



Revised AOI 31 Volatilization to Indoor Air Pathway Interim Measure Work Plan

**Revitalizing Auto Communities
Environmental Response (RACER) Trust
Eckles Road
Livonia, Michigan**

RACER

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1. Introduction

GHD, on behalf of Revitalizing Auto Communities Environmental Response Trust (RACER) has prepared this Area of Interest (AOI) 31 Volatilization to Indoor Air Pathway Interim Measure Work Plan (work plan) for the former fire training area (AOI 31) at the Eckles Road Site (Site) in Livonia, Michigan. Specifically, Newburgh Village, a senior housing facility located southeast of the Site (Newburgh Village). location and Area of Interest 31 Locations are presented on Figures 1 and Figure 2, respectively. This work plan addresses the AOI 31 impacted groundwater upgradient of Newburgh Village and potential completion of the volatilization to indoor air pathway. The Site location and its proximity to Newburgh Village is presented on Figure 1.

Volatilization to indoor air pathway (VIAP) investigations conducted by Hamp Matthew and Associates (HMA) and GHD on behalf of RACER since 2012. Recent Phase 2 and Phase 3 Groundwater investigation activities have defined the revised downgradient extents of trichloroethene (TCE) in groundwater above United States Environmental Protection Agency (USEPA) Vapor Intrusion Screening Levels (VISLs). Between February 2024 and June 2024, delineation efforts included the installation of soil boring/temporary monitoring wells, additional permanent monitoring wells and soil vapor implants within AOI 31 and further southeast (downgradient from the source area) within the Newburgh Village property. The details of the leading-edge investigation are summarized in *a February 2024 Geoprobe Groundwater and Soil Vapor Sample Results memorandum (Phase 2 Summary, HMA, June 2024)* and *a Phase 3 Vapor Intrusion Groundwater and Soil Vapor Sample Results summary memorandum (Phase 3 Data Package, HMA, September 2024)*. The Phase 2 and Phase 3 Vapor Intrusion Pathway investigation activities were implemented from March through August 2024 along the southern property line of residential homes on Grantland Street and within the northern drive of the Newburgh Village property. Analytical results indicated groundwater impacts exceeding USEPA VISLs within the shallow and deep portions of the aquifer. Groundwater and soil vapor data collected during the Phase 2 and Phase 3 investigations indicate the southeastern extents of the TCE impacted groundwater extend to the northern edge of North Capitol Drive. Subsequent seasonal groundwater monitoring activities conducted in August 2024 confirmed delineation of the leading edge of the plume. Groundwater monitoring locations in relation to AOI 31 are shown on Figure 2. Groundwater analytical results from 2015 through 2024 are presented in Table 1 and discussed in detail in Section 4.

Newburgh Lake and the Middle Branch of the Rouge River and associated streams are located approximately 0.5 miles southeast and downgradient from AOI 31. Current data suggests no complete receptor pathways for VIAP, drinking water or groundwater to surface water interface (GSI) exposures associated with the TCE in this area, as described in HMA's Phase 3 Data Package. However, there is a potential for the vapor intrusion to indoor air pathway due to concentrations of TCE in groundwater above USEPA VISLs in proximity to the Newburgh Village facility.

GHD and RACER presented a review of several interim measure alternatives to the USEPA on September 19, 2024. Due to site conditions (i.e. proximity to utilities and improved surfaces), property access constraints, and the low concentrations of TCE in both shallow and deep intervals of the aquifer, injection of colloidal carbon (PlumeStop™ or ColloidalChem™) and zero valent iron (microzvi™ or iZVI™) as a permeable reactive barrier (PRB) was selected for further evaluation as the most feasible remedy.

1.1 Objective of the Work Plan

The objective of this work plan is to present an interim measure alternative and associated implementation, including a performance monitoring plan to address the migration of TCE impacted groundwater at concentrations greater than USEPA VISLs. The vapor intrusion pathway is not yet complete but has a potential to become complete if no interim measure is implemented with a risk of exposure to the Newburgh Village facility southeast and downgradient of AOI 31. To mitigate the potential vapor intrusion to indoor air pathway this interim measure work plan proposes the use of Cascade for injection of their ColloidalChem™ and iZVI™ products as a PRB downgradient of the AOI 31 TCE plume.

1.2 Report Organization

The remainder of this report is presented in the following sections:

- **Section 2 – Background Information**– provides details on the physical layout of the Site, site characterization reports and applicable cleanup screening levels.
- **Section 3 – AOI 31 PRB Area Investigation** - provides details on the investigation and sampling activities, including investigation methods, hydraulic gradient calculations and laboratory analytical groundwater results of sampling completed between 2020 through 2024. These details provide the means to update the Conceptual Site Model and facilitate proper remedial design.
- **Section 4 – Conceptual Site Model (CSM)** – Utilizes the results of HMA’s monitoring well installation and GHD’s groundwater sampling to update the CSM and includes geology, hydrogeology, groundwater velocity, extent of impacts, pathway evaluation and potential receptors.
- **Section 5 - Groundwater Remediation Plan** - provides details on the plan for installation of a PRB (ColloidalChem™ and iZVI™) to reduce the migration of TCE impacted groundwater.
- **Section 6 - Performance Monitoring Plan** - provides details on the monitoring and reporting activities that will be performed to evaluate and document the performance of remediation and groundwater monitoring.
- **Section 7 - Contingency Plan** - provides details on the activities that will be completed if the selected remedial measures do not meet project objectives.
- **Section 8 - Schedule** - provides the general sequence of events that are anticipated for implementation of the proposed work plan
- **Section 9 - References** - provides a listing of reports used to facilitate development of this work plan.

2. Background

2.1 Exposure Pathway/Clean-up Criteria Evaluation

Analytical results of groundwater samples were compared to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Clean-up Criteria (Residential Drinking Water Criteria, Residential Groundwater Volatilization to Indoor Air Inhalation Criteria), VIAP Screening Levels for groundwater not in contact, and USEPA Vapor Intrusion Screening Levels (VISLs). There are no potable uses of groundwater in the vicinity of the Site, however, groundwater results are compared to EGLE residential Drinking Water Criteria to evaluate the extents of TCE-impacted groundwater in addition to the EGLE Volatilization to and USEPA VISLs to evaluate the vapor intrusion pathway.

There are no drinking water wells in the area; however, there is one bedrock well near Newburgh Road and Plymouth Road downgradient and less than a half mile southeast of AOI 31. The bedrock well is owned by Consumers Energy and was installed to a depth of approximately 250 feet for cathodic protection. Based on the review of the bedrock well log, there is a gray clay layer present from approximately 22 feet below ground surface (bgs) to 89 feet bgs, which is consistent with previous investigations conducted on and adjacent to the Eckles Road Site. Newburgh Lake and associated streams are located 0.5 miles southeast and downgradient from AOI 31. Current data suggests no complete receptor pathways for volatilization to indoor air pathway, drinking water and groundwater to surface water interface (GSI) associated with the TCE in groundwater within AOI 31, as described in HMA’s Phase 3 Data Package. However, there is a potential to complete the vapor intrusion to indoor air pathway due to the proximity of concentrations of TCE in groundwater above USEPA VISLs to Newburgh Village.

Based on the data collected during the vapor intrusion pathway investigation activities, the USEPA VISL is an applicable criterion for the TCE impacts in groundwater from AOI 31. Vapor intrusion to indoor air pathway is currently an incomplete, but potential pathway due to current upgradient concentrations of TCE, and an average groundwater flow velocity of 80 to 200 feet per year (see Section 3.2.3) and the proximity of residential structures downgradient

from the leading edge of the AOI 31 TCE plume. Other potential pathways were evaluated and found not applicable under the site's current conditions. According to the most recent storm sewer sample results, detections of 1,1,1-TCA were found in one of the catch basin samples, but at concentrations below USEPA VISLs and EGLE (Part 201) groundwater to surface water (GSI) criteria. Storm sewers will continue to be evaluated.

3. AOI 31 PRB Area Investigation Summary

In 2024, Phase 2 and Phase 3 Vapor Intrusion Pathway investigations were conducted to confirm delineation of the impacts of TCE in groundwater. These activities included collecting additional soil, groundwater, and soil gas data and installing additional soil vapor implants and groundwater monitoring well pairs (shallow and deep) to define the leading edge of the TCE impacted groundwater. During installation of Phase 3 soil borings and temporary monitoring wells, soil and groundwater samples were collected from select locations for the analysis of remedial alternative evaluation parameters. The soil and groundwater samples collected during the Phase 3 scope of work activities for treatability purposes were intended to confirm that existing soil and groundwater conditions would not inhibit the effectiveness of the proposed colloidal carbon and zero valent iron injections. No significant amounts of sorbed chlorinated VOCs were found and the soil contained a relatively low concentration of organic matter. Under these conditions the injections should perform as expected. The groundwater data showed that conditions are already somewhat reducing at the site (presence of dissolved iron and manganese and relatively low concentrations of nitrate and sulfate) so the ZVI would not be consumed by existing oxidizing conditions. Alkalinity was in the normal range and therefore excessive scaling of the PRB would not be expected. Total organic carbon in the groundwater was between 1 and 3.5 mg/L. At this level no adverse impacts from potential hydrocarbon material are expected to interfere with the ZVI and carbon reducing the effectiveness of the PRB. A summary of the remedial alternatives sample results is provided in Appendix A. Remedial alternative investigation Laboratory Analytical Reports are provided in Appendix B. The Phase 2 and Phase 3 investigation monitoring wells were added to the seasonal groundwater sampling events and results from the March 2024 and August 2024 seasonal sampling events indicate southern and eastern delineation of the TCE concentrations in groundwater.

3.1 Phase 2 and Phase 3 VIAP Investigations (HMA)

VIAP Investigations conducted by HMA occurred between February and July 2024. HMA installed several groundwater and soil vapor monitoring locations along the northern Newburgh Village property line and within the Grantland residential properties. HMA also conducted geoprobe groundwater and soil gas grab sampling to delineate the TCE groundwater impacts. An additional seasonal VIAP investigation sampling event was performed in August 2024. Additional information regarding the investigation activities and monitoring well/ installation details can be found in HMA's Phase 3 Data Package.

3.2 Groundwater Monitoring (GHD)

AOI 31 Groundwater has been monitoring as part of the Resource Conservation & Recovery Act (RCRA) Corrective Action Activities since 2002. Previous data has been provided under separate cover in various previous submittals. This section describes the results from the most recent, August 2024, groundwater monitoring event, which were included in the HMA Phase 3 Data Package.

3.2.1 Groundwater Elevation Monitoring

GHD gauged each monitoring well location prior to groundwater sample collection. A summary of water level measurements is presented in Table 2. Data collected during the gauging event suggests groundwater generally flows from northwest to southeast within the area of residential properties. Groundwater flow directions are consistent with

previous monitoring events. A contour map depicting the groundwater flow direction is presented on Figure 4. Groundwater Elevation summary is presented in Table 2.

3.2.2 Groundwater Analytical Results

Analytical results of groundwater samples collected in August 2024 within the existing AOI 31 shallow well network is generally consistent with previous analytical data. TCE and 1,1,1-TCA were detected at concentrations greater than EGLE drinking water criteria, EGLE VIAP criteria for groundwater not in contact, and/or USEPA VISLs. All laboratory results were assessed by a GHD Chemist. Based on a review and assessment of the laboratory results and quality assurance/quality control information, the data are acceptable for use and comparison to criteria. Laboratory analytical reports and Data Validation summaries are included in the Phase 3 Data Package. Historical analytical data is presented in Table 1 and 2020 - 2024 Groundwater Analytical Results Figure 2. Groundwater analytical results from the August 2024 groundwater monitoring event indicated exceedances of USEPA VISLs at the following offsite locations:

- OW-1, OW-3, MW-202S-R, MW-213S, MW-215S, MW-216S(R), MW-301S(R), MW-400S, MW-401S, MW-402S, MW-404S, MW-406S, MW-407S, and MW-509S exceeded USEPA VISLs for TCE.

The groundwater analytical results are summarized in Table 1 and the VOC exceedances are presented on Figures 2.

3.2.3 Hydraulic Gradients

The vertical gradients were calculated from groundwater elevation data collected during the December 2022 groundwater monitoring event, which is the most recent sampling event with simultaneous shallow and deep water level measurements. The horizontal hydraulic gradients were calculated from groundwater elevation data collected during the August 2024 groundwater monitoring event. The change of head (water level) divided by the distance determines the hydraulic gradient and direction of groundwater flow. A groundwater elevation summary is provided in Table 2.

Vertical Hydraulic Gradient

Using groundwater levels measured on December 2022, the vertical hydraulic gradient was calculated based on a limited data set consisting of one well pair in the AOI 31 upgradient from the proposed PRB. The vertical gradient for the well pair representing the AOI 31 PRB Area was calculated as 0.02 in the downward direction for this limited data set. Table 3 provides a summary of vertical hydraulic gradient calculations.

Horizontal Hydraulic Gradient

Using groundwater levels measured on August 2024, horizontal hydraulic gradients were calculated across the proposed AOI 31 PRB Area. As shown on Figure 3, the shallow groundwater contour map indicates a groundwater flow direction to generally be from the northwestern to southeastern portion of the site in the proposed AOI 31 PRB area. The average horizontal hydraulic gradient for the AOI 31 PRB area is 0.011. Calculations and well pair data used to generate the results are shown in Table 4.

4. AOI 31 Conceptual Site Model (CSM)

The AOI 31 Area CSM was developed by HMA integrating information from historic and current investigations conducted by both HMA and GHD to identify potential exposure risks. HMA CSM summarizes the Site geology, hydrogeology, impacted media, constituent(s) of concern, extent of impacts, and exposure pathways. The following tables and figures provide results from AOI 31 PRB Area VIAP investigations to update the CSM:

- Figures 2 and 3 present the locations of groundwater monitoring wells and analytical results, respectively

- Figure 4 presents the most recent groundwater elevation contour for the shallow zone of the aquifer at the leading edge of the groundwater plume
- Appendix C Figures present a cross-section location map and cross-sections (G-G', H-H', I-I', and J-J')
Cross-sections depict the vertical distribution of TCE concentrations relative to the subsurface geologic conditions in the vicinity of the selected groundwater remedy discussed in Section 5.0.

4.1 Geology

Based on HMA soil boring log descriptions and review of their cross sections, the general overburden consists of two distinct geologic units, an upper sand/silt unit and a lower silt/clay unit. The cross-section locations and cross sections (G-G', H-H', I-I', J-J') are presented as Appendix C.

Upper Sand/Silt Unit

The geologic profile of the upper sand/silt unit was developed by HMA through identification of soil types from the soil boring and interpretation of the overburden's stratigraphy is presented as cross sections Appendix C, Figure. (G-G' through J-J'). The upper sand unit is approximately 15 to 25 ft thick and generally characterized as a uniform, poorly graded permeable sand (SP) transitioning to a well graded less permeable sand (SW) and then to a silty sand (SM) alternating at various depths in each boring.

Lower Clay/Silt Unit

The lower silt unit (i.e., aquitard) consists of unsaturated regionally extensive silt/clay, which is present approximately 15 to 25 feet below ground surface.

4.2 Hydrogeology

The Site hydrogeologic setting interpreted from HMA's cross sections and groundwater elevation data collected August 2024 presented on Table 2. The geology of the upper sand/silt unit is characterized by a general uniform trend of increasing fines with depth with an increase in silt content at approximately 15 to 25 feet bgs. Based on this, the saturated portion of the upper sand/silt unit is broken into two intervals: shallow interval (5 to 15 feet) and the deep interval (15 to 25 feet bgs). The AOI 31 groundwater elevations are generally consistent with historical data. A groundwater elevation summary is provided as Table 2 and a groundwater elevation contour presented on Figure 3.

4.3 Linear Groundwater Velocity

Groundwater flow rates were calculated using an assumed effective porosity of 25 percent, which is typical in unconsolidated sand deposits. Hydraulic conductivity values and hydraulic gradients were calculated for the AOI 31 PRB Area and a wider area through the residential neighborhood. The linear velocity calculation utilized the area-specific hydraulic conductivity values and hydraulic gradient calculations. The AOI 31 PRB Area had a wide range of calculated hydraulic gradients (ranging between 0.005 and 0.016) and calculated flow velocities (ranging between 80 feet/year and 280 feet/year). A groundwater flow velocity was also calculated over a longer patch from upgradient of Grantland Avenue to the AOI 31 PRB Area of 130 feet per year. An average hydraulic conductivity (Kk) value of 0.00420 cm/sec was calculated from slug tests performed on-site injection wells in July 2004 as part of the RCRA Facility Investigation and AOI 31 Interim Measures for Groundwater activities. Calculations and well pair data used to generate the results are shown in Table 4.

4.4 Constituent(s) of Concern

The primary constituent of concern for the Site in groundwater is TCE. TCE in groundwater is the only constituent detected above USEPA VISLs. Analytical results of groundwater samples are presented on Figure 2.

4.5 Vertical Extent of Impacts

HMA's Phase 2 and Phase 3 VIAP investigation summaries indicate that TCE concentrations in groundwater were detected above the USEPA VISL from 5.0 to 7.5 feet bgs (ft bgs) in groundwater samples collected from soil boring SB--513 during the geoprobe grab sampling event. TCE was also detected above the USEPA VISL in groundwater samples collected from approximately 16.0 to 18.5 ft bgs at soil boring SB-511. Additional monitoring wells were installed in response to concentrations of TCE found during the Phase 2 investigation. Monitoring well pairs (MW-515S/D through MW-519S/D) and MW-520 were installed and sampled in June/July 2024 and additional seasonal groundwater samples were collected from the shallow monitoring wells during August 2024. The analytical results of groundwater samples from the southeastern most monitoring wells (leading edge of the plume) were non detect for TCE. Upon review of the cross-sections, the vertical extent of impacts vary throughout the silty sand aquifer, detections of TCE found in the shallow and deep portions, depths of impacts ranging from 5.0 ft bgs to depths of 18.5 ft bgs.

4.6 Horizontal Extent of Impacts

Horizontal impacts of TCE in groundwater in the AOI 31 PRB Area are delineated at MW-515S, MW-516S, MW-517S, MW-518S, MW-519S, and MW-520, to the southeast, MW-504S and MW-505S to the east, and MW-214S to the west. The TCE extents upgradient through the neighborhood to the south side of Amrhein Road with seasonal fluctuating concentrations of VOCs, northwest of the AOI 31 PRB area.

4.7 Exposure Pathway Evaluation

GHD's groundwater analytical results were compared to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Clean-up Criteria (Residential Drinking Water Criteria, Residential Groundwater Volatilization to Indoor Air Inhalation Criteria), EGLE (VIAP) Screening Levels for groundwater not in contact, and USEPA VISLs. There are no potable uses of groundwater in the vicinity of the Site, however, groundwater results are compared to EGLE residential Drinking Water Criteria to evaluate the extents of TCE-impacted groundwater in addition to the EGLE VIAP Screening Levels and USEPA VISLs to evaluate the vapor intrusion pathway.

Based on the data collected during HMA's site characterization activities and GHD groundwater monitoring events, USEPA VISL is an applicable criterion for the TCE impacts in groundwater at AOI 31. Vapor intrusion to indoor air is currently an incomplete, but potential pathway due to current upgradient concentrations of TCE and the proximity of residential structures downgradient from the leading edge of the AOI 31 TCE plume. Other potential pathways were evaluated and found not applicable under the site's current conditions. According to HMA's most recent storm sewer samples, a detection of 1,1,1-TCA were found in one of the catch basin samples below current USEPA VISLs and below EGLE GSI criteria. HMA will continue to evaluate the storm sewers and potential shallow groundwater migration into catch basins.

5. Groundwater Remediation Plan

GHD's Innovative Technology Group (ITG) was engaged to identify an effective remedial technology for treating low-level TCE impacted groundwater and preventing migration of groundwater with TCE concentrations exceeding the USEPA VISLs (10 µg/L). The ITG reviewed AOI 31 performance monitoring data, HMA VIAP data packages including subsurface investigation information from 2024. Based on this review, the ITG proposed injection of ColloidalChem™ and iZVI™ by Cascade. The ITG engaged Cascade to develop an injection plan for the AOI 31 PRB Area which is detailed in Section 5.1 and depicted on Figures 5 and 6. Based on preliminary design information provided by Cascade, the injected PRB is estimated to have a longevity of greater than 10 years. Longevity was estimated based on gradient flux over the design life of the PRB and the known persistence of these chemistries in groundwater. To date, colloidal iZVI has not been in place long enough for PRBs to truly estimate persistence, but it has been

estimated to be shorter than microscale ZVI (~45 to 150 microns) due to increased reactivity. Based on chlorinated volatile organic compound concentrations at the Site and groundwater flow rates, Cascade has estimated the longevity to be greater than 10 years for the combined colloidal carbon and iZVI barrier.

5.1 Pre-Injection Investigations

Prior to implementation of the proposed PRB injection activities, several investigation and evaluation activities to confirm subsurface conditions, condition of the existing storm sewer downgradient of PRB injection area, and the expected effectiveness of the proposed PRB injection activities. The investigation and injection optimization activities are described in the following subsections.

5.1.1 Storm Sewer Inspection/Televising

The existing storm sewer downgradient of the proposed PRB injection area was televised to evaluate the condition and integrity of the subsurface structures and identify if potential pathways are present for the migration of injected material to enter the storm sewer. The televising activities were completed on December 20, 2024 and December 23, 2024. No significant breaches or migration pathways into the storm sewer were identified during the televising activities. A summary of the field observations and review of the televising recording will be provided under separate cover.

5.1.2 Field Hydraulic Conductivity Evaluation

Based on a request from EGLE, a field hydraulic conductivity evaluation was performed on December 18, 2024. Single well response (slug) tests on two well pairs installed immediately downgradient of the North Capitol Court storm sewer as part of the Phase 3 Vapor Intrusion Pathway investigation activities during June 2024. The slug tests were performed using a stainless steel slug (0.125-inch diameter, 2 foot length) to displace the water column in two sets of well pairs (MW-517S/MW-517D and MW-518S/MW-518D) located approximately 50 feet downgradient of the proposed PRB injection area. Three to six sets of falling head and rising head tests were conducted to ensure adequate quantities of data for evaluation. The results of the slug tests are being evaluated and will be summarized under separate cover and submitted to USEPA and EGLE prior to implementation of the PRB injection activities.

5.1.3 Remediation Contractor Optimization Activities

Prior to full-scale PRB injection activities, the remediation contractor will mobilize to the Site to perform pre-implementation field tests to evaluate in-situ conditions in the area of proposed PRB injection area. The pre-implementation field tests will be conducted with a track-mounted direct push drilling rig and include a Waterloo Advanced Profiling System™ and pilot/bench scale testing. The results of the pre-implementation field tests will be used to confirm feasibility of the selected remedy, incorporated into the final design of the injection program, and allow for development of a 3d targeted injection plan. The results of the optimization studies will be summarized in the comprehensive interim measure implementation summary report described in section 6.2.

5.2 ColloidalChem™ and iZVI™ Injection Plan

To address the current low level TCE impacts in AOI 31 groundwater, two rows of ColloidalChem™ and iZVI™ injections will be advanced via direct push technology. Each boring will be advanced utilizing Cascade's Pathfinder technology to the confining clay layer at an approximate depth of 20 to 25 feet bgs. Concentrations of TCE in groundwater were present just down-gradient from the proposed PRB location during the Phase 3 temporary well installation activities in June 2024, but have not been detected at concentrations above USEPA VISL in groundwater downgradient of the proposed PRB as of August 2024. A conceptual design of injection soil boring locations are shown on Figure 6. The injection soil borings are proposed to be installed immediately north of the North Capitol Drive

at the leading edge of the plume spaced up to 10 feet apart in two rows based on an assumed radius of influence of 5 feet. The proposed spacing is based on observed radius of influence during injections conducted at sites with similar geology and groundwater conditions and will be refined based on the pre-implementation field optimization evaluations. The rows are proposed to be installed with an offset to stagger the borings and create a more effective barrier and will be located as far north of the existing storm sewer as possible. The specific spacing will be determined in the field and adjusted based on field pressure and flow readings observed during the injection activities. The proposed design consists of approximately 45 injection locations in each of the two rows, with approximately 1,750 gallons injected at each location. The suspension, consisting of ColloidalChem™ (~4,800 mg/L) and iZVI™ (~1,820 mg/L), will be injected throughout the saturated zone from the water table down to the clay aquitard layer. An enzyme ("parking agent") will also be included at the shallow intervals of the southern injection locations to limit the potential for downgradient migration of the injected material. ColloidalChem™ and iZVI™ safety data sheets are presented in Appendix D and Cascade technical references and case study is presented in Appendix E.

Treatment of chlorinated VOCs with ZVI typically does not result in the formation of vinyl chloride. Whereas biological reductive dechlorination proceeds by a single elimination reductive dechlorination pathway resulting in the formation of vinyl chloride, the abiotic reductive dechlorination pathway proceeds largely via the beta elimination pathway which does not result in the formation of vinyl chloride (Arnold et al. 2000). Furthermore, the accumulation of vinyl chloride as observed in biological reductive dechlorination often occurs because organisms with the enzyme required to convert vinyl chloride to ethene are either not present or are present in low numbers, but dechlorination via ZVI is a simple chemical reaction and does not require the presence of certain organisms therefore, even if reductive dechlorination occurs by single elimination, the dechlorination of vinyl chloride proceeds at the same rate as the production of vinyl chloride and the accumulation of vinyl chloride will not occur.

If reducing conditions created by the ZVI cause biological production of vinyl chloride by native microbes present at the site, the effect is likely to be mitigated by sorption of vinyl chloride to the colloidal carbon. Proposed monitoring described in Section 6 includes vinyl chloride as part of the VOC analysis and any increase in vinyl chloride will be noted, however, vinyl chloride is not expected with the colloidal carbon and ZVI injections. In the unlikely event that vinyl chloride is created and is present in groundwater downgradient of the PRB area, additional mitigation measures will be evaluated in consultation with USEPA and EGLE.

QA/QC monitoring of the injection effectiveness will be performed. Some performance monitoring wells will be installed within the radius of influence of the PRB injections as shown in Figure 6. The soil cores from the installation of these monitoring wells will be logged and observed visually for the presence of injected carbon and ZVI. Carbon and iron content analysis will be performed on sections of these cores. GHD will conduct qualitative screening of performance monitoring wells and observe water from the interior of storm sewer catch basins for the presence of mobile colloidal carbon by purging with a peristaltic pump and HDPE tubing lowered into the monitoring wells/catch basins while injections are being performed, and weekly for a period of 4 weeks following completion of the injections. The storm sewer will be evaluated at three catch basins along North Capitol Court, CB#6 located west of SB-510, CB-#5 located between SB-512 and SB-513, and the downstream catch basin, CB#4, located near MW-515S. Approximate catch basin locations are shown on the cross-section in Appendix C. Pending the results of storm sewer televising activities, the curb drains located on the north and south sides of North Capitol Court may also be evaluated during the injections, if accessible. Storm sewer components located more than 6 inches above the groundwater surface will not be monitored during the injection event. Weekly screening of monitoring wells would continue beyond 4 weeks following injections until colloidal carbon is no longer observed, or until the weekly screening is determined to be unnecessary in consultation with USEPA and EGLE. A sample will also be collected prior to implementation of the injections (baseline) and weekly during the injections from the downstream storm sewer catch basin (CB#4) for the analysis of TOC. If injected material is identified at locations further than expected, and pose a risk to entering the storm sewer, injection techniques will be adjusted in the field. If injected material is identified within the storm sewer or locations further downgradient, injections will cease and USEPA and EGLE will be notified.

6. Performance Monitoring Plan

6.1 Groundwater Monitoring

To monitor the effectiveness of the ColloidalChem™ and iZVI™ injections, groundwater performance monitoring will be conducted at fifteen monitoring wells. The performance monitoring will be completed at existing monitoring wells and proposed performance monitoring well locations located upgradient and downgradient of the PRB. The fifteen monitoring wells proposed for performance monitoring are shown on Figure 6 and include existing monitoring wells MW-405S, MW-504S (upgradient), MW-515S, MW-517S, MW-518S, MW-519S, and MW-520 (downgradient), two new upgradient monitoring wells, one new downgradient monitoring well, and five monitoring wells located within the southern row of PRB injection locations. The eight proposed performance monitoring wells will be installed after the PRB injections are completed.

