Pre-Design Investigation Report
Dearcop Farm
Rochester, New York

Site Number 828016

May 10, 2022

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Remedial Bureau E
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List of Abbreviations and Acronyms

AMSL	above mean sea level
bgs	below ground surface
CAMP	community air monitoring program
DCA	Dichloroethane
DCE	Dichlorethene
DER	Division of Environmental Remediation
E & E	Ecology and Environment Engineering and Geology, P.C.
LaBella	LaBella Associates, LLC
NTU	nephelometric turbidity unit
NYSDEC	New York State Department of Environmental Conservation
OU	operational unit
PDI	Pre-Design Investigation
ppm	parts per million
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TCA	Trichloroethane
TCE	Trichloroethylene
VOC	Volatile organic compound

1 Introduction

Pursuant to Work Assignment Number D009807-20, Ecology and Environment Engineering and Geology, P.C. (E & E) prepared this pre-design investigation (PDI) report for the Dearcop Farm (Dearcop) site in Gates, Monroe County, New York. As of September 2, 2020, WSP USA, Inc. ("WSP") filed a certificate of merger with New York State integrating E & E into WSP and WSP now stands as an associated entity to E & E. This report was prepared for the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER) to support the development of a Remedial Action Work Plan for the Dearcop Site (Site No. 828016).

The 16-acre site is situated in an urban area west of the New York State Barge Canal and the City of Rochester and consists of two operable units (OUs) (Figure 1). OU-1 comprises the southern 6 acres of the site, which is an undeveloped parcel adjacent to a residential area. The bordering residential area to the south consists of 80 homes along Dearcop Drive and Varian Lane. OU-2 is comprised of the northern 10 acres of the site, which are overlain by the interchanges of Interstate Routes 390 and 490.

The site was used as a disposal landfill from 1919 to 1970, receiving wastes from General Railway Signal Company, E.I. DuPont DeNemours and Company, Inc., American Brakeshoe Company, and Pfaudler Company. The wastes included rubbish, office paper, wood, debris, scrap iron, foundry dirt, sand blasting debris, sand castings, acids, heavy metals, waste oil and sludges, and volatile organic compounds (VOCs).

The purpose of this investigation was to characterize the extent of VOC-affected groundwater plume surrounding two shallow bedrock groundwater monitoring wells, designated DR-2 and DR-3, where concentrations of VOCs exceed the New York State standards and guidance values for class GA groundwater (Figure 2).

The scope of work for this PDI included the following:

- Install four new monitoring wells to delineate the extent of VOCs around two existing shallow bedrock monitoring wells, DR-2 and DR-3, with DR-2 located on undeveloped woodland near the north end of Dearcop Drive and DR-3 in the median of Interstate 490.
- Develop the four new monitoring wells.
- Collect groundwater samples from six monitoring wells, the four newly installed monitoring wells and the two existing wells, DR-2 and DR-3.

1.1 Site Geology and Hydrogeology

Overburden at the Dearcop site consists of glacial till and urban fill underlain by the Penfield Dolomite Member of the Lockport Formation. Historical work at the site indicates that the depth to bedrock across the site is approximately 10 to 30 feet below ground surface (bgs).

Historically, the groundwater in the overburden is approximately 10 feet bgs and flows east-northeast towards the canal. The depth to groundwater in the bedrock aquifer is approximately 10 to 30 to feet bgs across the site and flows in a north-northeast direction.

Groundwater elevations in the area fluctuate seasonally based on the raising and lowering of water levels in the Barge Canal. In the overburden, groundwater elevation has historically fluctuated approximately 7 feet throughout the year, whereas groundwater elevation in the bedrock aquifer typically fluctuated approximately 10 feet per year.

2 Investigation Summary

Field activities were performed by an E & E field team consisting of two geologists. The work included the installation, development, and sampling of four new bedrock groundwater wells (see Figure 2). Wells DR-2-U and DR-2-D are located 25 feet upgradient (west) and 29 feet downgradient (east) of DR-2, respectively. Wells DR-3-U and DR-3-D are similarly located upgradient (southwest) and downgradient (northeast) of DR-3 at distances of 29 feet and 40 feet, respectively. The wells were installed between November 23 and December 3, 2021. The drilling was conducted by LaBella Associates, LLC (Labella).

DR-2-U and DR-2-D were developed on November 30 and December 1, 2021, and DR-3-U and DR-3-D were developed on December 6, 2021. Groundwater sampling of the four new and two existing shallow bedrock monitoring wells took place on December 7 and 8, 2021.

A summary of the field procedures is provided in the following subsections.

2.1 Pre-Field Investigation Activities

On April 8, 2021, the NYSDEC project manager, E & E project team, and LaBella (NYSDEC call-out contractor) conducted a site walkover and scoping discussion. The main purpose was to assess current site conditions and accessibility and to determine the appropriate locations for new monitoring well installations. After the site walkover, E & E prepared and submitted a Sampling and Analysis Plan to the NYSDEC on May 3, 2021. A site-specific health and safety plan was prepared for this fieldwork and was included in the Sampling and Analysis Plan.

NYSDEC call-out contractor LaBella contacted Dig Safely New York to request mark-outs of underground utilities the week before beginning intrusive activities.

2.2 Borehole Drilling and Monitoring Well Installation

Four monitoring wells were installed at the site. All drilling and monitoring well installations were completed by LaBella. Drilling and well installation were conducted between November 22 and December 3, 2021.

A Q-Rae 4-gas meter was affixed to the drill rig as a precautionary measure in the event that natural gas was encountered during drilling. No alarms were raised throughout the borehole drilling process. A community air monitoring program (CAMP) was in place with stations upwind and downwind during the overburden

drilling activities, each containing a Mini-Rae 3000 photoionization detector and a Dusttrak DRX aerosol monitor 8533 to monitor VOCs and particulate matter in the air, respectively. No alarms or exceedances were encountered by the CAMP monitors throughout the overburden drilling process.

Overburden drilling was conducted using 6.25-inch inside-diameter hollow stem augers from ground surface to the top of competent rock before switching to air-rotary drilling methods. Soil samples for lithologic description were collected using standard (i.e., 5-foot center) split-spoons at DR-2-D and DR-2-U, and continuous split-spoons at DR-3-D and DR-3U. All split-spoon samples were logged for soil color, grain-size, density, and scanned with a photoionization detector to detect the presence of VOCs in the soil. Field observations were recorded in the logbook and were used to construct boring log diagrams (Appendix A).

A 6-inch nominal diameter roller bit was then advanced 1 to 2 feet into competent rock through the augers before setting a 4-inch diameter steel casing in the bedrock. The annulus was backfilled with a 95/5 percent mixture of portland cement/bentonite grout to ground surface. The grout was allowed to cure overnight before advancing the coring device.

After the casing was set and the grout cured, a 4-inch nominal diameter borehole was advanced from the bottom of the casing into bedrock using an NX coring device. Rock core was recovered, transferred to core boxes, and logged for lithology and fractures. Boring log diagrams are provided in Appendix A.

Upon reaching the target depth, each borehole was completed as an open bedrock monitoring well with a stickup casing. Three 2-inch diameter steel bollards were placed around each well in the DR-3 cluster in the median of the Interstate 490 and 390 interchange to protect against damage from New York State Department of Transportation grass cutting activities. Bollards were determined to not be necessary in the DR-2 cluster as they are located on undeveloped woodland. Lids and locks were placed at the top of casings for security once work was finished. Investigation-derived waste generated includes soil cuttings, drilling fluids, groundwater purge water, and decontamination waste such as rinsate and poly liner.

2.3 New Monitoring Well Development

The new monitoring wells were developed by an E & E and LaBella field team using a submersible typhoon pump a minimum of 24 hours after well installation activities were completed. The wells were surged by agitating the water column using the submersible pump to remove fine sediments from the open bedrock borehole. Groundwater was purged from the wells, and development was considered complete when pH, temperature, and conductivity stabilized within ± 10 percent over the final three readings and turbidity was less than 50 nephelometric turbidity units (NTUs) (see Appendix B for development logs). Each well was purged in excess of three well volumes, and a total of approximately 250 gallons of groundwater were purged from the four new wells. Purge water was containerized in 55-gallon drums.

2.4 Monitoring Well Sampling

On December 7 and 8, 2021, wells DR-2-U, DR-2, DR-2-D, DR-3-U, DR-3, and DR-3-D were sampled using U.S. Environmental Protection Agency low-flow purging and sampling techniques with a peristaltic pump and dedicated polyethylene tubing. During purging, temperature, pH, specific conductance, dissolved oxygen, and oxidation-reduction potential were monitored using a multi-parameter water-quality meter equipped with a flow-through cell, and drawdown was monitored using an electronic water-level meter. Upon stabilization of parameters, the flow-through cell was removed from the system and groundwater samples were collected using the peristaltic pump. Stabilization was defined as three consecutive readings with: pH within ± 0.1 standard units; temperature within ± 3 percent; oxidation-reduction potential within ± 10 millivolts; conductivity within ± 3 percent; dissolved oxygen within 10 percent, except when below 0.5 milligrams per liter; and turbidity less than 50 NTU. The purge logs that include the final groundwater quality parameters measured at the time of sampling are provided in Appendix C.

2.5 Site Survey

Geographic coordinates and elevations were surveyed by WSP's New York state licensed land surveyors on behalf of E & E on December 7, 2021. Survey control points were established referencing the New York State Continuously Operating Reference Station Network. The survey is referenced horizontally to the North American Datum of 1983 and vertically to the North American Vertical Datum of 1988. The horizontal coordinates of all the new monitoring wells along with DR-2 and DR-3 were calculated to the nearest 0.1 foot, and the vertical coordinates of the ground surface and top of casing elevations also were calculated to the nearest 0.01 foot. Table 1 includes the coordinates of each monitoring well.

2.6 Investigation-Derived Waste Management

Investigation-derived wastes (IDW) were containerized in 55-gallon steel drums, except rock cores, which are stored in wooden core-log boxes. The wastes are stored on-site and secured within a locking gate at the north end of Dearcop Drive for later sampling and disposal coordinated by LaBella. A total of 20 IDW drums were generated during this investigation: nine (9) drums of waste water from well development, sampling purge water, and decontamination rinsate; 10 drums of soil and rock core cuttings; and one (1) drum of decontamination pad materials. Four additional drums are present inside the fenced area, two are labeled as drums of purge water from previous sampling event, and two are unlabeled drums with unknown contents. The four rock core boxes generated during this investigation (one from each new well) are also staged in the drum area.

2.7 Sample Handling and Analysis

Groundwater samples were collected in laboratory-supplied bottleware. Upon collection, the sample containers were labeled and immediately placed in a cooler maintained with ice. Strict chain-of-custody procedures were followed, and the

samples were shipped via overnight courier to Pace Analytical Laboratories in Melville, New York (under subcontract with NYSDEC). Groundwater samples were analyzed for VOCs using the U.S. Environmental Protection Agency SW-846 Method 8260D, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry*.

