



engineering and constructing a better tomorrow

September 6, 2019

Mr. Benjamin Rung

Project Manager

Division of Environmental Remediation

Remedial Bureau E, 12<sup>th</sup> Floor

New York State Department of Environmental Conservation

625 Broadway

Albany, New York 12233-7016

Subject: **Erdle Perforating Company (NYSDEC Site 828072)**  
**May 2019 Groundwater Sampling Report**  
**MACTEC Engineering and Consulting, P. C., Project No. 3617137306**

Dear Mr. Rung:

MACTEC Engineering and Consulting, P.C. (MACTEC), under contract to the New York State Department of Environmental Conservation (NYSDEC) is submitting this Letter Report (Report) for groundwater sampling at the Erdle Perforating Company (Erdle) site (Site). The Site is listed as Class 2 hazardous waste Site No. 828072 in the Registry of Hazardous Waste Sites in New York State (Figure 1).

At the request of the NYSDEC Project Manager, MACTEC conducted a groundwater sampling event under Work Assignment No. D007619-26 to assess groundwater conditions at and in the vicinity of the Site after the NYSDEC implemented the selected remedy for the soil source area (i.e., electrical resistance heating [ERH]) from November 2014 through June 2016, and prior to implementation of any additional remedial actions.

## **BACKGROUND**

The Erdle Site is located at 100 Pixley Industrial Parkway in the Town of Gates, Monroe County (Figure 1). The Site property, approximately 9.2 acres in size, is bounded on the south by a marsh

and Conrail railroad tracks and an undeveloped wooded area further south of the railroad tracks. It is bounded on the north and east by light industry, and on the west by open land and Interstate 490. A residential development (Hidden Valley Development) is located south of the Site (south of the wooded area). The Site is currently zoned for industrial purposes including manufacturing and processing. The Site and surrounding developed areas are serviced by public water (MACTEC, 2010). Figure 2 shows the Site, surrounding area, and the existing monitoring well network.

Erdle Company manufactures perforated sheet metal products. The facility was constructed in 1968 on what was then farmland and used trichloroethene (TCE) during its manufacturing process to remove perforating oils. From the early 1970s to 1987, waste TCE was collected prior to disposal in an underground storage tank (UST) adjacent to the southwestern edge of the building. Waste oils were also stored in an underground tank next to the TCE tank. In February 1987, spent TCE, previously stored in a 2,000-gallon UST, was determined to have leaked and impacted soil and groundwater in the vicinity of the Site. The TCE tank and several other tanks on the property were removed in 1987 along with approximately 100 cubic yards of contaminated soil. In 1992 TCE was detected in groundwater at concentrations exceeding regulatory standards in samples collected by Erdle.

From 1994 through 2005, Erdle implemented a Remedial Investigation (RI)/Feasibility Study (FS) Order on Consent (the Order) with the NYSDEC. Results of the RI/FS determined that on-site groundwater contained concentrations of volatile organic compounds (VOCs) above NYSDEC Class GA groundwater standards. Based on these results, the NYSDEC determined that the nature and extent of the off-site groundwater contamination required further investigation and delineation. In addition, soil vapor intrusion investigations of residences in the Hidden Valley Development indicated that further action was required.

In September 2006, Erdle was determined to be in violation of the Order due to its failure to comply with the terms. Therefore, the Site was referred to the New York State Superfund program and MACTEC conducted an RI/FS between 2007 and 2010.

Following completion of several field investigations, a Record of Decision was issued in 2010 that outlined the remedial approach for the Site (NYSDEC, 2010). The selected remedy includes

installation of an in-situ ERH system for source area soil and groundwater (final completion in 2016) and potential implementation of in-situ enhanced biodegradation of groundwater depending on the effectiveness of the ERH at source area. Groundwater sampling was conducted just prior to the ERH operations in April 2015 to establish a baseline prior to implementation of the remedial action. Operation of the ERH system was conducted from June 2015 through April 2016. Upon completion of ERH operations, groundwater sampling of the ERH treatment area wells was conducted in May 2016 (MACTEC, 2017).

A limited groundwater sampling event was completed in May of 2018 to evaluate post remedy groundwater quality in comparison to pre-remedy. Results of the groundwater sampling event indicated that contaminants (primarily chlorinated compounds) are still present in groundwater at and downgradient from the Site at concentrations above New York State Standards (MACTEC, 2018).

This Report describes the groundwater sampling conducted in May 2019 to further evaluate the effectiveness of the ERH treatment at selected wells at and downgradient from the Site.

## **FIELD ACTIVITIES**

The performance of the groundwater sampling was governed by MACTEC's Field Activities Plan (MACTEC, 2019) submitted to the NYSDEC in May 2019. The NYSDEC call-out contractor TestAmerica Laboratories, Inc., provided the laboratory analytical services. Microbac Laboratories, Inc. was contracted for microbial analysis. Field activities were performed by MACTEC during the week of May 20, 2019.

The groundwater sampling program is detailed in Table 1. Groundwater sampling was conducted from wells located on Site and downgradient from the Site to assess the effectiveness of the source area groundwater ERH remedial action.

Water Level Measurements. Prior to groundwater sampling, a synoptic round of water level measurements was recorded (Table 2). Some wells had closed caps with pre-installed sample tubing, which did not allow for the collection of water level measurements. Groundwater

measurements generally aligned with those recorded previously; groundwater has been interpreted to flow primarily to the south from the Site (Figure 3 and 4).

Groundwater Sampling. Fifty-one wells were sampled using low-flow sampling techniques and analyzed for Target Compound List VOCs by Method 8260C. Field measurements for pH, temperature, specific conductivity, oxidation reduction potential, and dissolved oxygen were collected through a flow-through cell from each monitoring well during pre-sample purging. Turbidity was measured separately with a turbidity meter. Field measurements and monitoring well sampling activities were documented on Low Flow Groundwater Data Records included in Attachment 1.

Additionally, a subset of seven wells (including one background well for comparison) were tested for monitored natural attenuation (MNA) parameters to assess the potential implementation of in-situ enhanced biodegradation of groundwater in addition to the ERH remedial action. MNA parameters tested were: Iron and manganese by Method 6010, Total Organic Carbon by Method 415.1, Nitrate by Method 300, Nitrite by Method 354.1, Sulfate by Method 300, Sulfide by Method 4500, Methane/Ethane/Ethene by Method RSK-175, Carbon dioxide by Method RSK 175, Alkalinity by Method 2320, and Chloride by Method 300.

To evaluate if the correct microbes were present to dechlorinate the TCE to ethene, a subset of four wells (source area and downgradient) were sampled for microbial analysis by molecular quantitative polymerase chain reaction (qPCR) for evaluation of *dehalococcoides* (*DHC*), vinyl chloride reductase functional gene (*bvcA*), TCE reductase functional gene (*tceA*), and *Dehalobacter* bacteria.

Investigation Derived Waste. Groundwater purged during monitoring well sampling was containerized and treated on-Site using a portable granular activated carbon unit and allowed to infiltrate into the ground in a previous area of the Site.

Used disposable equipment and personal protective clothing was double bagged in polyethylene trash bags and sealed with twist ties. The disposable equipment was disposed of as nonhazardous municipal solid waste.

## ANALYTICAL RESULTS

Laboratory analytical results were validated and found to be usable as reported by the laboratory or qualified as documented in the Data Usability Summary Report (DUSR) (Attachment 2). Analytical data for the groundwater samples collected in May 2019 are summarized in Table 3 for VOCs and Table 4 for MNA parameters.

**VOCs.** The results for the primary contaminants of concern, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC) for the wells sampled in 2019 are presented on Figure 5. In general, groundwater chlorinated VOCs (CVOC) concentrations in the vicinity of the Site were similar to those detected in 2018. Historically, MW-2A and MW-3A/MW-3D have had the highest concentrations of CVOCs. In 2019, MW-2A had the highest concentration of total CVOCs, with similar concentrations to 2018, and MW-3/MW-3D had concentrations approximately 50 percent lower than the previous year. Further down gradient from the Site, groundwater concentrations detected in 2019 were slightly less than historic concentrations (especially true for TCE); although several wells had slightly higher concentrations in 2019. New York Class GA groundwater standards for CVOCs are currently exceeded at many locations at and downgradient of the Site, although degradation of TCE to cis-1,2-DCE and VC is generally observed.

**MNA Parameters.** MNA is the reliance on natural, rather than human-driven, processes to remediate certain groundwater contaminants, and can only occur under favorable conditions. The reported MNA parameters (Table 4) were evaluated using the United States Environmental Protection Agency BIOCHLOR Natural Attenuation Decision Support System model version 2.2 to assess the likelihood that natural attenuation is occurring at the Site, and if in-situ enhanced biodegradation of groundwater is a viable option at the Site. One well tested, MW-3A, showed strong evidence (>20 BIOCHLOR Score) for anaerobic biodegradation (i.e. reductive dechlorination) of chlorinated organics. The remaining wells tested show some evidence of anaerobic biodegradation, whether limited (6-14) or adequate (15-20). BIOCHLOR scoring worksheets are presented in Attachment 3.

**Microbial Analysis.** Molecular qPCR testing was used to gauge the relative strength of the five

specific microbial colonies for which testing was conducted. Results are presented in Attachment 4 and are reported in gene copies per liter, which is interpreted to represent cells per liter. Samples were tested for microbiological data to evaluate the potential effectiveness of MNA as a remedy for remaining groundwater contamination. TCE can undergo reductive dechlorination to nontoxic ethene via the daughter products cis-1,2-DCE and VC under the correct anaerobic conditions (Freedman et al. 1989, DiStefano et al. 1991). MW-3A had reported concentrations of DHC at  $5.83 \times 10^5$  cells per milliliter and the presence of  $DHC \geq 10^4$  cells/milliliter has been proposed as a screening criterion indicating high possibility of fully reductive dechlorination (See Microbial Insights DHC Interpretation Page included in Attachment 4). The remaining wells tested (MW-2A, MW-8D, MW-8) had populations ranging from  $10^1$  to  $<10^4$ , which are considered to have moderate potential for complete reductive dechlorination of TCE to ethene, especially when *bvcA* and *vcrA* genes are also present, as in these samples. The data indicates that the naturally occurring microbial population has the capability to completely dechlorinate the TCE to non-toxic ethene; however, the population may not be robust enough to fully remediate groundwater in the vicinity of the Site.

## CONCLUSIONS

Concentrations of CVOCs detected in 2019 in groundwater at and downgradient from the Site are similar to those detected in 2018, with continued elevated concentrations of TCE and daughter products in the former source area (MW-2A). In addition, concentrations further downgradient from the Site, in the vicinity of Hidden Valley Development, were generally lower than those detected in 2012 (last sampling round), especially concentrations of TCE.

Both the MNA evaluation using BIOCHLOR and the microbial analysis conducted indicate that conditions are generally favorable for natural dechlorination of the CVOCs to ethene; however, the biological population would likely need to be enhanced for effective remediation to occur. To remediate areas with continued high concentration of CVOCs other remedial actions could be considered such as in-situ chemical oxidation.

If you have questions on the information provided herein, please do not hesitate to contact us at (207) 775-5401.

Sincerely,



Charles Staples, PG

Senior Scientist



Jamie Welch

Project Manager

#### Enclosures

Figure 1	Site Location
Figure 2	Site Features
Figure 3	Overburden Groundwater Contours
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Table 1	Sampled Wells
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Table 4	MNA Parameters in Groundwater 2019
Attachment 1	Field Data Records
Attachment 2	Data Usability Summary Report
Attachment 3	BIOCHLOR Scoring Sheets
Attachment 4	Microbac Results

## REFERENCES

- Freedman, D. L. and Gossett, J. M., 1989. Biological Reductive Dechlorination of Tetrachloroethylene and Trichloroethylene to Ethylene under Methanogenic Conditions. *Applied and Environmental Microbiology*, 55 (9), 2144-2151.
- DiStefano, T. D., Gosset, J. M., & Zinder, S. H.. 1991. Reductive Dechlorination of High Concentrations of Tetrachloroethene to Ethene by an Anaerobic Enrichment Culture in the Absence of Methanogenesis.
- MACTEC Engineering and Consulting, P.C. (MACTEC), 2019. 2019 Groundwater Remedial Action Field Activities Plan, Erdle Perforating Company Site; Site Number 828027. August 6, 2019.
- MACTEC, 2018. May 2018 Post ERH-Remediation Groundwater Sampling Report, Erdle Perforating Company Site; Site Number 828027. July 25, 2018.
- MACTEC, 2017. Construction Completion Report, Erdle Perforating Company Remedial Action., Site No. 828072, prepared for the New York State Department of Environmental Conservation. March 2017.
- MACTEC, 2010. Final Remedial Investigation/Feasibility Study Report, Erdle Perforating Company, prepared for the New York State Department of Environmental Conservation. June 2010.
- New York State Department of Environmental Conservation (NYSDEC), 2010. Record of Decision, Erdle Perforating Site, State Superfund Project, Town of Gates, Monroe County, Site No. 828072. December 2010.



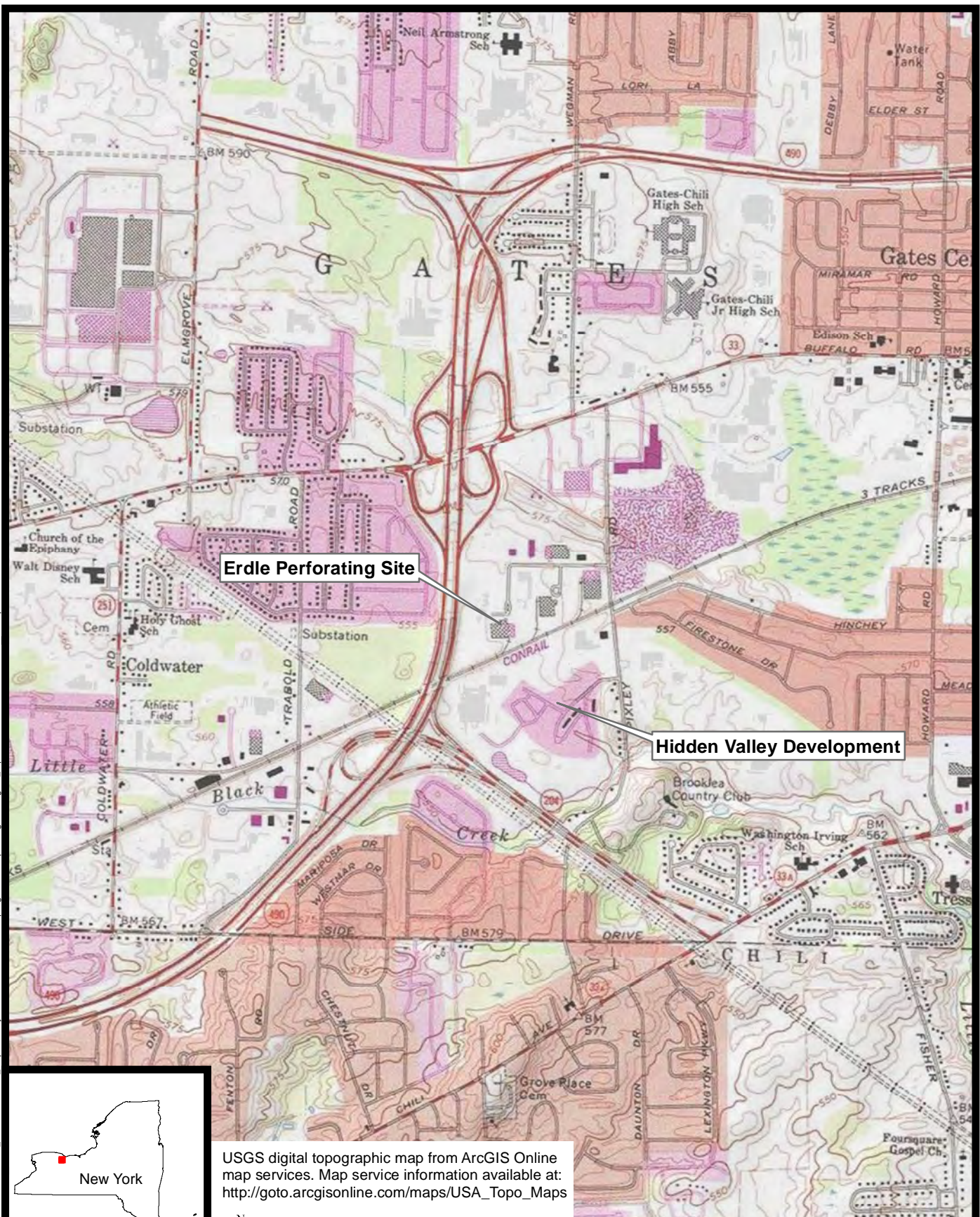
## LIST OF ACRONYMS AND ABBREVIATIONS

bvcA	vinyl chloride reductase
cis-1,2-DCE	cis-1,2-dichloroethene
CVOC	Chlorinated Volatile Organic Compound
<i>DHC</i>	<i>Dehalococcoides</i> species
DUSR	Data Usability Summary Report
Erdle	Erdle Perforating Company
ERH	electrical resistance heating
FS	Feasibility Study
MACTEC	MACTEC Engineering & Consulting, P.C.
MNA	Monitoring Natural Attenuation Parameters
NYSDEC	New York State Department of Environmental Conservation
the Order	Remedial Investigation Feasibility Study Order on Consent
qPCR	quantitative polymerase chain reaction
RI	Remedial Investigation
Site	Erdle Perforating Company Site
TCE	trichloroethylene
tceA	Trichloroethene Reductase
UST	underground storage tank

VC	vinyl chloride
vcrA	Vinyl Chloride Reductase
VOC	volatile organic compound

## **FIGURES**

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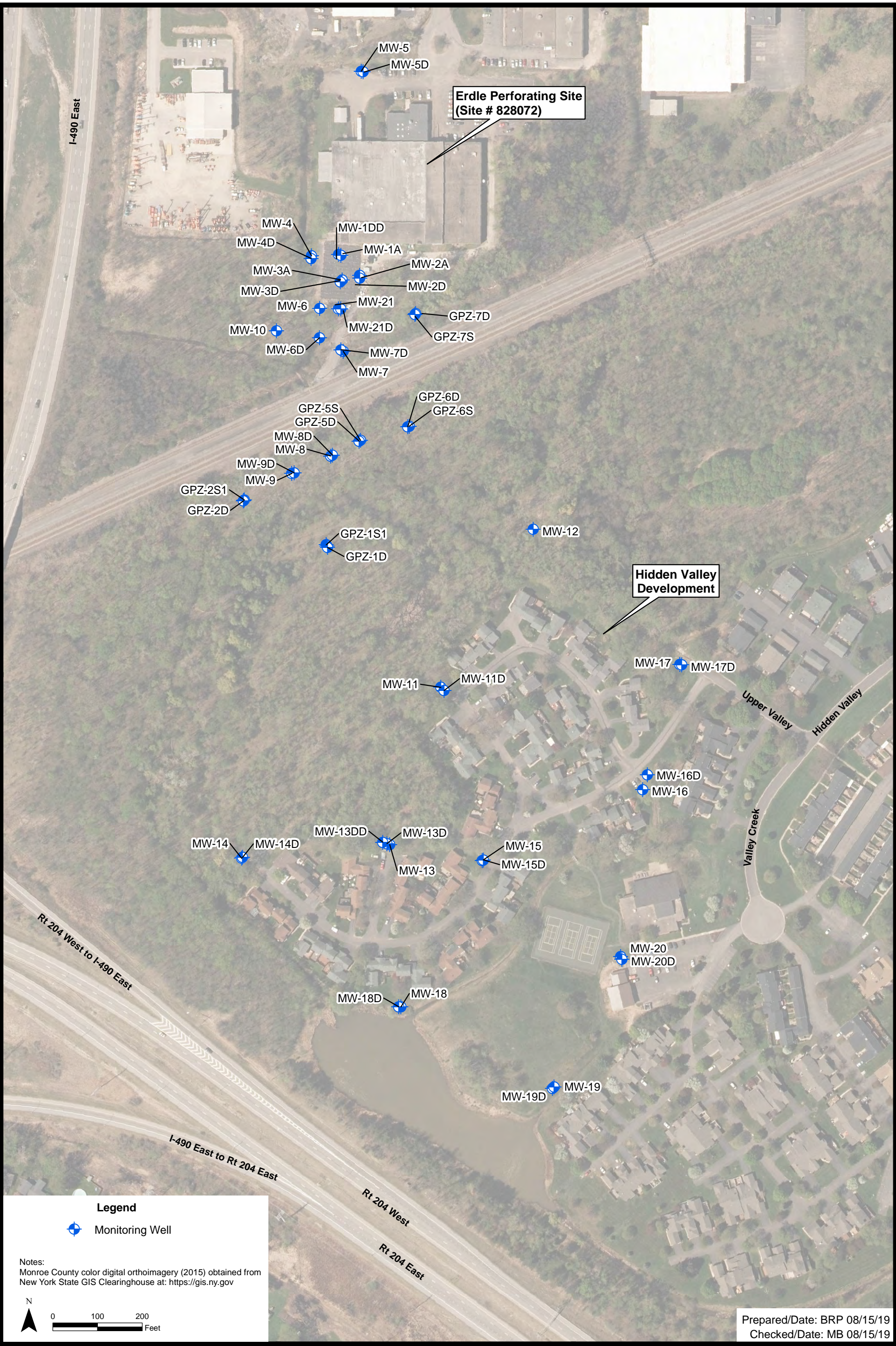
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ERDLE PERFORATING SITE  
GATES, NEW YORK



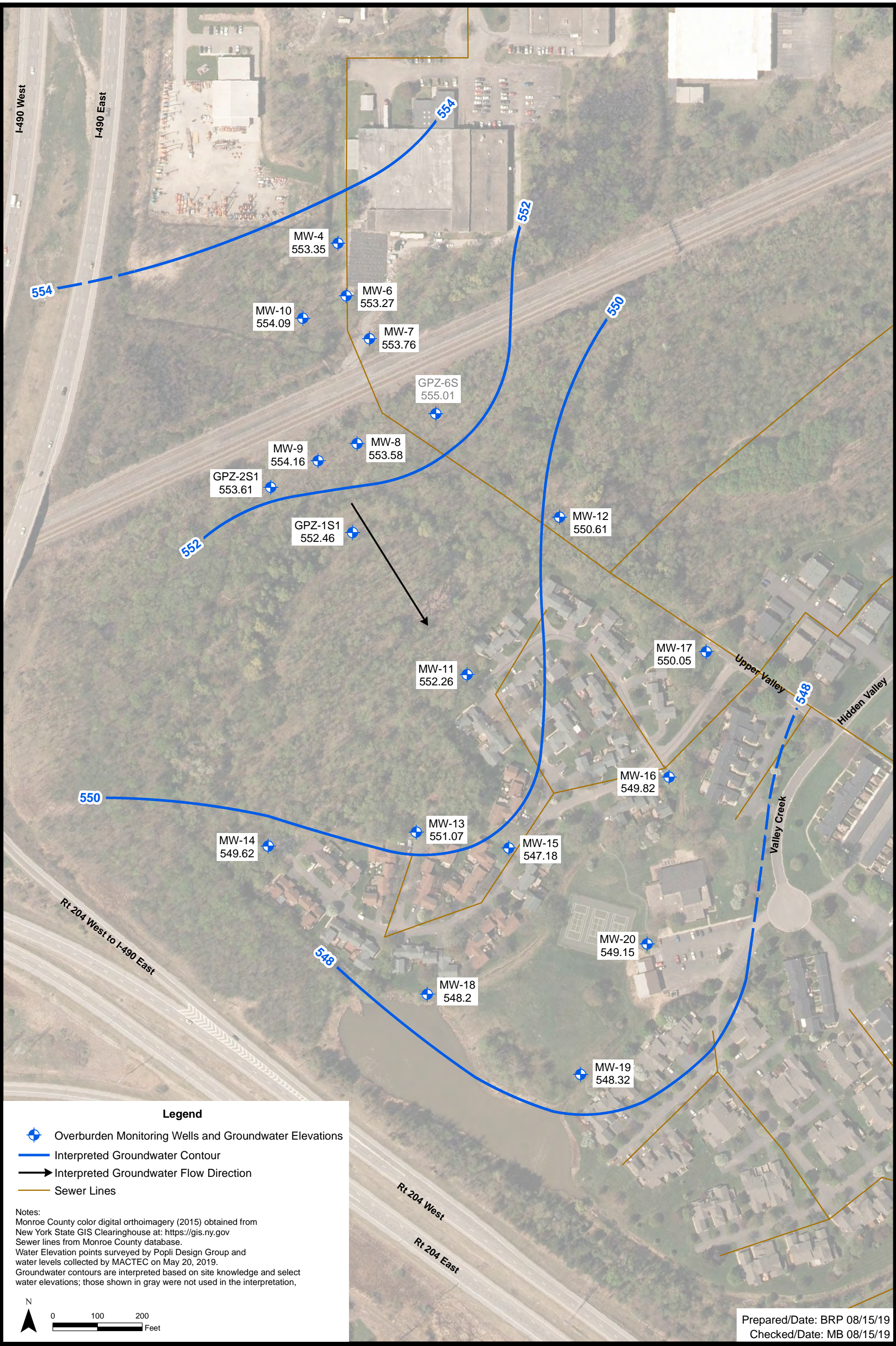
SITE LOCATION

Project 3617137306 Figure 1

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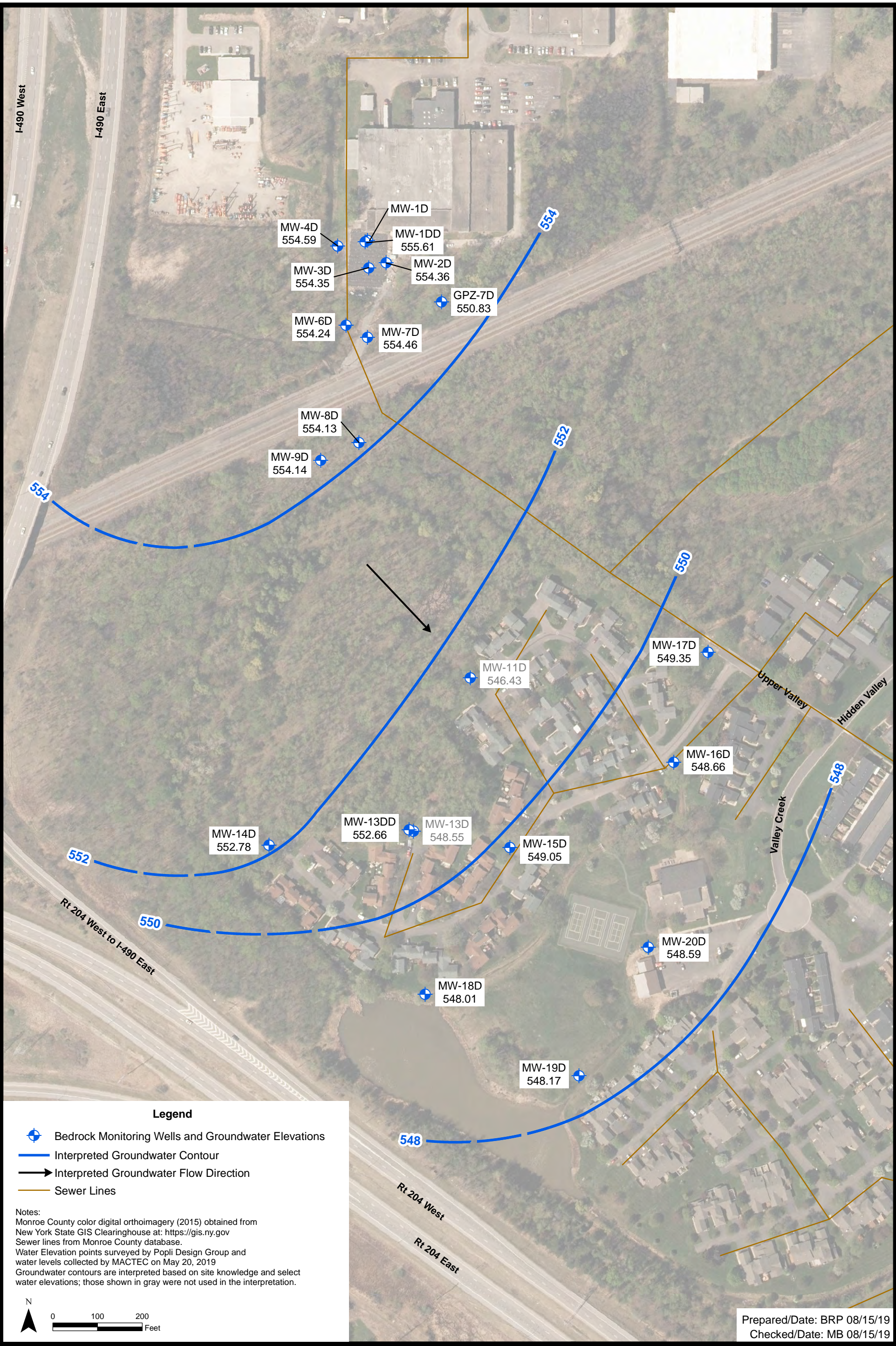