Quarterly groundwater monitoring of the performance wells will begin approximately five weeks following completion of the injections, anticipated to be initiated during the second quarter of 2025. Performance monitoring at each well will be contingent on the absence of colloidal carbon being observed in the performance monitoring well locations located within the injection radius of influence in the PRB. Groundwater samples would not be collected for analysis from any monitoring wells with colloidal carbon observed during the quarterly performance monitoring event but would be collected from the proposed performance monitoring wells with no observed colloidal carbon. Groundwater samples will be collected utilizing low-flow sampling techniques and analyzed for VOCs by USEPA Method 8260. Each monitoring well will be purged at approximately 100-200 milliliters/minute in accordance with low-flow protocols. Field parameters including pH, conductivity, temperature, turbidity, dissolved oxygen, and oxidation reduction potential (ORP) will be recorded prior to sample collection. These field parameters will be monitored during purging to ensure stabilization of the groundwater within each monitoring well prior to sampling. Upon obtaining stabilization, the groundwater samples will be collected from each monitoring well. Groundwater sample collection procedures are detailed in section 5 of the Quality Assurance Project Plan (QAPP) (GHD, June 2019). Laboratory analysis procedures are detailed in section 8 of the QAPP. The QAPP is currently being updated/revised and procedures included in the updated QAPP will be adopted once approved by USEPA.

The existing well network will also be used for hydraulic evaluations to verify that the ColloidalChem™ and iZVI™ injection area is intercepting the TCE plume. Measuring the groundwater potentiometric surface will provide information to evaluate changes in horizontal and vertical hydraulic gradients and direction of groundwater flow. This will provide data to document that the ColloidalChem™ and iZVI™ area is positioned properly to intercept the plume (i.e., perpendicular to groundwater flow). If there are substantial changes to groundwater flow, the TCE plume could migrate laterally around the injection area.

After one year of performance monitoring (groundwater flow direction, hydraulic gradients and sample analysis), the efficiency of the PRB and the need for supplementation interim measures or contingency actions will be evaluated. Long-term monitoring activities will be proposed, in consultation with USEPA and EGLE following the first year of performance monitoring.

6.2 Soil Gas Monitoring

Seasonal soil gas monitoring will continue at soil gas probes SV24-NV-28, SV24-NV-29, SV24-NV-30, SV24-NV-31, SV24-NV-32, SV24-NV-33, SV24-NV-34, SV24-NV-35, SV24-NV-36, SV24-NV-37, SV24-NV-38, SV24-NV-39, SV24-NV-41 through 2025 to monitor soil gas concentrations following implementation of the PRB injections. Details on soil gas sample collection and analysis are provided in the Phase 3 Vapor Intrusion Pathway Monitoring Work Plan (HMA, May 2024) and the QAPP for the Assessment of the Volatilization to Indoor Air Pathway (HMA, July 2024).

6.3 Reporting

Quarterly updates will be prepared following each round of performance monitoring. Quarterly performance monitoring updates will be submitted electronically and will include, at a minimum:

- A summary of any field activities conducted;
- Tabulated groundwater analytical results including the current and historical results
- Tabulated depth to water, groundwater elevations, and vertical gradients
- A figure with the results of the TCE concentrations in groundwater
- A groundwater elevation contour map(s)
- A discussion of the results
- A schedule for planned future activities

A comprehensive summary report will be prepared following four quarterly events summarizing the quarterly performance monitoring activities and results, including recommendations for ongoing long-term monitoring activities.

7. Contingency Plan

The primary quantitative performance measure for the ColloidalChem™ and iZVI™ injection is a reduction in contaminant concentrations downgradient of the injection area and continued non-detections found in the off-site monitoring wells at the leading edge of the plume. The goal is to prevent the migration of groundwater with TCE concentrations greater than 10.0 µg/L. A contingency plan will be developed if performance monitoring indicates groundwater with TCE concentrations greater than 10 ug/L is migrating past the PRB. If there is an indication that the injection area is not removing TCE below USEPA VISL, further upgradient investigation of the TCE plume will be conducted; additional tasks to address TCE could include:

- Source area injections upgradient of the PRBs and ColloidalChem™ and iZVI™ injection area
- Targeted injections upgradient of the PRB to reduce concentrations reaching the PRB and ColloidalChem™ and iZVI™ injection area
- Selection of an alternate remedial option(s) to address TCE groundwater impacts at Newburgh Village

Any contingency action will be discussed and submitted to EGLE and USEPA before altering the groundwater remediation plan.

8. Schedule

The following general sequence of events is anticipated for implementation of the proposed work plan (Contingent on USEPA/EGLE approval):

Task	Schedule
Storm Sewer Televising/Hydraulic Conductivity Field Test	December 2024
Pre-Implementation Optimization Field Tests	February 2025
ColloidalChem™ and iZVI™ PRB Injections	February/March 2025
Installation of Performance Monitoring Wells	March/April 2025
Baseline groundwater qualitative check	Weekly for four weeks

Task	Schedule
Quarterly Sampling Event/Monitoring Updates	2025 Q2 to 2026 Q1 pending results of Qualitative Monitoring
Summary Report	2026 Q2

9. References

- August 2024 Summer Seasonal Groundwater and Soil Vapor Results, RACER Eckles Road Site Off-Site Residential AOI 31, HMA, October 2024
- Phase 3 Vapor Intrusion Groundwater and Soil Vapor Sample Results, RACER Eckles Road Off-Site Residential AOI 31, HMA, September 2024
- Quality Assurance Project Plan for the Assessment of the Volatilization to Indoor Air Pathway, RACER Eckles Road Off-Site Residential AOI 31
- Geoprobe Groundwater and Soil Vapor Sample Results, RACER Eckles Road Off-Site residential AOI 31, HMA, June 2024
- Phase 3 Vapor Intrusion Pathway Monitoring Work Plan, RACER Eckles Road Off-Site Residential AOI 31, HMA, May 2024
- Phase 2 Vapor Intrusion Groundwater and Soil Vapor Sample Results, RACER Eckles Livonia Michigan, HMA March 2024
- Interim Measures Completion Report, AOI 31 – Former Fire Training Area – Groundwater, 13000 Eckles Road Site, CRA, August 2006
- Revised RFI Report, 13000 Eckles Road Site, CRA, March 2005

Tables

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Units		ug/L	ug/L	ug/L	ug/L	ug/L
Residential Drinking Water	a	200	70	100	5	2
Non-Residential Drinking Water	b	200	70	100	5	2
Groundwater Surface Water Interface	c	89	620	1500	200	13
Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
Water Solubility	f	1330000	3500000	6300000	1100000	2760000
Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
Residential	i	14300	477	199	10.4	2.14

EGLE (2)

EPA VISL(3)

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-103RD	GW-12607-012021-DA-021	01/20/2021		1.0 U	1.0 U	1.0 U	0.56 J	1.0 U
MW-103RD	GW-12607-121421-SK-009	12/14/2021		0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
MW-103RD	GW-12573440-120122-SK-008	12/01/2022		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-103RI	GW-12607-012021-DA-020	01/20/2021		1.7	1.0 U	1.0 U	2.4	1.0 U
MW-103RI	GW-12607-121421-SK-008	12/14/2021		0.50 U	0.50 U	0.50 U	0.34 J	0.50 U
MW-103RI	GW-12573440-120122-SK-006	12/01/2022		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-103RI	GW-12573440-120122-SK-007	12/01/2022	Duplicate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-103RS	GW-12607-012021-DA-019	01/20/2021		5.1	1.0 U	1.0 U	10 ^{ab}	1.0 U
MW-103RS	GW-12607-121421-SK-007	12/14/2021		2.3	0.50 U	0.50 U	3.4	0.50 U
MW-103RS	GW-12573440-120122-SK-005	12/01/2022		2.7	1.0 U	1.0 U	4.1	1.0 U
MW-103S	GW-12607-092315-EM-018	09/23/2015		13 J	1.7 U	1.7 U	44 J ^{abhi}	1.7 U
MW-103S	GW-12607-070816-CM-001	07/08/2016		10	1.0 U	1.0 U	33 ^{abhi}	1.0 U
MW-104S	GW-12573440-120222-SK-015	12/02/2022		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-104S	GW-12573440-090523-DA-001	09/05/2023		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-104S	GW-12573440-032624-CM-009	03/26/2024		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-104S	GW-12573440-032624-CM-010	03/26/2024	Duplicate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-104S	GW-12573440-081224-ES-006	08/12/2024		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-201S	GW-12607-092215-EM-012	09/22/2015		5.9	1.0 U	1.0 U	1.0 U	1.0 U
MW-202D-R	GW-12607-020221-DA-004	02/02/2021		1.0 U	1.0 U	1.0 U	0.25 J	1.0 U
MW-202D-R	GW-12607-122121-SK-033	12/21/2021		0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
MW-202D-R	GW-12573440-120222-SK-014	12/02/2022		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-202I-R	GW-12607-020221-DA-003	02/02/2021		13	1.7 U	1.7 U	30 ^{abhi}	1.7 U
MW-202I-R	GW-12607-122121-SK-032	12/21/2021		13	0.26 J	0.50 U	27 ^{abhi}	0.50 U
MW-202I-R	GW-12573440-120222-SK-013	12/02/2022		6.4	1.0 U	1.0 U	16 ^{abhi}	1.0 U
MW-202S	GW-12607-092215-EM-011	09/22/2015		14	1.0 U	1.0 U	36 ^{abhi}	1.0 U
MW-202S	GW-12607-063016-DC-007	06/30/2016		10	1.0 U	1.0 U	24 ^{abhi}	1.0 U
MW-202S	GW-12607-071817-SK-004	07/18/2017		11	1.0 U	1.0 U	29 ^{abhi}	1.0 U
MW-202S-R	GW-12607-020221-DA-005	02/02/2021		10	1.0 U	1.0 U	19 ^{abhi}	1.0 U
MW-202S-R	GW-12607-020221-DA-006	02/02/2021	Duplicate	11	1.0 U	1.0 U	19 ^{abhi}	1.0 U
MW-202S-R	GW-12607-122121-SK-031	12/21/2021		13	0.50 U	0.50 U	31 ^{abhi}	0.50 U
MW-202S-R	GW-12573440-120222-SK-012	12/02/2022		12	1.0 U	1.0 U	34 ^{abhi}	1.0 U
MW-202S-R	GW-12573440-090523-DA-008	09/05/2023		12	1.0 U	1.0 U	35 ^{abhi}	1.0 U
MW-202S-R	GW-12573440-032624-CM-005	03/26/2024		11	1.0 U	1.0 U	30 ^{abhi}	1.0 U
MW-202S-R	GW-12573440-081224-ES-004	08/12/2024		11	1.0 U	1.0 U	30 ^{abhi}	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

EGLE (1)	Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
	Units		ug/L	ug/L	ug/L	ug/L	ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
EGLE (2)	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
EPA VISL(3)	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-203S	GW-12607-092215-EM-010	09/22/2015		1.2	1.0 U	1.0 U	0.90 J	1.0 U
MW-203S	GW-12607-120419-SK-015	12/04/2019		0.98 J	1.0 U	1.0 U	1.6	1.0 U
MW-203S	GW-12607-121720-DA-027	12/17/2020		1.1	1.0 U	1.0 U	1.6	1.0 U
MW-203S	GW-12607-122121-SK-029	12/21/2021		1.1	0.50 U	0.50 U	1.4	0.50 U
MW-203S	GW-12607-122121-SK-030	12/21/2021	Duplicate	1.1	0.50 U	0.50 U	1.3	0.50 U
MW-203S	GW-12573440-032624-CM-007	03/26/2024		0.64 J	1.0 U	1.0 U	0.98 J	1.0 U
MW-204D	GW-061902-MM-088	06/19/2002		1 U	1 U	1 U	1 U	1 U
MW-205S	GW-12607-092515-EM-024	09/25/2015		12	1.0 U	1.0 U	1.2	1.0 U
MW-205S	GW-12607-071817-SK-003	07/18/2017		11	1.0 U	1.0 U	1.9	1.0 U
MW-205S	GW-12607-101718-DA-001	10/17/2018		1.3	1.0 U	1.0 U	1.2	1.0 U
MW-205S	GW-12607-120519-SK-019	12/05/2019		15	1.0 U	1.0 U	2.3	1.0 U
MW-205S	GW-12607-120120-DA-011	12/01/2020		14	1.0 U	1.0 U	3.0	1.0 U
MW-205S	GW-12607-121321-SK-001	12/13/2021		14	0.50 U	0.50 U	2.8	0.50 U
MW-205S	GW-12573440-120122-SK-009	12/01/2022		12	1.0 U	1.0 U	2.1	1.0 U
MW-205S	GW-12573440-090523-DA-009	09/05/2023		16	1.0 U	1.0 U	3.7	1.0 U
MW-205S	GW-12573440-032824-CM-019	03/28/2024		13	0.60 J	1.0 U	3.2	1.0 U
MW-205S	GW-12573440-032824-CM-020	03/28/2024	Duplicate	13	1.0 U	1.0 U	3.1	1.0 U
MW-205S	GW-12573440-081224-CM-001	08/12/2024		13	1.0 U	1.0 U	2.7	1.0 U
MW-206S	GW-12607-092115-EM-003	09/21/2015		12	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12607-101718-DA-003	10/17/2018		11 J	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12607-101718-DA-004	10/17/2018	Duplicate	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12607-120219-SK-001	12/02/2019		9.8	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12607-120120-DA-014	12/01/2020		9.5	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12607-121521-SK-017	12/15/2021		8.6	0.50 U	0.50 U	0.50 U	0.50 U
MW-206S	GW-12573440-113022-SK-004	11/30/2022		5.6	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12573440-090523-DA-007	09/05/2023		6.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12573440-032524-LK-001	03/25/2024		6.4	1.0 U	1.0 U	1.0 U	1.0 U
MW-206S	GW-12573440-081324-ES-008	08/13/2024		5.6	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-092115-EM-004	09/21/2015		12	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-071817-SK-001	07/18/2017		8.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-101718-DA-002	10/17/2018		8.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-120219-SK-002	12/02/2019		6.3	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-112320-DA-001	11/23/2020		5.1	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12607-121521-SK-018	12/15/2021		5.7	0.50 U	0.50 U	0.50 U	0.50 U
MW-211S	GW-12573440-113022-SK-003	11/30/2022		5.0	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12573440-090523-DA-005	09/05/2023		4.9	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12573440-032524-LK-002	03/25/2024		4.9	1.0 U	1.0 U	1.0 U	1.0 U
MW-211S	GW-12573440-081324-CM-009	08/13/2024		3.8	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

<u>EGLE (1)</u>	Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
	Units		ug/L	ug/L	ug/L	ug/L	ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
<u>EGLE (2)</u>	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
<u>EPA VISL(3)</u>	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-213S	GW-12607-092215-EM-006	09/22/2015		30	5.0 U	5.0 U	150 ^{abhi}	5.0 U
MW-213S	GW-12607-063016-DC-001	06/30/2016		16	3.3 U	3.3 U	69 ^{abhi}	3.3 U
MW-213S	GW-12607-072117-SK-021	07/21/2017		21	2.5 U	2.5 U	72 ^{abhi}	2.5 U
MW-213S	GW-12607-072117-SK-022	07/21/2017	Duplicate	21	2.5 U	2.5 U	73 ^{abhi}	2.5 U
MW-213S	GW-12607-101818-DA-013	10/18/2018		15	2.5 U	2.5 U	66 ^{abhi}	2.5 U
MW-213S	GW-12607-101818-DA-014	10/18/2018	Duplicate	14	2.5 U	2.5 U	66 ^{abhi}	2.5 U
MW-213S	GW-12607-101818-DA-015	10/18/2018		21	3.3 U	3.3 U	96 ^{abhi}	3.3 U
MW-213S	GW-12607-120519-SK-021	12/05/2019		7.8	2.5 U	2.5 U	31 ^{abhi}	2.5 U
MW-213S	GW-12607-120519-SK-020	12/05/2019		16	4.0 U	4.0 U	71 ^{abhi}	4.0 U
MW-213S	GW-12607-121720-DA-028	12/17/2020		19	2.5 U	2.5 U	88 ^{abhi}	2.5 U
MW-213S	GW-12607-121621-SK-021	12/16/2021		9.2	0.50 U	0.50 U	40 ^{abhi}	0.50 U
MW-213S	GW-12607-121621-SK-022	12/16/2021	Duplicate	8.8	0.50 U	0.50 U	37 ^{abhi}	0.50 U
MW-213S	GW-12573440-120622-SK-020	12/06/2022		14	2.0 U	2.0 U	71 ^{abhi}	2.0 U
MW-213S	GW-12573440-090623-DA-013	09/06/2023		13	1.0 U	1.0 U	62 ^{abhi}	1.0 U
MW-213S	GW-12573440-032724-CM-011	03/27/2024		12	1.0 U	1.0 U	56 ^{abhi}	1.0 U
MW-213S	GW-12573440-081324-ES-010	08/13/2024		8.2	3.3 U	3.3 U	38 ^{abhi}	3.3 U
MW-214S	GW-12607-092115-EM-002	09/21/2015		8.6	1.0 U	1.0 U	1.0 U	1.0 U
MW-214S	GW-12607-071917-SK-008	07/19/2017		10	1.0 U	1.0 U	1.0 U	1.0 U
MW-214S	GW-12607-120319-SK-009	12/03/2019		12	1.0 U	1.0 U	1.0 U	1.0 U
MW-214S	GW-12607-121720-DA-029	12/17/2020		11	1.0 U	1.0 U	0.32 J	1.0 U
MW-214S	GW-12573440-121422-SK-023	12/14/2022		13	1.0 U	1.0 U	1.0 U	1.0 U
MW-214S	GW-12573440-090623-DA-011	09/06/2023		14	1.0 U	1.0 U	1.0 U	1.0 U
MW-214S	GW-12573440-032724-LK-018	03/27/2024		7.3	0.81 J	1.0 U	0.50 J	1.0 U
MW-214S	GW-12573440-081324-CM-018	08/13/2024		8.6	1.0 U	1.0 U	1.0 U	1.0 U
MW-215S	GW-12607-092115-EM-005	09/21/2015		15	2.0 U	2.0 U	45 ^{abhi}	2.0 U
MW-215S	GW-12607-063016-DC-002	06/30/2016		11	1.3 U	1.3 U	23 ^{abhi}	1.3 U
MW-215S	GW-12607-071817-SK-002	07/18/2017		16	1.0 U	1.0 U	35 ^{abhi}	1.0 U
MW-215S	GW-12607-101718-DA-005	10/17/2018		13	1.0 U	1.0 U	28 J ^{abhi}	1.0 U
MW-215S	GW-12607-120219-SK-003	12/02/2019		15	1.0 U	1.0 U	29 ^{abhi}	1.0 U
MW-215S	GW-12607-112320-DA-002	11/23/2020		12	1.0 U	1.0 U	26 ^{abhi}	1.0 U
MW-215S	GW-12607-120220-DA-015	12/02/2020		13	1.0 U	1.0 U	23 ^{abhi}	1.0 U
MW-215S	GW-12607-121321-SK-005	12/13/2021		10	0.50 U	0.50 U	21 ^{abhi}	0.50 U
MW-215S	GW-12607-121321-SK-006	12/13/2021	Duplicate	10	0.50 U	0.50 U	21 ^{abhi}	0.50 U
MW-215S	GW-12573440-090523-DA-003	09/05/2023		13	1.0 U	1.0 U	27 ^{abhi}	1.0 U
MW-215S	GW-12573440-032524-LK-003	03/25/2024		5.2	1.0 U	1.0 U	13 ^{abhi}	1.0 U
MW-215S	GW-12573440-081324-ES-012	08/13/2024		7.1	1.0 U	1.0 U	19 ^{abhi}	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

<u>EGLE (1)</u>	Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
	Units		ug/L	ug/L	ug/L	ug/L	ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
<u>EGLE (2)</u>	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
<u>EPA VISL(3)</u>	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-216S	GW-12607-092215-EM-007	09/22/2015		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-216S	GW-12607-071917-SK-010	07/19/2017		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-216S	GW-12607-120519-SK-025	12/05/2019		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-216S	GW-12607-120220-DA-016	12/02/2020		0.54 J	1.0 U	1.0 U	1.0 U	1.0 U
MW-216S	GW-12607-120220-DA-017	12/02/2020	Duplicate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-216S	GW-12607-122021-SK-028	12/20/2021		0.93	0.50 U	0.50 U	0.50 U	0.50 U
MW-216S(R)	GW-12573440-032824-LK-023	03/28/2024		7.7	1.0 U	1.0 U	37 ^{abhi}	1.0 U
MW-216S(R)	GW-12573440-081324-CM-016	08/13/2024		9.1	2.5 U	2.5 U	46 ^{abhi}	2.5 U
MW-217D	GW-12607-072117-SK-016	07/21/2017		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-217D	GW-12607-101918-DA-019	10/19/2018		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-217D	GW-12607-121019-SK-026	12/10/2019		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-217D	GW-12607-120320-DA-026	12/03/2020		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-217D	GW-12607-121521-SK-012	12/15/2021		0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
MW-217D	GW-12573440-121422-SK-028	12/14/2022		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-217S	GW-12607-092115-EM-001	09/21/2015		51	1.7 U	1.7 U	1.7 U	1.7 U
MW-217S	GW-12607-070816-CM-002	07/08/2016		57	1.7 U	1.7 U	1.7 U	1.7 U
MW-301S(R)	GW-12573440-032824-CM-022	03/28/2024		25	2.5 U	2.5 U	69 ^{abhi}	2.5 U
MW-301S(R)	GW-12573440-081224-CM-007	08/12/2024		18	3.3 U	3.3 U	55 ^{abhi}	3.3 U
MW-303S	GW-12607-092215-EM-008	09/22/2015		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12607-092215-EM-009	09/22/2015	Duplicate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12607-071917-SK-009	07/19/2017		2.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12607-101718-DA-006	10/17/2018		4.0	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12607-120319-SK-012	12/03/2019		2.9	1.0 U	1.0 U	0.20 J	1.0 U
MW-303S	GW-12607-122021-SK-027	12/20/2021		4.9	0.50 U	0.50 U	0.50 U	0.50 U
MW-303S	GW-12573440-120522-SK-019	12/05/2022		3.4	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12573440-090623-DA-014	09/06/2023		0.75 J	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12573440-090623-DA-016	09/06/2023	Duplicate	0.80 J	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12573440-032724-LK-012	03/27/2024		1.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-303S	GW-12573440-081424-CM-021	08/14/2024		3.0	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

Parameters	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Residential Drinking Water	200	70	100	5	2
Non-Residential Drinking Water	200	70	100	5	2
Groundwater Surface Water Interface	89	620	1500	200	13
Residential Groundwater Volatilization to Indoor Air Inhalation	660000	93000	85000	2200	1100
Non-Residential Groundwater Volatilization to Indoor Air Inhalation	1300000	210000	200000	4900	13000
Water Solubility	1330000	3500000	6300000	1100000	2760000
Flammability and Explosivity Screening Levels	ID	530000	230000	ID	33000
Residential Groundwater Not in Contact	14000	95	390	10	2.1
Residential	14300	477	199	10.4	2.14

EGLE (2)

EPA VISL(3)

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-400S	GW-12607-063016-DC-003	06/30/2016		65	13 U	13 U	250 ^{abchi}	13 U
MW-400S	GW-12607-071917-SK-005	07/19/2017		73	10 U	10 U	300 ^{abchi}	10 U
MW-400S	GW-12607-101918-DA-016	10/19/2018		3.6	1.0 U	1.0 U	35 ^{abhi}	1.0 U
MW-400S	GW-12607-101918-DA-017	10/19/2018		13	2.5 U	2.5 U	97 ^{abhi}	2.5 U
MW-400S	GW-12607-101918-DA-018	10/19/2018		89	13 U	13 U	430 ^{abchi}	13 U
MW-400S	GW-12607-120219-SK-004	12/02/2019		46	10 U	10 U	190 ^{abhi}	10 U
MW-400S	GW-12607-120319-SK-011	12/03/2019		10	2.0 U	2.0 U	65 ^{abhi}	2.0 U
MW-400S	GW-12607-120319-SK-010	12/03/2019		6.7	1.0 U	1.0 U	45 ^{abhi}	1.0 U
MW-400S	GW-12607-112320-DA-004	11/23/2020		7.7	2.5 U	2.5 U	56 ^{abhi}	2.5 U
MW-400S	GW-12607-112320-DA-003	11/23/2020		58	14 U	14 U	310 ^{abchi}	14 U
MW-400S	GW-12607-113020-DA-005	11/30/2020		40	10 U	10 U	180 ^{abhi}	10 U
MW-400S	GW-12607-113020-DA-006	11/30/2020	Duplicate	40	10 U	10 U	180 ^{abhi}	10 U
MW-400S	GW-12607-121321-SK-002	12/13/2021		21	0.50 U	0.50 U	100 ^{abhi}	0.50 U
MW-400S	GW-12573440-113022-SK-002	11/30/2022		54	6.7 U	6.7 U	210 ^{abchi}	6.7 U
MW-400S	GW-12573440-090523-DA-002	09/05/2023		68	2.0 U	2.0 U	260 ^{abchi}	2.0 U
MW-400S	GW-12573440-032524-LK-004	03/25/2024		53	4.0 U	4.0 U	250 ^{abchi}	4.0 U
MW-400S	GW-12573440-081324-CM-017	08/13/2024		26	10 U	10 U	150 ^{abhi}	10 U
MW-401S	GW-12607-063016-DC-004	06/30/2016		150 ^c	12 U	12 U	230 ^{abchi}	12 U
MW-401S	GW-12607-063016-DC-005	06/30/2016	Duplicate	160 ^c	12 U	12 U	230 ^{abchi}	12 U
MW-401S	GW-12607-071917-SK-006	07/19/2017		210 ^{abc}	8.0 U	8.0 U	230 ^{abchi}	8.0 U
MW-401S	GW-12607-071917-SK-007	07/19/2017	Duplicate	200 ^c	8.0 U	8.0 U	210 ^{abchi}	8.0 U
MW-401S	GW-12607-101818-DA-010	10/18/2018		62	5.0 U	5.0 U	120 ^{abhi}	5.0 U
MW-401S	GW-12607-101818-DA-011	10/18/2018		98 ^c	10 U	10 U	200 ^{abhi}	10 U
MW-401S	GW-12607-101818-DA-012	10/18/2018		150 ^c	10 U	10 U	240 ^{abchi}	10 U
MW-401S	GW-12607-120319-SK-008	12/03/2019		130 ^c	10 U	10 U	210 ^{abchi}	10 U
MW-401S	GW-12607-120319-SK-007	12/03/2019		150 ^c	6.3 U	6.3 U	260 ^{abchi}	6.3 U
MW-401S	GW-12607-120319-SK-005	12/03/2019		200 ^c	6.3 U	6.3 U	58 J ^{abhi}	6.3 U
MW-401S	GW-12607-120319-SK-006	12/03/2019	Duplicate	190 ^c	6.3 U	6.3 U	170 J ^{abhi}	6.3 U
MW-401S	GW-12607-113020-DA-009	11/30/2020		160 ^c	10 U	10 U	210 ^{abchi}	10 U
MW-401S	GW-12607-113020-DA-008	11/30/2020		170 ^c	10 U	10 U	230 ^{abchi}	10 U
MW-401S	GW-12607-113020-DA-007	11/30/2020		210 ^{abc}	10 U	10 U	220 ^{abchi}	10 U
MW-401S	GW-12573440-032624-LK-006	03/26/2024		110 ^c	3.3 U	3.3 U	140 ^{abhi}	3.3 U
MW-401S	GW-12607-121321-SK-003	12/13/2021		210 ^{abc}	0.80	0.50 U	260 ^{abchi}	0.50 U
MW-401S	GW-12573440-081424-CM-019	08/14/2024		94 ^c	10 U	10 U	140 ^{abhi}	10 U

Table 1

Analytical Results Summary Select CVOCs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

