells are to be re-entered for the purpose of plugging, it would also be important to monitor, in near-real time, the effects of these activities on the local pressure regime and on the chemical composition at the known discharging sites, which include Spanjers spring and FFR locations. Monitoring of pressure could act as a sentinel to possible adverse affects on pressure but would also provide valuable information on the legacy gas borehole connections between hydrostratigraphic units.
6. Replace the existing culvert discharging groundwater at the FFR site and install a weir flow measurement device that has already been built as part of this scope of work. Include data download and collection to the proposed monitoring schedule to obtain a continuous set of flow data throughout the one year of monitoring. This is a critical piece of information to monitor the temporal evolution of groundwater discharge at FFR site. As discussed in the background section, the FFR discharge rate is interpreted to have increased from 55 to 821 m^3/day in the last decade, but without a systematic means of monitoring the flow rates, uncertainty remains high, which is why it is recommended to install a weir.
7. Considering the large flows at the FFR discharge site, the presence of additional groundwater discharge points, and our updated conceptual site model of the geology and hydrogeology, we do not recommend continuing attempts to plug the FFR discharge site without prior pressure mitigation in the bedrock and Lower Interstadial Sediment units, because of the risk of inducing additional or new groundwater discharge elsewhere in the Big Creek valley.

10 RECOMMENDATIONS ON A PATH FORWARD (OUT OF SCOPE)

The Montrose team gained significant knowledge and experience working on the problems at the FFR and Spanjers spring sites in the last 5 years and we have experience on related problems regionally and in southern Ontario as a whole. We have been asked many times by clients, stakeholders, colleagues and members of the public for advice, on the current conditions and a path forward at the FFR site. Our knowledge and understanding of this problem has significantly improved, specifically in the last 2 years, and we feel we can now safely offer high-level recommendations. These are offered as "ideal world" solutions from a purely technical point of view, and we recognize they will be constrained by jurisdictional, regulatory and budgetary concerns. They are offered in good faith and without prejudice, in the hope of stimulating the discussion on the best path forward between stakeholders, on minimizing the ongoing environmental and human health concerns at this site and in the region.

In our professional estimation, from a purely technical point of view, based on recent findings, we would propose in the short-term that the following actions be taken in approximately this order:

1. Prioritize nearby gas wells for decommissioning as part of the abandoned works program based on their likely contributions, based on the results of improved modelling. They should then be plugged in the order of the simulated lowest to highest risk, while carefully monitoring pressure at the monitoring wells (MW25-01 and MW24-02). Close coordination and discussions with the driller during the operations is also important to understand the system and minimize risk.
2. Contain existing flow and gas discharge with a temporary collection system and install a vacuum degasser. This could remove more than 90% of the H_2S, reduce or eliminate the off-site smell and hugely decrease the hydrogen sulphide loading on the aquatic surface environment. Such an endeavour would trigger the application of MECP air and water treatment requirements to unrealistically low standards and therefore a short-term exception should be sought from those requirements. Currently, hydrogen sulphide is entering the surface water environment at **tens of thousands of times above the regulatory limit** and reducing that by a factor of 10 in the short-term would likely be considered a worthy goal by all stakeholders.
3. Stop ongoing erosion at the current FFR discharge site by installing a nearby pressure relief well, the discharge of which should be connected to the vacuum degasser.
4. Initiate a technical working group with MNR, MOE, MOH, and Norfolk to work toward a long-term solution. With the recently increased understanding and improved tools it is now possible to consider permanent solutions. In addition to H_2S, discharging groundwater salt loading (i.e., sodium and chloride) is an important component to consider, has they should also be considered in any short-term or long-term solutions.
5. Subject to the committee's input and oversight, initiate an Environmental Assessment (EA) RFP to address the potential treatment and discharge of groundwater into Big Creek and the air and water quality requirements thereof. We recommend that the status quo be considered in the assessment as a benchmark by which to assess the outcomes of any proposed solutions.

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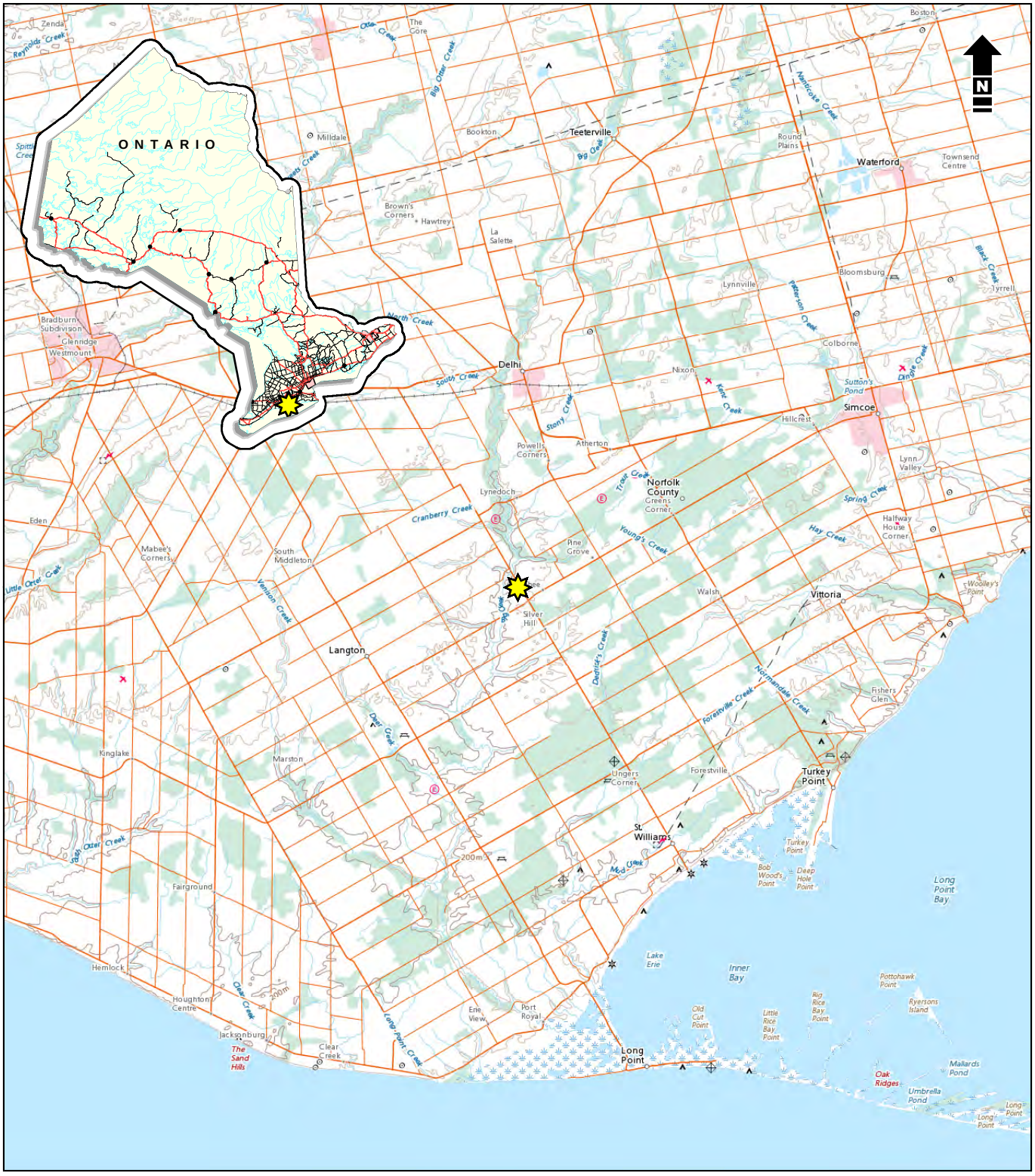


Reference: The Toporama Web Map Service (Toporama WMS) of the Earth Sciences Sector (ESS) at Natural Resources Canada (NRCan). Data are known for being accurate and up-to-date using CanVec 1:50,000, the National Topographic Data Base (NTDB) 1:250,000 and baseline data from the Atlas of Canada. Contains information licensed under the Open Government Licence – Canada. Contains information licensed under the Open Government Licence – Ontario.

1:250,000 kilometres

2.5 0 2.5 5

NAD 1983 UTM Zone 17N

MONTROSE ENVIRONMENTAL

Norfolk County

Forestry Farm Road- 2025 Groundwater Drilling and Monitoring Program

Site Location

Date:	Project:	Submitter:	Reviewer:
May 2025	31976	R. McCourt	S. Hamilton

Disclaimer: Third party materials used in this report have not been independently verified and will not be updated for future changes. Montrose Environmental Solutions Canada Inc. has made customary efforts to ensure the accuracy of such materials at the time of publication, however we do not accept any liability for errors, omissions, or inaccuracies in same. Where attached to a report, this figure/drawing is subject to the limitations and conditions stated therein.

Figure 1

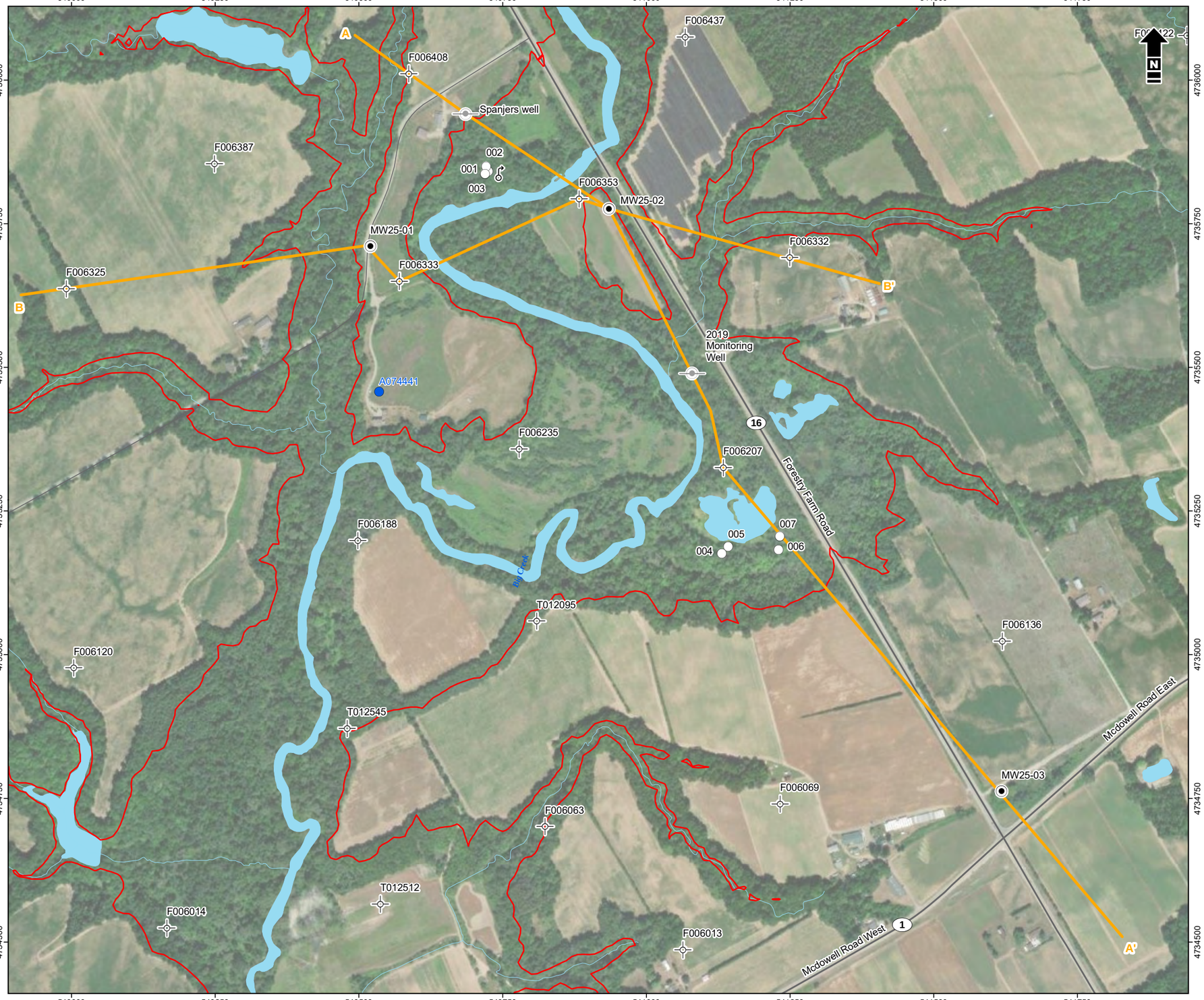
I:\MNRF\31976\FiguresAndTables\Hydrogeology\2025\Report\Figure-1-Site_Location_Map.mxd - Letter_P - 28-May-25, 11:34 AM - WXu - TID018

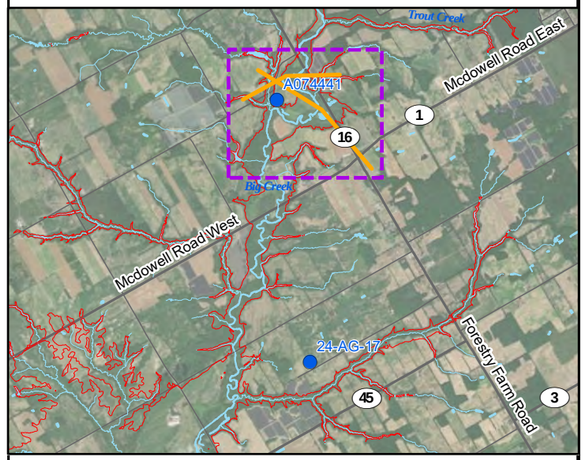
Easting (m)

540000 540250 540500 540750 541000 541250 541500 541750

Northing (m)

4736000 4735750 4735500 4735250 4735000 4734750 4734500





- Intersection of Regional Potentiometric Surface with Ground Surface
- Water Body
- Watercourse
- Highway
- Road
- Cross Section
- Micro-piezometer
- Abandoned Well
- Monitoring Well
- Water Well
- Spring
- Abandoned Gas Well

Reference: Produced under Licence with the Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry © Queen's Printer for Ontario (2024). Imagery (2016) Source: Esri, Maxar, Earthstar Geographics, and the GIS User

1:7,000 metres
70 0 70 140
NAD 1983 UTM Zone 17N

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road- 2025 Groundwater Drilling and Monitoring Program

Monitoring Well and Micro-Piezometer Locations

Date:	Project:	Submitter:	Reviewer:
May 2025	31976	R. McCourt	S. Hamilton

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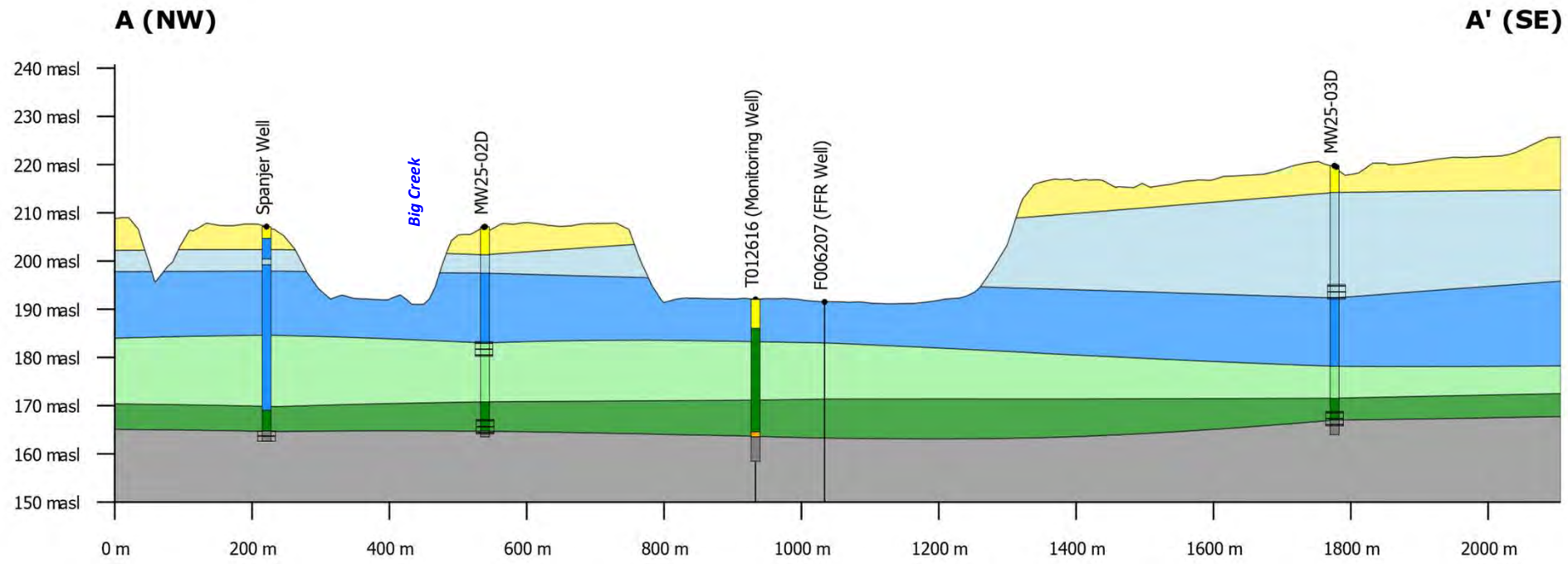
Figure 2

I:\MNR\F\31976\FiguresAndTables\Hydrogeology\2025\Report\Figure-2-Monitoring_Well_and_Micro-Piezometer_Locations.mxd - Tabloid_L - 29-May-25, 09:42 AM - WXu - TID05



Hydrogeologic Units
- 1. Norfolk Sand
- 3. Sandy Silt / Upper Interstadial Sediment
- 4. Clay / Interstadial Clay
- 5. Silty Sand / Lower Interstadial Sediment
- 6. Till / Port Stanley Drift / Catfish Creek Drift
- 7. Top of Bedrock

Borehole Interpretation
- Bedrock
- Clay
- Gravel
- Sand
- Silt
- Silt/Silty Sand
- Till

Wells
- Screened interval

Vertical exaggeration: x7

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

Conceptual Cross-Section A-A'

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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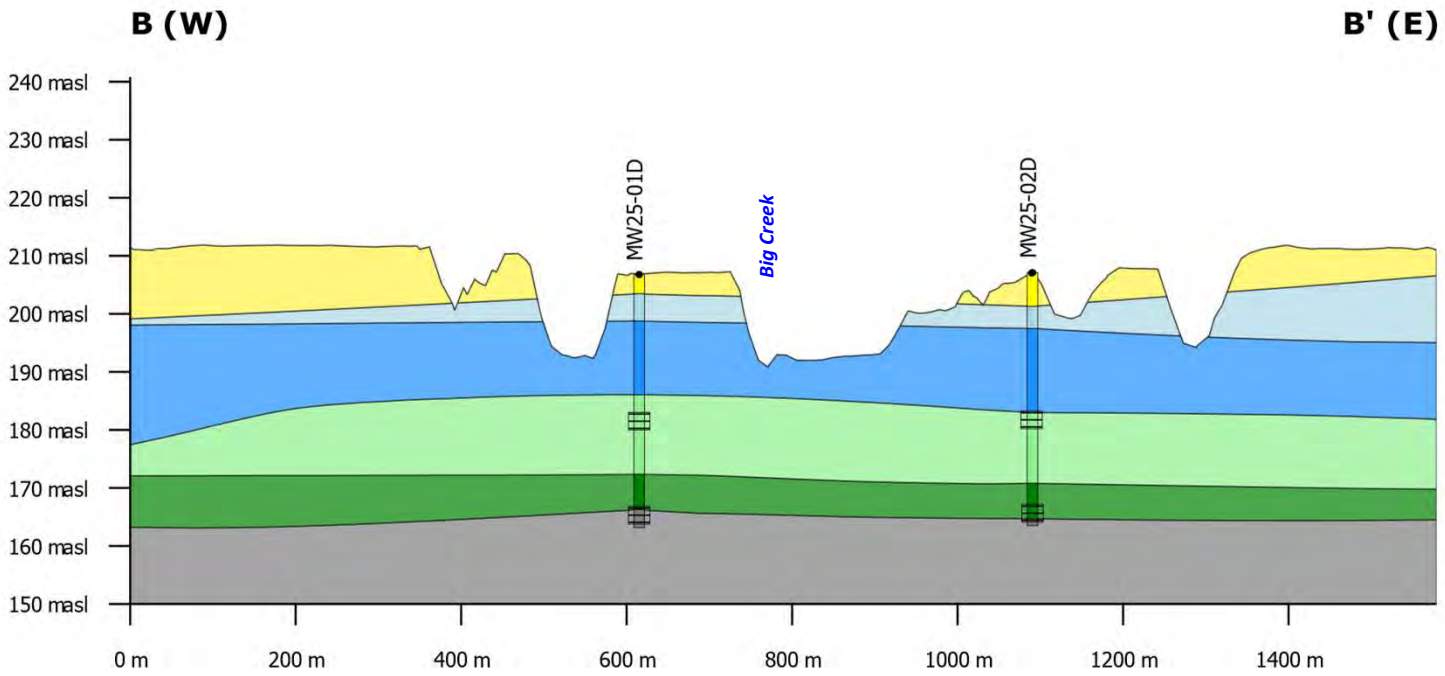
Figure 3



Hydrogeologic Units
- 1. Norfolk Sand
- 3. Sandy Silt / Upper Interstadial Sediment
- 4. Clay / Interstadial Clay
- 5. Silty Sand / Lower Interstadial Sediment
- 6. Till / Port Stanley Drift / Catfish Creek Drift
- 7. Top of Bedrock

Borehole Interpretation
- Bedrock
- Clay
- Gravel
- Sand
- Silt
- Silt/Silty Sand
- Till

Wells
- Screened interval

Vertical exaggeration: x7

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

Conceptual Cross-Section B-B'

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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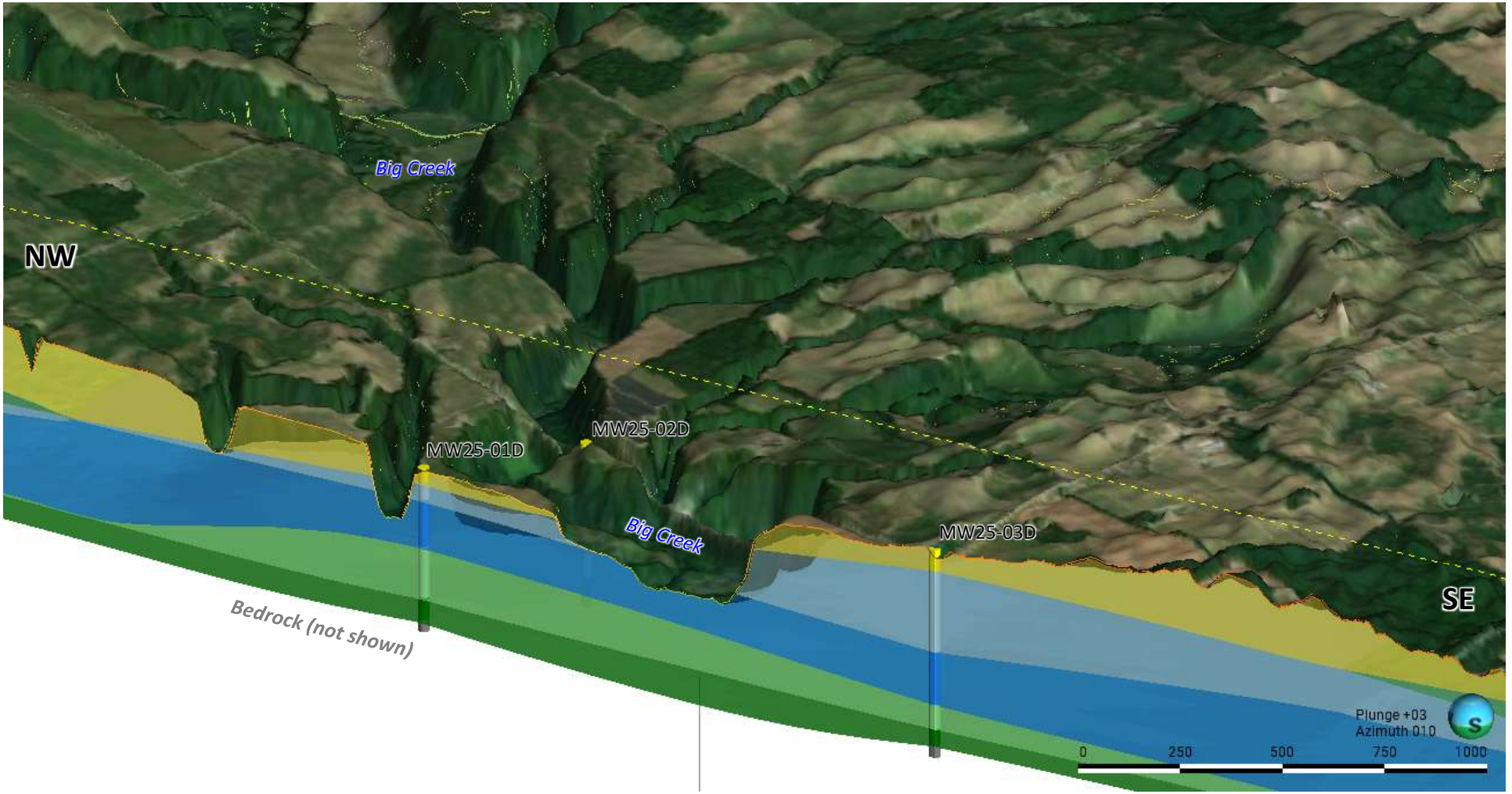
Figure 4



Hydrogeologic Units

- 1. Norfolk Sand
- 3. Sandy Silt / Upper Interstadial Sediment
- 4. Clay / Interstadial Clay
- 5. Silty Sand / Lower Interstadial Sediment
- 6. Till / Port Stanley Drift / Catfish Creek Drift
- 7. Top of Bedrock

Borehole Interpretation

- Bedrock
- Clay
- Gravel
- Sand
- Silt
- Silt/Silty Sand
- Till

Virtual Earth imagery
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Earthstar Geographics SIO

Vertical exaggeration: x10

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

3D Conceptual Geological Model

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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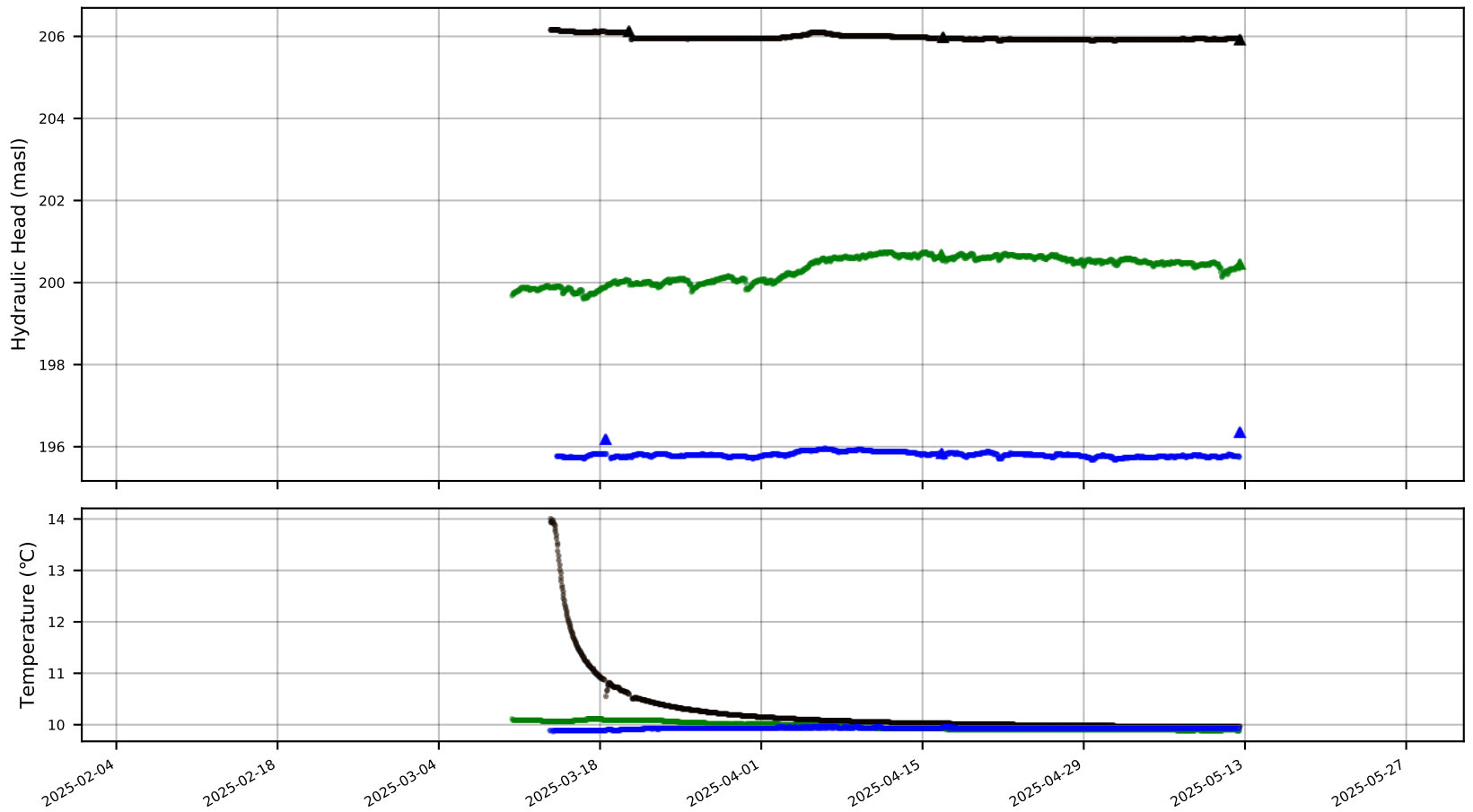
Figure 5



- 7117306 (Paula) Pres
- MW25-01D Pres
- MW25-01S Pres
- 7117306 (Paula) MWL
- MW25-01D MWL
- MW25-01S MWL
- 7117306 (Paula) Temp
- MW25-01D Temp
- MW25-01S Temp

MWL = Manual Water Level; Pres = Pressure from instrumentation; Temp = Temperature from instrumentation

MONTROSE ENVIRONMENTAL

Norfolk County

Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

MW25-01 Location
Hydraulic Heads and Temperature

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	A.Laleva	L-C. Boutin

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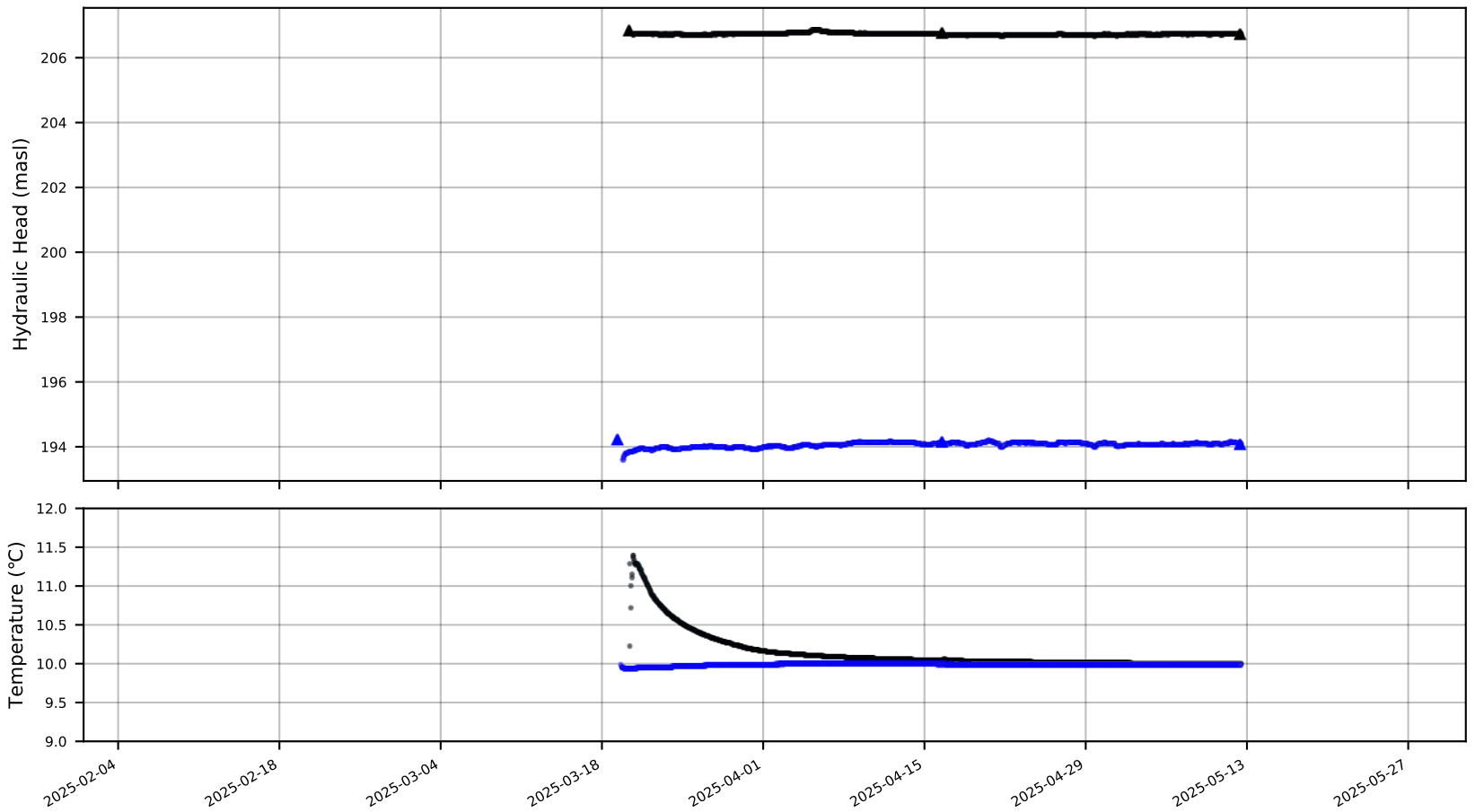
Figure 6



MW25-02D Pres ▲ MW25-02D MWL MW25-02D Temp
MW25-02S Pres ▲ MW25-02S MWL MW25-02S Temp

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

MW25-02 Location
Hydraulic Heads and Temperature

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	A.Laleva	L-C. Boutin

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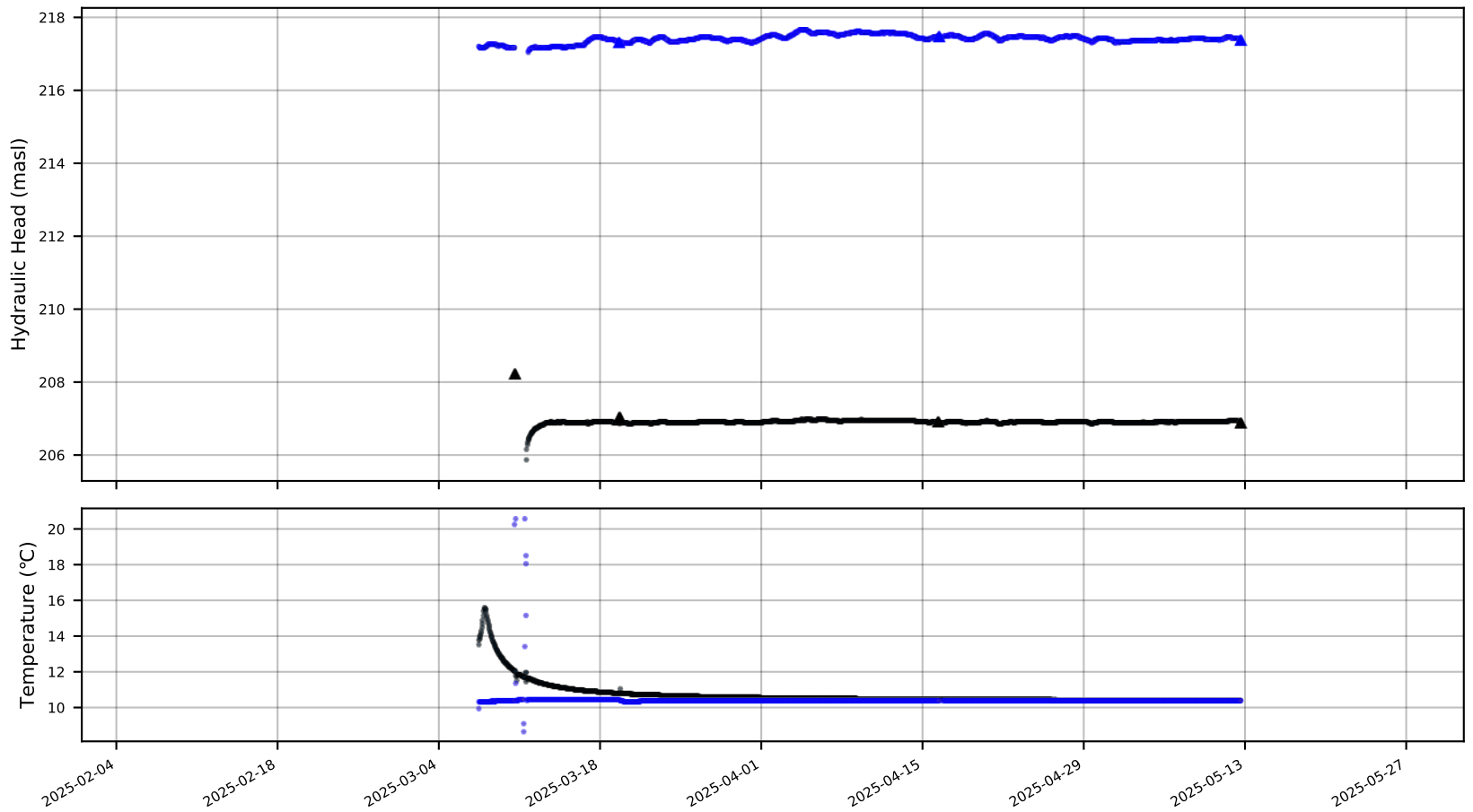
Figure 7