The analytical laboratory report was consistent with NYSDEC Analytical Services Protocol Category A deliverable requirements, and data were provided in NYSDEC Environmental Quality Information Systems electronic data deliverables for review by E & E. The laboratory report is provided in Appendix D.

2.8 Quality Assurance/Quality Control

Quality assurance/quality control samples were collected in accordance with the specifications of E & E's Quality Assurance Project Plan for NYSDEC projects (E & E 2020) and included a field duplicate, a trip blank, and a matrix spike/matrix spike duplicate pair. The duplicate sample was collected at DR-2-U, and the matrix spike/matrix spike duplicate was collected at DR-2-D.

2.9 Data Review

All laboratory deliverables were reviewed in accordance with the Quality Assurance Project Plan. A data usability summary report was prepared in accordance with NYSDEC's *DER-10 Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010). The data review included an evaluation of the following:

- Reporting limits/dilutions
- Matrix spike/matrix spike duplicate samples
- Laboratory control samples
- Field duplicates

Any deviations from acceptable quality control specifications are discussed in the data usability summary report. Qualifiers were added to the data, if appropriate, to indicate potential concerns with data usability, and these qualifiers were transferred to the data summary presented in Table 2. There were no significant impacts on data usability.

3 Results

3.1 Site Geology

Site overburden consists of a generally fining upward sequence of gravelly sand, silty sand with gravel, and silt. The shallowest soils at the site are topsoil comprised of silt and organics ranging on the order of less than a foot to 2 feet thick. Underlying the site topsoil is a layer of urban fill comprised of silt, sand, gravel, and occasional slag. This unit is underlain by 5 to 15 feet of yellowish-brown to gray silt with varying fractions of sand and gravel. Cobbles are common in this layer. The deepest unit in the overburden is a possible till characterized by dense to very dense brownish-gray to gray poorly graded sand with gravel, approximately 2 to 6 feet thick. The soil column was generally dry. Moist, but unsaturated, soil was observed above the bedrock interface. In general, overburden thickness was greater in the DR-3 cluster than in the DR-2 cluster. Overburden thickness ranged from 15.2 feet at DR-2-U to 23.3 feet at DR-3-U. See Appendix A for boring log diagrams.

The underlying bedrock consists of moderately fractured dolomite, containing dissolution features such as vugs and stylolites. Vugs are typically mineralized with calcium carbonate, and fractures are typically horizontal, narrow and clean, with occasional mineralization on the fracture surfaces. Water was used during the drilling process and the saturation of the bedrock fractures could not be determined from the recovered core.

3.2 Groundwater Flow Direction

Seven monitoring wells (i.e., DR-1, DR-2, DR-2-D, DR-2-U, DR-3, DR-3-D, and DR-3-U) were gauged for depth to water measurements using an electronic water level meter (Figure 1). The depth to groundwater ranged from approximately 17.5 feet bgs at DR-2, located upgradient at the site, to approximately 28 feet bgs at DR-3-U (Table 3).

Groundwater elevations measured at the site ranged from 510.33 feet above mean sea level (AMSL) at DR-3 to 519.53 feet AMSL at DR-2 (Table 3). The groundwater elevation contours indicate a flow direction to the east-northeast towards the barge canal, consistent with historical results (Figure 3). However, a perturbation in the flow field at DR-3D is present where the groundwater elevation of 516.46 feet AMSL is approximately 6 feet greater than nearby wells DR-3 and DR-3-U (510.33 and 510.77 feet AMSL, respectively). DR-3-D is located adjacent to a drainage ditch and was gauged during a rainfall event, which may have

influenced water levels in this location. However, the VOC concentrations in the sample collected from this well do not indicate dilution. Alternatively, DR-3-D may intercept a fracture with greater hydraulic head than those intercepted by wells DR-3 and DR-3-U.

3.3 Volatile Organic Compounds Groundwater Sampling Results

Seventeen total VOCs were detected in one or more of the six wells sampled at the site (Table 2). Of these, 11 compounds exceeded the evaluation criteria in one or more samples.[1] The exceedances are predominantly chlorinated VOCs and include:

- 1,1,1-trichloroethane (1,1,1-TCA; 5.78 to 81.9 micrograms per liter [µg/l])
- 1,1,2-TCA (1.9 µg/l)
- 1,1-dichloroethane (1,1-DCA; 5.49 to 909 µg/l)
- 1,1-dichlorethene (1,1-DCE; 10.1 to 55.2 µg/l)
- 1,2-DCA (3.65 to 14.1 µg/l)
- benzene (1.01 to 54.2 µg/l)
- chloroethane (17.6 to 249 µg/l)
- cis-1,2-DCE (93.5 to 1,760 µg/l)
- ethylbenzene (10.3 to 11.4 µg/l)
- trans-1,2-DCE (10.9 to 28.6 µg/l)
- Trichloroethylene (TCE; 17.2 to 124 µg/l)
- vinyl chloride (110 to 678 µg/l)

The highest concentrations of total VOCs were detected in the sample collected from monitoring well DR-3-D (2,305 µg/l). However, concentrations at the remainder of the wells, except DR-3, were within the same order of magnitude (i.e., approximately 1 to 2 parts per million [ppm]).

The groundwater sample results in DR-2 (1,235 µg/l of total VOCs) are consistent with historical sampling results which range from 747 µg/l to 1,871 µg/l of total VOCs between 2013 and August 2021. The total VOC concentrations in DR-2-D and DR-2-U (1,894 µg/l and 1,378 µg/l, respectively) are also consistent with historical concentrations in this area of the site. Historical groundwater sample results in DR-2 are presented in Table 4.

The December 2021 sampling results for DR-3 showed significantly reduced contaminant concentrations when compared with historical results. Between 2013 and

[1] Evaluation Criteria are the New York State Ambient Water Quality Standards and Guidance Values for Class GA groundwater as provided in the NYSDEC Division of Water, Technical and Operation Guidance Series (1.1.1), dated June 1998, and in the April 2000 Addendum.

2021, the total VOC concentrations in groundwater collected from this well have ranged from 444 µg/l to 2,910 µg/l, but concentrations have been slowly decreasing over time. For the December 2021 sample event, the total VOCs in DR-3 were 8.1 µg/l (approximately two orders of magnitude lower recent sampling events) and only 2 VOCs (1,1-DCA and 1,2-DCA) were detected at levels slightly exceeding the groundwater standards of 5 µg/l and 1 µg/l, respectively. Concentrations of total VOCs in DR-3-D (2,305 µg/l) and DR-3-U (1,794 µg/l) were more consistent with the historical VOC concentrations observed in this area of the site. Historical groundwater sample results in DR-3 are presented in Table 5.

4 Conclusions and Recommendations

4.1 Conclusions

Chlorinated VOC contamination has been present in the shallow bedrock aquifer wells DR-2 and DR-3 above groundwater standards over the past 30 years. Four additional shallow bedrock wells were installed around these wells (one upgradient and one downgradient of each well) to help determine if the VOC groundwater contamination is localized to the existing wells or present in the surrounding area of the wells.

Based on the results for DR-2 and the four new shallow bedrock wells, there appears to be chlorinated VOC contamination of 1 to 2 ppm in the shallow bedrock at the site. The one exception to this conclusion is that the sample results from DR-3 are significantly lower than previous sampling events. Although total VOC contamination has been generally decreasing in this well over time, such a significant decrease in VOC contamination is unexpected and could be the result of drilling and installing wells DR-3-U and DR-3-D. Bedrock coring of these wells may have impacted the groundwater in and immediately surrounding DR-3. Since the well was sampled by low flow methods, it is possible that the December sample may have been taken from the drill-impacted water in the well and not actual aquifer contaminated groundwater.

4.2 Recommendations

Based on the unexpected sample results from DR-3, E & E recommends collecting another round of groundwater samples from the DR-3 well cluster in spring or summer 2022 to assist in determining if the contamination reduction in DR-3 is real. Before the wells are sampled, E & E recommends at least two well volumes of groundwater be removed from DR-3 to ensure that aquifer groundwater is being sampled.

Based on the December 2021 sampling event, during which five of the six shallow bedrock wells were determined to have total VOC concentrations above 1 ppm, it appears that chlorinated VOC contamination in the shallow bedrock is present throughout the areas surrounding DR-2 and DR-3. Therefore, E & E has identified three potential options to address the shallow bedrock groundwater contamination at the site:

- Installation of additional shallow bedrock wells throughout and upgradient of the site to investigate the extent of chlorinated VOCs.
- As groundwater at the site is not utilized for drinking water and chlorinated VOC concentrations in DR-2 and DR-3 have been decreasing slowly over time, proceed with monitored natural attenuation at the site.
- If it is determined that monitored natural attenuation is not the path forward for the shallow bedrock contamination at the site, perform a chemical injection pilot study to identify an in-situ chemical injection that can accelerate contaminant degradation in the shallow bedrock at the site.

5 References

Ecology and Environment Engineering, P.C. (E & E). 2020. *Master Quality Assurance Project Plan (QAPP) for New York State Department of Environmental Conservation Projects*. Prepared for New York State Department of Environmental Conservation, Albany, New York, April 2020.

New York State Department of Environmental Conservation (NYDEC). 2010. *DER-10, Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation, Albany, New York, May 2010.