<u>EGLE (1)</u>	Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
	Units		ug/L	ug/L	ug/L	ug/L	ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
<u>EGLE (2)</u>	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
<u>EPA VISL(3)</u>	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-402S	GW-12607-063016-DC-006	06/30/2016		98 ^c	12 U	12 U	240 ^{abchi}	12 U
MW-402S	GW-12607-072017-SK-011	07/20/2017		110 ^c	13 U	13 U	290 ^{abchi}	13 U
MW-402S	GW-12607-101818-DA-007	10/18/2018		36	10 U	10 U	180 ^{abhi}	10 U
MW-402S	GW-12607-101818-DA-008	10/18/2018		41	6.3 U	6.3 U	200 ^{abhi}	6.3 U
MW-402S	GW-12607-101818-DA-009	10/18/2018		130 ^c	10 U	10 U	330 ^{abchi}	10 U
MW-402S	GW-12607-120419-SK-018	12/04/2019		35	11 U	11 U	170 ^{abhi}	11 U
MW-402S	GW-12607-120419-SK-017	12/04/2019		35	13 U	13 U	180 ^{abhi}	13 U
MW-402S	GW-12607-120419-SK-016	12/04/2019		91 ^c	0.55 J	1.0 U	270 ^{abchi}	1.0 U
MW-402S	GW-12607-113020-DA-010	11/30/2020		110 ^c	10 U	10 U	250 ^{abchi}	10 U
MW-402S	GW-12607-120120-DA-013	12/01/2020		110 ^c	10 U	10 U	250 ^{abchi}	10 U
MW-402S	GW-12607-120120-DA-012	12/01/2020		99 ^c	10 U	10 U	230 ^{abchi}	10 U
MW-402S	GW-12607-121321-SK-004	12/13/2021		100 ^c	0.58	0.50 U	290 ^{abchi}	0.50 U
MW-402S	GW-12573440-113022-SK-001	11/30/2022		82	6.1 U	6.1 U	230 ^{abchi}	6.1 U
MW-402S	GW-12573440-090523-DA-004	09/05/2023		94 ^c	0.65 J	1.0 U	270 ^{abchi}	1.0 U
MW-402S	GW-12573440-090523-DA-006	09/05/2023	Duplicate	100 ^c	0.81 J	1.0 U	290 ^{abchi}	1.0 U
MW-402S	GW-12573440-032624-LK-008	03/26/2024		97 ^c	5.0 U	5.0 U	240 ^{abchi}	5.0 U
MW-402S	GW-12573440-081424-ES-020	08/14/2024		56	13 U	13 U	190 ^{abhi}	13 U
MW-403D	GW-12607-072017-SK-015	07/20/2017		51	5.7 U	5.7 U	140 ^{abhi}	5.7 U
MW-403D	GW-12607-102218-DA-024	10/22/2018		60	20 U	20 U	260 ^{abchi}	20 U
MW-403D	GW-12607-120319-SK-014	12/03/2019		37	5.0 U	5.0 U	170 ^{abhi}	5.0 U
MW-403D	GW-12607-120220-DA-018	12/02/2020		36	5.0 U	5.0 U	150 ^{abhi}	5.0 U
MW-403D	GW-12607-121621-SK-020	12/16/2021		42	0.50 U	0.50 U	140 ^{abhi}	0.50 U
MW-403D	GW-12573440-120522-SK-018	12/05/2022		30	2.0 U	2.0 U	94 ^{abhi}	2.0 U
MW-403S	GW-12607-072017-SK-014	07/20/2017		0.89 J	1.0 U	1.0 U	4.6	1.0 U
MW-403S	GW-12607-102218-DA-022	10/22/2018		0.77 J	1.0 U	1.0 U	4.4	1.0 U
MW-403S	GW-12607-102218-DA-023	10/22/2018	Duplicate	0.77 J	1.0 U	1.0 U	4.2	1.0 U
MW-403S	GW-12607-120319-SK-013	12/03/2019		0.74 J	1.0 U	1.0 U	3.9	1.0 U
MW-403S	GW-12607-120220-DA-021	12/02/2020		2.8	2.0 U	2.0 U	30 ^{abhi}	2.0 U
MW-403S	GW-12607-121621-SK-019	12/16/2021		1.8	0.50 U	0.50 U	4.0	0.50 U
MW-403S	GW-12573440-120522-SK-017	12/05/2022		3.0	1.0 U	1.0 U	5.3 ^{ab}	1.0 U
MW-403S	GW-12573440-090723-DA-017	09/07/2023		2.0	1.0 U	1.0 U	5.1 ^{ab}	1.0 U
MW-403S	GW-12573440-032724-CM-013	03/27/2024		1.1	1.0 U	1.0 U	4.3	1.0 U
MW-403S	GW-12573440-081424-ES-022	08/14/2024		0.89 J	1.0 U	1.0 U	4.4	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

<u>EGLE (1)</u>	Parameters Units		1,1,1-Trichloroethane ug/L	cis-1,2-Dichloroethene ug/L	trans-1,2-Dichloroethene ug/L	Trichloroethene ug/L	Vinyl chloride ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
<u>EGLE (2)</u>	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
<u>EPA VISL(3)</u>	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-404D	GW-12607-072017-SK-013	07/20/2017		72	4.0 U	4.0 U	110 ^{abhi}	4.0 U
MW-404D	GW-012607-110918-KT-002	11/09/2018		67	5.0 U	5.0 U	110 ^{abhi}	5.0 U
MW-404D	GW-012607-110918-KT-003	11/09/2018	Duplicate	58	0.91 J	2.0 U	89 ^{abhi}	2.0 U
MW-404D	GW-12607-120519-SK-023	12/05/2019		52	0.67 J	3.3 U	60 ^{abhi}	3.3 U
MW-404D	GW-12607-120519-SK-024	12/05/2019	Duplicate	53	0.74 J	2.0 U	61 ^{abhi}	2.0 U
MW-404D	GW-12607-120220-DA-020	12/02/2020		3.1	2.0 U	2.0 U	28 ^{abhi}	2.0 U
MW-404D	GW-12607-122021-SK-024	12/20/2021		62	0.91	0.50 U	38 ^{abhi}	0.50 U
MW-404D	GW-12573440-120522-SK-016	12/05/2022		39	0.71 J	1.0 U	19 ^{abhi}	1.0 U
MW-404S	GW-12607-072017-SK-012	07/20/2017		4.5	1.3 U	1.3 U	30 ^{abhi}	1.3 U
MW-404S	GW-012607-110918-KT-001	11/09/2018		4.8	2.0 U	2.0 U	39 ^{abhi}	2.0 U
MW-404S	GW-12607-120519-SK-022	12/05/2019		3.3	1.0 U	1.0 U	34 ^{abhi}	1.0 U
MW-404S	GW-12607-120220-DA-019	12/02/2020		2.8	2.0 U	2.0 U	29 ^{abhi}	2.0 U
MW-404S	GW-12607-122021-SK-023	12/20/2021		3.5	0.50 U	0.50 U	23 ^{abhi}	0.50 U
MW-404S	GW-12573440-090623-DA-015	09/06/2023		11	1.0 U	1.0 U	48 ^{abhi}	1.0 U
MW-404S	GW-12573440-032724-LK-014	03/27/2024		6.3	1.0 U	1.0 U	24 ^{abhi}	1.0 U
MW-404S	GW-12573440-081424-ES-024	08/14/2024		8.1	1.0 U	1.0 U	32 ^{abhi}	1.0 U
MW-405D	GW-12607-072117-SK-020	07/21/2017		14	1.0 U	1.0 U	1.1	1.0 U
MW-405D	GW-12607-121019-SK-030	12/10/2019		11	1.0 U	1.0 U	5.1 ^{ab}	1.0 U
MW-405D	GW-12607-121019-SK-031	12/10/2019	Duplicate	11	1.0 U	1.0 U	5.4 ^{ab}	1.0 U
MW-405D	GW-12607-120320-DA-023	12/03/2020		9.6	1.0 U	1.0 U	8.0 ^{ab}	1.0 U
MW-405D	GW-12607-121521-SK-016	12/15/2021		11	0.50 U	0.50 U	10 ^{ab}	0.50 U
MW-405D	GW-12573440-121422-SK-024	12/14/2022		7.5	1.0 U	1.0 U	11 ^{abhi}	1.0 U
MW-405S	GW-12607-072117-SK-019	07/21/2017		2.0	1.0 U	1.0 U	1.0 U	1.0 U
MW-405S	GW-12607-121019-SK-029	12/10/2019		1.5	1.0 U	1.0 U	0.33 J	1.0 U
MW-405S	GW-12607-120320-DA-022	12/03/2020		1.1	1.0 U	1.0 U	0.50 J	1.0 U
MW-405S	GW-12607-121521-SK-015	12/15/2021		1.3	0.50 U	0.50 U	0.59	0.50 U
MW-405S	GW-12573440-090723-DA-021	09/07/2023		1.4	1.0 U	1.0 U	1.6	1.0 U
MW-405S	GW-12573440-032724-CM-015	03/27/2024		1.9	1.0 U	1.0 U	1.9	1.0 U
MW-405S	GW-12573440-081424-CM-027	08/14/2024		1.3	1.0 U	1.0 U	2.8	1.0 U
MW-405S	GW-12573440-081424-CM-029	08/14/2024	Duplicate	1.3	1.0 U	1.0 U	2.6	1.0 U
MW-406D	GW-12607-072117-SK-018	07/21/2017		91 ^e	2.5 U	2.5 U	2.5 U	2.5 U
MW-406D	GW-12607-101918-DA-020	10/19/2018		81 J	0.37 J	1.0 U	0.10 J	1.0 U
MW-406D	GW-12607-121019-SK-027	12/10/2019		79	2.5 U	2.5 U	1.3 J	2.5 U
MW-406D	GW-12607-120320-DA-025	12/03/2020		63	2.5 U	2.5 U	14 ^{abhi}	2.5 U
MW-406D	GW-12607-121521-SK-014	12/15/2021		84	0.50 U	0.50 U	36 ^{abhi}	0.50 U
MW-406D	GW-12573440-121422-SK-026	12/14/2022		55	2.0 U	2.0 U	54 ^{abhi}	2.0 U
MW-406D	GW-12573440-121422-SK-027	12/14/2022	Duplicate	56	1.0 U	1.0 U	55 ^{abhi}	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

Parameters	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Residential Drinking Water	200	70	100	5	2
Non-Residential Drinking Water	200	70	100	5	2
Groundwater Surface Water Interface	89	620	1500	200	13
Residential Groundwater Volatilization to Indoor Air Inhalation	660000	93000	85000	2200	1100
Non-Residential Groundwater Volatilization to Indoor Air Inhalation	1300000	210000	200000	4900	13000
Water Solubility	1330000	3500000	6300000	1100000	2760000
Flammability and Explosivity Screening Levels	ID	530000	230000	ID	33000
Residential Groundwater Not in Contact	14000	95	390	10	2.1
Residential	14300	477	199	10.4	2.14

EGLE (2)

EPA VISL(3)

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
MW-406S	GW-12607-072117-SK-017	07/21/2017		42	1.7 U	1.7 U	1.7 U	1.7 U
MW-406S	GW-12607-101918-DA-021	10/19/2018		21	1.0 U	1.0 U	1.0 U	1.0 U
MW-406S	GW-12607-121019-SK-028	12/10/2019		13	1.0 U	1.0 U	0.18 J	1.0 U
MW-406S	GW-12607-120320-DA-024	12/03/2020		15	1.0 U	1.0 U	2.0	1.0 U
MW-406S	GW-12607-121521-SK-013	12/15/2021		6.7	0.50 U	0.50 U	4.4	0.50 U
MW-406S	GW-12573440-121422-SK-025	12/14/2022		18	1.0 U	1.0 U	30 ^{abhi}	1.0 U
MW-406S	GW-12573440-090723-DA-019	09/07/2023		17	1.0 U	1.0 U	38 ^{abhi}	1.0 U
MW-406S	GW-12573440-032724-LK-016	03/27/2024		4.8	1.0 U	1.0 U	10 ^{ab}	1.0 U
MW-406S	GW-12573440-081424-CM-030	08/14/2024		15	1.0 U	1.0 U	52 ^{abhi}	1.0 U
MW-407D	GW-12607-020221-DA-002	02/02/2021		39	2.0 U	2.0 U	32 ^{abhi}	2.0 U
MW-407D	GW-12607-122021-SK-026	12/20/2021		52	0.50 U	0.50 U	45 ^{abhi}	0.50 U
MW-407D	GW-12573440-120622-SK-022	12/06/2022		38	1.0 U	1.0 U	39 ^{abhi}	1.0 U
MW-407S	GW-12607-020221-DA-001	02/02/2021		20	1.0 U	1.0 U	18 ^{abhi}	1.0 U
MW-407S	GW-12607-122021-SK-025	12/20/2021		19	0.50 U	0.50 U	30 ^{abhi}	0.50 U
MW-407S	GW-12573440-120622-SK-021	12/06/2022		17	1.0 U	1.0 U	44 ^{abhi}	1.0 U
MW-407S	GW-12573440-090723-DA-022	09/07/2023		21	1.0 U	1.0 U	48 ^{abhi}	1.0 U
MW-407S	GW-12573440-032724-CM-017	03/27/2024		17	1.0 U	1.0 U	40 ^{abhi}	1.0 U
MW-407S	GW-12573440-081424-CM-025	08/14/2024		11	1.0 U	1.0 U	30 ^{abhi}	1.0 U
MW-504S	GW-12573440-032824-LK-029	03/28/2024		57	1.0 U	1.0 U	1.0 U	1.0 U
MW-504S	GW-12573440-081424-ES-026	08/14/2024		35	1.0 U	1.0 U	1.0 U	1.0 U
MW-505S	GW-12573440-032824-CM-028	03/28/2024		29	1.0 U	1.0 U	1.0 U	1.0 U
MW-505S	GW-12573440-081424-ES-028	08/14/2024		57	1.0 U	1.0 U	1.0 U	1.0 U
MW-507S	GW-12573440-032824-LK-025	03/28/2024		0.66 J	1.0 U	1.0 U	1.3	1.0 U
MW-507S	GW-12573440-081424-CM-023	08/14/2024		0.87 J	1.0 U	1.0 U	0.97 J	1.0 U
MW-508S	GW-12573440-032824-CM-024	03/28/2024		2.6	1.0 U	1.0 U	1.0 U	1.0 U
MW-508S	GW-12573440-081324-ES-014	08/13/2024		1.8	1.0 U	1.0 U	1.0 U	1.0 U
MW-509S	GW-12573440-032824-LK-021	03/28/2024		10	1.0 U	1.0 U	36 ^{abhi}	1.0 U
MW-509S	GW-12573440-081224-ES-002	08/12/2024		8.7	1.0 U	1.0 U	35 ^{abhi}	1.0 U
MW-515S	GW-12573440-081524-ES-036	08/15/2024		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-516S	GW-12573440-081524-CM-035	08/15/2024		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-516S	GW-12573440-081524-CM-037	08/15/2024	Duplicate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-517S	GW-12573440-081524-CM-033	08/15/2024		5.9	1.0 U	1.0 U	1.0 U	1.0 U
MW-518S	GW-12573440-081524-ES-032	08/15/2024		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-519S	GW-12573440-081524-CM-031	08/15/2024		2.8	1.0 U	1.0 U	1.0 U	1.0 U
MW-520S	GW-12573440-081524-ES-034	08/15/2024		1.6	1.0 U	1.0 U	1.0 U	1.0 U

Table 1

Analytical Results Summary Select CVOs – 2015 - 2024
AOI 31 Groundwater Sampling
Eckles Road Site
Livonia, Michigan

<u>EGLE (1)</u>	Parameters		1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
	Units		ug/L	ug/L	ug/L	ug/L	ug/L
	Residential Drinking Water	a	200	70	100	5	2
	Non-Residential Drinking Water	b	200	70	100	5	2
	Groundwater Surface Water Interface	c	89	620	1500	200	13
	Residential Groundwater Volatilization to Indoor Air Inhalation	d	660000	93000	85000	2200	1100
	Non-Residential Groundwater Volatilization to Indoor Air Inhalation	e	1300000	210000	200000	4900	13000
	Water Solubility	f	1330000	3500000	6300000	1100000	2760000
<u>EGLE (2)</u>	Flammability and Explosivity Screening Levels	g	ID	530000	230000	ID	33000
<u>EPA VISL(3)</u>	Residential Groundwater Not in Contact	h	14000	95	390	10	2.1
	Residential	i	14300	477	199	10.4	2.14

AOI 31

Sample Location	Sample Identification	Sample Date	Sample Type	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride
OW-1	GW-12607-121421-SK-010	12/14/2021		140 ^e	1.4	1.0 U	660 ^{abchi}	1.0 U
OW-1	GW-12573440-120122-SK-010	12/01/2022		78	15 U	15 U	530 ^{abchi}	15 U
OW-1	GW-12573440-090623-DA-012	09/06/2023		15	1.0 U	1.0 U	50 ^{abhi}	1.0 U
OW-1	GW-12573440-032824-LK-027	03/28/2024		97 ^e	13 U	13 U	510 ^{abchi}	13 U
OW-1	GW-12573440-081324-CM-011	08/13/2024		50	25 U	25 U	330 ^{abchi}	25 U
OW-1	GW-12573440-081324-CM-013	08/13/2024	Duplicate	48	25 U	25 U	330 ^{abchi}	25 U
OW-3	GW-12607-121421-SK-011	12/14/2021		86	0.62	0.50 U	500 ^{abchi}	0.50 U
OW-3	GW-12573440-120222-SK-011	12/02/2022		50	9.5 U	9.5 U	320 ^{abchi}	9.5 U
OW-3	GW-12573440-090623-DA-010	09/06/2023		89	2.0 U	2.0 U	460 ^{abchi}	2.0 U
OW-3	GW-12573440-032824-CM-026	03/28/2024		59	10 U	10 U	350 ^{abchi}	10 U
OW-3	GW-12573440-081324-CM-015	08/13/2024		11	1.0 U	1.0 U	60 ^{abhi}	1.0 U

Notes:

(1) EGLE Generic cleanup criteria for residential category can yo, administrative rule R 299.44, effective December 30, 2013, pursuant to Part 201 of 1994 PA 451 as amended

(2) EGLE - Michigan Department of Environment, Great Lakes and Energy (EGLE) Volatilization to Indoor Air (VIAP) Screening Levels (SL), February 2024

(3) EPA VISL- Vapor Intrusion Assessment, Vapor Intrusion Screening Levels (VISL), (TCR=1E-05, THQ=1) April 2024

U - Not detected at the associated reporting limit.

J - Estimated concentration.

UJ - Not detected; associated reporting limit is estimated.

B - Result detected in associated method blank.

Table 2

AOI 31- Groundwater Elevation - August 2024
RACER Eckles
Livonia, MI

TOC elevation	Location	Date	Depth to Water	Groundwater
			August 2024 (ft bgs)	Elevation August 202 (ft amsl)
702.58	MW-104S	8/12/2024	17.79	684.79
699.08	MW-202S(R)	8/13/2024	10.5	688.58
697.68	MW-203S	8/14/2024	9.95	687.73
697.68	MW-203S	8/15/2024	9.95	687.73
697.42	MW-205S	8/16/2024	9	688.42
695.56	MW-206S	8/13/2024	10	685.56
694.32	MW-211S	8/13/2024	10.25	684.07
695.48	MW-213S	8/13/2024	10.61	684.87
687.80	MW-214S	8/13/2024	7.1	680.70
691.39	MW-215S	8/13/2024	8.67	682.72
688.83	MW-216S(R)	8/13/2024	7.51	681.32
696.27	MW-301S(R)	8/12/2024	12.25	684.02
687.41	MW-303S	8/14/2024	6.56	680.85
687.64	MW-400S	8/13/2024	6.92	680.72
688.88	MW-401S	8/14/2024	7.12	681.76
687.72	MW-402S	8/14/2024	6.46	681.26
688.70	MW-403S	8/14/2024	7.95	680.75
687.92	MW-404S	8/14/2024	7.92	680.00
684.88	MW-405S	8/14/2024	6.58	678.30
684.88	MW-405S	8/14/2024	6.58	678.30
683.54	MW-406S	8/14/2024	5.72	677.82
685.73	MW-407S	8/14/2024	7.15	678.58
680.53	MW-504S	8/14/2024	4.55	675.98
681.40	MW-505S	8/14/2024	5.15	676.25
686.76	MW-507S	8/14/2024	6.93	679.83
688.93	MW-508S	8/13/2024	8.25	680.68
696.77	MW-509S	8/12/2024	10.09	686.68
680.37	MW-515S	8/15/2024	4.94	675.43
681.47	MW-516S	8/15/2024	5.89	675.58
681.47	MW-516S	8/15/2024	5.89	675.58
680.77	MW-517S	8/15/2024	4.65	676.12
681.20	MW-518S	8/15/2024	4.62	676.58
683.55	MW-519S	8/15/2024	6.7	676.85
693.88	OW-1	8/13/2024	9.5	684.38
693.88	OW-1	8/13/2024	9.5	684.38
693.94	OW-3	8/13/2024	9.75	684.19
682.031	MW-520S	8/15/2024	6.21	675.82

Table 3

Vertical Hydraulic Gradients Summary – December 2022
Newburgh Village PRB Area
AOI 31 - RACER Eckles Site
Livonia, Michigan

Monitoring Well ID	Ground Surface Elevation (ft. AMSL)	Depth to Well Screen (ft. bgs)	Screen Length ft	Depth to Water (ft. bgs)	dl (ft. bgs)	dh (ft. bgs)	dh/dl	Direction
MW-403S	689.60	4.66	5.00	8.33				
MW-403D	689.60	12.64	5.00	8.51				

Calculations: 7.98 -0.18 -0.02 down

Notes:

dl and dh calculations are normalized relative to ground surface elevation.

dh - Change in hydraulic head of deep well vs. shallow well.

dl - Change in depth to top of screen of deep well vs. shallow well.

dh/dl - vertical hydraulic gradient.

Ft. bgs - Feet below ground surface.

All monitoring well screen lengths are 5 feet.

GSE = Ground Surface Elevation

Table 4

AOI 31 Hydraulic Gradients and Linear Groundwater Velocity Summary – August 2024
RACER Eckles Road
Livonia, Michigan

	Well ID	Northing	Easting	Date	Groundwater Elevation
AOI 31 PRB Area	MW-405S	319356.11	13380864.42	8/14/2024	678.30
	MW-519S	319297.39	13380932.04	8/15/2024	676.85
	<u>Gradient</u>				
	dh 1.45		<u>Velocity</u>		
	dl 89.559086		0.000272		cm/sec
	dh/dl: 0.01619043		281.42		feet per year
AOI 31 PRB Area	MW-406S	319403.38	13380944.53	8/14/2024	677.82
	MW-517S	319302.59	13381041.66	8/15/2024	676.12
	<u>Gradient</u>				
	dh 1.70		<u>Velocity</u>		
	dl 139.978636		0.000204		cm/sec
	dh/dl: 0.01214471		211.10		feet per year
AOI 31 PRB Area	MW-504S	319370.93	13381071.94	8/14/2024	675.98
	MW-515S	319313.04	13381175.18	8/15/2024	675.43
	<u>Gradient</u>				
	dh 0.55		<u>Velocity</u>		
	dl 118.365723		0.000078		cm/sec
	dh/dl: 0.00464662		80.77		feet per year

Average AOI 31 PRB Area Gradient 0.011

Average AOI 31 PRB Area Velocity 191.10 Feet per year

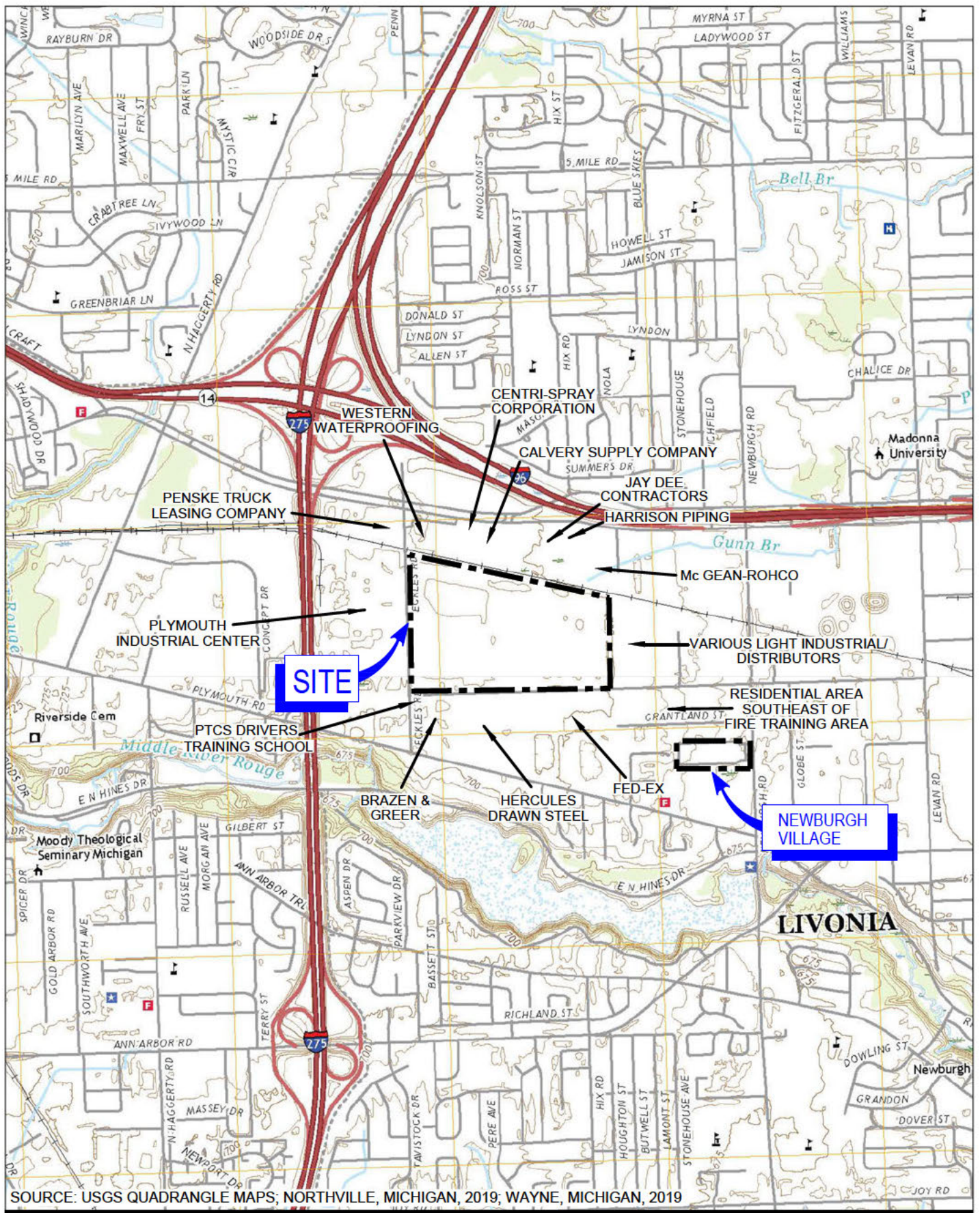
Average Off-Site AOI 31 Area Gradient and Velocity Calculations

AOI 31	MW-213S	319784.66	13380007.41	8/14/2024	684.87
	MW-515S	319313.04	13381175.18	8/15/2024	675.43
	<u>Gradient</u>				
	dh 9.44		<u>Velocity</u>		
	dl 1259.41021		0.000126		cm/sec
	dh/dl: 0.00749375		130.26		feet per year

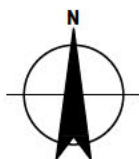
Notes:

- 0.00420 AOI 31 average hydraulic conductivity (from AOI 31 Injection well slug tests - July 2004)
- 0.25 Assumed effective porosity (25%)