Document: P:\Projects\sys\sect\Contract\007619\Projects\Earth - CO\4.0\_Deliverables\4.1\_Reports\2019-Groundwater Sampling\Figures\Figure 3 - Overburden GW May 2019.pdf 08/15/2019 3:07 PM brian.peters

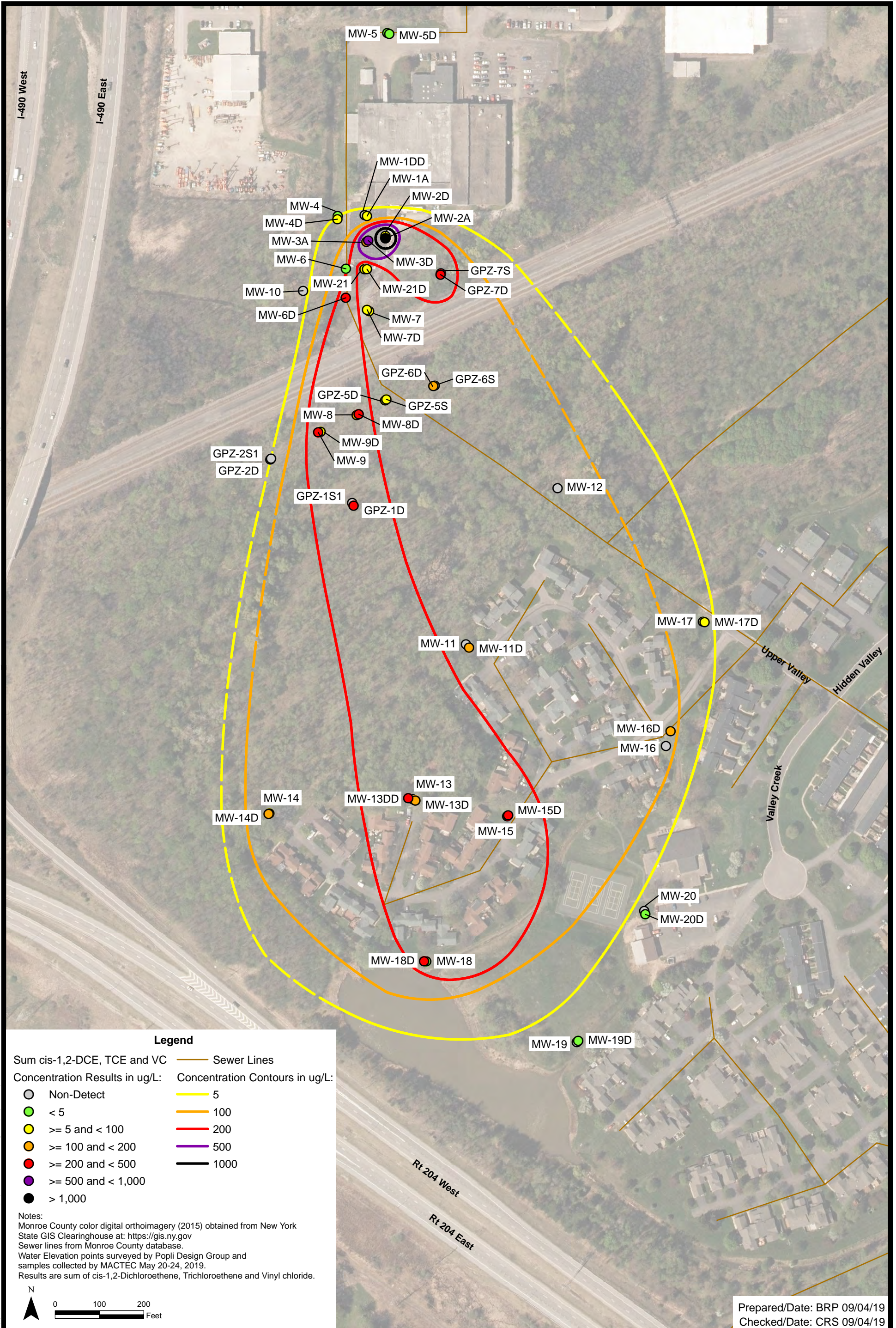


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Document: P:\Projects\jnysect\1\Contract\007619\Projects\Groundwater Sampling\Figures\Figure 4 - Bedrock GW May 2019.pdf 08/15/2019 2:47 PM brian.peters



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## **TABLES**

**Table 1: Groundwater Baseline Sample Identification and Analyses - May 21-24, 2019**

Site ID	Sample ID	DUP	VOCs	MNA parameters <sup>1</sup>	Microbial Analysis	Comments <sup>2</sup>
MW-1A	828072-MW01A008		1			Normal
MW-1DD	828072-MW1DD038		1			Normal
MW-2A	828072-MW02A008	1	1	1	1	Normal
MW-2D	828072-MW02D020		1			Normal
MW-3A	828072-MW03A008		1	1	1	Normal
MW-3D	828072-MW03D014		1			Very turbid, low flow rate
MW-4	828072-MW04008		1			Normal
MW-4D	828072-MW04D020		1			Turbid
MW-5 (Background)	828072-MW05006		1	1		Purged dry, resampled next day
MW-5D (Background)	828072-MW05D010		1			well damaged
MW-6	828072-MW06008		1	1		Normal
MW-6D	828072-MW06D015		1			Normal
MW-7	828072-MW07015		1			Some drawdown
MW-7D	828072-MW07D022		1			Damaged collar
MW-8	828072-MW08023		1	1	1	Normal
MW-8D	828072-MW08D033		1	1	1	Normal
MW-9	828072-MW09025		1			Normal
MW-9D	828072-MW09D035		1			Normal
MW-10	828072-MW10016		1			Normal
MW-11	828072-MW011012		1			Normal
MW-11D	828072-MW11D023		1			Normal
MW-12	828072-MW012011		1			Drawdown
MW-13	828072-MW013006		1			Purged dry then sampled recharge
MW-13D	828072-MW13D12	1	1			Normal
MW-13DD	828072-MW13DD040		1			Normal
MW-14	828072-MW014017		1			Normal
MW-14D	828072-MW14D033		1			Normal
MW-15	828072-MW015006		1			Purged dry, grab sample of recharge
MW-15D	828072-MW15D023		1			Normal
MW-16	828072-MW016008		1			Purged well dry, grab sample of recharge
MW-16D	828072-MW16D022		1			Fast drawdown
MW-17	828072-MW017007		1			Normal
MW-17D	828072-MW17D023		1			Normal
MW-18	828072-MW018010		1			Normal
MW-18D	828072-MW18D021		1			Normal
MW-19	828072-MW019006		1			Normal
MW-19D	828072-MW19D019		1			Normal
MW-20	828072-MW020006		1			Drawdown unstable
MW-20D	828072-MW20D020		1			Normal
MW-21	828072-MW021012	1	1	1		Normal
MW-21D	828072-MW21D020		1			Normal
GPZ-1S1	828072-GPZ1S1008		1			Normal
GPZ-1D	828072-GPZ1D014		1			Purged well dry, grab sample of recharge
GPZ-2D	828072-GPZ2D020		1			Purged dry, very little recharge when collecting grab sample
GPZ-2S1	828072-GPZ2S1014		1			Normal
GPZ-5D	828072-GPZ5D025		1			Well riser damaged
GPZ-5S	828072-GPZ5S018		1			Normal
GPZ-6D	828072-GPZ6D028		1			Normal
GPZ-6S	828072-GPZ6S018		1			Normal
GPZ-7D	828072-GPZ7D028		1			Normal
GPZ-7S	828072-GPZ7S010		1			Normal
<b>TOTAL SAMPLES</b>		3	51	7	4	Normal

Notes:

Sample ID = Site IDs begin with the NYSDEC Site # 8-28-072. Last three digits indicate sample intake depth in feet below ground surface.

MS/MSD = matrix spike and matrix spike duplicate sample collected (5%)

DUP = Duplicate sample collected (5%)

VOCs water = Target Compound List Volatile Organic Compounds analyzed by EPA Method 8260.

MNA Parameters = Monitoring Natural Attenuation Parameters = TOC by USEPA Method 415.1, Nitrate by NYSDEC ASP Method 300, Nitrite by NYSDEC ASP Method 354.1, Sulfate by NYSDEC ASP Method 300, Sulfide by NYSDEC ASP Method 4500, Methane/Ethane/Ethene by RSK-175, Carbon dioxide by RSK-175, Alkalinity by USEPA Method 2320, chloride by USEPA Method 300, and iron and manganese will be analyzed by USEPA Method 6010B. In addition, oxygen and reduction/oxidation potential will be measured during well stabilization.

1 - MNA Parameters for background well are Chloride (USEPA Method 300), and Alkalinity (USEPA Method 2320)

Labs: ALS for VOCs, MNA parameters

Microbac for microbial analysis

2 - Comments are observations made during sampling.

**Table 2: Monitoring Well and Groundwater Elevation Data- May 2019**

Exploration ID	Ground Elevation	Casing Elevation	Riser Elevation	Depth of Monitoring Well	Measurement Point	Measured Bottom of Well	DTW (TOR/TOC) (May 20, 2019)	Groundwater Elevation (May 20, 2019)
MW-1A	557.50	560.62	NA	10.0	NA	NA	NA	NA
MW-1DD	557.59	559.22	NA	42.9	TOC	41.7 ^	3.61	555.61
MW-2A	556.40	559.76	NA	10.0	NA	NA	NA	NA
MW-2D	555.59	557.32	NA	22.0	TOC	20.3 ^	2.96	554.36
MW-3A	555.70	559.04	NA	10.0	NA	NA	NA	NA
MW-3D	554.76	556.87	NA	16.0	TOC	14.9	2.52	554.35
MW-4	555.41	557.06	556.94	9.5	TOR	9.5	3.59	553.35
MW-4D	555.46	557.51	NA	22.1	TOC	22.1	2.92	554.59
MW-5	555.00	555.00	554.76	7.8	TOR	8.8	NA <sup>1</sup>	NA
MW-5D	555.16	555.36	NA	NA	TOC	12.0	0	555.36
MW-6	554.14	556.34	556.36	10.1	TOR	10.2	3.09	553.27
MW-6D	553.76	555.67	NA	25.6	TOC	25.7	1.43	554.24
MW-7	553.89	556.48	556.24	17.0	TOR	16.8	2.48	553.76
MW-7D	553.70	555.49	NA	27.1	TOC	26.0	1.03	554.46
MW-8	565.37	566.73	566.80	27.9	TOR	27.9	13.22	553.58
MW-8D	565.25	566.65	NA	38.7	TOC	38.1	12.52	554.13
MW-9	567.01	568.86	568.91	30.2	TOR	20.0	14.75	554.16
MW-9D	566.76	568.86	NA	48.0	TOC	40.9	14.72	554.14
MW-10	553.86	557.03	556.90	17.0	TOR	16.9	2.81	554.09
MW-11	553.55	556.75	556.60	13.3	TOR	13.2	4.34	552.26
MW-11D	554.05	557.81	555.09	23.7	TOC	23.7	8.66	546.43
MW-12	554.66	557.74	557.60	12.0	TOR	11.9	6.99	550.61
MW-13	553.71	553.79	553.40	7.8	TOR	6.8	2.33	551.07
MW-13D	553.57	553.63	553.33	12.3	TOR	12.2	4.78	548.55
MW-13DD	553.55	553.60	553.33	40.1	TOR	40.1	0.67	552.66
MW-14	552.88	553.01	552.64	16.2	TOR	16.3	3.02	549.62
MW-14D	552.96	552.97	552.78	33.8	TOR	33.8	0.00	552.78
MW-15	553.18	553.30	553.11	6.5	TOR	6.5	5.93	547.18
MW-15D	553.22	553.28	553.09	23.9	TOR	23.9	4.04	549.05
MW-16	553.94	553.96	553.78	8.9	TOR	9.0	3.96	549.82
MW-16D	553.94	553.97	553.64	22.2	TOR	22.1	4.98	548.66
MW-17	553.88	553.95	553.43	7.7	TOR	7.7	3.38	550.05
MW-17D	554.01	554.09	553.73	23.2	TOR	23.2	4.38	549.35
MW-18	552.34	552.25	551.84	10.9	TOR	10.9	3.64	548.2
MW-18D	552.28	552.23	551.72	22.8	TOR	22.7	3.71	548.01
MW-19	552.03	551.95	551.55	7.2	TOR	6.5	3.23	548.32
MW-19D	551.98	552.02	551.43	19.5	TOR	19.4	3.26	548.17
MW-20	553.62	553.70	553.39	6.8	TOR	6.8	4.24	549.15
MW-20D	553.59	553.64	553.39	20.9	TOR	20.8	4.80	548.59
MW-21	554.20	557.44	NA	12.7	TOC	NA	NA	NA
MW-21D	554.00	557.81	NA	22.0	TOC	NA	NA	NA
GPZ-1S1	552.70	NA	554.91	8.6	TOR	8.6	2.45	552.46
GPZ-1D	552.99	NA	555.50	15.5	NA	15.6	4.25	551.25
GPZ-2S1	562.79	NA	565.01	16.6	TOR	15.1	11.40	553.61
GPZ-2D	562.38	NA	564.88	27.5	NA	20.7	12.48	552.4
GPZ-5S	563.99	NA	566.94	20.0	TOR	18.4	12.51	554.43
GPZ-5D	564.08	NA	566.98	29.1	TOR	25.0	11.11	555.87
GPZ-6S	563.72	NA	564.14	20.1	TOR	19.4	9.13	555.01
GPZ-6D	564.25	NA	566.74	28.4	NA	28.9	14.01	552.73
GPZ-7S	557.95	NA	560.57	NA	TOR	19.1	5.76	554.81
GPZ-7D	557.82	NA	560.37	NA	TOR	10.5	9.54	550.83

**Notes:**

Wells Surveyed by Popli Design Group - Northing/Easting = North American Datum 83/96 - NYSPCS WEST (US SURVEY FT.)

Elevations = North Atlantic Vertical Datum 88 (US SURVEY FT.)

DTW = depth to water

TOR/TOC = from top of riser or top of casing

Groundwater levels collected by MACTEC Engineering on May 20, 2019

Measured bottom of well depth (unless notated) from May 2019; ^ = July 2012;

NA = Not Available

Table 3: VOCs in Groundwater 2019

Parameter Name	Location ID		GPZ-1D		GPZ-1S1		GPZ-2D		GPZ-2S1	
	Field Sample Date		5/24/2019		5/23/2019		5/24/2019		5/23/2019	
	Field Sample ID		828072-GPZ1D014		828072-GPZ1S1008		828072-GPZ2D020		828072-GPZ2S1014	
	Field Sample Depth (ft bgs)		14		8		20		14	
	QC Code		FS		FS		FS		FS	
	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>6.5</b>		1	U	1	U	1	U
1,1-Dichloroethene	5	--	<b>0.3</b>	J	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	<b>1.3</b>	J	<b>0.86</b>	J	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	5	U	5	U
Carbon disulfide	--	60	1	U	1	U	1	U	1	U
Chloroethane	5	--	<b>0.7</b>	J	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>180</b>		1	U	1	U	1	U
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	<b>1.4</b>		1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>0.62</b>	J	1	U	1	U	1	U
Trichloroethene	5	--	<b>24</b>		1	U	1	U	1	U
Vinyl chloride	2	--	<b>40</b>		1	U	1	U	1	U
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		GPZ-5D		GPZ-5S		GPZ-6D		GPZ-6S	
	Field Sample Date		5/23/2019		5/23/2019		5/23/2019		5/23/2019	
	Field Sample ID		828072-GPZ5D023		828072-GPZ5S016		828072-GPZ6D026		828072-GPZ6S017	
	Field Sample Depth (ft bgs)		23		16		26		17	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>0.78</b>	J	<b>0.21</b>	J	<b>5.2</b>		1	U
1,1-Dichloroethene	5	--	1	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	<b>26</b>	J	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	5	U	5	U
Carbon disulfide	--	60	1	U	1	U	1	U	<b>0.36</b>	J
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	<b>0.29</b>	J
cis-1,2-Dichloroethene	5	--	<b>34</b>		<b>8.2</b>		<b>83</b>		1	U
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>0.46</b>	J	1	U	<b>0.47</b>	J	1	U
Trichloroethene	5	--	<b>7.0</b>		<b>0.89</b>	J	<b>1.3</b>		1	U
Vinyl chloride	2	--	<b>10.0</b>		<b>0.69</b>	J	<b>24</b>		1	U
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		GPZ-7D		GPZ-7S		MW-1A		MW-1DD	
	Field Sample Date		5/22/2019		5/22/2019		5/21/2019		5/22/2019	
	Field Sample ID		828072-GPZ7D028		828072-GPZ7S010		828072-MW01A008		828072-MW01DD038	
	Field Sample Depth (ft bgs)		28		10		8		38	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>14</b>		1	U	10	U	1	U
1,1-Dichloroethene	5	--	1	U	1	U	10	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	10	U	1	U
1,4-Dioxane	--	--	<b>480</b>		40	U	400	U	40	U
2-Butanone	--	50	5	U	5	U	<b>160</b>		5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	<b>19</b>	J	5	U
Acetone	--	50	5	U	5	U	<b>530</b>		<b>3.8</b>	J
Carbon disulfide	--	60	1	U	1	U	10	U	<b>2.5</b>	
Chloroethane	5	--	1	U	1	U	10	U	1	U
Chloroform	7	--	1	U	1	U	<b>3.1</b>	J	1	U
Chloromethane	5	--	1	U	1	U	10	U	1	U
cis-1,2-Dichloroethene	5	--	<b>9.6</b>		1	U	<b>4.5</b>	J	1	U
Methyl Tertbutyl Ether	--	10	<b>0.82</b>	J	1	U	10	U	1	U
Naphthalene	--	10	1	U	1	U	10	U	1	U
Toluene	5	--	1	U	1	U	<b>16</b>		1	U
trans-1,2-Dichloroethene	5	--	<b>0.56</b>	J	1	U	<b>3.7</b>	J	1	U
Trichloroethene	5	--	1	U	1	U	<b>2.2</b>	J	1	U
Vinyl chloride	2	--	<b>240</b>		1	U	<b>11</b>		1	U
Xylene, o	5	--	1	U	1	U	10	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	20	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

Parameter Name	Location ID		MW-2A		MW-2A		MW-2D		MW-3A	
	Field Sample Date		5/21/2019		5/21/2019		5/21/2019		5/21/2019	
	Field Sample ID		828072-MW02A008		828072-MW02A008D		828072-MW02D020		828072-MW03A008	
	Field Sample Depth (ft bgs)		8		8		20		8	
	QC Code		FS		FD		FS		FS	
	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	20	U	20	U	1	U	10	U
1,1-Dichloroethene	5	--	<b>14</b>	J	<b>14</b>	J	1	U	10	U
1,2,4-Trimethylbenzene	5	--	20	U	20	U	1	U	<b>3.4</b>	J
1,4-Dioxane	--	--	800	U	800	U	40	U	400	U
2-Butanone	--	50	100	U	100	U	5	U	<b>10</b>	J
4-Methyl-2-pentanone	--	--	100	U	100	U	5	U	<b>7.5</b>	J
Acetone	--	50	100	U	100	U	5	U	50	U
Carbon disulfide	--	60	20	U	20	U	<b>0.43</b>	J	10	U
Chloroethane	5	--	20	U	20	U	1	U	10	U
Chloroform	7	--	20	U	20	U	1	U	10	U
Chloromethane	5	--	20	U	20	U	1	U	10	U
cis-1,2-Dichloroethene	5	--	<b>6800</b>		<b>8500</b>		<b>9.9</b>		<b>75</b>	
Methyl Tertbutyl Ether	--	10	20	U	20	U	1	U	10	U
Naphthalene	--	10	20	U	20	U	1	U	<b>10</b>	
Toluene	5	--	20	U	20	U	1	U	<b>4.5</b>	J
trans-1,2-Dichloroethene	5	--	<b>43</b>		<b>52</b>		1	U	10	U
Trichloroethene	5	--	<b>530</b>		<b>800</b>		<b>0.57</b>	J	10	U
Vinyl chloride	2	--	<b>660</b>		<b>730</b>		<b>1.6</b>		<b>53</b>	
Xylene, o	5	--	20	U	20	U	1	U	<b>3.1</b>	J
Xylenes (m&p)	5	--	40	U	40	U	2	U	<b>3.5</b>	J

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from  
 Technical and Operational Guidance Series (TOGS) 1.1.1,  
 "Ambient Water Quality Standards and Guidance Values and  
 Groundwater Effluent Limitations" (NYSDEC, 1998):  
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 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

Parameter Name	Location ID		MW-3D		MW-4		MW-4D		MW-5	
	Field Sample Date		5/21/2019		5/22/2019		5/22/2019		5/21/2019	
	Field Sample ID		828072-MW03D014		828072-MW004008		828072-MW04D020		828072-MW005006	
	Field Sample Depth (ft bgs)		14		8		20		6	
	QC Code		FS		FS		FS		FS	
	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	5	U	1	U	<b>0.31</b>	J	<b>0.4</b>	J
1,1-Dichloroethene	5	--	5	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	5	U	1	U	1	U	1	U
1,4-Dioxane	--	--	200	U	40	U	40	U	40	U
2-Butanone	--	50	<b>140</b>		5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	<b>3.9</b>	J	5	U	5	U	5	U
Acetone	--	50	<b>630</b>		<b>3.6</b>	J	5	U	<b>8.7</b>	
Carbon disulfide	--	60	5	U	1	U	1	U	1	U
Chloroethane	5	--	5	U	1	U	1	U	1	U
Chloroform	7	--	5	U	1	U	1	U	1	U
Chloromethane	5	--	5	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>530</b>		<b>1.1</b>		<b>3.1</b>		<b>0.42</b>	J
Methyl Tertbutyl Ether	--	10	5	U	1	U	1	U	1	U
Naphthalene	--	10	5	U	1	U	1	U	1	U
Toluene	5	--	<b>6.3</b>		1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>2.3</b>	J	1	U	<b>0.33</b>	J	1	U
Trichloroethene	5	--	5	U	<b>1.3</b>		<b>3.5</b>		1	U
Vinyl chloride	2	--	<b>230</b>		<b>0.31</b>	J	<b>0.34</b>	J	1	U
Xylene, o	5	--	5	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	10	U	2	U	2	U	2	U

**Notes:**  
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 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
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**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
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 -- = No listed value  
**Highlighted results exceed criteria**



**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-5D		MW-6		MW-6D		MW-7	
	Field Sample Date		5/20/2019		5/21/2019		5/21/2019		5/22/2019	
	Field Sample ID		828072-MW05D010		828072-MW006008		828072-MW06D015		828072-MW007015	
	Field Sample Depth (ft bgs)		10		8		15		15	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>0.5</b>	J	1	U	<b>0.92</b>	J	<b>0.35</b>	J
1,1-Dichloroethene	5	--	1	U	1	U	<b>0.99</b>	J	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	5	U	5	U
Carbon disulfide	--	60	1	U	1	U	<b>0.36</b>	J	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>0.4</b>	J	<b>0.69</b>	J	<b>220</b>		<b>2.4</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	1	U	1	U	<b>2.2</b>		1	U
Trichloroethene	5	--	1	U	1	U	<b>18</b>		1	U
Vinyl chloride	2	--	1	U	<b>0.47</b>	J	<b>11</b>		<b>3.1</b>	
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 201!**

	Location ID		MW-7D		MW-8		MW-8D		MW-9	
	Field Sample Date		5/22/2019		5/21/2019		5/21/2019		5/21/2019	
	Field Sample ID		828072-MW07D022		828072-MW008023		828072-MW08D033		828072-MW009025	
	Field Sample Depth (ft bgs)		22		23		33		25	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>0.65</b>	J	<b>1.5</b>		<b>0.8</b>	J	<b>1.6</b>	
1,1-Dichloroethene	5	--	1	U	<b>0.38</b>	J	<b>0.98</b>	J	<b>0.63</b>	J
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	5	U	5	U
Carbon disulfide	--	60	1	U	1	U	<b>0.35</b>	J	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>8.9</b>		<b>150</b>		<b>200</b>		<b>270</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	1	U	<b>3.4</b>		<b>2.3</b>		<b>1.5</b>	
Trichloroethene	5	--	<b>3.5</b>		<b>0.34</b>	J	<b>130</b>		<b>18</b>	
Vinyl chloride	2	--	<b>0.57</b>	J	<b>33</b>		<b>6.9</b>		<b>42</b>	
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**

Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**

GA/GV = Groundwater guidance or standard values from  
 Technical and Operational Guidance Series (TOGS) 1.1.1,  
 "Ambient Water Quality Standards and Guidance Values and  
 Groundwater Effluent Limitations" (NYSDEC, 1998):  
  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-9D		MW-10		MW-11		MW-11D	
	Field Sample Date		5/21/2019		5/22/2019		5/23/2019		5/23/2019	
	Field Sample ID		828072-MW09D035		828072-MW010016		828072-MW011012		828072-MW11D023	
	Field Sample Depth (ft bgs)		35		16		12		23	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>0.27</b>	J	1	U	1	U	<b>0.88</b>	J
1,1-Dichloroethene	5	--	<b>0.26</b>	J	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	<b>2.8</b>	J	5	U
Carbon disulfide	--	60	1	U	1	U	1	U	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	<b>0.31</b>	J	<b>0.39</b>	J
cis-1,2-Dichloroethene	5	--	<b>70</b>		1	U	1	U	<b>73</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>3.6</b>		1	U	1	U	<b>0.79</b>	J
Trichloroethene	5	--	<b>16</b>		1	U	1	U	1	U
Vinyl chloride	2	--	<b>3.2</b>		1	U	1	U	<b>110</b>	
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

Parameter Name	Location ID		MW-12		MW-13		MW-13D		MW-13D	
	Field Sample Date		5/23/2019		5/22/2019		5/23/2019		5/23/2019	
	Field Sample ID		828072-MW012011		828072-MW013006		828072-MW13D12		828072-MW13D12 DUP	
	Field Sample Depth (ft bgs)		11		6		12		12	
	QC Code		FS		FS		FS		FD	
	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	1	U	1	U	<b>0.9</b>	J	<b>0.92</b>	J
1,1-Dichloroethene	5	--	1	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	<b>2.4</b>	J	<b>2.2</b>	J
Carbon disulfide	--	60	1	U	1	U	1	U	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	1	U	1	U	<b>120</b>		<b>130</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	1	U	1	U	<b>0.48</b>	J	<b>0.54</b>	J
Trichloroethene	5	--	1	U	1	U	<b>0.27</b>	J	<b>0.25</b>	J
Vinyl chloride	2	--	1	U	1	U	<b>19</b>		<b>18</b>	
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**

Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**

GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-13DD		MW-14		MW-14D		MW-15	
	Field Sample Date		5/23/2019		5/23/2019		5/23/2019		5/22/2019	
	Field Sample ID		828072-MW13DD040		828072-MW014016		828072-MW14D033		828072-MW015006	
	Field Sample Depth (ft bgs)		40		16		33		6	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>1</b>		<b>0.76</b>	J	<b>1.4</b>		1	U
1,1-Dichloroethene	5	--	<b>0.48</b>	J	1	U	<b>0.5</b>	J	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	<b>3</b>	J	<b>2.9</b>	J	<b>2.4</b>	J
Carbon disulfide	--	60	1	U	1	U	1	U	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	<b>0.4</b>	J	<b>0.3</b>	J	1	U
cis-1,2-Dichloroethene	5	--	<b>190</b>		<b>63</b>		<b>160</b>		<b>0.41</b>	J
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>1.1</b>		<b>0.23</b>	J	<b>0.64</b>	J	1	U
Trichloroethene	5	--	<b>26</b>		<b>0.42</b>	J	<b>16</b>		1	U
Vinyl chloride	2	--	<b>13</b>		<b>15</b>		<b>4.7</b>		1	U
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-15D		MW-16		MW-16D		MW-17	
	Field Sample Date		5/22/2019		5/24/2019		5/24/2019		5/22/2019	
	Field Sample ID		828072-MW15D023		828072-MW016007		828072-MW16D020		828072-MW017007	
	Field Sample Depth (ft bgs)		23		7		20		7	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>1.8</b>	J	1	U	<b>0.74</b>	J	1	U
1,1-Dichloroethene	5	--	2	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	2	U	1	U	1	U	1	U
1,4-Dioxane	--	--	80	U	40	U	40	U	40	U
2-Butanone	--	50	10	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	10	U	5	U	5	U	5	U
Acetone	--	50	10	U	5	U	5	U	<b>4.2</b>	J
Carbon disulfide	--	60	2	U	1	U	1	U	1	U
Chloroethane	5	--	2	U	1	U	1	U	1	U
Chloroform	7	--	2	U	1	U	1	U	1	U
Chloromethane	5	--	2	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>260</b>		1	U	<b>60</b>		1	U
Methyl Tertbutyl Ether	--	10	2	U	1	U	1	U	1	U
Naphthalene	--	10	2	U	1	U	1	U	1	U
Toluene	5	--	2	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>0.96</b>	J	1	U	<b>0.6</b>	J	1	U
Trichloroethene	5	--	<b>0.4</b>	J	1	U	1	U	1	U
Vinyl chloride	2	--	<b>24</b>		1	U	<b>46</b>		1	U
Xylene, o	5	--	2	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	4	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-17D		MW-18		MW-18D		MW-19	
	Field Sample Date		5/23/2019		5/22/2019		5/22/2019		5/22/2019	
	Field Sample ID		828072-MW17D023		828072-MW018010		828072-MW18D021		828072-MW019006	
	Field Sample Depth (ft bgs)		23		10		21		6	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	1	U	1	U	<b>1.3</b>		1	U
1,1-Dichloroethene	5	--	1	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	<b>3.9</b>	J	<b>3.5</b>	J	<b>3.5</b>	J	5	U
Carbon disulfide	--	60	<b>0.91</b>	J	1	U	1	U	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>0.67</b>	J	<b>1.3</b>		<b>150</b>		1	U
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	1	U	1	U	<b>0.69</b>	J	1	U
Trichloroethene	5	--	1	U	1	U	1	U	1	U
Vinyl chloride	2	--	<b>5</b>		<b>1.8</b>		<b>61</b>		1	U
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**  
 Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**  
 GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-19D		MW-20		MW-20D		MW-21	
	Field Sample Date		5/22/2019		5/24/2019		5/24/2019		5/21/2019	
	Field Sample ID		828072-MW19D017		828072-MW020006		828072-MW20D020		828072-MW021012	
	Field Sample Depth (ft bgs)		17		6		20		12	
	QC Code		FS		FS		FS		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	1	U	1	U	1	U	<b>0.85</b>	J
1,1-Dichloroethene	5	--	1	U	1	U	1	U	<b>0.3</b>	J
1,2,4-Trimethylbenzene	5	--	1	U	1	U	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U	40	U	40	U
2-Butanone	--	50	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U	5	U	5	U
Acetone	--	50	5	U	5	U	5	U	5	U
Carbon disulfide	--	60	1	U	1	U	1	U	1	U
Chloroethane	5	--	1	U	1	U	1	U	1	U
Chloroform	7	--	1	U	1	U	1	U	1	U
Chloromethane	5	--	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>0.47</b>	J	1	U	<b>0.67</b>	J	<b>70</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U	1	U	1	U
Naphthalene	--	10	1	U	1	U	1	U	1	U
Toluene	5	--	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	--	1	U	1	U	1	U	<b>0.63</b>	J
Trichloroethene	5	--	1	U	1	U	1	U	<b>4.3</b>	
Vinyl chloride	2	--	<b>0.32</b>	J	1	U	<b>0.33</b>	J	<b>5.4</b>	
Xylene, o	5	--	1	U	1	U	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U	2	U	2	U

**Notes:**

Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
                   J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**

GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**



**Table 3: VOCs in Groundwater 2019**

	Location ID		MW-21		MW-21D	
	Field Sample Date		5/21/2019		5/21/2019	
	Field Sample ID		828072-MW021012 D		828072-MW21D020	
	Field Sample Depth (ft bgs)		12		20	
	QC Code		FD		FS	
Parameter Name	GA	GV	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	--	<b>0.82</b>	J	<b>0.7</b>	J
1,1-Dichloroethene	5	--	<b>0.27</b>	J	<b>0.27</b>	J
1,2,4-Trimethylbenzene	5	--	1	U	1	U
1,4-Dioxane	--	--	40	U	40	U
2-Butanone	--	50	5	U	5	U
4-Methyl-2-pentanone	--	--	5	U	5	U
Acetone	--	50	5	U	5	U
Carbon disulfide	--	60	1	U	1	U
Chloroethane	5	--	1	U	1	U
Chloroform	7	--	1	U	1	U
Chloromethane	5	--	1	U	1	U
cis-1,2-Dichloroethene	5	--	<b>69</b>		<b>40</b>	
Methyl Tertbutyl Ether	--	10	1	U	1	U
Naphthalene	--	10	1	U	1	U
Toluene	5	--	1	U	1	U
trans-1,2-Dichloroethene	5	--	<b>0.66</b>	J	<b>0.56</b>	J
Trichloroethene	5	--	<b>4</b>		<b>1.9</b>	
Vinyl chloride	2	--	<b>6.2</b>		<b>2.4</b>	
Xylene, o	5	--	1	U	1	U
Xylenes (m&p)	5	--	2	U	2	U

**Notes:**

Results reported in micrograms per liter (µg/L)  
 Only detected compounds shown.  
 Samples analyzed for VOCs by EPA Method SW8260B  
**QC Code:** FS= Field Sample, FD= Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit  
 J = Estimated value  
 ft bgs = feet below ground surface  
**Bold** = Compound detected in sample

**Notes Cont.**

GA/GV = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 -- = No listed value  
**Highlighted results exceed criteria**

**Table 4: MNA Parameters in Groundwater 2019**

		Background Sample for Biochlor Scoring											
		Location ID		MW-5		MW-2A		MW-3A		MW-6		MW-8	
		Field Sample Date		5/21/2019		5/21/2019		5/21/2019		5/21/2019		5/21/2019	
		Field Sample ID		828072-MW005006		828072-MW02A008		828072-MW03A008		828072-MW006008		828072-MW008023	
		Field Sample Depth (ft bgs)		6		8		8		8		23	
		QC Code		FS		FS		FS		FS		FS	
Parameter Name	Method	GA	GV	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
<b>Total Metals</b>													
Iron	USEPA 6010C	300	--			<b>3480</b>		<b>22300</b>		100	U	<b>3930</b>	
Manganese	USEPA 6010C	300	--			<b>1490</b>		<b>1790</b>		<b>1540</b>		<b>1200</b>	
<b>Dissolved Gases</b>													
Methane	RSK-175	--	--			<b>1700</b>	D	<b>9700</b>	D	<b>37</b>		<b>440</b>	D
Ethane	RSK-175	--	--			<b>14</b>		<b>190</b>		1	U	<b>1.4</b>	
Ethene	RSK-175	--	--			<b>35</b>		<b>56</b>		1	U	<b>3.2</b>	
Propane	RSK-175	--	--			10	U	10	U	1	U	1	U
<b>Inorganic Compounds</b>													
Chloride	NYSDEC ASP 300	250000	--	<b>4660000</b>		<b>43000</b>		<b>80600</b>		<b>84900</b>		<b>428000</b>	
Nitrate as N	NYSDEC ASP 300	10000	--	1000	U	<b>300</b>	J	1000	U	1000	U	1000	U
Sulfate	NYSDEC ASP 300	250000	--	<b>257000</b>		<b>97100</b>		<b>120000</b>		<b>1020000</b>		<b>550000</b>	
Sulfide	NYSDEC ASP 4500	--	50			<b>3600</b>		<b>6300</b>		1000	U	<b>350</b>	J
Total Alkalinity, as CaCO3	USEPA 2320	--	--	<b>474000</b>		<b>770000</b>		<b>581000</b>		<b>629000</b>		<b>660000</b>	
Total Organic Carbon	USEPA 415.1	--	--			<b>36600</b>		<b>109000</b>		<b>11500</b>		<b>7400</b>	
<b>Field Parameters</b>													
Dissolved Oxygen (mg/L)	YSI	--	--	0.90		0.9		0.7		0.6		1.0	
Oxygen Reduction Potential (mV)	YSI	--	--	-68.0		-59		-92		110		-79	
Biochlor Scoring *	EPA BIOCHLOR*	--	--	--		20		23		9		10	

**Notes:**  
 Results reported in micrograms per liter (µg/L) unless otherwise noted.  
 Only detected compounds shown.  
 Blank result indicates not analyzed  
 ft bgs = feet below ground surface  
 QC Code: FS = Field Sample; FD = Field Sample  
 Qualifiers: U = Not detected greater than the reporting limit; J = Estimated value; D = Result from diluted run  
 Criteria = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
 Bold = Compound detected in sample  
 Highlighted results exceed criteria

**\*Notes on Biochlor:**  
 Number score calculated using USEPA BIOCHLOR scoring system version 2.2 (March 2002).  
 Score represents modelled evidence for anaerobic biodegradation of chlorinated organics. 0-5 Inadequate evidence, 6-14 limited evidence, 15 to 20 adequate evidence, >20 strong evidence

Table 4: MNA Parameters in Groundwater 2019

		Location ID		MW-8D		MW-21	
		Field Sample Date		5/21/2019		5/21/2019	
		Field Sample ID		828072-MW08D033		828072-MW021012	
		Field Sample Depth (ft bgs)		33		12	
		QC Code		FS		FS	
Parameter Name	Method	GA	GV	Result	Qualifier	Result	Qualifier
<b>Total Metals</b>							
Iron	USEPA 6010C	300	--	<b>4340</b>		<b>1380</b>	
Manganese	USEPA 6010C	300	--	<b>152</b>		<b>89</b>	
<b>Dissolved Gases</b>							
Methane	RSK-175	--	--	<b>60</b>		<b>55</b>	
Ethane	RSK-175	--	--	<b>0.72</b>	J	1	U
Ethene	RSK-175	--	--	<b>1.3</b>		<b>0.15</b>	J
Propane	RSK-175	--	--	<b>1.2</b>		<b>1.1</b>	
<b>Inorganic Compounds</b>							
Chloride	NYSDEC ASP 300	250000	--	<b>698000</b>		<b>626000</b>	
Nitrate as N	NYSDEC ASP 300	10000	--	1000	U	1000	U
Sulfate	NYSDEC ASP 300	250000	--	<b>51000</b>		<b>89800</b>	
Sulfide	NYSDEC ASP 4500	--	50	<b>430</b>	J	<b>290</b>	J
Total Alkalinity, as CaCO3	USEPA 2320	--	--	<b>240000</b>		<b>301000</b>	
Total Organic Carbon	USEPA 415.1	--	--	<b>2600</b>		<b>2500</b>	
<b>Field Parameters</b>							
Dissolved Oxygen (mg/L)	YSI	--	--	0.3		0.4	
Oxygen Reduction Potential (mV)	YSI	--	--	-160		92	
Biochlor Scoring *	EPA BIOCHLOR*	--	--	13		10	

**Notes:**  
 Results reported in micrograms per liter (µg/L) unless otherwise noted.  
 Only detected compounds shown.  
 Blank result indicates not analyzed  
 ft bgs = feet below ground surface  
**QC Code:** FS = Field Sample; FD = Field Sample  
**Qualifiers:** U = Not detected greater than the reporting limit; J = Estimated value; D = Result from diluted run  
**Criteria** = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998):  
 GA = New York State Class GA Groundwater Standards  
 GV = New York State Guidance Values  
**Bold** = Compound detected in sample  
**Highlighted results exceed criteria**

**ATTACHMENT 1**

**FIELD DATA RECORDS**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW01A008-X</b>	SAMPLE TIME <b>1735</b>

LOCATION ID <b>MW-1A</b>	DATE <b>6/5/21/19</b>
START TIME <b>1615</b>	END TIME <b>1730</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER **NA**

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Enclosed well sticker*

INITIAL DTW (BMP) <b>/</b> FT	FINAL DTW (BMP) <b>/</b> FT	PROT. CASING STICKUP (AGS) <b>Sealed well</b>	TOC/TOR DIFFERENCE <b>/</b> FT
WELL DEPTH (BMP) <b>/</b> FT	SCREEN LENGTH <b>/</b> FT	PID AMBIENT AIR <b>/</b> PPM	REFILL TIMER SETTING <b>/</b> SEC
WATER COLUMN <b>/</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>/</b> GAL	PID WELL MOUTH <b>/</b> PPM	DISCHARGE TIMER SETTING <b>/</b> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>/</b> GAL	TOTAL VOL. PURGED <b>3.12</b> GAL	DRAWDOWN/TOTAL PURGED <b>/</b>	PRESSURE TO PUMP <b>/</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGERATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	CONDUCTAN CE	SP. (+/- 0.1 units)	pH (units) (+/- 0.1)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>												
<b>1620</b>	<b>160</b>	<b>13.78</b>	<b>2.623</b>	<b>6.86</b>	<b>1.27</b>	<b>8.61</b>	<b>-76.8</b>	<b>~5'</b>	<b>Light yellow/brown - some odor</b>			
<b>1630</b>	<b>160</b>	<b>13.59</b>	<b>2.599</b>	<b>6.84</b>	<b>3.48</b>	<b>8.05</b>	<b>-82.4</b>					
<b>1635</b>	<b>160</b>	<b>13.62</b>	<b>2.596</b>	<b>6.86</b>	<b>2.88</b>	<b>6.70</b>	<b>-82.5</b>					
<b>1640</b>	<b>160</b>	<b>13.47</b>	<b>2.606</b>	<b>6.87</b>	<b>1.92</b>	<b>6.20</b>	<b>-85.3</b>		<b>Sealed well</b>			
<b>1645</b>	<b>160</b>	<b>13.47</b>	<b>2.609</b>	<b>6.79</b>	<b>1.48</b>	<b>7.10</b>	<b>-88.3</b>					
<b>1650</b>	<b>160</b>	<b>13.52</b>	<b>2.608</b>	<b>6.85</b>	<b>1.08</b>	<b>6.35</b>	<b>-94.0</b>					
<b>1655</b>	<b>160</b>	<b>13.52</b>	<b>2.670</b>	<b>6.84</b>	<b>0.85</b>	<b>4.58</b>	<b>-97.4</b>					
<b>1700</b>	<b>160</b>	<b>13.57</b>	<b>2.475</b>	<b>6.86</b>	<b>0.74</b>	<b>4.21</b>	<b>-98.4</b>					
<b>1705</b>	<b>160</b>	<b>13.58</b>	<b>2.487</b>	<b>6.86</b>	<b>0.65</b>	<b>3.63</b>	<b>-101.9</b>					
<b>1710</b>	<b>160</b>	<b>13.52</b>	<b>2.368</b>	<b>6.87</b>	<b>0.50</b>	<b>2.79</b>	<b>-106.7</b>					
<b>1715</b>	<b>160</b>	<b>13.63</b>	<b>2.338</b>	<b>6.85</b>	<b>0.48</b>	<b>3.43</b>	<b>-111.2</b>					
<b>1720</b>	<b>160</b>	<b>13.72</b>	<b>2.313</b>	<b>6.85</b>	<b>0.44</b>	<b>2.78</b>	<b>-111.5</b>					
<b>1725</b>	<b>160</b>	<b>13.80</b>	<b>2.297</b>	<b>6.85</b>	<b>0.43</b>	<b>2.86</b>	<b>-116.8</b>					
<b>1730</b>	<b>160</b>											
<b>1735</b>	<b>sampled</b>											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

14    2.30    6.9    0.4    2.9    -120

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 3.53 = 3.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input type="checkbox"/> S. STEEL PUMP MATERIAL	<input checked="" type="checkbox"/> WL METER
<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL	<input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b>
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN	<input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b>
<input type="checkbox"/> OTHER _____	<input type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON BLADDER	<input checked="" type="checkbox"/> PUMP <b>Geopump</b>
	<input checked="" type="checkbox"/> OTHER <b>NA</b>	<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> OTHER <b>NA</b>	<input checked="" type="checkbox"/> FILTERS <b>NO. _____ TYPE _____</b>

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml		<b>N</b>	<b>MW01A008-446</b>
Alkalinity	2320F	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	3541	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4560	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poby			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	475.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER YES  NO

CONTAINERIZED YES  NO

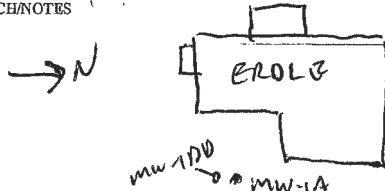
NO-PURGE METHOD YES  NO

UTILIZED YES  NO

NUMBER OF GALLONS GENERATED **~3**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **J. WOLCENSKI**

Checked By: *[Signature]* Date: **5/29/19**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072- MW-01DD-038  
 SAMPLE TIME: 925

LOCATION ID: MW-01DD  
 DATE: 5/22/19  
 START TIME: 0735  
 END TIME: 0950  
 SITE NAME/NUMBER: 828072  
 PAGE: 1 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_  
 TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER (inside 4")

WELL INTEGRITY  
 YES NO N/A  
 CAP  \_\_\_\_\_  
 CASING  \_\_\_\_\_  
 LOCKED  \_\_\_\_\_  
 COLLAR  \_\_\_\_\_

INITIAL DTW (BMP): 3.92 FT  
 FINAL DTW (BMP): 5.33 FT  
 PROT. CASING STICKUP (AGS): 1.8 ft  
 TOC/TOR DIFFERENCE: NA FT  
 WELL DEPTH (BMP): 42.8 FT  
 SCREEN LENGTH: open hole 32 FT  
 PID AMBIENT AIR: 1 PPM  
 REFILL TIMER SETTING: 1 SEC  
 WATER COLUMN: 35.88 FT  
 DRAWDOWN VOLUME: 0.009 GAL  
 PID WELL MOUTH: 1 PPM  
 DISCHARGE TIMER SETTING: 1 SEC  
 CALCULATED GAL/VOL: 0.26 GAL  
 TOTAL VOL. PURGED: 3.9 GAL  
 DRAWDOWN/TOTAL PURGED: 0.002  
 PRESSURE TO PUMP: 1 PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (ml/min)	TEMP. (°C) (+/- 3 degrees)	CONDUCTAN CE (mS/cm (3%))	pH (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
0750											BEGIN PURGING
0805	4.60	160	13.09	2.303	6.68	1.41	15.9	-98.7	NA	38'	present odor
0810	4.75	160	13.13	2.312	6.76	1.98	17.5	-115.9			black flakes
0815	4.89	160	13.19	2.311	6.80	2.16	19.5	-152.5			
0820	4.96	160	13.27	2.307	6.83	2.01	19.2	-176.1			
0825	5.06	160	13.45	2.297	6.84	1.86	16.0	-199.9			
0830	5.10										
0835	5.11	160	13.32	2.281	6.83	1.62	10.3	-225.9			switch to car battery
0840	5.18	160	13.37	2.274	6.83	1.44	8.32	-246.3			
0845	5.18	160	13.50	2.268	6.84	1.38	5.05	-252.2			
0850	5.20	160	13.50	2.266	6.83	1.34	4.14	-257.5			
0855	5.23	160	13.77	2.258	6.83	1.26	4.26	-261.5			
0900	5.24	160	13.99	2.245	6.84	1.30	4.16	-264.6			
0905	5.26	160	13.68	2.285	6.84	1.11	3.78	-256.7			
0910	5.29	160	14.28	2.301	6.87	1.28	3.75	-272.1			

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])  
 NA 14 2.30 6.9 1.2 2.6 270

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3331 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP:  PERISTALTIC  SUBMERSIBLE  BLADDER  OTHER \_\_\_\_\_

DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER \_\_\_\_\_

TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_

S. STEEL PUMP MATERIAL:  PVC PUMP MATERIAL  GEOPROBE SCREEN  TEFLON BLADDER  OTHER \_\_\_\_\_

EQUIPMENT USED:  WL METER  TURB. METER  HACH 2100Q  WQ METER  YSI 556 MPS  PUMP  Geopump  FILTERS NO. \_\_\_\_\_ TYPE \_\_\_\_\_

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	4	BY	MW-01DD-038
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354	No	4°C				
Sulfate	300	No	4°C				
Sulfide	450	No	4°C				
Fc Mn	6010H	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES  NO   
 NO-PURGE METHOD UTILIZED: YES  NO   
 NUMBER OF GALLONS GENERATED: 24  
 to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: \_\_\_\_\_ Print Name: J. Corvino

Checked By: \_\_\_\_\_ Date: 5/29/19

SKETCH/NOTES

EROLE

MW-1A  
 MW-10D  
 MW-30A/B/D  
 MW-2A/2B

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW01DD-038</b>	SAMPLE TIME <b>925</b>

LOCATION ID <b>MW-01DD</b>	DATE <b>5/22/19</b>
START TIME <b>0735</b>	END TIME <b>0950</b>
SITE NAME/NUMBER 828072	PAGE <b>2 OF 2</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER (**inner**)

INITIAL DTW (BMP) **3528.5** FT FINAL DTW (BMP) **5.33** FT PROT. CASING STICKUP (AGS) \_\_\_\_\_ FT

WELL DEPTH (BMP) **42.8** FT SCREEN LENGTH **open hole** FT PID AMBIENT AIR \_\_\_\_\_ PPM

WATER COLUMN **3668** FT DRAWDOWN VOLUME **0.004** GAL PID WELL MOUTH \_\_\_\_\_ PPM

CALCULATED GAL/VOL **0.26** GAL TOTAL VOL. PURGED **3.9** GAL DRAWDOWN/TOTAL PURGED \_\_\_\_\_

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CAP \_\_\_\_\_

CASING \_\_\_\_\_

LOCKED \_\_\_\_\_

COLLAR \_\_\_\_\_

TOCTOR DIFFERENCE \_\_\_\_\_ FT

REFILL TIMER SETTING \_\_\_\_\_ SEC

DISCHARGE TIMER SETTING \_\_\_\_\_ SEC

PRESSURE TO PUMP \_\_\_\_\_ PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGERATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CB	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>											
<del>0915</del>	<del>5.31</del>	<del>160</del>	<del>14.25</del>	<del>2.302</del>	<del>6.88</del>	<del>1.23</del>	<del>2.95</del>	<del>269.9</del>	<del>NA</del>	<del>238</del>	
<del>0920</del>	<del>5.33</del>	<del>160</del>	<del>14.19</del>	<del>2.297</del>	<del>6.87</del>	<del>1.18</del>	<del>2.56</del>	<del>269.8</del>	<del>↓</del>	<del>↓</del>	
<del>0925</del>	<del>sampled</del>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

14    2.30  
2.297    6.9    1.2    2.6    270

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP:  PERISTALTIC  SUBMERSIBLE  BLADDER  OTHER \_\_\_\_\_

DEION FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER (**distilled**)

TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_

S. STEEL PUMP MATERIAL:  PVC PUMP MATERIAL  GEOPROBE SCREEN  TEFLON BLADDER  OTHER \_\_\_\_\_

EQUIPMENT USED: WL METER \_\_\_\_\_ TURB. METER **HACH 2100Q** WQ METER **YSI 556 MPS** PUMP **Geopump** FILTERS NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	<b>MS/MSD</b>	<b>MW-01DD-038</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethers, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED: YES  NO

NO-PURGE METHOD UTILIZED: YES  NO

NUMBER OF GALLONS GENERATED: **24**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*See Page 1*

Sampler Signature: *[Signature]* Print Name: **J. Laskowski**

Checked By: *[Signature]* Date: **5/29/19**



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW02A-008</b>	SAMPLE TIME <b>1220</b>

LOCATION ID <b>MW-02A</b>	DATE <b>5/21/19</b>
START TIME <b>1100</b>	END TIME <b>1305</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER **VA**

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CAP \_\_\_\_\_

CASING \_\_\_\_\_

LOCKED \_\_\_\_\_

COLLAR \_\_\_\_\_

TOC/TOR DIFFERENCE **Sealed well** FT

REFILL TIMER SETTING **1** SEC

DISCHARGE TIMER SETTING **1** SEC

PRESSURE TO PUMP **1** PSI

INITIAL DTW (BMP) **1** FT

FINAL DTW (BMP) **1** FT

PROT. CASING STICKUP (AGS) **23/3** FT

WELL DEPTH (BMP) **Sealed well** FT

SCREEN LENGTH **WMC** FT

PID AMBIENT AIR **1** PPM

WATER COLUMN **1** FT

DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) **1** GAL

PID WELL MOUTH **1** PPM

CALCULATED GAL/VOL (column X well diameter squared X 0.041) **1** GAL

PURGED **234** GAL

DRAWDOWN/TOTAL PURGED **1**

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1105</b>	<b>BEGIN PURGING</b>										
<b>1115</b>	<b>120</b>	<b>120</b>	<b>12.74</b>	<b>1.457</b>	<b>6.35</b>	<b>1.44</b>	<b>12.7</b>	<b>-52.6</b>	<b>NA</b>	<b>8'</b>	<b>light yellow brown - slight brown color</b>
<b>1120</b>	<b>120</b>	<b>120</b>	<b>12.60</b>	<b>1.451</b>	<b>6.43</b>	<b>2.10</b>	<b>6.30</b>	<b>-60.4</b>			
<b>1125</b>	<b>120</b>	<b>120</b>	<b>12.73</b>	<b>1.450</b>	<b>6.50</b>	<b>3.37</b>	<b>4.86</b>	<b>-58.9</b>			
<b>1130</b>	<b>120</b>	<b>120</b>	<b>12.98</b>	<b>1.449</b>	<b>6.57</b>	<b>2.69</b>	<b>3.13</b>	<b>-60.2</b>			
<b>1135</b>	<b>120</b>	<b>120</b>	<b>13.04</b>	<b>1.450</b>	<b>6.60</b>	<b>2.36</b>	<b>2.86</b>	<b>-59.0</b>			
<b>1140</b>	<b>120</b>	<b>120</b>	<b>13.15</b>	<b>1.450</b>	<b>6.62</b>	<b>1.95</b>	<b>3.28</b>	<b>-58.3</b>			
<b>1145</b>	<b>120</b>	<b>120</b>	<b>13.03</b>	<b>1.454</b>	<b>6.64</b>	<b>1.73</b>	<b>2.35</b>	<b>-61.9</b>			
<b>1150</b>	<b>120</b>	<b>120</b>	<b>13.17</b>	<b>1.453</b>	<b>6.64</b>	<b>1.43</b>	<b>2.53</b>	<b>-62.9</b>			
<b>1155</b>	<b>120</b>	<b>120</b>	<b>13.31</b>	<b>1.443</b>	<b>6.64</b>	<b>1.21</b>	<b>2.65</b>	<b>-61.5</b>			
<b>1200</b>	<b>120</b>	<b>120</b>	<b>13.21</b>	<b>1.450</b>	<b>6.66</b>	<b>1.14</b>	<b>2.12</b>	<b>-61.8</b>			
<b>1205</b>	<b>120</b>	<b>120</b>	<b>13.14</b>	<b>1.449</b>	<b>6.66</b>	<b>1.00</b>	<b>2.08</b>	<b>-60.6</b>			
<b>1210</b>	<b>120</b>	<b>120</b>	<b>13.11</b>	<b>1.452</b>	<b>6.67</b>	<b>0.96</b>	<b>1.53</b>	<b>-57.8</b>			
<b>1215</b>	<b>120</b>	<b>120</b>	<b>12.90</b>	<b>1.447</b>	<b>6.66</b>	<b>0.92</b>	<b>1.76</b>	<b>-59.3</b>			
<b>1220</b>	<b>Sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

<b>13</b>	<b>1.447</b>	<b>6.7</b>	<b>0.9</b>	<b>1.8</b>	<b>-59</b>
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TEMP: nearest degree (ex. 10.1 = 10)  
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL	<input checked="" type="checkbox"/> WL METER <b>None</b>
<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL	<input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b>
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN	<input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b>
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFロン BLADDER	<input checked="" type="checkbox"/> PUMP <b>Geopump</b>
	<input checked="" type="checkbox"/> OTHER <b>None</b>	<input checked="" type="checkbox"/> OTHER <b>Teflon</b>	<input checked="" type="checkbox"/> OTHER <b>NA</b>	<input checked="" type="checkbox"/> FILTERS <b>None</b>

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>4</b>	<b>DUP (VOCs)</b>	<b>MW02A-008-01</b>
Alkalinity	2320B	No	4°C	125-250 ml Poly			<b>duplicate</b>
Chloride	300	No	4°C	125-250 ml Poly			<b>MW02A-008-02</b>
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C	<b>2ml each 1x 50ml poly</b>			
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	125 ml Poly			
Ethene, Ethane, Methane / CO <sub>2</sub>	RSK-175	No	4°C HCl/4°C	3 X 40 ml / 3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG / 3 X 40 ml			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.5**