Figures

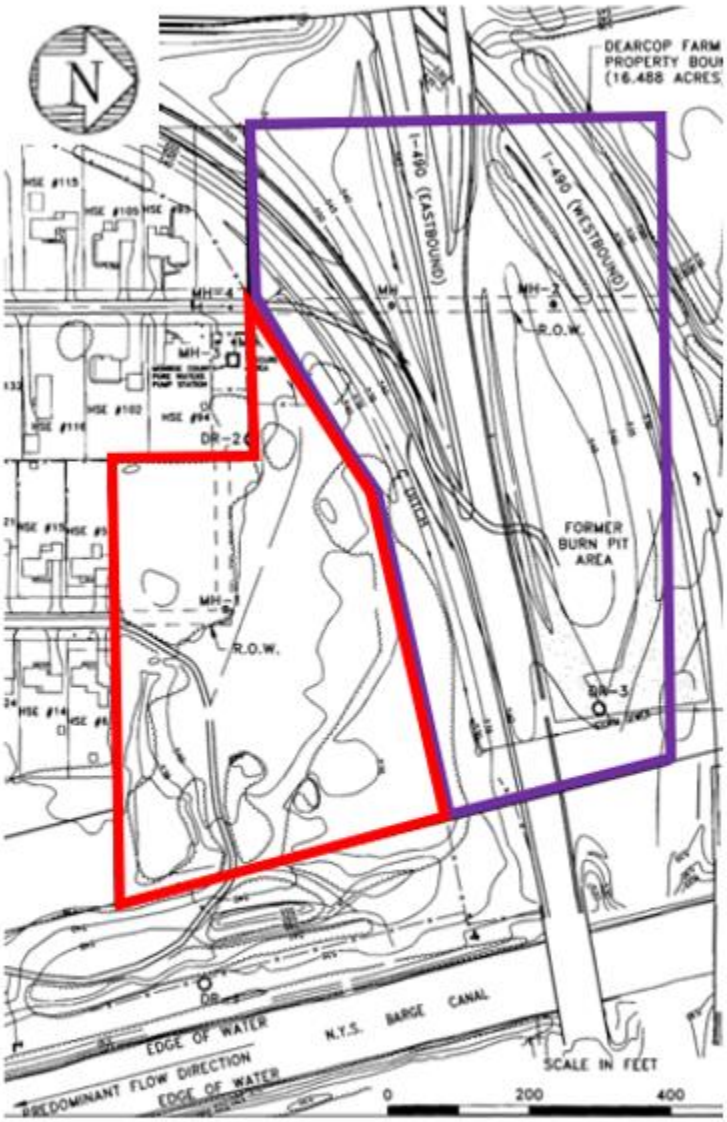

Figure 1 – Site Plan
Dearcop Farm
Monroe County
Town of Gates, New York

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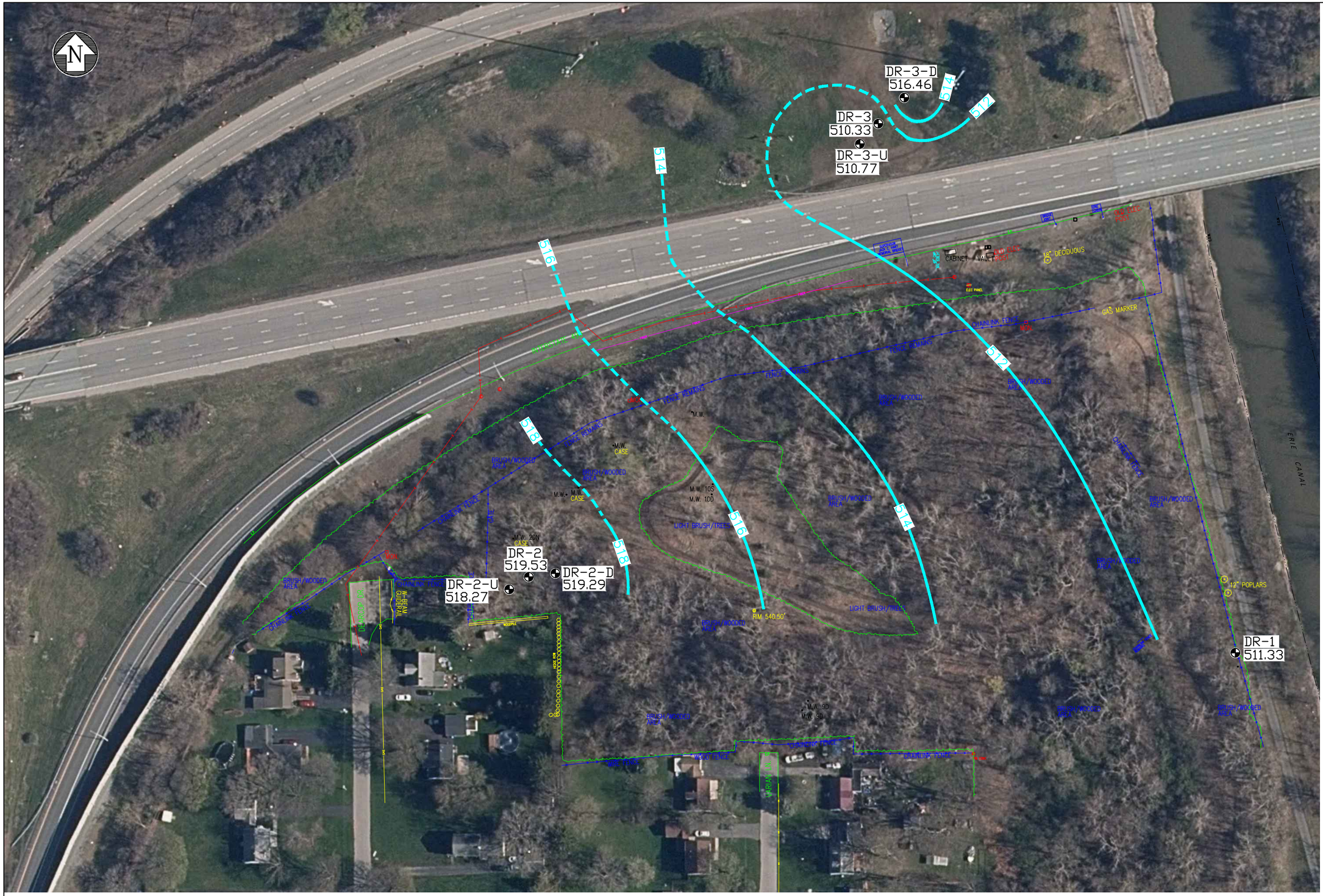

LEGEND

DR-3-D	MONITORING WELL LOCATION
510.77	GROUNDWATER ELEVATION (FEET)
512	GROUNDWATER CONTOUR – DASHED WHERE INFERRED (2' INTERVAL)

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SCALE IN FEET

0 100 200 300

NOTES

1. AERIAL IMAGERY SHOWN IS FROM TOWN OF GATES, 2020.

FIGURE 2 – SHALLOW BEDROCK GROUNDWATER CONTOURS
DEARCOP FARM
MONROE COUNTY
TOWN OF GATES, NEW YORK

Analyte (µg/L)	DR-3 12/08/21	DR-3-D 12/08/21	DR-3-U 12/07/21
1,1,1-Trichloroethane (TCA)	0.149 U	**81.9**	**18.1**
1,1,2-Trichloroethane	0.158 U	**1.90**	0.158 U
1,1-Dichloroethane	**5.49**	**174**	**449**
1,1-Dichloroethene	0.188 U	**28.5**	**10.1**
1,2-Dichloroethane	0.0819 U	0.0819 U	**3.65**
Benzene	**1.07**	**1.53**	**54.2**
Chlorobenzene	0.116 U	0.116 U	**8.22**
Chloroethane	0.192 U	**17.6**	3.84 U
Cis-1,2-Dichloroethylene	0.126 U	**1760**	**508**
Cyclohexane	0.188 U	**2.32**	**2.09**
Ethylbenzene	0.137 U	**11.4**	**10.3**
Methylcyclohexane	0.660 U	**5.25**	0.660 U
Toluene	0.278 U	0.278 U	**1.27**
Trans-1,2-Dichloroethene	**1.54**	**4.42**	**28.6**
Trichloroethylene (TCE)	0.190 U	**55.4**	**17.2**
Vinyl Chloride	0.234 U	**161**	**678**
Xylenes	0.174 U	0.174 U	**5.01**
TOTAL VOCS	**8.1**	**2305.22**	**1793.74**

Analyte (µg/L)	DR-2 12/07/21	DR-2-D 12/07/21	DR-2-U 12/07/21
1,1,1-Trichloroethane (TCA)	**5.78**	0.149 U	**35.3**
1,1-Dichloroethane	**744**	**793**	**909**
1,1-Dichloroethene	**121**	**132**	**55.2**
1,2-Dichloroethane	**9.22**	**14.1**	**5.26**
Benzene	**2.73**	**4.89**	**1.03**
Chloroethane	4.80 U	**249**	**86.7**
Cis-1,2-Dichloroethylene	**184**	**433**	**99.4**
Trans-1,2-Dichloroethene	**3.39**	**10.9**	0.149 U
Trichloroethylene (TCE)	**46.8**	**58.9**	**124**
Vinyl Chloride	**118**	**198**	**113**
TOTAL VOCS	**1234.92**	**1893.79**	**1417.39**

DR-3-D
DR-3
DR-3-U
DR-2
DR-2-D
DR-2-U
DR-1

LEGEND

DR-3-D — MONITORING WELL LOCATION

SCALE IN FEET
0 100 200 300

NOTES

1. AERIAL IMAGERY SHOWN IS FROM TOWN OF GATES, 2020.

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FIGURE 3 – PDI SAMPLING RESULTS
DEARCOP FARM
MONROE COUNTY
TOWN OF GATES, NEW YORK

Tables

Table 1 Monitoring Well Construction Summary
Dearcop Farm, Gates, NY

Well ID	Installation Date	Northing	Easting	Well Diameter (inches)	Ground Surface Elevation (ft AMSL)	Top of Casing Elevation (ft AMSL)	Depth to Bedrock (ft bgs)	Depth of Steel Casing (ft bgs)	Total Well Depth (ft bgs)
DR-1	UK	1151118.2	1390999.3	3.0	534.8	536.21	8	15	33
DR-2	UK	1151200.5	1390234.4	3.0	537.2	538.92	15	19	30
DR-2D	11/29/2021	1151204.5	1390263.2	4.0	537.8	539.62	15.8	19	34
DR-2U	11/24/2021	1151187.2	1390213.2	4.0	536.6	538.01	15.2	17.5	31.5
DR-3	UK	1151691.1	1390612.7	3.0	539.4	539.52	16	20.5	37
DR-3D	12/02/2021	1151719.5	1390640.8	4.0	536.1	538.22	20.5	22.5	37.5
DR-3U	12/03/2021	1151669.2	1390592.7	4.0	538.8	541.31	23.3	25	39

Key:
ft bgs = feet below ground surface
ft AMSL = feet above Mean Sea Level
UK = unknown

Source: Ecology and Environment Engineering, P.C. 2022

Table 2 Summary of Positive Analytical Results for Groundwater Samples
Dearcop Farm, Gates, NY