Figures



0 1000 2000 ft
1" = 2000 ft

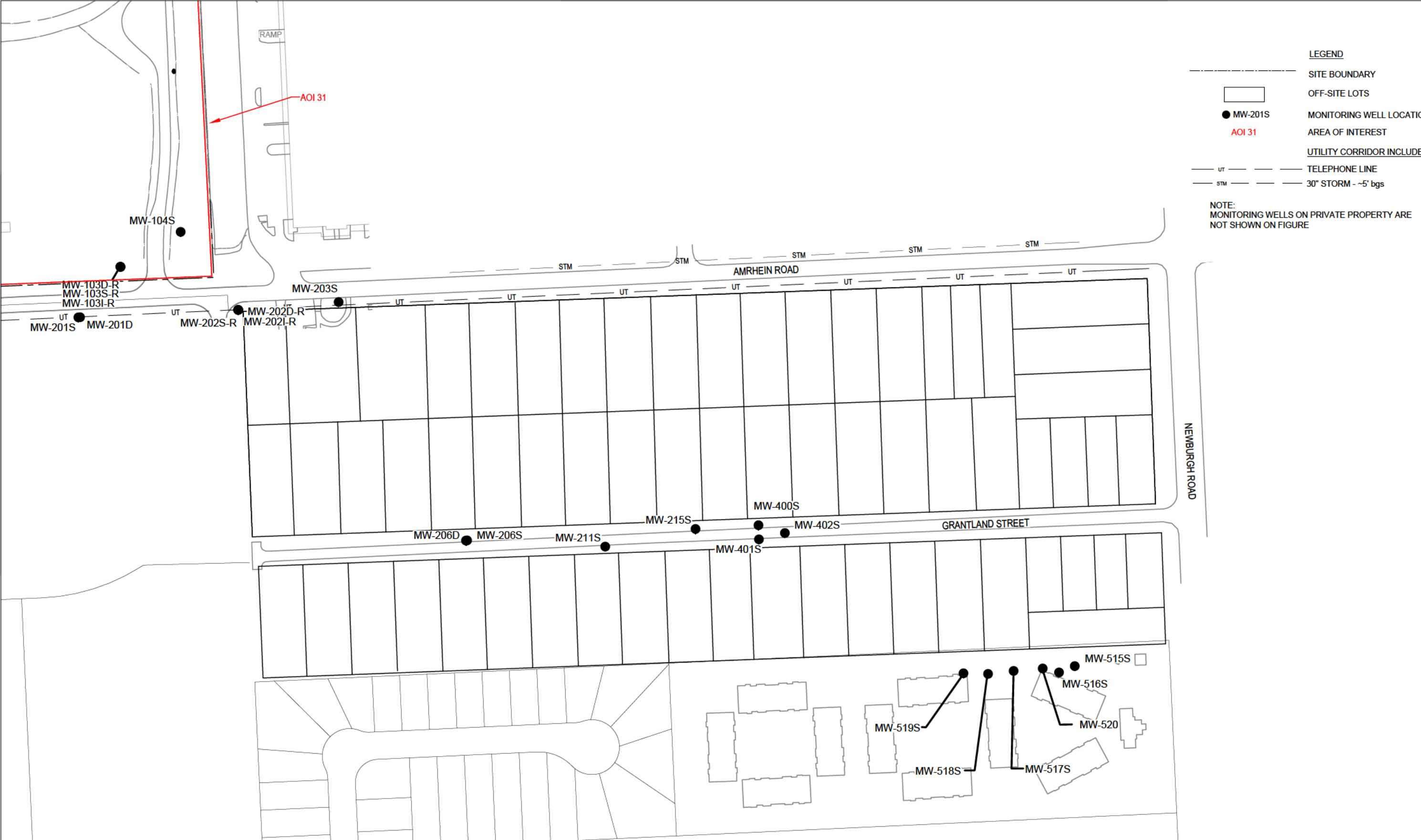


ECKLES ROAD SITE
LIVONIA, MICHIGAN

Project No. 12573440
Date October 2024

SITE LOCATION

FIGURE 1



LEGEND

SITE BOUNDARY

OFF-SITE LOTS

● MW-201S

MONITORING WELL LOCATION

AOI 31

AREA OF INTEREST

UTILITY CORRIDOR INCLUDES:

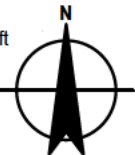
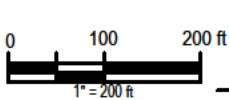
UT

TELEPHONE LINE

STM

30" STORM - ~5' bgs

NOTE:
MONITORING WELLS ON PRIVATE PROPERTY ARE
NOT SHOWN ON FIGURE

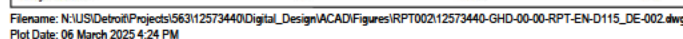


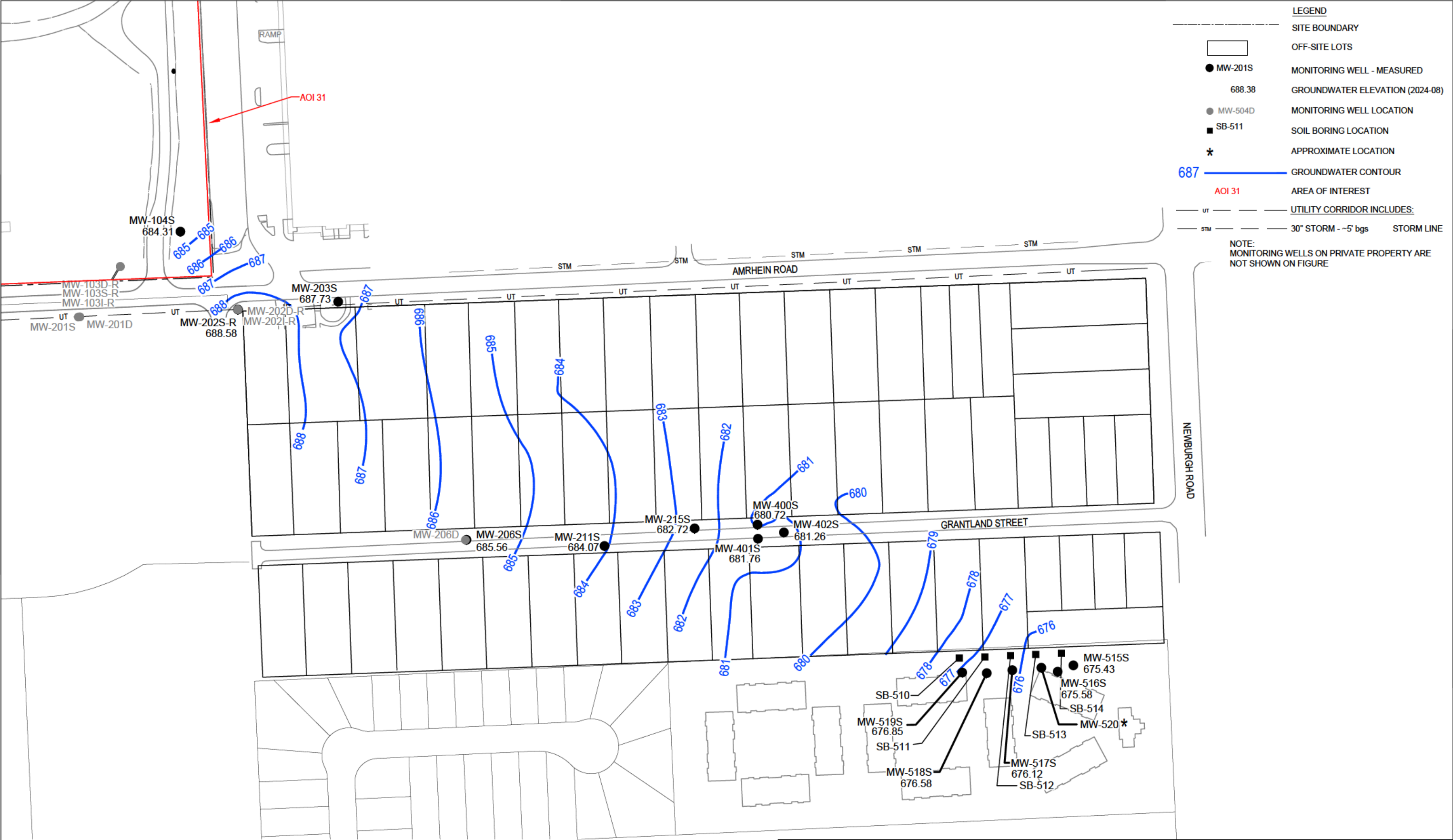
ECKLES ROAD SITE
LIVONIA, MICHIGAN

Project No. 12573440
Date March 2025

MONITORING WELL LOCATIONS

FIGURE 2





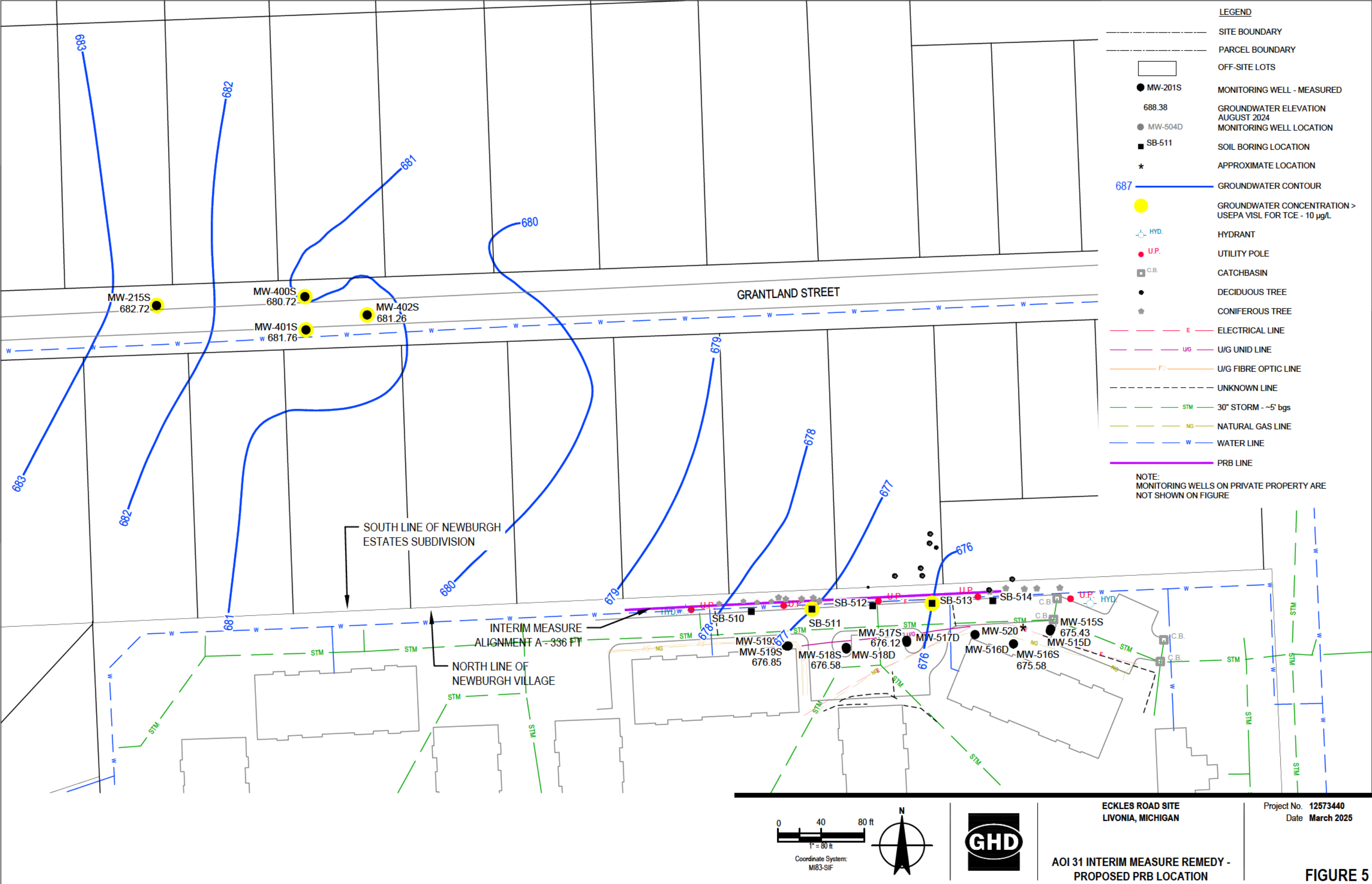


FIGURE 5

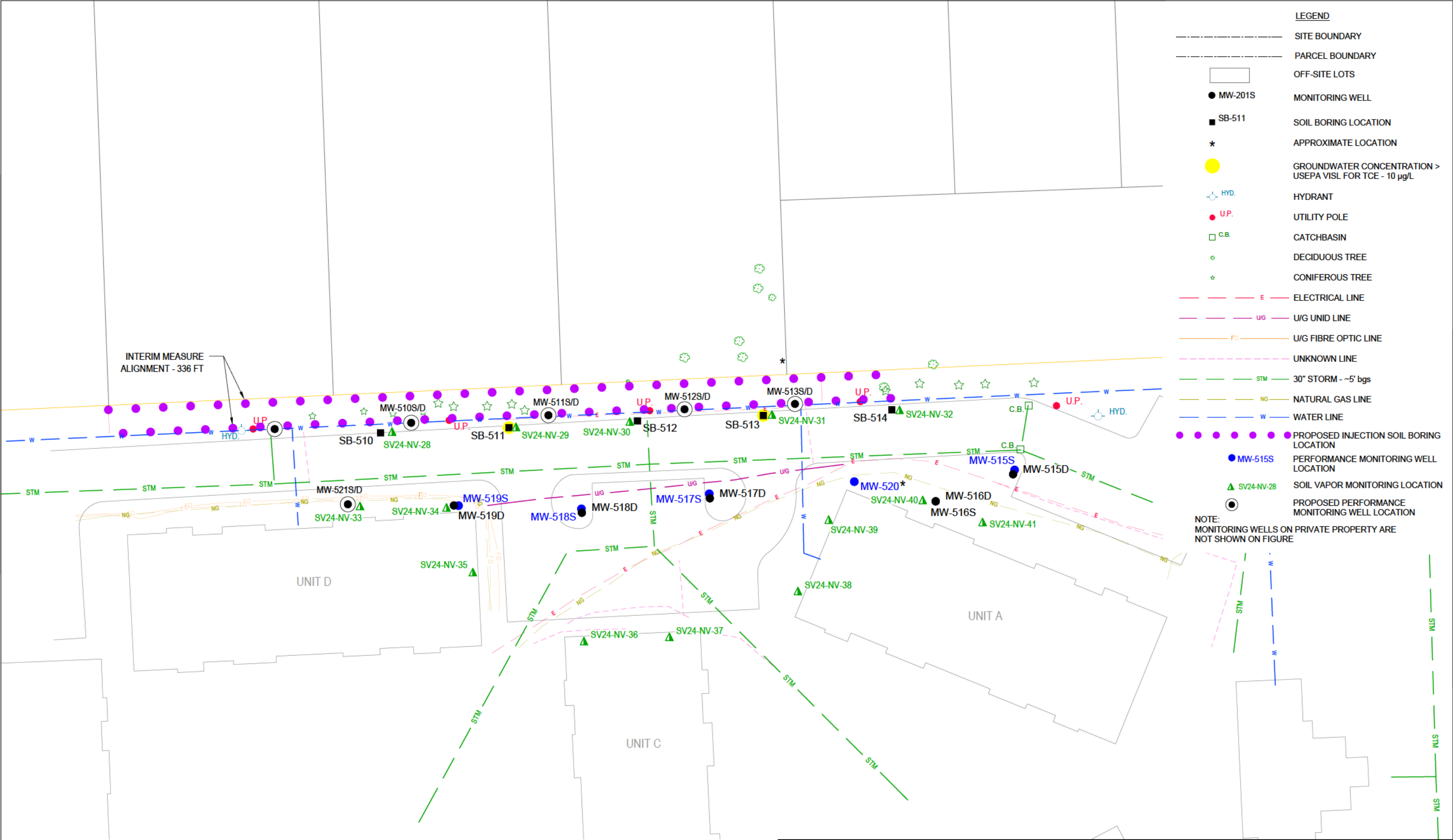


FIGURE 6

Appendices

Appendix A

Summary of AOI 31 Interim Measure Investigation Laboratory Results

Table A.1
Summary of AOI 31 Interim Measure Investigation Soil Sample Results
Eckles Road Site
Livonia, Michigan

Sample Location		SB-510	SB-510	SB-512	SB-512	SB-514	SB-514
Sample Identification		SB-510 (5-7.5)	SB-510 (12-14.5)	SB-512 (5-7.5)	SB-512 (12-14.5)	SB-514 (5-7.5)	SB-514 (12-14.5)
Sample Date		06/06/2024	06/06/2024	06/06/2024	06/06/2024	06/07/2024	06/07/2024
Sample Depth		(5-7.5) ft BGS	(12-14.5) ft BGS	(5-7.5) ft BGS	(12-14.5) ft BGS	(5-7.5) ft BGS	(12-14.5) ft BGS
	Units						
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	mg/kg	0.051 U	0.058 U	0.053	0.14	0.043 J	0.055 U
1,1,2,2-Tetrachloroethane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,1,2-Trichloroethane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,1-Dichloroethane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,1-Dichloroethene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,2,4-Trichlorobenzene	mg/kg	0.11 J	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
1,2-Dichlorobenzene	mg/kg	0.016 J	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
1,2-Dichloroethane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,2-Dichloropropane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
1,3-Dichlorobenzene	mg/kg	0.014 J	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
1,4-Dichlorobenzene	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	0.76 U	0.86 U	0.78 U	0.86 U	0.81 U	0.82 U
2-Hexanone	mg/kg	2.5 U	2.9 U	2.6 U	2.9 U	2.7 U	2.7 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	2.5 U	2.9 U	2.6 U	2.9 U	2.7 U	2.7 U
Acetone	mg/kg	0.76 U	0.86 U	0.78 U	0.86 U	0.81 U	0.82 U
Benzene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Bromodichloromethane	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
Bromoform	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
Bromomethane (Methyl bromide)	mg/kg	0.32 U	0.36 U	0.32 U	0.36 U	0.34 U	0.34 U
Carbon disulfide	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
Carbon tetrachloride	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Chlorobenzene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Chloroethane	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
Chloroform (Trichloromethane)	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Chloromethane (Methyl chloride)	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
cis-1,2-Dichloroethene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
cis-1,3-Dichloropropene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Cyclohexane	mg/kg	1.2 U	1.4 U	1.2 U	1.4 U	1.3 U	1.3 U
Dibromochloromethane	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Dichlorodifluoromethane (CFC-12)	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
Ethylbenzene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Isopropyl benzene	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
Methyl acetate	mg/kg	1.2 U	1.4 U	1.2 U	1.4 U	1.3 U	1.3 U
Methyl cyclohexane	mg/kg	1.2 U	1.4 U	1.2 U	1.4 U	1.3 U	1.3 U
Methyl tert butyl ether (MTBE)	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
Methylene chloride	mg/kg	0.63 U	0.72 U	0.65 U	0.72 U	0.67 U	0.68 U
Styrene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Tetrachloroethene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Toluene	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
trans-1,2-Dichloroethene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
trans-1,3-Dichloropropene	mg/kg	0.051 U	0.058 U	0.052 U	0.057 U	0.054 U	0.055 U
Trichloroethene	mg/kg	0.051 U	0.058 U	0.018 J	0.057 U	0.054 U	0.055 U
Trichlorofluoromethane (CFC-11)	mg/kg	0.1 U	0.12 U	0.1 U	0.11 U	0.11 U	0.11 U
Trifluorotrichloroethane (CFC-113)	mg/kg	0.25 U	0.29 U	0.26 U	0.29 U	0.27 U	0.27 U
Vinyl chloride	mg/kg	0.041 U	0.046 U	0.041 U	0.046 U	0.043 U	0.044 U
Xylenes (total)	mg/kg	0.15 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U
General Chemistry							
Fraction organic carbon (FOC)	%	0.2	0.1	0.2	0.2	0.2	0.2

Notes:
U - Not detected at the associated reporting limit.
J - Estimated concentration.

Table A.2
Summary of AOI 31 Interim Measure Investigation Groundwater Sample Results
Eckles Road Site
Livonia, Michigan

Sample Location		SB-510	SB-510	SB-512	SB-512	SB-514	SB-514
Sample Identification		SB-510 (5-7.5)	SB-510 (12-14.5)	SB-512 (5-7.5)	SB-512 (12-14.5)	SB-514 (5-7.5)	SB-514 (12-14.5)
Sample Date		06/06/2024	06/06/2024	06/07/2024	06/07/2024	06/07/2024	06/07/2024
Sample Depth		(5-7.5) ft BGS	(12-14.5) ft BGS	(5-7.5) ft BGS	(12-14.5) ft BGS	(5-7.5) ft BGS	(12-14.5) ft BGS
Parameters	Units						
Metals							
Iron	mg/L	0.24	0.63	0.077 J	1.2	4.6	7.2
Iron (dissolved)	mg/L	0.2	0.26	0.055 J	0.19	0.5	0.77
Manganese	mg/L	0.054	0.11	0.061	0.083	0.36	0.84
Manganese (dissolved)	mg/L	0.045	0.067	0.062	0.028	0.044	0.23
General Chemistry							
Alkalinity, total (as CaCO3)	mg/L	350	310	290	300	310	250
Nitrate (as N)	mg/L	0.75 H	1.9 H	3.2 H	2.7 H	3.7 H	0.61 H
Sulfate	mg/L	36	49	29	59	42	52
Total organic carbon (TOC)	mg/L	3.5	1.1	1.5	1.1	1.3	1.1

Notes:
J - Estimated concentration.
H - Sample was prepped or analyzed beyond the specified holding time.

Appendix B

AOI 31 Interim Measure Investigation Laboratory Reports

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Ruth Mickle
GHD Services Inc.
26850 Haggerty Rd.
Farmington Hills, Michigan 48331

Generated 6/25/2024 9:45:41 AM

JOB DESCRIPTION

12573440-T05Y2401C-01, RACER Eckles

JOB NUMBER

240-205928-1

Eurofins Cleveland

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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Case Narrative

Client: GHD Services Inc.
Project: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Job ID: 240-205928-1

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Job Narrative 240-205928-1

Receipt

The samples were received on 6/10/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 6.3°C.

GC/MS VOA

Method 8260D_ML: The continuing calibration verification (CCV) analyzed in batch 240-616284 was outside the method criteria for the following analyte(s): Chloromethane and Dichlorodifluoromethane. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D_ML: The continuing calibration verification (CCV) associated with batch 240-616284 recovered above the upper control limit for Bromomethane, Chloroethane, Isopropylbenzene and Trichlorofluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: SB-510 (5-7.5') (240-205928-1), SB-510 (12-14.5') (240-205928-2), SB-512 (5-7.5') (240-205928-3), SB-512 (12-14.5') (240-205928-4), SB-514 (5-7.5') (240-205928-5) and SB-514 (12-14.5') (240-205928-6).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Geotechnical

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-205928-1	SB-510 (5-7.5')	Solid	06/06/24 12:30	06/10/24 09:30
240-205928-2	SB-510 (12-14.5')	Solid	06/06/24 12:35	06/10/24 09:30
240-205928-3	SB-512 (5-7.5')	Solid	06/06/24 17:25	06/10/24 09:30
240-205928-4	SB-512 (12-14.5')	Solid	06/06/24 17:30	06/10/24 09:30
240-205928-5	SB-514 (5-7.5')	Solid	06/07/24 12:45	06/10/24 09:30
240-205928-6	SB-514 (12-14.5')	Solid	06/07/24 12:50	06/10/24 09:30

Detection Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Client Sample ID: SB-510 (5-7.5')

Lab Sample ID: 240-205928-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
1,2,4-Trichlorobenzene	110	J	250	71	ug/Kg	1		✱	8260D MI	Total/NA
1,2-Dichlorobenzene	16	J	100	7.6	ug/Kg	1		✱	8260D MI	Total/NA
1,3-Dichlorobenzene	14	J	100	7.6	ug/Kg	1		✱	8260D MI	Total/NA
Fractional Organic Carbon	0.2				%	1			D2974	Total/NA

Client Sample ID: SB-510 (12-14.5')

Lab Sample ID: 240-205928-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Fractional Organic Carbon	0.1				%	1			D2974	Total/NA

Client Sample ID: SB-512 (5-7.5')

Lab Sample ID: 240-205928-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
1,1,1-Trichloroethane	53		52	19	ug/Kg	1		✱	8260D MI	Total/NA
Trichloroethene	18	J	52	14	ug/Kg	1		✱	8260D MI	Total/NA
Fractional Organic Carbon	0.2				%	1			D2974	Total/NA

Client Sample ID: SB-512 (12-14.5')

Lab Sample ID: 240-205928-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
1,1,1-Trichloroethane	140		57	22	ug/Kg	1		✱	8260D MI	Total/NA
Fractional Organic Carbon	0.2				%	1			D2974	Total/NA

Client Sample ID: SB-514 (5-7.5')

Lab Sample ID: 240-205928-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
1,1,1-Trichloroethane	43	J	54	20	ug/Kg	1		✱	8260D MI	Total/NA
Fractional Organic Carbon	0.2				%	1			D2974	Total/NA

Client Sample ID: SB-514 (12-14.5')

Lab Sample ID: 240-205928-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Fractional Organic Carbon	0.2				%	1			D2974	Total/NA

This Detection Summary does not include radiochemical test results.

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Method Summary

Client: GHD Services Inc.

Job ID: 240-205928-1

Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Method	Method Description	Protocol	Laboratory
8260D MI	Volatile Organic Compounds by GC/MS	SW846	EET CLE
Moisture	Percent Moisture	EPA	EET CLE
D2974	Moisture, Ash and Organic Matter	ASTM	EET BUR
5035	Closed System Purge and Trap	SW846	EET CLE

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-510 (5-7.5')

Date Collected: 06/06/24 12:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-1

Matrix: Solid

Percent Solids: 88.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	51	U	51	19	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	20	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,1,2-Trichloroethane	51	U	51	15	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,1,2,2-Tetrachloroethane	51	U	51	15	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,1-Dichloroethane	51	U	51	10	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,1-Dichloroethene	51	U	51	20	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,2,4-Trichlorobenzene	110	J	250	71	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,2-Dibromo-3-Chloropropane	250	U	250	100	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Ethylene Dibromide	250	U	250	10	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,2-Dichlorobenzene	16	J	100	7.6	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,2-Dichloroethane	51	U	51	19	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,2-Dichloropropane	51	U	51	14	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,3-Dichlorobenzene	14	J	100	7.6	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
1,4-Dichlorobenzene	100	U	100	7.6	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
2-Butanone (MEK)	760	U	760	180	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
2-Hexanone	2500	U	2500	160	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
4-Methyl-2-pentanone (MIBK)	2500	U	2500	160	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Acetone	760	U	760	290	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Benzene	51	U	51	11	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Dichlorobromomethane	100	U	100	24	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Bromoform	100	U	100	39	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Bromomethane	320	U	320	260	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Carbon disulfide	250	U	250	20	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Carbon tetrachloride	51	U	51	20	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Chlorobenzene	51	U	51	11	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Chloroethane	250	U	250	210	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Chloroform	51	U	51	14	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Chloromethane	250	U	250	25	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
cis-1,2-Dichloroethene	51	U	51	11	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
cis-1,3-Dichloropropene	51	U	51	27	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Cyclohexane	1200	U	1200	60	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Chlorodibromomethane	51	U	51	14	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Dichlorodifluoromethane	100	U	100	46	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Ethylbenzene	51	U	51	7.6	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Isopropylbenzene	250	U	250	10	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Methyl acetate	1200	U	1200	310	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Methyl tert-butyl ether	250	U	250	63	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Methylcyclohexane	1200	U	1200	13	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Methylene Chloride	630	U	630	230	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Styrene	51	U	51	18	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Tetrachloroethene	51	U	51	8.9	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Toluene	100	U	100	30	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
trans-1,2-Dichloroethene	51	U	51	13	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
trans-1,3-Dichloropropene	51	U	51	28	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Trichloroethene	51	U	51	14	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Trichlorofluoromethane	100	U	100	51	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Vinyl chloride	41	U	41	15	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1
Xylenes, Total	150	U	150	34	ug/Kg	✱	06/11/24 13:41	06/12/24 14:26	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		56 - 125	06/11/24 13:41	06/12/24 14:26	1
Dibromofluoromethane (Surr)	91		41 - 138	06/11/24 13:41	06/12/24 14:26	1
4-Bromofluorobenzene (Surr)	97		41 - 143	06/11/24 13:41	06/12/24 14:26	1
1,2-Dichloroethane-d4 (Surr)	95		58 - 125	06/11/24 13:41	06/12/24 14:26	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-510 (12-14.5')