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: **[Signature]** Print Name: **James L. Lohman**

SKETCH/NOTES:

**Duplicate and MNA parameters** → N

**ERDLE**

**MW-1A100**

**MW-2A**

**MW-3A30**

Checked By: **[Signature]** Date: **5/21/19**



# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW-02D020-<del>X</del></b>	SAMPLE TIME <b>1400</b>

LOCATION ID <b>MW-02D</b>	DATE <b>5/21/19</b>
START TIME <b>1305</b>	END TIME <b>1405</b>
SITE NAME/NUMBER 828072	PAGE <b>1</b> OF <b>1</b>

WELL DIAMETER (INCHES) <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES NO N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TUBING ID (INCHES) <input checked="" type="checkbox"/> 1/8 <input type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
MEASUREMENT POINT (MP) <input type="checkbox"/> TOP OF RISER (TOR) <input checked="" type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	CASING <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
INITIAL DTW (BMP) <b>3.09</b> FT	TOC/TOR DIFFERENCE <b>NA</b> FT
FINAL DTW (BMP) <b>3.09</b> FT	PROT. CASING STICKUP (AGS) <b>1.7</b> FT
WELL DEPTH (BMP) <b>22 (41ST)</b> FT	PID AMBIENT AIR <b>1</b> PPM
SCREEN LENGTH <b>OPEN WITH NO BTL</b> FT	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>18.9</b> FT	PID WELL MOUTH <b>1</b> PPM
DRAWDOWN VOLUME <b>0</b> GAL	DISCHARGE TIMER SETTING <b>1</b> SEC
(initial DTW - final DTW X well diam. squared X 0.041)	PRESSURE TO PUMP <b>1</b> PSI
TOTAL VOL. PURGED <b>1.56</b> GAL	DRAWDOWN/TOTAL PURGED <b>0</b>
(mL per minute X total minutes X 0.00026 gal/mL)	

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
BEGIN PURGING											
<b>1316</b>											
<b>1325</b>	<b>3.09</b>	<b>120</b>	<b>13.84</b>	<b>2.527</b>	<b>7.09</b>	<b>0.90</b>	<b>2.41</b>	<b>-81.0</b>	<b>NA</b>	<b>120'</b>	
<b>1330</b>	<b>3.09</b>	<b>120</b>	<b>13.80</b>	<b>2.522</b>	<b>7.03</b>	<b>0.67</b>	<b>8.43</b>	<b>-79.0</b>			
<b>1335</b>	<b>3.09</b>	<b>120</b>	<b>13.87</b>	<b>2.521</b>	<b>7.05</b>	<b>0.69</b>	<b>6.59</b>	<b>-76.4</b>			
<b>1340</b>	<b>3.09</b>	<b>120</b>	<b>13.87</b>	<b>2.523</b>	<b>7.07</b>	<b>0.78</b>	<b>5.33</b>	<b>-76.2</b>			
<b>1345</b>	<b>3.09</b>	<b>120</b>	<b>13.81</b>	<b>2.525</b>	<b>7.09</b>	<b>0.90</b>	<b>6.18</b>	<b>-77.8</b>			
<b>1350</b>	<b>3.09</b>	<b>120</b>	<b>13.77</b>	<b>2.523</b>	<b>7.10</b>	<b>0.92</b>	<b>6.23</b>	<b>-79.5</b>			
<b>1355</b>	<b>3.09</b>	<b>120</b>	<b>13.81</b>	<b>2.523</b>	<b>7.11</b>	<b>0.89</b>	<b>6.67</b>	<b>-78.5</b>			
<b>1400</b>	- sampled										

### FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

**14      2.52      7.1      0.9      6.7      -79**

TRMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

### EQUIPMENT DOCUMENTATION

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>NA</b>	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> OTHER <b>NA</b>	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b> <input checked="" type="checkbox"/> PUMP <b>Geopump</b> <input checked="" type="checkbox"/> FILTERS <b>20</b> NO. _____ TYPE _____
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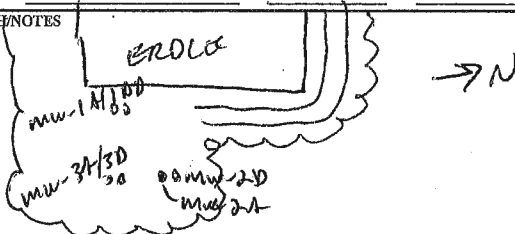
### ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		<b>N</b>	<b>MW02D020-<del>X</del></b>
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSI-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

### PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	NUMBER OF GALLONS GENERATED <b>~1.5</b> to sampling or _____ mL for this sample location.
NO-PURGE METHOD UTILIZED	YES <input type="checkbox"/> NO <input type="checkbox"/>	

### SKETCH/NOTES



Sampler Signature: *[Signature]* Print Name: **J. Corasi**

Checked By: *[Signature]* Date: **5/24/19**



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072-MW03A-00801 SAMPLE TIME: 1025

LOCATION ID: MW-3A DATE: 5/21/19  
 START TIME: 0805 END TIME: 1040  
 SITE NAME/NUMBER: 828072 PAGE: 1 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_  
 TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER NA  
 INITIAL DTW (BMP) / FT FINAL DTW (BMP) / FT PROT. CASING STICKUP (AGS) x 3.3 FT TOCTOR DIFFERENCE Sealed well FT  
 WELL DEPTH (BMP) / FT SCREEN LENGTH / FT PID AMBIENT AIR / PPM REFILL TIMER SETTING / SEC  
 WATER COLUMN / FT DRAWDOWN VOLUME / GAL PID WELL MOUTH / PPM DISCHARGE TIMER SETTING / SEC  
 CALCULATED GAL/VOL / GAL TOTAL VOL. PURGED 4.5 GAL DRAWDOWN/TOTAL PURGED / PSI  
(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY  
 YES NO N/A  
 CAP     
 CASING     
 LOCKED     
 COLLAR

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTIVAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<u>835</u>											Sealed well
		<b>BEGIN PURGING</b>									
<u>850</u>		<u>160</u>	<u>11.77</u>	<u>2.053</u>	<u>6.76</u>	<u>1.40</u>	<u>5.41</u>	<u>-97.1</u>	<u>NA</u>		
<u>855</u>		<u>160</u>	<u>11.71</u>	<u>2.034</u>	<u>6.75</u>	<u>3.00</u>	<u>4.21</u>	<u>-99.7</u>			purge water yellow/brown
<u>900</u>		<u>160</u>	<u>11.60</u>	<u>2.013</u>	<u>6.73</u>	<u>2.86</u>	<u>3.95</u>	<u>-97.2</u>			* slowest rate of pump
<u>905</u>		<u>160</u>	<u>11.63</u>	<u>2.973</u>	<u>6.73</u>	<u>2.57</u>	<u>5.30</u>	<u>-97.7</u>			of pump
<u>910</u>		<u>160</u>	<u>11.61</u>	<u>1.936</u>	<u>6.72</u>	<u>2.41</u>	<u>5.02</u>	<u>-96.1</u>			sour odor
<u>915</u>		<u>160</u>	<u>11.62</u>	<u>1.888</u>	<u>6.70</u>	<u>2.21</u>	<u>5.44</u>	<u>-87.4</u>			
<u>920</u>		<u>160</u>	<u>11.92</u>	<u>1.839</u>	<u>6.67</u>	<u>1.86</u>	<u>5.86</u>	<u>-79.2</u>			
<u>925</u>		<u>160</u>	<u>12.31</u>	<u>1.788</u>	<u>6.66</u>	<u>1.72</u>	<u>6.59</u>	<u>-89.4</u>			
<u>930</u>		<u>160</u>	<u>12.66</u>	<u>1.712</u>	<u>6.63</u>	<u>1.58</u>	<u>6.54</u>	<u>-88.3</u>			
<u>935</u>		<u>160</u>	<u>12.71</u>	<u>1.643</u>	<u>6.63</u>	<u>1.42</u>	<u>8.54</u>	<u>-89.6</u>			
<u>940</u>		<u>160</u>	<u>12.75</u>	<u>1.571</u>	<u>6.63</u>	<u>1.25</u>	<u>7.92</u>	<u>-91.5</u>			
<u>945</u>		<u>160</u>	<u>12.93</u>	<u>1.535</u>	<u>6.63</u>	<u>1.18</u>	<u>7.87</u>	<u>-95.6</u>			
<u>950</u>		<u>160</u>	<u>12.95</u>	<u>1.505</u>	<u>6.63</u>	<u>1.04</u>	<u>7.68</u>	<u>-95.9</u>			
<u>955</u>		<u>160</u>	<u>13.05</u>	<u>1.475</u>	<u>6.61</u>	<u>0.98</u>	<u>7.64</u>	<u>-97.5</u>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

13    1.43    6.7    0.7    7.1    -92

TRMP: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

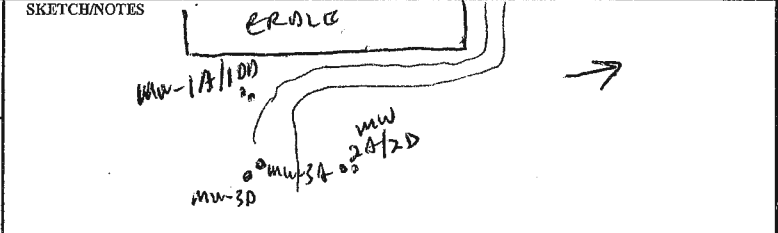
TYPE OF PUMP:  PERISTALTIC SUBMERSIBLE BLADDER  OTHER \_\_\_\_\_  
 DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER Deionized  
 TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER Teflon  
 EQUIPMENT USED:  WL METER Heum  TURB. METER HACH 2100Q  WQ METER YSI 536 MPS  PUMP Geopump  OTHER NA

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		<u>N</u>	<u>828072 MW03A-00801</u>
<input checked="" type="checkbox"/> Alkalinity	2320B	No	4°C	<u>125 250 ml Poly</u>			
<input checked="" type="checkbox"/> Chloride	300	No	4°C	<u>125 250 ml Poly</u>			
<input checked="" type="checkbox"/> Nitrate	300	No	4°C	<u>250 ml Poly</u>			
<input checked="" type="checkbox"/> Nitrite	354.1	No	4°C	<u>250 ml Poly</u>			
<input checked="" type="checkbox"/> Sulfate	300	No	4°C	<u>250 ml Poly</u>			
<input checked="" type="checkbox"/> Sulfide	4500	No	4°C ZnAc	<u>750 ml plastic</u>			
<input checked="" type="checkbox"/> Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	<u>250 ml Poly</u>			
<input checked="" type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	<u>3 X 40 ml</u>	<u>3 X 40 ml</u>		
<input checked="" type="checkbox"/> Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	<u>250 ml AG 3 X 10 ml</u>			

**PURGE OBSERVATIONS**  CO<sub>2</sub> - 25K-175

PURGE WATER CONTAINERIZED:  YES  NO  
 NO-PURGE METHOD UTILIZED:  YES  NO  
 NUMBER OF GALLONS GENERATED: 44.5  
 to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: [Signature] Print Name: Jolene Lewis  
 Checked By: [Signature] Date: 5/20/19



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW03A-0080A</b>	SAMPLE TIME <b>1025</b>

LOCATION ID <b>MW-3k</b>	DATE <b>5/21/19</b>
START TIME <b>0805</b>	END TIME <b>1055</b>
SITE NAME/NUMBER 828072	PAGE <b>2 OF 2</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER **NA**

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <b>1</b> FT	FINAL DTW (BMP) <b>1</b> FT	PROT. CASING STICKUP (AGS) <b>1</b> FT	TOCTOR DIFFERENCE <b>1</b> FT
WELL DEPTH (BMP) <b>1</b> FT	SCREEN LENGTH <b>1</b> FT	PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>1</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>4.5</b> GAL	PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>1</b> GAL	TOTAL VOL. PURGED (mL per minute X total minutes X 0.00026 gal/mL) <b>4.5</b> GAL	DRAWDOWN/ TOTAL PURGED <b>1</b>	PRESSURE TO PUMP <b>1</b> PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>											
<del>1000</del>	<del>1</del>	<del>160</del>	<del>13.30</del>	<del>1.457</del>	<del>6.62</del>	<del>0.90</del>	<del>7.01</del>	<del>-103.1</del>	<del>NA</del>	<del>8'</del>	<del>clean (IL)</del>
<del>1005</del>	<del>1</del>	<del>160</del>	<del>12.59</del>	<del>1.442</del>	<del>6.60</del>	<del>0.85</del>	<del>7.38</del>	<del>-103.0</del>	<del>1</del>	<del>↓</del>	
<del>1010</del>	<del>1</del>	<del>160</del>	<del>12.54</del>	<del>1.434</del>	<del>6.58</del>	<del>0.77</del>	<del>7.24</del>	<del>-94.2</del>	<del>1</del>	<del>↓</del>	
<del>1015</del>	<del>1</del>	<del>160</del>	<del>12.60</del>	<del>1.431</del>	<del>6.62</del>	<del>0.73</del>	<del>7.17</del>	<del>-93.1</del>	<del>1</del>	<del>↓</del>	
<del>1020</del>	<del>1</del>	<del>160</del>	<del>12.62</del>	<del>1.428</del>	<del>6.66</del>	<del>0.71</del>	<del>7.06</del>	<del>-92.1</del>	<del>1</del>	<del>↓</del>	
<b>1025</b>	<b>sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

TEMP: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**13    1.43    6.7    0.7    7.1    -92**

<b>EQUIPMENT DOCUMENTATION</b>		<b>DECON FLUIDS USED</b>		<b>TUBING/PUMP/BLADDER MATERIALS</b>		<b>EQUIPMENT USED</b>	
<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input type="checkbox"/> S. STEEL PUMP MATERIAL	<input checked="" type="checkbox"/> WL METER <b>Idem</b>	<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TURB. METER <b>HACH 2100Q</b>
<input type="checkbox"/> BLADDER	<input type="checkbox"/> DEIONIZED WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL	<input type="checkbox"/> WQ METER <b>YSI 556 MPS</b>	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PUMP <b>Geopump</b>
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input checked="" type="checkbox"/> OTHER <b>Teflon</b>	<input type="checkbox"/> TEFLON BLADDER	<input type="checkbox"/> FILTERS <b>NO</b>	<input type="checkbox"/> OTHER _____	<input type="checkbox"/> OTHER _____	<input type="checkbox"/> TYPE _____

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>4</b>	<b>N</b>	<b>MW03A-008</b>
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly	<b>1</b>	<b>1</b>	
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly	<b>1</b>	<b>1</b>	
<input type="checkbox"/> Nitrate	300	No	4°C		<b>1</b>	<b>1</b>	
<input type="checkbox"/> Nitrite	354.1	No	4°C		<b>1</b>	<b>1</b>	
<input type="checkbox"/> Sulfate	300	No	4°C		<b>1</b>	<b>1</b>	
<input type="checkbox"/> Sulfide	4500	No	4°C		<b>1</b>	<b>1</b>	
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO3	50 ml Poly	<b>1</b>	<b>1</b>	
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<b>1</b>	<b>1</b>	
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	<b>1</b>	<b>1</b>	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED YES  NO

NO-PURGE METHOD UTILIZED YES  NO

NUMBER OF GALLONS GENERATED **4.5**

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: *[Signature]* Print Name: **Jolene Lorenzli**

Checked By: *[Signature]* Date: **5/21/19**

**SKETCH/NOTES**

*See Page 1*

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>nw03D-014</b>	SAMPLE TIME <b>1605</b>

LOCATION ID <b>nw03D</b>	DATE <b>5/21/19</b>
START TIME <b>1430</b>	END TIME <b>1615</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES NO N/A CAP <input checked="" type="checkbox"/> _____ CASING <input checked="" type="checkbox"/> _____ LOCKED <input checked="" type="checkbox"/> _____ COLLAR <input checked="" type="checkbox"/> _____
TUBING ID (INCHES) <input checked="" type="checkbox"/> 1/8 <input type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	
MEASUREMENT POINT (MP) <input type="checkbox"/> TOP OF RISER (TOR) <input checked="" type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	
INITIAL DTW (BMP) <b>2.50</b> FT	FINAL DTW (BMP) <b>4.11</b> FT
WELL DEPTH (BMP) <b>15.1</b> FT	SCREEN LENGTH <b>OPEN HOLE</b> FT
WATER COLUMN <b>12.6</b> FT	DRAWDOWN VOLUME <b>2.4</b> GAL
CALCULATED GAL/VOL <b>18.5</b> GAL	TOTAL VOL. PURGED <b>2.8</b> GAL
	(column X well diameter squared X 0.041)
	(mL per minute X total minutes X 0.00026 gal/mL)
PROT. CASING STICKUP (AGS) <b>1</b> FT	TOC/TOR DIFFERENCE <b>1</b> FT
PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
DRAWDOWN/ TOTAL PURGED <b>0.80</b>	PRESSURE TO PUMP <b>1</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGERATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1435</b>	<b>BEGIN PURGING</b>										
<b>1500</b>	<b>3.15</b>	<b>160</b>	<b>13.85</b>	<b>3.851</b>	<b>8.59</b>	<b>0.38</b>	<b>103</b>	<b>-62.7</b>	<b>NA</b>	<b>24'</b>	<b>very turbid-blk</b>
<b>1505</b>	<b>3.28</b>	<b>120</b>	<b>14.03</b>	<b>3.852</b>	<b>8.58</b>	<b>0.34</b>	<b>86.5</b>	<b>-67.1</b>			<b>↓ rate pieces</b>
<b>1510</b>	<b>3.32</b>	<b>120</b>	<b>14.25</b>	<b>3.831</b>	<b>8.62</b>	<b>0.44</b>	<b>92.7</b>	<b>-71.7</b>			<b>-purge color</b>
<b>1515</b>	<b>purged ambient due to high turbidity</b>										
<b>1520</b>	<b>3.52</b>	<b>120</b>	<b>14.81</b>	<b>3.852</b>	<b>8.55</b>	<b>0.44</b>	<b>93.7</b>	<b>-65.9</b>			
<b>1525</b>	<b>3.60</b>	<b>120</b>	<b>14.70</b>	<b>3.862</b>	<b>8.58</b>	<b>0.46</b>	<b>80.2</b>	<b>-75.7</b>			
<b>1530</b>	<b>3.68</b>	<b>120</b>	<b>14.69</b>	<b>3.857</b>	<b>8.64</b>	<b>0.43</b>	<b>76.9</b>	<b>-79.4</b>			
<b>1535</b>	<b>3.75</b>	<b>120</b>	<b>14.68</b>	<b>3.857</b>	<b>8.62</b>	<b>0.44</b>	<b>80.7</b>	<b>-82.1</b>			
<b>1540</b>	<b>3.81</b>	<b>120</b>	<b>14.80</b>	<b>3.855</b>	<b>8.57</b>	<b>0.44</b>	<b>78.7</b>	<b>-74.3</b>			
<b>1545</b>	<b>3.88</b>	<b>120</b>	<b>14.78</b>	<b>3.848</b>	<b>8.53</b>	<b>0.44</b>	<b>78.2</b>	<b>-77.0</b>			
<b>1550</b>	<b>3.96</b>	<b>120</b>	<b>14.60</b>	<b>3.863</b>	<b>8.70</b>	<b>0.47</b>	<b>65.6</b>	<b>-85.3</b>			
<b>1555</b>	<b>4.08</b>	<b>120</b>	<b>14.53</b>	<b>3.852</b>	<b>8.67</b>	<b>0.41</b>	<b>62.0</b>	<b>-81.2</b>			<b>Should have purged</b>
<b>1600</b>	<b>4.11</b>	<b>120</b>	<b>14.56</b>	<b>3.852</b>	<b>8.62</b>	<b>0.41</b>	<b>60.6</b>	<b>-78.3</b>			<b>for 2 hour minimum</b>
<b>1605</b>	<b>-sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

**1435** 3.85 8.6 0.4 61 -78

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.695)  
pH: nearest tenth (ex. 3.53 = 3.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>not</b>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <b>Veron</b> <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b> <input checked="" type="checkbox"/> PUMP <b>Geopump</b> <input checked="" type="checkbox"/> OTHER _____
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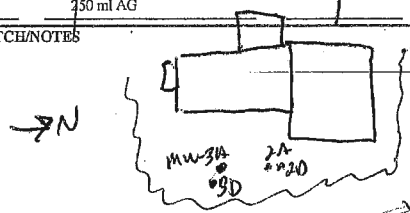
**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		<input checked="" type="checkbox"/>	<b>nw03D-014-01</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	3541	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe/Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RS#-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO  
 NO-PURGE METHOD UTILIZED  YES  NO  
 NUMBER OF GALLONS GENERATED **23**  
 to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **Diane Kravitz**

Checked By: *[Signature]* Date: **5/29/19**



## LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW-4-008</b>	SAMPLE TIME <b>1135</b>

LOCATION ID <b>MW-4</b>	DATE <b>5/22/19</b>
START TIME <b>950</b>	END TIME <b>1140</b>
SITE NAME/NUMBER 828072	PAGE <b>1</b> OF <b>2</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A

CAP \_\_\_\_\_

CASING LOCKED  \_\_\_\_\_

COLLAR  \_\_\_\_\_

INITIAL DTW (BMP) <b>3.80</b> FT	FINAL DTW (BMP) <b>4.67</b> FT	PROT. CASING STICKUP (AGS) <b>1.8</b> FT	TOCTOR DIFFERENCE <b>0.13</b> FT
WELL DEPTH (BMP) <b>9.5</b> FT	SCREEN LENGTH <b>UNK</b> FT	PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>5.70</b> FT	DRAWDOWN VOLUME <b>0.085</b> GAL <small>(initial DTW - final DTW X well diam. squared X 0.041)</small>	PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
CALCULATED GAL/VOL <b>0.04</b> GAL <small>(column X well diameter squared X 0.041)</small>	TOTAL VOL. PURGED <b>4.68</b> GAL <small>(mL per minute X total minutes X 0.00026 gal/mL)</small>	DRAWDOWN/ TOTAL PURGED <b>0.001</b>	PRESSURE TO PUMP <b>1</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>											
<b>1005</b>											
<b>1015</b>	<b>4.31</b>	<b>200</b>	<b>-hook</b>	<b>0.45</b>						<b>NA</b>	<b>28'</b>
<b>1020</b>	<b>4.35</b>	<b>200</b>	<b>12.05</b>	<b>0.921</b>	<b>6.73</b>	<b>2.57</b>	<b>7.92</b>	<b>-75.0</b>			<b>no color</b>
<b>1025</b>	<b>4.40</b>	<b>200</b>	<b>11.49</b>	<b>0.899</b>	<b>6.38</b>	<b>2.67</b>	<b>7.99</b>	<b>-46.1</b>			
<b>1030</b>	<b>4.48</b>	<b>200</b>	<b>11.38</b>	<b>0.909</b>	<b>6.43</b>	<b>3.42</b>	<b>4.00</b>	<b>-49.1</b>			
<b>1035</b>	<b>4.52</b>	<b>200</b>	<b>11.37</b>	<b>0.905</b>	<b>6.48</b>	<b>3.41</b>	<b>2.49</b>	<b>-52.7</b>			
<b>1040</b>	<b>4.54</b>	<b>200</b>	<b>11.27</b>	<b>0.910</b>	<b>6.47</b>	<b>2.98</b>	<b>2.41</b>	<b>-54.4</b>			
<b>1045</b>	<b>4.55</b>	<b>200</b>	<b>11.33</b>	<b>0.910</b>	<b>6.54</b>	<b>2.61</b>	<b>2.02</b>	<b>-57.0</b>			
<b>1050</b>	<b>4.58</b>	<b>200</b>	<b>11.76</b>	<b>0.920</b>	<b>6.59</b>	<b>2.37</b>	<b>1.39</b>	<b>-59.1</b>			
<b>1055</b>	<b>4.61</b>	<b>200</b>	<b>11.41</b>	<b>0.926</b>	<b>6.60</b>	<b>2.14</b>	<b>1.53</b>	<b>-61.5</b>			
<b>1100</b>	<b>4.63</b>	<b>200</b>	<b>11.61</b>	<b>0.935</b>	<b>6.63</b>	<b>1.93</b>	<b>1.36</b>	<b>-64.2</b>			
<b>1105</b>	<b>4.65</b>	<b>200</b>	<b>11.60</b>	<b>0.943</b>	<b>6.64</b>	<b>1.84</b>	<b>1.18</b>	<b>-66.4</b>			
<b>1110</b>	<b>4.67</b>	<b>200</b>	<b>11.71</b>	<b>0.950</b>	<b>6.66</b>	<b>1.68</b>	<b>0.95</b>	<b>-65.8</b>			
<b>1115</b>	<b>4.67</b>	<b>200</b>	<b>11.59</b>	<b>0.952</b>	<b>6.67</b>	<b>1.60</b>	<b>1.26</b>	<b>-66.9</b>			
<b>1120</b>	<b>4.67</b>	<b>200</b>	<b>11.73</b>	<b>0.944</b>	<b>6.67</b>	<b>1.40</b>	<b>3.34</b>	<b>-68.0</b>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <p><input checked="" type="checkbox"/> PERISTALTIC</p> <p><input type="checkbox"/> SUBMERSIBLE</p> <p><input type="checkbox"/> BLADDER</p> <p><input type="checkbox"/> OTHER _____</p>	<p>DECON FLUIDS USED</p> <p><input type="checkbox"/> LIQUINOX</p> <p><input type="checkbox"/> DEIONIZED WATER</p> <p><input type="checkbox"/> POTABLE WATER</p> <p><input type="checkbox"/> NITRIC ACID</p> <p><input checked="" type="checkbox"/> OTHER <b>MP</b></p>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <p><input checked="" type="checkbox"/> SILICON TUBING</p> <p><input type="checkbox"/> HDPE TUBING</p> <p><input checked="" type="checkbox"/> LDPE TUBING</p> <p><input type="checkbox"/> HDPE TUBING</p> <p><input checked="" type="checkbox"/> OTHER <b>NA</b></p>	<p>EQUIPMENT USED</p> <p><input checked="" type="checkbox"/> WL METER</p> <p><input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b></p> <p><input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b></p> <p><input checked="" type="checkbox"/> PUMP <b>Geopump</b></p> <p><input checked="" type="checkbox"/> FILTERS NO. _____ TYPE _____</p>
--	--	--	--

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>Y</b>	<b>Y</b>	<b>see pg 2</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	340	No	4°C				
Nitrite	34.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6030B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	R3K-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

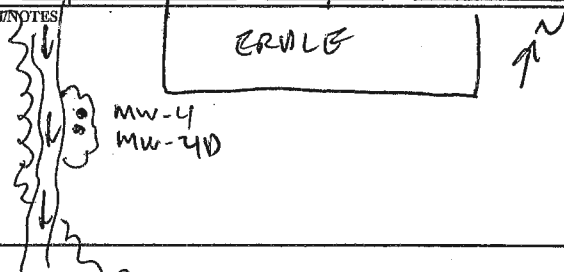
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **4.75**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **S. Lereushi**

Checked By: *[Signature]* Date: **5/29/19**



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW4008	SAMPLE TIME 1135

LOCATION ID MW4	DATE 5/22/19
START TIME 950	END TIME 1140
SITE NAME/NUMBER 828072	PAGE 2 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 3.80 5.00 FT	FINAL DTW (BMP) 4.67 FT	PROT. CASING STICKUP (AGS) 1.8 FT	TOC/TOR DIFFERENCE 0.13 FT
WELL DEPTH (BMP) 9.5 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR — PPM	REFILL TIMER SETTING 1 SEC
WATER COLUMN 5.70 FT	DRAWDOWN VOLUME 0.005 GAL (initial DTW - final DTW X well diam. squared X 0.041)	PID WELL MOUTH — PPM	DISCHARGE TIMER SETTING 1 SEC
CALCULATED GAL/VOL 0.04 GAL (column X well diameter squared X 0.041)	TOTAL VOL. PURGED 4.68 GAL (mL per minute X total minutes X 0.00026 gal/mL)	DRAWDOWN/ TOTAL PURGED 0.001	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>											
1125	4.67	200	11.81	0.952	6.67	1.37	2.52	-68.5	NA	18"	
1130	4.67	200	11.72	0.958	6.69	1.30	1.69	-70.2	h	↓	
1135	sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