Analyte	Screening Criteria [1]	Notes	Location ID: DR-2	DR-2-D	DR-2-U	DR-2-U	DR-3	DR-3-D	DR-3-U
			Sample Name: DR-2-120721	DR-2-D-120721	DR-2-U-120721	DR-2-U-120721Q	DR-3-120821	DR-3-D-120821	DR-3-U-120721
			Date: 12/07/21	12/07/21	12/07/21	12/07/21	12/08/21	12/08/21	12/07/21
Volatile Organic Compounds by Method 8260D (µg/L)									
1,1,1-Trichloroethane (TCA)	5		**5.78**	0.149 U	**35.2**	**35.3**	0.149 U	**81.9**	**18.1**
1,1,2-Trichloroethane	1		0.158 U	0.158 U	0.158 U	0.158 U	0.158 U	**1.90**	0.158 U
1,1-Dichloroethane	5		**744**	**793**	**858**	**909**	**5.49**	**174**	**449**
1,1-Dichloroethene	5		**121**	**132**	**55.2**	**53.0**	0.188 U	**28.5**	**10.1**
1,2-Dichloroethane	0.6		**9.22**	**14.1**	**5.26**	**5.26**	0.0819 U	0.0819 U	**3.65**
Benzene	1		**2.73**	**4.89**	**1.01**	**1.03**	**1.07**	**1.53**	**54.2**
Chlorobenzene	5		0.116 U	0.116 U	0.116 U	0.116 U	0.116 U	0.116 U	**8.22**
Chloroethane	5		4.80 U	**249**	**86.7**	**86.3**	0.192 U	**17.6**	3.84 U
Cis-1,2-Dichloroethylene	5		**184**	**433**	**99.4**	**93.5**	0.126 U	**1760 J**	**508**
Cyclohexane			0.188 U	0.188 U	0.188 U	0.188 U	0.188 U	**2.32**	**2.09**
Ethylbenzene	5		0.137 U	0.137 U	0.137 U	0.137 U	0.137 U	**11.4**	**10.3**
Methylcyclohexane			0.660 U	0.660 U	0.660 U	0.660 U	0.660 U	**5.25**	0.660 U
Toluene	5		0.278 U	0.278 U	0.278 U	0.278 U	0.278 U	0.278 U	**1.27**
Trans-1,2-Dichloroethene	5		**3.39**	**10.9**	0.149 U	0.149 U	**1.54**	**4.42**	**28.6**
Trichloroethylene (TCE)	5		**46.8**	**58.9**	**124**	**124**	0.190 U	**55.4**	**17.2**
Vinyl Chloride	2		**118**	**198**	**113**	**110**	0.234 U	**161**	**678**
Xylenes	5		0.174 U	0.174 U	0.174 U	0.174 U	0.174 U	0.174 U	**5.01**
TOTAL VOCS			**1234.92**	**1893.79**	**1377.77**	**1417.39**	**8.1**	**2305.22**	**1793.74**

Key:

Qualifiers

U = Not detected (method detection limit shown)

Notes

G = Guidance value (no standard available)

Other

µg/L = Micrograms per liter

"-Q" denotes field duplicate sample

Bold values denote positive hits.

Exceeds groundwater standard.

Exceeds groundwater guidance value.

1. New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations,* 1998 (with updates), Class GA Groundwater Standards and Guidance Values.

Key at end of table.

Source: WSP USA

Table 3 Groundwater Elevations
Dearcop Farm, Gates, NY

Well ID	Top of Casing Elevation (ft AMSL)	Depth to Water (ft btoc)	Groundwater Elevation (ft AMSL)
DR-1	536.21	24.88	511.33
DR-2	538.92	19.39	519.53
DR-2D	539.62	20.33	519.29
DR-2U	538.01	19.74	518.27
DR-3	539.52	29.19	510.33
DR-3D	538.22	21.76	516.46
DR-3U	541.31	30.54	510.77

Key:
ft btoc = feet below top of casing
ft bgs = feet below ground surface
ft AMSL = feet above Mean Sea Level
UK = unknown

Source: Ecology and Environment Engineering, P.C. 2022

Table 4 DR-2 Historical Results

Analyte (µg/L)	DR-2				
	11/20/1992	8/25/1993	10/30/2013	3/18/2020	12/7/2021
1,1,1-TRICHLOROETHANE	**93**	**490**	**6.3**	<0.82	**5.78**
1,1-DICHLOROETHANE	**1900**	**2400**	**1200**	**490**	**744**
1,1-DICHLOROETHENE	**120**	**190**	**83**	**120**	**121**
1,2-DICHLOROETHANE	U	**73**	**13**	**6.0**	**9.22**
TOTAL-1,2-DICHLOROETHENE	**250**	**250**	**260**	**110**	**187**
TRICHLOROETHENE	**200**	**340**	**79**	**6.1**	**46.8**
VINYL CHLORIDE	U	**190**	**190**	**13**	**118**

Table 5 DR-3 Historical Results

Analyte (µg/L)	DR-3				
	11/20/1992	3/26/1993	10/29/2013	3/18/2020	12/8/2021
1,1,1-TRICHLOROETHANE	**30**	**64**	**25**	<8.2	U
1,1-DICHLOROETHANE	**250**	**380**	**560**	**320**	**5.49**
1,1-DICHLOROETHENE	**26**	**52**	U	<2.9	U
TOTAL-1,2-DICHLOROETHENE	**1700**	**2300**	**1335**	**200**	**1.54**
TRICHLOROETHENE	**76**	**150**	**8.9**	**4.6**	U
VINYL CHLORIDE	**340**	**660**	**690**	**150**	U

A Boring Log Diagrams

Project Name: Dearcop Farm	**Client:**	**Location:** Gates, New York	**Boring Log:** MW-DR-2D
Drilled By: LaBella/Chris Steele	**Drill Start Date:**	**Drill End Date:**	**Drill Method:** HSA/Air Rotary
Logged By: Erik S. Reinert	**Total Depth (ft):** 34	**Bore Diameter (in):** 8.25/4	**Ground Surface (ft-msl):** 537.8
Coordinates (X/Y): 1390263.22/1151204.509	**Well Permit Number:**		**Top-of-Casing (ft-msl):** 539.62

Well Construction			Annulus	
Material	**Diameter (in)**	**Depth (ft)**	**Material**	**Depth (ft)**
Screen:	2		**Filter Pack:**	to
Riser:	2		**Seal:**	
Other:			**Other:**	

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	Graphic Log	Physical Description	Well
								Ground Surface	
				1, 6, 8, 3	50	0.0		***SILT (ml)*** Dark brown silt, trace rootlets; dry. [Topsoil]	
2	536			9, 5, 5, 4	100	0.0		***POORLY-GRADED SAND (sp)*** Dark brown medium-grained sand; loose; dry; tree root between 0.5 and 0.7 foot; slag between 0.7 and 1 foot.	
4	534			4, 5, 9, 11	100	0.0		***SILT (ml)*** Yellowish-brown silt, loose; dry.	
6	532			17, 31, 25, 20	100	0.0		***SILTY SAND (sm)*** Yellowish-brown fine-grained sand, little silt, trace gravel; loose; dry.	
8	530			17, 14, 13, 16	75	0.0		***SILT WITH SAND (ml)*** Reddish-brown silt, few sand and fine-grained sub-rounded gravel; medium dense; dry.	
10	528			10, 13, 14, 17	75	0.3		***SILTY SAND (sm)*** Yellowish-brown, fine-grained sand, little silt, few sub-rounded gravel to 0.5-inch in diameter; medium-dense; dry.	8.25
12	526			20, 25, 24, 40	100	0.2		***POORLY-GRADED SAND (sp)*** Yellowish brown, fine-grained sand, trace sub-rounded gravel, cobbles >2-inch diameter at 6.8 and 7.2 feet; dense; dry.	
14	524			50/0				***POORLY-GRADED SAND WITH SILT (sp-sm)*** Yellowish-brown fine-grained sand, few silt, trace clay nodules, trace sub-rounded gravel; medium dense to dense; dry.	
16	522							***POORLY-GRADED SAND WITH GRAVEL (sp)*** Brown fine-grained sand, little coarse-grained sand and sub-rounded gravel up to 2-inches plus in diameter; very dense; moist.	
18	520							***POORLY-GRADED SAND WITH GRAVEL (sp)*** Split-spoon refusal at 14 feet on boulder. Cuttings below.	
20	518							***Dolomite*** Cuttings	

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Project Name: Dearcop Farm	Client:	Location: Gates, New York	Boring Log: MW-DR-2D

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	Graphic Log	Physical Description	Well
22	516							***Dolomite*** Gray dolomite; strong to very strong; matrix is fresh; aphanitic to fine-grained; massive; fresh to slightly decomposed; slightly disintegrated along stylolite bands every 3 inches to 1 foot; moderately fractured. Fractures: 20 feet - Bedding plane joint; horizontal; moderately narrow; not healed; rough; cohesive sediment infilling. 22 to 24.5 feet - Vertical fracture; extremely narrow; partly healed; clean; smooth. 25.2 feet - Horizontal fracture; tight; totally healed; clean; smooth. 26.0 feet - Joint; 35 degree dip; extremely narrow; not healed; clean; smooth. 27 to 27.5 feet - vugs 27.5 feet - Horizontal fracture zone; narrow; not healed; clean; stepped. 29.5 to 29.6 feet - Horizontal fracture zone; tight; totally healed; mineralized with calcite; rough. 31 feet - Horizontal fracture zone; wide; not healed; disintegrated; rough; noted by drillers. 32.4 to 32.5 feet - Near-horizontal vug; wide; partly healed; mineralized with calcite; rough. 33.2 to 33.3 - Horizontal fracture zone; smooth; not healed; narrow; clean. *(continued)*	
24	514				100	76			
26	512								
28	510								
30	508								
32	506				100	78			
34	504							*Bottom of boring at 34 feet. Bottom of Hole*	
36	502								
38	500								
40	498								
42	496								
44	494								

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Project Name: Dearcop Farm	**Client:**	**Location:** Gates, New York	**Boring Log:** MW-DR-2U
Drilled By: LaBella/Chris Steele	**Drill Start Date:** 11/22/2021	**Drill End Date:**	**Drill Method:** HSA/Air Rotary
Logged By: Erik S. Reinert	**Total Depth (ft):** 31.5	**Bore Diameter (in):** 8.25/4	**Ground Surface (ft-msl):** 536.6
Coordinates (X/Y): 1390213.212/1151187.179	**Well Permit Number:**		**Top-of-Casing (ft-msl):** 538.01

Well Construction			Annulus	
Material	**Diameter (in)**	**Depth (ft)**	**Material**	**Depth (ft)**
Screen:	2		**Filter Pack:**	to
Riser:	2		**Seal:**	
Other:			**Other:**	

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Blows	Recovery (%)	RQD	PID (ppm)	Physical Description
						Ground Surface
		W W 5 5	25		0.0	***ORGANIC SOIL (ol/oh)*** Dark brown organic-rich soil, trace rootlets; soft; dry.
2	535	5 5 8 47	50		0.0	2.5 ***SILT (ml)*** Yellowish-brown silt, soft; dry; little clay.
4	533	4 15 9 13	100		0.0	***WELL-GRADED GRAVEL (gw)*** Gray siltstone fragments. ***POORLY-GRADED SAND WITH SILT (sp-sm)*** Light yellowish-brown fine-grained sand, trace gravel; medium dense; dry.
6	531	12 12 10 10	100		0.0	***WELL-GRADED SAND WITH SILT AND GRAVEL (sw-sm)*** Light yellowish-brown fine- to coarse-grained sand; medium dense; 2-inch diameter cobble at 8 feet.
8	529	9 15 12 15	100		0.0	***POORLY-GRADED SAND WITH GRAVEL (sp)*** Yellowish-brown fine-grained sand, little coarse sand and gravel; medium dense; dry.
10	527	9 12 15 23	100		0.4	
12	525	25 31 38 65	100		0.2	***POORLY-GRADED SAND WITH GRAVEL (sp)*** Brownish-gray to gray very fine to fine-grained sand, little gravel to 2-inches in diameter; dense; dry.
14	523	18 19 22	100		0.2	
16	521	50/2				***DOLOMITE*** Cuttings
18	519		100	67		
20	517					