MWL = Manual Water Level; Pres = Pressure from instrumentation; Temp = Temperature from instrumentation



MW25-03D Pres
MW25-03S Pres
MW25-03D MWL
MW25-03S MWL
MW25-03D Temp
MW25-03S Temp

MONTROSE ENVIRONMENTAL

Norfolk County

Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

MW25-03 Location
Hydraulic Heads and Temperature

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	A.Laleva	L-C. Boutin

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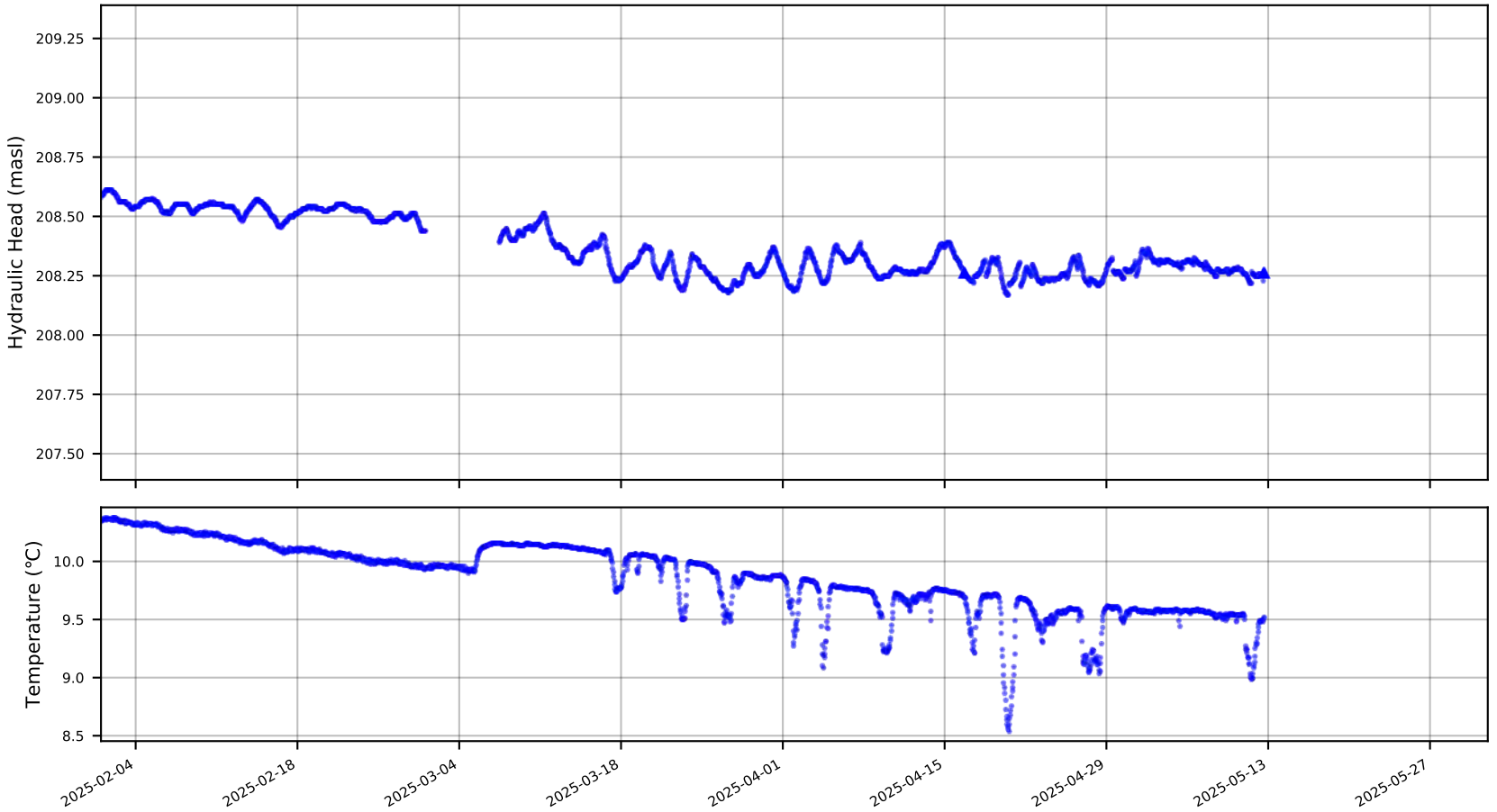
Figure 8

MWL = Manual Water Level; Pres = Pressure from instrumentation; Temp = Temperature from instrumentation



• 24-AG-176 (Mark) Pres ▲ 24-AG-176 (Mark) MWL • 24-AG-176 (Mark) Temp

MWL = Manual Water Level; Pres = Pressure from instrumentation; Temp = Temperature from instrumentation

MONTROSE ENVIRONMENTAL

Norfolk County

Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

24-AG-176 Location
Hydraulic Heads and Temperature

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	A.Laleva	L-C. Boutin

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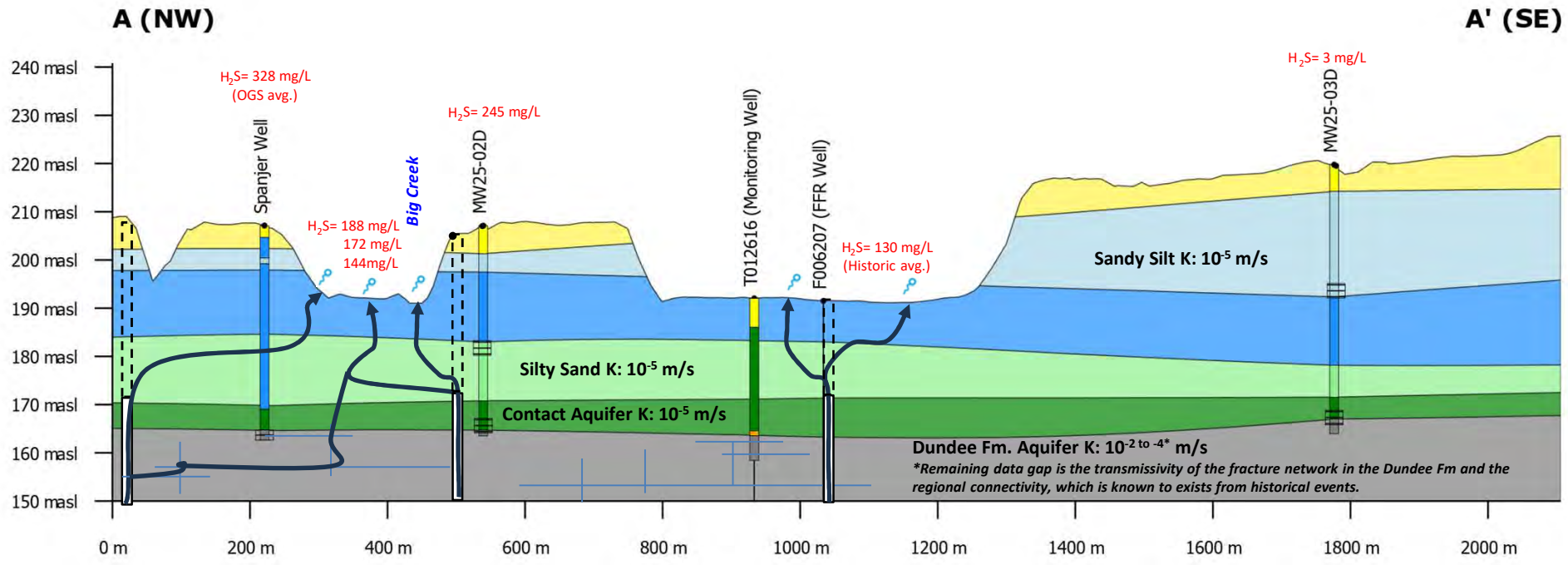
Figure 9



Dundee Fm. Fractures have limited hydraulic connectivity with the Contact Aquifer, which has limited transmissivity, but important storage capacity compared to the fracture network.

Dundee Fm. aquifer must have minimal inflow of groundwater from above or below and must have extremely high hydraulic diffusivity (K/S_s) in order to transmit the observed pressure response over such a large distance following the regional rise in water levels that occurred in the last decade. Fracture network connectivity is an important piece of additional information to understand the groundwater movement within such a system. Equivalent porous media at a local scale would not be able to precisely resolve groundwater flowpath, but when looking at a scale of 100s of meters, it can provide some insight if the scale is significantly greater that the fracture density.

Multiple groundwater discharges and methane emission point sources were identified at Spanjers and FFR sites through temperature and methane detection drone surveys.

Hydrogeologic Units
- 1. Norfolk Sand
- 3. Sandy Silt / Upper Interstadial Sediment
- 4. Clay / Interstadial Clay
- 5. Silty Sand / Lower Interstadial Sediment
- 6. Till / Port Stanley Drift / Catfish Creek Drift
- 7. Top of Bedrock

Borehole Interpretation
- Bedrock
- Clay
- Gravel
- Sand
- Silt
- Silt/Silty Sand
- Till

Wells
- Screened interval
- Discharge point
- Possible fluid flow pathways

Vertical exaggeration: x7

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

Updated Conceptual Site Model

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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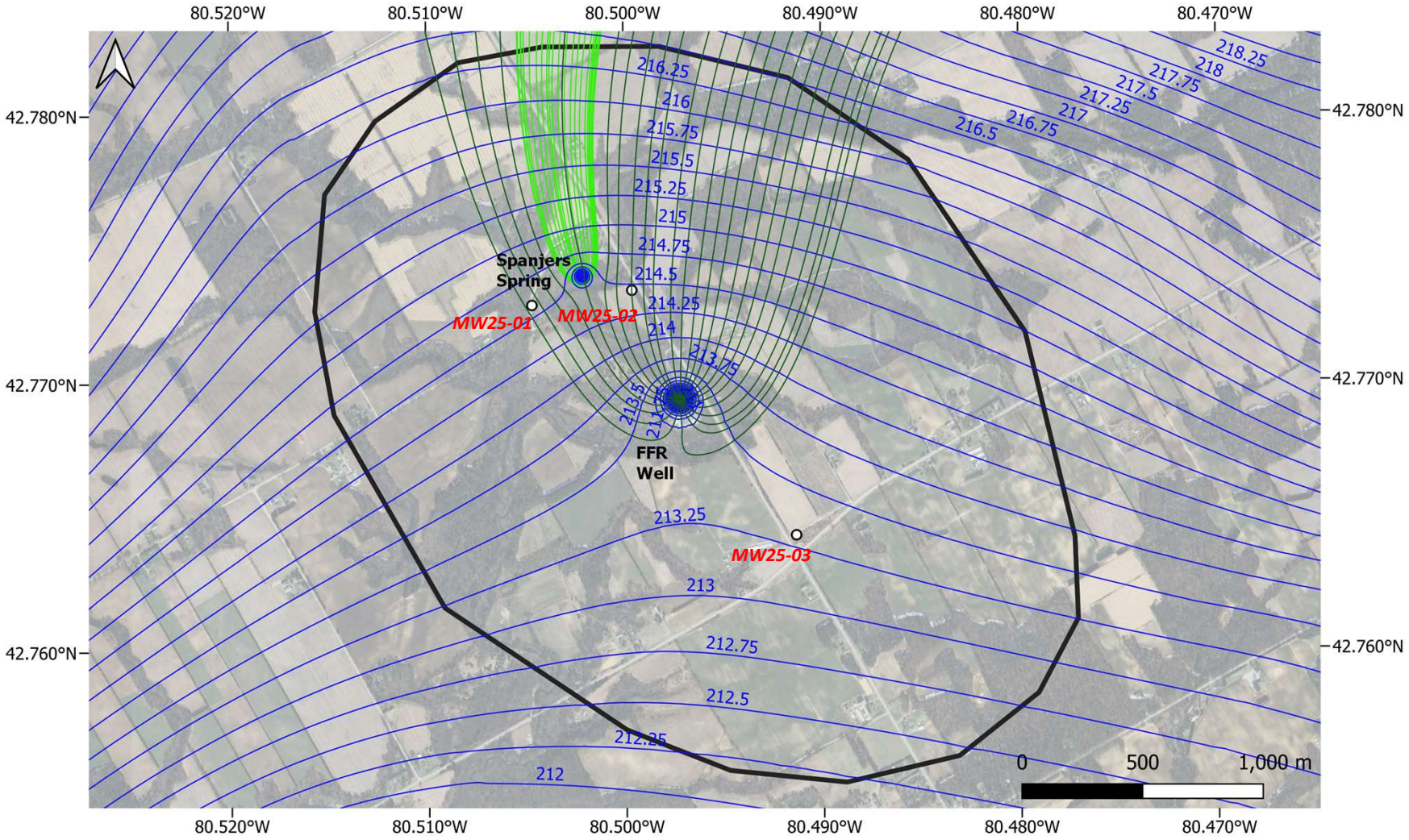
Figure 10



Simulated Hydraulic Head (m asl)

Backwards Particle Tracks from Spanjers Spring

Backwards Particle Tracks from FFR Well

Update Area

Monitoring Well

Notes:
- FFR Well and Spanjers Spring are simulated to create hydraulic connection between the bedrock and ground surface, creating hydraulic capture zones.
- Other oil and gas legacy wells are simulated to have no hydraulic connection to ground surface.

MONTROSE ENVIRONMENTAL

Norfolk County
Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

Simulated Hydraulic Heads and Groundwater Flow Pathways at Top of Bedrock Without Oil & Gas Wells Simulated

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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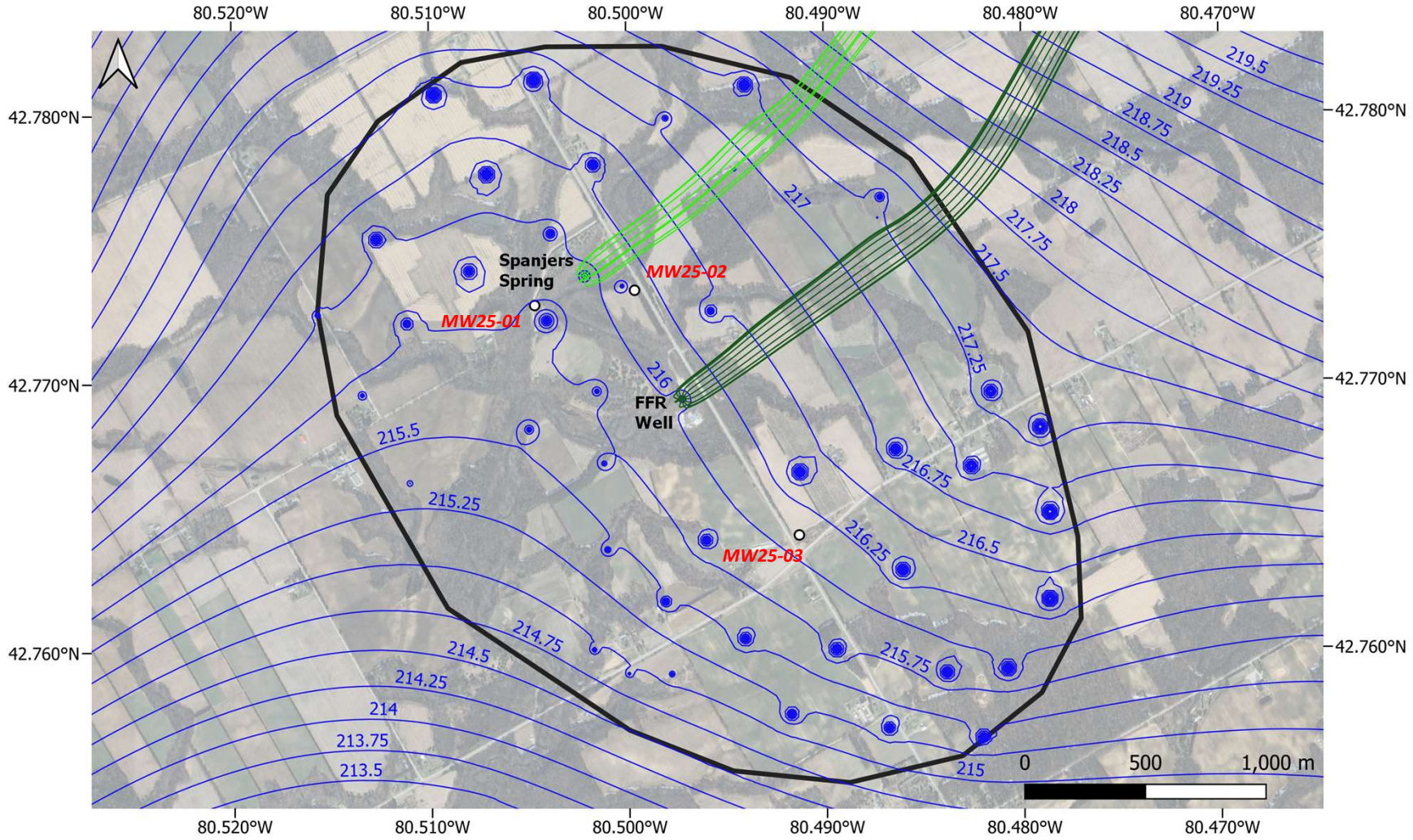
Figure 11



Simulated Hydraulic Head (m asl)

Backwards Particle Tracks from Spanjers Spring

Backwards Particle Tracks from FFR Well

Update Area

Monitoring Well

Notes:
- FFR Well and Spanjers Spring are simulated to create hydraulic connection between the bedrock and ground surface, creating hydraulic capture zones.
- Oil and gas legacy wells within the geological update area are simulated to have hydraulic connection to ground surface, creating hydraulic capture zones.

MONTROSE ENVIRONMENTAL

Norfolk County

Forestry Farm Road – 2025 Groundwater Drilling and Monitoring Program

Simulated Hydraulic Heads and Groundwater Flow Pathways at Top of Bedrock With Oil & Gas Wells Simulated

Date:	Project:	Submitter:	Reviewer:
May 2025	31976-551	M. Ranjram	L-C. Boutin

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Figure 12

TABLE 1

Well Coordinates

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Location	Easting	Northing	Top of Screen m	Bottom of Screen m	Top of Screen Elevation m	Bottom of Screen Elevation m	K values^ m/sec	Ground Surface Elevation (m asl)	Top of Casing (m asl)
MW25-01D	540520	4735711	39.93	43.0	166.8	163.8	3.20E-05	206.73	207.56
MW25-01S	540521	4735713	23.77	26.8	183.0	180.0	5.90E-08	206.76	207.60
MW25-02D	540935	4735776	39.93	43.0	167.2	165.9	6.60E-05	207.11	207.92
MW25-02S	540934	4735778	23.77	26.8	183.2	180.2	9.30E-08	207.04	207.94
MW25-03D	541618	4734763	50.90	54.0	168.9	165.8	1.10E-05	219.61	220.38
MW25-03S	541620	4734761	24.38	27.4	195.1	192.1	1.20E-06	219.74	220.52
7117306	540537	4735457	39.93	43.0	----	----	----	206.75	206.98
24AG176	540980	4731944	23.77	26.8	----	----	----	211.34	211.50

Notes:

m asl - meters above sea level

^ obtained through Slug Test/Pumping Test

TABLE 2

Micro-Piezometer Installation Details

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Location	Piezometer ID	Easting	Northing	Depth of Pond (m)	Stick-up^ m	Water Level In Piezometer (m btoc)	Depth of Piezometer in Pond Subsurface (m bgs)
Spanjers Springs	3197620250303-001	540727	4735842	0.61	1.61	0.63	0.30
Spanjers Springs	3197620250303-002	540721	4735858	0.66	1.62	0.67	0.29
Spanjers Springs	3197620250303-003	540711	4735842	0.71	1.71	0.78	0.30
FFR site	3197620250304-004	541132	4735176	0.293	1.49	1.53	0.32
FFR site	3197620250304-005	541142	4735188	0.26	1.45	1.87	0.35
FFR site	3197620250304-006	541230	4735182	0.25	1.46	1.87	0.33
FFR site	3197620250304-007	541232	4735206	0.46	1.34	1.87	0.33

Notes:

m btoc - *meters below top of casing*

m bgs - *meters below ground surface*

^ *stick up was measured from bottom of the pond*

TABLE 3

Manual Water Levels

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Location	Date & Time	Manual Water Level (m btoc)	Water Level Elevation (m asl)
MW25-01D	5/12/2025 11:00 AM	1.65	205.92
MW25-01D	4/16/2025 4:47 PM	1.59	205.98
MW25-01D	3/20/2025 1:08 PM	1.46	206.11
MW25-01S	5/12/2025 11:00 AM	11.24	196.36
MW25-01S	3/18/2025 12:07 PM	11.42	196.18
MW25-02D	5/12/2025 10:17 AM	1.19	206.73
MW25-02D	4/16/2025 1:00 PM	1.14	206.78
MW25-02D	3/20/2025 9:40 AM	1.09	206.83
MW25-02S	5/12/2025 10:00 AM	13.83	193.22
MW25-02S	4/16/2025 12:33 PM	13.79	193.26
MW25-02S	3/19/2025 10:25 AM	13.71	193.34
MW25-03D	3/19/2025 4:38 PM	13.27	207.07
MW25-03D	4/16/2025 9:15 AM	13.40	206.94
MW25-03D	5/12/2025 1:16 PM	13.43	206.91
MW25-03S	3/19/2025 5:20 PM	3.19	217.33
MW25-03S	4/16/2025 10:50 AM	3.03	217.49
MW25-03S	5/12/2025 1:15 PM	3.13	217.39

Notes:

m btoc - meters below top of casing

m asl - meters above sea level

TABLE 4

Soil Quality Results - Detailed Grain Size Analysis and Physical Characteristics

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Start Depth m	End Depth m	Sample Date	MSI Sample Number	Hydraulic Conductivity m/s	Sand %	Silt %	Clay %	Classification CSSC	Sieve						Hydrometer							Classification[ON153] coarse or medium/fine
										Sieve 4 <4750 µm %	Sieve 10 <2000 µm %	Sieve 20 <850 µm %	Sieve 40 <425 µm %	Sieve 100 <150 µm %	Sieve 200 <75 µm %	R1min <47 µm %	R3min <28 µm %	R10min <16 µm %	R30min <9 µm %	R90min <5 µm %	R270min <3 µm %	R1080min <1.5 µm %	
MW25-01D	4.57	7.11	10-Mar-25	31976250310024	---	7.0	31	62	Heavy clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-01D	4.57	7.11	10-Mar-25	31976250310024	---	32	63	5.3	Silt loam	100.0	100.0	100.0	100.0	100.0	96.2	56.6	26.4	13.8	8.8	7.5	5.0	5.0	Fine/Medium
MW25-01D	16.63	17.68	11-Mar-25	31976250311028	2.1E-10	3.0	51	46	Silty clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-01D	17.68	20.73	11-Mar-25	31976250311029	---	<2.0	36	62	Heavy clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-01D	35.97	36.58	11-Mar-25	31976250311038	2.1E-10	34	37	30	Clay loam	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-02D	11.89	14.94	17-Mar-25	31976250317042	1.9E-10	4.6	22	73	Heavy clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-02D	25.60	26.21	17-Mar-25	31976250317046	---	12	74	14	Silt loam	100.0	99.7	99.7	99.7	99.6	99.5	81.4	57.0	33.7	20.9	14.0	10.5	8.1	Fine/Medium
MW25-02D	27.13	30.18	17-Mar-25	31976250317047	1.4E-09	10	77	13	Silt loam	100.0	100.0	100.0	100.0	100.0	99.9	88.6	66.1	40.8	23.9	14.1	9.8	8.4	Fine/Medium
MW25-02D	36.58	37.49	17-Mar-25	31976250317051	1.0E-10	8.3	35	57	Clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-02D	37.49	39.62	17-Mar-25	31976250317052	2.1E-10	38	32	29	Clay loam	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-03S	3.47	5.46	03-Mar-25	31976250303003	2.2E-06	91	7.4	1.8	---	100.0	100.0	100.0	100.0	88.4	22.9	9.7	6.1	4.9	3.7	3.7	3.7	1.2	Coarse
MW25-03S	7.01	8.53	03-Mar-25	31976250303004	---	81	16	2.7	---	100.0	100.0	100.0	99.9	97.8	46.5	19.6	9.8	4.9	3.7	3.7	3.7	2.5	Coarse
MW25-03S	23.77	26.37	04-Mar-25	31976250304010	---	18	75	7.4	---	100.0	100.1	100.1	100.1	100.1	100.1	78.3	54.7	31.1	18.7	13.7	11.2	6.2	Fine/Medium
MW25-03S	32.92	35.97	04-Mar-25	31976250304015	---	<2.0	45	55	Silty clay	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-03D	42.06	43.58	06-Mar-25	31976250306017	---	12	77	11	Silt loam	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW25-03D	49.68	51.21	06-Mar-25	31976250306020	---	9.1	65	26	Silt loam	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Notes:

--- - not analyzed

ON153 - *Ontario Regulation 153/04: Records of Site Condition - Part XV.1 of the Environmental Protection Act* (MOE 2017)

CSSC - *The Canadian System of Soil Classification* (SCWG 1998)

TABLE 5

Field Parameters

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Date yyyy/mm/dd	pH	EC (uS/cm)	TDS (ppm)	ORP (mV)	Dissolved O2	Temperature (°C)	RKI- O2 (%)	RKI CO2 (%)	RKI H2S (ppm)	RKI CH4 (LEL %)	RKI CH4 (%vol)	H2S (ppm[1])	24 Hours After Sampling								
														pH	EC (uS/cm)	TDS (ppm)	ORP (mV)	Temperature (°C)	RKI- O2 (%)	RKI CO2 (%)	RKI H2S (ppm)	RKI CH4 (LEL %)	RKI CH4 (%vol)
3197620250303-001	2025-03-03	7.8	5810	2900	-263	n/a	4.9	20.9	0.06	>100	0.00	0.04	200	7.40	5290	2650	-242	19.4	18.10	0.50	>100	9.00	35.00
3197620250303-002	2025-03-03	7.2	5180	2600	-212	n/a	4.2	20.9	0.04	>100	0.00	0.05	100	7.70	5500	2200	-205	16.4	18.60	0.58	>100	1.00	1.75
3197620250303-003	2025-03-03	7.6	5300	2640	-211	n/a	3.3	20.9	0.06	>100	0.00	0.04	175	7.80	5690	2830	-277	16.8	20.10	0.16	>100	4.00	0.51
3197620250304-004	2025-03-04	7.4	441	230	-42	n/a	1.3	20.6	0.06	0.00	0.00	0.00	0.00	7.50	501	221	-51	19.1	20.30	0.04	0.00	0.00	0.00
3197620250304-005	2025-03-04	7.3	620	324	-62	n/a	1.8	20.6	0.06	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3197620250304-006	2025-03-04	7.3	756	379	-94	n/a	4.8	20.6	0.06	0.00	0.00	0.00	n/a [2]	7.38	754	389	-78	19.1	20.30	0.00	0.00	0.00	0.00
3197620250304-007	2025-03-04	7.2	1299	652	-73	n/a	4.3	20.6	0.06	0.00	0.00	0.00	n/a [2]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3197620250304-008	2025-03-04	7.0	327	1630	-51	n/a	13.6	20.6	0.06	0.00	0.00	0.00	0.00	7.08	312	1602	-49	19.1	19.30	0.32	0.00	0.00	0.00
MW25-01S	2025-03-18	6.13	2465	352	-281	16.00	2.6	20.6	0.20	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	19.8	0.06	0.00	0.00	0.00
MW25-01D	2025-03-18	5.80	2050	9	-283	9.80	4.4	20.6	0.64	>100	17.00	1.85	150.00	n/a	n/a	n/a	n/a	n/a	19.80	0.20	>100	0.00	0.00
MW25-02S	2025-03-19	7.20	2850	452	-281	12.2	2.6	20.9	0.02	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	20.20	0.06	0.00	0.00	0.00
MW25-02D	2025-03-19	7.28	3943	105	-318	11.40	1.7	20.9	0.12	28.50	0.00	0.00	45.00	n/a	n/a	n/a	n/a	n/a	20.90	0.06	>100	0.00	0.00
MW25-03S	2025-03-11	7.90	1200	1421	-208	11.00	2.2	20.9	0.06	0.00	0.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	20.20	0.02	0.00	0.00	0.00
MW25-03D	2025-03-11	8.17	424	1350	-232	10.90	1.9	20.9	0.06	>100	0.00	0.00	10.00	n/a	n/a	n/a	n/a	n/a	20.30	0.06	>100	0.00	0.00

Notes:

[1] measured with the H_2S kit. Values over 11 ppm required dilution.

[2] Not enough reagent to complete measurment

TABLE 6

Water Quality Results - General and Inorganic Parameters

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Sample Date	MSI Sample Number	Lab pH	Lab EC µS/cm	Ca-T mg/L	Mg-T mg/L	Na-T mg/L	K-T mg/L	Ca-D mg/L	Mg-D mg/L	Na-D mg/L	K-D mg/L	Br mg/L	Cl mg/L	F mg/L	SO_4 mg/L	NO_2-N mg/L	NO_3-N mg/L	NO_3+NO_2-N mg/L	NH_3-N mg/L	TKN mg/L	DKN mg/L	Total Phosporus mg/L	Dissolved Phosporus mg/L	Orthophosphate mg/L	Sulfide-S mg/L	Hydrogen Sulphide mg/L	Colour TCU	DOC mg/L	Alkalinity-T mg/L	HCO_3 mg/L	Hardness-T mg/L	TDS mg/L	Turbidity NTU
FFR 01042019	04-Jan-19	FFR 01042019	---	---	---	---	---	---	328	96.7	418	10.1	7.3	948	---	571	---	0.105	---	---	---	---	---	---	---	---	---	---	---	---	---	1217	2397	---
FFR 06062019	06-Jun-19	FFR 06062019	6.88	3470	---	---	---	---	311.8	90.2	379	9.2	5.1	871	1.80	592	---	---	---	---	---	---	---	---	---	---	---	---	---	357	357	1150	2274	---
Forestry Farm Road	10-May-23	31976230711002	7.63	---	---	---	---	---	417	111	443	11.8	7.9	923	1.84	806	<0.1	<0.2	---	---	1.43	---	---	---	---	115	122	---	31.6	277	277	1498	---	---
Forestry Farm Road	11-Jul-23	31976230711001	7.81	---	---	---	---	---	354	106	473	11.9	8.1	1020	1.88	562	<0.1	<0.2	---	---	1.41	---	---	---	---	130	138	---	1.69	335	335	1320	---	---
Forestry Farm Road	02-Nov-24	24-AG-183	6.99	4770	---	---	---	---	347	106	495	13	9.3	1400		390	<0.1	<0.2	---	---	1.2	---	---	---	---	108	12	---	2	397	397	1200	---	---
Spangers Spring	29-Oct-21	31976211029002	---	---	---	---	---	---	150	30	89	3.6	---	---	---	50	---	---	---	---	---	---	---	---	---	0.23	---	---	---	350	---	198	---	---
Spangers Spring	11-Jul-23	31976230711003	7.59	---	---	---	---	---	329	127	586	15.1	8.7	1270	1.73	<3	<0.1	<0.2	---	---	1.7	---	---	---	---	174	185	---	2.29	370	370	1344	---	---
Spanjers Well 7047368 10-AG-123	21-Jun-10	10-AG-123	*6.47*	3950	---	---	---	---	421.5	89.8	357	9.0	5.3	661	1.01	965	<0.003	0.004	---	1.06	1.7	---	<0.04	---	---	29	28.75	---	0.7	---	377	1422	2705	---
Spanjers Well 7047368 -18-AG-527	24-Sep-18	18-AG-527	6.96	6686	---	---	---	---	342.9	143.1	751	20.4	17.8	1779	0.95	330	<0.003	<0.002	---	2.62	2.50	---	<0.04	---	---	329	421	---	3.26	---	517	1445	3638	---
Spanjers Well 606219	06-Jun-19	7047368	6.98	---	---	---	---	---	289	130.4	---	17.1	11.3	1767	1.60	309	---	---	---	---	---	---	---	---	---	---	237	---	---	---	368	1258	2541	---
A050169	29-Oct-21	31976211029001	---	---	---	---	---	---	87	120	660	19	---	---	---	1	---	---	---	---	---	---	---	---	---	0.14	---	---	---	26	---	711	---	---
Silver Hills	16-Mar-20	F005318	7.08	5050	---	---	---	---	275.5	130.7	728	15.1	17.5	1686	---	461	---	---	---	---	---	---	*0.63*	---	---	0.28	---	---	---	---	---	1226	3333	---
Silver Hills	20-Oct-20	F005318	7.21	5150	---	---	---	---	275.7	132.7	754	15.8	15.7	1597	---	127	---	---	---	---	---	---	---	---	---	0.082	---	---	---	---	---	1235	2936	---
Silver Hills	08-Aug-23	31976230808001	7.43	5210	---	---	---	---	245	116	652	15.1	9.4	1490	1.88	57	<0.1	<0.2	---	1.97	1.97	---	<0.1	---	---	192	204	---	---	444	542	1089	3130	---
07-AG165	26-Jul-07	07-AG165	6.81	7510	---	---	---	---	379	147.21	730	31.1	19.1	2065	1.14	412	7	<0.0023	---	2.32	2.54	---	<0.1	---	---	11	---	---	1	---	134	1552.6	3852.4	---
18-AG-533	25-Sep-18	18-AG-533	7.27	4110	---	---	---	---	232.55	113.04	710	19.8	16.2	1609	0.92	18	<0.003	<0.0023	---	2.26	2.23	---	<0.04	---	---	187	---	---	3.11	---	460.9	1046.2	2943.4	---
14-AG-094	24-Jun-14	14-AG-094	8.41	716	---	---	---	---	14.43	9.29	115	4.0	1.4	158	2.63	0.5	<0.002	<0.002	---	0.85	0.87	---	*0.049*	---	---	0	---	---	1.6	---	141.9	74.3	377	---
18-AG-528	24-Sep-18	14-AG-094	7.94	944	---	---	---	---	15.76	9.52	109	3.7	1.6	140	2.70	0.4	<0.003	0.02	---	0.84	1.09	---	<0.04	---	---	0.24	---	---	3.98	---	151.4	78.5	358.6	---
24-AG-176	02-Nov-24	CA12157-1	7.99	6060	---	---	---	---	8	311	150	20.9	13	2100	1.59	95	0.03	0.006	0.03	---	---	---	---	---	---	161	13	640	5	---	---	1390	---	---
7117306	05-Feb-25	31976250205001	8.04	450	---	---	---	---	---	---	---	---	<0.010	<1.0	0.11	1.8	---	---	<0.10	<0.050	---	---	---	<0.1	<0.010	<0.020	---	---	0.43	240	240	250	250	0.1
7117306	10-Mar-25	31976250310101	7.98	440	---	---	---	---	---	---	---	---	<0.010	<1.0	0.14	1.1	---	---	0.12	<0.050	---	---	---	<0.1	<0.010	<0.020	---	---	<0.40	240	240	240	240	<0.1
7117306	15-May-25	31976250515001	7.44	450	---	---	---	---	---	---	---	---	<0.011	<1.1	0.14	1.5	---	---	0.12	<0.050	---	---	---	<0.2	<0.011	<0.021	---	---	<0.41	250	250	230	250	<0.1
31976250303101	03-Mar-25	31976250303101	8.29	5450	314	140	686	16.2	315	136	683	15.9	10.7	1580	1.97	409	<0.100	<0.200	<0.224	2.48	2.66	---	<0.500	<0.500	---	172	183	4.2	2.6	353	350	---	---	---
31976250303102	03-Mar-25	31976250303102	7.99	5040	303	133	636	14.3	299	133	627	14.1	9.49	1450	1.7	129	<0.100	<0.200	<0.224	2.74	2.49	---	<0.500	<0.500	---	188	200	5.9	2.36	389	389	---	---	---
31976250303103	03-Mar-25	31976250303103	8.10	5490	322	140	689	15.4	309	132	643	14.3	11.6	1570	1.86	133	<0.100	61.5	61.5	2.89	3.81	---	<0.500	<0.500	---	144	153	3.8	37.9	302	302	---	---	---
31976250303104	03-Mar-25	31976250303104	7.75	604	121	11.1	10.7	1.7	118	11.4	11.7	1.89	<0.50	23.9	<0.100	19.4	<0.050	0.126	0.126	0.43	1.11	---	<0.500	<0.500	---	<0.018	<0.019	8.8	6.72	282	282	---	---	---
31976250304005	04-Mar-25	31976250304005	7.68	636	116	9.85	23.6	0.544	115	9.93	23.5	0.558	<0.50	41	<0.100	7.42	<0.050	<0.100	<0.112	0.242	0.506	---	<0.500	<0.500	---	<0.018	<0.019	2.5	3.41	279	279	---	---	---
31976250304006	04-Mar-25	31976250304006	7.65	691	112	12.2	32.4	0.546	109	12	32.7	0.529	<0.50	57.6	<0.100	3.83	<0.050	0.111	<0.112	0.229	0.692	---	<0.500	<0.500	---	<0.018	<0.019	3	4.82	292	292	---	---	---
31976250304007	04-Mar-25	31976250304007	7.72	1220	130	16.2	131	0.779	125	16.3	133	0.781	<0.50	182	0.118	1.96	<0.050	<0.100	<0.112	0.111	0.545	---	<0.500	<0.500	---	<0.018	<0.019	3.5	5.06	390	390	---	---	---
31976250304008	04-Mar-25	31976250304008	7.72	3140	298	74.3	330	0.845	296	73.5	320	0.83	3.75	713	<0.200	378	<0.100	<0.200	<0.224	0.032	0.286	---	<0.500	<0.500	---	<0.018	<0.019	4	3.46	304	304	---	---	---
MW25-01S	18-Mar-25	31976250318001	*10.98*	391	---	---	---	---	24.3	0.144	33.2	1.61	<0.10	11.5	0.976	33.4	<0.010	0.06	0.06	0.72	---	0.956	<0.500	<0.050	---	0.033	0.035	6.5	2.73	96.9	<2.0	---	---	---
MW25-01D	18-Mar-25	31976250318002	7.37	2870	---	---	---	---	198	92.5	200	6.87	3.18	548	1.34	54	<0.050	<0.100	<0.112	0.831	---	1.12	<0.500	<0.500	---	79.5	84.6	6.3	2.52	655	655	---	---	---
MW25-02S	19-Mar-25	31976250319003	*8.73*	229	---	---	---	---	8.33	2.42	35.9	1.32	<0.10	5.94	1.04	11.5	<0.010	0.027	0.027	0.383	---	0.861	<0.500	<0.050	---	<0.018	<0.019	3.4	4.19	96.7	89.7	---	---	---
MW25-02D	19-Mar-25	31976250319004	8.15	5380	---	---	---	---	258	120	576	14.9	9.68	1480	1.76	124	<0.100	<0.200	<0.224	1.95	---	2.23	<0.500	<0.500	---	245	260	187	1.98	341	341	---	---	---
MW25-03S	11-Mar-25	31976250311005	8.44	299	---	---	---	---	23.6	15.2	12.7	0.674	<0.10	0.61	0.238	9.4	<0.010	0.029	0.029	0.357	---	0.452	<0.500	<0.050	---	<0.018	<0.019	<2.0	1.72	149	144	---	---	---
MW25-03D	11-Mar-25	31976250311006	8.17	628	---	---	---	---	52	23.4	45.3	2.19	<0.10	4.78	1.46	17.9	<0.010	<0.020	<0.0224	0.469	---	0.566	<0.500	<0.050	---	3.05	3.24	3	3.09	325	325	---	---	---
Ontario Drinking Water Quality Guidelines**			**6.5-8.5**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**1.5**	**NS**	**10**	**1**	**10**	**pH/T^{U}**	**NS**	**NS**	**0.01**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**<25%^{ALK}**	**NS**	**NS**	**NS**	**narrative**