112. 0.958 6.7 1.3 1.7 -70.2

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input checked="" type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <input type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> WQ METER <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> FILTERS	HACH 2100Q YSI 556 MPS Geopump NOX TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW004008
Alkalinity	2320B	No	4°C	250 ml Poly	Y	Y	
Chloride	300	No	4°C	250 ml Poly	Y	Y	
Nitrate	300	No	4°C		Y	Y	
Nitrite	354.1	No	4°C		Y	Y	
Sulfate	300	No	4°C		Y	Y	
Sulfide	4500	No	4°C		Y	Y	
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly	Y	Y	
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	Y	Y	
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	Y	Y	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED YES  NO

NO-PURGE METHOD UTILIZED YES  NO

NUMBER OF GALLONS GENERATED 4.75

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

See Page 1

Sampler Signature: *[Signature]* Print Name: J. Lukowski

Checked By: *[Signature]* Date: 5/22/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW040026</b>	SAMPLE TIME <b>1230</b>

LOCATION ID <b>MW-40</b>	DATE <b>5/22/19</b>
START TIME <b>1145</b>	END TIME <b>1300</b>
SITE NAME/NUMBER 828072	PAGE <b>1</b> OF <b>1</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <b>3.23</b> FT	FINAL DTW (BMP) <b>3.24</b> FT	PROT. CASING STICKUP (AGS) <b>2.25</b> FT	TOCTOR DIFFERENCE <b>NA</b> FT
WELL DEPTH (BMP) <b>22.2</b> FT	SCREEN LENGTH <b>OPEN HOLE 150' UNK</b> FT	PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>18.97</b> FT	DRAWDOWN VOLUME <b>0.000056</b> GAL	PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
CALCULATED GAL/VOL <b>0.124</b> GAL	TOTAL VOL. PURGED <b>1.85</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.0005</b>	PRESSURE TO PUMP <b>1</b> PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1145</b>	<b>BEGIN PURGING ~250</b>										
<b>1200</b>	<b>3.24</b>	<b>200 ↓</b>	<b>13.81</b>	<b>2.956</b>	<b>7.24</b>	<b>4.28</b>	<b>130</b>	<b>-85.0</b>	<b>NA</b>	<b>~20'</b>	<b>black pieces - turb. 0</b>
<b>1205</b>	<b>3.24</b>	<b>160 ↓</b>	<b>12.42</b>	<b>2.986</b>	<b>7.15</b>	<b>1.02</b>	<b>66.5</b>	<b>-99.0</b>			<b>no o.d.c.</b>
<b>1210</b>	<b>3.24</b>	<b>160</b>	<b>12.96</b>	<b>2.978</b>	<b>7.12</b>	<b>1.03</b>	<b>47.6</b>	<b>-106.8</b>			
<b>1215</b>	<b>3.24</b>	<b>160</b>	<b>12.89</b>	<b>2.988</b>	<b>7.13</b>	<b>1.09</b>	<b>37.3</b>	<b>-113.0</b>			
<b>1220</b>	<b>3.24</b>	<b>160</b>	<b>12.96</b>	<b>2.989</b>	<b>7.14</b>	<b>1.17</b>	<b>35.0</b>	<b>-118.1</b>			
<b>1225</b>	<b>3.24</b>	<b>160</b>	<b>12.90</b>	<b>2.982</b>	<b>7.16</b>	<b>1.10</b>	<b>33.9</b>	<b>-116.4</b>			
<b>1230</b>	<b>sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

**13    2.984    7.2    1.1    33.9    -116.4**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>NA</b>	<input checked="" type="checkbox"/> SILICON TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input checked="" type="checkbox"/> OTHER <b>NA</b>	<input checked="" type="checkbox"/> WL METER <b>Item</b> <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b> <input checked="" type="checkbox"/> PUMP <b>Geopump</b> <input checked="" type="checkbox"/> FILTERS <b>NO</b> TYPE <b>2</b>
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>Y</b>	<b>N</b>	<b>MW040020</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6019B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	20 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **12**

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: *[Signature]* Print Name: **Silverson**

Checked By: *[Signature]* Date: **5/22/19**

**SKETCH/NOTES**

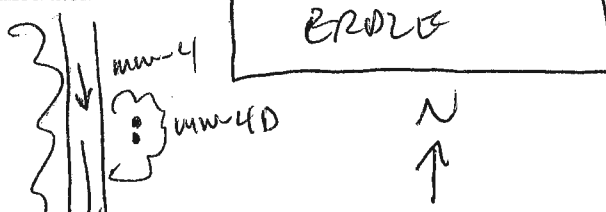


FIGURE 4.17

LOW FLOW GROUNDWATER SAMPLING RECORD  
NYSDEC QUALITY ASSURANCE PROJECT PLAN



511 Congress Street, Portland Maine 04101

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW005006- <del>X</del> (30)	SAMPLE TIME 755- 5/21/19

LOCATION ID MW-5	DATE <del>5/20/19</del> 5/20/19 8 5/21/19
START TIME 5:20:19 1420	END TIME <del>16:00</del> 0800
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 0.78 FT	FINAL DTW (BMP) 7.9 FT	PROT. CASING STICKUP (AGS) Flush FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 7.90 FT	SCREEN LENGTH 5 FT	PID AMBIENT AIR / PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 6.92 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.0077) 0.04 GAL	PID WELL MOUTH / PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 0.04 GAL	TOTAL VOL. PURGED 3.54 GAL	DRAWDOWN/ TOTAL PURGED 0.011	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
BEGIN PURGING												
1425-		160									#slowest rate	
1435	3.08	160	13.2	11.89	6.31	1.40	10.4	-21.4		7.8'	pump allows	
1440	3.71	160	13.13	11.96	6.36	3.17	7.56	-29.9			before shift was	
1445	4.20	160	13.21	11.86	6.42	4.88	5.86	-46.4			off	
1450	4.52	160	13.55	11.86	6.43	3.76	4.00	-47.1				
1455	4.75	160	13.38	11.92	6.46	3.44	3.14	-48.5				
1502	5.00	160	13.38	11.90	6.46	2.88	2.98	-49.2				
1505	5.138	160	12.84	11.90	6.46	2.50	2.14	-49.3				
1510	5.73	160	12.87	11.74	6.48	2.19	1.98	-49.4				
1515	6.22	160	12.69	11.64	6.48	2.85	1.56	-48.4				
* not stabilizing; let purge dry as historical; while monitor MWSD												
1550	well ran dry											
1558	sampled 120										DTW: 5.45'	# different scop

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

NA	13	11.6	6.5	1.9	1.6	-48
----	----	------	-----	-----	-----	-----

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<b>TYPE OF PUMP</b>		<b>DECON FLUIDS USED</b>		<b>TUBING/PUMP/BLADDER MATERIALS</b>		<b>EQUIPMENT USED</b>	
<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> LIQUINOX	<input type="checkbox"/> DEIONIZED WATER	<input checked="" type="checkbox"/> SILICON TUBING	<input type="checkbox"/> HDPE TUBING	<input checked="" type="checkbox"/> WL METER	<input type="checkbox"/> TURB. METER
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input type="checkbox"/> NITRIC ACID	<input checked="" type="checkbox"/> OTHER NA	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> HDPE TUBING	<input checked="" type="checkbox"/> WQ METER	<input type="checkbox"/> YSI 556 MPS
<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER		<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> PUMP	<input type="checkbox"/> Geopump
						<input checked="" type="checkbox"/> FILTERS	<input type="checkbox"/> NO. X TYPE

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW005006- <del>X</del> (30)
<input checked="" type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly	Y	N	
<input checked="" type="checkbox"/> Chloride	300	No	4°C	250 ml Poly	Y	N	
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	390	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6070B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	YSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

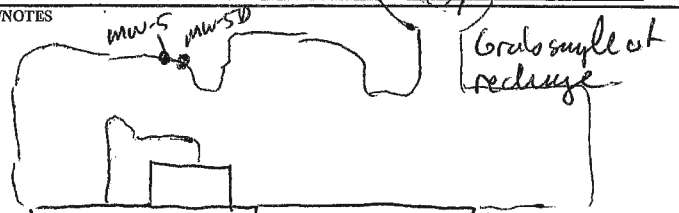
PURGE WATER CONTAINERIZED YES  NO

NO-PURGE METHOD UTILIZED YES  NO

NUMBER OF GALLONS GENERATED 23.5

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: Jane W...

Checked By: *[Signature]* Date: 5/29/19





## LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW5D0100X</b>	SAMPLE TIME <b>1620</b>

LOCATION ID <b>MW-5D</b>	DATE <b>5/20/19</b>
START TIME <b>1525</b>	END TIME <b>1630</b>
SITE NAME/NUMBER 828072	PAGE <b>1</b> OF <b>1</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A

CAP

CASING

LOCKED

COLLAR

*damaged open*

INITIAL DTW (BMP) <b>0.0</b> FT	FINAL DTW (BMP) <b>0.0</b> FT	PROT. CASING STICKUP (AGS) <b>0</b> FT	TOC/TOR DIFFERENCE <b>NA/</b> FT
WELL DEPTH (BMP) <b>12.0</b> FT	SCREEN LENGTH <b>OPEN HANG UNK</b> FT	PID AMBIENT AIR <b>/</b> PPM	REFILL TIMER SETTING <b>/</b> SEC
WATER COLUMN <b>12.0</b> FT	DRAWDOWN VOLUME <b>0.08</b> GAL	PID WELL MOUTH <b>/</b> PPM	DISCHARGE TIMER SETTING <b>/</b> SEC
CALCULATED GAL/VOL <b>0.08</b> GAL <small>(column X well diameter squared X 0.041)</small>	TOTAL VOL. PURGED <b>1.56</b> GAL <small>(mL per minute X total minutes X 0.00026 gal/mL)</small>	DRAWDOWN TOTAL PURGED <b>0.0</b>	PRESSURE TO PUMP <b>/</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1520</b>	<b>BEGIN PURGING</b>										
<b>1530</b>	<b>0.0</b>	<b>120</b>	<b>→ pump</b>	<b>2.570</b>	<b>7.14</b>	<b>0.58</b>	<b>5.36</b>	<b>-60.7</b>	<b>NA</b>	<b>10</b>	<b>artesian flow in</b>
<b>1540</b>	<b>0.0</b>	<b>120</b>	<b>12.51</b>	<b>2.570</b>	<b>7.09</b>	<b>0.79</b>	<b>11.0</b>	<b>-59.1</b>			<b>parking lot</b>
<b>1545</b>	<b>0.0</b>	<b>120</b>	<b>12.43</b>	<b>2.550</b>	<b>7.09</b>	<b>0.79</b>	<b>11.0</b>	<b>-62.5</b>			
<b>1550</b>	<b>0.0</b>	<b>120</b>	<b>12.35</b>	<b>2.543</b>	<b>7.09</b>	<b>0.01</b>	<b>10.0</b>	<b>-64.9</b>			
<b>1555</b>	<b>0.0</b>	<b>120</b>	<b>12.20</b>	<b>2.536</b>	<b>7.12</b>	<b>1.04</b>	<b>5.97</b>	<b>-64.9</b>			
<b>1600</b>	<b>0.0</b>	<b>120</b>	<b>12.14</b>	<b>2.534</b>	<b>7.13</b>	<b>0.99</b>	<b>4.64</b>	<b>-65.7</b>			
<b>1605</b>	<b>0.0</b>	<b>120</b>	<b>12.03</b>	<b>2.530</b>	<b>7.13</b>	<b>0.95</b>	<b>2.96</b>	<b>-66.5</b>			
<b>1610</b>	<b>0.0</b>	<b>120</b>	<b>12.04</b>	<b>2.526</b>	<b>7.13</b>	<b>0.91</b>	<b>2.73</b>	<b>-67.3</b>			
<b>1615</b>	<b>0.0</b>	<b>120</b>	<b>12.04</b>	<b>2.523</b>	<b>7.14</b>	<b>0.90</b>	<b>2.73</b>	<b>-68.1</b>			
<b>1620</b>	<b>sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

**12    2.523    7.1    6.9    2.2    -68**

TEMP: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>NA</b>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b> <input checked="" type="checkbox"/> PUMP <b>Geopump</b> <input checked="" type="checkbox"/> FILTERS <b>NO. X TYPE</b>
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>/</b>	<b>N</b>	<b>MW5D0100L</b>
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Nitrate	300	No	4°C	<b>/</b>	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Nitrite	3541	No	4°C	<b>/</b>	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Sulfate	300	No	4°C	<b>/</b>	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Sulfide	500	No	4°C	<b>/</b>	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Fe, Mn	6910B	No	4°C HNO3	50 ml Poly	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Ethane, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<b>/</b>	<b>/</b>	<b>/</b>
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	<b>/</b>	<b>/</b>	<b>/</b>

**PURGE OBSERVATIONS**

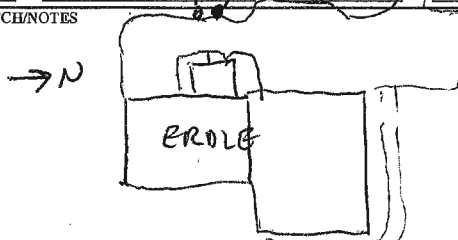
PURGE WATER CONTAINERIZED YES  NO

NO-PURGE METHOD UTILIZED YES  NO

NUMBER OF GALLONS GENERATED **2.5**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **Jolene Lorenson**

Checked By: *[Signature]* Date: **5/20/19**



# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072-MW006008  
 SAMPLE TIME: 1415

LOCATION ID: MW-6  
 DATE: 5/21/2019  
 START TIME: 1235  
 END TIME: 1450  
 SITE NAME/NUMBER: 828072  
 PAGE: 1 OF 1

WELL DIAMETER (INCHES):  1  2  4  6  8  OTHER \_\_\_\_\_  
 TUBING (INCHES):  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP):  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
 YES NO N/A  
 CAP     
 CASING     
 LOCKED     
 COLLAR

INITIAL DTW (BMP): 3.15 FT  
 FINAL DTW (BMP): 5.28 FT  
 PROT. CASING STICKUP (AGS): 2.23 FT (ABOVE PROTECTIVE CASING)  
 TOC/TOR DIFFERENCE: 0.10 (ABOVE PROTECTIVE CASING) FT  
 WELL DEPTH (BMP): 10.23 FT  
 SCREEN LENGTH: UNKNOWN  
 PID AMBIENT AIR: NA PPM  
 REFILL TIMER SETTING: NA SEC  
 WATER COLUMN: 7.08 FT  
 DRAWDOWN VOLUME: 0.35 GAL  
 PID WELL MOUTH: NA PPM  
 DISCHARGE TIMER SETTING: NA SEC  
 CALCULATED GAL/VOL: 1.16 GAL  
 TOTAL VOL. PURGED: 2.54 GAL  
 DRAWDOWN/TOTAL PURGED: 0.138  
 PRESSURE TO PUMP: NA PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP-CONDUCTAN	pH (units)	DISS. O <sub>2</sub>	TURBIDITY (ntu)	REDOX (mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
3-5 Minutes	0.0-0.33 ft Drawdown	(mL/min)	(+/- 3 degrees)	CE	(+/- 0.1 units)	(mg/L +/- 10%)	(+/- 10% <10 ntu)	(+/- 10 mv)				
BEGIN PURGING												
1302												
1310	4.40	150	10.92	3.541	6.68	0.76	3.38	109.9	NA	288	<del>5/21/19</del>	
1315	4.64	150	11.02	3.526	6.68	0.84	2.90	110.1				
1320	4.79	150	10.92	3.516	6.66	1.07	2.63	110.2				
1325	4.93	150	10.97	3.494	6.67	0.77	4.34	110.2				
1330	5.03	150	11.04	3.462	6.66	0.73	4.11	110.4				
1335	5.13	150	11.06	3.413	6.64	0.59	3.00	110.6				
1340	5.20	150	11.00	3.368	6.64	0.54	2.03	110.6				
1345	5.27	150	10.99	3.300	6.63	0.37	1.60	110.7				
1350	5.33	150	10.95	3.245	6.62	0.31	1.34	110.7				
1355	5.32	150	10.88	3.197	6.62	0.28	1.38	110.7				
1400	5.28	150	11.00	3.138	6.62	0.24	1.11	110.5				
1405	5.28	150	10.98	3.100	6.63	0.23	0.87	110.3				
1410	5.28	150	11.01	3.068	6.63	0.21	0.59	110.3				
1415	COLLECT SAMPLES											

1431-STOPPED PUMP  
 FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])  
 11, 3.07, 6.6, 0.2, 0.6, 110  
 TEMP: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP:  PERISTALTIC  SUBMERSIBLE  BLADDER  OTHER \_\_\_\_\_  
 DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER \_\_\_\_\_  
 TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_  
 S. STEEL PUMP MATERIAL  PVC PUMP MATERIAL  GEOPROBE SCREEN  TEFLON BLADDER  OTHER \_\_\_\_\_  
 EQUIPMENT USED:  WL METER: M200-70  
 TURB. METER: HACH 2100Q ID M024-31  
 WQ METER: YSI 556 MPS ID M015-05  
 PUMP: Geopump ID 500A-35  
 FILTERS: NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	125 250ml Poly			
Chloride	300	No	4°C	125 250ml Poly			
Nitrate	300	No	4°C	125 ml Poly			
Nitrite	354.1	No	4°C	125 ml Poly			
Sulfate	300	No	4°C	125 ml Poly			
Sulfide	4500	No	4°C	125 ml Poly			
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly 125 ml			
Ethene, Ethane, Methane, CO <sub>2</sub>	RSK-175	No	4°C HCl	None 60 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml + 3 X 40 ml WCA			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED: YES  NO   
 NO-PURGE METHOD UTILIZED: YES  NO   
 NUMBER OF GALLONS GENERATED: ~3.25  
 to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



NOTES:  
 \*CANNOT REDUCE PUMP SPEED UNDER 150 ml/min. OR PUMP SHUTS OFF.  
 \*PURGE WATER DESCRIPTION: COLORLESS, ODORLESS, CLEAR.

Sampler Signature: *K. Amann* Print Name: KATIE AMANN

Checked By: *J. Rawliff* Date: 5/29/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW06D015	SAMPLE TIME 1630

LOCATION ID MW-6D	DATE 5/21/2019
START TIME 1525	END TIME 1654
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER OPEN BEDROCK WELL

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 1.62 FT	FINAL DTW (BMP) 1.62 FT	PROT. CASING STICKUP (AGS) 2.05 FT	TOCTOR DIFFERENCE NA FT
WELL DEPTH (BMP) 16.05 FT	SCREEN LENGTH UNKNOWN FT	PID AMBIENT AIR NA PPM	REFILL TIMER SETTING NA SEC
WATER COLUMN 14.43 FT	DRAWDOWN VOLUME <del>NA</del> GAL	PID WELL MOUTH NA PPM	DISCHARGE TIMER SETTING NA SEC
CALCULATED GAL/VOL 21.3 GAL	TOTAL VOL. PURGED 3.58 GAL	DRAWDOWN/TOTAL PURGED 0	PRESSURE TO PUMP NA PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
1531	BEGIN PURGING											
1535	1.62	250	13.17	2.753	7.31	5.62	43.0	44.9	NA	115		
1540	1.62	250	12.47	2.763	7.33	4.81	31.3	43.3				
1545	1.62	250	12.35	2.763	7.33	4.70	28.6	42.2				
1550	1.62	250	12.39	2.764	7.32	4.65	22.7	39.0				
1555	1.62	250	12.48	2.764	7.33	4.74	22.8	36.4				
1600	1.62	250	12.57	2.764	7.33	4.76	23.5	34.5				
1605	1.62	250	12.57	2.765	7.34	4.79	23.7	33.2				
1610	1.62	250	12.58	2.764	7.33	4.82	22.0	31.6				
1615	1.62	250	12.57	2.765	7.33	4.82	18.3	31.5				
1620	1.62	250	12.49	2.765	7.33	4.83	20.0	30.7				
1625	1.62	250	12.48	2.764	7.33	4.80	19.6	31.0				
1630	COLLECT SAMPLES											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

12    2.76    7.3    4.8    19.6    31

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC SUBMERSIBLE BLADDER	<input checked="" type="checkbox"/> LIQUINOX DEIONIZED WATER POTABLE WATER NTRIC ACID OTHER	<input checked="" type="checkbox"/> SILICON TUBING HDPE TUBING LDPE TUBING HDPE TUBING OTHER	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL PVC PUMP MATERIAL GEOPROBE SCREEN TEFLON BLADDER OTHER	<input checked="" type="checkbox"/> WL METER ID M200-70 HERON DIPPER-T TURB. METER HACH 2100Q ID M024-31 WQ METER YSI 556 MPS ID M015-05 PUMP Geopump ID 8008-35 FILTERS NO. TYPE
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

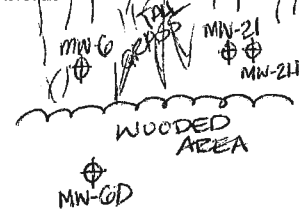
NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 23.6

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: K. Aman Print Name: KATIE AMANN

**SKETCH/NOTES**



**NOTES:**

PURGEWATER DESCRIPTION:  
PALE BROWN, SLIGHT ODOR, BLACK PARTICULATES PRESENT.  
AIR IN TUBING.

Checked By: J. Rawls

Date: 5/29/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW007015</b>	SAMPLE TIME 1110

LOCATION ID <b>MW-7</b>	DATE <b>5/22/2019</b>
START TIME <b>0835</b>	END TIME <b>1125</b>
SITE NAME/NUMBER 828072	PAGE <b>1 OF 2</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

INITIAL DTW (BMP) **2.80** FT FINAL DTW (BMP) **5.40** FT PROT. CASING STICKUP (AGS) **2.24** FT TOCTOR DIFFERENCE **0.32** (ABOVE CASING) FT

WELL DEPTH (BMP) **17.00** FT SCREEN LENGTH **UNKNOWN** PID AMBIENT AIR **NA** PPM REFILL TIMER SETTING **NA** SEC

WATER COLUMN **14.20** FT DRAWDOWN VOLUME **0.43** GAL PID WELL MOUTH **NA** PPM DISCHARGE TIMER SETTING **NA** SEC

CALCULATED GAL/VOL **2.33** GAL (column X well diameter squared X 0.041) PURGED **4.53** GAL (mL per minute X total minutes X 0.00026 gal/mL) DRAWDOWN/TOTAL PURGED **0.095** PSI

WELL INTEGRITY YES NO N/A  
 CAP  YES  NO  N/A  
 CASING  YES  NO  N/A  
 LOCKED  YES  NO  N/A  
 COLLAR  YES  NO  N/A

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>0853</b>	BEGIN PURGING										
<b>0905</b>	<b>3.59</b>	<b>100</b>	<b>12.90</b>	<b>1.729</b>	<b>7.31</b>	<b>8.53</b>	<b>151</b>	<b>60.4</b>	<b>NA</b>	<b>~15</b>	
<b>0910</b>	AIR IN TUBING, STOPPED PUMP, RE-ADJUSTED PUMP AND TUBING.										
<b>0913</b>	TURNED PUMP BACK ON.										
<b>0920</b>	<b>4.43</b>	<b>150</b>	<b>11.19</b>	<b>1.629</b>	<b>7.16</b>	<b>3.13</b>	<b>101</b>	<b>75.4</b>	<b>NA</b>	<b>~14</b>	PUMP ON LOWEST SETTING.
<b>0925</b>	<b>4.58</b>	<b>150</b>	<b>11.10</b>	<b>1.637</b>	<b>7.12</b>	<b>1.79</b>	<b>90.6</b>	<b>77.3</b>			AIR PRESENT IN TUBING AGAIN.
<b>0930</b>	<b>4.74</b>	<b>125</b>	<b>11.46</b>	<b>1.676</b>	<b>7.15</b>	<b>4.56</b>	<b>60.7</b>	<b>75.0</b>			
<b>0935</b>	<b>4.96</b>	<b>160</b>	<b>11.22</b>	<b>1.710</b>	<b>7.12</b>	<b>2.12</b>	<b>57.8</b>	<b>76.6</b>		<b>~15</b>	RE-ADJUSTED TUBING. AIR NO LONGER PRESENT IN TUBING. DID NOT ADJUST SPEED CONTROL KNOBS.
<b>0940</b>	<b>5.02</b>	<b>175</b>	<b>11.28</b>	<b>1.708</b>	<b>7.11</b>	<b>1.20</b>	<b>68.1</b>	<b>76.5</b>			
<b>0945</b>	<b>5.12</b>	<b>175</b>	<b>11.23</b>	<b>1.703</b>	<b>7.11</b>	<b>0.92</b>	<b>61.0</b>	<b>76.9</b>			
<b>0950</b>	<b>5.18</b>	<b>160</b>	<b>11.21</b>	<b>1.716</b>	<b>7.10</b>	<b>0.95</b>	<b>45.0</b>	<b>77.9</b>			REDUCED SPEED TO TRY TO REDUCE DRAWDOWN
<b>0955</b>	<b>5.15</b>	<b>160</b>	<b>11.17</b>	<b>1.723</b>	<b>7.11</b>	<b>0.97</b>	<b>45.6</b>	<b>77.1</b>			
<b>1000</b>	<b>5.14</b>	<b>160</b>	<b>11.17</b>	<b>1.728</b>	<b>7.11</b>	<b>0.92</b>	<b>36.8</b>	<b>77.9</b>			
<b>1005</b>	<b>5.16</b>	<b>160</b>	<b>11.14</b>	<b>1.734</b>	<b>7.12</b>	<b>0.78</b>	<b>29.1</b>	<b>76.8</b>			
<b>1010</b>	<b>5.23</b>	<b>160</b>	<b>11.02</b>	<b>1.736</b>	<b>7.12</b>	<b>0.67</b>	<b>28.7</b>	<b>77.0</b>			

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

TEMP: nearest degree (ex. 10.1 = 10)  
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**11 1.73 7.1 0.4 10.4 80**

EQUIPMENT DOCUMENTATION

TYPE OF PUMP:  PERISTALTIC  SUBMERSIBLE  BLADDER  OTHER \_\_\_\_\_

DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER **Dedicated**

TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_

S. STEEL PUMP MATERIAL  PVC PUMP MATERIAL  GEOPROBE SCREEN  TEFLON BLADDER  OTHER \_\_\_\_\_

EQUIPMENT USED: WL METER **M200 - FOMERIX DIPPER** TURB. METER **HACH 2100Q** WQ METER **YSI 556 MDS** PUMP **SCOP - 35** FILTERS NO. \_\_\_\_\_ TYPE \_\_\_\_\_

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	N/A
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	380	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C He/1	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C HNO4	250 ml AG			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **~5**

to sampling or \_\_\_\_\_ ml. for this sample location.

Sampler Signature: *Katie Amann* Print Name: **KATIE AMANN**

Checked By: *Jerry Paul* Date: **5/29/19**

SKETCH/NOTES

*WIPPED, BRUSH, FALL BRACES*

*RAILROAD TRACKS (ACTIVE)*

*THILL GRASSES WIPPED*

*MW-7*

NOTES: PURGE WATER DESCRIPTION: DRANKIE, SLIGHT ODDOR, CLOUDY

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072-MW007015	SAMPLE TIME 1110

LOCATION ID MW-7	DATE 5/22/2019
START TIME 0835	END TIME 1125
SITE NAME/NUMBER 828072	PAGE 2 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CAP LOCKED <input checked="" type="checkbox"/>		
CASING COLLAR <input checked="" type="checkbox"/>		
NO WELL PLUG; PROTECTIVE CASING HAS CAP <input checked="" type="checkbox"/>		

INITIAL DTW (BMP) <input type="text" value="2.80"/> FT	FINAL DTW (BMP) <input type="text" value="5.40"/> FT	PROT. CASING STICKUP (AGS) <input type="text" value="2.24"/> FT	TOC/TOR DIFFERENCE <input type="text" value="0.32 (ABOVE CASING)"/> FT
WELL DEPTH (BMP) <input type="text" value="17.00"/> FT	SCREEN LENGTH <input type="text" value="UNKNOWN"/> FT	PID AMBIENT AIR <input type="text" value="NA"/> PPM	REFILL TIMER SETTING <input type="text" value="NA"/> SEC
WATER COLUMN <input type="text" value="14.20"/> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <input type="text" value="0.43"/> GAL	PID WELL MOUTH <input type="text" value="NA"/> PPM	DISCHARGE TIMER SETTING <input type="text" value="NA"/> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <input type="text" value="2.33"/> GAL	TOTAL VOL. PURGED (mL per minute X total minutes X 0.00026 gal/mL) <input type="text" value="4.53"/> GAL	DRAWDOWN/TOTAL PURGED <input type="text" value="0.095"/>	PRESSURE TO PUMP <input type="text" value="NA"/> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
BEGIN PURGING											
1015	5.23	150	10.96	1.735	7.12	0.59	27.3	77.7	NA	~15	
1020	5.23	150	11.11	1.730	7.12	0.57	21.6	77.2			
1025	5.23	150	11.06	1.735	7.12	0.50	23.9	77.6			
1030	5.27	150	10.93	1.735	7.12	0.46	20.2	78.4			
1035	5.29	150	10.86	1.735	7.11	0.43	16.4	79.1			
1040	5.35	150	10.80	1.737	7.12	0.42	14.7	79.4			
1045	5.34	150	10.88	1.734	7.11	0.40	13.6	80.3			
1050	5.34	150	10.83	1.735	7.11	0.42	12.1	81.1			
1055	5.37	150	10.91	1.733	7.12	0.40	10.4	81.2			
1100	5.40	150	11.15	1.731	7.11	0.41	10.5	80.5			
1105	5.40	150	11.19	1.733	7.11	0.40	10.4	80.3			
1110	COLLECT SAMPLES										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

11	1.73	7.1	0.4	10.4	80
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TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input checked="" type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL
<input type="checkbox"/> SUBMERSIBLE	<input checked="" type="checkbox"/> DEIONIZED WATER	<input checked="" type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN
<input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON BLADDER
	<input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER

EQUIPMENT USED

WL METER	M200-70 HERON DIPPER-T
TURB. METER	HACH 2100Q M024-31
WQ METER	YSI 556 MPS M015-05
PUMP	Geopump SC09-35
FILTERS	NO TYPE

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED  ml for this sample location.