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Project Name: Dearcop Farm	Client:	Location: Gates, New York	Boring Log: MW-DR-2U

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	PID (ppm)	Graphic Log	Physical Description	Well
22	515								***DOLOMITE*** Gray dolomite; hard; fresh; thickly bedded; broken between 17.5 and 18.3 feet; massive between 18.3 and 21.5 feet; horizontal fractures/mechanical breaks at 17.7, 17.74, 17.85, 17.9, 18.1 to 18.3, 19, 19.3, 19.6, 19.7, 21.1, and 21.4 feet, 1-inch diameter vug at 19.3 feet, fracture surfaces are fresh, unweathered with no infilling, rough and stepped. *(continued)*	
24	513								***DOLOMITE*** Gray dolomite; core and fracture depths cannot be determined due to dropped core; vuggy, phaneritic (recrystallized), high-angle (10->45 degree) dissolution planes every 2 feet, approximately; broken between 29.6 and 31.5 feet, where core was recovered in-situ.	
26	511				100	83				
28	509									
30	507									
32	505								*Bottom of boring at 31.5 feet. Bottom of Hole*	
34	503									
36	501									
38	499									
40	497									
42	495									
44	493									

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Project Name: Dearcop Farm	**Client:**	**Location:** Gates, New York	**Boring Log:** MW-DR-3D
Drilled By: LaBella/Chris Steele	**Drill Start Date:**	**Drill End Date:**	**Drill Method:** HSA/Air Rotary
Logged By: Erik S. Reinert	**Total Depth (ft):** 37.5	**Bore Diameter (in):** 8.25/4	**Ground Surface (ft-msl):** 536.1
Coordinates (X/Y): 1390640.828/1151719.507	**Well Permit Number:**		**Top-of-Casing (ft-msl):** 538.22

Well Construction			Annulus	
Material	**Diameter (in)**	**Depth (ft)**	**Material**	**Depth (ft)**
Screen:	2		**Filter Pack:**	to
Riser:	2		**Seal:**	
Other:			**Other:**	

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	PID (ppm)	Graphic Log	Physical Description	Well
									Ground Surface	
2	534								***SILT (ml)*** Yellowish-brown and gray silt, trace organics and wood fragments.	
4	532									
6	530	X		2 2 2 2	100		0.0			
8	528								8.5	
10	526	X		4 6 11 19	100		0.0		***SILT WITH GRAVEL (ml)*** Yellowish-brown and gray silt, few gravel (0.1 to 0.25-inch in diameter); sense; dry; cobble in tip of sampler.	
12	524									
14	522									
16	520	X		23 33 24 24	50		0.1		16 16.3 ***POORLY-GRADED GRAVEL (gp)*** Limestone cobble.	
18	518								***POORLY-GRADED SAND WITH GRAVEL (sp)*** Gray fine-grained sand, little sub-rounded gravel and coarse-grained sand; medium dense; moist.	
20	516								20	

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

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Project Name: Dearcop Farm | **Client:** | **Location:** Gates, New York | **Boring Log:** MW-DR-3D

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	PID (ppm)	Graphic Log	Physical Description	Well
				29 50/2	71				***POORLY-GRADED GRAVEL (gp)*** Dolomite/limestone fragments	
22	514								***Dolomite*** Cuttings	
24	512								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; moderately disintegrated (vuggy); slightly to moderately fractured. Fractures: 22.75 feet - 15 degree dipping joint; very narrow; not healed; clean; rough. 22.5 to 22.8 feet - Vugs and pits throughout 23.2 to 23.4 feet - Fracture zone; narrow; not healed; clean; rough. 23.8 feet - Stylolite 24.3 feet - Mechanical break; extremely narrow; clean; smooth; horizontal 24.5 feet - Horizontal mechanical break 25.1 to 25.3 feet - Vuggy, partly healed with calcite mineralization. 25.3 to 25.4 feet - Fracture zone; narrow; not healed; clean; smooth. 25.8 feet - Mechanical break; clean; smooth; horizontal. 26 to 26.6 feet - Vuggy; partly healed with calcite mineralization 27.1 to 27.4 feet - Large open vugs with calcite mineralization 27.6 and 27.7 feet - Mechanical breaks; rough, not healed. 28.4 feet - Fracture/joint; 15 degree dip; extremely narrow; not healed; clean; smooth. 28.8 to 28.9 feet - Joint along stylolite; 15 degree dip; very narrow; partially healed with calcite mineralization; rough. 29 - Vugs 29.6 - Mechanical break; smooth; clean 31.1 - Mechanical break	
26	510									
28	508				87	69				
30	506									
32	504								Core-locked at 31.2 feet. No recovery below.	
34	502								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; slightly disintegrated (vugs); slightly to moderately fractured, primarily mechanical breaks. Fractures: 32.9 feet - Fracture along stylolite; 10 degrees; very narrow; not healed; clean; smooth. 35, 35.5, 36.3 and 36.6 feet - Bedding plane fracture/joint; very narrow; not healed; non-cohesive sedimentation (possible drill cuttings) rough. Mechanical breaks at 32.5, 33.8, 34.3, 34.7, 35.8, 36.2, 36.8, 37.2 feet.	
36	500									
38	498								*Bottom of boring at 37.5 feet. Bottom of Hole*	
40	496									
42	494									
44	492									

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Project Name: Dearcop Farm | **Client:** | **Location:** Gates, New York | **Boring Log:** MW-DR-3D

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	PID (ppm)	Graphic Log	Physical Description	Well
				29 50/2	71				***POORLY-GRADED GRAVEL (gp)*** Dolomite/limestone fragments	
22	514								***Dolomite*** Cuttings	
24	512								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; moderately disintegrated (vuggy); slightly to moderately fractured. Fractures: 22.75 feet - 15 degree dipping joint; very narrow; not healed; clean; rough. 22.5 to 22.8 feet - Vugs and pits throughout 23.2 to 23.4 feet - Fracture zone; narrow; not healed; clean; rough. 23.8 feet - Stylolite 24.3 feet - Mechanical break; extremely narrow; clean; smooth; horizontal 24.5 feet - Horizontal mechanical break 25.1 to 25.3 feet - Vuggy, partly healed with calcite mineralization. 25.3 to 25.4 feet - Fracture zone; narrow; not healed; clean; smooth. 25.8 feet - Mechanical break; clean; smooth; horizontal. 26 to 26.6 feet - Vuggy; partly healed with calcite mineralization 27.1 to 27.4 feet - Large open vugs with calcite mineralization 27.6 and 27.7 feet - Mechanical breaks; rough, not healed. 28.4 feet - Fracture/joint; 15 degree dip; extremely narrow; not healed; clean; smooth. 28.8 to 28.9 feet - Joint along stylolite; 15 degree dip; very narrow; partially healed with calcite mineralization; rough. 29 - Vugs 29.6 - Mechanical break; smooth; clean 31.1 - Mechanical break	
26	510									
28	508				87	69				
30	506									
32	504								Core-locked at 31.2 feet. No recovery below.	
34	502								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; slightly disintegrated (vugs); slightly to moderately fractured, primarily mechanical breaks. Fractures: 32.9 feet - Fracture along stylolite; 10 degrees; very narrow; not healed; clean; smooth. 35, 35.5, 36.3 and 36.6 feet - Bedding plane fracture/joint; very narrow; not healed; non-cohesive sedimentation (possible drill cuttings) rough. Mechanical breaks at 32.5, 33.8, 34.3, 34.7, 35.8, 36.2, 36.8, 37.2 feet.	
36	500									
38	498								*Bottom of boring at 37.5 feet. Bottom of Hole*	
40	496									
42	494									
44	492									

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Project Name: Dearcop Farm | **Client:** | **Location:** Gates, New York | **Boring Log:** MW-DR-3D

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Type	Lab Sample Interval	Blows	Recovery (%)	RQD	PID (ppm)	Graphic Log	Physical Description	Well
				29 50/2	71				***POORLY-GRADED GRAVEL (gp)*** Dolomite/limestone fragments	
22	514								***Dolomite*** Cuttings	
24	512								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; moderately disintegrated (vuggy); slightly to moderately fractured. Fractures: 22.75 feet - 15 degree dipping joint; very narrow; not healed; clean; rough. 22.5 to 22.8 feet - Vugs and pits throughout 23.2 to 23.4 feet - Fracture zone; narrow; not healed; clean; rough. 23.8 feet - Stylolite 24.3 feet - Mechanical break; extremely narrow; clean; smooth; horizontal 24.5 feet - Horizontal mechanical break 25.1 to 25.3 feet - Vuggy, partly healed with calcite mineralization. 25.3 to 25.4 feet - Fracture zone; narrow; not healed; clean; smooth. 25.8 feet - Mechanical break; clean; smooth; horizontal. 26 to 26.6 feet - Vuggy; partly healed with calcite mineralization 27.1 to 27.4 feet - Large open vugs with calcite mineralization 27.6 and 27.7 feet - Mechanical breaks; rough, not healed. 28.4 feet - Fracture/joint; 15 degree dip; extremely narrow; not healed; clean; smooth. 28.8 to 28.9 feet - Joint along stylolite; 15 degree dip; very narrow; partially healed with calcite mineralization; rough. 29 - Vugs 29.6 - Mechanical break; smooth; clean 31.1 - Mechanical break	
26	510									
28	508				87	69				
30	506									
32	504								Core-locked at 31.2 feet. No recovery below.	
34	502								***DOLOMITE*** Gray dolomite/limestone; aphanitic to fine-grained; massive; fresh; slightly disintegrated (vugs); slightly to moderately fractured, primarily mechanical breaks. Fractures: 32.9 feet - Fracture along stylolite; 10 degrees; very narrow; not healed; clean; smooth. 35, 35.5, 36.3 and 36.6 feet - Bedding plane fracture/joint; very narrow; not healed; non-cohesive sedimentation (possible drill cuttings) rough. Mechanical breaks at 32.5, 33.8, 34.3, 34.7, 35.8, 36.2, 36.8, 37.2 feet.	
36	500									
38	498								*Bottom of boring at 37.5 feet. Bottom of Hole*	
40	496									
42	494									
44	492									

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B Well Development Logs

WELL DEVELOPMENT RECORD

Site Name: Dearcop Farm
Well ID: DR-2-U
Project Number: EE 170507.0020.2
Date: 12/1/21
Location: Gates, NY
Diameter (inches): 4
Initial Depth to Water (ft below TOIC): 22.50
Final Water Level (ft below TOIC): 34.50
Initial Well Depth (ft below TOIC): 34.88
Final Well Depth (ft below TOIC): 34.86
Initial Casing Volume (gallons): 8.08
3x Static Casing Volume (gallons): 24.24
Description of development equipment and technique: Submersible pump / surge