Date Collected: 06/06/24 12:35

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-2

Matrix: Solid

Percent Solids: 82.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	58	U	58	22	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,1,2-Trichloro-1,2,2-trifluoroethane	290	U	290	23	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,1,2-Trichloroethane	58	U	58	17	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,1,2,2-Tetrachloroethane	58	U	58	17	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,1-Dichloroethane	58	U	58	12	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,1-Dichloroethene	58	U	58	23	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,2,4-Trichlorobenzene	290	U	290	81	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,2-Dibromo-3-Chloropropane	290	U	290	120	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Ethylene Dibromide	290	U	290	12	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,2-Dichlorobenzene	120	U	120	8.6	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,2-Dichloroethane	58	U	58	22	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,2-Dichloropropane	58	U	58	16	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,3-Dichlorobenzene	120	U	120	8.6	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
1,4-Dichlorobenzene	120	U	120	8.6	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
2-Butanone (MEK)	860	U	860	200	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
2-Hexanone	2900	U	2900	190	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
4-Methyl-2-pentanone (MIBK)	2900	U	2900	190	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Acetone	860	U	860	330	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Benzene	58	U	58	13	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Dichlorobromomethane	120	U	120	27	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Bromoform	120	U	120	45	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Bromomethane	360	U	360	290	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Carbon disulfide	290	U	290	23	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Carbon tetrachloride	58	U	58	23	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Chlorobenzene	58	U	58	13	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Chloroethane	290	U	290	240	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Chloroform	58	U	58	16	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Chloromethane	290	U	290	29	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
cis-1,2-Dichloroethene	58	U	58	13	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
cis-1,3-Dichloropropene	58	U	58	30	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Cyclohexane	1400	U	1400	68	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Chlorodibromomethane	58	U	58	16	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Dichlorodifluoromethane	120	U	120	52	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Ethylbenzene	58	U	58	8.6	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Isopropylbenzene	290	U	290	12	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Methyl acetate	1400	U	1400	360	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Methyl tert-butyl ether	290	U	290	72	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Methylcyclohexane	1400	U	1400	14	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Methylene Chloride	720	U	720	260	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Styrene	58	U	58	20	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Tetrachloroethene	58	U	58	10	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Toluene	120	U	120	35	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
trans-1,2-Dichloroethene	58	U	58	14	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
trans-1,3-Dichloropropene	58	U	58	32	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Trichloroethene	58	U	58	16	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Trichlorofluoromethane	120	U	120	58	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Vinyl chloride	46	U	46	17	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1
Xylenes, Total	170	U	170	39	ug/Kg	☆	06/11/24 13:41	06/12/24 14:49	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		56 - 125	06/11/24 13:41	06/12/24 14:49	1
Dibromofluoromethane (Surr)	85		41 - 138	06/11/24 13:41	06/12/24 14:49	1
4-Bromofluorobenzene (Surr)	94		41 - 143	06/11/24 13:41	06/12/24 14:49	1
1,2-Dichloroethane-d4 (Surr)	90		58 - 125	06/11/24 13:41	06/12/24 14:49	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-512 (5-7.5')

Date Collected: 06/06/24 17:25

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-3

Matrix: Solid

Percent Solids: 87.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	53		52	19	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,1,2-Trichloro-1,2,2-trifluoroethane	260	U	260	21	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,1,2-Trichloroethane	52	U	52	16	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,1,2,2-Tetrachloroethane	52	U	52	16	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,1-Dichloroethane	52	U	52	10	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,1-Dichloroethene	52	U	52	21	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,2,4-Trichlorobenzene	260	U	260	72	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,2-Dibromo-3-Chloropropane	260	U	260	100	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Ethylene Dibromide	260	U	260	10	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,2-Dichlorobenzene	100	U	100	7.8	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,2-Dichloroethane	52	U	52	19	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,2-Dichloropropane	52	U	52	14	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,3-Dichlorobenzene	100	U	100	7.8	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
1,4-Dichlorobenzene	100	U	100	7.8	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
2-Butanone (MEK)	780	U	780	180	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
2-Hexanone	2600	U	2600	170	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
4-Methyl-2-pentanone (MIBK)	2600	U	2600	170	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Acetone	780	U	780	300	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Benzene	52	U	52	12	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Dichlorobromomethane	100	U	100	25	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Bromoform	100	U	100	40	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Bromomethane	320	U	320	260	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Carbon disulfide	260	U	260	21	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Carbon tetrachloride	52	U	52	21	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Chlorobenzene	52	U	52	12	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Chloroethane	260	U	260	210	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Chloroform	52	U	52	14	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Chloromethane	260	U	260	26	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
cis-1,2-Dichloroethene	52	U	52	12	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
cis-1,3-Dichloropropene	52	U	52	27	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Cyclohexane	1200	U	1200	61	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Chlorodibromomethane	52	U	52	14	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Dichlorodifluoromethane	100	U	100	47	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Ethylbenzene	52	U	52	7.8	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Isopropylbenzene	260	U	260	10	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Methyl acetate	1200	U	1200	320	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Methyl tert-butyl ether	260	U	260	65	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Methylcyclohexane	1200	U	1200	13	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Methylene Chloride	650	U	650	230	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Styrene	52	U	52	18	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Tetrachloroethene	52	U	52	9.1	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Toluene	100	U	100	31	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
trans-1,2-Dichloroethene	52	U	52	13	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
trans-1,3-Dichloropropene	52	U	52	28	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Trichloroethene	18 J		52	14	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Trichlorofluoromethane	100	U	100	52	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Vinyl chloride	41	U	41	16	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1
Xylenes, Total	160	U	160	35	ug/Kg	☆	06/11/24 13:41	06/12/24 15:13	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		56 - 125	06/11/24 13:41	06/12/24 15:13	1
Dibromofluoromethane (Surr)	86		41 - 138	06/11/24 13:41	06/12/24 15:13	1
4-Bromofluorobenzene (Surr)	88		41 - 143	06/11/24 13:41	06/12/24 15:13	1
1,2-Dichloroethane-d4 (Surr)	91		58 - 125	06/11/24 13:41	06/12/24 15:13	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-512 (12-14.5')

Date Collected: 06/06/24 17:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-4

Matrix: Solid

Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	140		57	22	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,1,2-Trichloro-1,2,2-trifluoroethane	290	U	290	23	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,1,2-Trichloroethane	57	U	57	17	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,1,2,2-Tetrachloroethane	57	U	57	17	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,1-Dichloroethane	57	U	57	11	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,1-Dichloroethene	57	U	57	23	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,2,4-Trichlorobenzene	290	U	290	80	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,2-Dibromo-3-Chloropropane	290	U	290	110	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Ethylene Dibromide	290	U	290	11	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,2-Dichlorobenzene	110	U	110	8.6	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,2-Dichloroethane	57	U	57	22	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,2-Dichloropropane	57	U	57	16	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,3-Dichlorobenzene	110	U	110	8.6	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
1,4-Dichlorobenzene	110	U	110	8.6	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
2-Butanone (MEK)	860	U	860	200	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
2-Hexanone	2900	U	2900	190	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
4-Methyl-2-pentanone (MIBK)	2900	U	2900	190	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Acetone	860	U	860	330	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Benzene	57	U	57	13	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Dichlorobromomethane	110	U	110	27	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Bromoform	110	U	110	44	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Bromomethane	360	U	360	290	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Carbon disulfide	290	U	290	23	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Carbon tetrachloride	57	U	57	23	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Chlorobenzene	57	U	57	13	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Chloroethane	290	U	290	240	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Chloroform	57	U	57	16	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Chloromethane	290	U	290	29	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
cis-1,2-Dichloroethene	57	U	57	13	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
cis-1,3-Dichloropropene	57	U	57	30	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Cyclohexane	1400	U	1400	67	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Chlorodibromomethane	57	U	57	16	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Dichlorodifluoromethane	110	U	110	52	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Ethylbenzene	57	U	57	8.6	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Isopropylbenzene	290	U	290	11	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Methyl acetate	1400	U	1400	350	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Methyl tert-butyl ether	290	U	290	72	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Methylcyclohexane	1400	U	1400	14	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Methylene Chloride	720	U	720	260	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Styrene	57	U	57	20	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Tetrachloroethene	57	U	57	10	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Toluene	110	U	110	34	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
trans-1,2-Dichloroethene	57	U	57	14	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
trans-1,3-Dichloropropene	57	U	57	32	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Trichloroethene	57	U	57	16	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Trichlorofluoromethane	110	U	110	57	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Vinyl chloride	46	U	46	17	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1
Xylenes, Total	170	U	170	39	ug/Kg	✱	06/11/24 13:41	06/12/24 15:36	1

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Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		56 - 125	06/11/24 13:41	06/12/24 15:36	1
Dibromofluoromethane (Surr)	91		41 - 138	06/11/24 13:41	06/12/24 15:36	1
4-Bromofluorobenzene (Surr)	96		41 - 143	06/11/24 13:41	06/12/24 15:36	1
1,2-Dichloroethane-d4 (Surr)	97		58 - 125	06/11/24 13:41	06/12/24 15:36	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-514 (5-7.5')

Date Collected: 06/07/24 12:45

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-5

Matrix: Solid

Percent Solids: 85.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	43	J	54	20	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,1,2-Trichloro-1,2,2-trifluoroethane	270	U	270	21	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,1,2-Trichloroethane	54	U	54	16	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,1,2,2-Tetrachloroethane	54	U	54	16	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,1-Dichloroethane	54	U	54	11	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,1-Dichloroethene	54	U	54	21	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,2,4-Trichlorobenzene	270	U	270	75	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,2-Dibromo-3-Chloropropane	270	U	270	110	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Ethylene Dibromide	270	U	270	11	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,2-Dichlorobenzene	110	U	110	8.1	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,2-Dichloroethane	54	U	54	20	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,2-Dichloropropane	54	U	54	15	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,3-Dichlorobenzene	110	U	110	8.1	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
1,4-Dichlorobenzene	110	U	110	8.1	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
2-Butanone (MEK)	810	U	810	190	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
2-Hexanone	2700	U	2700	170	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
4-Methyl-2-pentanone (MIBK)	2700	U	2700	170	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Acetone	810	U	810	310	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Benzene	54	U	54	12	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Dichlorobromomethane	110	U	110	26	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Bromoform	110	U	110	42	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Bromomethane	340	U	340	270	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Carbon disulfide	270	U	270	21	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Carbon tetrachloride	54	U	54	21	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Chlorobenzene	54	U	54	12	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Chloroethane	270	U	270	220	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Chloroform	54	U	54	15	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Chloromethane	270	U	270	27	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
cis-1,2-Dichloroethene	54	U	54	12	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
cis-1,3-Dichloropropene	54	U	54	28	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Cyclohexane	1300	U	1300	63	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Chlorodibromomethane	54	U	54	15	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Dichlorodifluoromethane	110	U	110	48	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Ethylbenzene	54	U	54	8.1	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Isopropylbenzene	270	U	270	11	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Methyl acetate	1300	U	1300	330	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Methyl tert-butyl ether	270	U	270	67	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Methylcyclohexane	1300	U	1300	13	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Methylene Chloride	670	U	670	240	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Styrene	54	U	54	19	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Tetrachloroethene	54	U	54	9.4	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Toluene	110	U	110	32	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
trans-1,2-Dichloroethene	54	U	54	13	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
trans-1,3-Dichloropropene	54	U	54	30	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Trichloroethene	54	U	54	15	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Trichlorofluoromethane	110	U	110	54	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Vinyl chloride	43	U	43	16	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1
Xylenes, Total	160	U	160	36	ug/Kg	☆	06/11/24 13:41	06/12/24 16:00	1

Eurofins Cleveland

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	91		56 - 125	06/11/24 13:41	06/12/24 16:00	1
Dibromofluoromethane (Surr)	82		41 - 138	06/11/24 13:41	06/12/24 16:00	1
4-Bromofluorobenzene (Surr)	87		41 - 143	06/11/24 13:41	06/12/24 16:00	1
1,2-Dichloroethane-d4 (Surr)	88		58 - 125	06/11/24 13:41	06/12/24 16:00	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS

Client Sample ID: SB-514 (12-14.5')

Date Collected: 06/07/24 12:50

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-6

Matrix: Solid

Percent Solids: 84.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	55	U	55	20	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,1,2-Trichloro-1,2,2-trifluoroethane	270	U	270	22	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,1,2-Trichloroethane	55	U	55	16	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,1,2,2-Tetrachloroethane	55	U	55	16	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,1-Dichloroethane	55	U	55	11	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,1-Dichloroethene	55	U	55	22	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,2,4-Trichlorobenzene	270	U	270	76	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,2-Dibromo-3-Chloropropane	270	U	270	110	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Ethylene Dibromide	270	U	270	11	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,2-Dichlorobenzene	110	U	110	8.2	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,2-Dichloroethane	55	U	55	20	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,2-Dichloropropane	55	U	55	15	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,3-Dichlorobenzene	110	U	110	8.2	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
1,4-Dichlorobenzene	110	U	110	8.2	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
2-Butanone (MEK)	820	U	820	190	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
2-Hexanone	2700	U	2700	180	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
4-Methyl-2-pentanone (MIBK)	2700	U	2700	180	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Acetone	820	U	820	310	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Benzene	55	U	55	12	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Dichlorobromomethane	110	U	110	26	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Bromoform	110	U	110	42	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Bromomethane	340	U	340	280	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Carbon disulfide	270	U	270	22	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Carbon tetrachloride	55	U	55	22	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Chlorobenzene	55	U	55	12	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Chloroethane	270	U	270	220	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Chloroform	55	U	55	15	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Chloromethane	270	U	270	27	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
cis-1,2-Dichloroethene	55	U	55	12	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
cis-1,3-Dichloropropene	55	U	55	29	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Cyclohexane	1300	U	1300	64	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Chlorodibromomethane	55	U	55	15	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Dichlorodifluoromethane	110	U	110	49	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Ethylbenzene	55	U	55	8.2	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Isopropylbenzene	270	U	270	11	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Methyl acetate	1300	U	1300	340	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Methyl tert-butyl ether	270	U	270	68	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Methylcyclohexane	1300	U	1300	14	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Methylene Chloride	680	U	680	240	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Styrene	55	U	55	19	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Tetrachloroethene	55	U	55	9.5	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Toluene	110	U	110	33	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
trans-1,2-Dichloroethene	55	U	55	14	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
trans-1,3-Dichloropropene	55	U	55	30	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Trichloroethene	55	U	55	15	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Trichlorofluoromethane	110	U	110	55	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Vinyl chloride	44	U	44	16	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1
Xylenes, Total	160	U	160	37	ug/Kg	✱	06/11/24 13:41	06/12/24 16:23	1

Eurofins Cleveland

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: SW846 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		56 - 125	06/11/24 13:41	06/12/24 16:23	1
Dibromofluoromethane (Surr)	85		41 - 138	06/11/24 13:41	06/12/24 16:23	1
4-Bromofluorobenzene (Surr)	93		41 - 143	06/11/24 13:41	06/12/24 16:23	1
1,2-Dichloroethane-d4 (Surr)	92		58 - 125	06/11/24 13:41	06/12/24 16:23	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-510 (5-7.5')					Lab Sample ID: 240-205928-1				
Date Collected: 06/06/24 12:30					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 88.1				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	88.1		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	11.9		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-510 (12-14.5')					Lab Sample ID: 240-205928-2				
Date Collected: 06/06/24 12:35					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 82.0				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	82.0		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	18.0		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-512 (5-7.5')						Lab Sample ID: 240-205928-3			
Date Collected: 06/06/24 17:25						Matrix: Solid			
Date Received: 06/10/24 09:30						Percent Solids: 87.2			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	87.2		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	12.8		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-512 (12-14.5')					Lab Sample ID: 240-205928-4				
Date Collected: 06/06/24 17:30					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 82.1				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	82.1		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	17.9		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-514 (5-7.5')					Lab Sample ID: 240-205928-5				
Date Collected: 06/07/24 12:45					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 85.3				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	85.3		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	14.7		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

General Chemistry

Client Sample ID: SB-514 (12-14.5')						Lab Sample ID: 240-205928-6			
Date Collected: 06/07/24 12:50						Matrix: Solid			
Date Received: 06/10/24 09:30						Percent Solids: 84.5			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	84.5		0.1	0.1	%			06/10/24 13:11	1
Percent Moisture (EPA Moisture)	15.5		0.1	0.1	%			06/10/24 13:11	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-510 (5-7.5')					Lab Sample ID: 240-205928-1				
Date Collected: 06/06/24 12:30					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 88.1				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.2				%			06/13/24 19:17	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-510 (12-14.5')					Lab Sample ID: 240-205928-2				
Date Collected: 06/06/24 12:35					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 82.0				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.1				%			06/13/24 19:17	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-512 (5-7.5')					Lab Sample ID: 240-205928-3				
Date Collected: 06/06/24 17:25					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 87.2				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.2				%			06/13/24 19:17	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-512 (12-14.5')					Lab Sample ID: 240-205928-4				
Date Collected: 06/06/24 17:30					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 82.1				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.2				%			06/13/24 19:17	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-514 (5-7.5')					Lab Sample ID: 240-205928-5				
Date Collected: 06/07/24 12:45					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 85.3				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.2				%			06/13/24 19:17	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: ASTM D2974 - Moisture, Ash and Organic Matter

Client Sample ID: SB-514 (12-14.5')					Lab Sample ID: 240-205928-6				
Date Collected: 06/07/24 12:50					Matrix: Solid				
Date Received: 06/10/24 09:30					Percent Solids: 84.5				
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fractional Organic Carbon	0.2				%			06/13/24 19:17	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
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- 13
- 14
- 15

QC Association Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

GC/MS VOA

Prep Batch: 616222

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205928-1	SB-510 (5-7.5')	Total/NA	Solid	5035	
240-205928-2	SB-510 (12-14.5')	Total/NA	Solid	5035	
240-205928-3	SB-512 (5-7.5')	Total/NA	Solid	5035	
240-205928-4	SB-512 (12-14.5')	Total/NA	Solid	5035	
240-205928-5	SB-514 (5-7.5')	Total/NA	Solid	5035	
240-205928-6	SB-514 (12-14.5')	Total/NA	Solid	5035	
MB 240-616222/1-A	Method Blank	Total/NA	Solid	5035	
LCS 240-616222/2-A	Lab Control Sample	Total/NA	Solid	5035	
240-205928-1 MS	SB-510 (5-7.5')	Total/NA	Solid	5035	
240-205928-1 MSD	SB-510 (5-7.5')	Total/NA	Solid	5035	

Analysis Batch: 616284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205928-1	SB-510 (5-7.5')	Total/NA	Solid	8260D MI	616222
240-205928-2	SB-510 (12-14.5')	Total/NA	Solid	8260D MI	616222
240-205928-3	SB-512 (5-7.5')	Total/NA	Solid	8260D MI	616222
240-205928-4	SB-512 (12-14.5')	Total/NA	Solid	8260D MI	616222
240-205928-5	SB-514 (5-7.5')	Total/NA	Solid	8260D MI	616222
240-205928-6	SB-514 (12-14.5')	Total/NA	Solid	8260D MI	616222
MB 240-616222/1-A	Method Blank	Total/NA	Solid	8260D MI	616222
LCS 240-616222/2-A	Lab Control Sample	Total/NA	Solid	8260D MI	616222
240-205928-1 MS	SB-510 (5-7.5')	Total/NA	Solid	8260D MI	616222
240-205928-1 MSD	SB-510 (5-7.5')	Total/NA	Solid	8260D MI	616222

General Chemistry

Analysis Batch: 616080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205928-1	SB-510 (5-7.5')	Total/NA	Solid	Moisture	
240-205928-2	SB-510 (12-14.5')	Total/NA	Solid	Moisture	
240-205928-3	SB-512 (5-7.5')	Total/NA	Solid	Moisture	
240-205928-4	SB-512 (12-14.5')	Total/NA	Solid	Moisture	
240-205928-5	SB-514 (5-7.5')	Total/NA	Solid	Moisture	
240-205928-6	SB-514 (12-14.5')	Total/NA	Solid	Moisture	

Geotechnical

Analysis Batch: 205263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205928-1	SB-510 (5-7.5')	Total/NA	Solid	D2974	
240-205928-2	SB-510 (12-14.5')	Total/NA	Solid	D2974	
240-205928-3	SB-512 (5-7.5')	Total/NA	Solid	D2974	
240-205928-4	SB-512 (12-14.5')	Total/NA	Solid	D2974	
240-205928-5	SB-514 (5-7.5')	Total/NA	Solid	D2974	
240-205928-6	SB-514 (12-14.5')	Total/NA	Solid	D2974	

QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-616222/1-A

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 616222

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	40	U	40	15	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,1,2-Trichloro-1,2,2-trifluoroethane	200	U	200	16	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,1,2-Trichloroethane	40	U	40	12	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,1,2,2-Tetrachloroethane	40	U	40	12	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,1-Dichloroethane	40	U	40	8.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,1-Dichloroethene	40	U	40	16	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,2,4-Trichlorobenzene	200	U	200	56	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,2-Dibromo-3-Chloropropane	200	U	200	80	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Ethylene Dibromide	200	U	200	8.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,2-Dichlorobenzene	80	U	80	6.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,2-Dichloroethane	40	U	40	15	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,2-Dichloropropane	40	U	40	11	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,3-Dichlorobenzene	80	U	80	6.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
1,4-Dichlorobenzene	80	U	80	6.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
2-Butanone (MEK)	600	U	600	140	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
2-Hexanone	2000	U	2000	130	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
4-Methyl-2-pentanone (MIBK)	2000	U	2000	130	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Acetone	600	U	600	230	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Benzene	40	U	40	9.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Dichlorobromomethane	80	U	80	19	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Bromoform	80	U	80	31	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Bromomethane	250	U	250	200	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Carbon disulfide	200	U	200	16	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Carbon tetrachloride	40	U	40	16	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Chlorobenzene	40	U	40	9.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Chloroethane	200	U	200	160	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Chloroform	40	U	40	11	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Chloromethane	200	U	200	20	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
cis-1,2-Dichloroethene	40	U	40	9.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
cis-1,3-Dichloropropene	40	U	40	21	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Cyclohexane	960	U	960	47	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Chlorodibromomethane	40	U	40	11	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Dichlorodifluoromethane	80	U	80	36	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Ethylbenzene	40	U	40	6.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Isopropylbenzene	200	U	200	8.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Methyl acetate	960	U	960	250	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Methyl tert-butyl ether	200	U	200	50	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Methylcyclohexane	960	U	960	10	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Methylene Chloride	500	U	500	180	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Styrene	40	U	40	14	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Tetrachloroethene	40	U	40	7.0	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Toluene	80	U	80	24	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
trans-1,2-Dichloroethene	40	U	40	10	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
trans-1,3-Dichloropropene	40	U	40	22	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Trichloroethene	40	U	40	11	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Trichlorofluoromethane	80	U	80	40	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Vinyl chloride	32	U	32	12	ug/Kg		06/11/24 13:41	06/12/24 13:39	1
Xylenes, Total	120	U	120	27	ug/Kg		06/11/24 13:41	06/12/24 13:39	1

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 240-616222/1-A

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 616222

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		56 - 125	06/11/24 13:41	06/12/24 13:39	1
Dibromofluoromethane (Surr)	84		41 - 138	06/11/24 13:41	06/12/24 13:39	1
4-Bromofluorobenzene (Surr)	87		41 - 143	06/11/24 13:41	06/12/24 13:39	1
1,2-Dichloroethane-d4 (Surr)	88		58 - 125	06/11/24 13:41	06/12/24 13:39	1

Lab Sample ID: LCS 240-616222/2-A

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	1000	941		ug/Kg		94	74 - 136
1,1,2-Trichloro-1,2,2-trifluoroethane	1000	1090		ug/Kg		109	64 - 148
1,1,2-Trichloroethane	1000	865		ug/Kg		86	79 - 120
1,1,2,2-Tetrachloroethane	1000	759		ug/Kg		76	66 - 129
1,1-Dichloroethane	1000	860		ug/Kg		86	74 - 121
1,1-Dichloroethene	1000	958		ug/Kg		96	68 - 141
1,2,4-Trichlorobenzene	1000	1120		ug/Kg		112	58 - 132
1,2-Dibromo-3-Chloropropane	1000	814		ug/Kg		81	52 - 133
Ethylene Dibromide	1000	906		ug/Kg		91	80 - 121
1,2-Dichlorobenzene	1000	990		ug/Kg		99	73 - 120
1,2-Dichloroethane	1000	862		ug/Kg		86	71 - 123
1,2-Dichloropropane	1000	827		ug/Kg		83	76 - 126
1,3-Dichlorobenzene	1000	999		ug/Kg		100	73 - 120
1,4-Dichlorobenzene	1000	981		ug/Kg		98	74 - 120
2-Butanone (MEK)	2000	1780		ug/Kg		89	63 - 142
2-Hexanone	2000	1520	J	ug/Kg		76	65 - 142
4-Methyl-2-pentanone (MIBK)	2000	1540	J	ug/Kg		77	62 - 142
Acetone	2000	1780		ug/Kg		89	58 - 160
Benzene	1000	918		ug/Kg		92	76 - 121
Dichlorobromomethane	1000	820		ug/Kg		82	71 - 138
Bromoform	1000	798		ug/Kg		80	57 - 140
Bromomethane	1000	361		ug/Kg		36	10 - 171
Carbon disulfide	1000	815		ug/Kg		81	43 - 152
Carbon tetrachloride	1000	939		ug/Kg		94	64 - 144
Chlorobenzene	1000	953		ug/Kg		95	80 - 120
Chloroethane	1000	549		ug/Kg		55	11 - 164
Chloroform	1000	875		ug/Kg		87	78 - 120
Chloromethane	1000	634		ug/Kg		63	41 - 142
cis-1,2-Dichloroethene	1000	949		ug/Kg		95	78 - 124
cis-1,3-Dichloropropene	1000	831		ug/Kg		83	70 - 133
Cyclohexane	1000	996		ug/Kg		100	65 - 137
Chlorodibromomethane	1000	832		ug/Kg		83	68 - 131
Dichlorodifluoromethane	1000	559		ug/Kg		56	21 - 150
Ethylbenzene	1000	1060		ug/Kg		106	80 - 120
Isopropylbenzene	1000	1180		ug/Kg		118	80 - 130
Methyl acetate	2000	1400		ug/Kg		70	60 - 133
Methyl tert-butyl ether	1000	952		ug/Kg		95	70 - 130
Methylcyclohexane	1000	1120		ug/Kg		112	70 - 138

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 240-616222/2-A

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Methylene Chloride	1000	826		ug/Kg		83	71 - 124
Styrene	1000	1080		ug/Kg		108	75 - 140
Tetrachloroethene	1000	1000		ug/Kg		100	76 - 127
Toluene	1000	928		ug/Kg		93	80 - 120
trans-1,2-Dichloroethene	1000	951		ug/Kg		95	76 - 130
trans-1,3-Dichloropropene	1000	866		ug/Kg		87	61 - 121
Trichloroethene	1000	1010		ug/Kg		101	74 - 130
Trichlorofluoromethane	1000	746		ug/Kg		75	50 - 154
Vinyl chloride	1000	845		ug/Kg		85	49 - 146
Xylenes, Total	2000	2100		ug/Kg		105	80 - 122
m-Xylene & p-Xylene	1000	1020		ug/Kg		102	80 - 122
o-Xylene	1000	1080		ug/Kg		108	80 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	95		56 - 125
Dibromofluoromethane (Surr)	91		41 - 138
4-Bromofluorobenzene (Surr)	98		41 - 143
1,2-Dichloroethane-d4 (Surr)	91		58 - 125

Lab Sample ID: 240-205928-1 MS

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	51	U	1270	1200		ug/Kg	☼	95	46 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	1270	1290		ug/Kg	☼	102	35 - 164
1,1,2-Trichloroethane	51	U	1270	1100		ug/Kg	☼	87	26 - 149
1,1,2,2-Tetrachloroethane	51	U	1270	953		ug/Kg	☼	75	26 - 159
1,1-Dichloroethane	51	U	1270	1070		ug/Kg	☼	85	46 - 135
1,1-Dichloroethene	51	U	1270	1160		ug/Kg	☼	92	44 - 160
1,2,4-Trichlorobenzene	110	J	1270	1320		ug/Kg	☼	95	10 - 120
1,2-Dibromo-3-Chloropropane	250	U	1270	987		ug/Kg	☼	78	12 - 144
Ethylene Dibromide	250	U	1270	1180		ug/Kg	☼	94	31 - 142
1,2-Dichlorobenzene	16	J	1270	1210		ug/Kg	☼	94	10 - 126
1,2-Dichloroethane	51	U	1270	1110		ug/Kg	☼	87	40 - 132
1,2-Dichloropropane	51	U	1270	1050		ug/Kg	☼	83	45 - 133
1,3-Dichlorobenzene	14	J	1270	1250		ug/Kg	☼	97	10 - 131
1,4-Dichlorobenzene	100	U	1270	1210		ug/Kg	☼	96	10 - 129
2-Butanone (MEK)	760	U	2530	2390		ug/Kg	☼	94	30 - 157
2-Hexanone	2500	U	2530	2070	J	ug/Kg	☼	82	20 - 166
4-Methyl-2-pentanone (MIBK)	2500	U	2530	2120	J	ug/Kg	☼	84	31 - 159
Acetone	760	U	2530	2390		ug/Kg	☼	94	35 - 167
Benzene	51	U	1270	1180		ug/Kg	☼	93	39 - 134
Dichlorobromomethane	100	U	1270	1050		ug/Kg	☼	83	32 - 146
Bromoform	100	U	1270	1070		ug/Kg	☼	84	12 - 144
Bromomethane	320	U	1270	483		ug/Kg	☼	38	10 - 161
Carbon disulfide	250	U	1270	1000		ug/Kg	☼	79	24 - 153
Carbon tetrachloride	51	U	1270	1150		ug/Kg	☼	91	37 - 145