Notes:

--- - not analyzed

NS - not specified

pH/T - dependent on pH and temperature values

^{U} - guideline for un-ionized ammonia (NH_3)

^{Alk} - should not be decreased by more than 25% of the natural concentration

** - *O. Reg. 169/03: Ontario Drinking Water Quality Standards*

- insufficient information to calculate guideline

Italics - values do not meet applicable guidelines

TABLE 7

Water Quality Results - Dissolved Metals

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Monitoring Well	Sample Date	MSI Sample Number	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mn mg/L	Mo mg/L	Ni mg/L	Se mg/L	Si mg/L	Ag mg/L	Sr mg/L	S mg/L	Tl mg/L	Th mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L
FFR 01042019	04-Jan-19	FFR 01042019	0.0064	1.4E-05	---	0.0705	0	---	0.9	0	8.5E-05	8.5E-05	0.00033	0.003	0.000013	0.291	0.0163	0.000039	0.00017	---	4.84	0.000006	11.66	---	0.000005	---	0.00596	0.00033	1.07E-05	0.00048	0	---
FFR 06062019	06-Jun-19	FFR 06062019	0.013	0.00002	---	0.0692	0.000042	---	0.883	0.000012	9.7E-05	0.0002	4.9E-05	0.01	0.00032	0.255	0.0082	0.000092	0.0012	---	4.51	0.000038	8.5	---	0.00001	---	8.3E-05	0.0004	1.21E-05	0.00087	0.0022	---
Forestry Farm Road	10-May-23	31976230711002	0.0176	<0.00100	<0.0010	0.0713	<0.00020	<0.00050	0.977	<0.00050	<0.0050	<0.0010	<0.0020	<0.10	<0.00050	0.355	0.0304	<0.00050	<0.0050	0.0267	6.01	<0.00010	11.6	223	<0.00010	<0.010	<0.0010	<0.0030	<0.00010	<0.0050	<0.010	---
Forestry Farm Road	11-Jul-23	31976230711001	0.0165	<0.00100	<0.0010	0.0725	<0.00020	<0.00050	1.06	<0.00050	<0.005	<0.0010	<0.0020	<0.10	<0.00050	0.344	0.0121	<0.00050	<0.0050	0.0209	5.45	<0.00010	12.9	316	<0.00001	<0.010	<0.0010	<0.0030	<0.00010	<0.0050	<0.010	---
Forestry Farm Road	02-Nov-24	CA12157-3	0.004	<0.0009	0.0007	0.0865	0.00001	<0.00001	0.624	<0.000003	0.00026	4.7E-05	<0.001	0.007	<0.00009	0.482	0.0112	<0.0004	0.00002	<0.00004	---	<0.00005	12.2	0.00006	<0.00006	0.0002	0.00008	0.0005	0.000008	0.00017	<0.002	---
Spangers Spring	11-Jul-23	31976230711003	<0.010	<0.00100	<0.0010	0.136	<0.00020	<0.00050	0.978	<0.00050	<0.0050	<0.0010	<0.020	<0.10	<0.00050	0.400	0.0187	<0.00050	<0.0050	0.0259	5.38	<0.00010	12.8	160	<0.00010	---	<0.0010	<0.0030	<0.00010	<0.0050	<0.010	---
Spanjers Well 7047368 10-AG-123	21-Jun-10	10-AG-123	<0.05	1.8E-05	<0.0003	0.042	---	---	1.029	<0.00001	<0.00002	<0.000005	0.01	<0.003	0.000004	0.322	0.019	0.000091	<0.0001	<0.0001	3.95	0.012	12.66	---	<0.000001	<0.000001	0.00002	0.00033	0.000023	0.00003	0.0014	---
Spanjers Well 7047368 -18-AG-527	24-Sep-18	18-AG-527	0.0028	1.4E-05	0.00033	0.128	---	---	0.9	0.000007	<0.002	<0.00005	0.00194	0.016	<0.00002	0.499	0.0383	0.0005	0.0029	0.00094	4.25	0.0092	13.29	---	<0.0000003	<0.000001	1.4E-05	0.00095	8.7E-06	8.1E-05	0.0031	---
Spanjers Well 606219	06-Jun-19	7047368	0.0007	1.4E-05	---	0.134	1.07E-05	---	0.932	0.00001	0.00029	0.00018	2.5E-05	0.033	0.000034	0.401	0.048	0.00091	0.00117	---	4.56	0.000028	9.24	---	5.6E-06		0.0001	0.0002	5.5E-06	0.00113	0.0014	---
Silver Hills	16-Mar-20	F005318	<0.010	<0.00100	0.00119	0.151	<0.00020	<0.00050	0.802	<0.00050	<0.0050	<0.0010	<0.0020	<0.10	<0.00050	0.397	0.00309	<0.00050	<0.0050	0.162	4.84	<0.0010	9.76	776	<0.00010	<0.010	<0.0010	<0.0030	<0.00010	<0.0050	<0.010	---
Silver Hills	20-Oct-20	F005318	0.0037	<0.00100	---	0.12	0	---	0.846	0.0000032	3.9E-05	6.8E-05	0.00016	0.003	0.000027	0.473	0.0036	0.00078	0.00014	---	5.15	0.000019	11.96	---	0.000007	<0.010	0.00015	0.00015	1.03E-05	0.00014	0	---
Silver Hills	08-Aug-23	31976230808001	0.0112	1.4E-05	---	0.1172	0	---	0.863	0	4.2E-05	4.5E-05	0.00014	0.004	0.000019	0.457	0.0038	0.00032	0.00012	---	5.47	0.000009	11.81	---	0.000007	---	0.00007	0.00014	8.4E-06	0.00015	0.0007	---
07-AG165	26-Jul-07	07-AG165	<0.05	4.1E-05	0.0007	0.0846	---	---	0.506	0.000018	0.00045	<0.000005	0.0013	0.061	<0.000002	0.533	0.038	0.038	0.0016	0	4.58	0.02	16.98	---	<0.000001	<0.000001	8.6E-05	0.00136	2.1E-06	5.3E-05	0.0019	---
18-AG-533	25-Sep-18	18-AG-533	0.0024	9E-06	0.00032	0.121	---	---	0.72	0.0000053	0.00024	<0.00005	0.00117	0.106	<0.00002	0.394	0.07598	0.07598	0.0018	0.000494	4.52	0.0094	10.44	---	<0.0000003	<0.000001	<0.000009	0.0011	6E-07	4.8E-05	0.0027	---
14-AG-094	24-Sep-18	14-AG-094	0.006	6E-06	0.00028	0.036	---	---	0.8	0.0000625	2.1E-05	0.00034	0.0002	0.363	<0.00002	0.154	0.01409	0.01409	0.00009	0.000136	4.32	0.0034	1.43	---	<0.0000004	1.5E-06	<0.000009	<0.0004	4.8E-06	5E-05	<0.0004	---
7117306	05-Feb-25	31976250205001	0.0053	<0.00050	<0.0010	0.0099	<0.00040	---	0.013	<0.000090	<0.0050	<0.00050	0.0099	<0.1	<0.00050	---	<0.0020	<0.00050	<0.0010	<0.0020	6	<0.000090	0.11	---	<0.000050	---	---	<0.0050	0.00054	<0.00050	0.015	---
7117306	10-Mar-25	31976250310101	0.0064	<0.00050	<0.0010	0.011	<0.00040	---	0.014	<0.000090	<0.0050	<0.00050	0.0068	<0.1	<0.00050	---	<0.0020	<0.00050	<0.0010	<0.0020	5.4	<0.000090	0.1	---	<0.000050	---	---	<0.0050	0.00066	<0.00050	0.0097	---
7117306	15-May-25	31976250310101	0.0052	<0.00050	<0.0010	0.01	<0.00040	---	0.013	<0.000090	<0.0050	<0.00050	0.018	<0.1	<0.00050	---	<0.0020	<0.00050	<0.0010	<0.0020		<0.000090	0.1	---	<0.000050	---	---	<0.0050	0.0005	<0.00050	0.023	---
31976250303101	03-Mar-25	31976250303101	0.0107	<0.00100	<0.00100	0.14	<0.000200	<0.000500	1.07	<0.0000500	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.436	0.00691	<0.000500	<0.00500	0.0844	5.32	<0.000100	12	137	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	0.0167	<0.00300
31976250303102	03-Mar-25	31976250303102	<0.0100	<0.00100	0.00118	0.151	<0.000200	<0.000500	0.914	<0.0000500	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.414	0.0782	<0.000500	<0.00500	0.195	5.88	<0.000100	11.3	339	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	0.0386	<0.00300
31976250303103	03-Mar-25	31976250303103	0.0108	<0.00100	0.00111	0.16	<0.000200	<0.000500	0.913	<0.0000500	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.407	0.0419	<0.000500	<0.00500	0.0709	5.67	<0.000100	11.3	134	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	<0.0100	<0.00300
31976250303104	03-Mar-25	31976250303104	0.0109	<0.00100	0.00132	0.0533	<0.000200	<0.000500	<0.100	<0.0000500	<0.00500	<0.00100	<0.00200	9.53	<0.000500	<0.0100	2.99	<0.000500	<0.00500	<0.000500	6.4	<0.000100	0.275	7.96	<0.000100	<0.00100	<0.00100	<0.00300	0.000171	<0.00500	0.124	<0.00300
31976250304005	04-Mar-25	31976250304005	<0.0100	<0.00100	0.00345	0.0612	<0.000200	<0.000500	<0.100	<0.0000500	<0.00500	<0.00100	<0.00200	8.66	<0.000500	<0.0100	3.13	<0.000500	<0.00500	<0.000500	7.9	<0.000100	0.263	<5.00	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	0.45	<0.00300
31976250304006	04-Mar-25	31976250304006	0.0148	<0.00100	0.00908	0.0598	<0.000200	<0.000500	<0.100	<0.0000500	<0.00500	<0.00100	<0.00200	22.6	<0.000500	<0.0100	1.62	<0.000500	<0.00500	<0.000500	7.05	<0.000100	0.297	<5.00	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	<0.0100	<0.00300
31976250304007	04-Mar-25	31976250304007	0.0256	<0.00100	0.0026	0.0739	<0.000200	<0.000500	<0.100	<0.0000500	<0.00500	<0.00100	<0.00200	13.1	<0.000500	<0.0100	2.5	<0.000500	<0.00500	<0.000500	7	<0.000100	0.338	<5.00	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	<0.0100	<0.00300
31976250304008	04-Mar-25	31976250304008	0.0126	<0.00100	0.00111	0.134	<0.000200	<0.000500	0.514	<0.0000500	<0.00500	<0.00100	<0.00200	5.63	<0.000500	0.085	4.18	0.000543	<0.00500	<0.000500	6.06	<0.000100	5.03	136	<0.000100	<0.00100	<0.00100	<0.00300	0.000266	<0.00500	<0.0100	<0.00300
MW25-01S	18-Mar-25	31976250318001	0.24	0.00178	0.00671	0.0389	<0.000020	<0.000050	0.18	<0.0000050	0.00079	<0.00010	<0.00020	<0.010	<0.000050	0.001	<0.00010	0.0233	<0.00050	0.000508	11.9	<0.000010	0.31	10.5	<0.000010	<0.00010	0.00048	<0.00030	<0.000010	0.0156	<0.0010	<0.00030
MW25-01D	18-Mar-25	31976250318002	<0.0100	<0.00100	<0.00100	0.11	<0.000200	<0.000500	0.844	<0.0000500	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.288	0.0347	<0.000500	<0.00500	0.0479	3.41	<0.000100	7.52	56.1	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	<0.0100	<0.00300
MW25-02S	19-Mar-25	31976250319003	0.197	0.00239	0.0307	0.0489	<0.000020	<0.000050	0.37	<0.0000050	<0.00050	0.00021	0.00035	0.265	0.000243	0.003	0.0126	0.022	0.00075	0.000514	5.08	<0.000010	0.192	3.47	<0.000010	<0.00010	<0.00010	<0.00800	0.00238	0.00969	<0.0010	<0.00030
MW25-02D	19-Mar-25	31976250319004	<0.0100	<0.00100	0.00153	0.148	<0.000200	<0.000500	0.923	<0.0000500	<0.00500	<0.00100	<0.00200	<0.100	<0.000500	0.423	0.012	<0.000500	<0.00500	0.104	4.38	<0.000100	11.6	172	<0.000100	<0.00100	<0.00100	<0.00300	<0.000100	<0.00500	<0.0100	<0.00300
MW25-03S	11-Mar-25	31976250311005	0.003	0.00018	0.0028	0.168	<0.000020	<0.000050	0.043	<0.0000050	<0.00050	<0.00010	<0.00020	0.069	<0.000050	0.005	0.0111	0.00341	<0.00050	<0.000050	9.61	<0.000010	0.844	2.79	<0.000010	<0.00010	<0.00010	<0.00030	0.000234	<0.00050	<0.0010	<0.00030
MW25-03D	11-Mar-25	31976250311006	0.0032	0.00014	0.0011	0.145	<0.000020	<0.000050	0.494	<0.0000050	0.00266	<0.00010	<0.00020	0.07	<0.000050	0.032	0.0314	0.00484	0.0006	0.00999	5.83	<0.000010	1.89	9.56	<0.000010	<0.00010	<0.00010	<0.00030	0.00074	<0.00050	<0.0010	<0.00030
Ontario Ontario Drinking Water Quality Guidelines**			**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**5**	**NS**	**0.05**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**0.01**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Notes:

--- - not analyzed

NS - not specified

** - *Water Management: Policies, Guidelines, Provincial Water Quality Guidelines of the Ministry of Environment and Energy* (MOEE 1999)

Italics - values do not meet applicable guidelines

TABLE 8

Groundwater Quality Results - Isotopes

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Sample Date	MSI Sample Number	E^3H	$\delta^{18}O_{water}$ ‰VSMOW	$\delta^{2}H_{water}$ ‰VSMOW	$d^{18}O_{SO4}$ ‰VSMOW	$\delta^{34}S_{SO4}$ ‰VCDT	$\delta^{34}S_{S2}$ ‰VCDT	$\delta^{13}C_{CH4}$ ‰VPDB	$\delta^{2}H_{CH4}$ ‰VSMOW
Forestry Farm Road	11-Jul-23	31976230711001	<0.8	-11.07	-73.20	18	50.8	-7.80	---	---
Forestry Farm Road	10-May-23	31976230711002	<0.8	-11.01	-72.80	17	50.8	-1.20	---	---
Forestry Farm Road	02-Nov-24	CA12157-2	<0.9	-10.93	-73.42	17	51.0	5.00	-56.10	---
Spanjers Well	21-Jun-10	10-AG-123	<0.8	-10.97	-70.76	16	40.8	---	---	---
Spanjers Well	24-Sep-18	18-AG-527	<0.8	-10.78	-72.85	17	67.9	5.98	-54.05	-190.50
Spangers Spring	11-Jul-23	31976230711003	<0.8	-11.09	-73.50	18	59.1	2.20	---	---
Silver Hills	08-Aug-23	31976230808001	---	-11.30	-74.50	26	89.9	18.60	---	---
07-AG165	26-Jul-07	07-AG-165	---	-10.90	-71.23	20	34.5	---	---	---
18-AG-533	25-Sep-18	18-AG-533	<0.8	-10.88	-71.49	14	75.0	24.70	-53.50	-186.00
14-AG-094	24-Sep-18	18-AG-528	<0.8	-12.08	-82.22	---	---	---	-46.60	-204.00
Big Creek Water	11-Jul-23	31976230711004	---	-9.64	-62.50	1	4.4	---	---	---
MW25-01S	18-Mar-25	31976250318001	1.3	-9.77	-65.70	13.2	11.7	72.7	---	---
MW25-01D	18-Mar-25	31976250318002	<0.8	-11.27	-75.60	17.4	57.6	18.9	---	---
MW25-02S	19-Mar-25	31976250319003	1.1	-10.13	-67.10	NP	NP	NES	---	---
MW25-02D	19-Mar-25	31976250319004	1.3	-10.73	-71.60	18.1	63.8	16.9	---	---
MW25-03S	11-Mar-25	31976250311005	<0.8	-10.30	-68.20	NP	NP	NES	---	---
MW25-03D	11-Mar-25	31976250311006	<0.8	-10.15	-66.40	NP	NP	26.0	---	---

Notes:

NP - no precipitation

NES - not enough sample

TABLE 9

Compositional & Isotopic Gas Results

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Sample Date	MSI Sample Number	Sample Type	Compositional Analysis - Headspace											
				Methane (C1) % (V/V)	Ethane (C2) % (V/V)	Propane (C3) % (V/V)	I-Butane (C4) % (V/V)	N-Butane (C4) % (V/V)	NeoPentane(C5) % (V/V)	I-Pentane(C5) % (V/V)	N-Pentane(C5) % (V/V)	Hexanes (C6) % (V/V)	C7+ % (V/V)	Carbon Dioxide % (V/V)	Hydrogen Sulphide % (V/V)
Forestry Farm Road	12-Jul-23	31976230711-001_#1	Free Gas	57.29	0.68	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.27	1.58
Forestry Farm Road	12-Jul-23	31976230711-001_#2	Free Gas	57.41	0.68	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.27	1.62
FFR 24-AG-183-GAS	01-Oct-24	24-AG-183-GAS	Free gas	47.37	0.81	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.38	<0.001
24-AG-183	02-Nov-24	24-AG-183	Free gas	9.31	0.22	0.00	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.38	---
Spangers Spring	12-Jul-23	31976230711-003	Free Gas	49.67	1.09	0.00	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2.54	1.98
Spanjers Well	24-Sep-18	18-AG-527	Field sample	---	---	---	---	---	---	---	---	---	---	---	---
Spanjers Well b	24-Sep-18	18-AG-529	Field sample	---	---	---	---	---	---	---	---	---	---	---	---
Silver Hills	08-Aug-23	31976230808-001_#1	Free Gas	61.55	1.59	0.10	0.01	0.02	0.002	0.01	0.002	<0.001	<0.001	2.45	2.73
Silver Hills	08-Aug-23	31976230808-001_#2	Free Gas	61.85	1.59	0.10	0.01	0.02	0.002	0.01	0.002	<0.001	<0.001	2.46	2.56
24-AG-175	10-Oct-24	24-AG-175	Dissolved Gas	32.89	1.23	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.14	---
24-AG-176	17-Oct-24	24-AG-176	Dissolved Gas	26.24	1.17	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2.36	---
24-AG-179	10-Oct-24	24-AG-179	Dissolved Gas	46.65	1.58	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.14	---
24-AG-180	17-Oct-24	24-AG-180	Dissolved Gas	0.38	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	3.04	---
MW25-01D	18-Mar-25	31976250318002	Free Gas	72.42	0.23	0.01	0.00	0.00	0.002	0.00	<0.001	<0.001	<0.001	7.67	0.77
MW25-02D	19-Mar-25	31976250319004	Free Gas	44.58	1.05	0.00	<0.001	<0.001	0.001	0.00	<0.001	0.00	<0.001	1.51	1.86
MW25-03D	11-Mar-25	31976250311006	Free Gas	70.20	0.05	0.00	<0.001	0.00	0.002	0.00	<0.001	0.00	<0.001	0.33	0.01

TABLE 9

Compositional & Isotopic Gas Results

Norfolk County

Forestry Farm Road - 2025 Groundwater Drilling and Monitoring Program

Sample Point	Sample Date	MSI Sample Number	Sample Type	Dissolved - Field										Isotopes		
				Helium % (V/V)	Hydrogen % (V/V)	Ar+Oxygen - O_2 % (V/V)	Nitrogen % (V/V)	C1	C2	C3	iC4	Carbon Dioxide	Nitrogen	Methane Delta-13C per mil PDB	Carbon Dioxide Delta-13C per mil PDB	Methane Delta-2H per mil PDB
Forestry Farm Road	12-Jul-23	31976230711-001_#1	Free Gas	0.28	<0.01	0.50	38.38	---	---	---	---	---	---	-60.05	---	-242.50
Forestry Farm Road	12-Jul-23	31976230711-001_#2	Free Gas	0.28	<0.01	0.50	38.22	---	---	---	---	---	---	-59.85	---	-245.50
FFR 24-AG-183-GAS	01-Oct-24	24-AG-183-GAS	Free gas	0.37	<0.01	2.72	47.34	---	---	---	---	---	---	---	---	---
24-AG-183	02-Nov-24	24-AG-183	Free gas	0.02	<0.01	3.60	86.47	---	---	---	---	---	---	-56.40	---	---
Spangers Spring	12-Jul-23	31976230711-003	Free Gas	0.09	0.09	4.89	39.64	---	---	---	---	---	---	-56.30	---	-238.50
Spanjers Well	24-Sep-18	18-AG-527	Field sample	---	---	---	---	20.70	0.25	0.01	---	84.76	11.86	-54.40	---	-187.00
Spanjers Well b	24-Sep-18	18-AG-529	Field sample	---	---	---	---	26.62	1.28	0.05	---	185.19	16.94	-53.70	---	-194.00
Silver Hills	08-Aug-23	31976230808-001_#1	Free Gas	0.42	0.02	0.78	30.32	---	---	---	---	---	---	-53.20	-25.30	-207.00
Silver Hills	08-Aug-23	31976230808-001_#2	Free Gas	0.42	0.02	0.71	30.25	---	---	---	---	---	---	-52.65	-25.60	-209.00
24-AG-175	10-Oct-24	24-AG-175	Dissolved Gas	---	---	0.24	8.71	---	---	---	---	---	---	-44.30	---	---
24-AG-176	17-Oct-24	24-AG-176	Dissolved Gas	---	---	0.87	21.02	---	---	---	---	---	---	-67.30	---	---
24-AG-179	10-Oct-24	24-AG-179	Dissolved Gas	---	---	0.22	8.08	---	---	---	---	---	---	-44.45	---	---
24-AG-180	17-Oct-24	24-AG-180	Dissolved Gas	---	---	0.58	19.05	---	---	---	---	---	---	-34.44	---	---
MW25-01D	18-Mar-25	31976250318002	Free Gas	0.01	0.02	3.37	15.50	---	---	---	---	---	---	-58.70	-35.00	-318.13
MW25-02D	19-Mar-25	31976250319004	Free Gas	0.35	0.06	5.06	45.53	---	---	---	---	---	---	-51.50	-28.45	-218.40
MW25-03D	11-Mar-25	31976250311006	Free Gas	0.01	0.20	0.85	28.34	---	---	---	---	---	---	-66.57	---	-292.60

APPENDIX A
Borehole Logs

Borehole Log - USC

Project/Site: **31976**

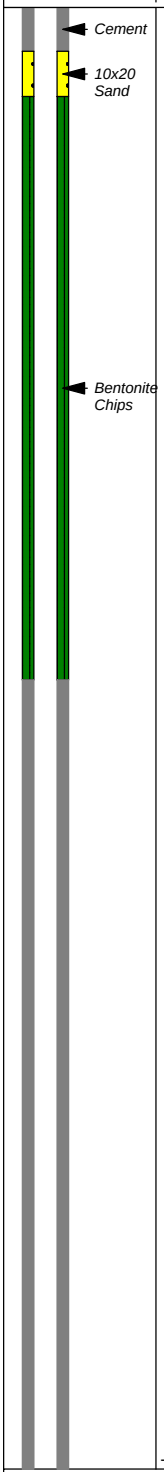
Well/borehole #: **MW25-01D**

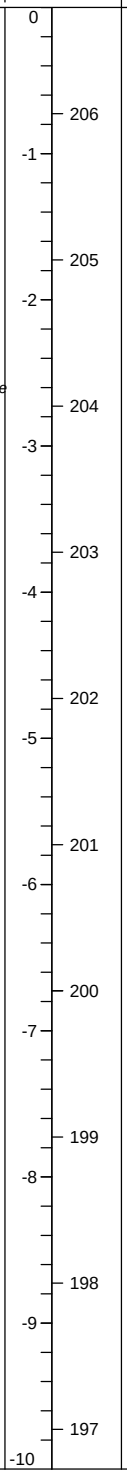
Client: **Norfolk County**
Logged By: **R. Drysdale/ R.McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

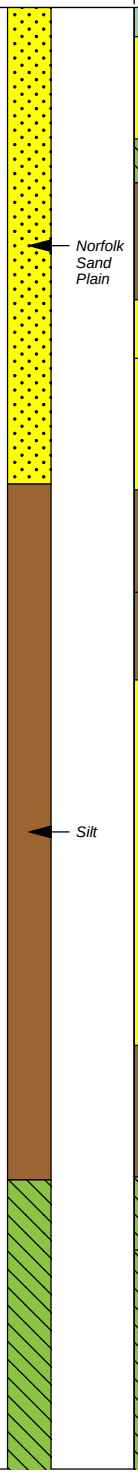
Start Time: **Mar 10 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.57 m**
Ground Elev: **206.73 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735711**
Easting: **540520**
Datum/Zone: **NAD83 / Zone17N**







Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250310/11...
ORGANIC TOPSOIL: (0-0.2 m) dark brown, moist.	
SAND (FINE GRAINED): (0.2-0.9 m) some silt, trace clay, dark brown, moist, poorly graded.	
CLAY: (0.9-1.2 m) some silt, trace sand (fine grained), brown, moist, low plasticity, laminated.	1.14-1.98 m (#021) GS
Sandy (fine grained) SILT: (1.2-2.0 m) light brown, moist, low dilatency, coursening down.	
SAND (FINE GRAINED): (2.0-2.4 m) trace silt, brown, moist, poorly graded.	
SAND (FINE GRAINED): (2.4-3.3 m) trace silt, brown, moist, poorly graded.	2.44-3.23 m (#022) GS
SILT: (3.3-4.0 m) some sand (fine grained), trace gravel (fine grained, subangular), brown, wet, high dilatency, varying sand content (bedded).	3.23-3.96 m (#023) GS
Sandy (fine grained) SILT: (4.0-4.6 m) light brown, wet, high dilatency.	
Silty SAND (FINE GRAINED): (4.6-7.1 m) light brown with grey layers, wet, poorly graded.	4.57-7.11 m (#024) GS
SILT: (7.1-8.0 m) some sand (fine grained), some clay, grey, wet, non-plastic, high dilatency.	7.11-8 m (#025) GS
Silty CLAY: (8.0-8.5 m) grey, moist, medium plasticity.	
CLAY: (8.5-11.6 m) trace silt, dark grey, moist, high plasticity, trace drop stones near bottom of run, lacustrine, massive.	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-01D**

Client: **Norfolk County**
Logged By: **R. Drysdale/ R.McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 10 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.57 m**
Ground Elev: **206.73 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735711**
Easting: **540520**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250310/11...
	-10 / 196				10.06-11.58 m (#026) GS
	-11 / 195			NO RECOVERY: (11.6-12.6 m)	
	-12 / 194			CLAY: (12.6-14.6 m) trace silt, trace gravel (drop structure, fine grained, subangular), dark grey, moist, high plasticity, lacustrine, massigve, PP = 1.5 kg/cm2.	13.11-14.63 m (#027) GS
	-13 / 193				
	-14 / 192	Clay		NO RECOVERY: (14.6-16.7 m)	
	-15 / 191				
	-16 / 190			CLAY: (16.7-17.7 m) trace silt, trace gravel (fine grained, angular), dark grey, moist, high plasticity, lacustrine, massive, PP = 2.0 kg/cm2.	16.63-17.68 m (#028) GS/ST
	-17 / 189			CLAY: (17.7-20.7 m) trace silt, trace gravel (fine grained, angular), dark grey, moist, high plasticity, lcaustrine, massive, PP = 0.75 kg/cm2.	17.68-19.2 m (#029) GS
	-18 / 188				
	-19 / 187				
	-20				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

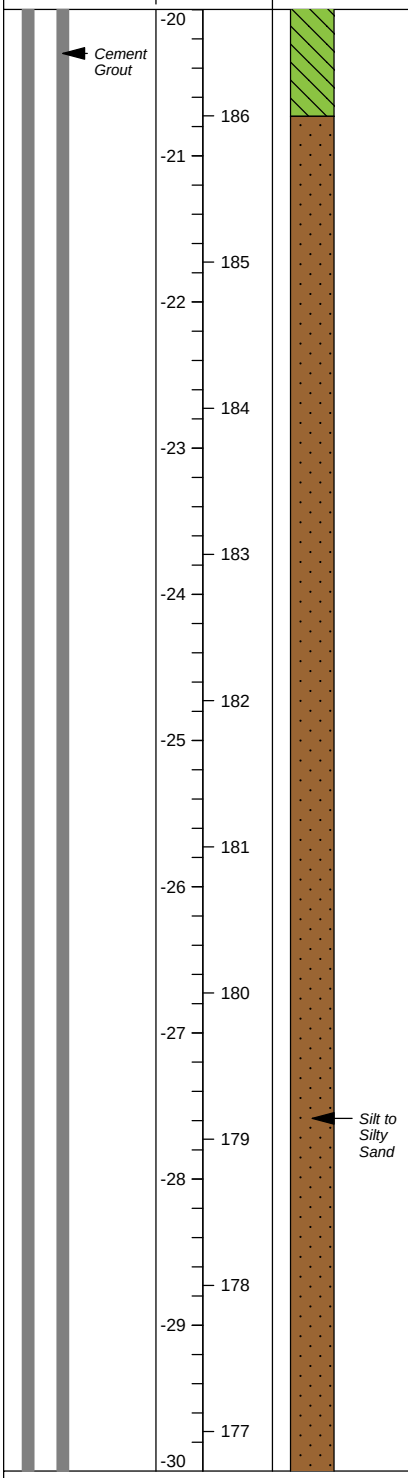
Well/borehole #: **MW25-01D**

Client: **Norfolk County**
Logged By: **R. Drysdale/ R.McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 10 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.57 m**
Ground Elev: **206.73 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735711**
Easting: **540520**
Datum/Zone: **NAD83 / Zone17N**



Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250310/11...
Clayey SILT: (20.7-23.8 m) trace gravel (fine grained, angular), dark grey, moist, non-plastic, low dilatency.	20.73-22.25 m (#030) GS
Clayey SILT: (23.8-26.8 m) some sand (fine grained), dark grey, moist, medium plasticity, low dilatency.	23.77-25.3 m (#031) GS
Clayey (interbeded) SILT: (26.8-29.9 m) dark grey, moist, low plasticity, high dilatency, proximal varve.	26.82-28.35 m (#032) GS
	29.87-31.39 m (#033) GS

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-01D**

Client: **Norfolk County**
Logged By: **R. Drysdale/ R.McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 10 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.57 m**
Ground Elev: **206.73 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735711**
Easting: **540520**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250310/11...
	-30 / 176			SILT: (29.9-32.9 m) some sand (fine grained), some clay, dark gray, moist, low plasticity, high dilatency.	31.39-32.92 m (#034) GS
	-31 / 175				
	-32 / 174				
	-33 / 173			CLAY: (32.9-33.8 m) dark grey, moist, medium plasticity, no dilatency.	32.92-33.76 m (#035) GS
	-34			Sandy SILT: (33.8-34.4 m) dark grey, moist, non-plastic, low dilatency.	33.76-34.44 m (#036) GS
	-35 / 172			CLAY TILL: (34.4-36.0 m) trace silt, dark grey, moist, high plasticity, no dilatency.	34.44-35.97 m (#037) GS
	-36 / 171			Silty CLAY TILL: (36.0-36.6 m) trace gravel (fine grained, angular), dark grey, moist, low plasticity, no dilatency.	35.97-36.58 m (#038) GS
	-37 / 170			Silty CLAY TILL: (36.6-38.7 m) some gravel (fine grained, angular), dark grey, moist, low plasticity, no dilatency.	
Bentonite Chips	-38 / 169	Till			
	-39 / 168			BOULDER: (38.7-39 m) rock flower, dark grey, dry.	
				Silty CLAY TILL: (39.0-40.5 m) some gravel (fine grained, angular), dark grey, moist, low plasticity, no dilatency, petroleum-like odour.	39.01-40.54 m (#039) GS
	-40 / 167				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-01D**

Client: **Norfolk County**
Logged By: **R. Drysdale/ R.McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 10 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.57 m**
Ground Elev: **206.73 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735711**
Easting: **540520**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250310/11...
10x20 Sand; Screen	-40 / 166				
	-41 / 165			BEDROCK: (40.5-42.1 m) high fractured limestone.	
	-42 / 164	Bedrock		BEDROCK: (42.1-43.59 m) high fractured limestone, brown grey, petroleum-like odour, fossiliferous.	42.06-43.59 m (#040) GS
	-43 / 163			Bottom of Hole	
	-44 / 162				
	-45 / 161				
	-46 / 160				
	-47 / 159				
	-48 / 158				
	-49 / 157				
	-50				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

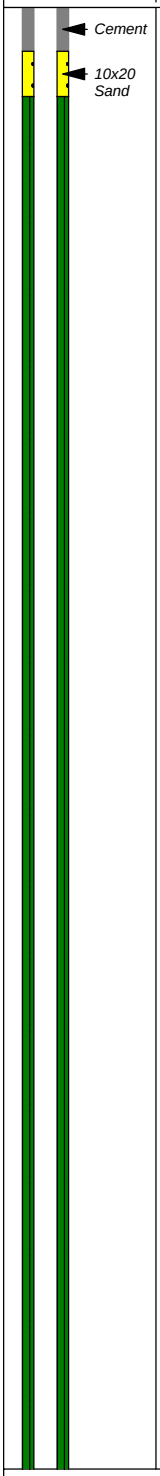
Well/borehole #: **MW25-01S**

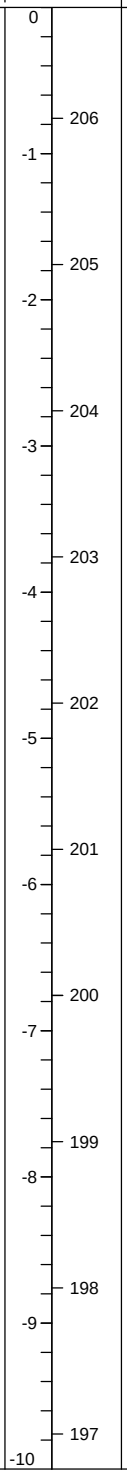
Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

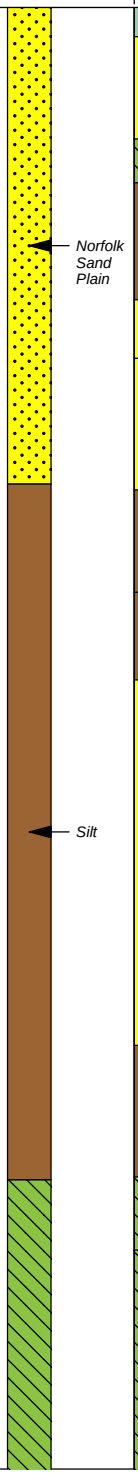
Start Time: **Mar 12 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.60 m**
Ground Elev: **206.76 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735713**
Easting: **540521**
Datum/Zone: **NAD83 / Zone17N**







Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: --
ORGANIC TOPSOIL: (0-0.2 m) dark brown, moist.	
SAND (FINE GRAINED): (0.2-0.9 m) some silt, trace clay, dark brown, moist, poorly graded.	
CLAY: (0.9-1.2 m) some silt, trace sand (fine grained), brown, moist, low plasticity, laminated.	
Sandy (fine grained) SILT: (1.2-2.0 m) light brown, moist, low dilatency, coursening down.	
SAND (FINE GRAINED): (2.0-2.4 m) trace silt, brown, moist, poorly graded.	
SAND (FINE GRAINED): (2.4-3.3 m) trace silt, brown, moist, poorly graded.	
SILT: (3.3-4.0 m) some sand (fine grained), trace gravel (fine grained, subangular), brown, wet, high dilatency, varying sand content (bedded).	
Sandy (fine grained) SILT: (4.0-4.6 m) light brown, wet, high dilatency.	
Silty SAND (FINE GRAINED): (4.6-7.1 m) light brown with grey layers, wet, poorly graded.	
SILT: (7.1-8.0 m) some sand (fine grained), some clay, grey, wet, non-plastic, high dilatency.	
Silty CLAY: (8.0-8.5 m) grey, moist, medium plasticity.	
CLAY: (8.5-11.6 m) trace silt, dark grey, moist, high plasticity, trace drop stones near bottom of run, lacustrine, massive.	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-01S**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 12 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.60 m**
Ground Elev: **206.76 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735713**
Easting: **540521**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: --
	-10 / 196				
	-11				
Bentonite Chips	-12 / 195			NO RECOVERY: (11.6-12.6 m)	
	194			CLAY: (12.6-14.6 m) trace silt, trace gravel (drop structure, fine grained, subangular), dark grey, moist, high plasticity, lacustrine, massigve, PP = 1.5 kg/cm2.	
	-13 / 193				
	-14	Clay			
	192			NO RECOVERY: (14.6-16.7 m)	
	-15				
	191				
	-16				
	190			CLAY: (16.7-17.7 m) trace silt, trace gravel (fine grained, angular), dark grey, moist, high plasticity, lacustrine, massive, PP = 2.0 kg/cm2.	
	-17				
	189			CLAY: (17.7-20.7 m) trace silt, trace gravel (fine grained, angular), dark grey, moist, high plasticity, lcaustrine, massive, PP = 0.75 kg/cm2.	
	-18				
	188				
	-19				
	187				
	-20				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

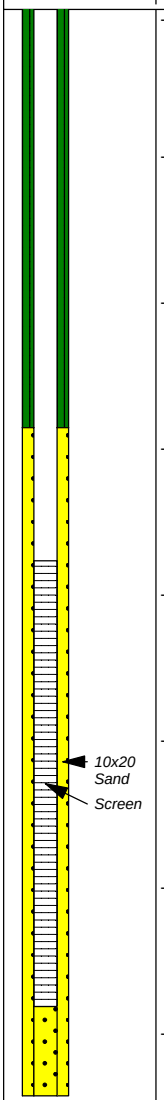
Well/borehole #: **MW25-01S**

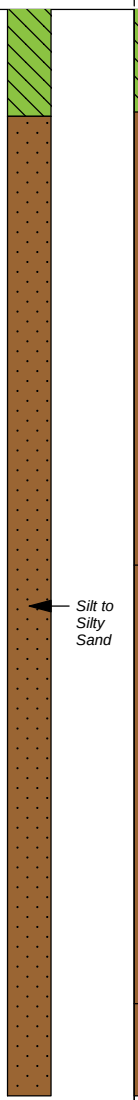
Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 12 2025**
Finish Time: **Mar 12 2025**
Top of Casing: **207.60 m**
Ground Elev: **206.76 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: 1860 12th Concession Rd, Delhi, ON
Relative Location: **South**
Northing: **4735713**
Easting: **540521**
Datum/Zone: **NAD83 / Zone17N**





Depth (m)	Elevation (m)
-20	
	186
-21	
	185
-22	
	184
-23	
	183
-24	
	182
-25	
	181
-26	
	180
-27	
	179
-28	
	178
-29	
	177
-30	

Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube)
Clayey SILT: (20.7-23.8 m) trace gravel (fine grained, angular), dark grey, moist, non-plastic, low dilatency.	
Clayey SILT: (23.8-26.8 m) some sand (fine grained), dark grey, moist, medium plasticity, low dilatency.	
Clayey (interbeded) SILT: (26.8-27.43 m) dark grey, moist, low plasticity, high dilatency, proximal varve.	
Bottom of Hole	

Sample No. Prefix: --

NOTE: --

Borehole Log - USC

Project/Site: **31976**

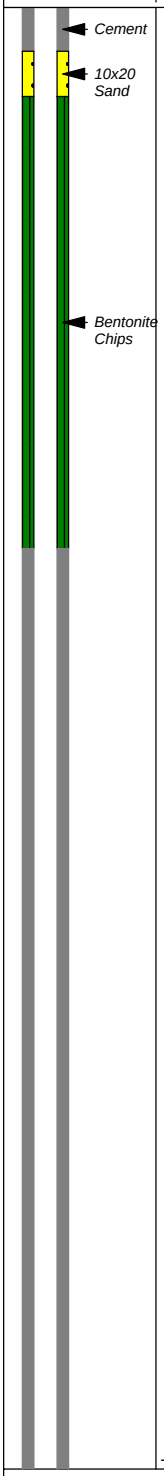
Well/borehole #: **MW25-02D**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

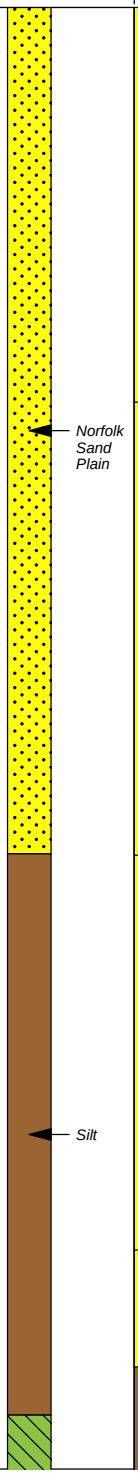
Start Time: **Mar 13 2025**
Finish Time: **Mar 17 2025**
Top of Casing: **207.91 m**
Ground Elev: **207.10 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **South**
Northing: **4735776**
Easting: **540935**
Datum/Zone: **NAD83 / Zone17N**



Depth (m)	Elevation (m)
0	207
-1	206
-2	205
-3	204
-4	203
-5	202
-6	201
-7	200
-8	199
-9	198
-10	



Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250313/17...
SAND (FINE GRAINED): (0-2.7 m) some silt, brown, moist, well graded.	
SAND (FINE GRAINED): (2.7-5.8 m) some silt, trace pebbles, brown, moist, well sorted.	
Silty SAND (FINE GRAINED): (5.8-8.5 m) slightly silty with depth, brown, moist, low dilatency.	5.79-7.32 m (#041) GS
SAND (FINE GRAINED): (8.5-9.3 m) some silt, brown, moist, well sorted.	
SILT AND SAND (FINE GRAINED): (9.3-11.5 m) trace clay, grey/brown, moist, fining down.	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-02D**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 13 2025**
Finish Time: **Mar 17 2025**
Top of Casing: **207.91 m**
Ground Elev: **207.10 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **South**
Northing: **4735776**
Easting: **540935**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250313/17...
	-10 / 197				
	-11 / 196			CLAY: (11.5-11.9 m) some to trace silt, fining down, contorted laminations.	
	-12 / 195			CLAY: (11.9-14.9 m) some laminations.	11.89-14.94 m (#042) GS
	-13 / 194				
	-14 / 193				
	-15 / 192			CLAY: 14.9-18.0 m) some silt laminations, pebbles drop.	14.94-17.98 m (#043) GS
	-16 / 191			@ 16.2-16.8 m slightly silty.	
	-17 / 190	Clay			
	-18 / 189			Silty CLAY: (18.0-21.0 m) silty laminations, small drops of pebbles.	
Cement Grout	-19 / 188				
	-20				19.51-20.42 m (#044) GS

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-02D**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 13 2025**
Finish Time: **Mar 17 2025**
Top of Casing: **207.91 m**
Ground Elev: **207.10 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **South**
Northing: **4735776**
Easting: **540935**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250313/17...
	-20 / 187				
	-21 / 186			Silty CLAY: (21.0-24.1 m) siltier with depth(silty clay to clay silt).	21.03-22.56 m (#045) GS
	-22 / 185				
	-23 / 184				
	-24 / 183			SILT AND SAND (FINE GRAINED): (24.1-26.8 m) occassional clay layers, slightly coarser with depth, clay layers are a max of 3 inches.	
	-25 / 182				
	-26 / 181				25.6-26.21 m (#046) GS
	-27 / 180			SILT AND SAND (FINE GRAINED): (26.8-30.2 m) occasional silty clay layers of 3 inches, coarse material on top of clay, slightly more silty every 2.5 feet.	27.13-30.18 m (#047) GS
	-28 / 179				
	-29 / 178				
	-30				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

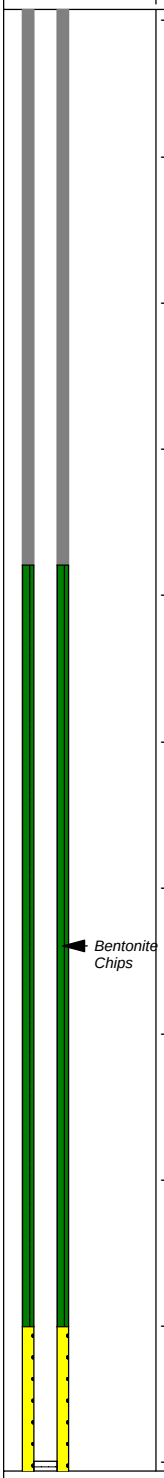
Well/borehole #: **MW25-02D**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 13 2025**
Finish Time: **Mar 17 2025**
Top of Casing: **207.91 m**
Ground Elev: **207.10 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **South**
Northing: **4735776**
Easting: **540935**
Datum/Zone: **NAD83 / Zone17N**



Depth (m)	Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250313/17...
-30	177	Silt to Silty Sand			
				SILT AND SAND (FINE GRAINED): (30.2-33.8 m) less clay than other layers, increase sand with depth, clay layers are getting apart.	30.18-31.7 m (#048) GS
-31	176				
-32	175				
-33	174				
-34	173			SILT AND SAND (FINE GRAINED): (33.8-35.1 m) clay layers are present (3-5 cm thick), increase sand with depth.	
-35	172			NO RECOVERY: (35.1-36.3 m) likely soft, silty material that fell from core barrel.	35.05-36.27 m (#049) GS
-36	171				36.27-36.58 m (#050) GS
-37	170			TILL: (36.3-37.6 m) (Port Stanley Till), silty clay, low stone content, reddish grey, firm.	36.58-37.49 m (#051) GS
-38	169			TILL: (37.6-39.3 m) (Catfish Creek Till), silty sand (fine/medium grained), gritty, very stoney, dense grey.	37.49-39.62 m (#052) GS
-39	168	Till			
-40				TILL: (39.3-40.2 m) (Catfish Creek Till), silty sand (fine/medium grained), gritty, high stone content (pebbles to small boulders), sand and silt beds (clasts ground by drilling).	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

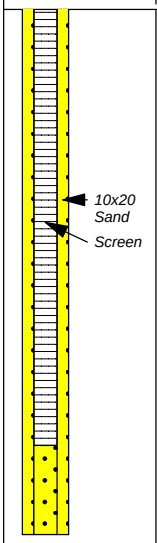
Well/borehole #: **MW25-02D**

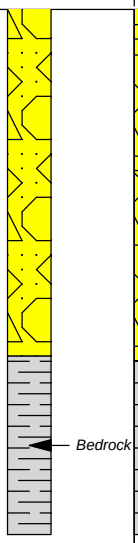
Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 13 2025**
Finish Time: **Mar 17 2025**
Top of Casing: **207.91 m**
Ground Elev: **207.10 m**
Top / Base of Sand Pack: 39.01/43.59 m

Screened Interval: 39.93-42.98 m
Slot Size: **0.01 "**
Total Depth: **43.59 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **South**
Northing: **4735776**
Easting: **540935**
Datum/Zone: **NAD83 / Zone17N**





Depth (m)	Elevation (m)
-40	167
-41	166
-42	165
-43	164
-44	163
-45	162
-46	161
-47	160
-48	159
-49	158
-50	

Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250313/17...
TILL: (40.2-41.1 m) (Catfish Creek Till), light pink silt layers (ground clasts) alternating with broken clasts and dark grey silty sand layers.	
TILL: (41.1-42.4 m) (Catfish Creek Till), silty sand, gritty, very stoney, dark grey.	
BEDROCK: (42.4-43.59 m) Dundee Formation, grey limestone, fractured along bedding, occasional fossil, notable petroliferous order, small chert nodules.	
Bottom of Hole	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

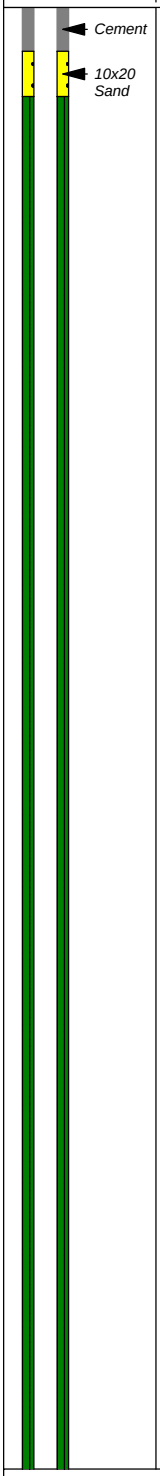
Well/borehole #: **MW25-02S**

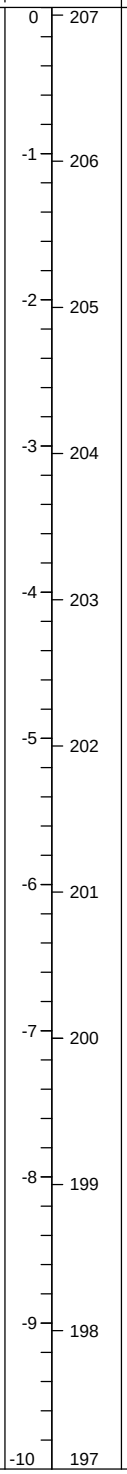
Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

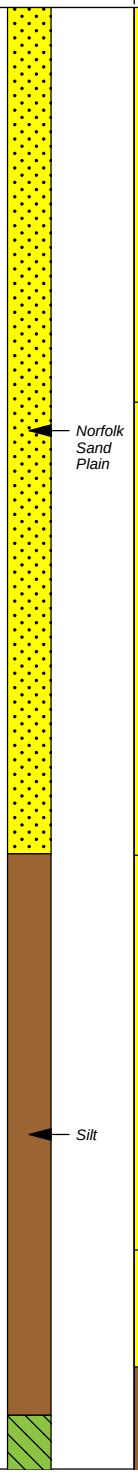
Start Time: **Mar 18 2025**
Finish Time: **Mar 18 2025**
Top of Casing: **207.93 m**
Ground Elev: **207.05 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **North**
Northing: **4735777**
Easting: **540934**
Datum/Zone: **NAD83 / Zone17N**







Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: --
	SAND (FINE GRAINED): (0-2.7 m) some silt, brown, moist, well graded.	
	SAND (FINE GRAINED): (2.7-5.8 m) some silt, trace pebbles, brown, moist, well sorted.	
	Silty SAND (FINE GRAINED): (5.8-8.5 m) slightly silty with depth, brown, moist, low dilatency.	
	SAND (FINE GRAINED): (8.5-9.3 m) some silt, brown, moist, well sorted.	
	SILT AND SAND (FINE GRAINED): (9.3-11.5 m) trace clay, grey/brown, moist, fining down.	

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-02S**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 18 2025**
Finish Time: **Mar 18 2025**
Top of Casing: **207.93 m**
Ground Elev: **207.05 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **North**
Northing: **4735777**
Easting: **540934**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: --
	-10 / 197				
	-11 / 196				
Bentonite Chips				CLAY: (11.5-11.9 m) some to trace silt, fining down, contorted laminations.	
	-12 / 195			CLAY: (11.9-14.9 m) some laminations.	
	-13 / 194				
	-14 / 193				
	-15 / 192			CLAY: 14.9-18.0 m) some silt laminations, pebbles drop.	
	-16 / 191			@ 16.2-16.8 m slightly silty.	
		Clay			
	-17 / 190				
	-18 / 189			Silty CLAY: (18.0-21.0 m) silty laminations, small drops of pebbles.	
	-19 / 188				
	-20 / 187				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-02S**

Client: **Norfolk County**
Logged By: **R. Drysdale**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 18 2025**
Finish Time: **Mar 18 2025**
Top of Casing: **207.93 m**
Ground Elev: **207.05 m**
Top / Base of Sand Pack: 22.86/27.43 m

Screened Interval: 23.77-26.82 m
Slot Size: **0.01 "**
Total Depth: **27.43 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: Wayne Scheers Farm Field, N of 1925 Forestry Farm Rd
Relative Location: **North**
Northing: **4735777**
Easting: **540934**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: --
	-20 / 187				
	-21 / 186			Silty CLAY: (21.0-24.1 m) siltier with depth(silty clay to clay silt).	
	-22 / 185				
	-23 / 184				
	-24 / 183			SILT AND SAND (FINE GRAINED): (24.1-26.8 m) occassional clay layers, slightly coarser with depth, clay layers are a max of 3 inches.	
10x20 Sand	-25 / 182				
Screen		Silt to Silty Sand			
	-26 / 181				
	-27 / 180			SILT AND SAND (FINE GRAINED): (26.8-27.43 m) occasional silty clay layers of 3 inches, coarse material on top of clay, slightly more silty every 2.5 feet.	
				Bottom of Hole	
	-28 / 179				
	-29 / 178				
	-30				

NOTE: --

Borehole Log - USC

Project/Site: **31976**

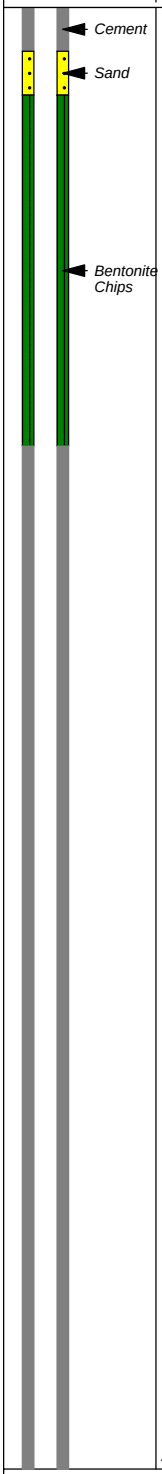
Well/borehole #: **MW25-03D**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**



Depth (m)	Elevation (m)
0	219
-1	218
-2	217
-3	216
-4	215
-5	214
-6	213
-7	212
-8	211
-9	210
-10	

Geologic Unit: Norfolk Sand Plain

Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250306...
ORGANICS: (0-0.3 m) some sand (fine grained), some silt, brown, wet.	
Gravelly (fine to coarse grained, angular) SAND (FINE TO COARSE GRAINED): (0.3-0.9 m) well graded, brown, moist, (FILL).	
PEAT: (0.9-1.0 m) dark brown, moist.	
Silty SAND (FINE GRAINED): (1.0-1.5 m) poorly graded, light brown, orange iron oxide staining, moist, trace debris.	
NO RECOVERY: (1.5-2.4 m)	
SAND (FINE GRAINED): (2.4-2.9 m) poorly graded, brown, orange oxide staining, wet.	
@ 2.9-3.2 m greyish black	
Sandy (fine grained) SILT: (3.2-3.5 m) grey, high dilatency, wet.	
SAND (FINE GRAINED): (3.5-5.5 m) poorly graded, grey, wet.	
SAND (FINE GRAINED): (5.5-8.5 m) some silt, poorly graded, grey, wet.	
SAND (FINE GRAINED): (8.5-11.6 m) some silt, poorly graded, grey, wet.	

NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-03D**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250306...
	-10 / 209				
	-11 / 208			Silty SAND: (11.6-11.8 m) grey, wet, high plasticity.	
	-12 / 207			Silty SAND (FINE GRAINED): (11.8-12.5 m) poorly graded, grey, wet.	
	-13 / 206			Clayey SILT: (12.5-14.3 m) some sand (fine grained), grey, wet, non-plastic, lacustrine, fining upwards. @ 13.1-13.4 m clay, dark grey.	
	-14 / 205			NO RECOVERY: (14.3-14.6 m)	
	-15 / 204			Silty SAND (FINE GRAINED): (14.6-17.7 m) poorly graded, grey, wet.	
	-16 / 203	Silt			
	-17 / 202			Silty SAND (FINE GRAINED): (17.7-19.2 m) poorly graded, grey, wet.	
	-18 / 201			@ 18.6-18.9 m silt, sandy (fine grained), grey, wet.	
	-19 / 200			Silty SAND (FINE GRAINED): (19.2-23.8 m) poorly graded, grey, wet.	
	-20				

NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-03D**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250306...
	-20 / 199				
	-21 / 198				
	-22 / 197				
	-23 / 196				
	-24 / 195			Sandy (fine grained) SILT: (23.8-26.4 m) grey, wet.	
Cement Grout	-25 / 194				
	-26 / 193			Silty SAND (FINE GRAINED): (26.4-26.8 m) poorly graded, grey, wet.	
	-27 / 192			Silty SAND (FINE GRAINED): (26.8-27.4 m) poorly graded, grey, wet.	
	-28 / 191			CLAY: (27.4-29.4 m) some silt, grey, wet, medium plasticity.	
	-29 / 190			Silty CLAY: (29.4-29.9 m) grey, wet, low to medium plasticity, red blebs, inclusions, varred.	
	-30				

NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-03D**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250306...
	-30 / 189			CLAY: (29.9-32.5 m) trace silt, grey, moist, high platisticity, massive, pp = 1.5kg/cm2.	
	-31 / 188				
	-32 / 187			CLAY: (32.5-32.9 m) some silt, trace gravel (fine grained, subangular), dark grey, moist, low plasticity, thinly laminated, lacustrine.	
	-33 / 186			CLAY: (32.9-36 m) some silt to silty, dark grey, moist, medium plasticity, thinly laminated, lacustrine, pp = 1.75 kg/cm2.	
	-34 / 185	Clay			
	-35 / 184				
	-36 / 183			Silty CLAY: (36.0-37.5 m) grey, wet, low plasticity, red blebs.	35.97-37.49 m (#016)
	-37 / 182			CLAY: (37.5-39.0 m) some silt, grey, wet, high plasticity, lacustrine.	
	-38 / 181				
	-39 / 180			Silty CLAY: (39.0-41.6 m) grey, wet, high plasticity.	
	-40				

NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

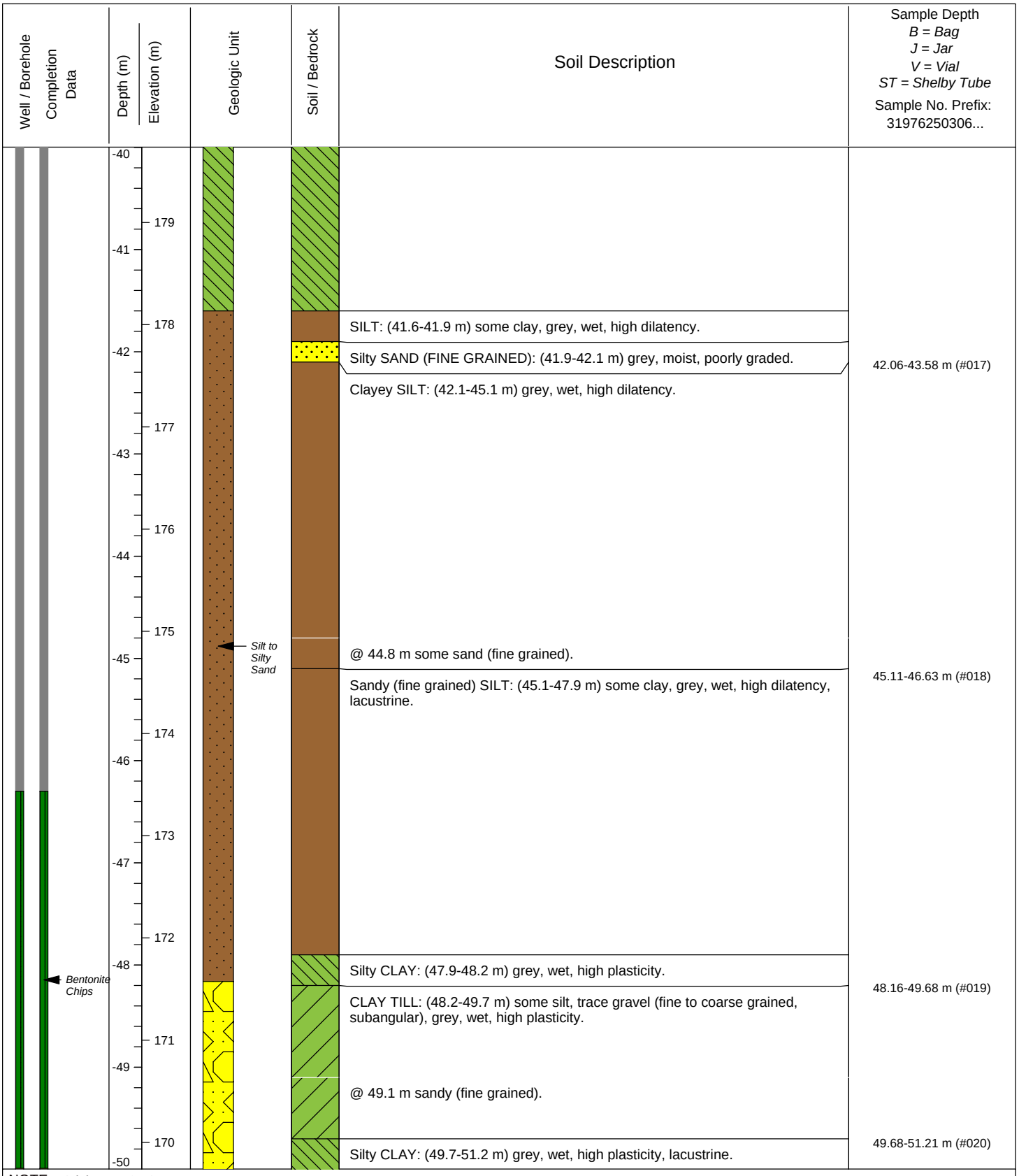
Well/borehole #: **MW25-03D**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**



NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

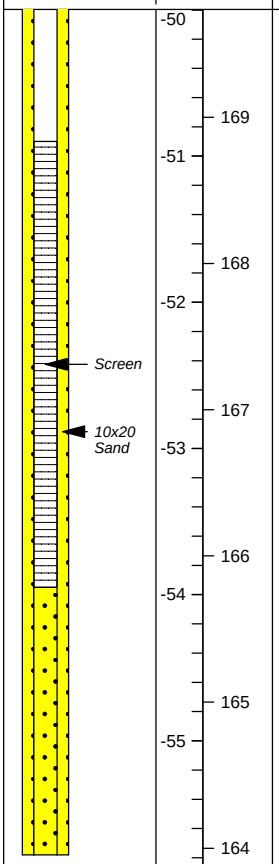
Well/borehole #: **MW25-03D**

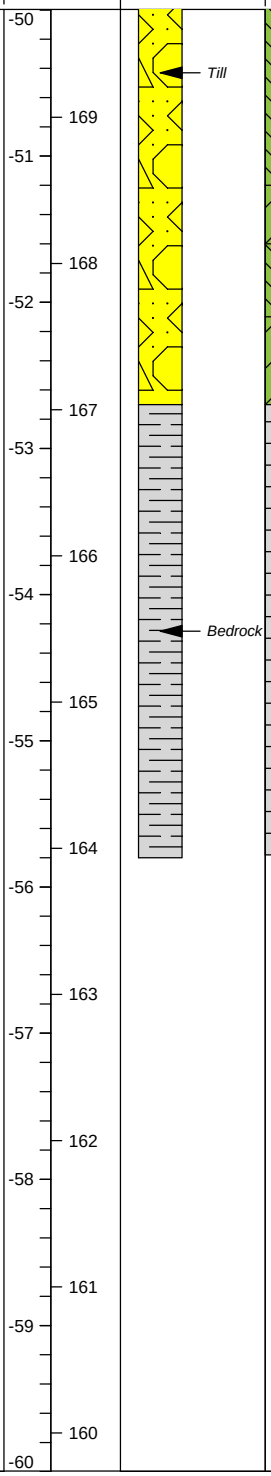
Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 04 2025**
Finish Time: **Mar 07 2025**
Top of Casing: **220.52 m**
Ground Elev: **219.74 m**
Top / Base of Sand Pack: 49.99/55.78 m

Screened Interval: 50.9-53.95 m
Slot Size: **0.01 "**
Total Depth: **55.78 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734763**
Easting: **541618**
Datum/Zone: **NAD83 / Zone17N**





Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250306...
Silty CLAY TILL: (51.2-51.6 m) trace sand (fine grained), trace gravel (fine to coarse grained, subangular), grey, wet, high plasticity.	
Silty CLAY: (51.6-52.1 m) grey, wet, high plasticity, lacustrine.	
Silty CLAY TILL: (52.1-52.7 m) some sand (fine to coarse grained), trace gravel (fine to coarse grained, subangular), dark grey, moist, medium plasticity.	
DOLOSTONE/LIMESTONE (BEDROCK): (52.7-55.78 m) weathered, brownish-grey, very hard, petroleum-like odour, highly fractured.	
Bottom of Hole	

NOTE: Stick up = 0.78 m

Borehole Log - USC

Project/Site: **31976**

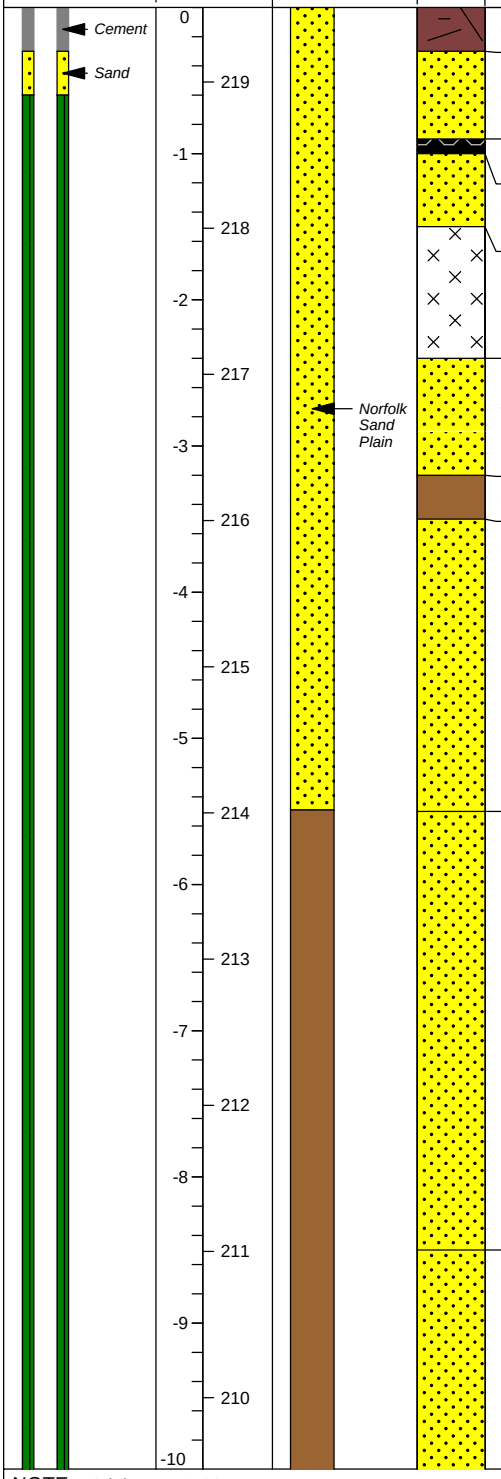
Well/borehole #: **MW25-03S**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 03 2025**
Finish Time: **Mar 04 2025**
Top of Casing: **220.34 m**
Ground Elev: **219.51 m**
Top / Base of Sand Pack: 23.47/28.35 m

Screened Interval: 24.38-27.43 m
Slot Size: **0.01 "**
Total Depth: **35.97 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734761**
Easting: **541620**
Datum/Zone: **NAD83 / Zone17N**



Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250303/04...
ORGANICS: (0-0.3 m) some sand (fine grained), some silt, brown, wet.	
Gravelly (fine to coarse grained, angular) SAND (FINE TO COARSE GRAINED): (0.3-0.9 m) well graded, brown, moist, (FILL).	
PEAT: (0.9-1.0 m) dark brown, moist.	
Silty SAND (FINE GRAINED): (1.0-1.5 m) poorly graded, light brown, orange iron oxide staining, moist, trace debris.	
NO RECOVERY: (1.5-2.4 m)	
SAND (FINE GRAINED): (2.4-2.9 m) poorly graded, brown, orange oxide staining, wet.	2.44-3.05 m (#001)
@ 2.9-3.2 m greyish black	
Sandy (fine grained) SILT: (3.2-3.5 m) grey, high dilatency, wet.	3.15-3.48 m (#002)
SAND (FINE GRAINED): (3.5-5.5 m) poorly graded, grey, wet.	3.47-5.46 m (#003)
SAND (FINE GRAINED): (5.5-8.5 m) some silt, poorly graded, grey, wet.	7.01-8.53 m (#004)
SAND (FINE GRAINED): (8.5-11.6 m) some silt, poorly graded, grey, wet.	