Time	Total Volume Removed Gallons	Total Volume Removed Number	pH	Temp. (°F / °C)	Conductivity (µS/cm)	Turbidity (NTU)	Depth to Water (ft TOIC)	Comments
1250	2	—	7.09	11.7	1.509	73.6	26.69	1247 Begin
1258	8	—	7.10	11.5	1.521	200	30.50	* Purged
1306	~12	—	—	—	DRY —		33.81	~15-20 gal
—	Allow Recharge; 1337 restart							11/30
1338	13	—	6.96	11.9	1.717	99.9	26.55	
1343	~16	—	6.98	11.9	1.712	54.9	29.60	
1348	~20	—	7.05	11.8	1.692	46.5	32.10	
1350	~22	—	7.04	11.8	1.714	27.1	33.50	
1352	25	—	—	DRY	—		34.55	- Allow recharge
1405	28	—	7.07	11.8	1.767	64.1	30.00	1405 restart
1410	~31	—	7.00	11.6	1.764	17.02	32.35	
1414	33	—	7.08	11.6	1.773	9.50	34.30	
1415	34	DRY					34.50	

Personnel: C. Porreca
J. Folger (LaBella)
Signature: CJP
Date: 12-1-2021

WELL DEVELOPMENT RECORD

Site Name: Dear Cop Farm
Well ID: DR-2-D
Project Number: EE170 5007.0020.2
Date: 12-1-2021
Location: Gates, NY
Diameter (inches): 4
Initial Depth to Water (ft below TOIC): 20.21
Final Water Level (ft below TOIC): 35.75
Initial Well Depth (ft below TOIC): 36.75
Final Well Depth (ft below TOIC): 36.62
Initial Casing Volume (gallons): 10.8
3x Static Casing Volume (gallons): 32.4
Description of development equipment and technique: Surging / Pumping w/ typhoon pump

Time	Total Volume Removed Gallons	Total Volume Removed Number	pH	Temp. (°F / °C)	Conductivity (µS/cm)	Turbidity (NTU)	Depth to Water (ft TOIC)	Comments
1003	-	-	6.94	11.7	0.616	20.2	21.80	* ~~3x well vol.~~ ~15-20 gal. removed 11/30 w/
1006	5	-	7.06	11.1	1.308	77.3	23.22	
1010	7	-	7.00	11.1	1.322	57.8	25.32	
1015	9	-	7.09	11.0	0.016	169	24.91	
1023	12	-	7.05	11.1	1.341	355	31.04	- Pull pump +
1035	17	-	7.14	11.3	1.376	900	31.50	fix tubing
1041	20	-	7.13	11.4	1.380	785	34.00	connection
1047	24	-	~~7~~.14	11.3	1.417	712	35.8	1031 Restart
1053	26	-	-	-	-	-	36.75	Dry
1210	29	-	7.16	10.8	0.027	112	24.67	- Allow Recharge
1215	33	-	7.00	11.3	1.372	86.2	27.69	1206 resume
1220	36	-	7.01	11.2	1.380	86.2	30.30	
1225	39	-	7.04	11.1	0.672	50.1	32.80	
1230	42	-	7.06	11.4	1.414	25.2	34.85	
1234	44	-	-	-	-	-	35.75	Dry

Personnel: C. Porreca
J. Folger (LaBella)
Signature: CJP
Date: 12-1-2021

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WELL ~~PURGE & SAMPLE~~ Development RECORD

Site Name/Location: Dearcop Farm — Well ID: DR-3-D

EEEPC Project No.: EE170500 7.0020 — Date: 19-6-21

Initial Depth to Water: 20.42 feet TOIC — Final DTW: 35.05 — Start Time: 1140

Total Well Depth: ~38.90 feet TOIC — Final Well Depth: 38.98 — End Time: 1255

Depth to Pump: _____ feet TOIC — ☐ Bailer ☒ Pump

Initial Pump Rate: _____ Lpm / gpm — Pump Type: Typhoon Surge/purge

adjusted to: _____ at _____ minutes — Well Diameter: 4 inches

adjusted to: _____ at _____ minutes (CP) — 1x Well Volume: _____ gallons

Time	Purge Volume (gallons/liters)	pH (S.u.)	Temp. (°C/°F)	ORP (mV)	Conductivity (µS/cm mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)	
1145	6	6.77	12.4	—	3.047	—	85.8	24.68	
1150	12	6.87	12.5	—	2.906	—	180	25.09	May be inaccurate due to finicky meter
1155	18	6.89	12.4	—	2.918	—	331	25.25	
1200	24	6.93	12.3	—	2.881	—	117	26.69	
1205	30	6.94	12.4	—	2.883	—	109	32.42	
1210	36	6.81	12.4	—	2.890	—	87.6	32.94	
1215	42	6.79	12.5	—	2.888	—	83.6	33.62	
1220	48	6.82	12.3	—	2.885	—	64.9	34.50	
1225	54	6.77	12.4	—	2.887	—	57.3	34.92	
1230	60	6.84	12.4	—	2.894	—	51.7	35.02	
1235	66	6.82	12.4	—	2.891	—	48.1	35.22	
1240	72	6.80	12.3	—	2.885	—	40.2	35.75	
1245	78	6.77	12.4	—	2.888	—	46.9	35.09	
1250	84	6.79	12.3	—	2.880	—	45.4	35.05	
1255	90	6.82	12.3	—	2.881	—	39.3	35.05	
Final Sample Data:									

Sample ID: _____ — Duplicate? ☐ — Dupe Samp ID: _____

Sample Time: _____ — MS/MSD? ☐

Analyses: — Methods:

- ☐ VOCs — ☐ CLP
- ☐ SVOCs — ☐ SW846
- ☐ PCBs — ☐ Drink. Wtr.
- ☐ Metals — ☐ _____
- ☐ _____ — ☐ _____

Comments: _____

Sampler(s): C. Porreca, J. Folger (LaBella)

WELL DEVELOPMENT RECORD

Site Name: Dearcop Farm
Well ID: DR-3-U
Project Number: EE170507.0020
Date: 12-6-2021
Location: Gates, NY
Diameter (inches): 4
Initial Depth to Water (ft below TOIC): 30.45
Final Water Level (ft below TOIC): 31.03
Initial Well Depth (ft below TOIC): 39.45
Final Well Depth (ft below TOIC): ~40.10
Initial Casing Volume (gallons): 5.87 gal.
3x Static Casing Volume (gallons): 17.61
Description of development equipment and technique: Typhoon Surge/purge

Time	Total Volume Removed Gallons	Total Volume Removed Number	pH	Temp (°F / °C)	Conductivity mS(µS/cm)	Turbidity (NTU)	Depth to Water (ft TOIC)	Comments
9⁰⁵	—	—	—	—	—	>1,000	—	Begin Purge
9⁰⁸	1.5	—	—	—	Pump is c	logged -	well Full of	silt/sed.
10²⁰	—	—	—	Restart	purge			
10³⁰	15	—	6.80	13.1	2.996	500	30.93	
10³⁵	21	—	6.86	12.7	3.127	230	30.85	
10⁴⁰	27	—	6.86	12.5	3.172	340	30.89	
10⁴⁵	33	—	6.87	12.5	3.191	665	30.99	
10⁵⁰	39	—	6.85	12.5	3.205	100	31.05	
10⁵⁵	45	—	6.85	12.4	3.222	26.8	31.06	
11⁰⁰	51	—	6.85	12.4	3.229	66.7	31.08	
11⁰⁵	57	—	6.86	12.5	3.249	84.6	31.06	
11¹⁰	63	—	6.89	12.4	3.262	32.49	31.03	
11¹⁵	69	—	6.85	12.4	3.272	29.2	31.03	
11²⁰	75	—	6.85	12.5	3.283	32.9	31.03	

Personnel: C. Porreca
J. Folger (LaBella)
Signature:
Date: 12-6-21

C Groundwater Sampling Purge Logs

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WELL PURGE & SAMPLE RECORD

Site Name/Location: Deer Crop Farm
Well ID: DR-2
EEEPC Project No.: EE170500 7.0020
Date: 12-7-21

Initial Depth to Water: 19.39 feet TOIC
Start Time: 945
Total Well Depth: 30.70 feet TOIC
End Time: 1025
Depth to Pump: ~25 feet TOIC
☐ Bailer ☒ Pump
Initial Pump Rate: ~0.086 (Lpm) gpm
Pump Type: Peristaltic
adjusted to: _____ at _____ minutes
Well Diameter: ~3 inches
adjusted to: _____ at _____ minutes
1x Well Volume: 4.5 (CP) ~~4.38~~ gallons x 3 = ~~13.14~~ (CP) 12.45

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp (°C/°F)	ORP (mV)	Conductivity (µS/cm/mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
9:50		6.67	8.7	-67.1	76.854	1.29	18.03	19.78
9:55		6.68	7.5	-47.0	76.716	0.30	14.98	19.85
10:00		6.68	7.4	-42.3	76.650	0.59	13.56	19.97
10:05		6.68	7.6	-42.1	76.884	0.46	11.49	20.12
10:10		6.67	7.4	-42.5	76.779	0.41	10.52	20.23
10:15		6.68	7.8	-43.1	76.932	0.39	11.34	20.30
10:20	3.0	6.68	7.3	-42.6	76.404	0.38	11.09	20.34
Final Sample Data:		6.68	7.3	-42.6	76,404	0.38	11.09	20.34

Sample ID: (CP) ~~1020~~ DR-2-120721
Duplicate? ☐
Dupe Samp ID: _____
Sample Time: 1020
MS/MSD? ☐

Analyses: Methods:
☒ VOCs ☐ CLP
☐ SVOCs ☐ SW846
☐ PCBs ☐ Drink. Wtr.
☐ Metals ☐ _____
☐ _____ ☐ _____

Comments: Clear; no strong odor; no sheen; High conductivity - issue w/ sensor?

Sampler(s): CP, JF (LaBella)

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WELL PURGE & SAMPLE RECORD

Site Name/Location: Dearcop Farm
Well ID: DR-2-D
EEEPC Project No.: EE 1705007.0020
Date: 12-7-21

Initial Depth to Water: 20.33 feet TOIC
Total Well Depth: 34.88 feet TOIC
Depth to Pump: ~25 feet TOIC
Initial Pump Rate: ~0.13 (lpm) / gpm
adjusted to: _____ at _____ minutes
adjusted to: _____ at _____ minutes

Start Time: 11:00
End Time: 1140
☐ Bailer ☒ Pump
Pump Type: Peristaltic
Well Diameter: 4 inches
1x Well Volume: 9.5 gallons x 3 = 28.5

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp (°C/°F)	ORP (mV)	Conductivity (µS/cm mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
11:05		6.75	9.4	-50.6	71.939	2.00	43.82	20.52
11:10		6.71	8.5	-42.1	71.781	1.00	35.46	20.58
11:15		6.70	8.0	-42.2	71.790	0.69	25.33	20.63
11:20		6.70	8.5	-43.5	71.757	0.56	22.68	20.69
11:25		6.69	8.6	-44.4	72.247	0.54	16.44	20.62
11:30		6.69	8.9	-44.5	71.583	0.50	16.75	20.72
11:35	4.0	6.69	9.4	-46.5	72.036	0.52	20.43	20.75
Final Sample Data:		6.69	9.9	-46.5	72.036	0.52	20.43	20.75

Sample ID: DR-2-D-120721
Sample Time: 1135
Duplicate? ☐
MS/MSD? ☒
Dupe Samp ID: _____

Analyses: ☒ VOCs ☐ SVOCs ☐ PCBs ☐ Metals ☐ _____
Methods: ☐ CLP ☐ SW846 ☐ Drink. Wtr. ☐ _____ ☐ _____

Comments: Clear; no strong odor; no sheen; high conductivity - sensor calibration issue?