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 240-205928-1 MS

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chlorobenzene	51	U	1270	1210		ug/Kg	✱	96	18 - 134
Chloroethane	250	U	1270	719		ug/Kg	✱	57	14 - 159
Chloroform	51	U	1270	1110		ug/Kg	✱	87	43 - 134
Chloromethane	250	U	1270	773		ug/Kg	✱	61	32 - 151
cis-1,2-Dichloroethene	51	U	1270	1200		ug/Kg	✱	94	48 - 132
cis-1,3-Dichloropropene	51	U	1270	1070		ug/Kg	✱	85	23 - 139
Cyclohexane	1200	U	1270	1190	J	ug/Kg	✱	94	31 - 147
Chlorodibromomethane	51	U	1270	1080		ug/Kg	✱	85	25 - 143
Dichlorodifluoromethane	100	U	1270	661		ug/Kg	✱	52	16 - 157
Ethylbenzene	51	U	1270	1340		ug/Kg	✱	106	17 - 137
Isopropylbenzene	250	U	1270	1470		ug/Kg	✱	116	10 - 146
Methyl acetate	1200	U	2530	1820		ug/Kg	✱	72	13 - 164
Methyl tert-butyl ether	250	U	1270	1200		ug/Kg	✱	95	55 - 134
Methylcyclohexane	1200	U	1270	1330		ug/Kg	✱	105	20 - 153
Methylene Chloride	630	U	1270	1010		ug/Kg	✱	80	38 - 145
Styrene	51	U	1270	1390		ug/Kg	✱	110	10 - 149
Tetrachloroethene	51	U	1270	1250		ug/Kg	✱	98	19 - 147
Toluene	100	U	1270	1170		ug/Kg	✱	93	30 - 137
trans-1,2-Dichloroethene	51	U	1270	1190		ug/Kg	✱	94	41 - 145
trans-1,3-Dichloropropene	51	U	1270	1120		ug/Kg	✱	88	19 - 130
Trichloroethene	51	U	1270	1270		ug/Kg	✱	101	21 - 158
Trichlorofluoromethane	100	U	1270	904		ug/Kg	✱	71	36 - 161
Vinyl chloride	41	U	1270	1010		ug/Kg	✱	79	32 - 163
Xylenes, Total	150	U	2530	2640		ug/Kg	✱	104	17 - 138
m-Xylene & p-Xylene	150	U	1270	1290		ug/Kg	✱	102	10 - 141
o-Xylene	150	U	1270	1350		ug/Kg	✱	107	18 - 139

Surrogate	MS %Recovery	MS Qualifier	MS Limits
Toluene-d8 (Surr)	94		56 - 125
Dibromofluoromethane (Surr)	91		41 - 138
4-Bromofluorobenzene (Surr)	97		41 - 143
1,2-Dichloroethane-d4 (Surr)	91		58 - 125

Lab Sample ID: 240-205928-1 MSD

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane	51	U	1270	1210		ug/Kg	✱	95	46 - 144	1	37
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	1270	1330		ug/Kg	✱	105	35 - 164	3	37
1,1,2-Trichloroethane	51	U	1270	1100		ug/Kg	✱	87	26 - 149	0	40
1,1,2,2-Tetrachloroethane	51	U	1270	952		ug/Kg	✱	75	26 - 159	0	40
1,1-Dichloroethane	51	U	1270	1090		ug/Kg	✱	86	46 - 135	2	36
1,1-Dichloroethene	51	U	1270	1200		ug/Kg	✱	95	44 - 160	3	37
1,2,4-Trichlorobenzene	110	J	1270	1520		ug/Kg	✱	111	10 - 120	14	40
1,2-Dibromo-3-Chloropropane	250	U	1270	1040		ug/Kg	✱	82	12 - 144	5	40
Ethylene Dibromide	250	U	1270	1170		ug/Kg	✱	92	31 - 142	1	40
1,2-Dichlorobenzene	16	J	1270	1260		ug/Kg	✱	98	10 - 126	4	40

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 240-205928-1 MSD

Matrix: Solid

Analysis Batch: 616284

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Prep Batch: 616222

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2-Dichloroethane	51	U	1270	1090		ug/Kg	✱	86	40 - 132	2	35
1,2-Dichloropropane	51	U	1270	1050		ug/Kg	✱	83	45 - 133	0	37
1,3-Dichlorobenzene	14	J	1270	1260		ug/Kg	✱	99	10 - 131	2	40
1,4-Dichlorobenzene	100	U	1270	1210		ug/Kg	✱	96	10 - 129	0	40
2-Butanone (MEK)	760	U	2530	2150		ug/Kg	✱	85	30 - 157	11	40
2-Hexanone	2500	U	2530	1960	J	ug/Kg	✱	77	20 - 166	5	40
4-Methyl-2-pentanone (MIBK)	2500	U	2530	1980	J	ug/Kg	✱	78	31 - 159	7	40
Acetone	760	U	2530	2040		ug/Kg	✱	81	35 - 167	16	40
Benzene	51	U	1270	1160		ug/Kg	✱	91	39 - 134	2	40
Dichlorobromomethane	100	U	1270	1030		ug/Kg	✱	81	32 - 146	2	39
Bromoform	100	U	1270	1070		ug/Kg	✱	85	12 - 144	1	40
Bromomethane	320	U	1270	627		ug/Kg	✱	49	10 - 161	26	40
Carbon disulfide	250	U	1270	1050		ug/Kg	✱	83	24 - 153	4	40
Carbon tetrachloride	51	U	1270	1190		ug/Kg	✱	94	37 - 145	4	38
Chlorobenzene	51	U	1270	1200		ug/Kg	✱	95	18 - 134	1	40
Chloroethane	250	U	1270	830		ug/Kg	✱	66	14 - 159	14	40
Chloroform	51	U	1270	1100		ug/Kg	✱	86	43 - 134	1	36
Chloromethane	250	U	1270	803		ug/Kg	✱	63	32 - 151	4	38
cis-1,2-Dichloroethene	51	U	1270	1220		ug/Kg	✱	96	48 - 132	2	37
cis-1,3-Dichloropropene	51	U	1270	1030		ug/Kg	✱	81	23 - 139	4	39
Cyclohexane	1200	U	1270	1200		ug/Kg	✱	95	31 - 147	1	39
Chlorodibromomethane	51	U	1270	1080		ug/Kg	✱	85	25 - 143	0	40
Dichlorodifluoromethane	100	U	1270	712		ug/Kg	✱	56	16 - 157	7	40
Ethylbenzene	51	U	1270	1320		ug/Kg	✱	104	17 - 137	2	40
Isopropylbenzene	250	U	1270	1490		ug/Kg	✱	117	10 - 146	1	40
Methyl acetate	1200	U	2530	1820		ug/Kg	✱	72	13 - 164	0	40
Methyl tert-butyl ether	250	U	1270	1210		ug/Kg	✱	95	55 - 134	0	37
Methylcyclohexane	1200	U	1270	1340		ug/Kg	✱	106	20 - 153	1	40
Methylene Chloride	630	U	1270	1040		ug/Kg	✱	82	38 - 145	2	40
Styrene	51	U	1270	1360		ug/Kg	✱	107	10 - 149	3	40
Tetrachloroethene	51	U	1270	1260		ug/Kg	✱	99	19 - 147	1	40
Toluene	100	U	1270	1170		ug/Kg	✱	92	30 - 137	0	40
trans-1,2-Dichloroethene	51	U	1270	1210		ug/Kg	✱	95	41 - 145	1	37
trans-1,3-Dichloropropene	51	U	1270	1120		ug/Kg	✱	88	19 - 130	0	40
Trichloroethene	51	U	1270	1270		ug/Kg	✱	100	21 - 158	0	40
Trichlorofluoromethane	100	U	1270	1230		ug/Kg	✱	97	36 - 161	31	40
Vinyl chloride	41	U	1270	1070		ug/Kg	✱	85	32 - 163	6	38
Xylenes, Total	150	U	2530	2650		ug/Kg	✱	105	17 - 138	0	40
m-Xylene & p-Xylene	150	U	1270	1280		ug/Kg	✱	101	10 - 141	1	40
o-Xylene	150	U	1270	1370		ug/Kg	✱	108	18 - 139	1	40

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Toluene-d8 (Surr)	94		56 - 125
Dibromofluoromethane (Surr)	92		41 - 138
4-Bromofluorobenzene (Surr)	95		41 - 143
1,2-Dichloroethane-d4 (Surr)	90		58 - 125

Eurofins Cleveland

Surrogate Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Method: 8260D MI - Volatile Organic Compounds by GC/MS
Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TOL	DBFM	BFB	DCA
		(56-125)	(41-138)	(41-143)	(58-125)
240-205928-1	SB-510 (5-7.5')	97	91	97	95
240-205928-1 MS	SB-510 (5-7.5')	94	91	97	91
240-205928-1 MSD	SB-510 (5-7.5')	94	92	95	90
240-205928-2	SB-510 (12-14.5')	95	85	94	90
240-205928-3	SB-512 (5-7.5')	94	86	88	91
240-205928-4	SB-512 (12-14.5')	101	91	96	97
240-205928-5	SB-514 (5-7.5')	91	82	87	88
240-205928-6	SB-514 (12-14.5')	97	85	93	92
LCS 240-616222/2-A	Lab Control Sample	95	91	98	91
MB 240-616222/1-A	Method Blank	94	84	87	88

Surrogate Legend
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Client Sample ID: SB-510 (5-7.5')

Date Collected: 06/06/24 12:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-510 (5-7.5')

Date Collected: 06/06/24 12:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-1

Matrix: Solid

Percent Solids: 88.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 14:26

Client Sample ID: SB-510 (12-14.5')

Date Collected: 06/06/24 12:35

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-510 (12-14.5')

Date Collected: 06/06/24 12:35

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-2

Matrix: Solid

Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 14:49

Client Sample ID: SB-512 (5-7.5')

Date Collected: 06/06/24 17:25

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-512 (5-7.5')

Date Collected: 06/06/24 17:25

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-3

Matrix: Solid

Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 15:13

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Lab Chronicle

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Client Sample ID: SB-512 (12-14.5')

Date Collected: 06/06/24 17:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-512 (12-14.5')

Date Collected: 06/06/24 17:30

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-4

Matrix: Solid

Percent Solids: 82.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 15:36

Client Sample ID: SB-514 (5-7.5')

Date Collected: 06/07/24 12:45

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-514 (5-7.5')

Date Collected: 06/07/24 12:45

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-5

Matrix: Solid

Percent Solids: 85.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 16:00

Client Sample ID: SB-514 (12-14.5')

Date Collected: 06/07/24 12:50

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-6

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	616080	AJ	EET CLE	06/10/24 13:11
Total/NA	Analysis	D2974		1	205263	MAP	EET BUR	06/13/24 19:17

Client Sample ID: SB-514 (12-14.5')

Date Collected: 06/07/24 12:50

Date Received: 06/10/24 09:30

Lab Sample ID: 240-205928-6

Matrix: Solid

Percent Solids: 84.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			616222	LAM	EET CLE	06/11/24 13:41
Total/NA	Analysis	8260D MI		1	616284	AJS	EET CLE	06/12/24 16:23

Laboratory References:

EET BUR = Eurofins Burlington, 530 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Eurofins Cleveland

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205928-1

Laboratory: Eurofins Cleveland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-28-25
Georgia	State	4062	02-27-25
Illinois	NELAP	200004	07-31-24
Iowa	State	421	06-01-25
Kentucky (UST)	State	112225	02-27-25
Kentucky (WW)	State	KY98016	12-30-24
Minnesota	NELAP	039-999-348	12-31-24
New Jersey	NELAP	OH001	06-30-24
New York	NELAP	10975	04-02-25
Ohio VAP	State	ORELAP 4062	02-27-25
Oregon	NELAP	4062	06-16-24
Pennsylvania	NELAP	68-00340	08-31-24
Texas	NELAP	T104704517-22-19	08-31-24
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-24
West Virginia DEP	State	210	12-31-24

Laboratory: Eurofins Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-26
Connecticut	State	PH-0751	09-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-19-25
Florida	NELAP	E87467	06-30-24
Minnesota	NELAP	050-999-436	12-31-24
New Hampshire	NELAP	2006	12-18-24
New Jersey	NELAP	VT972	06-30-24
New York	NELAP	10391	03-31-25
Pennsylvania	NELAP	68-00489	04-30-25
Rhode Island	State	LAO00298	12-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00272	12-19-26
Vermont	State	VT4000	02-10-25
Virginia	NELAP	460209	12-14-24
Wisconsin	State	399140830	08-31-24



240-205928 Chain of Custody

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # : _____	
Barberton Facility			
Client <u>GHD</u>		Site Name _____	
Cooler Received on <u>6-10-24</u>		Opened on <u>6-10-24</u>	
FedEx 1 st Ord Exp <u>UPS</u>		FAS Waypoint Client Drop Off Eurofins Courier Other _____	
Receipt After-hours Drop-off Date/Time _____		Storage Location _____	
Eurofins Cooler # <u>42</u>		Foam Box Client Cooler Box Other _____	
Packing material used: <u>Bubble Wrap</u>		Foam Plastic Bag None Other _____	
COOLANT Wet Ice Blue Ice Dry Ice <u>Water</u>		None _____	
1 Cooler temperature upon receipt ☐ See Multiple Cooler Form			
IR GUN # <u>18</u> (CF <u>A</u> °C) Observed Cooler Temp. <u>6.3</u> °C Corrected Cooler Temp <u>6.3</u> °C			
2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____		Yes No	
-Were the seals on the outside of the cooler(s) signed & dated?		Yes No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/McHg)?		Yes No	
-Were tamper/custody seals intact and uncompromised?		Yes No NA	
3 Shippers' packing slip attached to the cooler(s)?		Yes No	
4 Did custody papers accompany the sample(s)?		Yes No	
5 Were the custody papers relinquished & signed in the appropriate place?		Yes No	
6 Was/were the person(s) who collected the samples clearly identified on the COC?		Yes No	
7 Did all bottles arrive in good condition (Unbroken)?		Yes No	
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?		Yes No	
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		Yes No	
10 Were correct bottle(s) used for the test(s) indicated?		Yes No	
11 Sufficient quantity received to perform indicated analyses?		Yes No	
12 Are these work share samples and all listed on the COC?		Yes No	
If yes, Questions 13-17 have been checked at the originating laboratory			
13 Were all preserved sample(s) at the correct pH upon receipt?		Yes No NA pH Strip Lot# HC339814	
14 Were VOAs on the COC?		Yes No	
15 Were air bubbles >6 mm in any VOA vials? Larger than this.		Yes No NA	
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____		Yes No	
17 Was a LL Hg or Me Hg trip blank present? _____		Yes No	
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____			
Concerning _____			

Tests that are not
checked for pH by
Receiving:

VOAs
Oil and Grease
TOC

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES☐ additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen. _____

Temperature readings _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservation</u>	<u>Preservation</u>
			<u>pH</u>	<u>Temp</u>	<u>Added</u>	<u>Lot Number</u>
SB-510 (5-7 5)	240-205928-B-1	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-510 (5-7 5)	240-205928-C-1	Soil jar 16oz - clear glass	_____	_____	_____	_____
SB-510 (12-14.5)	240-205928-B-2	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-510 (12-14.5)	240-205928-C-2	Soil jar 16oz - clear glass	_____	_____	_____	_____
SB-512 (5-7.5)	240-205928-B-3	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-512 (5-7.5)	240-205928-C-3	Soil jar 16oz - clear glass	_____	_____	_____	_____
SB-512 (12-14 5)	240-205928-B-4	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-512 (12-14 5)	240-205928-C-4	Soil jar 16oz - clear glass	_____	_____	_____	_____
SB-514 (5-7 5)	240-205928-B-5	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-514 (5-7 5)	240-205928-C-5	Soil jar 16oz - clear glass	_____	_____	_____	_____
SB-514 (12-14 5)	240-205928-B-6	Voa Vial 40ml - 10mL MeOH	_____	_____	_____	_____
SB-514 (12-14 5)	240-205928-C-6	Soil jar 16oz - clear glass	_____	_____	_____	_____

fins | Environment Testing

[illegible]

ORIGIN ID: CAKA (330) 312-0176
LANCE HERSHMAN
EUROFINS TESTAMERICA BARBERTON
180 S VAN BUREN

BARBERTON, OH 44203
UNITED STATES US

SHIP DATE: 10JUN24
ACTWGT: 37.00 LB MAN
CAD: 0792304/C/FE3808

BILL SENDER

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
530 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON VT 05403

(002) 600-1990
PO-YES

REF: 8240-121531



FedEx
Express



TUE - 11 JUN 10:30

FedEx
TRACK
0201

7415 6788 5140

TUE - 11 JUN AA
PRIORITY OVERNIGHT

NX BTVA

05403
VT-US
BTV



4910589 11Jun 02:48 INDHU 57765/8210/D406

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 240-205928-1

Login Number: 205928

List Number: 2

Creator: Muniz, Luca

List Source: Eurofins Burlington

List Creation: 06/12/24 09:54 AM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.2°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Ruth Mickle
GHD Services Inc.
26850 Haggerty Rd.
Farmington Hills, Michigan 48331

Generated 6/23/2024 10:29:39 AM

JOB DESCRIPTION

12573440-T05Y2401C-01, RACER Eckles

JOB NUMBER

240-205929-1

Eurofins Cleveland

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
6/23/2024 10:29:39 AM

Authorized for release by
Denise Heckler, Project Manager II
Denise.Heckler@et.eurofinsus.com
(330)966-9477

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Case Narrative

Client: GHD Services Inc.
Project: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Job ID: 240-205929-1

Eurofins Cleveland

Job Narrative 240-205929-1

Receipt

The samples were received on 6/10/2024 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 6.4°C. The nitrate was analyzed past the 48 hour holding time as the samples arrived after the hold time expired.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Cleveland

Definitions/Glossary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-205929-1	SB-510 (5-7.5')	Water	06/06/24 14:37	06/10/24 09:30
240-205929-2	SB-510 (12-14.5')	Water	06/06/24 15:33	06/10/24 09:30
240-205929-3	SB-512 (5-7.5')	Water	06/07/24 11:12	06/10/24 09:30
240-205929-4	SB-512 (12-14.5')	Water	06/07/24 10:38	06/10/24 09:30
240-205929-5	SB-514 (5-7.5')	Water	06/07/24 17:11	06/10/24 09:30
240-205929-6	SB-514 (12-14.5')	Water	06/07/24 16:22	06/10/24 09:30

Detection Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Client Sample ID: SB-510 (5-7.5')

Lab Sample ID: 240-205929-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	240		100	47	ug/L	1		6020B	Total
									Recoverable
Manganese	54		5.0	3.5	ug/L	1		6020B	Total
									Recoverable
Iron	200		100	47	ug/L	1		6020B	Dissolved
Manganese	45		5.0	3.5	ug/L	1		6020B	Dissolved
Alkalinity	350		5.0	2.6	mg/L	1		2320B-2011	Total/NA
Nitrate as N	0.75	H H3	0.10	0.015	mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	36		1.0	0.35	mg/L	1		300.0-1993 R2.1	Total/NA
Total Organic Carbon	3.5		1.0	0.44	mg/L	1		5310 C-2014	Total/NA

Client Sample ID: SB-510 (12-14.5')

Lab Sample ID: 240-205929-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	630		100	47	ug/L	1		6020B	Total
									Recoverable
Manganese	110		5.0	3.5	ug/L	1		6020B	Total
									Recoverable
Iron	260		100	47	ug/L	1		6020B	Dissolved
Manganese	67		5.0	3.5	ug/L	1		6020B	Dissolved
Alkalinity	310		5.0	2.6	mg/L	1		2320B-2011	Total/NA
Nitrate as N	1.9	H H3	0.10	0.015	mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	49		1.0	0.35	mg/L	1		300.0-1993 R2.1	Total/NA
Total Organic Carbon	1.1		1.0	0.44	mg/L	1		5310 C-2014	Total/NA

Client Sample ID: SB-512 (5-7.5')

Lab Sample ID: 240-205929-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	77	J	100	47	ug/L	1		6020B	Total
									Recoverable
Manganese	61		5.0	3.5	ug/L	1		6020B	Total
									Recoverable
Iron	55	J	100	47	ug/L	1		6020B	Dissolved
Manganese	62		5.0	3.5	ug/L	1		6020B	Dissolved
Alkalinity	290		5.0	2.6	mg/L	1		2320B-2011	Total/NA
Nitrate as N	3.2	H H3	0.10	0.015	mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	29		1.0	0.35	mg/L	1		300.0-1993 R2.1	Total/NA
Total Organic Carbon	1.5		1.0	0.44	mg/L	1		5310 C-2014	Total/NA

Client Sample ID: SB-512 (12-14.5')

Lab Sample ID: 240-205929-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	1200		100	47	ug/L	1		6020B	Total
									Recoverable
Manganese	83		5.0	3.5	ug/L	1		6020B	Total
									Recoverable
Iron	190		100	47	ug/L	1		6020B	Dissolved
Manganese	28		5.0	3.5	ug/L	1		6020B	Dissolved
Alkalinity	300		5.0	2.6	mg/L	1		2320B-2011	Total/NA
Nitrate as N	2.7	H H3	0.10	0.015	mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	59		1.0	0.35	mg/L	1		300.0-1993 R2.1	Total/NA
Total Organic Carbon	1.1		1.0	0.44	mg/L	1		5310 C-2014	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Client Sample ID: SB-514 (5-7.5')

Lab Sample ID: 240-205929-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Iron	4600		100	47	ug/L	1			6020B	Total
										Recoverable
Manganese	360		5.0	3.5	ug/L	1			6020B	Total
										Recoverable
Iron	500		100	47	ug/L	1			6020B	Dissolved
Manganese	44		5.0	3.5	ug/L	1			6020B	Dissolved
Alkalinity	310		5.0	2.6	mg/L	1			2320B-2011	Total/NA
Nitrate as N	3.7	H H3	0.10	0.015	mg/L	1			300.0-1993 R2.1	Total/NA
Sulfate	42		1.0	0.35	mg/L	1			300.0-1993 R2.1	Total/NA
Total Organic Carbon	1.3		1.0	0.44	mg/L	1			5310 C-2014	Total/NA

Client Sample ID: SB-514 (12-14.5')

Lab Sample ID: 240-205929-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Iron	7200		100	47	ug/L	1			6020B	Total
										Recoverable
Manganese	840		5.0	3.5	ug/L	1			6020B	Total
										Recoverable
Iron	770		100	47	ug/L	1			6020B	Dissolved
Manganese	230		5.0	3.5	ug/L	1			6020B	Dissolved
Alkalinity	250		5.0	2.6	mg/L	1			2320B-2011	Total/NA
Nitrate as N	0.61	H H3	0.10	0.015	mg/L	1			300.0-1993 R2.1	Total/NA
Sulfate	52		1.0	0.35	mg/L	1			300.0-1993 R2.1	Total/NA
Total Organic Carbon	1.1		1.0	0.44	mg/L	1			5310 C-2014	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Method Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CLE
2320B-2011	Alkalinity, Total	SM	EET CLE
300.0-1993 R2.1	Anions, Ion Chromatography	EPA	EET CLE
5310 C-2014	Total Organic Carbon/Persulfate - Ultrav	SM	EET CLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-510 (5-7.5')							Lab Sample ID: 240-205929-1			
Date Collected: 06/06/24 14:37							Matrix: Water			
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	240		100	47	ug/L		06/11/24 14:00	06/12/24 23:17	1	
Manganese	54		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:17	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-510 (12-14.5')						Lab Sample ID: 240-205929-2				
Date Collected: 06/06/24 15:33						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	630		100	47	ug/L		06/11/24 14:00	06/12/24 23:22	1	
Manganese	110		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:22	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-512 (5-7.5')						Lab Sample ID: 240-205929-3				
Date Collected: 06/07/24 11:12						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	77	J	100	47	ug/L		06/11/24 14:00	06/12/24 23:27	1	
Manganese	61		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:27	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-512 (12-14.5')						Lab Sample ID: 240-205929-4				
Date Collected: 06/07/24 10:38						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	1200		100	47	ug/L		06/11/24 14:00	06/12/24 23:32	1	
Manganese	83		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:32	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-514 (5-7.5')						Lab Sample ID: 240-205929-5				
Date Collected: 06/07/24 17:11						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	4600		100	47	ug/L		06/11/24 14:00	06/12/24 23:42	1	
Manganese	360		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:42	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: SB-514 (12-14.5')						Lab Sample ID: 240-205929-6			
Date Collected: 06/07/24 16:22						Matrix: Water			
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	7200		100	47	ug/L		06/11/24 14:00	06/12/24 23:47	1
Manganese	840		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:47	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-510 (5-7.5')							Lab Sample ID: 240-205929-1			
Date Collected: 06/06/24 14:37							Matrix: Water			
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	200		100	47	ug/L		06/11/24 14:00	06/12/24 23:19	1	
Manganese	45		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:19	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-510 (12-14.5')						Lab Sample ID: 240-205929-2				
Date Collected: 06/06/24 15:33						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	260		100	47	ug/L		06/11/24 14:00	06/12/24 23:24	1	
Manganese	67		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:24	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-512 (5-7.5')					Lab Sample ID: 240-205929-3				
Date Collected: 06/07/24 11:12					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	55	J	100	47	ug/L		06/11/24 14:00	06/12/24 23:29	1
Manganese	62		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:29	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-512 (12-14.5')						Lab Sample ID: 240-205929-4				
Date Collected: 06/07/24 10:38						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	190		100	47	ug/L		06/11/24 14:00	06/12/24 23:35	1	
Manganese	28		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:35	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-514 (5-7.5')							Lab Sample ID: 240-205929-5			
Date Collected: 06/07/24 17:11							Matrix: Water			
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	500		100	47	ug/L		06/11/24 14:00	06/12/24 23:45	1	
Manganese	44		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:45	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Client Sample ID: SB-514 (12-14.5')						Lab Sample ID: 240-205929-6				
Date Collected: 06/07/24 16:22						Matrix: Water				
Date Received: 06/10/24 09:30										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Iron	770		100	47	ug/L		06/11/24 14:00	06/12/24 23:50	1	
Manganese	230		5.0	3.5	ug/L		06/11/24 14:00	06/12/24 23:50	1	

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-510 (5-7.5')					Lab Sample ID: 240-205929-1				
Date Collected: 06/06/24 14:37					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	350		5.0	2.6	mg/L			06/14/24 18:22	1
Nitrate as N (EPA 300.0-1993 R2.1)	0.75	H H3	0.10	0.015	mg/L			06/10/24 17:18	1
Sulfate (EPA 300.0-1993 R2.1)	36		1.0	0.35	mg/L			06/10/24 17:18	1
Total Organic Carbon (SM 5310 C-2014)	3.5		1.0	0.44	mg/L			06/20/24 17:04	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-510 (12-14.5')					Lab Sample ID: 240-205929-2				
Date Collected: 06/06/24 15:33					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	310		5.0	2.6	mg/L			06/14/24 18:28	1
Nitrate as N (EPA 300.0-1993 R2.1)	1.9	H H3	0.10	0.015	mg/L			06/10/24 17:58	1
Sulfate (EPA 300.0-1993 R2.1)	49		1.0	0.35	mg/L			06/10/24 17:58	1
Total Organic Carbon (SM 5310 C-2014)	1.1		1.0	0.44	mg/L			06/20/24 23:02	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-512 (5-7.5')					Lab Sample ID: 240-205929-3				
Date Collected: 06/07/24 11:12					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	290		5.0	2.6	mg/L			06/14/24 18:34	1
Nitrate as N (EPA 300.0-1993 R2.1)	3.2	H H3	0.10	0.015	mg/L			06/10/24 18:38	1
Sulfate (EPA 300.0-1993 R2.1)	29		1.0	0.35	mg/L			06/10/24 18:38	1
Total Organic Carbon (SM 5310 C-2014)	1.5		1.0	0.44	mg/L			06/21/24 06:13	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-512 (12-14.5')					Lab Sample ID: 240-205929-4				
Date Collected: 06/07/24 10:38					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	300		5.0	2.6	mg/L			06/14/24 18:39	1
Nitrate as N (EPA 300.0-1993 R2.1)	2.7	H H3	0.10	0.015	mg/L			06/10/24 21:18	1
Sulfate (EPA 300.0-1993 R2.1)	59		1.0	0.35	mg/L			06/10/24 21:18	1
Total Organic Carbon (SM 5310 C-2014)	1.1		1.0	0.44	mg/L			06/21/24 12:13	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-514 (5-7.5')					Lab Sample ID: 240-205929-5				
Date Collected: 06/07/24 17:11					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	310		5.0	2.6	mg/L			06/14/24 18:45	1
Nitrate as N (EPA 300.0-1993 R2.1)	3.7	H H3	0.10	0.015	mg/L			06/10/24 19:58	1
Sulfate (EPA 300.0-1993 R2.1)	42		1.0	0.35	mg/L			06/10/24 19:58	1
Total Organic Carbon (SM 5310 C-2014)	1.3		1.0	0.44	mg/L			06/20/24 18:15	1