**SKETCH/NOTES**

SEE PAGE 1 OF 2

Sampler Signature: *Katie Amann* Print Name: KATIE AMANN

Checked By: *Jerry Pauloff* Date: 5/22/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW07D022	SAMPLE TIME 1255

LOCATION ID MW-7D	DATE 5/22/2019
START TIME 1129	END TIME 1320
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER OPEN BEDROCK WELL

INITIAL DTW (BMP) 1.26 FT FINAL DTW (BMP) 1.26 FT PROT. CASING STICKUP (AGS) 1.8 FT TOCTOR DIFFERENCE NA FT

WELL DEPTH (BMP) 26.10 FT SCREEN LENGTH UNKNOWN FT PID AMBIENT AIR NA PPM REFILL TIMER SETTING NA SEC

WATER COLUMN 24.84 FT DRAWDOWN VOLUME 0 GAL PID WELL MOUTH NA PPM DISCHARGE TIMER SETTING NA SEC

CALCULATED GAL/VOL 36.7 GAL TOTAL VOL. PURGED 5.19 GAL DRAWDOWN/TOTAL PURGED 0 PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY YES NO N/A  
 CAP     
 CASING     
 LOCKED     
 COLLAR    DAMAGED

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<u>1133</u>	<b>BEGIN PURGING</b>										
<u>1145</u>	<u>1.26</u>	<u>285</u>	<u>13.75</u>	<u>2.709</u>	<u>7.55</u>	<u>0.78</u>	<u>190</u>	<u>41.8</u>	<u>NA</u>	<u>22</u>	
<u>1150</u>	<u>1.26</u>	<u>285</u>	<u>13.61</u>	<u>2.721</u>	<u>7.58</u>	<u>0.59</u>	<u>143</u>	<u>24.2</u>			
<u>1155</u>	<u>1.26</u>	<u>285</u>	<u>13.15</u>	<u>2.719</u>	<u>7.57</u>	<u>0.45</u>	<u>123</u>	<u>10.6</u>			
<u>1200</u>	<u>1.26</u>	<u>285</u>	<u>13.23</u>	<u>2.714</u>	<u>7.60</u>	<u>0.39</u>	<u>98.6</u>	<u>-15.8</u>			
<u>1205</u>	<u>1.26</u>	<u>285</u>	<u>13.12</u>	<u>2.719</u>	<u>7.61</u>	<u>0.34</u>	<u>90.4</u>	<u>-31.2</u>			
<u>1210</u>	<u>1.26</u>	<u>285</u>	<u>13.10</u>	<u>2.723</u>	<u>7.62</u>	<u>0.29</u>	<u>81.2</u>	<u>-52.1</u>			
<u>1215</u>	<u>1.26</u>	<u>285</u>	<u>13.05</u>	<u>2.720</u>	<u>7.62</u>	<u>0.27</u>	<u>67.7</u>	<u>-64.2</u>			
<u>1220</u>	<u>1.26</u>	<u>285</u>	<u>13.00</u>	<u>2.723</u>	<u>7.63</u>	<u>0.23</u>	<u>62.5</u>	<u>-80.8</u>			
<u>1225</u>	<u>1.26</u>	<u>285</u>	<u>12.91</u>	<u>2.725</u>	<u>7.65</u>	<u>0.22</u>	<u>56.3</u>	<u>-80.9</u>			
<u>1230</u>	<u>1.26</u>	<u>285</u>	<u>12.85</u>	<u>2.725</u>	<u>7.65</u>	<u>0.20</u>	<u>50.8</u>	<u>-80.9</u>			
<u>1235</u>	<u>1.26</u>	<u>285</u>	<u>12.74</u>	<u>2.721</u>	<u>7.65</u>	<u>0.20</u>	<u>50.5</u>	<u>-68.1</u>			
<u>1240</u>	<u>1.26</u>	<u>285</u>	<u>12.59</u>	<u>2.730</u>	<u>7.67</u>	<u>0.18</u>	<u>45.5</u>	<u>-73.2</u>			
<u>1245</u>	<u>1.26</u>	<u>285</u>	<u>12.51</u>	<u>2.723</u>	<u>7.69</u>	<u>0.18</u>	<u>43.0</u>	<u>-71.9</u>			
<u>1250</u>	<u>1.26</u>	<u>285</u>	<u>12.57</u>	<u>2.723</u>	<u>7.68</u>	<u>0.17</u>	<u>42.1</u>	<u>-75.6</u>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

13    2.72    7.7    0.2    42    -76

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>HERON DIPPER-T M200-70</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q M024-031</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS M018-05</u> <input checked="" type="checkbox"/> PUMP <u>Geopump SB08-35</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
---	--	--	--	---

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<u>YES</u>	<u>NO</u>	<u>NA</u>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethane, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 25.25

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: K Amann Print Name: KATIE AMANN

**SKETCH/NOTES**

↑  
N

*WOODEN TUBING WEST SIDE OF WELL*  
*GRAVEL ACCESS WAY*  
*MW-7D*  
*MW-7*  
*EMERGENCY TRACKS (ACTIVE)*

**NOTES**

SOFT BOTTOM  
 PURGE WATER DESCRIPTION: ORANGE, ODOR, CLOUDY

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW0058023</b>	SAMPLE TIME <b>1400</b>

LOCATION ID <b>MW-8</b>	DATE <b>5/21/19</b>
START TIME <b>1215</b>	END TIME <b>1410</b>
SITE NAME/NUMBER 828072	PAGE <b>1 OF 1</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

INITIAL DTW (BMP) **13.36** FT FINAL DTW (BMP) **14.42** FT PROT. CASING STICKUP (AGS) **1.45** FT TOC/TOR DIFFERENCE **0.10 Above casing** FT

WELL DEPTH (BMP) **27.9** FT SCREEN LENGTH **10** FT PID AMBIENT AIR \_\_\_\_\_ PPM REFILL TIMER SETTING \_\_\_\_\_ SEC

WATER COLUMN **14.54** FT DRAWDOWN VOLUME **0.64** GAL PID WELL MOUTH \_\_\_\_\_ PPM DISCHARGE TIMER SETTING \_\_\_\_\_ SEC

CALCULATED GAL/VOL **2.3** GAL TOTAL VOL. PURGED **2.3** GAL DRAWDOWN/TOTAL PURGED **0.28** PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>(22)</b>	<b>BEGIN PURGING</b>										
<b>1235</b>	<b>13.71</b>	<b>125</b>	<b>10.2</b>	<b>3.309</b>	<b>6.6</b>	<b>1.8</b>	<b>3.3</b>	<b>-70</b>			<i>carry overhole for a few minutes</i>
<b>1250</b>	<b>14.08</b>	<b>135</b>	<b>10.2</b>	<b>3.318</b>	<b>6.6</b>	<b>3.1</b>	<b>2.2</b>	<b>-78</b>			
<b>1255</b>	<b>14.12</b>	<b>100</b>	<b>10.5</b>	<b>3.307</b>	<b>6.6</b>	<b>2.3</b>	<b>3.3</b>	<b>-77</b>			
<b>1300</b>	<b>14.16</b>	<b>105</b>	<b>10.7</b>	<b>3.315</b>	<b>6.6</b>	<b>1.8</b>	<b>2.6</b>	<b>-69</b>			
<b>1305</b>	<b>14.21</b>	<b>105</b>	<b>10.5</b>	<b>3.316</b>	<b>6.6</b>	<b>1.5</b>	<b>1.9</b>	<b>-65</b>			
<b>1310</b>	<b>14.24</b>	<b>105</b>	<b>10.4</b>	<b>3.315</b>	<b>6.6</b>	<b>1.4</b>	<b>2.0</b>	<b>-63</b>			
<b>1315</b>	<b>14.28</b>	<b>105</b>	<b>10.4</b>	<b>3.309</b>	<b>6.6</b>	<b>1.2</b>	<b>1.9</b>	<b>-69</b>			
<b>1320</b>	<b>14.32</b>	<b>110</b>	<b>10.3</b>	<b>3.303</b>	<b>6.6</b>	<b>1.2</b>	<b>1.7</b>	<b>-83</b>			
<b>1325</b>	<b>14.35</b>	<b>110</b>	<b>10.3</b>	<b>3.303</b>	<b>6.6</b>	<b>1.1</b>	<b>1.8</b>	<b>-86</b>			
<b>1330</b>	<b>14.39</b>	<b>110</b>	<b>10.4</b>	<b>3.306</b>	<b>6.6</b>	<b>1.1</b>	<b>1.5</b>	<b>-71</b>			
<b>1335</b>	<b>14.40</b>	<b>105</b>	<b>10.5</b>	<b>3.303</b>	<b>6.6</b>	<b>1.0</b>	<b>1.2</b>	<b>-73</b>			
<b>1340</b>	<b>14.42</b>	<b>110</b>	<b>10.5</b>	<b>3.301</b>	<b>6.6</b>	<b>1.0</b>	<b>1.6</b>	<b>-79</b>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

**11    3.30    6.6    1.0    1.6    -79**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>deducted</i>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <i>Wetron</i> <input checked="" type="checkbox"/> TURB. METER <i>HACH 2100Q</i> <input checked="" type="checkbox"/> WQ METER <i>YSI 556 MFS</i> <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
✓ VOCs	8260C	No	4°C HCl	3 X 40 ml		✓	<i>Also collected a microplastic sample (1 x 16 poly)</i>
✓ Alkalinity	2320B	No	4°C	125 250 ml Poly		✓	
✓ Chloride	300	No	4°C	125 50 ml Poly		✓	
✓ Nitrate	300	No	4°C			✓	
✓ Nitrite	354.1	No	4°C			✓	
✓ Sulfate	300	No	4°C			✓	
✓ Sulfide	4500	No	4°C	<i>2ml HCl 125 50 ml Poly</i>		✓	
✓ Fe, Mn	6010B	No	4°C HNO3	<i>125 50 ml Poly</i>		✓	
✓ Ethene, Ethane, Methane	RSK-175	No	4°C HCl	<i>1/4 3 X 40 ml</i>		✓	
✓ Total Organic Carbon	415.1	No	4°C H2SO4	<i>3 x 40 ml</i>		✓	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.3**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*R.R.*

*Top of ridge*

*MW-8 • • MW-8D*

Sampler Signature: *Jerry Rawel* Print Name: **Jerry Rawel**

Checked By: *Wally* Date: **5/21/19**

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>mw080033</b>	SAMPLE TIME <b>1150</b>

LOCATION ID <b>mw-80</b>	DATE <b>5/21/19</b>
START TIME <b>0900</b>	END TIME <b>1215</b>
SITE NAME/NUMBER 828072	PAGE <b>1</b> OF <b>2</b>

WELL DIAMETER (INCHES) <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> 6 <input type="checkbox"/> 8	OTHER _____	WELL INTEGRITY YES <input checked="" type="checkbox"/> NO _____ N/A _____
TUBING ID (INCHES) <input type="checkbox"/> 1/8 <input type="checkbox"/> 1/4 <input checked="" type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8	OTHER _____	CAP <input checked="" type="checkbox"/>
MEASUREMENT POINT (MP) <input type="checkbox"/> TOP OF RISER (TOR) <input checked="" type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____		CASING <input checked="" type="checkbox"/>
		LOCKED <input checked="" type="checkbox"/>
		COLLAR <input checked="" type="checkbox"/>
INITIAL DTW (BMP) <b>12.62</b> FT	FINAL DTW (BMP) <b>12.64</b> FT	PROT. CASING STICKUP (AGS) <b>1.4</b> FT
TOC/TOR DIFFERENCE <b>NA</b> FT		
WELL DEPTH (BMP) <b>38.1</b> FT	SCREEN LENGTH <b>0.012</b> FT	PID AMBIENT AIR _____ PPM
REFILL TIMER SETTING _____ SEC		
WATER COLUMN <b>25.5</b> FT	DRAWDOWN VOLUME <b>0.015</b> GAL	PID WELL MOUTH _____ PPM
DISCHARGE TIMER SETTING _____ SEC		
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>37.4</b> GAL	TOTAL VOL. PURGED <b>3.9</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.004</b>
PRESSURE TO PUMP _____ PSI		

### FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity	PUMP INTAKE DEPTH	Comments
<b>0931</b>	<b>BEGIN PURGING</b>										
<b>0950</b>	<b>12.64</b>	<b>135</b>	<b>10.7</b>	<b>2.418</b>	<b>8.9</b>	<b>1.7</b>	<b>27</b>	<b>98</b>			<i>Soft bottom</i>
<b>1000</b>	<b>12.64</b>	<b>140</b>	<b>11.1</b>	<b>2.432</b>	<b>8.9</b>	<b>1.0</b>	<b>28</b>	<b>97</b>			
<b>1010</b>	<b>12.63</b>	<b>145</b>	<b>10.8</b>	<b>2.434</b>	<b>8.9</b>	<b>0.6</b>	<b>28</b>	<b>77</b>			
<b>1020</b>	<b>12.63</b>	<b>150</b>	<b>10.8</b>	<b>2.431</b>	<b>9.0</b>	<b>0.4</b>	<b>27</b>	<b>50</b>			
<b>1025</b>	<b>12.64</b>	<b>150</b>	<b>11.0</b>	<b>2.432</b>	<b>9.0</b>	<b>0.4</b>	<b>25</b>	<b>41</b>			
<b>1030</b>	<b>12.64</b>	<b>165</b>	<b>11.1</b>	<b>2.434</b>	<b>9.0</b>	<b>0.4</b>	<b>24</b>	<b>29</b>			
<b>1035</b>	<b>12.64</b>	<b>165</b>	<b>11.1</b>	<b>2.432</b>	<b>9.0</b>	<b>0.3</b>	<b>22</b>	<b>16</b>			
<b>1040</b>	<b>12.65</b>	<b>165</b>	<b>11.2</b>	<b>2.436</b>	<b>9.0</b>	<b>0.3</b>	<b>22</b>	<b>3</b>			
<b>1045</b>	<b>12.65</b>	<b>165</b>	<b>11.3</b>	<b>2.437</b>	<b>9.0</b>	<b>0.3</b>	<b>27</b>	<b>-5</b>			
<b>1050</b>	<b>12.65</b>	<b>160</b>	<b>11.2</b>	<b>2.437</b>	<b>9.0</b>	<b>0.3</b>	<b>24</b>	<b>-13</b>			
<b>1055</b>	<b>12.65</b>	<b>165</b>	<b>11.1</b>	<b>2.433</b>	<b>9.0</b>	<b>0.3</b>	<b>23</b>	<b>-27</b>			
<b>1100</b>	<b>12.64</b>	<b>150</b>	<b>11.0</b>	<b>2.436</b>	<b>9.0</b>	<b>0.3</b>	<b>21</b>	<b>-33</b>			
<b>1105</b>	<b>12.63</b>	<b>145</b>	<b>11.1</b>	<b>2.436</b>	<b>8.9</b>	<b>0.3</b>	<b>21</b>	<b>-28</b>			
<b>1110</b>	<b>12.63</b>	<b>145</b>	<b>11.2</b>	<b>2.447</b>	<b>8.8</b>	<b>0.3</b>	<b>24</b>	<b>-40</b>			

### FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

**12      2.60      7.7      0.3      16      -160**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

### EQUIPMENT DOCUMENTATION

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>Deionized</i>	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <i>Heron</i> <input checked="" type="checkbox"/> TURB. METER <i>HACH 2100Q</i> <input checked="" type="checkbox"/> WQ METER <i>YSI 556 MPS</i> <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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### ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml			<i>Also collected Microbial Sample (1x16 Poly)</i>
Alkalinity	2320B	No	4°C	125 250 ml Poly			
Chloride	300	No	4°C	125 250 ml Poly			
Nitrate	300	No	4°C	w/chloride			
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C 2N FeSO <sub>4</sub>	50 50 ml poly			
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	125 50 ml Poly			
Ethane, Ethane, Methane	RSK-175	No	4°C HCl/4°C	3 X 40 ml / 3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG 3 X 40 ml			

### PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	NUMBER OF GALLONS GENERATED <b>3.9</b>
NO-PURGE METHOD UTILIZED <input type="checkbox"/> YES <input type="checkbox"/> NO	to sampling or _____ mL for this sample location.

### SKETCH/NOTES

*ERDLE*

*high ridge*

Sampler Signature: *Jerry Rawcliffe* Print Name: **Jerry Rawcliffe**

Checked By: *MWA* Date: **7/28/19**



511 Congress Street, Portland Maine 04101



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW080 033	SAMPLE TIME 1150

LOCATION ID MW-80	DATE 5/21/19
START TIME 0900	END TIME 1215
SITE NAME/NUMBER 828072	PAGE 2 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 12.62 FT FINAL DTW (BMP) 12.64 FT PROT. CASING STICKUP (AGS) 1.4 FT TOC/TOR DIFFERENCE NA FT

WELL DEPTH (BMP) 38.1 FT SCREEN LENGTH OPEN TO HOLE FT PID AMBIENT AIR \_\_\_\_\_ PPM REFILL TIMER SETTING \_\_\_\_\_ SEC

WATER COLUMN 25.5 FT DRAWDOWN VOLUME .03 GAL PID WELL MOUTH \_\_\_\_\_ PPM DISCHARGE TIMER SETTING \_\_\_\_\_ SEC

CALCULATED GAL/VOL 37.4 GAL TOTAL VOL. PURGED 5.1 GAL DRAWDOWN/TOTAL PURGED .006 PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
0931	BEGIN PURGING										
1115	12.64	150	11.2	2.459	8.7	0.2	21	-73			
1120	12.63	150	11.4	2.481	8.6	0.1	19	-146			
1125	12.64	155	11.5	2.503	8.4	0.2	18	-185	1.3		
1130	12.64	158	11.5	2.540	8.0	0.2	18	-184			
1135	12.64	155	11.5	2.527	7.7	0.3	16	-162			
Have purged for > 2 hours many parameters are not stable - no drawdown believe this is a representative sample of bedrock groundwater Goes to grab sample.											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

12    2.60    7.7    0.3    16    -160

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>Bevon</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Also collected Microbial Sample (1x) 1/2 Poly
<input checked="" type="checkbox"/> Alkalinity	2320B	No	4°C	125-250 ml Poly	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Chloride	300	No	4°C	125-250 ml Poly	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Nitrate	300	No	4°C	w/Chloride	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Nitrite	354.1	No	4°C		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Sulfate	300	No	4°C		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Sulfide	4500	No	4°C	1/2ml H <sub>2</sub> O in 1x 500ml poly	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	125 ml Poly	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	1/4 3 X 40 ml / 3 X 40 ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml H <sub>2</sub> O 3 X 40 ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 5.1

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

See page 1.

Sampler Signature:

*Jerry Rawel*

Print Name:

Jerry Rawel, FLO

Checked By:

*MEM*

Date:

7/28/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <i>mw009025</i>	SAMPLE TIME 1730

LOCATION ID <i>mw-9</i>	DATE 5/21/19
START TIME 1625	END TIME 1740
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 14.74 FT	FINAL DTW (BMP) 14.91 FT	PROT. CASING STICKUP (ACS) 1.9 FT	TOCTOR DIFFERENCE 0.06 Above Casing FT
WELL DEPTH (BMP) 30.0 FT	SCREEN LENGTH 10 FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN 15.20 FT	DRAWDOWN VOLUME 0.03 GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 2.41 GAL	TOTAL VOL. PURGED (mL per minute X total minutes X 0.00026 gal/mL) 2.3 GAL	DRAWDOWN/TOTAL PURGED .012	PRESSURE TO PUMP _____ PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>BEGIN PURGING</b>											
1626											
1635	14.93	190	11.1	2.809	6.6	2.3	2.6	-57	1.47		
1640	14.91	155	10.1	2.814	6.7	2.4	2.2	-68			
1645	14.91	155	11.1	2.817	7.0	1.9	3.1	-74			
1650	14.91	155	11.1	2.817	6.8	1.7	1.2	-73			
1655	14.92	155	11.0	2.814	6.8	1.5	1.1	-73			
1700	14.91	155	11.1	2.812	6.8	1.3	1.3	-75			
1705	14.91	160	11.0	2.811	6.8	1.2	1.7	-71			
1710	14.91	160	11.0	2.810	6.8	1.1	1.4	-69			
1715	14.91	160	10.9	2.809	6.8	0.9	1.4	-69			
1720	14.91	160	11.0	2.808	6.8	0.9	1.4	-73			
1728	14.91	160	10.9	2.806	6.8	0.8	1.3	-71			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

11      2.81      6.8      0.8      1.3      -71

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>deducted</i>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> PUMP <input type="checkbox"/> FILTERS	<i>Heron</i> HACH 2100Q YSI 556 MPS Geopump NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	_____	_____
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Nitrate	300	No	4°C	_____	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Nitrite	354.1	No	4°C	_____	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Sulfate	300	No	4°C	_____	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Sulfide	4500	No	4°C	_____	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<input type="checkbox"/>	_____	_____
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG	<input type="checkbox"/>	_____	_____

**PURGE OBSERVATIONS**

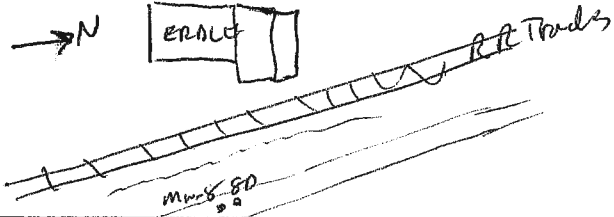
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED *2.3*

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *Jerry Rausch* Print Name: **Jerry Rausch**

Checked By: *[Signature]* Date: *7/25/19*

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW09D035	SAMPLE TIME 1620

LOCATION ID mw-90	DATE 5/21/19
START TIME 1410	END TIME 1625
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 14.84 FT	FINAL DTW (BMP) 14.86 FT	PROT. CASING STICKUP (AGS) 2.1 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 40.9 FT	SCREEN LENGTH 32 FT	PID AMBIENT AIR PPM	REFILL TIMER SETTING SEC
WATER COLUMN 26.06 FT	DRAWDOWN VOLUME 1.03 GAL	PID WELL MOUTH PPM	DISCHARGE TIMER SETTING SEC
CALCULATED GAL/VOL 38.3 GAL	TOTAL VOL. PURGED 4.3 GAL	DRAWDOWN/TOTAL PURGED 1007	PRESSURE TO PUMP PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1421	BEGIN PURGING										
1545	14.83	140	11.2	2.44	9.0	1.2	9.4	12	1.25		
1550	14.84	140	11.2	2.410	9.2	0.7	9.3	9			
1555	14.84	140	11.2	2.405	9.2	0.5	8.6	6			
1600	14.85	140	11.2	2.404	9.2	0.5	8.2	6			
1605	14.85	145	11.1	2.406	9.2	0.3	8.3	4			
1610	14.86	145	11.2	2.403	9.2	0.4	8.3	4			
1615	14.86	145	11.0	2.408	9.2	0.4	8.8	2			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

11      2.41      9.2      0.4      8.8      2

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>Henry</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 4.3

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

~~RR Drills~~

~~West Street~~

MAN UNDERIDGE

mw-90

Sampler Signature: Jerry Rawcliffe Print Name: Jerry Rawcliffe

Checked By: M.H. J... Date: 7/25/19

## LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <i>mw010 016</i>	SAMPLE TIME 1010

LOCATION ID <i>MW-10</i>	DATE <i>5/22/19</i>
START TIME <i>0830</i>	END TIME <i>1030</i>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY		
YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <i>3.07</i> FT	FINAL DTW (BMP) <i>3.94</i> FT	PROT. CASING STICKUP (AGS) <i>3.1</i> FT	TOC/TOR DIFFERENCE <i>0.14</i> FT
WELL DEPTH (BMP) <i>13.2</i> FT	SCREEN LENGTH <i>10</i> FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN <i>9.93</i> FT	DRAWDOWN VOLUME <i>1.14</i> GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL <i>1.6</i> GAL	TOTAL VOL. PURGED <i>2.4</i> GAL	DRAWDOWN/TOTAL PURGED <i>106</i>	PRESSURE TO PUMP _____ PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
BEGIN PURGING											
<i>0857</i>											
<i>0905</i>	<i>3.21</i>	<i>125</i>	<i>10.4</i>	<i>1.994</i>	<i>7.0</i>	<i>1.6</i>	<i>7.6</i>	<i>144</i>	<i>1.02</i>		
<i>0915</i>	<i>3.43</i>	<i>150</i>	<i>10.3</i>	<i>2.017</i>	<i>7.0</i>	<i>0.8</i>	<i>6.5</i>	<i>119</i>			
<i>0925</i>	<i>4.06</i>	<i>160</i>	<i>10.2</i>	<i>2.010</i>	<i>7.0</i>	<i>1.0</i>	<i>4.7</i>	<i>83</i>			
<i>0930</i>	<i>3.99</i>	<i>125</i>	<i>10.3</i>	<i>1.999</i>	<i>7.1</i>	<i>1.1</i>	<i>5.1</i>	<i>69</i>			
<i>0935</i>	<i>3.47</i>	<i>125</i>	<i>10.4</i>	<i>1.996</i>	<i>7.1</i>	<i>1.2</i>	<i>5.6</i>	<i>63</i>			
<i>0940</i>	<i>3.96</i>	<i>130</i>	<i>10.6</i>	<i>1.985</i>	<i>7.1</i>	<i>1.1</i>	<i>—</i>	<i>48</i>			
<i>0945</i>	<i>3.96</i>	<i>135</i>	<i>10.5</i>	<i>1.978</i>	<i>7.1</i>	<i>1.1</i>	<i>3.4</i>	<i>43</i>			
<i>0950</i>	<i>3.95</i>	<i>135</i>	<i>10.6</i>	<i>1.958</i>	<i>7.1</i>	<i>1.0</i>	<i>4.0</i>	<i>36</i>			
<i>0955</i>	<i>3.95</i>	<i>135</i>	<i>10.6</i>	<i>1.935</i>	<i>7.1</i>	<i>1.0</i>	<i>3.1</i>	<i>30</i>			
<i>1000</i>	<i>3.94</i>	<i>135</i>	<i>10.6</i>	<i>1.911</i>	<i>7.1</i>	<i>0.9</i>	<i>2.1</i>	<i>26</i>			
<i>1005</i>	<i>3.94</i>	<i>135</i>	<i>10.6</i>	<i>1.888</i>	<i>7.1</i>	<i>0.9</i>	<i>2.8</i>	<i>23</i>	<i>1.97</i>		

### FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])

*11*    *1.89*    *7.1*    *0.9*    *2.8*    *23*

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

### EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC SUBMERSIBLE BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <i>Heron</i> <input checked="" type="checkbox"/> TURB. METER <i>HACH 2100Q</i> <input checked="" type="checkbox"/> WQ METER <i>YSI 556 MPS</i> <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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### ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