Sampler(s): CP, JF (LaBella)

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WELL PURGE & SAMPLE RECORD

Site Name/Location: Dearcop Farm
Well ID: DR-2-U
EEEPC Project No.: EE1705007.0020
Date: 12-7-21

Initial Depth to Water: 19.74 feet TOIC
Start Time: 840
Total Well Depth: 36.45 feet TOIC
End Time: 935
Depth to Pump: ~22 feet TOIC
☐ Bailer ☒ Pump
Initial Pump Rate: 0.12 (Lpm) / gpm
Pump Type: Peristaltic
adjusted to: _____ at _____ minutes
Well Diameter: 4 inches
adjusted to: _____ at _____ minutes
1x Well Volume: 10.91 gallons x3 = 32.73

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp (°C/F)	ORP (mV)	Conductivity (µS/cm, mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
8:45	–	6.72	7.7	-8.0	64.096	2.59	75.61	19.93
8:50	–	[illegible]	7.4	-112.5	63.945	1.25	66.15	19.94
8:55	–	7.05	7.5	-111.3	63.958	1.10	61.24	19.96
9:00	–	7.03	7.4	-111.5	63.914	0.94	57.81	19.99
9:05	–	7.07	8.2	-104.5	64.157	0.84	54.72	20.05
9:10	–	7.05	8.1	-100.8	64.364	0.81	47.89	20.08
9:15	–	7.02	7.9	-100.7	64.505	0.76	44.58	20.12
9:20	–	7.00	8.3	-97.1	64.955	0.70	43.65	20.16
9:25	–	6.96	8.3	-91.4	64.998	0.67	38.35	20.15
9:30	6	6.93	87.8	-86.6	65,380	0.64	32.00	20.19
Final Sample Data:		6.93	7.8	-86.6	65,380	0.64	32.00	20.19

Sample ID: DR-2-U-120721
Duplicate? ☒
Dupe Samp ID: DR-2-U-120721Q
Sample Time: 930
MS/MSD? ☐

Analyses: Methods:
☒ VOCs ☐ CLP
☐ SVOCs ☐ SW846
☐ PCBs ☐ Drink. Wtr.
☐ Metals ☐ _____
☐ _____ ☐ _____

Comments: Mostly clear, some sediment; no strong odor; no sheen; cond. seems high - will re-calibrate

Sampler(s): CP, JF (LaBella)

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WELL PURGE & SAMPLE RECORD

Site Name/Location: Dearcop Farm
Well ID: DR-3
EEEPC Project No.: EE1705007.0020
Date: 12-8-21

Initial Depth to Water: ~~28.19~~ 29.19 feet TOIC
Total Well Depth: 38.12 feet TOIC
Depth to Pump: ~35 feet TOIC
Initial Pump Rate: ~0.167 (Lpm) gpm
adjusted to: _____ at _____ minutes
adjusted to: _____ at _____ minutes

Depths from top of protective casing (~1.33' above TOIC)

Start Time: 1150
End Time: 1235
☐ Bailer ☒ Pump
Pump Type: Peristaltic
Well Diameter: ~3 inches
1x Well Volume: 3.28 gallons x 3 = 9.84

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp. (°C/°F)	ORP (mV)	Conductivity (µS/cm, mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
11:55		6.60	10.2	-115.6	14.650	1.05	8.75	29.69
12:00		6.64	10.5	-171.3	14.772	0.52	13.29	29.92
12:05		6.65	10.5	-199.9	14.811	0.38	15.73	30.12
12:10		6.67	10.7	-219.4	14.836	0.33	12.81	30.17
12:15		6.69	10.8	-239.1	14.875	0.28	9.54	30.19
12:20		6.70	9.7	-[illegible]	14.901	0.29	8.01	30.07
12:25	5.0	6.70	9.2	-255.6	14.895	0.28	4.33	29.98
Final Sample Data:		6.70	9.2	-255.6	14,895	0.28	4.33	29.98

Sample ID: DR-3-120821
Sample Time: 123025 (CP)
Duplicate? ☐ MS/MSD? ☐
Dupe Samp ID: _____

Analyses: Methods:
☒ VOCs ☐ CLP
☐ SVOCs ☐ SW846
☐ PCBs ☐ Drink. Wtr.
☐ Metals ☐ _____
☐ _____ ☐ _____

Comments: Strong odor; mostly clear; no sheen

Sampler(s): CP, JF (LaBella)

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WELL PURGE & SAMPLE RECORD

Site Name/Location: Dearcop Farm
Well ID: DR-3-U
EEEPC Project No.: EE170507.0020
Date: 12-7-21

Initial Depth to Water: 30.54 feet TOIC
Total Well Depth: 41.48 feet TOIC
Depth to Pump: ~35 feet TOIC
Initial Pump Rate: 0.15 (Lpm) gpm
adjusted to: _____ at _____ minutes
adjusted to: _____ at _____ minutes

Start Time: 13:20
End Time: 1510
☐ Bailer ☒ Pump
Pump Type: Peristaltic
Well Diameter: 4 inches
1x Well Volume: 7.14 gallons x3 = 21.42

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp (°C/°F)	ORP (mV)	Conductivity (µS/cm mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
13:25		6.72	10.5	-16.9	167.119	1.09	84.72	30.55
13:30		6.75	11.6	-16.5	173.877	1.15	54.97	30.58
13:35		6.76	11.7	-16.7	174.469	1.10	57.05	30.58
13:40		6.77	11.4	-19.0	175.101	1.07	52.92	30.58
13:45		6.79	10.9	-20.1	175.107	1.05	54.74	30.58
13:50		6.74	11.1	-21.4	175.343	1.08	58.11	30.58
13:55		6.78	11.1	-22.5	175.483	1.09	54.62	30.56
14:00		6.79	11.0	-23.3	175.644	1.11	64.78	30.56
14:05		6.79	10.8	-23.6	175.959	1.09	64.23	30.55
14:10		Changed tubing due to significant bubbles in line						
14:15								
14:20		6.80	8.4	-40.1	171.505	1.41	534	30.54
14:25		6.82	10.2	-29.5	175.243	1.33	455	30.50
14:30		6.82	10.4	-32.1	174.109	1.21	198	30.49
14:35		6.82	9.9	-33.5	173.513	1.23	155	30.50
14:40		6.82	9.5	-34.1	173.144	1.22	154	30.50
14:45		6.83	9.3	-34.7	173.191	1.37	187	30.49
14:50		6.83	9.0	-34.5	172.960	1.34	201	30.50
15:05 Final Sample Data:	12.0	6.75	8.2	-30.4	176.116	1.38	151	30.50

clean out flow-through cell

Sample ID: DR-3-U-120721
Sample Time: 1505
Duplicate? ☐
MS/MSD? ☐
Dupe Samp ID: _____

Analyses: ☒ VOCs ☐ SVOCs ☐ PCBs ☐ Metals ☐ _____
Methods: ☐ CLP ☐ SW846 ☐ Drink. Wtr. ☐ _____ ☐ _____

Comments: clear / lt. brown w/some sediment - low turbidity @ first then became turbid; no strong odor; no sheen; high conductivity?

Sampler(s): CP, JF (LaBella)

12-8-21 Dearcop Farm

Well DR-3-D Purge Record:

Initial Depth to water: 21.76' TOIC

Total Well depth: 40.30' TOIC

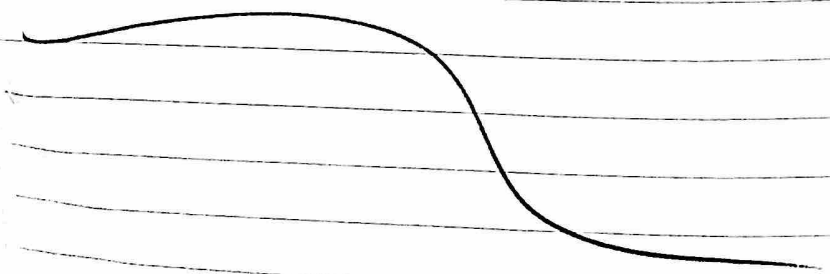
Well diameter: 4" 1x well Vol. = 12.1 gal.

Depth to pump: ~27' (peristaltic)

Purge Vol.: 5L Pump Rate: ~0.167 Lpm

Time	pH	Temp(°C)	ORP(mV)	Cond.(mS/cm)	DO(mg/L)	Turbidity(NTU)	Water Level(ft.)
13:00	6.53	11.1	-191.1	7.416	0.83	4.28	21.45
13:05	6.52	9.7	-191.5	7.324	0.53	3.42	21.40
13:10	6.51	10.0	-192.2	7.282	0.43	2.95	21.36
13:15	6.51	9.8	-192.1	7.296	0.37	2.63	21.35
13:20	6.51	10.1	-192.8	7.278	0.32	2.02	21.37
13:25	6.51	10.1	-192.8	7.293	0.30	2.05	21.37
13:30	6.51	9.9	-192.5	7.298	0.28	1.73	21.37

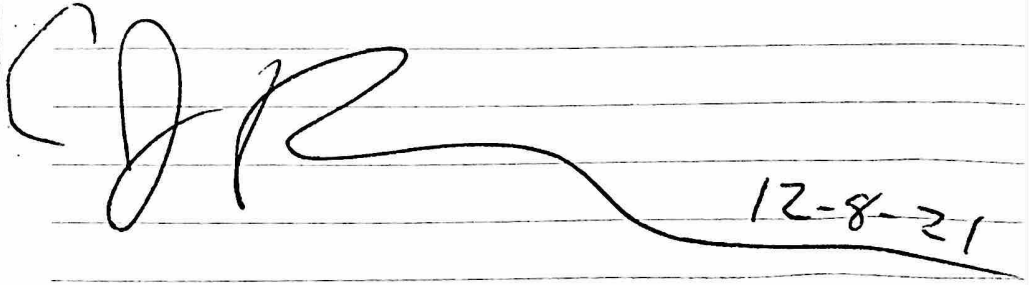
* - Mostly clear, some dark brown/black tint; slight odor; no sheen



12-8-21 Dearcop Farm

Start/Finish: 12:55/1335

Sample Time: 1330



D Data Usability Summary Report

Data Usability Summary Report	Project: Dearcop Farm RA
Date Completed: March 17, 2022	Completed by: Eridania Marte

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness based on applicable sections of the following guidelines.