Client Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry

Client Sample ID: SB-514 (12-14.5')					Lab Sample ID: 240-205929-6				
Date Collected: 06/07/24 16:22					Matrix: Water				
Date Received: 06/10/24 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity (SM 2320B-2011)	250		5.0	2.6	mg/L			06/14/24 18:50	1
Nitrate as N (EPA 300.0-1993 R2.1)	0.61	H H3	0.10	0.015	mg/L			06/10/24 20:38	1
Sulfate (EPA 300.0-1993 R2.1)	52		1.0	0.35	mg/L			06/10/24 20:38	1
Total Organic Carbon (SM 5310 C-2014)	1.1		1.0	0.44	mg/L			06/20/24 18:39	1

QC Association Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Metals

Prep Batch: 616171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Dissolved	Water	3005A	
240-205929-1	SB-510 (5-7.5')	Total Recoverable	Water	3005A	
240-205929-2	SB-510 (12-14.5')	Dissolved	Water	3005A	
240-205929-2	SB-510 (12-14.5')	Total Recoverable	Water	3005A	
240-205929-3	SB-512 (5-7.5')	Dissolved	Water	3005A	
240-205929-3	SB-512 (5-7.5')	Total Recoverable	Water	3005A	
240-205929-4	SB-512 (12-14.5')	Dissolved	Water	3005A	
240-205929-4	SB-512 (12-14.5')	Total Recoverable	Water	3005A	
240-205929-5	SB-514 (5-7.5')	Dissolved	Water	3005A	
240-205929-5	SB-514 (5-7.5')	Total Recoverable	Water	3005A	
240-205929-6	SB-514 (12-14.5')	Dissolved	Water	3005A	
240-205929-6	SB-514 (12-14.5')	Total Recoverable	Water	3005A	
MB 240-616171/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-616171/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 616388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Dissolved	Water	6020B	616171
240-205929-1	SB-510 (5-7.5')	Total Recoverable	Water	6020B	616171
240-205929-2	SB-510 (12-14.5')	Dissolved	Water	6020B	616171
240-205929-2	SB-510 (12-14.5')	Total Recoverable	Water	6020B	616171
240-205929-3	SB-512 (5-7.5')	Dissolved	Water	6020B	616171
240-205929-3	SB-512 (5-7.5')	Total Recoverable	Water	6020B	616171
240-205929-4	SB-512 (12-14.5')	Dissolved	Water	6020B	616171
240-205929-4	SB-512 (12-14.5')	Total Recoverable	Water	6020B	616171
240-205929-5	SB-514 (5-7.5')	Dissolved	Water	6020B	616171
240-205929-5	SB-514 (5-7.5')	Total Recoverable	Water	6020B	616171
240-205929-6	SB-514 (12-14.5')	Dissolved	Water	6020B	616171
240-205929-6	SB-514 (12-14.5')	Total Recoverable	Water	6020B	616171
MB 240-616171/1-A	Method Blank	Total Recoverable	Water	6020B	616171
LCS 240-616171/2-A	Lab Control Sample	Total Recoverable	Water	6020B	616171

General Chemistry

Analysis Batch: 616099

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-2	SB-510 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-3	SB-512 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-4	SB-512 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-5	SB-514 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-6	SB-514 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	
MB 240-616099/3	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 240-616099/4	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	

Analysis Batch: 616100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-2	SB-510 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-3	SB-512 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-4	SB-512 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	

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QC Association Summary

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

General Chemistry (Continued)

Analysis Batch: 616100 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-5	SB-514 (5-7.5')	Total/NA	Water	300.0-1993 R2.1	
240-205929-6	SB-514 (12-14.5')	Total/NA	Water	300.0-1993 R2.1	
MB 240-616100/3	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 240-616100/4	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	

Analysis Batch: 616741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Total/NA	Water	2320B-2011	
240-205929-2	SB-510 (12-14.5')	Total/NA	Water	2320B-2011	
240-205929-3	SB-512 (5-7.5')	Total/NA	Water	2320B-2011	
240-205929-4	SB-512 (12-14.5')	Total/NA	Water	2320B-2011	
240-205929-5	SB-514 (5-7.5')	Total/NA	Water	2320B-2011	
240-205929-6	SB-514 (12-14.5')	Total/NA	Water	2320B-2011	
MB 240-616741/30	Method Blank	Total/NA	Water	2320B-2011	
MB 240-616741/56	Method Blank	Total/NA	Water	2320B-2011	
LCS 240-616741/55	Lab Control Sample	Total/NA	Water	2320B-2011	

Analysis Batch: 617468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-205929-1	SB-510 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-2	SB-510 (12-14.5')	Total/NA	Water	5310 C-2014	
240-205929-3	SB-512 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-4	SB-512 (12-14.5')	Total/NA	Water	5310 C-2014	
240-205929-5	SB-514 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-6	SB-514 (12-14.5')	Total/NA	Water	5310 C-2014	
MB 240-617468/37	Method Blank	Total/NA	Water	5310 C-2014	
MB 240-617468/5	Method Blank	Total/NA	Water	5310 C-2014	
LCS 240-617468/21	Lab Control Sample	Total/NA	Water	5310 C-2014	
LCS 240-617468/36	Lab Control Sample	Total/NA	Water	5310 C-2014	
LCS 240-617468/54	Lab Control Sample	Total/NA	Water	5310 C-2014	
LCS 240-617468/6	Lab Control Sample	Total/NA	Water	5310 C-2014	
240-205929-1 MS	SB-510 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-1 MSD	SB-510 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-2 MS	SB-510 (12-14.5')	Total/NA	Water	5310 C-2014	
240-205929-2 MSD	SB-510 (12-14.5')	Total/NA	Water	5310 C-2014	
240-205929-3 MS	SB-512 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-3 MSD	SB-512 (5-7.5')	Total/NA	Water	5310 C-2014	
240-205929-4 MS	SB-512 (12-14.5')	Total/NA	Water	5310 C-2014	
240-205929-4 MSD	SB-512 (12-14.5')	Total/NA	Water	5310 C-2014	

QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-616171/1-A

Matrix: Water

Analysis Batch: 616388

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 616171

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	100	U	100	47	ug/L		06/11/24 14:00	06/12/24 22:41	1
Manganese	5.0	U	5.0	3.5	ug/L		06/11/24 14:00	06/12/24 22:41	1

Lab Sample ID: LCS 240-616171/2-A

Matrix: Water

Analysis Batch: 616388

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 616171

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5000	4910		ug/L		98	80 - 120
Manganese	500	463		ug/L		93	80 - 120

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 240-616741/30

Matrix: Water

Analysis Batch: 616741

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	2.6	mg/L			06/14/24 14:51	1

Lab Sample ID: MB 240-616741/56

Matrix: Water

Analysis Batch: 616741

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0	2.6	mg/L			06/14/24 17:57	1

Lab Sample ID: LCS 240-616741/55

Matrix: Water

Analysis Batch: 616741

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	80.6	84.0		mg/L		104	86 - 123

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 240-616099/3

Matrix: Water

Analysis Batch: 616099

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0	0.35	mg/L			06/10/24 15:38	1

Lab Sample ID: LCS 240-616099/4

Matrix: Water

Analysis Batch: 616099

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	50.0	50.0		mg/L		100	90 - 110

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 240-616100/3

Matrix: Water

Analysis Batch: 616100

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.10	U	0.10	0.015	mg/L			06/10/24 15:38	1

Lab Sample ID: LCS 240-616100/4

Matrix: Water

Analysis Batch: 616100

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	2.50	2.51		mg/L		100	90 - 110

Method: 5310 C-2014 - Total Organic Carbon/Persulfate - Ultrav

Lab Sample ID: MB 240-617468/37

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0	0.44	mg/L			06/21/24 05:01	1

Lab Sample ID: MB 240-617468/5

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0	0.44	mg/L			06/20/24 16:16	1

Lab Sample ID: LCS 240-617468/21

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon	16.3	16.0		mg/L		99	85 - 115

Lab Sample ID: LCS 240-617468/36

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon	16.3	15.9		mg/L		98	85 - 115

Lab Sample ID: LCS 240-617468/54

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon	16.3	16.3		mg/L		100	85 - 115

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: 5310 C-2014 - Total Organic Carbon/Persulfate - Ultrav (Continued)

Lab Sample ID: LCS 240-617468/6

Matrix: Water

Analysis Batch: 617468

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon			16.3	16.4		mg/L		101	85 - 115		

Lab Sample ID: 240-205929-1 MS

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon	3.5		10.0	13.2		mg/L		97	65 - 134		

Lab Sample ID: 240-205929-1 MSD

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-510 (5-7.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon	3.5		10.0	13.2		mg/L		97	65 - 134	0	10

Lab Sample ID: 240-205929-2 MS

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-510 (12-14.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon	1.1		10.0	10.9		mg/L		98	65 - 134		

Lab Sample ID: 240-205929-2 MSD

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-510 (12-14.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon	1.1		10.0	11.2		mg/L		101	65 - 134	3	10

Lab Sample ID: 240-205929-3 MS

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-512 (5-7.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon	1.5		10.0	11.6		mg/L		101	65 - 134		

Lab Sample ID: 240-205929-3 MSD

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-512 (5-7.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon	1.5		10.0	11.4		mg/L		99	65 - 134	2	10

Lab Sample ID: 240-205929-4 MS

Matrix: Water

Analysis Batch: 617468

Client Sample ID: SB-512 (12-14.5')

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Organic Carbon	1.1		10.0	11.0		mg/L		99	65 - 134		

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QC Sample Results

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Method: 5310 C-2014 - Total Organic Carbon/Persulfate - Ultrav

Lab Sample ID: 240-205929-4 MSD							Client Sample ID: SB-512 (12-14.5')					
Matrix: Water							Prep Type: Total/NA					
Analysis Batch: 617468												
Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit	
Total Organic Carbon	1.1		10.0	11.1		mg/L		100	65 - 134	1	10	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Client Sample ID: SB-510 (5-7.5')

Lab Sample ID: 240-205929-1

Date Collected: 06/06/24 14:37

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:19
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:17
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:22
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 17:18
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 17:18
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/20/24 17:04

Client Sample ID: SB-510 (12-14.5')

Lab Sample ID: 240-205929-2

Date Collected: 06/06/24 15:33

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:24
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:22
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:28
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 17:58
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 17:58
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/20/24 23:02

Client Sample ID: SB-512 (5-7.5')

Lab Sample ID: 240-205929-3

Date Collected: 06/07/24 11:12

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:29
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:27
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:34
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 18:38
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 18:38
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/21/24 06:13

Client Sample ID: SB-512 (12-14.5')

Lab Sample ID: 240-205929-4

Date Collected: 06/07/24 10:38

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:35

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Lab Chronicle

Client: GHD Services Inc.
Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Job ID: 240-205929-1

Client Sample ID: SB-512 (12-14.5')

Lab Sample ID: 240-205929-4

Date Collected: 06/07/24 10:38

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:32
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:39
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 21:18
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 21:18
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/21/24 12:13

Client Sample ID: SB-514 (5-7.5')

Lab Sample ID: 240-205929-5

Date Collected: 06/07/24 17:11

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:45
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:42
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:45
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 19:58
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 19:58
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/20/24 18:15

Client Sample ID: SB-514 (12-14.5')

Lab Sample ID: 240-205929-6

Date Collected: 06/07/24 16:22

Matrix: Water

Date Received: 06/10/24 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Dissolved	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:50
Total Recoverable	Prep	3005A			616171	BN	EET CLE	06/11/24 14:00
Total Recoverable	Analysis	6020B		1	616388	AJC	EET CLE	06/12/24 23:47
Total/NA	Analysis	2320B-2011		1	616741	JMR	EET CLE	06/14/24 18:50
Total/NA	Analysis	300.0-1993 R2.1		1	616099	QUY8	EET CLE	06/10/24 20:38
Total/NA	Analysis	300.0-1993 R2.1		1	616100	QUY8	EET CLE	06/10/24 20:38
Total/NA	Analysis	5310 C-2014		1	617468	QUY8	EET CLE	06/20/24 18:39

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

Client: GHD Services Inc.

Job ID: 240-205929-1

Project/Site: 12573440-T05Y2401C-01, RACER Eckles

Laboratory: Eurofins Cleveland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-28-25
Georgia	State	4062	02-27-25
Illinois	NELAP	200004	07-31-24
Iowa	State	421	06-01-25
Kentucky (UST)	State	112225	02-27-25
Kentucky (WW)	State	KY98016	12-30-24
Minnesota	NELAP	039-999-348	12-31-24
New Jersey	NELAP	OH001	06-30-24
New York	NELAP	10975	04-02-25
Ohio VAP	State	ORELAP 4062	02-27-25
Oregon	NELAP	4062	02-27-25
Pennsylvania	NELAP	68-00340	08-31-24
Texas	NELAP	T104704517-22-19	08-31-24
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-24
West Virginia DEP	State	210	12-31-24

Ver. 06/08/2021

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # : _____	
Barberion Facility		Coolant Preserved by VOA	
Client <u>CHD</u>		Site Name _____	
Cooler Received on <u>4-10-24</u>		Opened on <u>4-10-24</u>	
FedEx: 1 st <u>Ord Exp.</u> UPS FAS Waypoint Client Drop Off Eurofins Courier Other _____		Storage Location _____	
Receipt After Hours: Drop-off Date/Time _____			
Eurofins Cooler # <u>22</u> Foam Box Client Cooler Box Other _____			
Packing material used <u>Bubble Wrap</u> Foam Plastic Bag None Other _____			
COOLANT Wet Ice <u>Blue Ice</u> Dry Ice <u>Water</u> None ☐ See Multiple Cooler Form			
1	Cooler temperature upon receipt	IR GUN # <u>12</u> (CF <u>8</u> °C)	Observed Cooler Temp. <u>6.4</u> °C Corrected Cooler Temp. <u>6.4</u> °C
2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	☒ Yes ☒ No -Were the seals on the outside of the cooler(s) signed & dated? Yes ☒ No ☒ NA -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes ☒ No ☒ NA -Were tamper/custody seals intact and uncompromised? Yes ☒ No ☒ NA	
3	Shippers' packing slip attached to the cooler(s)?	Yes ☒ No ☒	
4	Did custody papers accompany the sample(s)?	Yes ☒ No ☒	
5	Were the custody papers relinquished & signed in the appropriate place?	Yes ☒ No ☒	
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes ☒ No ☒	
7	Did all bottles arrive in good condition (Unbroken)?	Yes ☒ No ☒	
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes ☒ No ☒	
9	For each sample, does the COC specify preservatives (CAN), # of containers (CAN), and sample type of grab/comp (CAN)?	Yes ☒ No ☒	
10	Were correct bottle(s) used for the test(s) indicated?	Yes ☒ No ☒	
11	Sufficient quantity received to perform indicated analyses?	Yes ☒ No ☒	
12	Are these work share samples and all listed on the COC?	Yes ☒ No ☒	
13	If yes, Questions 13-17 have been checked at the originating laboratory		
14	Were all preserved sample(s) at the correct pH upon receipt?	Yes ☒ No ☒ NA pH Strip Lot# HC339814	
15	Were VOAAs on the COC?	Yes ☒ No ☒	
16	Were air bubbles >6 mm in any VOA vials?	Larger than this Yes ☒ No ☒ NA	
17	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes ☒ No ☒	
17	Was a LL Hg or Me Hg trip blank present?	Yes ☒ No ☒	
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____			
Concerning _____			
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page		Samples processed by _____	
19. SAMPLE CONDITION			
Sample(s) _____ were received after the recommended holding time had expired.			
Sample(s) _____ were received in a broken container			
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)			
20. SAMPLE PRESERVATION			
Sample(s) _____ were further preserved in the laboratory			
Time preserved _____ Preservative(s) added/Lot number(s): _____			
VOA Sample Preservation - Date/Time VOAs Frozen _____			

6/10/2024

Login Container Summary Report

240-205929

6/23/2024

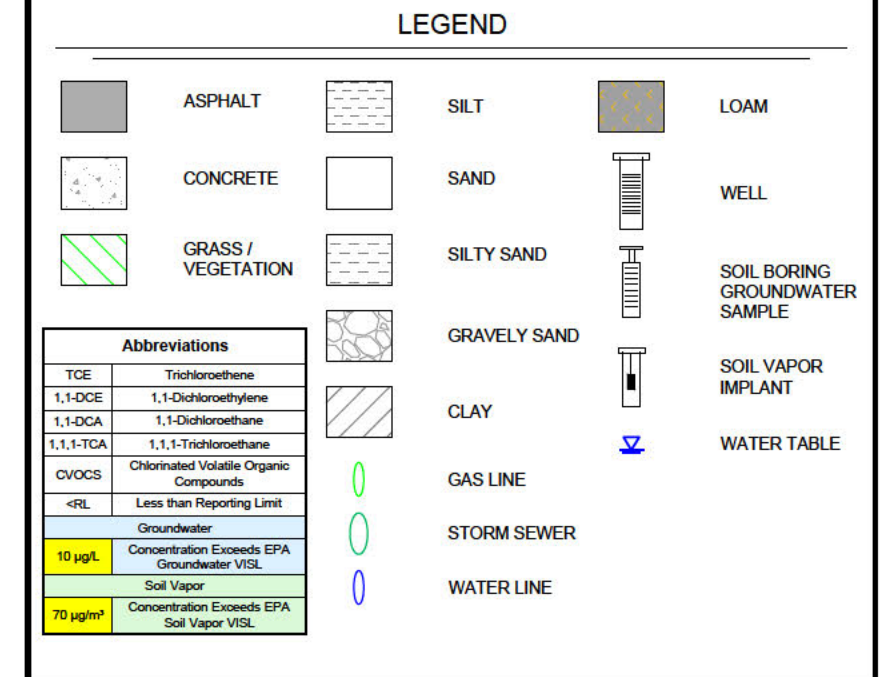
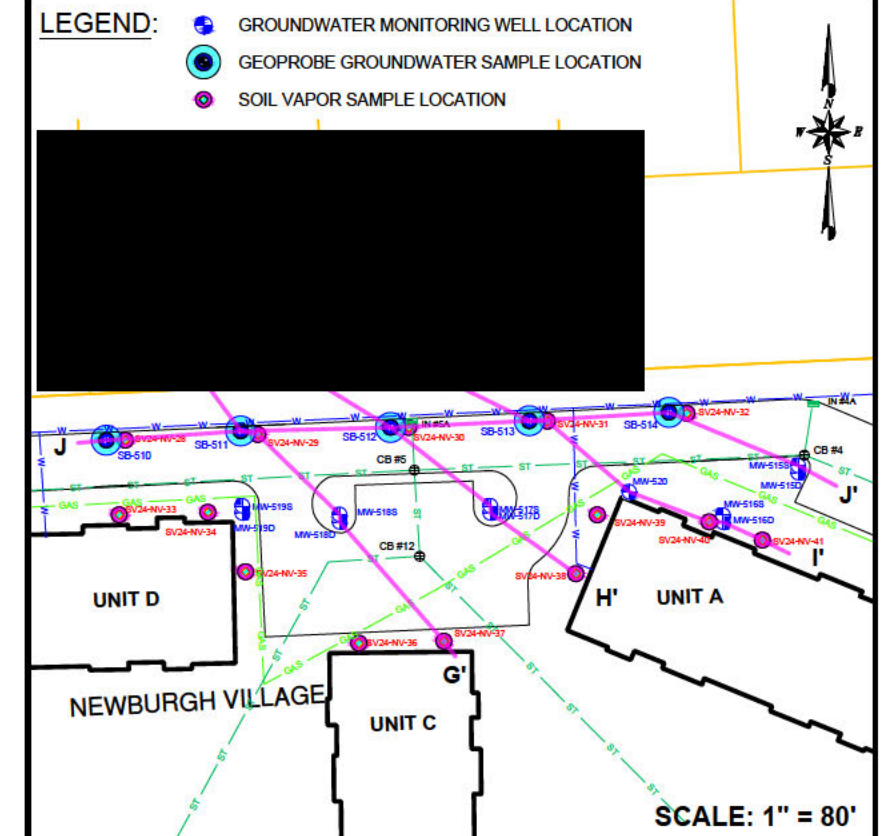
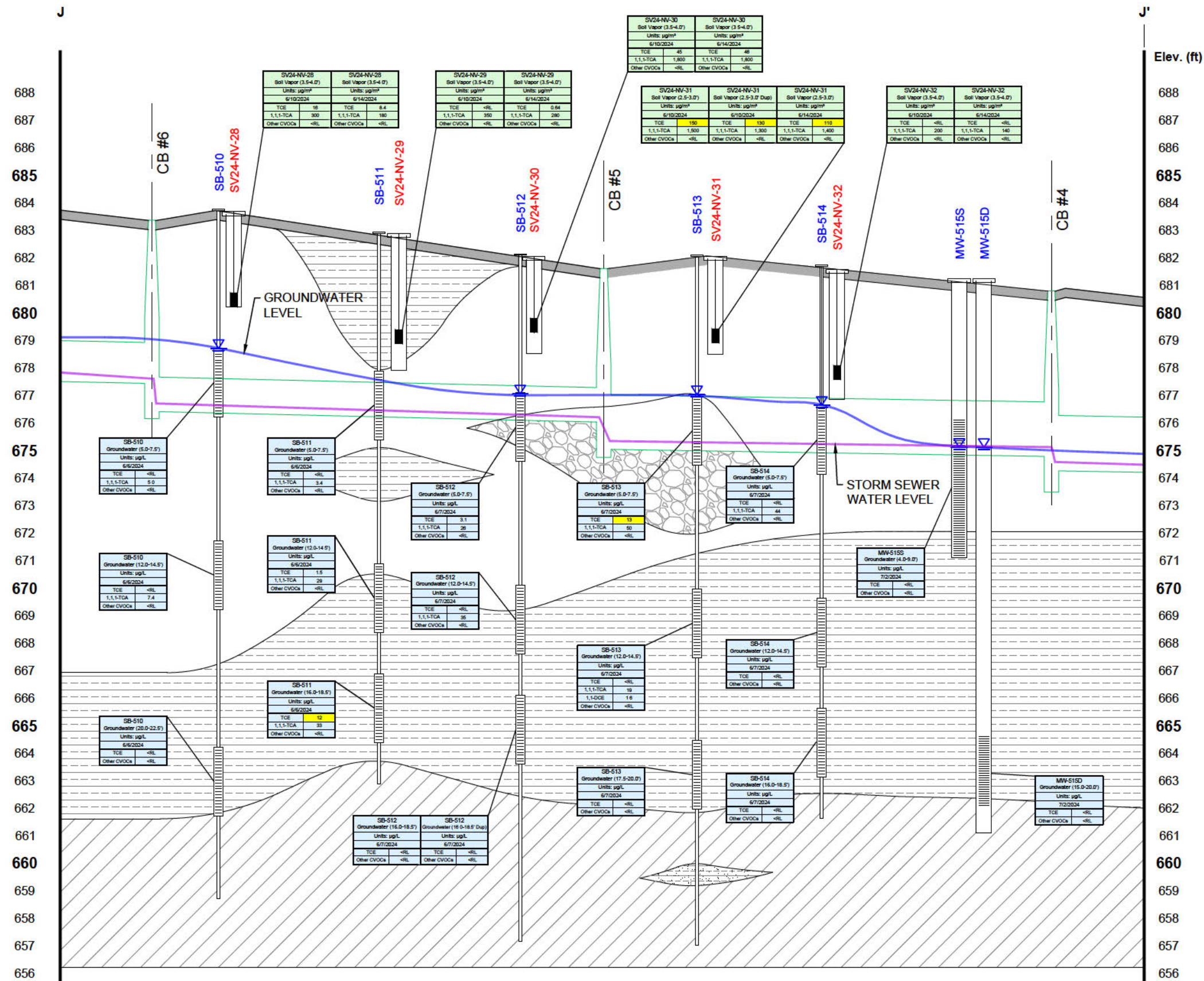
Temperature readings

Client Sample ID	Lab ID	Container Type	Container			Preservation	Preservation Lot Number
			pH	Temp	Added		
SB-510 (5-7 5)	240-205929-A-1	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-B-1	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-C-1	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-D-1	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-E-1	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-F-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-G-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-H-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____	_____
SB-510 (5-7 5)	240-205929-I-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-A-2	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-B-2	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-C-2	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-D-2	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-E-2	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-F-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-G-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-H-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____	_____
SB-510 (12-14 5)	240-205929-I-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-A-3	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-B-3	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-C-3	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-D-3	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-E-3	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-F-3	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-512 (5-7 5)	240-205929-G-3	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-A-4	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-B-4	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-C-4	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-D-4	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-E-4	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
SB-512 (12-14 5)	240-205929-F-4	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
SB-512 (12-14 5)	240 205929-G-4	Plastic 500ml - w/ Nitric - Dis	<2	_____	_____	_____	_____
SB-514 (5-7 5)	240-205929-A-5	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-514 (5-7 5)	240-205929-B-5	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____
SB-514 (5-7 5)	240-205929-C-5	Voa Vial 40ml - with Sulfuric Acid	_____	_____	_____	_____	_____

Client Sample ID	Lab ID	Container Type	Container pH	Preservation Temp	Preservation Added	Preservation Lot Number
SB-514 (5-7.5)	240-205929-D-5	Plastic 60 mL - unpreserved				
SB-514 (5-7.5)	240-205929-E-5	Plastic 60 mL - unpreserved				
SB-514 (5-7.5)	240-205929-F-5	Plastic 500ml - with Nitric Acid	<2			
SB-514 (5-7.5)	240-205929-G-5	Plastic 500ml - w/ Nitric - Dis	<2			
SB-514 (12-14.5)	240-205929-A-6	Yoa Vial 40ml - with Sulfuric Acid				
SB-514 (12-14.5)	240-205929-B-6	Yoa Vial 40ml - with Sulfuric Acid				
SB-514 (12-14.5)	240 205929-C-6	Yoa Vial 40ml - with Sulfuric Acid				
SB-514 (12-14.5)	240-205929-D-6	Plastic 60 mL - unpreserved				
SB-514 (12-14.5)	240-205929-E-6	Plastic 60 mL - unpreserved				
SB-514 (12-14.5)	240-205929-F-6	Plastic 500ml - with Nitric Acid	<2			
SB-514 (12-14.5)	240-205929-G-6	Plastic 500ml - w/ Nitric - Dis	<2			

Appendix C

**AOI 31 Cross Sections – HMA September
2024**





**HAMP
MATHEWS &
ASSOCIATES, INC.**

RACER TRUST
LIVONIA ECKLES ROAD SITE
LIVONIA, MICHIGAN

FIGURE 10 CROSS SECTION J-J'

Appendix D

**ColloidalChem™ and iZVI™ Safety Data
Sheets (SDS)**

SAFETY DATA SHEET

Section 1: Identification

Product Name: ColloidalChem™

Chemical Name/Synonyms: CAS 7440-440

Company: Cascade Remediation Services LLC, PO Box 1184, Woodinville, WA 98072, 425-527-9700

In emergency call: Brooke King, EHS Director 503-310-1195 (Cell)

Section 2: Hazard(s) Identification

Hazard Classification: H316: Causes mild skin irritation. H320: Causes eye irritation. H335: May cause respiratory irritation. P281: Use personal protective equipment as required.

Hazard Statements: Activated carbon is an eye irritant and eye protection must be worn when handling. Store in sealed containers in a clean cool, well-ventilated area away from strong oxidizers, ignition sources, combustible materials, and heat. Do not store near, or allow contact with, moisture or strong oxidizers. Dispose in accordance with applicable federal, state, and local government regulations.

Section 3: Composition/ Information on Ingredients

Chemical Name	CAS#	Conc.
Carbon, Activated	7440-44-0	< 30
Water	7732-15-5	>70

Section 4: First-Aid Measures

After skin contact: Prolonged or repeated skin contact may cause irritation, drying, and redness. Wash affected areas with soap and water. Get medical attention immediately if irritation develops.

After eye contact: Activated carbon particles may cause mild irritation. Hold eyelids apart and flush eyes with copious amounts of water for at least 20 minutes. Fine particles of activated carbon may not be detected in the eyes following an exposure event, so appropriate medical attention is advised.

After inhalation: Dry residue may cause respiratory irritation. Wet activated carbon can absorb and deplete oxygen from the air. Remove person from source of exposure and into fresh air. Get medical attention if irritation or breathing difficulties develop.