NOTE: Stick up = 0.83 m

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-03S**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 03 2025**
Finish Time: **Mar 04 2025**
Top of Casing: **220.34 m**
Ground Elev: **219.51 m**
Top / Base of Sand Pack: 23.47/28.35 m

Screened Interval: 24.38-27.43 m
Slot Size: **0.01 "**
Total Depth: **35.97 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734761**
Easting: **541620**
Datum/Zone: **NAD83 / Zone17N**

Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250303/04...
	-10 / 209				10.06-11.58 m (#005)
	-11 / 208			Silty SAND: (11.6-11.8 m) grey, wet, high plasticity.	
Bentonite Chips	-12			Silty SAND (FINE GRAINED): (11.8-12.5 m) poorly graded, grey, wet.	
	-12 / 207			Clayey SILT: (12.5-14.3 m) some sand (fine grained), grey, wet, non-plastic, lacustrine, fining upwards.	12.42-14.33 m (#006)
	-13			@ 13.1-13.4 m clay, dark grey.	
	-13 / 206				
	-14				
	-14 / 205			NO RECOVERY: (14.3-14.6 m)	
				Silty SAND (FINE GRAINED): (14.6-17.7 m) poorly graded, grey, wet.	
	-15 / 204				
	-16				16.15-17.68 m (#007)
	-16 / 203	Silt			
	-17				
	-17 / 202				
	-18			Silty SAND (FINE GRAINED): (17.7-19.2 m) poorly graded, grey, wet.	
	-18 / 201				
	-19			@ 18.6-18.9 m silt, sandy (fine grained), grey, wet.	
	-19 / 200			Silty SAND (FINE GRAINED): (19.2-23.8 m) poorly graded, grey, wet.	19.2-20.73 m (#008)
	-20				

NOTE: Stick up = 0.83 m

Borehole Log - USC

Project/Site: **31976**

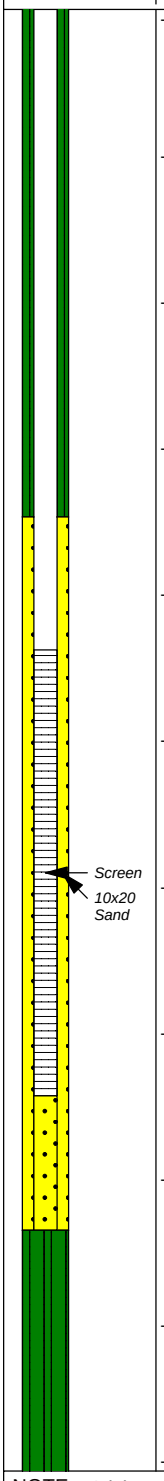
Well/borehole #: **MW25-03S**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 03 2025**
Finish Time: **Mar 04 2025**
Top of Casing: **220.34 m**
Ground Elev: **219.51 m**
Top / Base of Sand Pack: 23.47/28.35 m

Screened Interval: 24.38-27.43 m
Slot Size: **0.01 "**
Total Depth: **35.97 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734761**
Easting: **541620**
Datum/Zone: **NAD83 / Zone17N**



Depth (m)	Elevation (m)	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250303/04...
-20	199		
-21	198		
-22	197		22.25-23.77 m (#009)
-23	196		
-24	195	Sandy (fine grained) SILT: (23.8-26.4 m) grey, wet.	23.77-26.37 m (#010)
-25	194		
-26	193	Silty SAND (FINE GRAINED): (26.4-26.8 m) poorly graded, grey, wet.	
-27	192	Silty SAND (FINE GRAINED): (26.8-27.4 m) poorly graded, grey, wet.	
-28	191	CLAY: (27.4-29.4 m) some silt, grey, wet, medium plasticity.	28.35-29.87 m (#011)
-29	190	Silty CLAY: (29.4-29.9 m) grey, wet, low to medium plasticity, red blebs, inclusions, varred.	29.41-29.87 m (#012))
-30			29.87-32.49 m (#013)

NOTE: Stick up = 0.83 m

Borehole Log - USC

Project/Site: **31976**

Well/borehole #: **MW25-03S**

Client: **Norfolk County**
Logged By: **R. McCourt**
Compiled By: **B. Dang**
Driller: **CSD**
Drill Equipment: **Sonic**

Start Time: **Mar 03 2025**
Finish Time: **Mar 04 2025**
Top of Casing: **220.34 m**
Ground Elev: **219.51 m**
Top / Base of Sand Pack: 23.47/28.35 m

Screened Interval: 24.38-27.43 m
Slot Size: **0.01 "**
Total Depth: **35.97 m**
Boring Diameter: **0.15 m**
Casing Diameter: **0.05 m**

Legal Location: McDowell Rd at Forestry Farm Rd
Relative Location: **McDowell Rd at Forestry Farm Rd**
Northing: **4734761**
Easting: **541620**
Datum/Zone: **NAD83 / Zone17N**

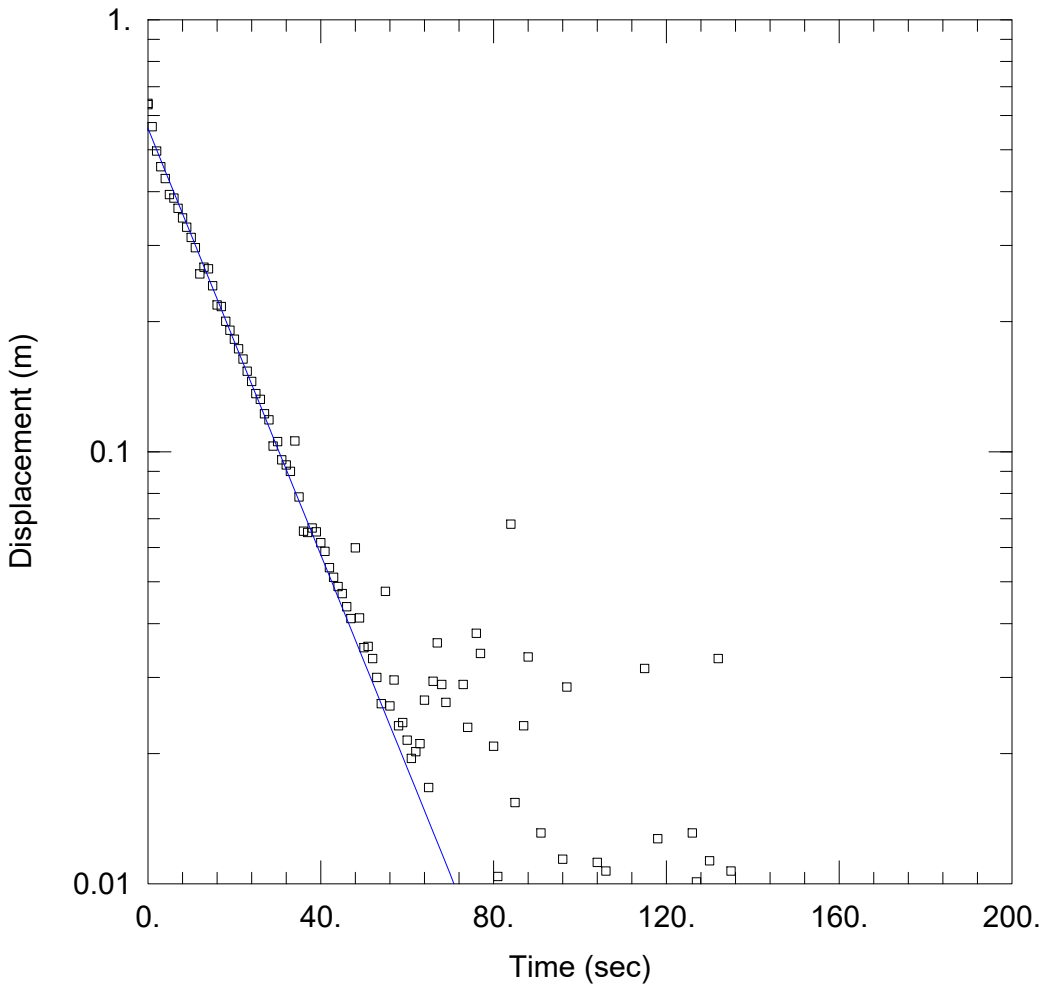
Well / Borehole Completion Data	Depth (m) / Elevation (m)	Geologic Unit	Soil / Bedrock	Soil Description	Sample Depth (B = Bag, J = Jar, V = Vial, ST = Shelby Tube) Sample No. Prefix: 31976250303/04...
Bentonite Chips	-30 / 189	Clay		CLAY: (29.9-32.5 m) trace silt, grey, moist, high platisticity, massive, pp = 1.5kg/cm2.	
	-31 / 188				
	-32 / 187			CLAY: (32.5-32.9 m) some silt, trace gravel (fine grained, subangular), dark grey, moist, low plasticity, thinly laminated, lacustrine.	32.49-32.92 m (#014)
	-33 / 186			CLAY: (32.9-35.97 m) some silt to silty, dark grey, moist, medium plasticity, thinly laminated, lacustrine, pp = 1.75 kg/cm2.	32.92-35.97 m (#015)
	-34 / 185				
	-35 / 184				
	-36 / 183			Bottom of Hole	
	-37 / 182				
	-38 / 181				
	-39 / 180				
	-40				

NOTE: Stick up = 0.83 m

APPENDIX B
Slug Test

Figure 1 - MW25-01D Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	12th Concession Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 3.2E-5 m/sec y0 = 0.56 m

AQUIFER DATA

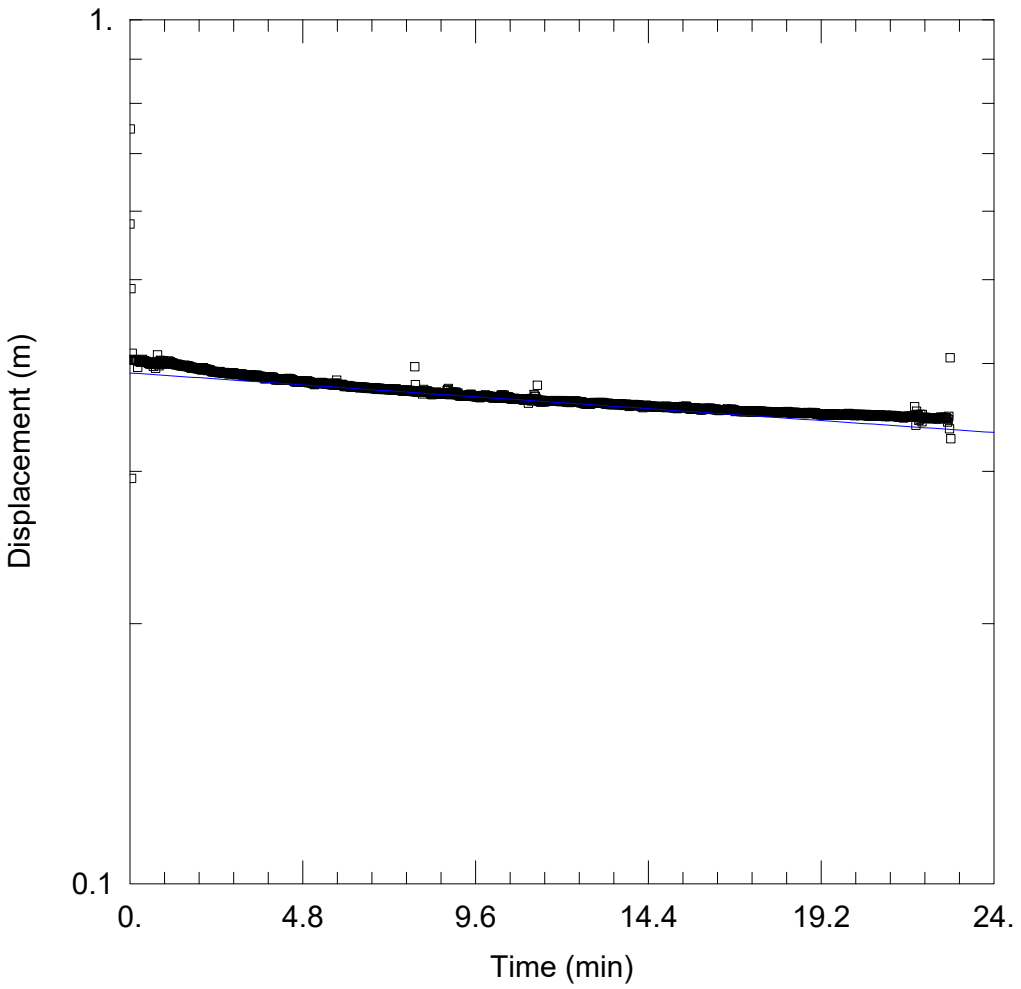
Saturated Thickness: 42.23 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW25-01D)

Initial Displacement: 0.64 m
Static Water Column Height: 42.23 m
Total Well Penetration Depth: 42.23 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Figure 2 - MW25-01S Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	12th Concession Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 5.9E-8 m/sec y0 = 0.39 m

AQUIFER DATA

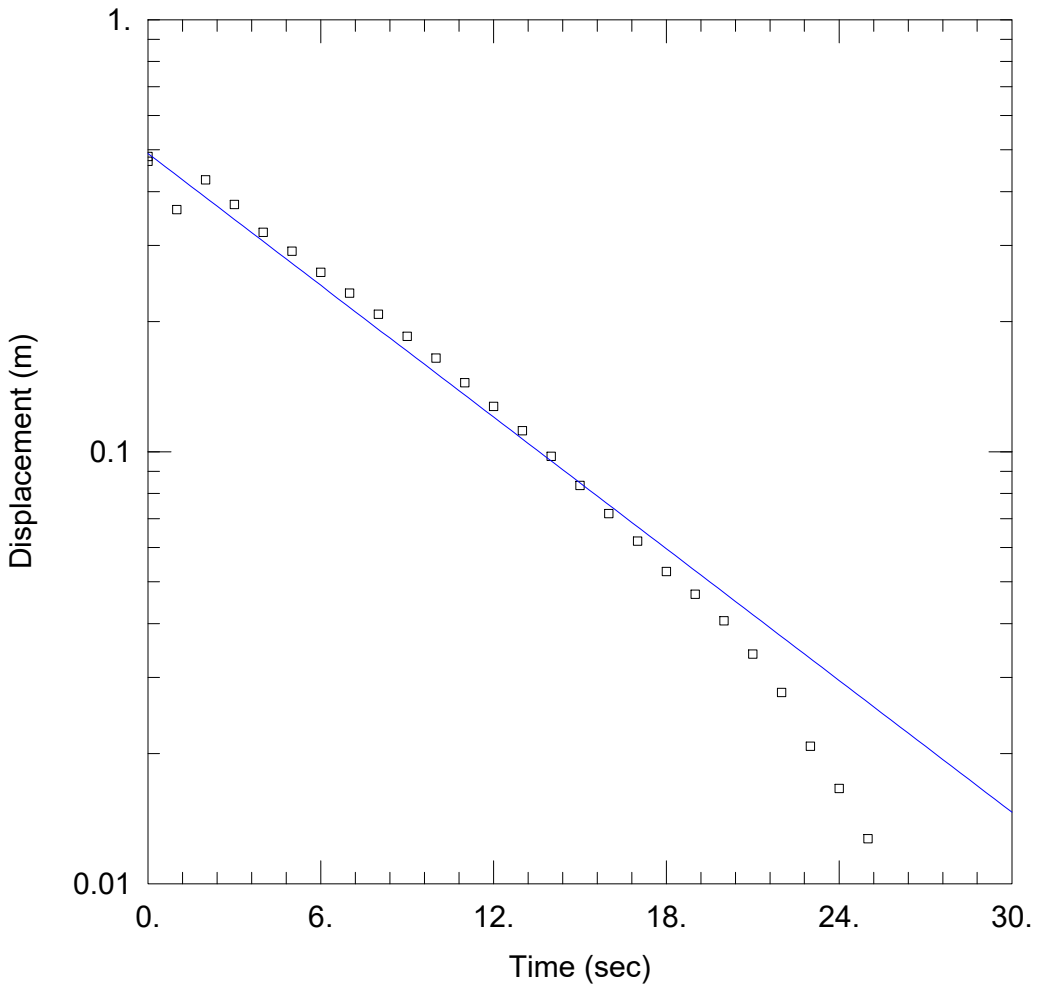
Saturated Thickness: 10. m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (01S)

Initial Displacement: 0.58 m
Static Water Column Height: 15.6 m
Total Well Penetration Depth: 26.82 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Figure 3 - MW25-02D Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	Forestry Farm Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 6.6E-5 m/sec y0 = 0.49 m

AQUIFER DATA

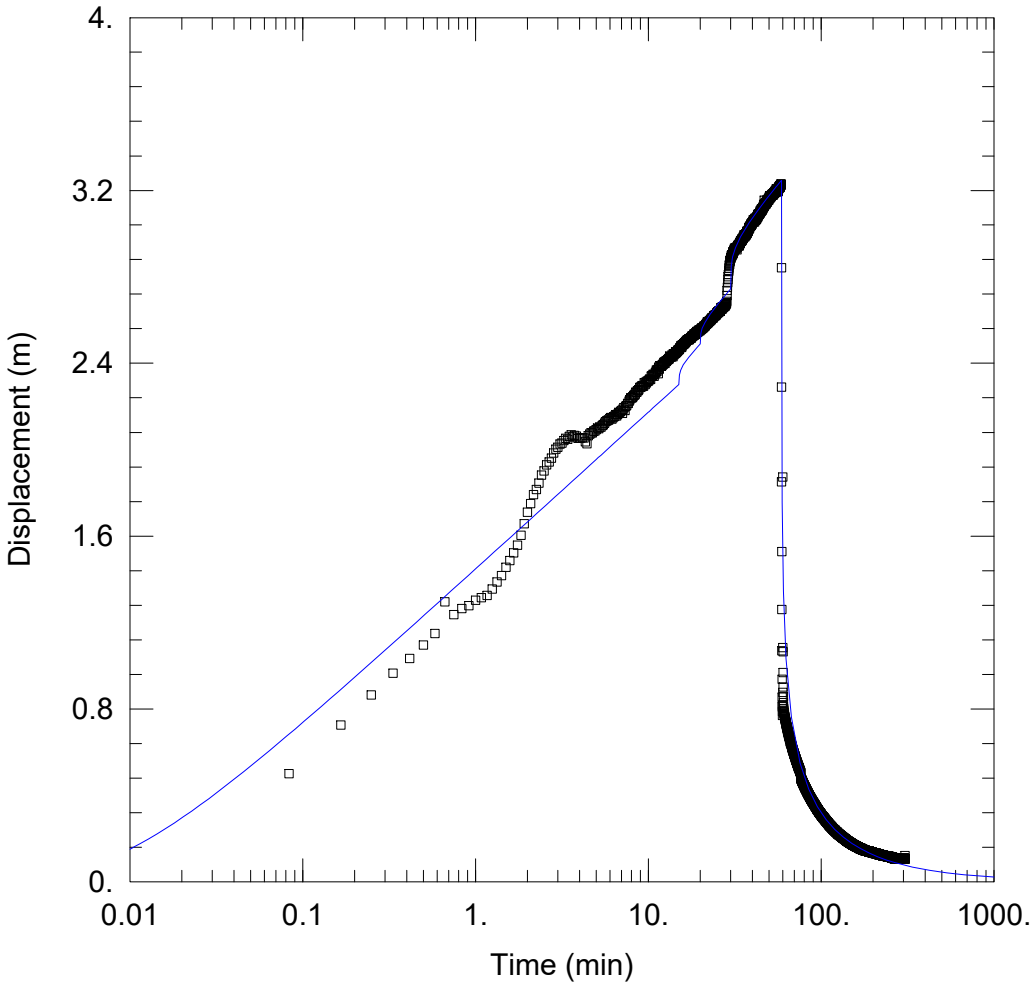
Saturated Thickness: 42.65 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW25-02D)

Initial Displacement: 0.47 m
Static Water Column Height: 42.65 m
Total Well Penetration Depth: 42.65 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Figure 4 - MW25-02D Pumping Test with Theis Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	Forestry Farm Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 4.2E-5 m^2/sec
Kz/Kr = 1.

S = 0.01
b = 1.19 m

WELL DATA

Pumping Wells

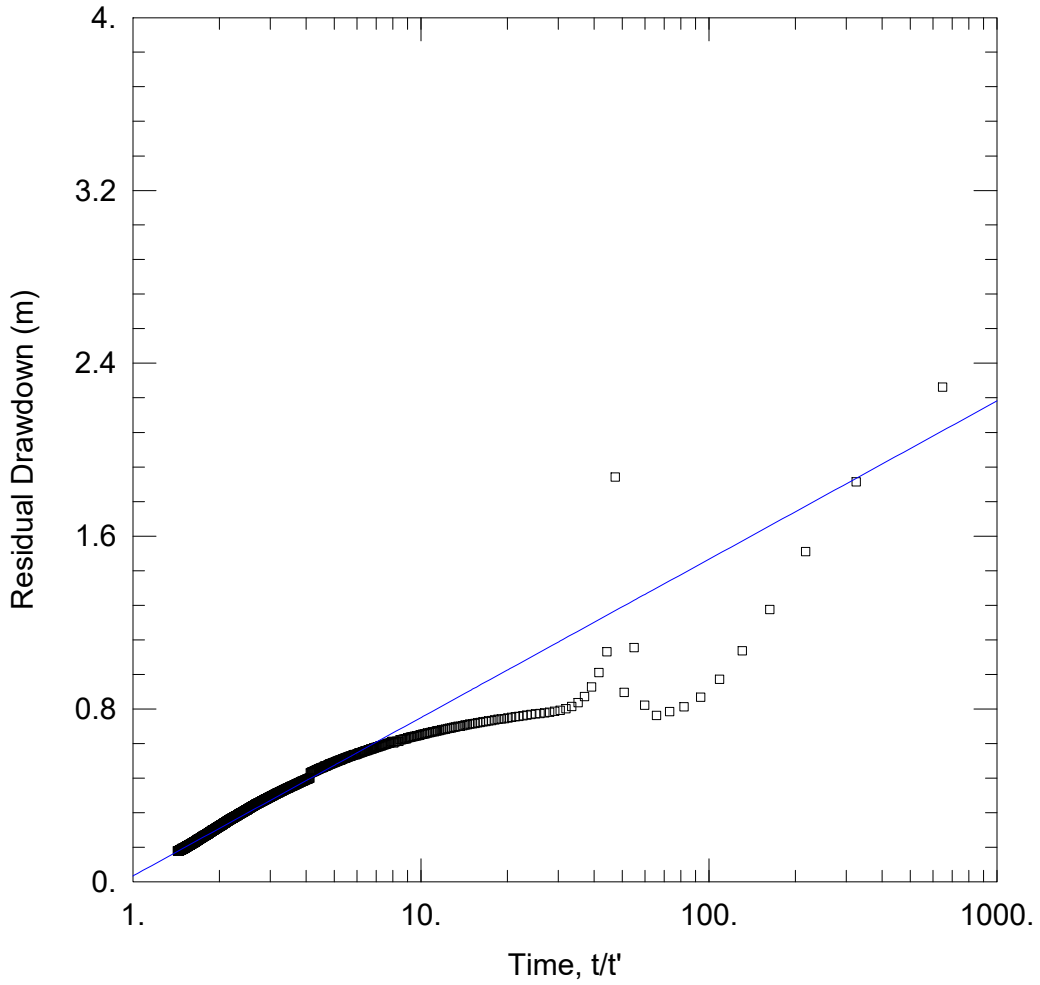
Well Name	X (m)	Y (m)
MW25-02D	540935	4735776

Observation Wells

Well Name	X (m)	Y (m)
□ MW25-02D	540935	4735776

Figure 5 - MW25-02D Pumping Test with Theis Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	Forestry Farm Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Theis (Recovery)

T = 5.0E-5 m^2/sec S/S' = 0.92

AQUIFER DATA

Saturated Thickness: 1.19 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

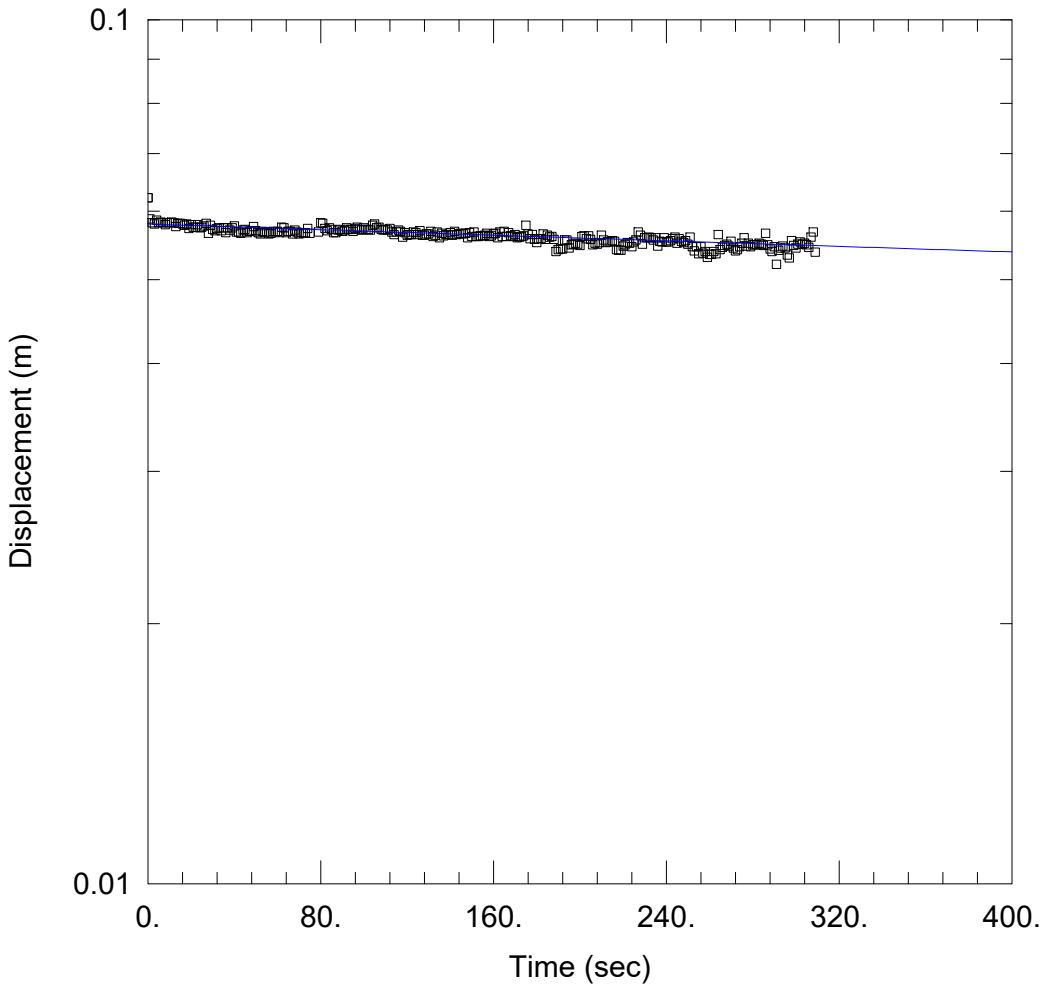
Well Name	X (m)	Y (m)
MW25-02D	540935	4735776

Observation Wells

Well Name	X (m)	Y (m)
□ MW25-02D	540935	4735776

Figure 6 - MW25-02S Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	Forestry Farm Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 9.27E-8 m/sec y0 = 0.058 m

AQUIFER DATA

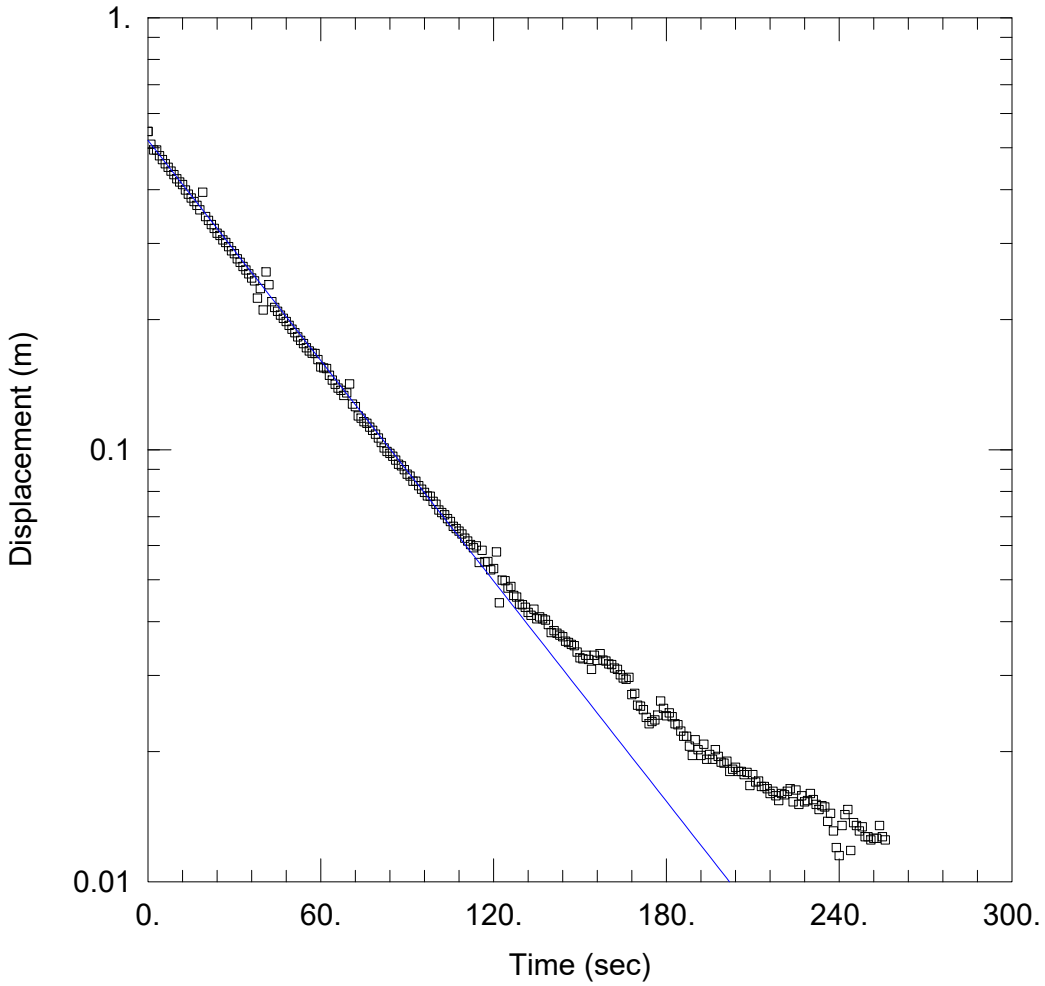
Saturated Thickness: 14.75 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW25-02S)

Initial Displacement: 0.0622 m
Static Water Column Height: 14.75 m
Total Well Penetration Depth: 14.75 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Figure 7 - MW25-03D Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose ENV	Norfolk County
Project:	Location:
31976	Norfolk County



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.1E-5 m/sec y0 = 0.52 m

AQUIFER DATA

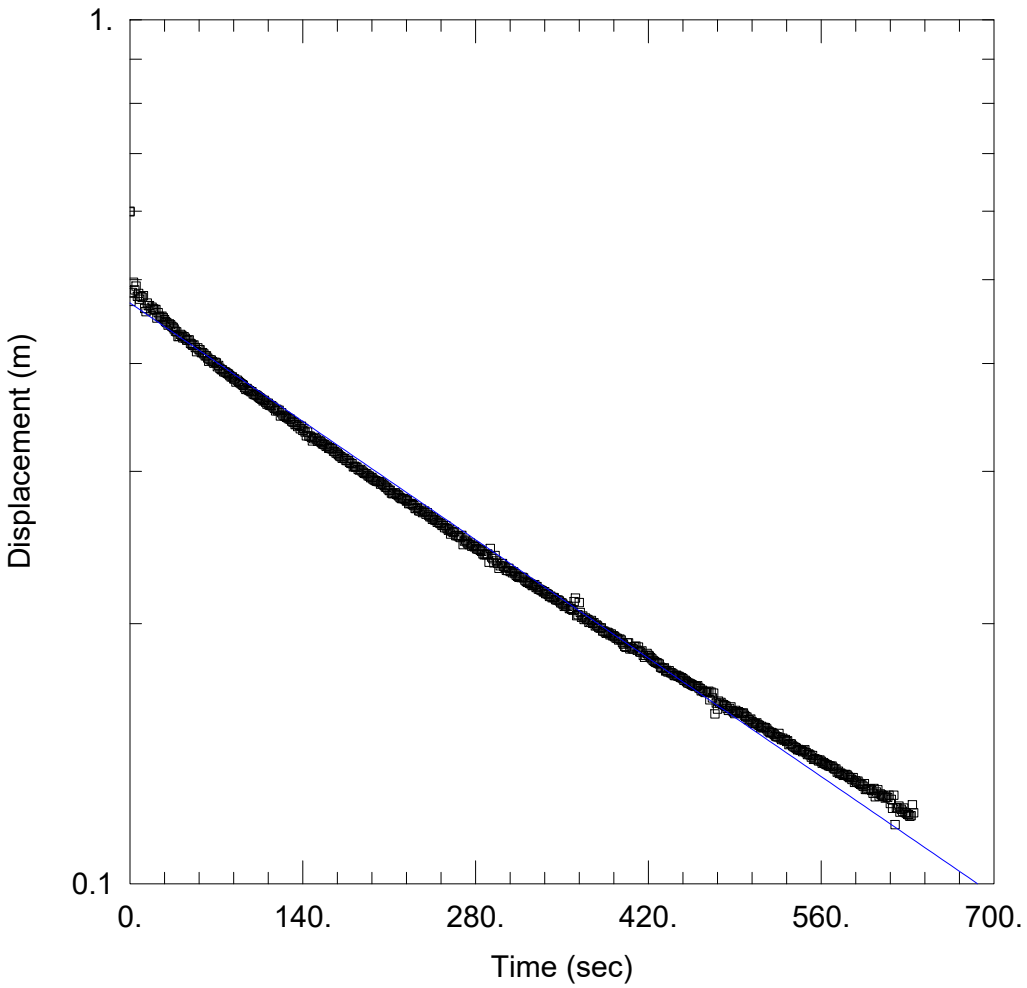
Saturated Thickness: 41.33 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW25-03D)

Initial Displacement: 0.5457 m
Static Water Column Height: 41.33 m
Total Well Penetration Depth: 41.33 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

Figure 8 - MW25-03S Slug Test with Bouwer-Rice Solution

Prepared By:	Prepared For:
Montrose Environmental	Norfolk County
Project:	Location:
31976	McDowel Rd



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 1.2E-6 m/sec y0 = 0.47 m

AQUIFER DATA

Saturated Thickness: 25.23 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW25-03S)

Initial Displacement: 0.6 m
Static Water Column Height: 25.23 m
Total Well Penetration Depth: 25.23 m
Screen Length: 3.05 m
Casing Radius: 0.0254 m
Well Radius: 0.0762 m

APPENDIX C
Site Photographs

Montrose
March 13, 2025

1. Aerial of MW25-02

Montrose
March 10, 2025

2. MW25-01 Drilling

Montrose
March 10, 2025

3. MW25-01s packer installation

Montrose
March 10, 2025

4. MW25-01s Packer Installation

Montrose
March 10, 2025

5. MW25-01d

Montrose
March 10, 2025

6. MW25-01d

Montrose
April 16, 2025

7. MW25-02s and MW25-02d

Montrose
April 16, 2025

8. MW25-02s with J-plug installed

Montrose
April 16, 2025

9. MW25-02d with packer installed and pressure valve closed

Montrose
March 7, 2025

10. MW25-03s and MW25-03d

Montrose
March 13, 2025

11. Bottom of packer with DR cable out

Montrose
March 13, 2025

12. MW25-03s and MW25-03d

Montrose
March 13, 2025

13. Top of packer with direct read cable installed

Montrose
March 13, 2025

14. Packer with bottom parts removed


A


B


C

APPENDIX D
Laboratory Analytical Results

Your Project #: 31976
Your C.O.C. #: 1045841-01-01

Attention: Ronan Drysdale

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/05/26
Report #: R8544996
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C556549
Received: 2025/05/16, 15:44

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2025/05/22	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2025/05/22	CAM SOP-00102	APHA 4500-CO2 D
Anions	1	N/A	2025/05/22	CAM SOP-00435	SM 24 4110 B m
Chloride by Automated Colourimetry	1	N/A	2025/05/22	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	1	N/A	2025/05/22	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2025/05/21	CAM SOP-00446	SM 24 5310 B m
Fluoride	1	2025/05/22	2025/05/22	CAM SOP-00449	SM 24 4500-F C m
Hardness (calculated as CaCO3)	1	N/A	2025/05/26	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	1	N/A	2025/05/23	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2025/05/26		
Anion and Cation Sum	1	N/A	2025/05/26	CAM SOP-00102	SM 24 1030E m
Total Ammonia-N	1	N/A	2025/05/26	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	1	N/A	2025/05/21	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Total Oil and Grease	1	2025/05/22	2025/05/22	CAM SOP-00326	EPA1664B m,SM5520B m
pH (3)	1	2025/05/22	2025/05/22	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	1	N/A	2025/05/22	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	1	N/A	2025/05/26		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2025/05/26		Auto Calc
Sulphate by Automated Turbidimetry	1	N/A	2025/05/22	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphide	1	N/A	2025/05/21	CAM SOP-00455	SM 24 4500-S G m
Total Dissolved Solids (TDS calc)	1	N/A	2025/05/26		Auto Calc
Turbidity	1	N/A	2025/05/20	CAM SOP-00417	SM 24 2130 B

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement

Your Project #: 31976
Your C.O.C. #: 1045841-01-01

Attention: Ronan Drysdale

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/05/26
Report #: R8544996
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C556549
Received: 2025/05/16, 15:44

Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

==========

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RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID		AQZB02			AQZB02		
Sampling Date		2025/05/15 15:50			2025/05/15 15:50		
COC Number		1045841-01-01			1045841-01-01		
	UNITS	31976250515001	RDL	QC Batch	31976250515001 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	4.95	N/A	9932059			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	240	1.0	9931951			
Calculated TDS	mg/L	250	1.0	9932063			
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.6	1.0	9931951			
Cation Sum	me/L	4.73	N/A	9932059			
Hardness (CaCO3)	mg/L	230	1.0	9931947			
Ion Balance (% Difference)	%	2.21	N/A	9932058			
Langelier Index (@ 20C)	N/A	0.666		9932061			
Langelier Index (@ 4C)	N/A	0.416		9932062			
Saturation pH (@ 20C)	N/A	7.19		9932061			
Saturation pH (@ 4C)	N/A	7.44		9932062			
Inorganics							
Total Ammonia-N	mg/L	<0.050	0.050	9932987	<0.050	0.050	9932987
Conductivity	umho/cm	450	2.0	9933333	450	2.0	9933333
Dissolved Organic Carbon	mg/L	<0.40	0.40	9932116	<0.40	0.40	9932116
Orthophosphate (P)	mg/L	<0.010	0.010	9933050	<0.010	0.010	9933050
pH	pH	7.86		9933329	7.90		9933329
Dissolved Sulphate (SO4)	mg/L	1.5	1.0	9933049	1.8	1.0	9933049
Alkalinity (Total as CaCO3)	mg/L	250	1.0	9933332	240	1.0	9933332
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	9933048	<1.0	1.0	9933048
Nitrite (N)	mg/L	<0.010	0.010	9932109			
Nitrate (N)	mg/L	0.12	0.10	9932109			
Nitrate + Nitrite (N)	mg/L	0.12	0.10	9932109			
Metals							
Dissolved Aluminum (Al)	ug/L	5.2	4.9	9932321			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	9932321			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	9932321			
Dissolved Barium (Ba)	ug/L	10	2.0	9932321			
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	9932321			
Dissolved Boron (B)	ug/L	13	10	9932321			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID		AQZB02			AQZB02		
Sampling Date		2025/05/15 15:50			2025/05/15 15:50		
COC Number		1045841-01-01			1045841-01-01		
	UNITS	31976250515001	RDL	QC Batch	31976250515001 Lab-Dup	RDL	QC Batch
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	9932321			
Dissolved Calcium (Ca)	ug/L	66000	200	9932321			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	9932321			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	9932321			
Dissolved Copper (Cu)	ug/L	18	0.90	9932321			
Dissolved Iron (Fe)	ug/L	<100	100	9932321			
Dissolved Lead (Pb)	ug/L	2.2	0.50	9932321			
Dissolved Magnesium (Mg)	ug/L	16000	50	9932321			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	9932321			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	9932321			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	9932321			
Dissolved Phosphorus (P)	ug/L	<100	100	9932321			
Dissolved Potassium (K)	ug/L	1000	200	9932321			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	9932321			
Dissolved Silicon (Si)	ug/L	4800	50	9932321			
Dissolved Silver (Ag)	ug/L	<0.090	0.090	9932321			
Dissolved Sodium (Na)	ug/L	1500	100	9932321			
Dissolved Strontium (Sr)	ug/L	100	1.0	9932321			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	9932321			
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	9932321			
Dissolved Uranium (U)	ug/L	0.50	0.10	9932321			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	9932321			
Dissolved Zinc (Zn)	ug/L	23	5.0	9932321			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AQZB02			AQZB02		
Sampling Date		2025/05/15 15:50			2025/05/15 15:50		
COC Number		1045841-01-01			1045841-01-01		
	UNITS	31976250515001	RDL	QC Batch	31976250515001 Lab-Dup	RDL	QC Batch
Inorganics							
Fluoride (F-)	mg/L	0.14	0.10	9933334	0.11	0.10	9933334
Sulphide	mg/L	<0.020	0.020	9932216			
Turbidity	NTU	<0.1	0.1	9932108	<0.1	0.1	9932108
Dissolved Bromide (Br-)	mg/L	<1.0	1.0	9932549			
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	<0.50	0.50	9933514			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C556549
Report Date: 2025/05/26