### PURGE OBSERVATIONS

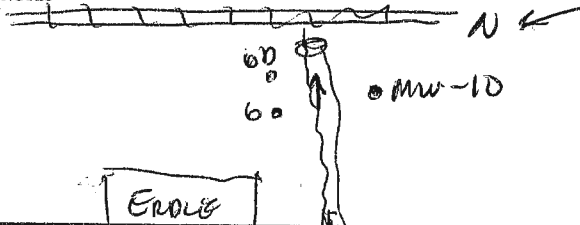
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED *2.4*

to sampling or location. \_\_\_\_\_ mL for this sample

### SKETCH/NOTES



Sampler Signature: *Jerry Rawel* Print Name: *Jerry Rawel*

Checked By: *[Signature]* Date: *7/25/19*

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW011012	SAMPLE TIME 1035

LOCATION ID MW-11	DATE 5/23/19
START TIME 915	END TIME 1040
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

	YES	NO	N/A
CAP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CASING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCKED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COLLAR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <b>5.14</b> FT	FINAL DTW (BMP) <b>7.30</b> FT	PROT. CASING STICKUP (AGS) <b>3.1</b> FT	TOC/TOR DIFFERENCE <b>0.14</b> FT
WELL DEPTH (BMP) <b>12.2</b> FT	SCREEN LENGTH <b>unk</b> FT	PID AMBIENT AIR <b>-</b> PPM	REFILL TIMER SETTING <b>-</b> SEC
WATER COLUMN <b>7.06</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>0.014</b> GAL	PID WELL MOUTH <b>-</b> PPM	DISCHARGE TIMER SETTING <b>-</b> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>0.046</b> GAL	TOTAL VOL. PURGED <b>3.2</b> GAL	DRAWDOWN/ TOTAL PURGED <b>0.0043</b>	PRESSURE TO PUMP <b>-</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
925	BEGIN PURGING										
940	6.78	200	10.13	0.913	6.71	2.79	3.42	-95.4			N/A
945	6.19	200	10.32	0.865	6.73	2.67	1.78	-92.2			
950	6.29	200	10.45	0.850	6.75	2.85	1.95	-87.7			
955	6.45	160	10.63	0.846	6.77	2.70	1.25	-81.3			
1005	6.85	160	10.54	0.855	6.77	2.63	1.79	-81.4			
1005	6.72	160	10.53	0.856	6.77	2.64	1.52	-80.8			
1010	6.85	160	10.53	0.859	6.78	2.24	2.76	-79.3			
1015	6.98	160	10.65	0.858	6.78	2.05	3.10	-76.3			
1020	7.15	160	10.77	0.856	6.80	1.99	2.54	-74.4			
1025	7.26	160	10.85	0.854	6.81	1.95	1.88	-73.8			
1030	7.30	160	10.89	0.854	6.81	1.93	1.54	-74.2			
1035	sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

11      0.854      6.8      1.9      1.5      -74.2

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.51 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>NA</b>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> OTHER <b>NA</b>	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER HACH 2100Q <input checked="" type="checkbox"/> WQ METER YSI 556 MPS <input checked="" type="checkbox"/> PUMP Geopump <input checked="" type="checkbox"/> FILTERS <b>NO</b> TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>Y</b>	<b>N</b>	<b>MW011012</b>
Alkalinity	2320B	No	4°C	250 ml Poly	<b>Y</b>	<b>N</b>	
Chloride	300	No	4°C	250 ml Poly	<b>Y</b>	<b>N</b>	
Nitrate	300	No	4°C		<b>Y</b>	<b>N</b>	
Nitrite	35-1	No	4°C		<b>Y</b>	<b>N</b>	
Sulfate	300	No	4°C		<b>Y</b>	<b>N</b>	
Sulfide	4500	No	4°C		<b>Y</b>	<b>N</b>	
F, Mn	601DB	No	4°C HNO3	50 ml Poly	<b>Y</b>	<b>N</b>	
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<b>Y</b>	<b>N</b>	
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	<b>Y</b>	<b>N</b>	

**PURGE OBSERVATIONS**

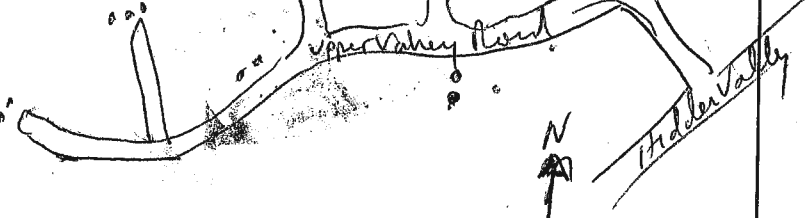
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **13.25**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **J. Kruski**

Checked By: *[Signature]* Date: **5/24/19**

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW11D023</b>	SAMPLE TIME <b>1145</b>

LOCATION ID <b>MW-11D</b>	DATE <b>5/23/19</b>
START TIME <b>1040</b>	END TIME <b>1155</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES NO N/A <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TUBING ID (INCHES) <input checked="" type="checkbox"/> 1/8 <input type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> CASING <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> LOCKED <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COLLAR <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
MEASUREMENT POINT (MP) <input type="checkbox"/> TOP OF RISER (TOR) <input checked="" type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	TOC/TOR DIFFERENCE <b>2.75'</b> FT
INITIAL DTW (BMP) <b>8.80</b> FT	FINAL DTW (BMP) <b>8.80</b> FT
PROT. CASING STICKUP (AGS) <b>4.0</b> FT	TOC/TOR DIFFERENCE <b>2.75'</b> FT
WELL DEPTH (BMP) <b>23.7</b> FT	SCREEN LENGTH <b>unk</b> FT
PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN <b>14.9</b> FT	DRAWDOWN VOLUME <b>0.0</b> GAL
PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL <b>0.098</b> GAL	TOTAL VOL. PURGED <b>2.49</b> GAL
DRAWDOWN/TOTAL PURGED <b>6.0</b>	PRESSURE TO PUMP _____ PSI

### FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1043</b>	<b>BEGIN PURGING 200</b>										
<b>1100</b>	<b>8.80</b>	<b>160</b>	<b>10.30</b>	<b>1.394</b>	<b>7.28</b>	<b>0.26</b>	<b>36.1</b>	<b>-112.9</b>	<b>NA</b>	<b>23'</b>	
<b>1105</b>	<b>8.86</b>	<b>160</b>	<b>10.58</b>	<b>1.396</b>	<b>7.17</b>	<b>0.45</b>	<b>22.6</b>	<b>-102.4</b>			
<b>1115</b>	<b>8.80</b>	<b>160</b>	<b>10.40</b>	<b>1.361</b>	<b>6.96</b>	<b>1.74</b>	<b>16.6</b>	<b>-92.7</b>			
<b>1120</b>	<b>8.80</b>	<b>160</b>	<b>10.44</b>	<b>1.353</b>	<b>6.95</b>	<b>1.60</b>	<b>11.0</b>	<b>-97.1</b>			
<b>1125</b>	<b>8.80</b>	<b>160</b>	<b>10.45</b>	<b>1.349</b>	<b>6.94</b>	<b>1.46</b>	<b>9.81</b>	<b>-99.9</b>			
<b>1130</b>	<b>8.80</b>	<b>160</b>	<b>10.53</b>	<b>1.346</b>	<b>6.95</b>	<b>1.30</b>	<b>8.73</b>	<b>-104.4</b>			
<b>1135</b>	<b>8.80</b>	<b>160</b>	<b>10.60</b>	<b>1.346</b>	<b>6.96</b>	<b>1.25</b>	<b>6.54</b>	<b>-104.7</b>			
<b>1140</b>	<b>8.80</b>	<b>160</b>	<b>10.64</b>	<b>1.342</b>	<b>6.96</b>	<b>1.21</b>	<b>6.02</b>	<b>-105.3</b>			
<b>1145</b>	<b>-sampled</b>										

### FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])

**11**      **1.346**      **7.0**      **1.2**      **6.0**      **-110**  
**1053**

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

### EQUIPMENT DOCUMENTATION

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>dedicated</b>	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER      HACH 2100Q <input checked="" type="checkbox"/> WQ METER      YSI 556 MPS <input checked="" type="checkbox"/> PUMP      Geopump <input checked="" type="checkbox"/> FILTERS      NO. <b>X</b> TYPE _____
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### ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>Y</b>	<b>N</b>	<b>MW11D023</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C H <sub>2</sub>	3 X 40 ml			
Total Organic Carbon	4151	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

### PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	NUMBER OF GALLONS GENERATED <b>2.5</b>
NO-PURGE METHOD UTILIZED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	to sampling or _____ mL for this sample location.

### SKETCH/NOTES



Sampler Signature: *[Signature]* Print Name: **J. Lorusso**

Checked By: *[Signature]* Date: **5/29/19**



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company
PROJECT NUMBER 3617137306.02
SAMPLE ID 828072- <u>mwo12011</u>
SAMPLE TIME <u>1600</u>

LOCATION ID <u>mwo-12</u>	DATE <u>5/23/19</u>
START TIME <u>1430</u>	END TIME <u>1610</u>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

CAP	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
CASING	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
LOCKED	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
COLLAR	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>

INITIAL DTW (BMP) <u>7.43</u> FT	FINAL DTW (BMP) <u>9.38</u> FT	PROT. CASING STICKUP (AGS) <u>3.05</u> FT	TOCTOR DIFFERENCE <u>0.14</u> FT
WELL DEPTH (BMP) <u>11.9</u> FT	SCREEN LENGTH <u>11/4</u> FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN <u>4.47</u> FT	DRAWDOWN VOLUME <u>0.3</u> GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL <u>0.71</u> GAL	TOTAL VOL. PURGED <u>2.2</u> GAL	DRAWDOWN/TOTAL PURGED <u>0.14</u>	PRESSURE TO PUMP _____ PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<u>1443</u>	<b>BEGIN PURGING</b>										
<u>1450</u>	<u>7.85</u>	<u>140</u>	<u>11.7</u>	<u>0.898</u>	<u>6.8</u>	<u>2.4</u>	<u>5.2</u>	<u>20</u>	<u>0.44</u>		
<u>1500</u>	<u>8.28</u>	<u>135</u>	<u>11.7</u>	<u>0.881</u>	<u>6.8</u>	<u>2.5</u>	<u>2.3</u>	<u>19</u>			
<u>1505</u>	<u>8.44</u>	<u>120</u>	<u>12.0</u>	<u>0.879</u>	<u>6.8</u>	<u>2.2</u>	<u>1.3</u>	<u>17</u>			
<u>1510</u>	<u>8.64</u>	<u>115</u>	<u>12.0</u>	<u>0.885</u>	<u>6.8</u>	<u>1.8</u>	<u>1.4</u>	<u>3</u>			
<u>1515</u>	<u>8.71</u>	<u>110</u>	<u>11.9</u>	<u>0.892</u>	<u>6.8</u>	<u>1.7</u>	<u>1.1</u>	<u>-4</u>			
<u>1520</u>	<u>8.86</u>	<u>110</u>	<u>12.1</u>	<u>0.894</u>	<u>6.8</u>	<u>1.5</u>	<u>0.8</u>	<u>-8</u>			
<u>1525</u>	<u>8.96</u>	<u>100</u>	<u>12.1</u>	<u>0.896</u>	<u>6.8</u>	<u>1.4</u>	<u>0.5</u>	<u>-15</u>			<i>lowest setting on pump</i>
<u>1530</u>	<u>9.04</u>	<u>100</u>	<u>12.2</u>	<u>0.894</u>	<u>6.8</u>	<u>1.2</u>	<u>0.6</u>	<u>-19</u>			
<u>1535</u>	<u>9.14</u>	<u>100</u>	<u>12.1</u>	<u>0.894</u>	<u>6.8</u>	<u>1.1</u>	<u>1.2</u>	<u>-19</u>			
<u>1540</u>	<u>9.21</u>	<u>100</u>	<u>12.0</u>	<u>0.893</u>	<u>6.8</u>	<u>1.0</u>	<u>0.8</u>	<u>-20</u>			<i>Penetration while except</i>
<u>1545</u>	<u>9.29</u>	<u>105</u>	<u>12.0</u>	<u>0.887</u>	<u>6.8</u>	<u>0.8</u>	<u>0.4</u>	<u>-21</u>			<i>drawdown have purged</i>
<u>1550</u>	<u>9.33</u>	<u>105</u>	<u>11.9</u>	<u>0.887</u>	<u>6.8</u>	<u>0.8</u>	<u>0.5</u>	<u>-25</u>			<i>2.5 x drawdown so</i>
<u>1555</u>	<u>9.38</u>	<u>105</u>	<u>11.8</u>	<u>0.888</u>	<u>6.8</u>	<u>0.8</u>	<u>0.6</u>	<u>-29</u>			<i>collecting sample</i>

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

<u>12</u>	<u>0.888</u>	<u>6.8</u>	<u>0.8</u>	<u>0.6</u>	<u>-29</u>
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TEMP: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL
<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON BLADDER
	<input checked="" type="checkbox"/> OTHER <u>Dechlor</u>	<input type="checkbox"/> OTHER _____	<input type="checkbox"/> OTHER _____

EQUIPMENT USED

WL METER	<u>Heron</u>
TURB. METER	<u>HACH 2100Q</u>
WQ METER	<u>YSI 556 MFS</u>
PUMP	<u>Geopump</u>
FILTERS	NO. _____ TYPE _____

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

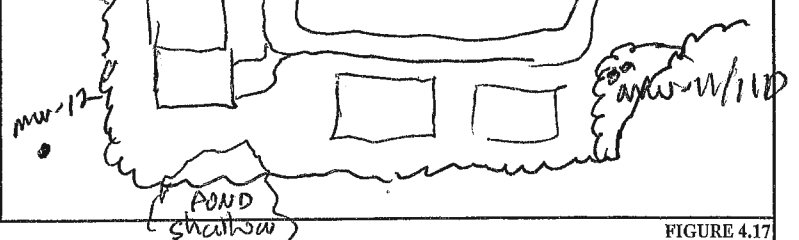
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 2.2

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: Jerry Rawcliffe Print Name: Jerry Rawcliffe

Checked By: [Signature] Date: 7/25/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <i>MW 013006</i>	SAMPLE TIME 1530

LOCATION ID <i>MW-13</i>	DATE <i>5/23/19</i>
START TIME <i>1155</i>	END TIME <i>1530</i>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <i>3.08</i> FT	FINAL DTW (BMP) <i>5.54</i> FT	PROT. CASING STICKUP (AGS) <i>1</i> FT	TOC/TOR DIFFERENCE <i>1</i> FT
WELL DEPTH (BMP) <i>6.7/2.15</i> FT	SCREEN LENGTH <i>10</i> FT	PID AMBIENT AIR <i>1</i> PPM	REFILL TIMER SETTING <i>1</i> SEC
WATER COLUMN <i>9.07</i> FT	DRAWDOWN VOLUME <i>.4</i> GAL	PID WELL MOUTH <i>1</i> PPM	DISCHARGE TIMER SETTING <i>1</i> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <i>1.45</i> GAL	TOTAL VOL. PURGED <i>1.24</i> GAL	DRAWDOWN/TOTAL PURGED <i>0.32</i>	PRESSURE TO PUMP <i>1</i> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGERATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
<i>1205</i>	<b>BEGIN PURGING</b>											
<i>1210</i>	<i>3.56</i>	<i>160</i>	<i>11.29</i>	<i>0.945</i>	<i>6.84</i>	<i>2.34</i>	<i>4.88</i>	<i>-44.3</i>	<i>NA</i>			
<i>1215</i>	<i>3.72</i>	<i>160</i>	<i>11.35</i>	<i>0.927</i>	<i>6.62</i>	<i>1.58</i>	<i>3.80</i>	<i>-55.7</i>				
<i>1220</i>	<i>4.62</i>	<i>160</i>	<i>11.21</i>	<i>0.932</i>	<i>6.62</i>	<i>2.87</i>	<i>6.12</i>	<i>-61.1</i>				
<i>1225</i>	<i>5.22</i>	<i>160</i>	<i>10.86</i>	<i>0.965</i>	<i>6.63</i>	<i>2.65</i>	<i>4.96</i>	<i>-70.1</i>				
<i>1230</i>	<i>5.64</i>	<i>160</i>	<i>10.63</i>	<i>0.956</i>	<i>6.63</i>	<i>2.59</i>	<i>3.89</i>	<i>-75.7</i>				
<i>1235</i>	<i>6.21</i>	<i>160</i>	<i>11.05</i>	<i>1.063</i>	<i>6.63</i>	<i>2.38</i>	<i>2.79</i>	<i>-85.6</i>				
<i>1530</i>	<i>purge ended</i>											
			<i>sanded</i>									
			<i>Purged down then sampled recharge</i>									

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

*11 1.06 6.6 2.4 2.8 -86*

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.57 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>dedicated</i>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input checked="" type="checkbox"/> OTHER <i>NA</i>	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> PUMP <input checked="" type="checkbox"/> FILTERS	<i>Heron</i> <i>HACH 21000</i> <i>YSI 556 MPS</i> <i>Geopump</i> <i>NO TYPE</i>
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<i>Y</i>	<i>N</i>	<i>MW013006</i>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	<i>30</i> <i>30 X 40 ml</i>			
Total Organic Carbon	4151	No	4°C H2SO4	240 ml AP			

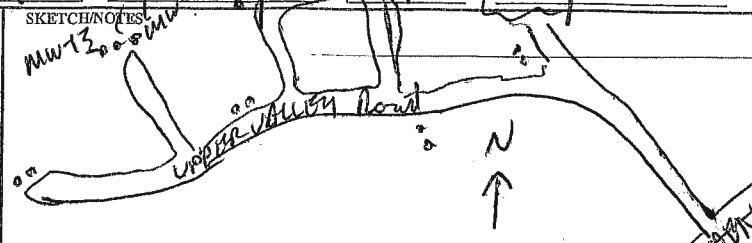
**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED *1.25*

to sampling or \_\_\_\_\_ mL for this sample location.



Sampler Signature: *[Signature]* Print Name: *J. Lawski*

Checked By: *[Signature]* Date: *5/29/19*



## LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW13D12	SAMPLE TIME 1340

LOCATION ID MW-13D	DATE 5/23/19
START TIME 1240	END TIME 1350
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <b>4.82</b> FT	FINAL DTW (BMP) <b>4.84</b> FT	PROT. CASING STICKUP (AGS) <b>0</b> FT	TOC/TOR DIFFERENCE <b>0.45</b> FT
WELL DEPTH (BMP) <b>12.2</b> FT	SCREEN LENGTH <b>unk</b> FT	PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>7.38</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>0.008</b> GAL	PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
CALCULATED GAL/VOL. (column X well diameter squared X 0.041) <b>0.048</b> GAL	TOTAL VOL. PURGED <b>2.49</b> GAL	DRAWDOWN/TOTAL PURGED <b>1001</b>	PRESSURE TO PUMP <b>1</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS-O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1240	BEGIN PURGING										
1255	4.84	160	12.11	2.258	7.42	0.35	25.6	-88.8	NA	~12'	
1300	4.84	160	11.69	2.306	7.45	0.65	19.4	-126.0			
1305	4.84	160	11.69	2.330	7.54	0.80	20.5	-142.4			
1315	4.84	160	11.72	2.577	7.10	1.12	17.1	-127.9			
1320	4.84	160	11.84	2.544	7.09	1.17	15.4	-119.7			
1325	4.84	160	11.86	2.561	7.08	1.21	9.24	-116.7			
1330	4.84	160	11.93	2.567	7.08	1.18	9.85	-111.5			
1335	4.84	160	12.01	2.560	7.08	1.18	7.32	-109.8			
1340	-sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

12   
 2.56   
 7.1   
 1.2   
 7.3   
 -109.8

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NTRIC ACID <input checked="" type="checkbox"/> OTHER _____	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER HACH 2100Q <input checked="" type="checkbox"/> WQ METER YSI 556 MPS <input type="checkbox"/> PUMP Geopump <input type="checkbox"/> FILTERS NO. <b>2</b> TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	Y	MW13D12
Alkalinity	2320F	No	4°C	250 ml Poly		DUP	* Duplicate
Chloride	309	No	4°C	250 ml Poly			
Nitrate	370	No	4°C				
Nitrite	374.1	No	4°C				
Sulfate	600	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	FSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

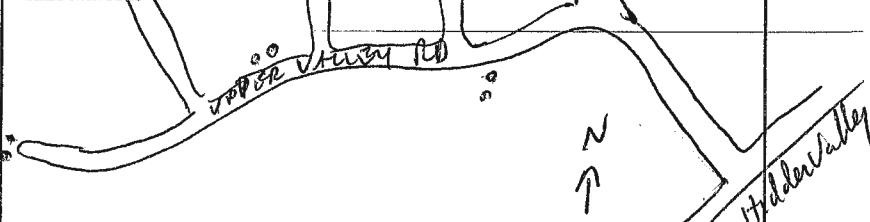
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.5**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **J. Storkuski**

Checked By: *[Signature]* Date: **5/29/19**



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW-13DD040	SAMPLE TIME 1520

LOCATION ID MW-13DD	DATE 5/23/19
START TIME 1420	END TIME 1525
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 0.80 FT	FINAL DTW (BMP) 0.80 FT	PROT. CASING STICKUP (AGS) 0 FT	TOC/TOR DIFFERENCE 0.35 FT
WELL DEPTH (BMP) 40.1 FT	SCREEN LENGTH 10' <del>OR 10'</del>	PID AMBIENT AIR / PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 39.2 FT	DRAWDOWN VOLUME 0 GAL	PID WELL MOUTH / PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL 6.24 GAL	TOTAL VOL. PURGED 2.08 GAL	DRAWDOWN/TOTAL PURGED 0	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS-O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP- INTAKE DEPTH	Comments
1430	BEGIN PURGING										
1435	0.80	160	14.22	2.767	7.08	0.77	14.3	-65.5	NA	40'	
1440	0.80	160	14.06	2.763	7.06	0.77	11.1	-69.8			
1455	0.80	160	14.14	2.764	7.08	0.96	8.53	-74.2			
1500	0.80	160	13.87	2.771	7.11	1.12	9.51	-77.9			
1505	0.80	160	13.53	2.773	7.08	1.06	6.59	-79.3			
1510	0.80	160	13.59	2.771	7.08	1.04	7.40	-83.1			
1515	0.80	160	13.65	2.771	7.08	1.00	5.46	-84.5			
1520											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

14    2.77    7.1    1.0    5.5    -85

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 3.53 = 3.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input checked="" type="checkbox"/> OTHER <u>NA</u>	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER HACH 2100Q <input checked="" type="checkbox"/> WQ METER YSI 556 MPS <input type="checkbox"/> PUMP Geopump <input checked="" type="checkbox"/> BLTHERM NOX <u>(292)</u>
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	✓	N	MW-13DD040
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354I	No	4°C				
Sulfate	300	No	4°C				
Sulfide	450	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	8 ml AG			

**PURGE OBSERVATIONS**

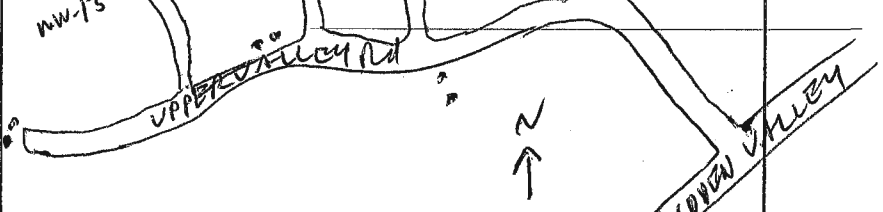
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 22

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: J. Lorkowski

Checked By: *[Signature]* Date: 5/24/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW014016	SAMPLE TIME 1715

LOCATION ID MW-14	DATE 5/23/19
START TIME 1615	END TIME 1720
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 3.25 FT	FINAL DTW (BMP) 5.81 FT	PROT. CASING STICKUP (AGS) flush FT	TOC/TOR DIFFERENCE 0.38 FT
WELL DEPTH (BMP) 16.2 FT	SCREEN LENGTH 5 FT	PID AMBIENT AIR / PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 12.95 FT	DRAWDOWN VOLUME 0.016 GAL	PID WELL MOUTH / PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL 0.08 GAL	TOTAL VOL. PURGED 2.28 GAL	DRAWDOWN/TOTAL PURGED 0.007	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1620	BEGIN PURGING										
1630	4.50	160	12.18	1.723	7.02	1.40	15.9	-45.3	NA	16'	
1635	4.70	160	12.23	1.711	7.09	1.19	13.0	-50.8			
1640	5.08	160	12.98	1.710	7.21	1.24	11.7	-60.4			
1645	5.25	160	11.57	1.700	7.19	1.25	9.87	-63.5			
1650	5.81	160	11.97	1.708	7.17	1.00	7.56	-65.2			
1655	5.81	160	11.80	1.767	7.26	0.98	8.32	-68.6			
1700	5.81	160	11.80	1.897	7.22	0.10	6.02	-72.2			
1705	5.81	160	11.74	1.880	7.24	1.14	5.30	-74.0			
1710	5.81	160	11.71	1.885	7.24	1.11	9.56	-75.2			
1715	sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

12      1.889      7.2      1.1      4.9      -75

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input type="checkbox"/> S. STEEL PUMP MATERIAL	<input checked="" type="checkbox"/> WL METER
<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL	<input checked="" type="checkbox"/> TURB. METER HACH 2100Q
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN	<input checked="" type="checkbox"/> WQ METER YSI 556 MPS
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON BLADDER	<input checked="" type="checkbox"/> PUMP Geopump
	<input checked="" type="checkbox"/> OTHER <i>70%</i>	<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> OTHER <i>NA</i>	<input type="checkbox"/> FILTERS NO. <input checked="" type="checkbox"/> TYPE _____

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW014016
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4600	No	4°C				
<input type="checkbox"/> Fe/Mn	6010B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	475.1	No	4°C H2SO4	230 ml AG			

**PURGE OBSERVATIONS**

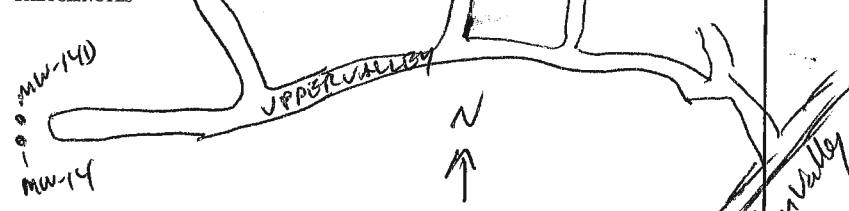
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED *2.25*

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: *J. Karst*

Checked By: *[Signature]* Date: *5/24/19*

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW14D033	SAMPLE TIME 1757U

LOCATION ID MW-14D	DATE 5/23/19
START TIME 1720	END TIME 1755
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

	YES	NO	N/A
CAP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CASING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCKED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COLLAR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 0.0 FT	FINAL DTW (BMP) 0.0 FT	PROT. CASING STICKUP (AGS) 0 FT	TOC/TOR DIFFERENCE 0.19 FT
WELL DEPTH (BMP) 33.8 FT	SCREEN LENGTH 10 FT	PID AMBIENT AIR 1 PPM	REFILL TIMER SETTING 1 SEC
WATER COLUMN 33.8 FT	DRAWDOWN VOLUME 0.0 GAL	PID WELL MOUTH 1 PPM	DISCHARGE TIMER SETTING f SEC
CALCULATED GAL/VOL 5.4 GAL	TOTAL VOL. PURGED 1.57 GAL	DRAWDOWN/TOTAL PURGED 0.0	PRESSURE TO PUMP — PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1720											BEGIN PURGING
1725	0.0	200	12.69	2.877	7.07	0.88	3.32	-79.4	N/A	133'	Agitation flow from BR well
1730	0.0	200	12.60	2.896	7.09	0.03	2.36	-78.5	1	1	
1735	0.0	200	12.99	2.891	7.09	1.19	1.58	-78.9	1	1	
1740	0.0	200	13.13	2.912	7.10	1.22	2.39	-79.8	1	1	
1745	0.0	200	13.36	2.903	7.11	1.24	1.74	-79.6	1	1	
1750	sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

13      290      7.1      1.2      1.7      -80

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC SUBMERSIBLE BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>NK</u>	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER HACH 2100Q <input checked="" type="checkbox"/> WQ METER YSI 556 MFS <input checked="" type="checkbox"/> PUMP Geopump <input type="checkbox"/> FILTERS NO. <u>2</u> TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW14D033
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354	No	4°C				
Sulfate	300	No	4°C				
Sulfide	450D	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-75	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

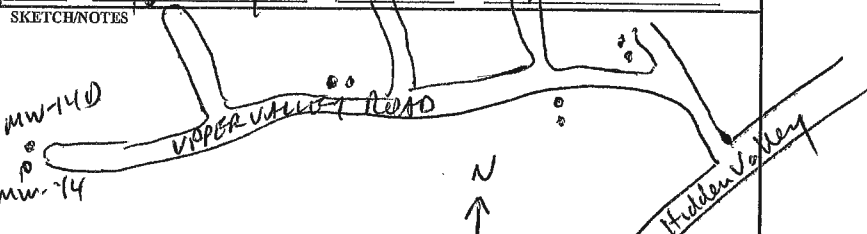
**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 1.5

to sampling or \_\_\_\_\_ mL for this sample location.