After swallowing: May cause mild gastrointestinal tract irritation and diarrhea. If person is fully conscious, give one or two cups of water or milk to drink. Get medical attention immediately if large quantities are ingested

Section 5: Fire-Fighting Measures

Suitable extinguishing agents: In case of fire, use dry chemical, N₂ or CO₂. Use water to cool fire-exposed containers. Water will be adsorbed by activated carbon and will displace surface oxygen. Upon drying activated carbon will passivate with oxygen which will cause localized heat build-up. Use water only when necessary.

Special protective equipment for firefighters: If all water is removed fire is possible at elevated temperatures or by self-heating when exposed to strong oxidizers. Dry activated carbon tends to burn slowly without producing smoke or flame. Material allowed to smolder for long periods in enclosed spaces may produce carbon monoxide, which may reach a lower explosive limit of carbon monoxide (12.5%) in air. Activated carbon depletes oxygen from the air. Thermal decomposition may produce toxic gases of oxides of carbon, sulfur, nitrogen, sodium, and nitriles of carbon.

Section 6: Accidental Release Measures

Personal precautions: Safety glasses with side shields are recommended as minimum industrial eye protection. Protective gloves are recommended to minimize skin contact. Wash thoroughly with soap and water after handling. Provide maximum dilution or appropriate exhaust ventilation.

Measures for cleaning/collecting: Pick up released product with appropriate implements and return to original container if reusable or disposed.

Section 7: Handling and Storage

Handling: Handling Precautions Follow good handling and housekeeping practices. Avoid spills and accumulations of puddles of material. If dry residue is present avoid dust, or generation of airborne dust. In the event of a spill and if the material is allowed to dry, precautions should be taken to avoid inhalation and eye contact. Minimize ignition sources from enclosed material handling, transfer, and processing areas where dust may be present.

Storage: Store in sealed containers in a clean area and prevent from overheating or freezing.
Work/Hygienic Practices Wash thoroughly with soap and water after handling.

Section 8: Exposure Controls/Personal Protection

Chemical Name	OSHA PEL	OSHA PEL (ceiling)	ACGIH OEL (TWA)	ACGIH OEL (STEL)
Carbon, Activated	15 mg/m ³ , total dust as particulates not otherwise specified.		5 mg/m ³ , respirable dust, as particulates not otherwise specified.	

General protective and hygienic measures: Protective gloves are recommended to minimize skin contact. Use a lab coat or disposable coveralls to prevent excessive contamination to personal clothing.

Breathing equipment: In the event the solution has dried use NIOSH-approved respirator for particulate dust (e.g., N95).

Eye protection: Safety glasses with side shields are recommended as minimum industrial eye protection when handling bulk product or performing spill cleanup.

Section 9: Physical and Chemical Properties

Form: Black, free flowing slurry.

Odor: Not Applicable

Odor threshold: Not Applicable

pH: < 12.5

Melting point/melting range: 0°C at standard pressure

Boiling point/boiling range: 85°C at standard pressure

Flash point: Not Available

Evaporation rate: Not Available

Flammability: Not Available

Upper/lower flammability or explosive limits: Not Available

Auto ignition temperature: > 400°C, if completely dry

Decomposition Temperature: Not Applicable

Solubility: Not Applicable

Vapor pressure: Not Available

Vapor density: Not Available

Relative density: 1-1.2 gm/ml

Viscosity: 1000 - 4000 cp (at shear rate of 5 s⁻¹) at 25°C

Section 10: Stability and Reactivity

Reactivity: Activated carbon adsorbs most chemical compounds; some may be reacted to the surface of the carbon.

Chemical stability: Stable under ordinary conditions of shipment, storage, and use.

Conditions to avoid: Concentrated strong acids and bases.

Incompatible materials: Avoid contact with strong oxidizing agents such as sulfuric acid and nitric acid.

Hazardous decomposition products: No hazardous reactions are known. Activated carbon is a known health and environmental control for hazardous material.

Section 11: Toxicological Information

Ingredients – Toxicological Data: Toxicological data for the activate ingredient, activated carbon.

LC50 (inhal, rat): > 64,400 mg/m³

LD50 (oral, rat): > 10,000 mg/kg Chronic/Carcinogenicity

The product is not listed as potentially carcinogenic by NTP, IARC, OSHA, or ACGIH. Contains a component (crystalline silica) that is listed by IARC as group 1, by ACGIH as group A2, and by NTP as a known human carcinogen.

Section 12: Ecological Information (non-mandatory)

Ecotoxicity: No information available for the product. However, ecotoxicity is expected to be minimal

Mobility: No Information available for the product.

Biodegradation: Not biodegradable.

Bioaccumulation: No Information available for the product.

Section 13: Disposal Considerations (non-mandatory)

Dispose in accordance with applicable federal, state, and local government regulations. Dispose of material in approved landfill. Avoid dispersal of spilled material and runoff into soil waterways, drains, and sewers.

Section 14: Transport Information (non-mandatory)

UN Number: 1362

Shipping Name: Activated carbon in water solution.

Packing Group: N/A

Environmental Hazards: N/A

This product is NOT considered spontaneously combustible under the "Self-Heating Test for Carbon" protocol listed in the United Nations Manual of Tests and Criteria [33.3.1]

Transport Hazard Class: N/A

Section 15: Regulatory Information (non-mandatory)

US Federal Regulations: Product is subject to SARA 311/312: See section 2 for more information. Product does not have a CERCLA RQ.

SARA Section 313 (specific toxic chemical listings): This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

TSCA (Toxic Substances Control Act): Toxic Substance Control Act (TSCA): All ingredients of the product are listed on the TSCA 8(b) Chemical Substance Inventory or are exempt.

Section 16: Other Information

SDS date of preparation/update: 9.12.2022

Disclaimer

This information relates to the product designated herein and does not relate to its use in combination with any other material or in any other process. To the best of Cascade Remediation Services LLC, knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability, and completeness are not guaranteed. Users are responsible to verify this data for their own particular use and they assume all risks of their reliance



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Limit of Liability: Cascade Remediation Services LLC, shall not be liable for, and Buyer assumes responsibility for, personal injury and property damage resulting from the handling, possession, use, storage, or resale of the product, whether used alone or in combination with other materials.

SAFETY DATA SHEET

Section 1: Identification

Product Name: Colloidal-IZVI

Chemical Name/Synonyms: CAS 7439-89-6

Company: Cascade Remediation Services LLC, PO Box 1184, Woodinville, WA 98072, 425-527-9700

In emergency call: Brooke King, EHS Director 503-310-1195 (Cell)

Section 2: Hazard(s) Identification

Hazard Classification: This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazard Statements: ZVI is an eye irritant and eye protection must be worn when handling. Store in sealed containers in a clean cool, well-ventilated area away from strong oxidizers, ignition sources, combustible materials, and heat. Do not store near, or allow contact with, moisture or strong oxidizers. Dispose in accordance with applicable federal, state, and local government regulations.

Section 3: Composition/ Information on Ingredients

Chemical Name	CAS#	Conc
Iron	7439-89-6	35 to 45%
Glycerol	56-81-5	45 to 65%
Water	7732-18-5	< 15%

Section 4: First-Aid Measures

After skin contact: Prolonged or repeated skin contact may cause irritation, drying, and redness. Wash affected areas with soap and water. Get medical attention immediately if irritation develops.

After eye contact: Iron particles may cause mild irritation. Hold eyelids apart and flush eyes with copious amounts of water for at least 20 minutes. Fine particles of activated carbon may not be detected in the eyes following an exposure event, so appropriate medical attention is advised.

After inhalation: NA

After swallowing: May cause mild gastrointestinal tract irritation and diarrhea. If person is fully conscious, give one or two cups of water or milk to drink. Get medical attention immediately if large quantities are ingested

Section 5: Fire-Fighting Measures

Suitable extinguishing agents: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Keep containers and surroundings cool with water spray. Use: Dry powder.

Special protective equipment for firefighters: The product is not flammable. As in any fire, wear self-contained breathing apparatus and full protective gear..

Section 6: Accidental Release Measures

Personal precautions: Safety glasses with side shields are recommended as minimum industrial eye protection. Protective gloves are recommended to minimize skin contact. Wash thoroughly with soap and water after handling. Provide maximum dilution or appropriate exhaust ventilation.

Measures for cleaning/collecting: Pick up released product with appropriate implements and return to original container if reusable or disposed.

Section 7: Handling and Storage

Handling: Handling Precautions Follow good handling and housekeeping practices. Avoid spills and accumulations of puddles of material. If dry residue is present avoid dust, or generation of airborne dust. In the event of a spill and if the material is allowed to dry, precautions should be taken to avoid inhalation and eye contact. Minimize ignition sources from enclosed material handling, transfer, and processing areas where dust may be present.

Storage: Store in sealed containers in a clean area and prevent from overheating or freezing.
Work/Hygienic Practices Wash thoroughly with soap and water after handling.

Section 8: Exposure Controls/Personal Protection

Chemical Name	OSHA PEL	ACGIH OEL (TWA)
Glycerol 56-81-5	TWA: 15 mg/m ³ mist, total particulate TWA: 5 mg/m ³ mist, respirable fraction (vacated) TWA: 10 mg/m ³ mist, total particulate (vacated) TWA: 5 mg/m ³ mist, respirable fraction	TWA: 10 mg/m ³ mist
Iron 7439-89-6	Nuisance dust: 15 mg/m ³	Nuisance dust: 15 mg/m ³
Water	NA	

General protective and hygienic measures: Protective gloves are recommended to minimize skin contact. Use a lab coat or disposable coveralls to prevent excessive contamination to personal clothing.

Breathing equipment: In the event the solution has dried use NOISH-approved respirator for particulate dust (e.g., N95).

Eye protection: Safety glasses with side shields are recommended as minimum industrial eye protection when handling bulk product or performing spill cleanup.

Section 9: Physical and Chemical Properties

Form: Black, free flowing slurry.

Odor: Slight

Odor threshold: Not Applicable

pH: Not applicable

Melting point/melting range: No data available

Boiling point/boiling range: No data available

Flash point: Not Flammable

Evaporation rate: Not determined

Flammability: Not Flammable

Upper/lower flammability or explosive limits: Not Applicable

Auto ignition temperature: > 400°C, if completely dry

Decomposition Temperature: Not Applicable

Solubility: No information available

Vapor pressure: No data available

Vapor density: Not Determined

Relative density: 1.8 gm/cm³ @ 20C

Viscosity: 2000 - 5000 cp

Section 10: Stability and Reactivity

Reactivity: Stable under normal conditions.

Chemical stability: Stable under ordinary conditions of shipment, storage, and use.

Conditions to avoid: Concentrated strong acids and bases.

Incompatible materials: Strong oxidizing agents and acids.

Hazardous decomposition products: No hazardous reactions are known.

Section 11: Toxicological Information

Ingredients – Toxicological Data: Toxicological data for the activate ingredients

Iron In Fish: LC50 96 h = 13.6 mg/L (Morone saxatilis - static)

Glycerol in Fish: LC50 96 h 51 - 57 mL/L(Oncorhynchus mykiss - static) EC50 24 h > 500 mg/L (Daphnia magna)

Glycerol in Crustacea: EC50 24 h > 500 mg/L(Daphnia magna)

Section 12: Ecological Information (non-mandatory)

Ecotoxicity: No information available for the product. However, ecotoxicity is expected to be minimal

Mobility: No Information available for the product.

Biodegradation: Not biodegradable.

Bioaccumulation: No Information available for the product.

Section 13: Disposal Considerations (non-mandatory)

Dispose in accordance with applicable federal, state, and local government regulations. Dispose of material in approved landfill. Avoid dispersal of spilled material and runoff into soil waterways, drains, and sewers.

Section 14: Transport Information (non-mandatory)

UN Number: Not applicable

Shipping Name: Not applicable

Packing Group: Not applicable

Environmental Hazards: Not applicable

Transport Hazard Class: Not applicable

Section 15: Regulatory Information (non-mandatory)

US Federal Regulations: Product is subject to SARA 311/312: See section 2 for more information. Product does not have a CERCLA RQ.

SARA Section 313 (specific toxic chemical listings): Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

TSCA (Toxic Substances Control Act): There are no significant new uses anticipated.

Section 16: Other Information

SDS date of preparation/update: 10.2.23

Disclaimer

This information relates to the product designated herein and does not relate to its use in combination with any other material or in any other process. To the best of Cascade Environmental LLC, knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability, and completeness are not guaranteed. Users are responsible to verify this data for their own particular use and they assume all risks of their reliance upon information contained herein. Cascade Environmental LLC shall under no circumstances be liable for incidental or consequential damages because of reliance upon information contained herein.



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SAFETY DATA SHEET

Section 1: Identification

Product Name: +Anchor Solution

Chemical Name/Synonyms: Cellulase

Company: Cascade Remediation Services LLC, PO Box 1184, Woodinville, WA 98072, 425-527-9700

In emergency call: Alex Amort, VP Compliance, 415-302-1231

Section 2: Hazard(s) Identification

Hazard Classification: Classification of the chemical in accordance with 29CFR §1910.1200 WHMIS Classification. Respiratory sensitization, Category 1

Hazard Statements:

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary Statements – Prevention:

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray

P284 - In case of inadequate ventilation wear respiratory protection
Precautionary Statements - Response

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing P342 +

P311 - If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician

Section 3: Composition/ Information on Ingredients

Chemical Name	CAS#	Conc
Cellulase (aep) aep (active enzyme protein) contributes to the GHS classification.	9012-54-8	0.01 to < 2.5 Wt.%
Water	7732-18-5	>80%

Section 4: First-Aid Measures

In Case of unintended Over Exposure

Inhalation Effects Symptoms and First Aid:

May cause allergic respiratory reaction. Shortness of breath, wheezing and coughing. The effect of inhalation may be delayed.

Remove person to fresh air. If signs/symptoms continue, get medical attention. Show this safety data sheet to the doctor in attendance.

Skin Contact Effects Symptoms and First Aid:

May cause slight irritation. Slight irritation.

Remove and wash contaminated clothing before re-use. Wash off immediately with plenty of water. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance.

Eye Contact Effects Symptoms First Aid:

May cause slight irritation. Slight irritation.

Hold eye open and rinse slowly and gently with water for 15-20 min. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance.

Ingestion Effects Symptoms First Aid:

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Irritation.

Rinse mouth with water and drink plenty of water. If symptoms persist, call a doctor. Show this safety data sheet to the doctor in attendance.

Section 5: Fire-Fighting Measures

Suitable extinguishing agents: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters: Self-contained breathing apparatus and standard turn-out apparel Firefighters

Section 6: Accidental Release Measures

Personal Precautions: For personal protection see section 8

Environmental Precautions: Collect spillage.

Measures for Cleaning/Collecting: Spilled preparation should be removed immediately to avoid formation of dust from dried preparation. Take up by mechanical means preferably by a vacuum cleaner equipped with a HEPA (High Efficiency Particulate Air) filter. Flush remainder carefully with plenty of water. Avoid splashing, high pressure washing or compressed air cleaning to avoid formation of aerosols. Ensure sufficient ventilation. Wash contaminated clothing.

Section 7: Handling and Storage

Handling:

Avoid formation of dust and aerosols. Ensure adequate ventilation.

Liquid enzyme preparations are dust free preparations

However, inappropriate handling may cause formation of dust or aerosols

Storage: Keep tightly closed in a dry and cool place. Temperature 0-25 °C (32-77 °F). In unbroken packaging - dry and protect from the sun. The product has been formulated for optimal stability. Extended storage or adverse conditions such as higher temperatures or higher humidity may lead to a higher dosage requirement.

Section 8: Exposure Controls/Personal Protection

Chemical Name	IDNEL Dermal Acute Local (Workers)	DMEL Inhalation Long term Local (Workers)
Cellulase (aep.)		60 ng/m ³

Occupational Exposure Controls Engineering Controls:

Ensure adequate ventilation, especially in confined areas.

Maintain good conditions of industrial hygiene. Some processes may require enclosures, local exhaust ventilation, or other engineering controls to control airborne levels. Additional handling and healthy/safety information is available upon request

Personal Protective Equipment Respiratory Protection:

In case of insufficient ventilation wear suitable respiratory equipment that meets HEPA/PI 00 specifications

Eye Protection Skin and Body Protection:

Wear safety glasses with side shields (or goggles)

No special technical protective measures are necessary

General Hygiene Considerations Environmental Exposure Controls

Handle in accordance with good industrial hygiene and safety practice

Local authorities should be advised if significant spillages cannot be contained

Section 9: Physical and Chemical Properties

Form: Liquid

Odor: Slight fermentation odor

pH: Typically 4 to 9

Melting point/melting range: No data available

Boiling point/boiling range: No data available

Flash point: Not determined

Evaporation rate: Not determined

Flammability: Non Flammable

Upper/lower flammability or explosive limits: Not applicable

Auto ignition temperature: Not available

Decomposition Temperature: Not applicable

Solubility: Readily soluble in application-relevant solutions at all levels of concentration, temperature and pH which may occur in normal usage.

Vapor pressure: No data available

Vapor density: Not determined

Relative density: 1 gm/cm³

Viscosity: No data available

Section 10: Stability and Reactivity

Reactivity: Not relevant

Chemical stability: Stable under ordinary conditions of shipment, storage, and use.

Conditions to avoid: None
Incompatible materials: None.
Hazardous decomposition products: None

Section 11: Toxicological Information

Repeated inhalation of enzyme dust or aerosols resulting from improper handling may induce sensitization and may cause allergic type 1 reactions in sensitized individuals
Mild skin irritation Mild eye irritation
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea

Toxicological Data: Toxicological data for the activate ingredients

Chemical name	Acute oral toxicity	Acute inhalation toxicity	Skin corrosion/irritation	Serious eye damage/eye irritation
Cellulase (aep.)	LD50: > 2000 mg/kg bw (OECD TG 401, 420)		Not irritating (OECD TG 404)	Not irritating (OECD TG 405)

Chemical name	Specific target organ toxicity (single exposure)	Genetic toxicity	Skin sensitization	Respiratory sensitization
Cellulase (aep.)		No indication of mutagenic effects (OECD TG 471,476)		Sensitizer (Human experience)

Section 12: Ecological Information (non-mandatory)

Ecotoxicity: No information available for the product. However, ecotoxicity is expected to be minimal
Mobility: No Information available for the product.
Biodegradation: Readily biodegradable (OECD 301E/F)
Bioaccumulation: Does not bioaccumulate
Daphnia, acute: IEC50 (48 hours): >39.5 mg aep/;
Fish, acute: ILC50 (96 hours): >39.5 mg aep/l

Section 13: Disposal Considerations (non-mandatory)

Dispose of in accordance with local regulations.
Dispose of wastes in an approved waste disposal facility.

Section 14: Transport Information (non-mandatory)

Transport Regulations

No dangerous goods according to transport regulations No special precautions required

UN Number: Not applicable
Shipping Name: Not applicable

Packing Group: Not applicable
Environmental Hazards: Not applicable
Transport Hazard Class: Not applicable

Section 15: Regulatory Information (non-mandatory)

TSCA Inventory:

The active ingredient and all components of the enzyme preparation are listed on the TSCA inventory

SARA 313:

Section 313 of Title 111 of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and 40 CFR Part 372.

SARA 311/312 Hazardous Categorization:

Acute health hazard No
Chronic Health Hazard No
Fire hazard No
Sudden Release of Pressure Hazard No
Reactive Hazard No

California Proposition 65:

This product does not contain any intentionally added Proposition 65 chemicals.

WHMIS Statement:

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by WHMIS 2015.

Section 16: Other Information

SDS date of preparation/update: 10.10.24

Disclaimer

This information relates to the product designated herein and does not relate to its use in combination with any other material or in any other process. To the best of Cascade Environmental LLC, knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability, and completeness are not guaranteed. Users are responsible to verify this data for their own particular use and they assume all risks of their reliance upon information contained herein. Cascade Environmental LLC shall under no circumstances be liable for incidental or consequential damages because of reliance upon information contained herein.

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Limit of Liability: Cascade Environmental LLC, shall not be liable for, and Buyer assumes responsibility for, personal injury and property damage resulting from the handling, possession, use, storage, or resale of the product, whether used alone or in combination with other materials.

Appendix E

Cascade Technical References

Cascade Chemistries

PATHFINDER



WHAT IS THE PATHFINDER?

Although research over the last 20 years has shown distribution and contact of in situ chemistries is a key success factor, injection technology has not advanced. That's why Cascade developed a fully-automated injection system called the Pathfinder. It is designed to deliver microscale colloidal solids like ZVI, activated carbon and other liquid amendments like EVO, oxidants and liquid reductants more effectively in transmissive zones. It addresses the issue of distribution by providing an automated system that takes human variables out of the equation, while Cascade Chemistries products provide persistent contact with contaminants in the subsurface.

HOW DOES IT WORK?

The automated system involves:

- Flow control via automated valves that adjust automatically to meet pressure and flow set points.
- Control of injection pressures, groundwater depth changes, and flows minimizing fracturing, excessive groundwater mounding and short circuiting.
- Continuous monitoring and data logging of injection rates, pressures, and in-well pressure transducers.



Pathfinder Benefits

Colloidal solids and liquids can be distributed through transmissive zones via soil pore throats, but existing injection technology is imprecise and cannot prevent distribution through new flow paths by exceeding the fracture pressure or the site's hydraulic capacity. Automation that sets precise shutdown or control setpoints ensures optimal distribution with supporting documentation. This system can achieve injection performance at up to 10 simultaneous locations with direct push or injection wells.

Pathfinder Return on Remediation Investment

- Considering the large life cycle costs of remediation and the investment made in characterization, design, chemistries and their injection, it only makes sense that injection approach be optimized.
- Automation results in lower costs and a shorter time frame to achieving remediation goals.

For more information, visit
[www.cascade-env.com/
cascade-chemistries](http://www.cascade-env.com/cascade-chemistries)

Cascade Chemistries

PATHFINDER



TURNKEY SOLUTIONS

While effective chemistries are a key part of successful remediation solutions, Cascade's turnkey solution meets the overall in situ remediation objective "to make contact with contaminant mass for a long enough period of time to achieve destruction." Cascade adds significant value and higher performance to the application its Chemistries by providing:

- High resolution design optimization through our MIHPT and Waterloo^{APS} subsurface technologies to identify target zones based on mass, lithology, and hydraulic conductivity.
- Bench-scale and column testing as needed.
- Advanced automated injection and fracturing technologies for both liquids and solid slurries.
- Client design support for chemistry dosing and critical injection parameters, including spacing and injection volumes and concentrations based on geology and hydraulic conductivity.
- Water hydraulics testing and field design optimization to eliminate any full-scale unexpected conditions.



CASCADE

Cascade Chemistries

COLLOIDAL iZVI™



WHAT IS COLLOIDAL iZVI?

Colloidal iZVI is a colloidal injectable zero valent iron (iZVI) amendment specifically developed for remediating chlorinated solvents (CVOCs) and metals in soil and groundwater. It's part of the Cascade Chemistries line of amendments for in situ groundwater remediation, designed to help you reach site closure faster and cost-effectively.

HOW DOES IT WORK?

Colloidal iZVI is a precisely blended colloidal liquid-suspension that is injected, via direct push and other methods, to address CVOCs and heavy metal contaminants such as hexavalent chromium, arsenic, and selenium. The unique formulation promotes broad dispersion in the subsurface at low injection pressures, which accelerates treatment. Through processes known as reductive dechlorination (for solvents) and chemical reduction (for metals), the contaminants are degraded upon contact with the ZVI.

Advantages for distribution, contact & residence time

- Direct injection into wells or DPT injection points at sub-fracture pressures
- Minimized potential for daylighting
- Flexible chemistry that allows dilution to customize distribution & residence time for specific project needs

Benefits of ZVI biotic/abiotic reactions and...

- Up to 5 to 7 years of persistence in the subsurface to overcome back diffusion issues
- Neat, pre-blended colloidal ZVI suspension that eliminates clumping and blending issues in the field
- Simple mixing and dilution without the need for further suspension chemistry
- Easily integrated as a combined remedy with other remediation chemistries and amendments



For more information, visit
[www.cascade-env.com/
cascade-chemistries](http://www.cascade-env.com/cascade-chemistries)

Cascade Chemistries

COLLOIDAL iZVI™



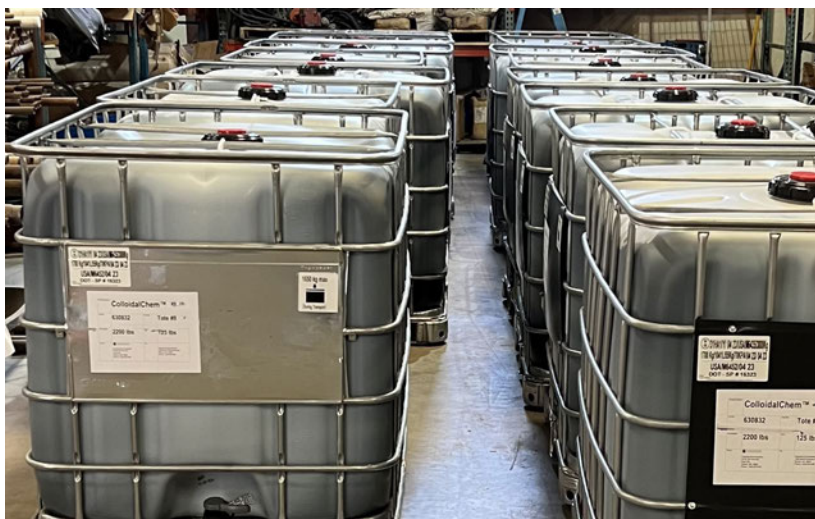
TURNKEY SOLUTIONS

While effective chemistries are a key part of successful remediation solutions, Cascade's turnkey solution meets the overall in situ remediation objective "to make contact with contaminant mass for a long enough period of time to achieve destruction." Cascade adds significant value to the application of Colloidal iZVI by providing:

- High resolution design optimization through our MiHPT subsurface technologies to identify target zones based on mass, lithology, and hydraulic conductivity.
- Client design support for dosing and critical injection parameters, including spacing and injection volumes and concentrations based on geology and hydraulic conductivity. Bench-scale and field design optimization services are available.

Cascade Chemistries

COLLOIDALCHEM™



WHAT IS COLLOIDALCHEM?

ColloidalChem is an injectable colloidal activated carbon product designed to target difficult-to-treat contaminants like chlorinated volatile organic compounds (CVOCs), benzene/toluene/ethylbenzene/xylenes (BTEX), per and polyfluoroalkyl substances (PFAS), and other pollutants.

HOW DOES IT WORK?

ColloidalChem is an activated colloidal carbon product consisting of 3 um/D90 particles, which allow for effective delivery and distribution within the subsurface. Once injected, ColloidalChem creates an effective treatment zone for contact with the contaminated groundwater plume. As the water flows, contaminants are captured within activated carbon pores, where their concentrations are reduced to MCLs through sequestration, destruction (+ISCR), and biodegradation (+BIO) and for high seepage velocity sites (+Anchor).

Advantages of controlled distribution, achieving contact and greater residence times

- High surface area makes it especially effective in situ applications.
- High persistence in the subsurface allows for greater efficacy against recalcitrant chemicals in the soil phase.
- Provides for the benefits of solid amendment for low pressure injection into transmissive flux zones.

Benefits of activated colloidal carbon

- A logical alternative to high CAPEX and O&M costs to Pump and Treat technology.
- Shorter time frame to reducing achieving sustainable groundwater targets.
- Breakdown products eliminated versus generation by traditional treatment technologies.
- Eliminates safety or site infrastructure risks associated with hazardous chemistries.

For more information, visit:
www.cascade-env.com/cascade-chemistries

Cascade Chemistries

COLLOIDALCHEM™



TURNKEY SOLUTIONS

While effective chemistries are a key part of successful remediation solutions, Cascade's turnkey solution meets the overall in situ remediation objective to make contact with contaminant mass for a long enough period of time to achieve destruction. Cascade adds significant value and higher performance to the application of our Chemistries by providing:

- High resolution design optimization (HRDO) through our MIHPT and Waterloo^{APS} subsurface technologies to identify target zones based on mass and lithology to determine flux and storage zones.
- Bench-scale and column testing as needed to verify performance on site groundwater.
- Advanced automated injection, "Pathfinder" for both liquids and our colloidal solid chemistries.
- Full "transparent" design support for chemistry dosing and critical injection parameters, including ROI, injection volumes, and concentrations based on our own dosing calculators and target zones hydraulic conductivity and seepage velocity.
- Design Optimization Testing (DOT) to confirm injection design assumptions.





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