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Sampler Initials: RD

TEST SUMMARY

Bureau Veritas ID: AQZB02
Sample ID: 31976250515001
Matrix: Water

Collected: 2025/05/15
Shipped:
Received: 2025/05/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9933332	N/A	2025/05/22	Nachiketa Gohil
Carbonate, Bicarbonate and Hydroxide	CALC	9931951	N/A	2025/05/22	Automated Statchk
Anions	IC	9932549	N/A	2025/05/22	Violeta Porcila
Chloride by Automated Colourimetry	SKAL	9933048	N/A	2025/05/22	Massarat Jan
Conductivity	AT	9933333	N/A	2025/05/22	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9932116	N/A	2025/05/21	Gyulshen Idriz
Fluoride	ISE	9933334	2025/05/22	2025/05/22	Nachiketa Gohil
Hardness (calculated as CaCO3)		9931947	N/A	2025/05/26	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9932321	N/A	2025/05/23	Prempal Bhatti
Ion Balance (% Difference)	CALC	9932058	N/A	2025/05/26	Automated Statchk
Anion and Cation Sum	CALC	9932059	N/A	2025/05/26	Automated Statchk
Total Ammonia-N	SKAL/NH4	9932987	N/A	2025/05/26	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9932109	N/A	2025/05/21	Chandra Nandlal
Total Oil and Grease	BAL	9933514	2025/05/22	2025/05/22	Kishan Patel
pH	AT	9933329	2025/05/22	2025/05/22	Nachiketa Gohil
Orthophosphate	SKAL	9933050	N/A	2025/05/22	Massarat Jan
Sat. pH and Langelier Index (@ 20C)	CALC	9932061	N/A	2025/05/26	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	9932062	N/A	2025/05/26	Automated Statchk
Sulphate by Automated Turbidimetry	SKAL	9933049	N/A	2025/05/22	Massarat Jan
Sulphide	ISE/S	9932216	N/A	2025/05/21	Sreena Thekkoot
Total Dissolved Solids (TDS calc)	CALC	9932063	N/A	2025/05/26	Automated Statchk
Turbidity	AT	9932108	N/A	2025/05/20	Kien Tran

Bureau Veritas ID: AQZB02 Dup
Sample ID: 31976250515001
Matrix: Water

Collected: 2025/05/15
Shipped:
Received: 2025/05/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9933332	N/A	2025/05/22	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9933048	N/A	2025/05/22	Massarat Jan
Conductivity	AT	9933333	N/A	2025/05/22	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9932116	N/A	2025/05/21	Gyulshen Idriz
Fluoride	ISE	9933334	2025/05/22	2025/05/22	Nachiketa Gohil
Total Ammonia-N	SKAL/NH4	9932987	N/A	2025/05/26	Muskan
pH	AT	9933329	2025/05/22	2025/05/22	Nachiketa Gohil
Orthophosphate	SKAL	9933050	N/A	2025/05/22	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9933049	N/A	2025/05/22	Massarat Jan
Turbidity	AT	9932108	N/A	2025/05/20	Kien Tran

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.7°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9932108	Turbidity	2025/05/20			97	80 - 120	<0.1	NTU	NC	20
9932109	Nitrate (N)	2025/05/21	90	80 - 120	97	80 - 120	<0.10	mg/L	3.5	20
9932109	Nitrite (N)	2025/05/21	96	80 - 120	100	80 - 120	<0.010	mg/L	2.5	20
9932116	Dissolved Organic Carbon	2025/05/21	94	80 - 120	97	80 - 120	<0.40	mg/L	NC	20
9932216	Sulphide	2025/05/21	96	80 - 120	94	80 - 120	<0.020	mg/L	NC	20
9932321	Dissolved Aluminum (Al)	2025/05/23	99	80 - 120	100	80 - 120	<4.9	ug/L		
9932321	Dissolved Antimony (Sb)	2025/05/23	101	80 - 120	100	80 - 120	<0.50	ug/L	2.4	20
9932321	Dissolved Arsenic (As)	2025/05/23	100	80 - 120	98	80 - 120	<1.0	ug/L	6.7	20
9932321	Dissolved Barium (Ba)	2025/05/23	99	80 - 120	96	80 - 120	<2.0	ug/L	2.3	20
9932321	Dissolved Beryllium (Be)	2025/05/23	100	80 - 120	94	80 - 120	<0.40	ug/L	NC	20
9932321	Dissolved Boron (B)	2025/05/23	NC	80 - 120	93	80 - 120	<10	ug/L	1.1	20
9932321	Dissolved Cadmium (Cd)	2025/05/23	99	80 - 120	97	80 - 120	<0.090	ug/L	3.2	20
9932321	Dissolved Calcium (Ca)	2025/05/23	NC	80 - 120	98	80 - 120	<200	ug/L		
9932321	Dissolved Chromium (Cr)	2025/05/23	99	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
9932321	Dissolved Cobalt (Co)	2025/05/23	98	80 - 120	98	80 - 120	<0.50	ug/L	6.6	20
9932321	Dissolved Copper (Cu)	2025/05/23	100	80 - 120	97	80 - 120	<0.90	ug/L	NC	20
9932321	Dissolved Iron (Fe)	2025/05/23	100	80 - 120	100	80 - 120	<100	ug/L		
9932321	Dissolved Lead (Pb)	2025/05/23	96	80 - 120	95	80 - 120	<0.50	ug/L	0.58	20
9932321	Dissolved Magnesium (Mg)	2025/05/23	NC	80 - 120	98	80 - 120	<50	ug/L		
9932321	Dissolved Manganese (Mn)	2025/05/23	NC	80 - 120	98	80 - 120	<2.0	ug/L		
9932321	Dissolved Molybdenum (Mo)	2025/05/23	101	80 - 120	98	80 - 120	<0.50	ug/L	10	20
9932321	Dissolved Nickel (Ni)	2025/05/23	97	80 - 120	96	80 - 120	<1.0	ug/L	4.9	20
9932321	Dissolved Phosphorus (P)	2025/05/23	99	80 - 120	100	80 - 120	<100	ug/L		
9932321	Dissolved Potassium (K)	2025/05/23	100	80 - 120	99	80 - 120	<200	ug/L		
9932321	Dissolved Selenium (Se)	2025/05/23	100	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
9932321	Dissolved Silicon (Si)	2025/05/23	95	80 - 120	96	80 - 120	<50	ug/L		
9932321	Dissolved Silver (Ag)	2025/05/23	94	80 - 120	96	80 - 120	<0.090	ug/L	NC	20
9932321	Dissolved Sodium (Na)	2025/05/23	NC	80 - 120	100	80 - 120	<100	ug/L	2.1	20
9932321	Dissolved Strontium (Sr)	2025/05/23	NC	80 - 120	100	80 - 120	<1.0	ug/L		
9932321	Dissolved Thallium (Tl)	2025/05/23	98	80 - 120	97	80 - 120	<0.050	ug/L	7.0	20
9932321	Dissolved Titanium (Ti)	2025/05/23	98	80 - 120	97	80 - 120	<5.0	ug/L		

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9932321	Dissolved Uranium (U)	2025/05/23	99	80 - 120	98	80 - 120	<0.10	ug/L	3.6	20
9932321	Dissolved Vanadium (V)	2025/05/23	100	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
9932321	Dissolved Zinc (Zn)	2025/05/23	NC	80 - 120	95	80 - 120	<5.0	ug/L	5.0	20
9932549	Dissolved Bromide (Br-)	2025/05/22	102	80 - 120	105	80 - 120	<1.0	mg/L	NC	20
9932987	Total Ammonia-N	2025/05/26	107	75 - 125	106	80 - 120	<0.050	mg/L	NC	20
9933048	Dissolved Chloride (Cl-)	2025/05/22	96	80 - 120	98	80 - 120	<1.0	mg/L	NC	20
9933049	Dissolved Sulphate (SO4)	2025/05/22	91	75 - 125	92	80 - 120	<1.0	mg/L	19	20
9933050	Orthophosphate (P)	2025/05/22	92	75 - 125	91	80 - 120	<0.010	mg/L	NC	20
9933329	pH	2025/05/22			102	98 - 103			0.57	N/A
9933332	Alkalinity (Total as CaCO3)	2025/05/22			96	85 - 115	<1.0	mg/L	0.90	20
9933333	Conductivity	2025/05/22			100	85 - 115	<2.0	umho/cm	1.1	10
9933334	Fluoride (F-)	2025/05/22	97	80 - 120	102	80 - 120	<0.10	mg/L	NC	20
9933514	Total Oil & Grease	2025/05/22			98	80 - 110	<0.50	mg/L	0.25	25

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C556549
2025/05/16 15:44

Page 1 of 1

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IMMEDIATE

NONT-2025-05-3435

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#31375 Montrose Environmental Solutions Canada Inc	Company Name:	#22594 Montrose Environmental Solutions Canada Inc	Quotation #:	C31779
Attention:	Accounts Payable	Attention:	Ronan Drysdale	P.O. #:	
Address:	Suite 200, 214 - 11 Avenue SW	Address:	7B-650 Woodlawn Rd. W.	Project:	31976
	Calgary AB T2R 0K1		Guelph ON N1K 1B8	Project Name:	
Tel:	(905) 877-9531 Fax: (905) 877-4143	Tel:	(226) 314-1913 Fax:	Site #:	
Email:	ap@matrix-solutions.com	Email:	rdrysdale@montrose-env.ca; eds@montrose-env.ca	Sampled By:	

Lab Use Only: Bottle Order #: 1045841 | COC #: C#1045841-01-01 | Project Manager: Kudrat Bajwa

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Reg 406 Table ☑ Other ODWS

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) ☐
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	RCAp - Comprehensive	Fluoride	Sulphide	Turbidity	Bromide	Total Oil and Grease				# of Bottles	Comments
1	31976250515001	Paula's Well	25/05/15	15:50	Water	X	X	X	X	X	X	X				6	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Recel	Custody Seal Present	Yes	No
Ronan Drysdale	25/05/15	17:50	Ashlie Suckauman	2025/05/16	15:44			16/16/16	Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Isotope Analyses for:
Montrose Environmental

IT^2 FILE # 250069

2025-04-25

Approved by:

Orfan Shouakar-Stash, PhD
Director
Isotope Tracer Technologies Inc.
608 Weber St. North Unit 3&4
Waterloo, ON, N2V 1K4
Tel: 519-886-5555 | Fax: 519-886-5575
Email: orfan@it2isotopes.com
Website: www.it2isotopes.com

Reported: 2025-04-25

In Person: N/A

ISOTOPE TRACER TECHNOLOGIES INC

Client: Montrose Environmental
Address: Guelph, ON

Att.: Stew Hamilton
E-mail: smhamilton@montrose-env.ca
Phone: 2.3E+09

File Number: 250069
Project #: 204073
PO:

#	Sample ID	Sample Collection		Sample #	E3H	Result	± 1σ	$\delta^{18}O$	Aver	Stdv	$\delta^{2}H$	Aver	Stdv
		Date	Time		Enriched	TU		H_2O	VSMOW		H_2O	VSMOW	
1	MW25-01s	N/A	N/A	176534	x	1.3	0.6	x	-9.77	0.04	x	-65.7	0.4
2	MW2501D	N/A	N/A	176535	x	< 0.8	0.7	x	-11.27	0.05	x	-75.6	0.3
3	MW2502S	N/A	N/A	176536	x	1.1	0.5	x	-10.13	0.07	x	-67.1	0.2
4	MW25-02d	N/A	N/A	176537	x	1.3	0.5	x	-10.73	0.07	x	-71.6	0.4
5	MW25003S	N/A	N/A	176538	x	< 0.8	0.4	x	-10.30	0.09	x	-68.2	0.4
6	24-AG-189	N/A	N/A	176539	x	< 0.8	0.4	x	-10.15	0.07	x	-66.4	0.2

#	Sample ID	Sample Collection		Sample #	$\delta^{18}O$	Result	Repea	$\delta^{34}S$	Result	Repeat	$\delta^{34}S$	Result	Repeat
		Date	Time		SO_4	VSMOW		SO_4	VCDT		S2	VCDT	
1	MW25-01s	N/A	N/A	176534	x	13.2		x	11.7		x	72.7	
2	MW2501D	N/A	N/A	176535	x	17.4		x	57.6		x	18.9	17.2
3	MW2502S	N/A	N/A	176536	x	NP		x	NP		x	NES	
4	MW25-02d	N/A	N/A	176537	x	18.1		x	63.8	64.5	x	16.9	13.1
5	MW25003S	N/A	N/A	176538	x	NP		x	NP		x	NES	
6	24-AG-189	N/A	N/A	176539	x	NP		x	NP		x	26.0	

#	Sample #	Sample ID	
		COC Email	Bottle
1	176534	MW25-01S	MW25-01s
2	176535	MW25-01D	MW2501D
3	176536	MW25-02S	MW2502S
4	176537	MW25-02D	MW25-02d
5	176538	MW25-03S	MW25003S
6	176539	MW25-03D	24-AG-189

Client Note:

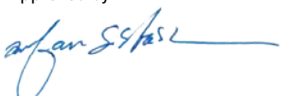
Can we please get a 3-week turnaround time,
by the week of April 11th.

Notes:

NP: No Precipitation

NES: Not Enough Sample

Approved by:



Orfan Shouakar-Stash, PhD
Director
Isotope Tracer Technologies Inc.
608 Weber St. North Unit 3, Waterloo, ON, N2V 1K4
Tel: 519-886-5555 | Fax: 519-886-5575
Website: www.it2isotopes.com

Reported: 2025-04-25

Delivered In Person

ISOTOPE TRACER TECHNOLOGIES INC

Client: Montrose Environmental
Address: Guelph, ON

Att.: Stew Hamilton
E-mail: smhamilton@montrose-env.ca
Phone: 2.3E+09

File Number: 250069
Project #: 204073
PO:

E^3H ANALYSES

Tritium is reported in Tritium Units.
1TU = 3.221 Picocurries/L per IAEA, 2000 Report.
1TU = 0.11919 Becquerels/L per IAEA, 2000 Report.

^{18}O & ^{2}H (CRDS)

Instrument Used: Cavity Ring Down Spectroscopy (CRDS)
CRDS (Model L2130-i) (Picarro, California, USA).

Standard Used:
IT2-12E / IT2-13E / IT2-14D Calibrated with IAEA Standards (V-SMOW, SLAP, and GISP)

Typical Standard deviation:
(^{18}O ±0.1‰) (^{2}H ± 1‰)

^{18}O SO_4 Analyses

Instrument Used:
Isotope Ratio Mass Spectrometry (IRMS) - Delta^{Plus}, Finnigan MAT, Germany
Coupled with TC/EA, Thermo Scientific, Germany.

Standard Used:
USGS-32 / NBS-127 / IAEA-SO-5 / IAEA-SO-6

Typical Standard deviation:
±0.5‰

^{34}S SO_4 Analyses

Instrument Used:
Isotope Ratio Mass Spectrometry (IRMS) - MAT 253,
Thermo Scientific, Germany.
Coupled with Elemental Analyzer (EA), Fisons Instruments, Italy

Standard Used:
IAEA-SO-6 / IT^2-520 / IAEA-SO-5 / IT^2-518

Typical Standard deviation: ±0.5‰

^{34}S S_2 Analyses

Instrument Used:
Isotope Ratio Mass Spectrometry (IRMS) - MAT 253, Thermo Scientific, Germany
Coupled with Elemental Analyzer (EA), Fisons Instruments, Italy

Standard Used:
IAEA-SO-6 / IT^2-520 / IAEA-SO-5 / IT^2-518 / NBS-127

Typical Standard deviation:
±0.5‰

Approved by:

Orfan Shouakar-Stash, PhD
Director
Isotope Tracer Technologies Inc.
608 Weber St. North Unit 3, Waterloo, ON, N2V 1K4
Tel: 519-886-5555 | Fax: 519-886-5575
Website: www.it2isotopes.com

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Your C.O.C. #: C#1033206-01-01

Attention: Stewart Hamilton

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/02/21
Report #: R8490958
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C512726
Received: 2025/02/05, 17:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2025/02/07	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2025/02/07	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2025/02/10	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	1	N/A	2025/02/07	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (2)	1	N/A	2025/02/06	CAM SOP-00446	SM 24 5310 B m
Fluoride	1	2025/02/06	2025/02/07	CAM SOP-00449	SM 24 4500-F C m
Hardness (calculated as CaCO3)	1	N/A	2025/02/11	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	1	N/A	2025/02/10	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2025/02/11		
Anion and Cation Sum	1	N/A	2025/02/11		
Bromide in water by IC (1)	1	N/A	2025/02/18	AB SOP-00052	SM 24 4110 B m
Total Ammonia-N	1	N/A	2025/02/10	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (3)	1	N/A	2025/02/07	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (4)	1	2025/02/06	2025/02/07	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	1	N/A	2025/02/07	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	1	N/A	2025/02/11		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2025/02/11		Auto Calc
Sulphate by Automated Turbidimetry	1	N/A	2025/02/10	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphide	1	N/A	2025/02/07	CAM SOP-00455	SM 24 4500-S G m
Total Dissolved Solids (TDS calc)	1	N/A	2025/02/11		Auto Calc
Turbidity	1	N/A	2025/02/06	CAM SOP-00417	SM 24 2130 B

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Your C.O.C. #: C#1033206-01-01

Attention: Stewart Hamilton

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/02/21
Report #: R8490958
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C512726
Received: 2025/02/05, 17:00

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8
(2) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(4) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C512726
Report Date: 2025/02/21

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID				ANVI07		
Sampling Date				2025/02/05 12:10		
COC Number				C#1033206-01-01		
	UNITS	**MAC**	**A/O**	**31976250205001**	**RDL**	**QC Batch**
Calculated Parameters						
Anion Sum	me/L	-	-	4.84	N/A	9871613
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	240	1.0	9871597
Calculated TDS	mg/L	-	500	250	1.0	9871584
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	2.4	1.0	9871597
Cation Sum	me/L	-	-	5.07	N/A	9871613
Hardness (CaCO3)	mg/L	-	80:100	**250**	1.0	9871459
Ion Balance (% Difference)	%	-	-	2.29	N/A	9871484
Langelier Index (@ 20C)	N/A	-	-	0.869		9871614
Langelier Index (@ 4C)	N/A	-	-	0.619		9871615
Saturation pH (@ 20C)	N/A	-	-	7.17		9871614
Saturation pH (@ 4C)	N/A	-	-	7.42		9871615
Inorganics						
Total Ammonia-N	mg/L	-	-	<0.050	0.050	9872285
Conductivity	umho/cm	-	-	450	2.0	9871855
Dissolved Organic Carbon	mg/L	-	5	0.43	0.40	9871592
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	9872134
pH	pH	-	6.5:8.5	8.04		9871854
Dissolved Sulphate (SO4)	mg/L	-	500	1.8	1.0	9872137
Alkalinity (Total as CaCO3)	mg/L	-	30:500	240	1.0	9871853
Dissolved Chloride (Cl-)	mg/L	-	250	<1.0	1.0	9872138
Nitrite (N)	mg/L	1	-	<0.010	0.010	9871852
Nitrate (N)	mg/L	10	-	<0.10	0.10	9871852
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	0.10	9871852
Metals						
Dissolved Aluminum (Al)	ug/L	-	100	5.3	4.9	9872390
Dissolved Antimony (Sb)	ug/L	6	-	<0.50	0.50	9872390

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID				ANVI07		
Sampling Date				2025/02/05 12:10		
COC Number				C#1033206-01-01		
	UNITS	MAC	A/O	31976250205001	RDL	QC Batch
Dissolved Arsenic (As)	ug/L	10	-	<1.0	1.0	9872390
Dissolved Barium (Ba)	ug/L	1000	-	9.9	2.0	9872390
Dissolved Beryllium (Be)	ug/L	-	-	<0.40	0.40	9872390
Dissolved Boron (B)	ug/L	5000	-	13	10	9872390
Dissolved Cadmium (Cd)	ug/L	5	-	<0.090	0.090	9872390
Dissolved Calcium (Ca)	ug/L	-	-	71000	200	9872390
Dissolved Chromium (Cr)	ug/L	50	-	<5.0	5.0	9872390
Dissolved Cobalt (Co)	ug/L	-	-	<0.50	0.50	9872390
Dissolved Copper (Cu)	ug/L	-	1000	9.9	0.90	9872390
Dissolved Iron (Fe)	ug/L	-	300	<100	100	9872390
Dissolved Lead (Pb)	ug/L	10	-	<0.50	0.50	9872390
Dissolved Magnesium (Mg)	ug/L	-	-	17000	50	9872390
Dissolved Manganese (Mn)	ug/L	-	50	<2.0	2.0	9872390
Dissolved Molybdenum (Mo)	ug/L	-	-	<0.50	0.50	9872390
Dissolved Nickel (Ni)	ug/L	-	-	<1.0	1.0	9872390
Dissolved Phosphorus (P)	ug/L	-	-	<100	100	9872390
Dissolved Potassium (K)	ug/L	-	-	1100	200	9872390
Dissolved Selenium (Se)	ug/L	50	-	<2.0	2.0	9872390
Dissolved Silicon (Si)	ug/L	-	-	6000	50	9872390
Dissolved Silver (Ag)	ug/L	-	-	<0.090	0.090	9872390
Dissolved Sodium (Na)	ug/L	-	200000	1700	100	9872390
Dissolved Strontium (Sr)	ug/L	-	-	110	1.0	9872390
Dissolved Thallium (Tl)	ug/L	-	-	<0.050	0.050	9872390
Dissolved Titanium (Ti)	ug/L	-	-	<5.0	5.0	9872390
Dissolved Uranium (U)	ug/L	20	-	0.54	0.10	9872390
Dissolved Vanadium (V)	ug/L	-	-	<0.50	0.50	9872390
Dissolved Zinc (Zn)	ug/L	-	5000	15	5.0	9872390

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C512726
Report Date: 2025/02/21

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID				ANVI07			ANVI07		
Sampling Date				2025/02/05 12:10			2025/02/05 12:10		
COC Number				C#1033206-01-01			C#1033206-01-01		
	UNITS	MAC	A/O	31976250205001	RDL	QC Batch	31976250205001 Lab-Dup	RDL	QC Batch
Inorganics									
Dissolved Bromide (Br-)	mg/L	-	-	<0.010	0.010	9878411			
Fluoride (F-)	mg/L	1.5	-	0.11	0.10	9871856			
Sulphide	mg/L	-	0.05	<0.020	0.020	9872109	<0.020	0.020	9872109
Turbidity	NTU	-	5	0.1	0.1	9871698			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively
(Made under the Ontario Safe Drinking Water Act, 2002)

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C512726
Report Date: 2025/02/21

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

TEST SUMMARY

Bureau Veritas ID: ANVI07
Sample ID: 31976250205001
Matrix: Water

Collected: 2025/02/05
Shipped:
Received: 2025/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9871853	N/A	2025/02/07	Nachiketa Gohil
Carbonate, Bicarbonate and Hydroxide	CALC	9871597	N/A	2025/02/07	Automated Statchk
Chloride by Automated Colourimetry	SKAL	9872138	N/A	2025/02/10	Massarat Jan
Conductivity	AT	9871855	N/A	2025/02/07	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9871592	N/A	2025/02/06	Gyulshen Idriz
Fluoride	ISE	9871856	2025/02/06	2025/02/07	Nachiketa Gohil
Hardness (calculated as CaCO3)		9871459	N/A	2025/02/11	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9872390	N/A	2025/02/10	Prempal Bhatti
Ion Balance (% Difference)	CALC	9871484	N/A	2025/02/11	Automated Statchk
Anion and Cation Sum	CALC	9871613	N/A	2025/02/11	Automated Statchk
Bromide in water by IC	IC/UV	9878411	N/A	2025/02/18	Joshua BEAVIS
Total Ammonia-N	SKAL/NH4	9872285	N/A	2025/02/10	Muskan
Nitrate & Nitrite as Nitrogen in Water	LACH	9871852	N/A	2025/02/07	Chandra Nandlal
pH	AT	9871854	2025/02/06	2025/02/07	Nachiketa Gohil
Orthophosphate	SKAL	9872134	N/A	2025/02/07	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	9871614	N/A	2025/02/11	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	9871615	N/A	2025/02/11	Automated Statchk
Sulphate by Automated Turbidimetry	SKAL	9872137	N/A	2025/02/10	Massarat Jan
Sulphide	ISE/S	9872109	N/A	2025/02/07	Sreena Thekkoot
Total Dissolved Solids (TDS calc)	CALC	9871584	N/A	2025/02/11	Automated Statchk
Turbidity	AT	9871698	N/A	2025/02/06	Kien Tran

Bureau Veritas ID: ANVI07 Dup
Sample ID: 31976250205001
Matrix: Water

Collected: 2025/02/05
Shipped:
Received: 2025/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sulphide	ISE/S	9872109	N/A	2025/02/07	Sreena Thekkoot

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-1.7°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9871592	Dissolved Organic Carbon	2025/02/06	90	80 - 120	95	80 - 120	<0.40	mg/L	1.2	20
9871698	Turbidity	2025/02/06			102	80 - 120	<0.1	NTU	1.6	20
9871852	Nitrate (N)	2025/02/07	101	80 - 120	103	80 - 120	<0.10	mg/L	NC	20
9871852	Nitrite (N)	2025/02/07	97	80 - 120	102	80 - 120	<0.010	mg/L	NC	20
9871853	Alkalinity (Total as CaCO3)	2025/02/07			95	85 - 115	<1.0	mg/L	0.74	20
9871854	pH	2025/02/07			101	98 - 103			0.32	N/A
9871855	Conductivity	2025/02/07			102	85 - 115	<2.0	umho/cm	1.0	10
9871856	Fluoride (F-)	2025/02/07	101	80 - 120	102	80 - 120	<0.10	mg/L	15	20
9872109	Sulphide	2025/02/07	108	80 - 120	100	80 - 120	<0.020	mg/L	NC	20
9872134	Orthophosphate (P)	2025/02/07	89	75 - 125	98	80 - 120	<0.010	mg/L	0.29	20
9872137	Dissolved Sulphate (SO4)	2025/02/10	NC	75 - 125	95	80 - 120	<1.0	mg/L	1.7	20
9872138	Dissolved Chloride (Cl-)	2025/02/10	NC	80 - 120	95	80 - 120	<1.0	mg/L	0.35	20
9872285	Total Ammonia-N	2025/02/10	91	75 - 125	98	80 - 120	<0.050	mg/L	NC	20
9872390	Dissolved Aluminum (Al)	2025/02/10	103	80 - 120	97	80 - 120	<4.9	ug/L		
9872390	Dissolved Antimony (Sb)	2025/02/10	108	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
9872390	Dissolved Arsenic (As)	2025/02/10	106	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
9872390	Dissolved Barium (Ba)	2025/02/10	102	80 - 120	97	80 - 120	<2.0	ug/L	2.3	20
9872390	Dissolved Beryllium (Be)	2025/02/10	104	80 - 120	99	80 - 120	<0.40	ug/L	NC	20
9872390	Dissolved Boron (B)	2025/02/10	103	80 - 120	97	80 - 120	<10	ug/L	5.3	20
9872390	Dissolved Cadmium (Cd)	2025/02/10	103	80 - 120	97	80 - 120	<0.090	ug/L	NC	20
9872390	Dissolved Calcium (Ca)	2025/02/10	NC	80 - 120	100	80 - 120	<200	ug/L		
9872390	Dissolved Chromium (Cr)	2025/02/10	102	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
9872390	Dissolved Cobalt (Co)	2025/02/10	99	80 - 120	96	80 - 120	<0.50	ug/L	3.5	20
9872390	Dissolved Copper (Cu)	2025/02/10	102	80 - 120	96	80 - 120	<0.90	ug/L	NC	20
9872390	Dissolved Iron (Fe)	2025/02/10	103	80 - 120	99	80 - 120	<100	ug/L		
9872390	Dissolved Lead (Pb)	2025/02/10	99	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
9872390	Dissolved Magnesium (Mg)	2025/02/10	NC	80 - 120	97	80 - 120	<50	ug/L		
9872390	Dissolved Manganese (Mn)	2025/02/10	101	80 - 120	98	80 - 120	<2.0	ug/L		
9872390	Dissolved Molybdenum (Mo)	2025/02/10	106	80 - 120	97	80 - 120	<0.50	ug/L	4.2	20
9872390	Dissolved Nickel (Ni)	2025/02/10	97	80 - 120	94	80 - 120	<1.0	ug/L	1.2	20

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9872390	Dissolved Phosphorus (P)	2025/02/10	109	80 - 120	101	80 - 120	<100	ug/L		
9872390	Dissolved Potassium (K)	2025/02/10	105	80 - 120	100	80 - 120	<200	ug/L		
9872390	Dissolved Selenium (Se)	2025/02/10	103	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
9872390	Dissolved Silicon (Si)	2025/02/10	105	80 - 120	99	80 - 120	<50	ug/L		
9872390	Dissolved Silver (Ag)	2025/02/10	96	80 - 120	95	80 - 120	<0.090	ug/L	NC	20
9872390	Dissolved Sodium (Na)	2025/02/10	NC	80 - 120	98	80 - 120	<100	ug/L	0.11	20
9872390	Dissolved Strontium (Sr)	2025/02/10	104	80 - 120	102	80 - 120	<1.0	ug/L		
9872390	Dissolved Thallium (Tl)	2025/02/10	102	80 - 120	99	80 - 120	<0.050	ug/L	NC	20
9872390	Dissolved Titanium (Ti)	2025/02/10	108	80 - 120	100	80 - 120	<5.0	ug/L		
9872390	Dissolved Uranium (U)	2025/02/10	102	80 - 120	97	80 - 120	<0.10	ug/L	3.5	20
9872390	Dissolved Vanadium (V)	2025/02/10	103	80 - 120	97	80 - 120	<0.50	ug/L	0.39	20
9872390	Dissolved Zinc (Zn)	2025/02/10	98	80 - 120	96	80 - 120	<5.0	ug/L	5.2	20
9878411	Dissolved Bromide (Br-)	2025/02/18	109	80 - 120	101	80 - 120	<0.010	mg/L		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C512726
Report Date: 2025/02/21

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C512726
2025/02/05 17:00

IMMEDIATE

Page 1 of 1

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		
Company Name:	#31375 Montrose Environmental Solutions Canada Inc	Company Name:	#22594 Montrose Environmental Solutions Canada Inc	Quotation #:	C31779	NONT-2025-02-797
Attention:	Accounts Payable	Attention:	Stewart Hamilton	P.O. #:	31976-204073	
Address:	Suite 200, 214 - 11 Avenue SW	Address:	7B-650 Woodlawn Rd. W.	Project:	31976-204073	
	Calgary AB T2R 0K1		Guelph ON N1K 1B8	Project Name:		
Tel:	(905) 877-9531 Fax: (905) 877-4143	Tel:	(519) 772-3777 Fax:	Site #:		
Email:	ap@matrix-solutions.com ap@montrose-env.ca	Email:	Shamilton@montrose-env.ca eds@montrose...	Sampled By:	Ryan McCourt	

Bottle Order #: 1033206
Project Manager: Kushrat Bajwa
C#1033206-01-01

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ☐ PWQO ☐ Reg 406 Table ☑ Other ODWS

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? Y

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects
Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (Metals / Hg / Cr VI)	RCAp - Comprehensive	Fluoride	Sulphide	Turbidity	Bromide in water by IC	# of Bottles	Comments
1		319762502050O1	Feb 5, 2025	12:10 pm	GW	✓	✓	✓	✓	✓	✓	5	Metals bottle filtered, All other bottles unfiltered
2													
3													
4													
5													
6													
7													
8													
9													
10													

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan McCourt	25/02/05	5:55 pm	Sharon De Fonseka SDF	2025/02/05	17:40	

Laboratory Use Only
Time Sensitive | Temperature (°C) on Recel: -1 / -2 / -2 | Custody Seal Present / Intact: Yes / No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Exceedance Summary Table – ODWS (2002)

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Grain Size Analysis Report

Client Sample ID: AOSA01-01-31976250303004
Maxxam Sample ID: DGG685-01
Maxxam Job #: C522180

Tot. Sample Wt (g)*: 11.44
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B724470
Batch # (Hydro): B723898

Analysis Date (Sieve): 3/19/2025
Analysis Date (Hydro): 3/18/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	99.9
	Sieve 100	0.150	97.8
	Sieve 200	0.075	46.5
Hydrometer	R1min	0.0521	19.6
	R3min	0.0308	9.8
	R10min	0.0169	4.9
	R30min	0.0098	3.7
	R90min	0.0056	3.7
	R270min	0.0033	3.7
	R1080min	0.0016	2.5

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	81.3
Silt	0.002	0.050	15.9
Clay	-	0.002	2.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

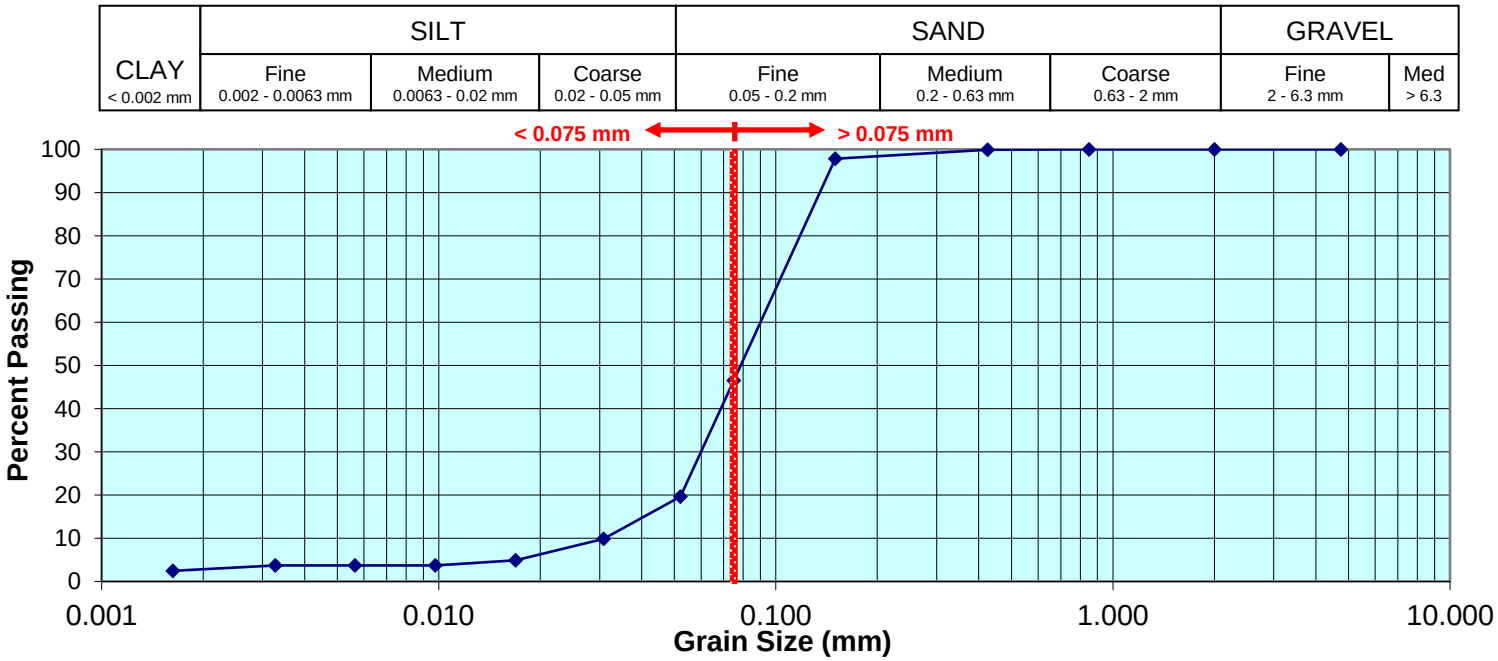
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 46.5
Classification = Coarse Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 46.5
Classification = Coarse Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: AOSA01-01-31976250303004
Maxxam Sample ID: DUP DGG685-01
Maxxam Job #: C522180

Tot. Sample Wt (g)*: 11.47
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B724470
Batch # (Hydro): B723898

Analysis Date (Sieve): 3/19/2025
Analysis Date (Hydro): 3/18/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	97.3
	Sieve 200	0.075	38.6
Hydrometer	R1min	0.0514	22.7
	R3min	0.0308	9.6
	R10min	0.0168	6.0
	R30min	0.0098	4.8
	R90min	0.0056	4.8
	R270min	0.0033	3.6
	R1080min	0.0016	2.4

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	78.2
Silt	0.002	0.050	19.2
Clay	-	0.002	2.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