- EPA Region 2 Data Validation SOP No. HW-34A, Revision 1

Specific criteria for QC limits were obtained from the master QAPP. Compliance with the project QA program is indicated in the checklist and tables below. Any major or minor concerns affecting data usability are listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

Project ID	Lab Work Order	Laboratory Report
EE1705007.0020.01	70197617	Pace Analytical

Table 1 Sample Listing Summary

Work Order	Matrix	Sample ID	Lab ID	Sample Date	Field QC	ID Correc-tions
70197617	WG	DR-2-120721	70197617001	2021/12/07 10:20:00		
70197617	WG	DR-2-D-120721	70197617002	2021/12/07 11:35:00	MS/MSD	
70197617	WG	DR-2-U-120721	70197617003	2021/12/07 09:30:00		
70197617	WG	DR-2-U-120721Q	70197617004	2021/12/07 09:30:00		
70197617	WG	DR-3-120821	70197617005	2021/12/08 12:25:00		
70197617	WG	DR-3-D-120821	70197617006	2021/12/08 13:30:00		
70197617	WG	DR-3-U-120721	70197617007	2021/12/07 15:05:00		
70197617	WQ	TB-120721	70197617008	2021/12/07 00:00:00		

Table 1A Sample Test Summary

Work Orders	Matrix	Test Method	Method Name	Number of Samples	Sample Type
70197617	WG	SW8260D	Volatile Organic Compounds by GC/MS	6	N
70197617	WG	SW8260D	Volatile Organic Compounds by GC/MS	1	FD
70197617	WQ	SW8260D	Volatile Organic Compounds by GC/MS	1	TB
70197617	WQ	SW8260D	Volatile Organic Compounds by GC/MS	1	MS/MSD

Data Usability Summary Report	Project: Dearcop Farm RA
Date Completed: March 17, 2022	Completed by: Eridania Marte

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes.
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	Yes.
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs Equipment Blank - 1/20 samples	Yes. 1 FD per 6 samples. 1 MS/MSD per 6 samples. 1 trip blank: 1 per VOC cooler. Rinsate blank not required, dedicated equipment used.
Case narrative present and complete?	Yes.
Any holding time violations?	No.

The following tables are presented at the end of this DUSR and provide summaries of results outside QC criteria:

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Reanalysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Data Usability Summary Report	Project: Dearcop Farm RA
Date Completed: March 17, 2022	Completed by: Eridania Marte

Volatile Organic Compounds by GC/MS – Method 8260C	
Description	**Notes and Qualifiers**
Any compounds present in method, trip, or, field blanks (see Table 2)?	No.
For samples, if results are < 5 times the blank or < 10 times the blank for common laboratory contaminants, then "U" flag data. Qualification also applies to TICs.	Not applicable.
Are surrogates for method blanks and LCS within limits?	Yes.
Are surrogates for samples and MS/MSD within limits? (See Table 3). If not, were all samples reanalyzed for VOCs? Matrix effects should be established.	Yes.
Is Laboratory QC frequency at least one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Category A report provided. Unable to determine.
Is MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then "J" flag positive data in original sample due to matrix.	1,1-Dichloroethane, 1,1-dichloroethene, chloroethane, and cis-1,2-dichloroethylene were recovered outside of the acceptance criteria in the MS and/or MSD for sample DR-2-D-120721. The associated sample results were greater than 4X the spike amount. No qualification was made. 1,2-Dibromo-3-chloropropane was recovered below the acceptance criteria in the MSD for sample DR-2-D-120721. The RPD was also outside of the acceptance criteria. The associated sample result was UJ qualified as estimated non-detect. Bromomethane RPD was recovered outside control limits for sample DR-2-D-120721. The sample result was non-detect; therefore, no qualification was made.
Is LCS within QC criteria (see Table 5)? If out, and the recovery is high with no positive values, then no data qualification is required.	Cis-1,2-dichloroethylene was recovered above the acceptance criteria in LCSD R3741698-2. The associated sample result for DR-3-D-120821 was J qualified as estimated. The associated sample result for DR-3-120821 was non-detect; therefore, no qualification was made.
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Category A report provided. Unable to determine.
Is initial calibration for target compounds <20 %RSD or curve fit?	Category A report provided. Unable to determine.
Is %D in the continuing calibration for target compounds less than method specifications?	All samples were qualified in the report for analytes bromoform, bromomethane, chloromethane due to continuing calibration standard low response. Method sensitivity check was acceptable. The sample results were UJ qualified as estimated non-detect.
Were any samples reanalyzed or diluted (see Table 6)? For any sample reanalysis or dilutions, is only one reportable result flagged?	Samples DR-2-U-120721, DR-2-U-120721Q, DR-2-120721, DR-2-D-120721, DR-3-U-120721, and DR-3-D-120821 were diluted due to analyte concentrations exceeding the calibration range.

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Volatile Organic Compounds by GC/MS – Method 8260C	
Description	**Notes and Qualifiers**
For TICs are there any system related compounds that should not be reported?	Not applicable.
Do field duplicate results show good precision for all compounds (see Table 7)?	Yes.

Summary of Findings

VOCs by 8260D

- Sample result for DR-3-D-120821 was J qualified as estimated for cis-1,2-dichloroethylene due to LCSD poor recovery.
- Sample result for DR-2-D-120721 was UJ qualified as estimated non-detect for 1,2-Dibromo-3-chloropropane due to MSD and RPD between the MS and MSD poor recovery.
- All samples were UJ qualified as estimated non-detect for analytes bromoform, bromomethane, chloromethane due to continuing calibration standard low response.

Table 2 - List of Positive Results for Blank Samples

None.

Table 2A - List of Samples Qualified for Method Blank Contamination

None.

Table 2B - List of Samples Qualified for Field Blank Contamination

None.

Table 3 - List of Samples with Surrogates outside Control Limits

None.

Table 4A – List of MS/MSD Recoveries outside Control Limits

Method	Parent Sample	Analyte	Orig. Result	Spike Amount	Dil Fac	Unit	Low Limit	High Limit	MS	SD	Qualifier
8260D	DR-2-D-120721	1,1-Dichloroethane	846	5.00	1	µg/L	25	158	40	360	None – 4X
8260D	DR-2-D-120721	1,1-Dichloroethene	132	5.00	1	µg/L	11	160	0	140	None – 4X
8260D	DR-2-D-120721	Chloroethane	546	5.00	1	µg/L	10	160	0	0	None – 4X
8260D	DR-2-D-120721	1,2-Dibromo-3-Chloropropane	ND	5.00	1	µg/L	22	151	83.4	6.04	UJ Flag
8260D	DR-2-D-120721	Cis-1,2-Dichloroethylene	489	5.00	1	µg/L	10	160	80	360	None – 4X

Table 4B – List of MS/MSD RPDs outside Control Limits

Method	Sample ID	Analyte	RPD	RPD Limit	Sample Flag
8260D	DR-2-D-120721	Bromomethane	48.3	38	None
8260D	DR-2-D-120721	1,2-Dibromo-3-Chloropropane	173	34	UJ Flag

Table 5A - List of LCS Recoveries outside Control Limits

Sample ID	Analyte	Rec.	Low Limit	High Limit	Sample Qualifier
R3741698-2LCSD	Cis-1,2-Dichloroethylene	125	73	120	J Flag

Table 5B – List of LCS RPDs outside Control Limits

Method	Sample ID	Analyte	RPD	RPD Limit	Sample Flag
8260D	R3740297-1/2	1,2-Dibromo-3-chloropropane	26.9	20	None

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Table 6 –Samples that were Re-analyzed

Sample ID	Lab ID	Method	Sample Type	Action
DR-2-U-120721	70197617001	8260D	N	25X: Diluted for 1,1-Dichloroethane due to exceeding calibration range.
DR-2-U-120721Q	70197617002	8260D	FD	25X: Diluted for 1,1-Dichloroethane due to exceeding calibration range.
DR-2-120721	70197617003	8260D	N	25X: Diluted for 1,1-Dichloroethane, Chloroethane, and Cis-1,2-Dichloroethylene due to exceeding calibration range.
DR-2-D-120721	70197617004	8260D	N	25X: Diluted for 1,1-Dichloroethane, Chloroethane, Vinyl Chloride and Cis-1,2-Dichloroethylene due to exceeding calibration range.
DR-3-U-120721	70197617006	8260D	N	20X: Diluted for 1,1-Dichloroethane, Chloroethane, Vinyl Chloride and Cis-1,2-Dichloroethylene due to exceeding calibration range.
DR-3-D-120821	70197617008	8260D	N	20X: Diluted for Vinyl Chloride and Cis-1,2-Dichloroethylene due to exceeding calibration range.

Table 7A – Summary of Field Duplicate Results

Method	Analyte	Unit	Matrix	PQL	Anal Type	DR-2-U-120721	DR-2-U-120721Q	RPD	RPD Rating	Sample Qual
8260D	1,1,1-Trichloroethane (TCA)	ug/l	WG	1.00	A	35.2	35.3	0.3%	Good	None
8260D	1,1-Dichloroethane	ug/l	WG	25.0	A	858	909	5.8%	Good	None
8260D	1,1-Dichloroethene	ug/l	WG	1.00	A	55.2	53.0	4.1%	Good	None
8260D	1,2-Dichloroethane	ug/l	WG	1.00	A	5.26	5.26	0.0%	Good	None
8260D	Benzene	ug/l	WG	1.00	A	1.01	1.03	2.0%	Good	None
8260D	Chloroethane	ug/l	WG	5.00	A	86.7	86.3	0.5%	Good	None
8260D	Cis-1,2-Dichloroethylene	ug/l	WG	1.00	A	99.4	93.5	6.1%	Good	None
8260D	Trichloroethylene (TCE)	ug/l	WG	1.00	A	124	124	0.0%	Good	None
8260D	Vinyl Chloride	ug/l	WG	1.00	A	113	110	2.7%	Good	None

Acronym List and Table Key:

CCB	=	continuing calibration blank
CCV	=	continuing calibration verification
COC	=	chain of custody
DUSR	=	data usability summary report
FD	=	field duplicate
GC/MS	=	gas chromatography / mass spectrometry
ICS	=	interference check standard
ICV	=	initial calibration verification
LCS	=	laboratory control sample
MB	=	method blank
MDL	=	method detection limit
µg/L	=	micrograms per liter
MS	=	matrix spike
MSD	=	matrix spike duplicate
N	=	normal (field) sample
NC	=	not calculated
ND	=	not detected
NYSDEC	=	New York State Department of Environmental Conservation
PQL	=	practical quantitation limit
QA	=	quality assurance
QAPP	=	quality assurance project plan
QC	=	quality control
RB	=	equipment rinse blank
RPD	=	relative percent difference
SDG	=	sample delivery group
TB	=	trip blank
TRG	=	target compound
%D	=	percent difference
%RSD	=	percent relative standard deviation