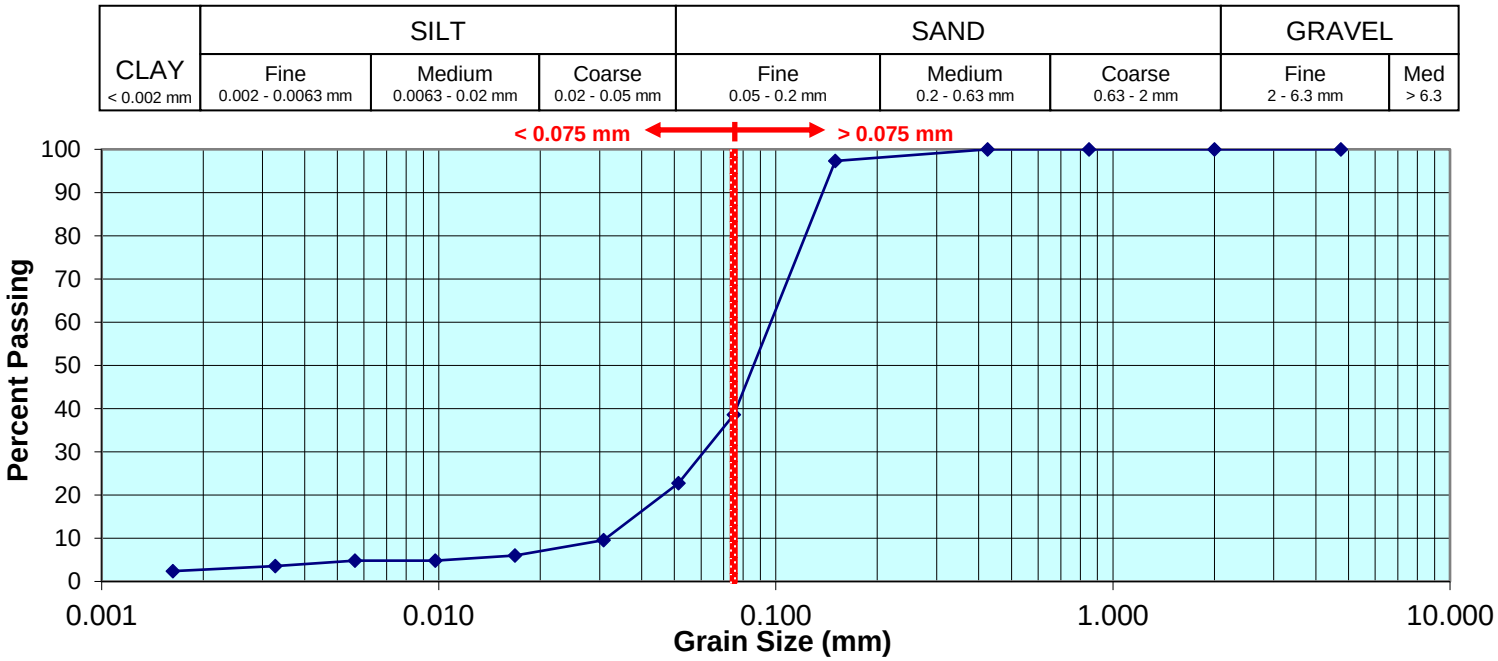
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 38.6
Classification = Coarse Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 38.6
Classification = Coarse Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: AOSA01-01-31976250303004
Maxxam Sample ID: DUP DGG685-01
Maxxam Job #: C522180

Tot. Sample Wt (g)*: 12.10
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B724470
Batch # (Hydro): B723898

Analysis Date (Sieve): 3/19/2025
Analysis Date (Hydro): 3/18/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	99.8
	Sieve 100	0.150	96.9
	Sieve 200	0.075	44.1
Hydrometer	R1min	0.0514	22.7
	R3min	0.0308	9.6
	R10min	0.0168	6.0
	R30min	0.0098	4.8
	R90min	0.0056	4.8
	R270min	0.0033	3.6
	R1080min	0.0016	2.4

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	78.2
Silt	0.002	0.050	19.2
Clay	-	0.002	2.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

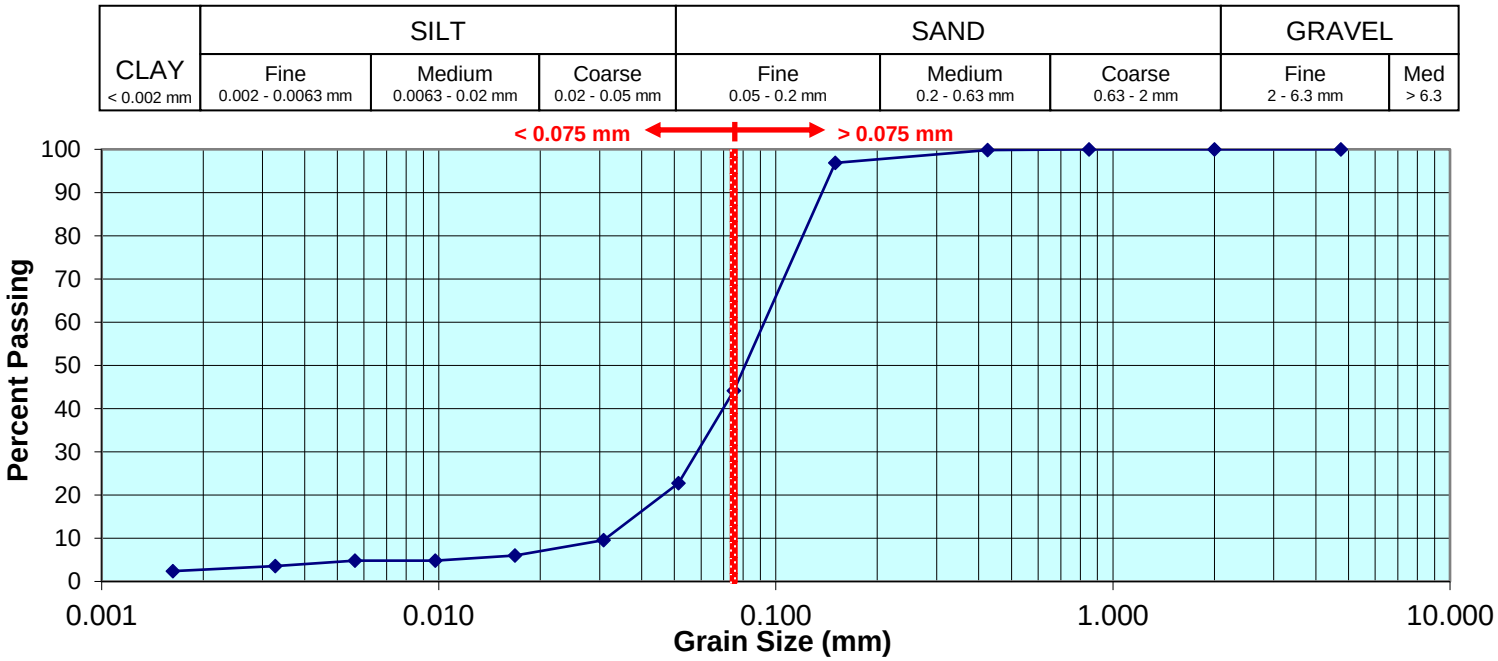
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 44.1
Classification = Coarse Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 44.1
Classification = Coarse Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: AOSA00-04-31976250303003
Maxxam Sample ID: DGG684-01
Maxxam Job #: C522180

Tot. Sample Wt (g)*: 16.53
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B724470
Batch # (Hydro): B723898

Analysis Date (Sieve): 3/19/2025
Analysis Date (Hydro): 3/18/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	88.4
	Sieve 200	0.075	21.9
Hydrometer	R1min	0.0533	9.7
	R3min	0.0309	6.1
	R10min	0.0169	4.9
	R30min	0.0098	3.7
	R90min	0.0056	3.7
	R270min	0.0033	3.7
	R1080min	0.0016	1.2

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	90.8
Silt	0.002	0.050	7.4
Clay	-	0.002	1.8

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

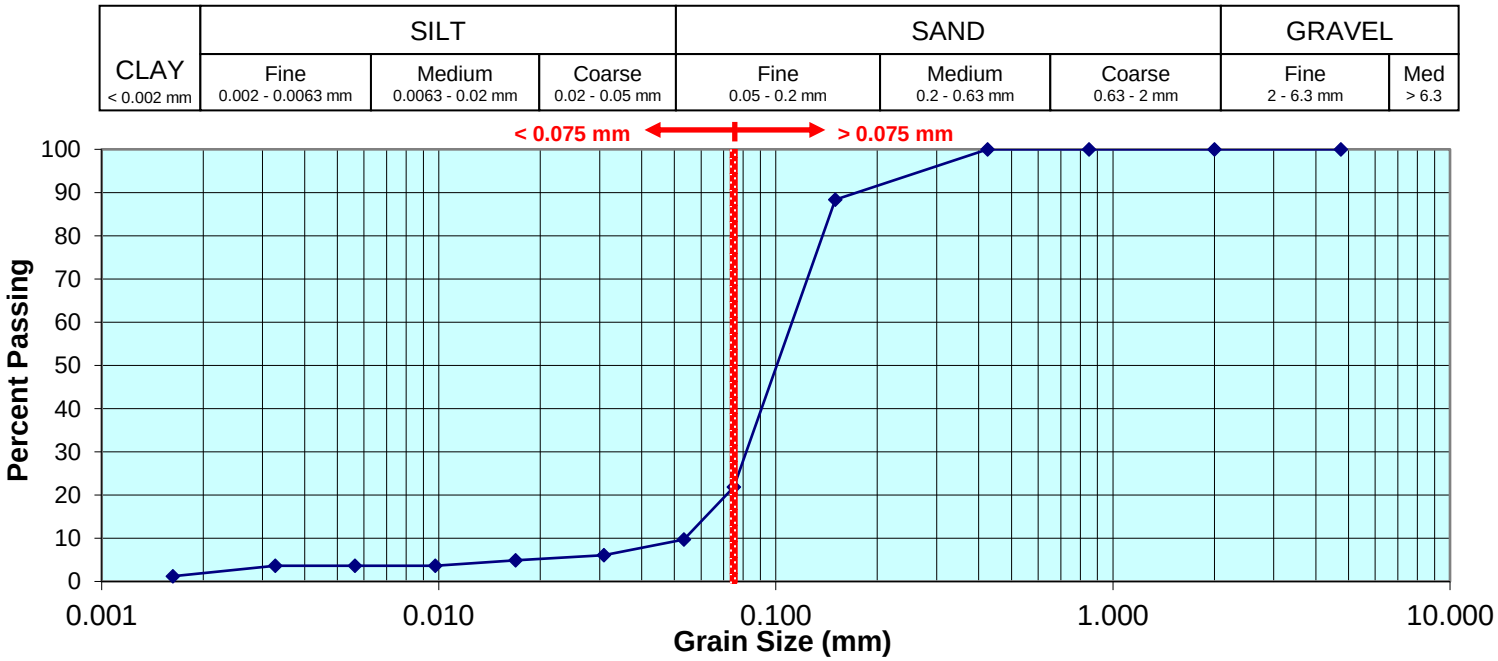
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 21.9
Classification = Coarse Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 21.9
Classification = Coarse Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: AOSA02-01-31976250304010
Maxxam Sample ID: DGG686-01
Maxxam Job #: C522180

Tot. Sample Wt (g)*: 14.66
> 2 mm Sample Wt (g)*: -0.01
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B724470
Batch # (Hydro): B723898

Analysis Date (Sieve): 3/19/2025
Analysis Date (Hydro): 3/18/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.1
	Sieve 20	0.850	100.1
	Sieve 40	0.425	100.1
	Sieve 100	0.150	100.1
	Sieve 200	0.075	99.4
Hydrometer	R1min	0.0442	78.3
	R3min	0.0275	54.7
	R10min	0.0159	31.1
	R30min	0.0095	18.7
	R90min	0.0055	13.7
	R270min	0.0032	11.2
	R1080min	0.0016	6.2

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	17.7
Silt	0.002	0.050	74.9
Clay	-	0.002	7.4

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

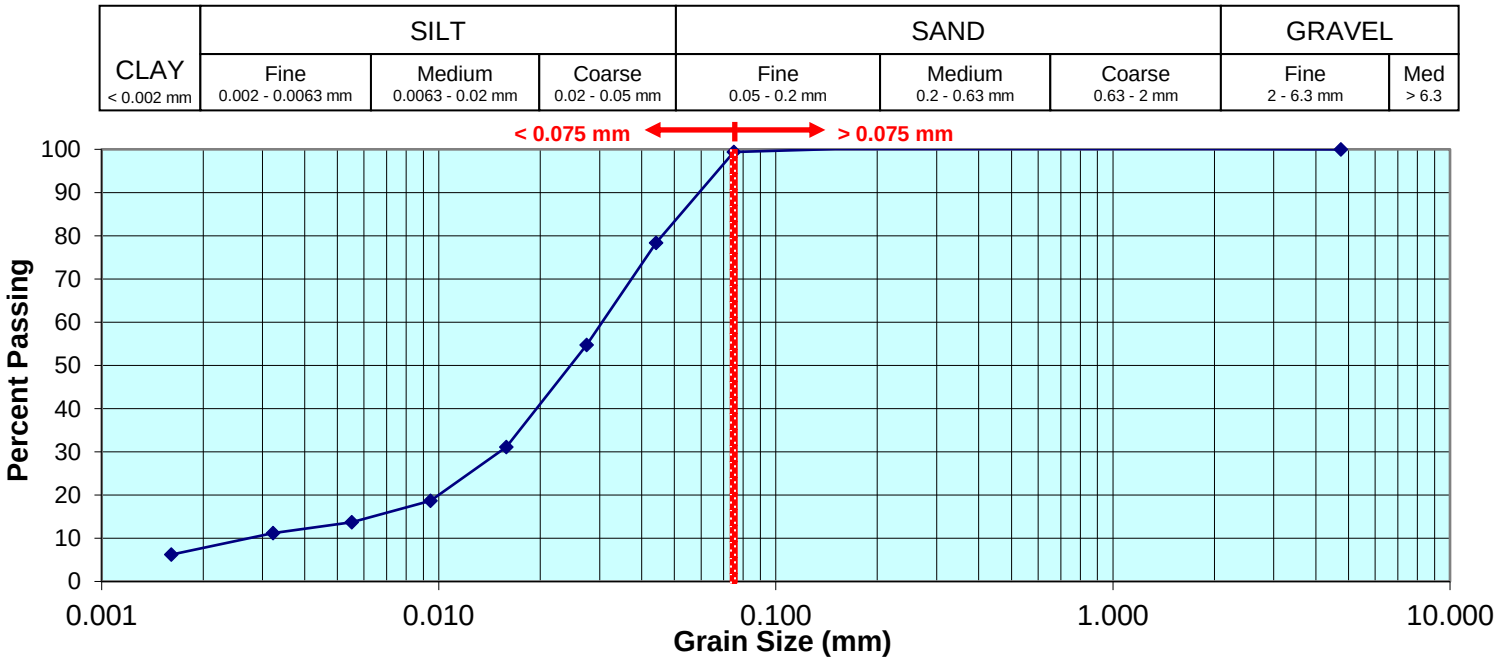
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.4
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.3
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: B724470

Hydrometer Batch #: B723898

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	99	75	125
	< 0.075 mm	101	75	125
Hydrometer	Sand	102	75	125
	Silt	105	75	125
	Clay	92	75	125

Grain Size Analysis Report (QA-DUP)

Sieve Batch #: B724470
Hydrometer Batch #: B723898
Maxxam Job #: C522180

Duplicate Sample ID: DGG685

			Acceptance Limit
	Fraction (mm)	% RPD	Maximum
Sieve	4.750	NC	30
	2.000	NC	30
	0.850	NC	30
	0.425	NC	30
	0.150	25.2	30
	0.075	13.4	30
Hydrometer	0.0514	NC	30
	0.0308	NC	30
	0.0168	NC	30
	0.0098	NC	30
	0.0056	NC	30
	0.0033	NC	30
	0.0016	NC	30

Your P.O. #: 31976-204073
Your Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your C.O.C. #: N/A

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/04/22
Report #: R8524256
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C524896
Received: 2025/03/07, 16:24

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Bulk Density Kg/m3 (1)	1	N/A	2025/03/28	WIN SOP-00028	Klute Ch 28, 2006 m
Saturated Hydraulic Conductivity (Ksat) (1)	1	N/A	2025/04/28	WIN SOP-00028	Klute Ch 28, 2006 m
Soil Water Content (1)	1	N/A	2025/03/28	WIN SOP-00028	Klute Ch 21, 2006 m
Texture by Hydrometer (2)	2	N/A	2025/03/18	AB SOP-00030	Carter 2nd ed 55.3 m
Texture by Hydrometer (2)	1	N/A	2025/03/19	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class (2)	2	N/A	2025/03/18		Auto Calc
Texture Class (2)	1	N/A	2025/03/19		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Winnipeg, 675 Berry Street Unit D, Winnipeg, MB, R3H 1A7
(2) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8

Your P.O. #: 31976-204073
Your Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your C.O.C. #: N/A

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/04/22
Report #: R8524256
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C524896
Received: 2025/03/07, 16:24

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C524896
Report Date: 2025/04/22

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your P.O. #: 31976-204073
Sampler Initials: RM

KSAT - FIELD CORE (SOIL)

Bureau Veritas ID		AOSA00		
Sampling Date		2025/03/03		
COC Number		N/A		
	UNITS	**31976250303003**	**RDL**	**QC Batch**
Physical Testing				
Bulk Density	Kg/m3	1640	1	9904531
Soil Water Content	%w/w	19	0.1	9904532
PHYSICAL PROPERTIES				
Type of Compaction	N/A	STDPROC	N/A	9904530
Ksat cm/s	N/A	2.2E-04	N/A	9904530
Ksat cm/hr	N/A	7.9E-01	N/A	9904530
Ksat in/hr	N/A	3.1E-01	N/A	9904530
Ksat in/s	N/A	8.6E-05	N/A	9904530

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Bureau Veritas Job #: C524896
Report Date: 2025/04/22

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your P.O. #: 31976-204073
Sampler Initials: RM

SUBCONTRACTED ANALYSIS (SOIL)

Bureau Veritas ID		AOSA03		AOSA04	AOSA05		
Sampling Date		2025/03/04		2025/03/06	2025/03/06		
COC Number		N/A		N/A	N/A		
	UNITS	319762503 04015	QC Batch	319762503 06017	319762503 06020	RDL	QC Batch
Physical Testing							
Clay	%	55	9894139	11	26	2.0	9894018
Sand	%	<2.0	9894139	12	9.1	2.0	9894018
Silt	%	45	9894139	77	65	2.0	9894018
Texture	N/A	SILTY CLAY	9894140	SILT LOAM	SILT LOAM	N/A	9894140

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C524896
Report Date: 2025/04/22

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your P.O. #: 31976-204073
Sampler Initials: RM

TEST SUMMARY

Bureau Veritas ID: AOSA00 **Collected:** 2025/03/03
Sample ID: 31976250303003 **Shipped:**
Matrix: Soil **Received:** 2025/03/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9904531	N/A	2025/03/28	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9904530	N/A	2025/04/28	Laura Coupland
Soil Water Content	BAL	9904532	N/A	2025/03/28	Laura Coupland

Bureau Veritas ID: AOSA03 **Collected:** 2025/03/04
Sample ID: 319762503 04015 **Shipped:**
Matrix: Soil **Received:** 2025/03/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9894139	N/A	2025/03/19	Maria Eliza Javier
Texture Class	CALC	9894140	N/A	2025/03/19	Automated Statchk

Bureau Veritas ID: AOSA04 **Collected:** 2025/03/06
Sample ID: 319762503 06017 **Shipped:**
Matrix: Soil **Received:** 2025/03/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9894018	N/A	2025/03/18	Maria Eliza Javier
Texture Class	CALC	9894140	N/A	2025/03/18	Automated Statchk

Bureau Veritas ID: AOSA05 **Collected:** 2025/03/06
Sample ID: 319762503 06020 **Shipped:**
Matrix: Soil **Received:** 2025/03/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9894018	N/A	2025/03/18	Maria Eliza Javier
Texture Class	CALC	9894140	N/A	2025/03/18	Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C524896
Report Date: 2025/04/22

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your P.O. #: 31976-204073
Sampler Initials: RM

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	2.3°C

Sample AOSA00 [31976250303003] : If standard proctor compaction is reported, the results are based on the estimated optimum water content sample as per the reference method.

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
9894018	Clay	2025/03/18	7.5	30	106	75 - 125
9894018	Sand	2025/03/18	3.1	30	92	75 - 125
9894018	Silt	2025/03/18	7.1	30	104	75 - 125
9894139	Clay	2025/03/19			101	75 - 125
9894139	Sand	2025/03/19			98	75 - 125
9894139	Silt	2025/03/19			102	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C524896
Report Date: 2025/04/22

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: MCDOWELL RD & FORESTRY FARM RD
Your P.O. #: 31976-204073
Sampler Initials: RM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C524896
2025/03/07 16:24

www.BVNA.com

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905 817-5700 Fax: 905 817-5779 Toll Free: 800-563-6266

CHAIN OF CUSTODY RECORD

ENV COC - 00014v5

MONT-2025-03-1505

Invoice Information	Invoice to (requires report) ☐	Report Information (if differs from Invoice)		Project Information	
Company:	#31375 Montrose Environmental	Company:	Montrose Environmental	Quotation #:	C31779
Contact Name:	Accounts Payable	Contact Name:	Louis-Charles Bouthillier	P.O. #/ AFE#:	31976-204073
Street Address:	Suite 200, 214 - 11 Avenue SW	Street Address:		Project #:	31976
City:	Calgary	Prov: AB	Postal Code: T2R 0K1	City:	Prov:	Postal Code:	Site #:	
Phone:	905-877-9531	Phone:	403-589-0477	Site Location:	McDowell Rd and Forestry Farm Rd
Email:	ap@montrose-env.ca	Email:	lbouthillier@montrose-env.ca	Site Location Province:	ON
Copies:		Copies:	eds@montrose-env.ca, shamilton@mon...	Sampled By:	Ryan McCourt

Regulatory Criteria

REG 153: ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ Res/Park ☐ Ind/Comm ☐ Agri/other ☐ Med/Fine ☐ Coarse ☐ For RSC

OTHER: ☐ CCME ☐ Reg 558* ☐ MISA ☐ PWQO ☐ Reg 406, Table ____ ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ____ ☐ Other: ____ *min 3 day TAT

Include Criteria on Certificate of Analysis (check if yes): ☐

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)

☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply

☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YYYY MM DD

Comments

	Sample Identification (Please print or Type)	Date Sampled YYYY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX/ F1	F2 - F4	VOCs	Reg 153 metals and inorganics	Reg 153 ICPMS metals	Reg 153 metals (Me, Cr VI, ICPMS metals, HWS - B)	10	11	12	13	14	15	16	17	18	19	20	21	22
																	Texture By Hydrometer	Particle Size Distribution Graph	Saturated Hydraulic Conductivity								# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	319762503103003	2025	03	03			SO										✓	✓	✓								4	
2	319762503 03004	2025	03	03			SO										✓	✓									1	
3	319762503 04010	2025	03	04			SO										✓	✓									1	
4	319762503 04015	2025	03	04			SO										✓										1	
5	319762503 06017	2025	03	06			SO										✓										1	
6	319762503 06020	2025	03	06			SO										✓										1	
7	~~319762503~~						~~SO~~																					
8	~~319762503~~						~~SO~~																					
9	~~319762503~~						~~SO~~																					
10	~~319762503~~						~~SO~~																					
11																												
12																												

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGEMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS AND CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY.

LAB USE ONLY	Yes	No	°C				Temperature reading by:
Seal present		=					
Seal intact		=		2	4	1	
Cooling media present	X		1	2	3		

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present			1	2	3	

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present			1	2	3	

Relinquished by: (Signature/ Print)	Date YYYY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YYYY	MM	DD	Time HH	MM	Special Instructions
1 Ryan McCourt	2025	03	07	16	20	1	2025	03	07	16	24	
2						2						

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Your C.O.C. #: C#1033206-02-01

Attention: Stewart Hamilton

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/03/17
Report #: R8503656
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C525935
Received: 2025/03/11, 17:22

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2025/03/13	CAM SOP-00448	SM 24 2320 B m
Carbonate, Bicarbonate and Hydroxide	1	N/A	2025/03/13	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	1	N/A	2025/03/13	CAM SOP-00463	SM 24 4500-Cl E m
Conductivity	1	N/A	2025/03/13	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (2)	1	N/A	2025/03/12	CAM SOP-00446	SM 24 5310 B m
Fluoride	1	2025/03/13	2025/03/13	CAM SOP-00449	SM 24 4500-F C m
Hardness (calculated as CaCO3)	1	N/A	2025/03/13	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	1	N/A	2025/03/13	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	1	N/A	2025/03/13		
Anion and Cation Sum	1	N/A	2025/03/13	CAM SOP-00102	SM 24 1030E m
Bromide in water by IC (1)	1	N/A	2025/03/13	AB SOP-00052	SM 24 4110 B m
Total Ammonia-N	1	N/A	2025/03/13	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (3)	1	N/A	2025/03/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Total Oil and Grease	1	2025/03/16	2025/03/16	CAM SOP-00326	EPA1664B m,SM5520B m
pH (4)	1	2025/03/13	2025/03/13	CAM SOP-00413	SM 24th - 4500H+ B
Orthophosphate	1	N/A	2025/03/13	CAM SOP-00461	SM 24 4500-P E
Sat. pH and Langelier Index (@ 20C)	1	N/A	2025/03/13		Auto Calc
Sat. pH and Langelier Index (@ 4C)	1	N/A	2025/03/13		Auto Calc
Sulphate by Automated Turbidimetry	1	N/A	2025/03/13	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphide	1	N/A	2025/03/13	CAM SOP-00455	SM 24 4500-S G m
Total Dissolved Solids (TDS calc)	1	N/A	2025/03/13		Auto Calc
Turbidity	1	N/A	2025/03/12	CAM SOP-00417	SM 24 2130 B

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Your C.O.C. #: C#1033206-02-01

Attention: Stewart Hamilton

Montrose Environmental Solutions Canada Inc.
7B-650 Woodlawn Rd. W.
Guelph, ON
Canada N1K 1B8

Report Date: 2025/03/17
Report #: R8503656
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C525935
Received: 2025/03/11, 17:22

Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8
(2) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(4) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

==========

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Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID		AOUJ08			AOUJ08		
Sampling Date		2025/03/10 08:55			2025/03/10 08:55		
COC Number		C#1033206-02-01			C#1033206-02-01		
	UNITS	31976250310101	RDL	QC Batch	31976250310101 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	me/L	4.81	N/A	9889125			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	240	1.0	9888917			
Calculated TDS	mg/L	240	1.0	9888914			
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.1	1.0	9888917			
Cation Sum	me/L	4.89	N/A	9889125			
Hardness (CaCO3)	mg/L	240	1.0	9888910			
Ion Balance (% Difference)	%	0.810	N/A	9889124			
Langelier Index (@ 20C)	N/A	0.791		9888911			
Langelier Index (@ 4C)	N/A	0.542		9888913			
Saturation pH (@ 20C)	N/A	7.19		9888911			
Saturation pH (@ 4C)	N/A	7.44		9888913			
Inorganics							
Total Ammonia-N	mg/L	<0.15 (1)	0.15	9889474			
Conductivity	umho/cm	440	2.0	9890134	440	2.0	9890134
Dissolved Organic Carbon	mg/L	<0.40	0.40	9889483	<0.40	0.40	9889483
Orthophosphate (P)	mg/L	<0.010	0.010	9889729			
pH	pH	7.98		9890129	8.02		9890129
Dissolved Sulphate (SO4)	mg/L	1.1	1.0	9889730			
Alkalinity (Total as CaCO3)	mg/L	240	1.0	9890132	240	1.0	9890132
Dissolved Chloride (Cl-)	mg/L	<1.0	1.0	9889728			
Nitrite (N)	mg/L	<0.010	0.010	9889332			
Nitrate (N)	mg/L	0.12	0.10	9889332			
Nitrate + Nitrite (N)	mg/L	0.12	0.10	9889332			
Metals							
Dissolved Aluminum (Al)	ug/L	6.4	4.9	9889893			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	9889893			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	9889893			
Dissolved Barium (Ba)	ug/L	11	2.0	9889893			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

RCAP - COMPREHENSIVE (WATER)

Bureau Veritas ID		AOUJ08			AOUJ08		
Sampling Date		2025/03/10 08:55			2025/03/10 08:55		
COC Number		C#1033206-02-01			C#1033206-02-01		
	UNITS	31976250310101	RDL	QC Batch	31976250310101 Lab-Dup	RDL	QC Batch
Dissolved Beryllium (Be)	ug/L	<0.40	0.40	9889893			
Dissolved Boron (B)	ug/L	14	10	9889893			
Dissolved Cadmium (Cd)	ug/L	<0.090	0.090	9889893			
Dissolved Calcium (Ca)	ug/L	69000	200	9889893			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	9889893			
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	9889893			
Dissolved Copper (Cu)	ug/L	6.8	0.90	9889893			
Dissolved Iron (Fe)	ug/L	<100	100	9889893			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	9889893			
Dissolved Magnesium (Mg)	ug/L	16000	50	9889893			
Dissolved Manganese (Mn)	ug/L	<2.0	2.0	9889893			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	9889893			
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	9889893			
Dissolved Phosphorus (P)	ug/L	<100	100	9889893			
Dissolved Potassium (K)	ug/L	970	200	9889893			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	9889893			
Dissolved Silicon (Si)	ug/L	5400	50	9889893			
Dissolved Silver (Ag)	ug/L	<0.090	0.090	9889893			
Dissolved Sodium (Na)	ug/L	1600	100	9889893			
Dissolved Strontium (Sr)	ug/L	100	1.0	9889893			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	9889893			
Dissolved Titanium (Ti)	ug/L	<5.0	5.0	9889893			
Dissolved Uranium (U)	ug/L	0.66	0.10	9889893			
Dissolved Vanadium (V)	ug/L	<0.50	0.50	9889893			
Dissolved Zinc (Zn)	ug/L	9.7	5.0	9889893			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C525935
Report Date: 2025/03/17

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AOUJ08			AOUJ08		
Sampling Date		2025/03/10 08:55			2025/03/10 08:55		
COC Number		C#1033206-02-01			C#1033206-02-01		
	UNITS	**31976250310101**	**RDL**	**QC Batch**	**31976250310101 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Dissolved Bromide (Br-)	mg/L	<0.010	0.010	9891491			
Fluoride (F-)	mg/L	0.14	0.10	9890133	0.11	0.10	9890133
Sulphide	mg/L	<0.020	0.020	9889987			
Turbidity	NTU	<0.1	0.1	9889363			
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	<0.50	0.50	9891693			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C525935
Report Date: 2025/03/17

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

TEST SUMMARY

Bureau Veritas ID: AOUJ08
Sample ID: 31976250310101
Matrix: Water

Collected: 2025/03/10
Shipped:
Received: 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9890132	N/A	2025/03/13	Nachiketa Gohil
Carbonate, Bicarbonate and Hydroxide	CALC	9888917	N/A	2025/03/13	Automated Statchk
Chloride by Automated Colourimetry	SKAL	9889728	N/A	2025/03/13	Alina Dobreanu
Conductivity	AT	9890134	N/A	2025/03/13	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9889483	N/A	2025/03/12	Gyulshen Idriz
Fluoride	ISE	9890133	2025/03/13	2025/03/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9888910	N/A	2025/03/13	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9889893	N/A	2025/03/13	Nan Raykha
Ion Balance (% Difference)	CALC	9889124	N/A	2025/03/13	Automated Statchk
Anion and Cation Sum	CALC	9889125	N/A	2025/03/13	Automated Statchk
Bromide in water by IC	IC/UV	9891491	N/A	2025/03/13	Tracy (Jing) Ling
Total Ammonia-N	SKAL/NH4	9889474	N/A	2025/03/13	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9889332	N/A	2025/03/12	Helen He
Total Oil and Grease	BAL	9891693	2025/03/16	2025/03/16	Navneet Singh
pH	AT	9890129	2025/03/13	2025/03/13	Nachiketa Gohil
Orthophosphate	SKAL	9889729	N/A	2025/03/13	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	9888911	N/A	2025/03/13	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	9888913	N/A	2025/03/13	Automated Statchk
Sulphate by Automated Turbidimetry	SKAL	9889730	N/A	2025/03/13	Alina Dobreanu
Sulphide	ISE/S	9889987	N/A	2025/03/13	Gurparteek KAUR
Total Dissolved Solids (TDS calc)	CALC	9888914	N/A	2025/03/13	Automated Statchk
Turbidity	AT	9889363	N/A	2025/03/12	Gurparteek KAUR

Bureau Veritas ID: AOUJ08 Dup
Sample ID: 31976250310101
Matrix: Water

Collected: 2025/03/10
Shipped:
Received: 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9890132	N/A	2025/03/13	Nachiketa Gohil
Conductivity	AT	9890134	N/A	2025/03/13	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9889483	N/A	2025/03/12	Gyulshen Idriz
Fluoride	ISE	9890133	2025/03/13	2025/03/13	Nachiketa Gohil
pH	AT	9890129	2025/03/13	2025/03/13	Nachiketa Gohil

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.0°C

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C525935
Report Date: 2025/03/17

QUALITY ASSURANCE REPORT

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Your P.O. #: 31976-204073
Sampler Initials: RM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9889332	Nitrate (N)	2025/03/12	100	80 - 120	101	80 - 120	<0.10	mg/L	0.053	20
9889332	Nitrite (N)	2025/03/12	102	80 - 120	106	80 - 120	<0.010	mg/L	1.1	20
9889363	Turbidity	2025/03/12			101	80 - 120	<0.1	NTU	15	20
9889474	Total Ammonia-N	2025/03/13	92	75 - 125	99	80 - 120	<0.050	mg/L	NC	20
9889483	Dissolved Organic Carbon	2025/03/12	93	80 - 120	97	80 - 120	<0.40	mg/L	NC	20
9889728	Dissolved Chloride (Cl-)	2025/03/13	NC	80 - 120	92	80 - 120	<1.0	mg/L	1.6	20
9889729	Orthophosphate (P)	2025/03/13	90	75 - 125	96	80 - 120	<0.010	mg/L	12	20
9889730	Dissolved Sulphate (SO4)	2025/03/13	NC	75 - 125	91	80 - 120	<1.0	mg/L	0.0030	20
9889893	Dissolved Aluminum (Al)	2025/03/13	101	80 - 120	102	80 - 120	<4.9	ug/L		
9889893	Dissolved Antimony (Sb)	2025/03/13	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
9889893	Dissolved Arsenic (As)	2025/03/13	101	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
9889893	Dissolved Barium (Ba)	2025/03/13	99	80 - 120	100	80 - 120	<2.0	ug/L	0.75	20
9889893	Dissolved Beryllium (Be)	2025/03/13	100	80 - 120	100	80 - 120	<0.40	ug/L	NC	20
9889893	Dissolved Boron (B)	2025/03/13	95	80 - 120	96	80 - 120	<10	ug/L	2.1	20
9889893	Dissolved Cadmium (Cd)	2025/03/13	100	80 - 120	100	80 - 120	<0.090	ug/L	NC	20
9889893	Dissolved Calcium (Ca)	2025/03/13	NC	80 - 120	101	80 - 120	<200	ug/L		
9889893	Dissolved Chromium (Cr)	2025/03/13	100	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
9889893	Dissolved Cobalt (Co)	2025/03/13	97	80 - 120	99	80 - 120	<0.50	ug/L	2.5	20
9889893	Dissolved Copper (Cu)	2025/03/13	99	80 - 120	101	80 - 120	<0.90	ug/L	4.4	20
9889893	Dissolved Iron (Fe)	2025/03/13	100	80 - 120	101	80 - 120	<100	ug/L		
9889893	Dissolved Lead (Pb)	2025/03/13	96	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
9889893	Dissolved Magnesium (Mg)	2025/03/13	98	80 - 120	99	80 - 120	<50	ug/L		
9889893	Dissolved Manganese (Mn)	2025/03/13	99	80 - 120	100	80 - 120	<2.0	ug/L		
9889893	Dissolved Molybdenum (Mo)	2025/03/13	100	80 - 120	99	80 - 120	<0.50	ug/L	0.93	20
9889893	Dissolved Nickel (Ni)	2025/03/13	96	80 - 120	99	80 - 120	<1.0	ug/L	12	20
9889893	Dissolved Phosphorus (P)	2025/03/13	107	80 - 120	102	80 - 120	<100	ug/L		
9889893	Dissolved Potassium (K)	2025/03/13	100	80 - 120	101	80 - 120	<200	ug/L		
9889893	Dissolved Selenium (Se)	2025/03/13	100	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
9889893	Dissolved Silicon (Si)	2025/03/13	97	80 - 120	99	80 - 120	<50	ug/L		
9889893	Dissolved Silver (Ag)	2025/03/13	98	80 - 120	98	80 - 120	<0.090	ug/L	NC	20

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9889893	Dissolved Sodium (Na)	2025/03/13	100	80 - 120	101	80 - 120	<100	ug/L		
9889893	Dissolved Strontium (Sr)	2025/03/13	98	80 - 120	99	80 - 120	<1.0	ug/L		
9889893	Dissolved Thallium (Tl)	2025/03/13	99	80 - 120	102	80 - 120	<0.050	ug/L	NC	20
9889893	Dissolved Titanium (Ti)	2025/03/13	96	80 - 120	98	80 - 120	<5.0	ug/L		
9889893	Dissolved Uranium (U)	2025/03/13	97	80 - 120	99	80 - 120	<0.10	ug/L	1.0	20
9889893	Dissolved Vanadium (V)	2025/03/13	100	80 - 120	100	80 - 120	<0.50	ug/L	7.4	20
9889893	Dissolved Zinc (Zn)	2025/03/13	99	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
9889987	Sulphide	2025/03/13	73 (1)	80 - 120	91	80 - 120	<0.020	mg/L	20	20
9890129	pH	2025/03/13			101	98 - 103			0.59	N/A
9890132	Alkalinity (Total as CaCO3)	2025/03/13			94	85 - 115	<1.0	mg/L	1.9	20
9890133	Fluoride (F-)	2025/03/13	99	80 - 120	104	80 - 120	<0.10	mg/L	NC	20
9890134	Conductivity	2025/03/13			101	85 - 115	<2.0	umho/cm	0.22	10
9891491	Dissolved Bromide (Br-)	2025/03/13	110	80 - 120	104	80 - 120	<0.010	mg/L		
9891693	Total Oil & Grease	2025/03/16			99	80 - 110	<0.50	mg/L	0	25

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C525935
2025/03/11 17:22

BUREAU VERITAS

IMMEDIATE

Bureau Veritas Laboratories, 5 Michener Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

Page 1 of 1

NONT-2025-03-1967

Bottle Order #: 1033206

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#31375 Montrose Environmental Solutions Canada Inc	Company Name:	#22594 Montrose Environmental Solutions Canada Inc	Quotation #:	C31779
Attention:	Accounts Payable	Attention:	Stewart Hamilton	P.O. #:	31976-204073
Address:	Suite 200, 214 - 11 Avenue SW	Address:	7B-650 Woodlawn Rd. W.	Project:	31976-204073
	Calgary AB T2R 0K1		Guelph ON N1K 1B8	Project Name:	
Tel:	(905) 877-9531 Fax: (905) 877-4143	Tel:	(519) 772-3777 Fax:	Site #:	
Email:	ap@matrix-solutions.com ap@montrose-env.ca	Email:	shamilton@montrose-env.ca edd@montrose-env.ca	Sampled By:	Ryan McCourt

COC #: C#1033206-02-01

Project Manager: Kudret Bajwa

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558, ☐ Storm Sewer Bylaw	
☐ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality	
☐ Table ___	☐ PWQO ☐ Reg 406 Table	
	☑ Other ODWS	

Include Criteria on Certificate of Analysis (Y/N)? ____

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	RCAp - Comprehensive	Fluoride	Sulphide	Turbidity	Bromide in water by IC	Total Oil and Grease	# of Bottles	Comments
1		22608												
2		3197625031010 1	March 10, 2025	8:55 AM	GW	✓	✓	✓	✓	✓	✓	✓	6	Metal bottle filtered. All other bottles unfiltered
3														
4														
5														
6														
7														
8														
9														
10														

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Ryan McCourt	~~25/03/11~~ 25/03/11	17:15		25-03-11	1700	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei 01117	Custody Seal Present	Yes	No
		Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Your P.O. #: 31976-204073
Your Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your C.O.C. #: N/A

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/04/04
Report #: R8515547
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C526032
Received: 2025/03/11, 17:34

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Bulk Density Kg/m3 (1)	1	N/A	2025/03/27	WIN SOP-00028	Klute Ch 28, 2006 m
Bulk Density Kg/m3 (1)	1	N/A	2025/03/28	WIN SOP-00028	Klute Ch 28, 2006 m
Saturated Hydraulic Conductivity (Ksat) (1)	1	N/A	2025/03/27	WIN SOP-00028	Klute Ch 28, 2006 m
Saturated Hydraulic Conductivity (Ksat) (1)	1	N/A	2025/04/28	WIN SOP-00028	Klute Ch 28, 2006 m
Soil Water Content (1)	1	N/A	2025/03/27	WIN SOP-00028	Klute Ch 21, 2006 m
Soil Water Content (1)	1	N/A	2025/03/28	WIN SOP-00028	Klute Ch 21, 2006 m
Texture by Hydrometer (2)	3	N/A	2025/03/21	AB SOP-00030	Carter 2nd ed 55.3 m
Texture by Hydrometer (2)	1	N/A	2025/04/04	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class (2)	3	N/A	2025/03/21		Auto Calc
Texture Class (2)	1	N/A	2025/04/04		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your P.O. #: 31976-204073
Your Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your C.O.C. #: N/A

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/04/04
Report #: R8515547
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C526032

Received: 2025/03/11, 17:34

(1) This test was performed by Bureau Veritas Winnipeg, 675 Berry Street Unit D, Winnipeg, MB, R3H 1A7
(2) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C526032
Report Date: 2025/04/04

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RM

KSAT - FIELD CORE (SOIL)

Bureau Veritas ID		AOUL16			AOUL18		
Sampling Date		2025/03/11			2025/03/11		
COC Number		N/A			N/A		
	UNITS	31976250311028	RDL	QC Batch	31976250311038	RDL	QC Batch
Physical Testing							
Bulk Density	Kg/m3	1730	1	9904535	2060	1	9904531
Soil Water Content	%w/w	21	0.1	9904536	10	0.1	9904532
PHYSICAL PROPERTIES							
Type of Compaction	N/A	SHELBYTUBE	N/A	9904534	STDPROC	N/A	9904530
Ksat cm/s	N/A	2.1E-08	N/A	9904534	2.1E-08	N/A	9904530
Ksat cm/hr	N/A	7.7E-05	N/A	9904534	7.4E-05	N/A	9904530
Ksat in/hr	N/A	3.0E-05	N/A	9904534	2.9E-05	N/A	9904530
Ksat in/s	N/A				8.1E-09	N/A	9904530
Ksat mm/hr	N/A	7.7E-04	N/A	9904534			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C526032
Report Date: 2025/04/04

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RM

SUBCONTRACTED ANALYSIS (SOIL)

Bureau Veritas ID		AOUL15		AOUL16			AOUL16		
Sampling Date		2025/03/10		2025/03/11			2025/03/11		
COC Number		N/A		N/A			N/A		
	UNITS	31976250310034	QC Batch	31976250311028	RDL	QC Batch	31976250311028 Lab-Dup	RDL	QC Batch
Physical Testing									
Clay	%	62	9904661	46	2.0	9904663	45	2.0	9904663
Sand	%	7.0	9904661	3.0	2.0	9904663	3.7	2.0	9904663
Silt	%	31	9904661	51	2.0	9904663	51	2.0	9904663
Texture	N/A	HEAVY CLAY	9904662	SILTY CLAY	N/A	9904662			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas ID		AOUL17	AOUL18		
Sampling Date		2025/03/11	2025/03/11		
COC Number		N/A	N/A		
	UNITS	31976250311029	31976250311038	RDL	QC Batch
Physical Testing					
Clay	%	62	30	2.0	9904661
Sand	%	<2.0	34	2.0	9904661
Silt	%	36	37	2.0	9904661
Texture	N/A	HEAVY CLAY	CLAY LOAM	N/A	9904662

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C526032
Report Date: 2025/04/04

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RM

TEST SUMMARY

Bureau Veritas ID: AOUL15 **Collected:** 2025/03/10
Sample ID: 31976250310034 **Shipped:**
Matrix: Soil **Received:** 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9904661	N/A	2025/03/21	Maria Eliza Javier
Texture Class	CALC	9904662	N/A	2025/03/21	Automated Statchk

Bureau Veritas ID: AOUL16 **Collected:** 2025/03/11
Sample ID: 31976250311028 **Shipped:**
Matrix: Soil **Received:** 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9904535	N/A	2025/03/27	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9904534	N/A	2025/03/27	Laura Coupland
Soil Water Content	BAL	9904536	N/A	2025/03/27	Laura Coupland
Texture by Hydrometer		9904663	N/A	2025/04/04	Maria Eliza Javier
Texture Class	CALC	9904662	N/A	2025/04/04	Automated Statchk

Bureau Veritas ID: AOUL16 Dup **Collected:** 2025/03/11
Sample ID: 31976250311028 **Shipped:**
Matrix: Soil **Received:** 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9904663	N/A	2025/04/04	Maria Eliza Javier

Bureau Veritas ID: AOUL17 **Collected:** 2025/03/11
Sample ID: 31976250311029 **Shipped:**
Matrix: Soil **Received:** 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9904661	N/A	2025/03/21	Maria Eliza Javier
Texture Class	CALC	9904662	N/A	2025/03/21	Automated Statchk

Bureau Veritas ID: AOUL18 **Collected:** 2025/03/11
Sample ID: 31976250311038 **Shipped:**
Matrix: Soil **Received:** 2025/03/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9904531	N/A	2025/03/28	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9904530	N/A	2025/04/28	Laura Coupland
Soil Water Content	BAL	9904532	N/A	2025/03/28	Laura Coupland
Texture by Hydrometer		9904661	N/A	2025/03/21	Maria Eliza Javier
Texture Class	CALC	9904662	N/A	2025/03/21	Automated Statchk

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	13.0°C
Package 2	14.0°C
Package 3	18.0°C

Sample AOUL18 [31976250311038] : If standard proctor compaction is reported, the results are based on the estimated optimum water content sample as per the reference method.

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			RPD		QC Standard	
QC Batch	**Parameter**	**Date**	**Value (%)**	**QC Limits**	**% Recovery**	**QC Limits**
9904661	Clay	2025/03/21			107	75 - 125
9904661	Sand	2025/03/21			97	75 - 125
9904661	Silt	2025/03/21			97	75 - 125
9904663	Clay	2025/04/04	3.3	30	101	75 - 125
9904663	Sand	2025/04/04	21	30	100	75 - 125
9904663	Silt	2025/04/04	1.6	30	100	75 - 125

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C526032
Report Date: 2025/04/04

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976
Site Location: 12TH CONCESSION RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C526032
2025/03/11 17:34

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#31375

6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CHAIN OF CUSTODY RECORD

ENV COC - 00014v5

Page 1 of 1

Invoice Information	Invoice to (requires report) ☐	Report Information (if differs from invoice)		Project Information	
Company:	Montrose Environmental	Company:	Montrose Environmental	Quotation #:	C31779
Contact Name:	Accounts Payable	Contact Name:	Louis-Charles Boutin	P.O. #/ AFE#:	31976-204073
Street Address:	Suite 200, 214-11 Ave SW	Street Address:		Project #:	
City:	Calgary Prov: AB Postal Code: T2R0K2	City:	Prov: Postal Code:	Site #:	
Phone:	905-877-9531	Phone:	403-589-0477	Site Location:	12th Concession Rd, Norfolk
Email:	ap@montrose-env.ca	Email:	lboutin@montrose-env.ca	Site Location Province:	ON
Copies:		Copies:	eds@montrose-env.ca, shamilton@mon...	Sampled By:	Ryan McCourt

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

REG 153: ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ Res/Park ☐ Ind/Comm ☐ Agri/other ☐ Med/Fine ☐ Coarse ☐ For RSC

OTHER: ☐ CCME ☐ Reg 558* *min 3 day TAT ☐ MISA ☐ PWQO ☐ Reg 406, Table: ____ ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ____ ☐ Other: ____

Include Criteria on Certificate of Analysis (check if yes): ☐

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)

☑ 5 to 7 Day ☐ 10 Day

Rush Turnaround Time (TAT) Surcharges apply

☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YYYY MM DD

Comments

	Sample Identification (Please print or Type)	Date Sampled YYYY	MM	DD	Time (24hr) HH	MM	Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX/F1	F2 - F4	VOCs	Reg 153 metals and inorganics	Reg 153 ICPMS metals	Reg 153 metals (Up. Cr, VI, ICPMS metals, HWS - B)	Texture By Hydrometer	Particle Size Distribution	Saturated Hydraulic Conductivity	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE
1	3197625031002A	2025	03	10			SO										✓	✓		1	
2	3197625031102B	2025	03	11			SO										✓		✓	1	
3	3197625031102C	2025	03	11			SO										✓			1	
4	3197625031103B	2025	03	11			SO										✓		✓	4	
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

NONT-2025-03-2052

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY.

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present		✓		K	13	13

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present		✓		13	13	16

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present		✓				
Seal intact		✓				
Cooling media present		✓		18	18	18

Temperature reading by:

Relinquished by: (Signature/ Print)	Date YYYY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YYYY	MM	DD	Time HH	MM
1 Ryan McCourt	2025	03	11	17	30	1	2025	03	11	17	34
2						2					

Special instructions

Grain Size Analysis Report

Client Sample ID: 31976250310024 MW25-01D
Maxxam Sample ID: DGW220-01
Maxxam Job #: C524960

Tot. Sample Wt (g)*: 16.21
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B767249
Batch # (Hydro): B767210

Analysis Date (Sieve): 4/29/2025
Analysis Date (Hydro): 4/28/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	100.0
	Sieve 200	0.075	96.2
Hydrometer	R1min	0.0463	56.6
	R3min	0.0290	26.4
	R10min	0.0164	13.8
	R30min	0.0096	8.8
	R90min	0.0056	7.5
	R270min	0.0032	5.0
	R1080min	0.0016	5.0

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	38.3
Silt	0.002	0.050	56.7
Clay	-	0.002	5.0

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

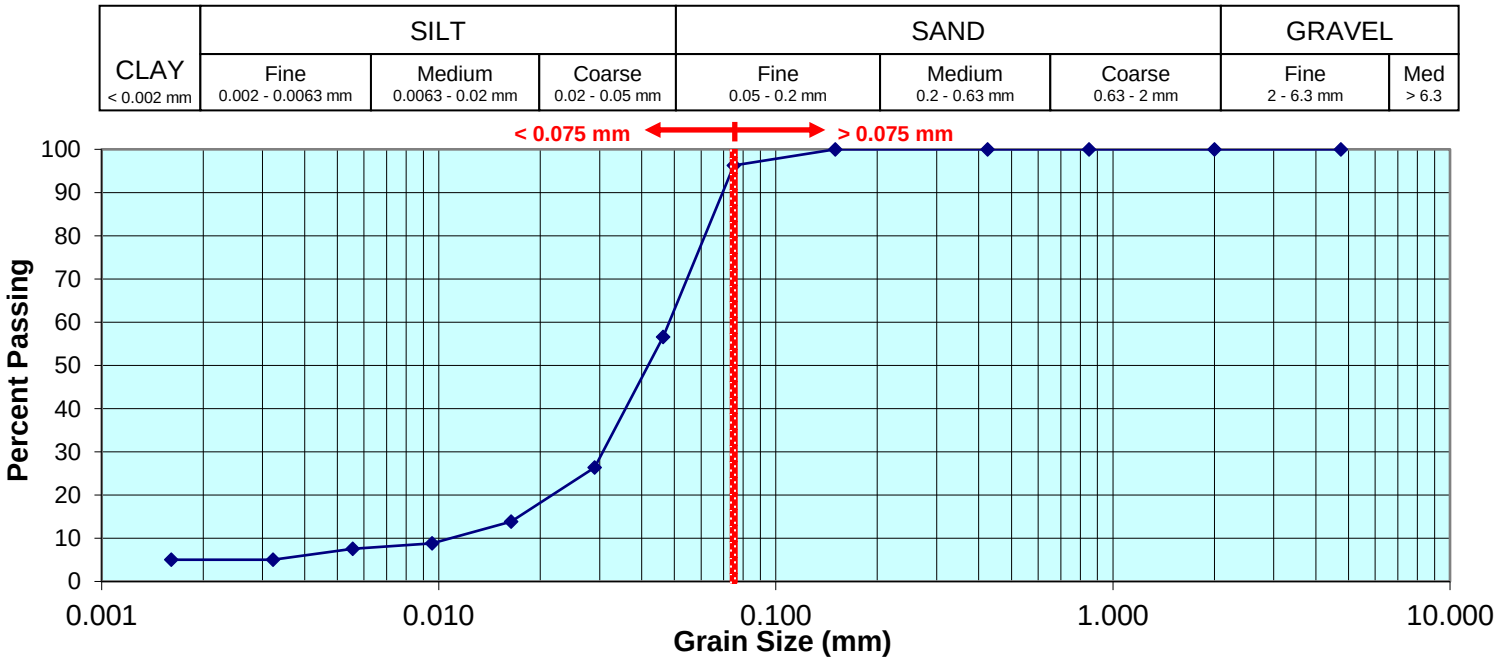
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 96.2
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 96.2
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: 31976250310024 MW25-01D
Maxxam Sample ID: DUP DGW220-01
Maxxam Job #: C524960

Tot. Sample Wt (g)*: 13.68
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B767249
Batch # (Hydro): B767210

Analysis Date (Sieve): 4/29/2025
Analysis Date (Hydro): 4/28/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	99.9
	Sieve 100	0.150	99.9
	Sieve 200	0.075	96.7
Hydrometer	R1min	0.0463	56.5
	R3min	0.0290	26.3
	R10min	0.0164	13.8
	R30min	0.0096	7.5
	R90min	0.0056	6.3
	R270min	0.0032	5.0
	R1080min	0.0016	5.0

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	38.3
Silt	0.002	0.050	56.6
Clay	-	0.002	5.0

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

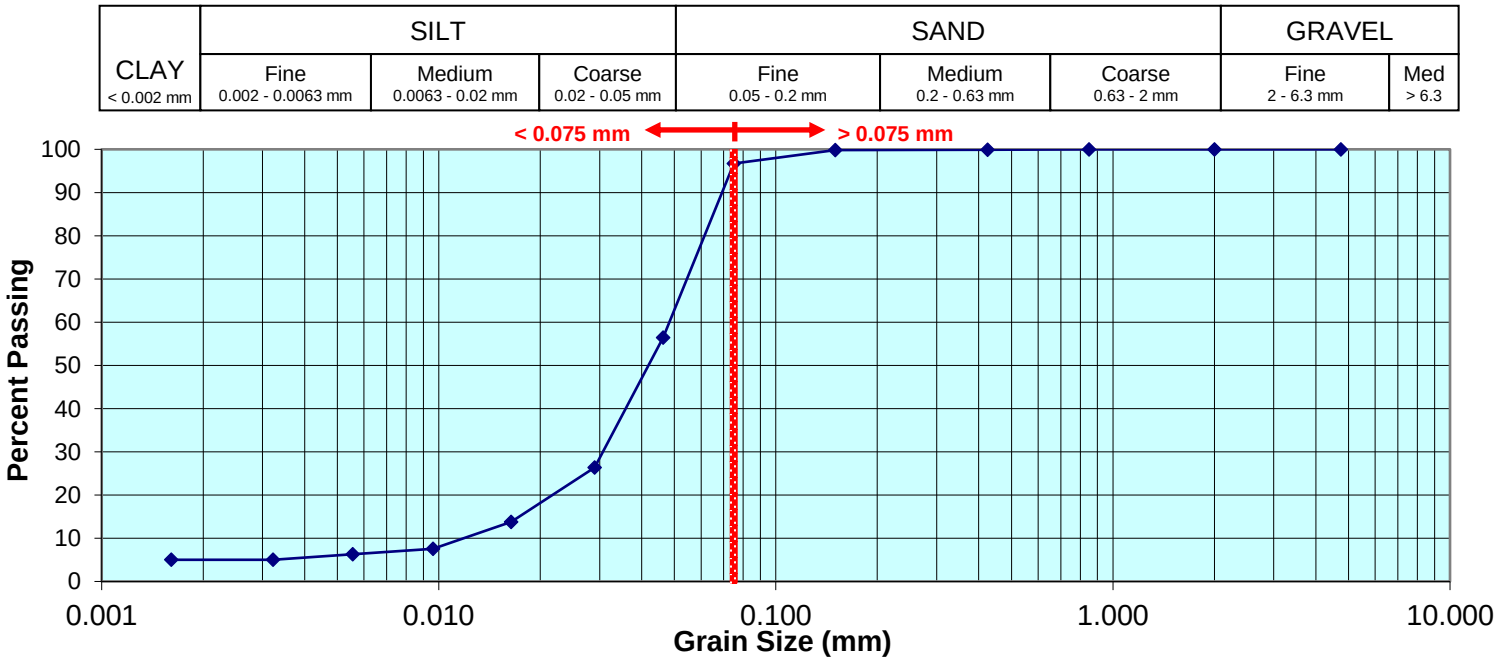
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 96.7
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 96.7
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: 31976250317046 MW25-02D
Maxxam Sample ID: DGW224-01
Maxxam Job #: C524960

Tot. Sample Wt (g)*: 14.04
> 2 mm Sample Wt (g)*: 0.04
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B767249
Batch # (Hydro): B767210

Analysis Date (Sieve): 4/29/2025
Analysis Date (Hydro): 4/28/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	99.7
	Sieve 20	0.850	99.7
	Sieve 40	0.425	99.7
	Sieve 100	0.150	99.6
	Sieve 200	0.075	99.5
Hydrometer	R1min	0.0426	81.4
	R3min	0.0263	57.0
	R10min	0.0155	33.7
	R30min	0.0093	20.9
	R90min	0.0055	14.0
	R270min	0.0032	10.5
	R1080min	0.0016	8.1

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	14.2
Silt	0.002	0.050	77.0
Clay	-	0.002	8.8

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

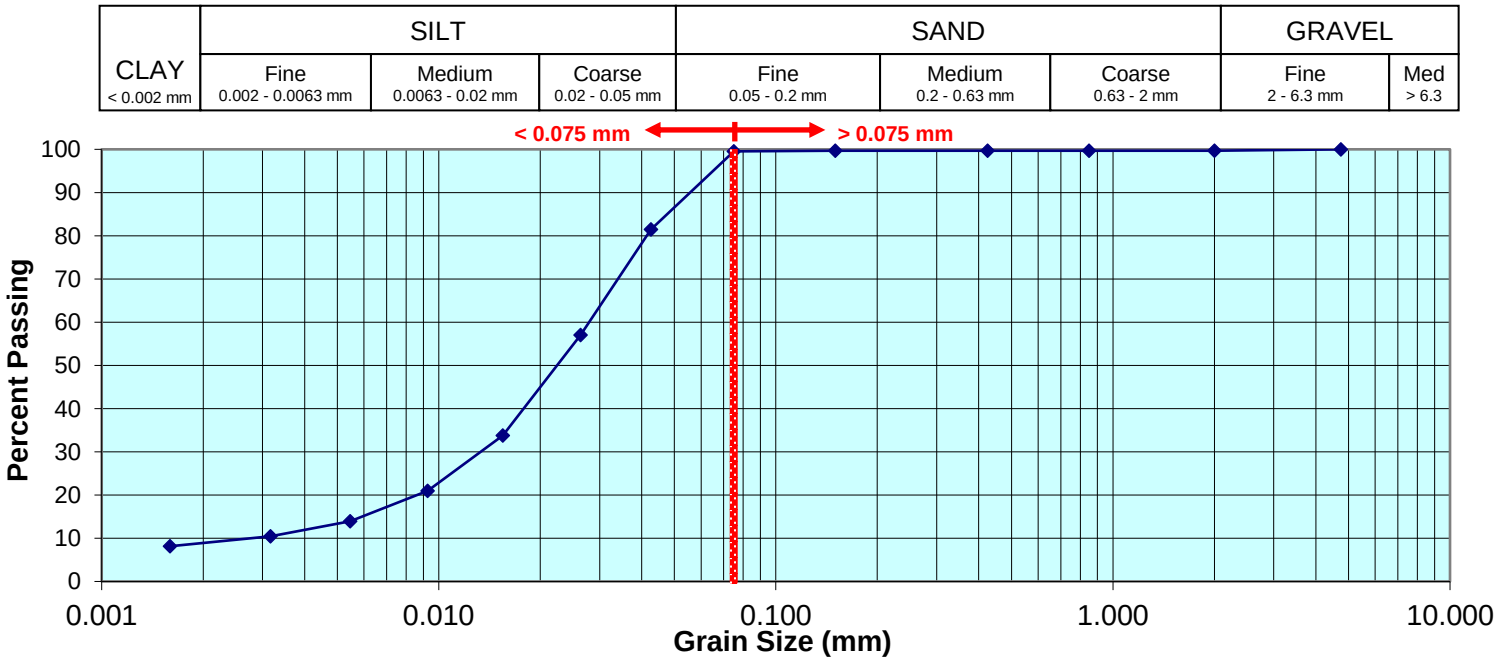
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.5
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: 31976250317047 MW25-02D
Maxxam Sample ID: DGW225-01
Maxxam Job #: C524960

Tot. Sample Wt (g)*: 12.77
> 2 mm Sample Wt (g)*: 0.00
* Dry mass based on Sieve Aliquot

Batch # (Sieve): B767249
Batch # (Hydro): B767210

Analysis Date (Sieve): 4/29/2025
Analysis Date (Hydro): 4/28/2025

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	100.0
	Sieve 20	0.850	100.0
	Sieve 40	0.425	100.0
	Sieve 100	0.150	100.0
	Sieve 200	0.075	99.9
Hydrometer	R1min	0.0433	88.6
	R3min	0.0265	66.1
	R10min	0.0155	40.8
	R30min	0.0093	23.9
	R90min	0.0055	14.1
	R270min	0.0032	9.8
	R1080min	0.0016	8.4

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	9.0
Silt	0.002	0.050	82.2
Clay	-	0.002	8.8

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

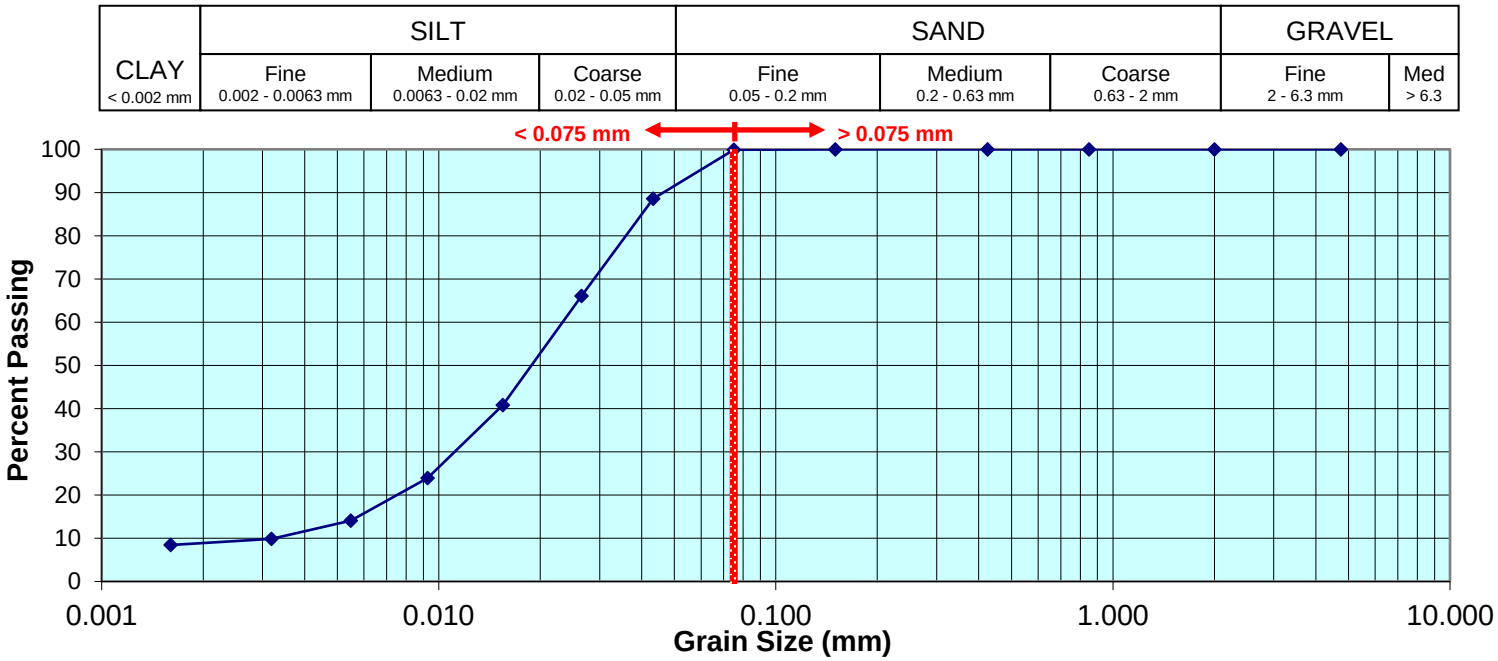
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 99.9
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: B767249

Hydrometer Batch #: B767210

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	102	75	125
	< 0.075 mm	99	75	125
Hydrometer	Sand	100	75	125
	Silt	103	75	125
	Clay	97	75	125

Grain Size Analysis Report (QA-DUP)

Sieve Batch #: B767249
Hydrometer Batch #: B767210
Maxxam Job #: C524960

Duplicate Sample ID: DGW220

			Acceptance Limit
	Fraction (mm)	% RPD	Maximum
Sieve	4.750	NC	30
	2.000	NC	30
	0.850	NC	30
	0.425	NC	30
	0.150	NC	30
	0.075	17.9	30
Hydrometer	0.0463	NC	30
	0.0290	NC	30
	0.0164	NC	30
	0.0096	NC	30
	0.0056	NC	30
	0.0032	NC	30
	0.0016	NC	30

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your C.O.C. #: C#1034652-03-01

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/05/02
Report #: R8531006
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C531325
Received: 2025/03/21, 15:05

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Bulk Density Kg/m3 (1)	2	N/A	2025/04/07	WIN SOP-00028	Klute Ch 28, 2006 m
Bulk Density Kg/m3 (1)	2	N/A	2025/04/08	WIN SOP-00028	Klute Ch 28, 2006 m
Saturated Hydraulic Conductivity (Ksat) (1)	2	N/A	2025/04/07	WIN SOP-00028	Klute Ch 28, 2006 m
Saturated Hydraulic Conductivity (Ksat) (1)	2	N/A	2025/04/08	WIN SOP-00028	Klute Ch 28, 2006 m
Soil Water Content (1)	2	N/A	2025/04/07	WIN SOP-00028	Klute Ch 21, 2006 m
Soil Water Content (1)	2	N/A	2025/04/08	WIN SOP-00028	Klute Ch 21, 2006 m
Texture by Hydrometer (2)	6	N/A	2025/04/02	AB SOP-00030	Carter 2nd ed 55.3 m
Texture Class (2)	6	N/A	2025/04/02		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Winnipeg, 675 Berry Street Unit D, Winnipeg, MB, R3H 1A7
(2) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8

Your P.O. #: 31976-204073
Your Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your C.O.C. #: C#1034652-03-01

Attention: Louis-Charles Boutin

Montrose Environmental Solutions Canada Inc.
Suite 200, 214 - 11 Avenue SW
Calgary, AB
CANADA T2R 0K1

Report Date: 2025/05/02
Report #: R8531006
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C531325
Received: 2025/03/21, 15:05

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

KSAT - FIELD CORE (SOIL)

Bureau Veritas ID		APEC50	APEC52	APEC53	APEC54		
Sampling Date		2025/03/17	2025/03/17	2025/03/17	2025/03/17		
COC Number		C#1034652-03-01	C#1034652-03-01	C#1034652-03-01	C#1034652-03-01		
	UNITS	31976250317042 MW25-02D	31976250317047 MW25-02D	31976250317051 MW25-02D	31976250317052 MW25-02D	RDL	QC Batch
Physical Testing							
Bulk Density	Kg/m3	1730	1690	1850	2030	1	9911064
Soil Water Content	%w/w	21	23	17	12	0.1	9911066
PHYSICAL PROPERTIES							
Type of Compaction	N/A	STDPROC	STDPROC	STDPROC	STDPROC	N/A	9911065
Ksat cm/s	N/A	1.9E-08	1.4E-07	1.0E-08	2.1E-08	N/A	9911065
Ksat cm/hr	N/A	6.9E-05	5.0E-04	3.6E-05	7.6E-05	N/A	9911065
Ksat in/hr	N/A	2.7E-05	2.0E-04	1.4E-05	3.0E-05	N/A	9911065
Ksat in/s	N/A	7.5E-09	5.4E-08	4.0E-09	8.4E-09	N/A	9911065

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

SUBCONTRACTED ANALYSIS (SOIL)

Bureau Veritas ID		APEC49	APEC50	APEC51	APEC52		
Sampling Date		2025/03/10	2025/03/17	2025/03/17	2025/03/17		
COC Number		C#1034652-03-01	C#1034652-03-01	C#1034652-03-01	C#1034652-03-01		
	UNITS	31976250310024 MW25-01D	31976250317042 MW25-02D	31976250317046 MW25-02D	31976250317047 MW25-02D	RDL	QC Batch
Physical Testing							
Clay	%	5.3	73	14	13	2.0	9903032
Sand	%	32	4.6	12	10	2.0	9903032
Silt	%	63	22	74	77	2.0	9903032
Texture	N/A	SILT LOAM	HEAVY CLAY	SILT LOAM	SILT LOAM	N/A	9903033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas ID		APEC53	APEC54		
Sampling Date		2025/03/17	2025/03/17		
COC Number		C#1034652-03-01	C#1034652-03-01		
	UNITS	31976250317051 MW25-02D	31976250317052 MW25-02D	RDL	QC Batch
Physical Testing					
Clay	%	57	29	2.0	9903032
Sand	%	8.3	38	2.0	9903032
Silt	%	35	32	2.0	9903032
Texture	N/A	CLAY	CLAY LOAM	N/A	9903033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

TEST SUMMARY

Bureau Veritas ID: APEC49 **Collected:** 2025/03/10
Sample ID: 31976250310024 MW25-01D **Shipped:**
Matrix: Soil **Received:** 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

Bureau Veritas ID: APEC50 **Collected:** 2025/03/17
Sample ID: 31976250317042 MW25-02D **Shipped:**
Matrix: Soil **Received:** 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9911064	N/A	2025/04/07	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9911065	N/A	2025/04/07	Laura Coupland
Soil Water Content	BAL	9911066	N/A	2025/04/07	Laura Coupland
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

Bureau Veritas ID: APEC51 **Collected:** 2025/03/17
Sample ID: 31976250317046 MW25-02D **Shipped:**
Matrix: Soil **Received:** 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

Bureau Veritas ID: APEC52 **Collected:** 2025/03/17
Sample ID: 31976250317047 MW25-02D **Shipped:**
Matrix: Soil **Received:** 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9911064	N/A	2025/04/07	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9911065	N/A	2025/04/07	Laura Coupland
Soil Water Content	BAL	9911066	N/A	2025/04/07	Laura Coupland
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

Bureau Veritas ID: APEC53 **Collected:** 2025/03/17
Sample ID: 31976250317051 MW25-02D **Shipped:**
Matrix: Soil **Received:** 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9911064	N/A	2025/04/08	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9911065	N/A	2025/04/08	Laura Coupland
Soil Water Content	BAL	9911066	N/A	2025/04/08	Laura Coupland
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

TEST SUMMARY

Bureau Veritas ID: APEC54
Sample ID: 31976250317052 MW25-02D
Matrix: Soil

Collected: 2025/03/17
Shipped:
Received: 2025/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Bulk Density Kg/m3	BAL	9911064	N/A	2025/04/08	Laura Coupland
Saturated Hydraulic Conductivity (Ksat)		9911065	N/A	2025/04/08	Laura Coupland
Soil Water Content	BAL	9911066	N/A	2025/04/08	Laura Coupland
Texture by Hydrometer		9903032	N/A	2025/04/02	Randeep Deol
Texture Class	CALC	9903033	N/A	2025/04/02	Automated Statchk

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	15.3°C

If standard proctor compaction is reported, the results are based on the estimated optimum water content sample as per the reference method.

Sample APEC49 [31976250310024 MW25-01D] : Sample was analyzed past method specified hold time for Particle Size by Sieve (Dry). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample APEC51 [31976250317046 MW25-02D] : Sample was analyzed past method specified hold time for Particle Size by Sieve (Dry). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample APEC52 [31976250317047 MW25-02D] : Sample was analyzed past method specified hold time for Particle Size by Sieve (Dry). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

QUALITY ASSURANCE REPORT

			QC Standard	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**
9903032	Clay	2025/04/02	105	75 - 125
9903032	Sand	2025/04/02	98	75 - 125
9903032	Silt	2025/04/02	97	75 - 125

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C531325
Report Date: 2025/05/02

Montrose Environmental Solutions Canada Inc.
Client Project #: 31976-204073
Site Location: FORESTRY FARM RD, NORFORK
Your P.O. #: 31976-204073
Sampler Initials: RD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

C531325
2025/03/21 15:05

Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#31375 Montrose Environmental Solutions Canada Inc	Company Name:	#22594 Montrose Environmental Solutions Canada Inc	Quotation #:	C31779	Bureau Veritas Job #:	Bottle Order #: 1034652
Attention:	Accounts Payable	Attention:	~~Stewart Hamilton~~ Louis-Charles Boutin	P.O. #:	31976-204073		
Address:	Suite 200, 214 - 11 Avenue SW Calgary AB T2R 0K1	Address:	7B-650 Woodlawn Rd. W. Guelph ON N1K 1B8	Project:	31976-204073	COC #: C#1034652-03-01	Project Manager: Kudrat Bajwa
Tel:	(905) 877-9531 Fax: (905) 877-4143	Tel:	~~(519) 772-3777~~ (403) 588-0477 Fax:	Project Name:			
Email:	ap@matrix-solutions.com	Email:	lboutin@montrose-envi.ca / EDS@montrose-envi.ca	Site #:	Forestry Farm Rd, Morrisburg		
				Sampled By:	D. Drysdale		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Total Oil and Grease	Texture by hydrometer	Saturated hydraulic conductivity	Particle size Distribution	# of Bottles	Comments
1	3197625031002 4	MW25-01D	25/03/10		Soil			✓		✓	1	
2	3197625031704 2	MW25-02D	25/03/17		Soil			✓	✓		2	
3	3197625031704 6	MW25-02D	25/03/17		Soil			✓		✓	1	
4	3197625031704 7	MW25-02D	25/03/17		Soil			✓	✓	✓	4	
5	3197625031705 1	MW25-02D	25/03/17		Soil			✓	✓		4	
6	3197625031705 2	MW25-02D	25/03/17		Soil			✓	✓		4	
7												
8												
9												
10												

NONT-2025-03-4739

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only
Eila O'Neil	25/03/21	15:00		25/03/24	1105		Time Sensitive; Temperature (°C) on Recei 13/15/11; Custody Seal Present / Intact: Yes ☐ No ☐

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Ice

Bureau Veritas Canada (2019) Inc.