Sampler Signature: *[Signature]* Print Name: J. L. Walsh

Checked By: *[Signature]* Date: 5/23/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company		LOCATION ID MW-15	DATE 5/22/19-5/23/19
PROJECT NUMBER 3617137306.02		START TIME 1530 5/22/19	END TIME 1600 5/23/19
SAMPLE ID 828072- MW015006	SAMPLE TIME 1600-5/23/19	SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

INITIAL DTW (BMP) 5.95 FT FINAL DTW (BMP) 6.15 FT PROT. CASING STICKUP (AGS) 01 FT TOC/TOR DIFFERENCE 0.09 FT

WELL DEPTH (BMP) 6.5 FT SCREEN LENGTH 4.5 FT PID AMBIENT AIR / PPM REWILL TIMER SETTING / SEC

WATER COLUMN - FT DRAWDOWN VOLUME - GAL PID WELL MOUTH / PPM DISCHARGE TIMER SETTING / SEC

CALCULATED GAL/VOL - GAL TOTAL VOL. PURGED - GAL DRAWDOWN/ TOTAL PURGED - PSI

WELL INTEGRITY YES NO N/A  
 CAP     
 CASING     
 LOCKED     
 COLLAR

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP. CONDUCTAN	pH (units)	DISS. O <sub>2</sub>	TURBIDITY (ntu)	REDOX (mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1610	BEGIN PURGING										
1619	-	160	12.45	8.938	7.08	1.39	unable to collect	-62.5	NA		- heat dry and flow thru cell just filled
5/23/19	5.50										
1555	sampled										
1600	sampled										
Very low yield low recharge shallow well											
Purged dry and collected good sample of recharge.											

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER _____	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	S. STEEL PUMP MATERIAL PVC PUMP MATERIAL GEOFROBE SCREEN TEFLON BLADDER OTHER NA	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER HACH 2100Q <input checked="" type="checkbox"/> WQ METER YSI 556 MPS <input checked="" type="checkbox"/> PUMP Geopump <input type="checkbox"/> FILTERS NO. X TYPE _____
---	---	--	--	---

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW015006
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethane, Ethane, Methane	HSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

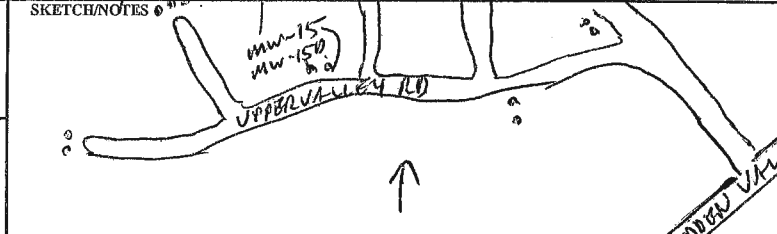
NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 6.25

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: J. L. Jolenczowski Print Name: Jolenczowski

Checked By: Jerry Duncliff Date: 5/23/19



# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW15 D023	SAMPLE TIME 1710

LOCATION ID MW-15D	DATE 5/22/19
START TIME 1615	END TIME 1710
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 4.15 FT	FINAL DTW (BMP) 4.30 FT	PROT. CASING STICKUP (AGS) 0 FT	TOC/TOR DIFFERENCE 0.13 FT
WELL DEPTH (BMP) 23.9 FT	SCREEN LENGTH 10 FT	PID AMBIENT AIR / PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 14.75 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) 6.002 GAL	PID WELL MOUTH / PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL 3.16 GAL	TOTAL VOL. PURGED 2.00 GAL	DRAWDOWN/TOTAL PURGED 0.0005 GAL	PRESSURE TO PUMP / PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1618	BEGIN PURGING										
1625	4.30	160	10.59	2.705	6.98	1.21	35.4	-56.2	NA	123'	
1630	4.30	160	10.69	2.647	6.84	1.09	33.3	-62.8			
1635	4.30	160	10.52	2.611	6.84	1.24	22.2	-64.4			
1640	4.30	160	10.42	2.572	6.83	1.82	11.7	-67.4			
1645	4.30	160	10.39	2.549	6.86	1.70	8.85	-69.9			
1650	4.30	160	10.37	2.534	6.85	1.68	6.87	-71.5			
1655	4.30	160	10.37	2.523	6.88	1.78	4.53	-74.1			
1700	4.30	160	10.33	2.514	6.90	1.66	4.76	-75.6			
1705	4.30	160	10.34	2.511	6.90	1.60	4.51	-76.8			
1710	sampled										

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

10	2.574	6.9	1.8	4.5	-77
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TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<input checked="" type="checkbox"/> PERISTALTIC	<input type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL
<input type="checkbox"/> SUBMERSIBLE	<input type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN
<input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON BLADDER
	<input checked="" type="checkbox"/> OTHER	<input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> OTHER

EQUIPMENT USED

WL METER	Heron
TURB. METER	HACH 2100Q
WQ METER	YSI 556 MPS
PUMP	Geopump
FILTERS	NO. TYPE

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW15 D023
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6910B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 22

to sampling or \_\_\_\_\_ mL for this sample location.

SKETCH/NOTES

*mw-15D as mw-15*

*UPPER VALLEY (16D)*

*↑*

Sampler Signature: *[Signature]* Print Name: *Solene Levesque*

Checked By: *[Signature]* Date: *5/22/19*



# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company		LOCATION ID MW-16	DATE 5/24/2019
PROJECT NUMBER 3617137306.02		START TIME 0815	END TIME 1335
SAMPLE ID 828072-MW016007	SAMPLE TIME 1310	SITE NAME/NUMBER 828072	PAGE 1 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY YES NO N/A  
 CAP  CANNOT CLOSE WELL LID IF CAP  
 LOCKED  ROAD BOX ON RISER  
 COLLAR  \_\_\_\_\_

INITIAL DTW (BMP) 7.4439 FT FINAL DTW (BMP) DRY FT PROT. CASING STICKUP (AGS) FLUSH-MOUNT TOC/TOR DIFFERENCE 0.09 FT

WELL DEPTH (BMP) 8.95 FT SCREEN LENGTH 4.5 FT PID AMBIENT AIR NA PPM REFILL TIMER SETTING NA SEC

WATER COLUMN 4.56 FT DRAWDOWN VOLUME 0.75 GAL PID WELL MOUTH NA PPM DISCHARGE TIMER SETTING NA SEC

CALCULATED GAL/VOL 0.75 GAL TOTAL VOL. PURGED 1.5 GAL DRAWDOWN/TOTAL PURGED 0.5 PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
0828	BEGIN PURGING										
0835	STOPPED PUMP, AIR PRESENT IN TUBING PAST FLOW-THRU CELL. FIXED RUBBER RING IN LID OF FLOW-THRU CELL.										
0838	RE-STARTED PUMP.										
0850	5.15	100	11.88	0.990	6.65	1.44	7.02	109.9	NA	27	
0855	5.33	100	11.85	0.988	6.66	1.58	4.52	110.6			
0900	5.53	100	11.81	0.989	6.68	1.06	3.92	110.5			
0905	5.67	100	11.90	0.990	6.69	0.87	3.40	110.1			
0910	5.81	100	11.94	0.992	6.71	0.73	2.60	109.9			
0915	5.95	100	11.86	0.996	6.72	0.65	2.43	110.4			
0920	6.10	100	11.81	0.994	6.73	0.56	2.78	110.5			
0925	6.29	100	11.95	0.995	6.74	1.11	7.47	110.8			
0930	6.37	100	11.40	0.998	6.71	1.08	3.90	111.4			
0935	DRAWDOWN TOO GREAT. TURNED UP SPEED TO PURGE WELL DRY. WILL SAMPLE RECHARGE										
1250	RETURNED TO WELL. DTW = 6.36. STARTED PUMP.										
1300	6.69	110	11.74	0.992	6.77	3.55	7.86	111.8			WELL DRY. TOTAL GALLONS PURGED = 5.25.

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])

0930	11	0.998	6.7	1.1	3.9	110
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TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input checked="" type="checkbox"/> LIQUINOX <input checked="" type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> OTHER _____	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input checked="" type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER <u>HERON DIPPER-T M200-70</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q M024-31</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS M015-05</u> <input checked="" type="checkbox"/> PUMP <u>Geopump SDDP-35</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Pb, Mn	6010B	No	4°C HNO <sub>3</sub>	30 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	260 ml AG			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 115

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: K. Ann Print Name: KATIE AMANN

Checked By: Jerry Rumboltz Date: 5/24/19

SKETCH/NOTES

NOTES: 'PURGE WATER DESCRIPTION: PALE YELLOW, CLEAR, ODORLESS.'

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072-MW016007  
 SAMPLE TIME: 1310

LOCATION ID: MW-16  
 DATE: 5/24/2019  
 START TIME: 0815  
 END TIME: 1335  
 SITE NAME/NUMBER: 828072  
 PAGE: 2 OF 2

WELL DIAMETER (INCHES):  1  2  4  6  8  OTHER \_\_\_\_\_  
 TUBING ID (INCHES):  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP):  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
 YES NO N/A  
 CAP CAN NOT CLOSE WELL LID  
 CASING WHEN CAP IS ON RISER  
 LOCKED  
 COLLAR

INITIAL DTW (BMP): 4.39 FT  
 FINAL DTW (BMP): 0.24 FT  
 PROT. CASING STICKUP (AGS): FLUSH MOUNTED  
 TOC/TOR DIFFERENCE: 0.09 FT  
 WELL DEPTH (BMP): 8.95 FT  
 SCREEN LENGTH: 4.5 FT  
 PID AMBIENT AIR: NA PPM  
 REFILL TIMER SETTING: NA SEC  
 WATER COLUMN: 4.56 FT  
 DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): 0.75 GAL  
 PID WELL MOUTH: NA PPM  
 DISCHARGE TIMER SETTING: NA SEC  
 CALCULATED GAL/VOL (column X well diameter squared X 0.041): 0.75 GAL  
 TOTAL VOL. PURGED: 1.5 GAL  
 DRAWDOWN/TOTAL PURGED: 0.5 PSI  
 PRESSURE TO PUMP: NA PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
	BEGIN PURGING										
1305	6.76	100	11.87	0.991	6.77	3.58	7.53	111.7	NA	27	
1310	COLLECT SAMPLES										
<del>DATA 5/23/2019</del>											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP:  PERISTALTIC  SUBMERSIBLE  BLADDER  OTHER \_\_\_\_\_  
 DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER: Dedicated  
 TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_  
 S. STEEL PUMP MATERIAL  PVC PUMP MATERIAL  GEOPROBE SCREEN  TEFLON BLADDER  OTHER \_\_\_\_\_  
 EQUIPMENT USED:  WL METER: HERONDIPPER-T M200-70  
 TURB. METER: HACH 2100Q M024-31  
 WQ METER: YSI 556 MPS M015-05  
 PUMP: Geopump SCD-35  
 FILTERS: NO TYPE

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		NO	NA
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	319B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED:  YES  NO  
 NO-PURGE METHOD UTILIZED:  YES  NO  
 NUMBER OF GALLONS GENERATED: 1.5  
 to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

SEE PAGE 1 OF 2

Sampler Signature: *K. Amanu* Print Name: KATHIE AMANU

Checked By: *Jerry Pauloff* Date: 5/29/19



511 Congress Street, Portland Maine 04101



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company		LOCATION ID MW-16D	DATE 5/24/2019
PROJECT NUMBER 3617137306.02		START TIME 1110	END TIME 1250
SAMPLE ID 828072- MW16D020	SAMPLE TIME 1235	SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A  
CAP  PVC RISER  
CASING   
LOCKED   
COLLAR

INITIAL DTW (BMP) 5.16 FT	FINAL DTW (BMP) 5.60 FT	PROT. CASING STICKUP (AGS) FLUSH-MOUNTED	FLUSH-MOUNT TOE/TOR DIFFERENCE 0.25 FT
WELL DEPTH (BMP) 22.15 FT	SCREEN LENGTH _____ FT	PID AMBIENT AIR NA PPM	REFILL TIMER SETTING NA SEC
WATER COLUMN 16.99 FT	DRAWDOWN VOLUME 0.072 GAL	PID WELL MOUTH NA PPM	DISCHARGE TIMER SETTING NA SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 2.79 GAL	TOTAL VOL. PURGED 2.74 GAL	DRAWDOWN/ TOTAL PURGED 0.026	PRESSURE TO PUMP NA PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
11:19	BEGIN PURGING											
11:30	5.65	190	11.31	0.847	7.02	0.83	16.4	103.1	NA	~20	<div style="border: 1px solid black; padding: 5px; transform: rotate(-45deg); display: inline-block;">                     DATA STABILIZED                 </div>	
11:35	5.59	160	11.23	0.830	7.03	0.65	14.3	103.7				
11:40	5.58	160	11.35	0.828	7.03	0.46	12.2	104.0				
11:45	5.58	160	11.23	0.828	7.02	0.38	9.36	104.4				
11:50	5.57	160	11.22	0.827	7.02	0.31	8.87	104.3				
11:55	5.59	160	11.37	0.826	7.02	0.33	10.1	104.1				
12:00	5.60	160	11.41	0.825	7.02	0.31	10.9	104.3				
12:05	5.60	160	11.30	0.825	7.02	0.26	7.64	104.4				
12:10	5.60	160	11.14	0.825	7.02	0.27	8.72	104.8				
12:15	5.60	160	11.28	0.826	7.02	0.26	6.89	105.4				
12:20	5.59	160	11.16	0.827	7.02	0.23	5.34	105.5				
12:25	5.60	160	11.14	0.828	7.02	0.25	5.65	105.7				
12:30	5.60	160	11.15	0.828	7.02	0.24	5.43	105.7				
12:35	COLLECT SAMPLES											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

11	0.828	7.0	0.2	5.4	110
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TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input checked="" type="checkbox"/> LIQUINOX <input checked="" type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <u>HERON/DIFFER-T M200-70</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q M024-31</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS M015-05</u> <input checked="" type="checkbox"/> PUMP <u>Geopump SC03-35</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250-ml-Poly			
Chloride	300	No	4°C	250-ml-Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50-ml-Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250-ml-AG			

**PURGE OBSERVATIONS**

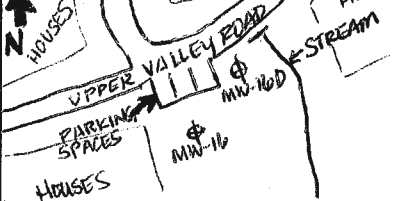
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 3

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



**NOTES**

PURGE WATER DESCRIPTION - PALE YELLOW, ODOR, SOME SMALL WHITE SUSPENDED PARTICULATES.

Sampler Signature: Katie Amann Print Name: **KATIE AMANN**

Checked By: Jimmy Rankin Date: 5/24/19



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW 017007</b>	SAMPLE TIME <b>1825</b>

LOCATION ID <b>MW-17</b>	DATE <b>5/22/19</b>
START TIME <b>1715</b>	END TIME <b>1830</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A

CAP  YES  NO  N/A

CASING  YES  NO  N/A

LOCKED COLLAR  YES  NO  N/A

INITIAL DTW (BMP) <b>3.58</b> FT	FINAL DTW (BMP) <b>6.09</b> FT	PROT. CASING STICKUP (AGS) <input checked="" type="checkbox"/> FT	TOC/TOR DIFFERENCE <b>0.52</b> FT
WELL DEPTH (BMP) <b>7.7</b> FT	SCREEN LENGTH <b>4.5</b> FT	PID AMBIENT AIR <input type="checkbox"/> PPM	REFILL TIMER SETTING <input type="checkbox"/> SEC
WATER COLUMN <b>4.12</b> FT	DRAWDOWN VOLUME <b>2.49</b> GAL	PID WELL MOUTH <input type="checkbox"/> PPM	DISCHARGE TIMER SETTING <input type="checkbox"/> SEC
CALCULATED GAL/VOL <b>0.667</b> GAL	TOTAL VOL. PURGED <b>2.49</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.166</b> GAL	PRESSURE TO PUMP <input type="checkbox"/> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>1726</b>	<b>BEGIN PURGING</b>										
<b>1730</b>	<b>4.00</b>	<b>160</b>	<b>10.68</b>	<b>0.970</b>	<b>7.01</b>	<b>4.76</b>	<b>15.0</b>	<b>-56.1</b>	<b>NA</b>	<b>7'</b>	
<b>1735</b>	<b>4.52</b>	<b>160</b>	<b>10.72</b>	<b>0.857</b>	<b>6.92</b>	<b>4.00</b>	<b>-</b>	<b>-48.1</b>			
<b>1740</b>	<b>4.70</b>	<b>160</b>	<b>10.70</b>	<b>0.832</b>	<b>6.87</b>	<b>3.26</b>	<b>4.30</b>	<b>-49.6</b>			
<b>1745</b>	<b>4.72</b>	<b>160</b>	<b>10.65</b>	<b>0.833</b>	<b>6.86</b>	<b>2.90</b>	<b>-</b>	<b>-51.5</b>			
<b>1750</b>	<b>5.12</b>	<b>160</b>	<b>10.47</b>	<b>0.832</b>	<b>6.55</b>	<b>2.95</b>	<b>5.87</b>	<b>53.1</b>			
<b>1855</b>											
<b>1800</b>	<b>5.56</b>	<b>160</b>	<b>10.29</b>	<b>0.836</b>	<b>6.84</b>	<b>3.03</b>	<b>5.82</b>	<b>-54.9</b>			
<b>1805</b>	<b>5.80</b>	<b>160</b>	<b>10.28</b>	<b>0.837</b>	<b>6.84</b>	<b>-</b>	<b>-</b>	<b>-</b>			
<b>1810</b>	<b>5.91</b>	<b>160</b>	<b>10.30</b>	<b>0.840</b>	<b>6.84</b>	<b>3.14</b>	<b>3.91</b>	<b>-55.4</b>			
<b>1815</b>	<b>6.00</b>	<b>160</b>	<b>10.16</b>	<b>0.844</b>	<b>6.84</b>	<b>3.29</b>	<b>3.43</b>	<b>-56.1</b>			
<b>1820</b>	<b>6.09</b>	<b>160</b>	<b>10.22</b>	<b>0.844</b>	<b>6.83</b>	<b>3.24</b>	<b>2.39</b>	<b>-56.2</b>			
<b>1825</b>	<b>sampled</b>										
			<b>10</b>	<b>0.840</b>							

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

**10 0.844 6.8 3.2 2.4 -56**

TEMP: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3331 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <p><input checked="" type="checkbox"/> PERISTALTIC</p> <p><input type="checkbox"/> SUBMERSIBLE</p> <p><input type="checkbox"/> BLADDER</p> <p><input type="checkbox"/> OTHER _____</p>	<p>DECON FLUIDS USED</p> <p><input type="checkbox"/> LIQUINOX</p> <p><input type="checkbox"/> DEIONIZED WATER</p> <p><input type="checkbox"/> POTABLE WATER</p> <p><input type="checkbox"/> NITRIC ACID</p> <p><input checked="" type="checkbox"/> OTHER <b>Dedical</b></p>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <p><input checked="" type="checkbox"/> SILICON TUBING</p> <p><input type="checkbox"/> HDPE TUBING</p> <p><input checked="" type="checkbox"/> LDPE TUBING</p> <p><input type="checkbox"/> HDPE TUBING</p> <p><input type="checkbox"/> OTHER _____</p>	<p>EQUIPMENT USED</p> <p><input checked="" type="checkbox"/> WL METER <b>Heron</b></p> <p><input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b></p> <p><input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b></p> <p><input checked="" type="checkbox"/> PUMP <b>Geopump</b></p> <p><input type="checkbox"/> FILTERS NO. _____ TYPE _____</p>
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>4</b>	<b>1</b>	<b>MW017007</b>
Alkalinity	2370B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AC			

**PURGE OBSERVATIONS**

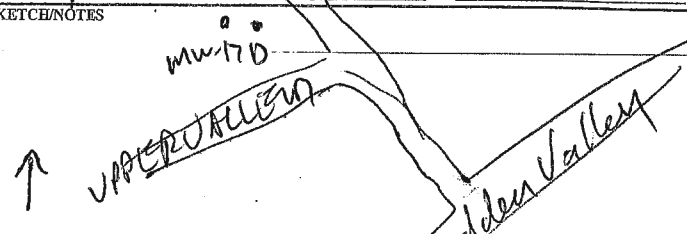
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.5**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **J. Lavash**

Checked By: *[Signature]* Date: **5/24/19**



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>MW17D023</b>	SAMPLE TIME <b>905</b>

LOCATION ID <b>MW-17D</b>	DATE <b>5/23/19</b>
START TIME <b>0800</b>	END TIME <b>910</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <b>4.69</b> FT	FINAL DTW (BMP) <b>6.19</b> FT	PROT. CASING STICKUP (AGS) <b>0</b> FT	TOC/TOR DIFFERENCE <b>0.32</b> FT
WELL DEPTH (BMP) <b>23.2</b> FT	SCREEN LENGTH <b>10</b> FT	PID AMBIENT AIR <b>1</b> PPM	REFILL TIMER SETTING <b>1</b> SEC
WATER COLUMN <b>18.51</b> FT	DRAWDOWN VOLUME <b>0.009</b> GAL	PID WELL MOUTH <b>1</b> PPM	DISCHARGE TIMER SETTING <b>1</b> SEC
CALCULATED GAL/VOL <b>0.12</b> GAL	TOTAL VOL. PURGED <b>2.28</b> GAL	DRAWDOWN/ TOTAL PURGED <b>0.0039</b>	PRESSURE TO PUMP <b>1</b> PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>0810</b>	<b>BEGIN PURGING</b>										
<b>0820</b>	<b>5.82</b>	<b>160</b>	<b>11.25</b>	<b>1.301</b>	<b>6.69</b>	<b>2.04</b>	<b>6.05</b>	<b>-105.9</b>	<b>NA</b>	<b>23</b>	
<b>0825</b>	<b>6.12</b>	<b>160</b>	<b>10.76</b>	<b>1.351</b>	<b>6.60</b>	<b>0.82</b>	<b>6.36</b>	<b>-129.2</b>			
<b>0830</b>	<b>6.19</b>	<b>160</b>	<b>10.62</b>	<b>1.350</b>	<b>6.65</b>	<b>0.84</b>	<b>4.58</b>	<b>-134.0</b>			
<b>0835</b>	<b>6.19</b>	<b>160</b>	<b>10.85</b>	<b>1.334</b>	<b>6.71</b>	<b>0.30</b>	<b>3.67</b>	<b>-137.9</b>			
<b>0840</b>	<b>6.19</b>	<b>160</b>	<b>10.87</b>	<b>1.327</b>	<b>6.75</b>	<b>2.43</b>	<b>2.79</b>	<b>-137.7</b>			
<b>0845</b>	<b>6.19</b>	<b>160</b>	<b>10.85</b>	<b>1.298</b>	<b>6.79</b>	<b>2.64</b>	<b>4.90</b>	<b>-144.4</b>			
<b>0850</b>	<b>6.19</b>	<b>160</b>	<b>10.89</b>	<b>1.254</b>	<b>6.81</b>	<b>2.52</b>	<b>3.42</b>	<b>-146.3</b>			
<b>0855</b>	<b>6.19</b>	<b>160</b>	<b>10.91</b>	<b>1.230</b>	<b>6.83</b>	<b>2.40</b>	<b>3.78</b>	<b>-148.6</b>			
<b>0900</b>	<b>6.19</b>	<b>160</b>	<b>10.81</b>	<b>1.224</b>	<b>6.85</b>	<b>2.36</b>	<b>2.51</b>	<b>-148.4</b>			
<b>0905</b>	<b>sampled</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

**11      1.224    6.9    2.4    2.5    -148.4**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>Distilled</b>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS</b> <input checked="" type="checkbox"/> PUMP <b>Geopump</b> <input type="checkbox"/> FILTERS NO. <b>2</b> TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		<b>Y</b>	<b>MW17D023</b>
Alkalinity	2320B	No	4°C	250 ml Poly			<b>MS/MSD collected</b>
Chloride	300	No	4°C	250 ml Poly			<b>MW17D023</b>
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010F	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

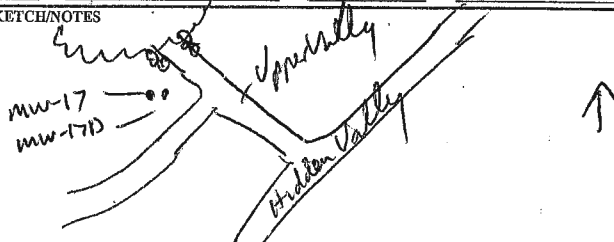
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.285**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: **J. Wozniak**

Checked By: *[Signature]* Date: **5/29/19**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW018010	SAMPLE TIME 1415

LOCATION ID MW-18	DATE 5/22/19
START TIME 1300	END TIME 1420
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 3.70 FT	FINAL DTW (BMP) 4.35 FT	PROT. CASING STICKUP (AGS) 0 FT	TOC/TOR DIFFERENCE 0.541 FT
WELL DEPTH (BMP) 106.09 FT	SCREEN LENGTH 4.7 FT	PID AMBIENT AIR 1 PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 7.20 FT	DRAWDOWN VOLUME 0.004 GAL	PID WELL MOUTH 1 PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL 0.118 1.15 GAL	TOTAL VOL. PURGED 1.08 GAL	DRAWDOWN/TOTAL PURGED 0.05	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1325	BEGIN PURGING										
1335	4.15	160	11.52	0.845	6.72	2.92	37.0	-54.5	NA	~10'	
1340	4.26	160	11.04	0.772	6.45	1.09	20.6	-39.2			
1345	4.30	160	10.88	0.760	6.55	0.90	14.5	-49.9			
1350	4.33	160	11.05	0.764	6.60	0.91	9.98	-49.8			
1355	4.33	160	11.11	0.766	6.66	0.58	5.61	-54.1			
1400	4.34	160	11.00	0.765	6.70	2.34	4.43	-57.3			
1405	4.35	160	10.84	0.767	6.70	2.40	3.23	-58.5			
1410	4.35	160	10.82	0.775	6.72	2.31	2.76	-58.6			
1415	- Sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

11      0.775   6.7   2.3   2.8   -58.6

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Water</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input checked="" type="checkbox"/> OTHER <u>NA</u>	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> PUMP <input checked="" type="checkbox"/> FILTERS	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	Y	N	MW018010
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	450	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK 475	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250ml AG			

**PURGE OBSERVATIONS**

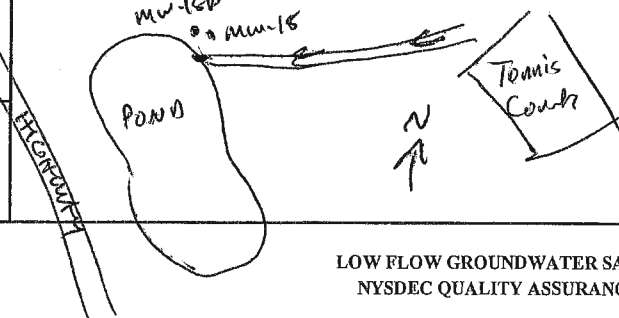
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 22

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *[Signature]* Print Name: J. Wozniak

Checked By: *[Signature]* Date: 5/29/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW18D021	SAMPLE TIME 1505

LOCATION ID MW-18D	DATE 5/22/19
START TIME 1420	END TIME 1515
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 3.77 FT	FINAL DTW (BMP) 3.86 FT	PROT. CASING STICKUP (AGS) 0 / FT	TOC/TOR DIFFERENCE 0.42 FT
WELL DEPTH (BMP) 22.7 FT	SCREEN LENGTH 10 FT	PID AMBIENT AIR / PPM	REFILL TIMER SETTING / SEC
WATER COLUMN 16.93 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) 0.014 GAL	PID WELL MOUTH / PPM	DISCHARGE TIMER SETTING / SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 302.8 GAL	TOTAL VOL. PURGED 1.5 GAL	DRAWDOWN/TOTAL PURGED 0.9093	PRESSURE TO PUMP / PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1425	BEGIN PURGING										
1430	3.86	160	16.76	1.930	7.05	1.03	18.9	-103.1	NA	221'	
1435	3.86	160	10.77	2.025	6.98	0.59	15.6	-109.4			
1440	3.86	160	10.53	2.148	6.92	0.78	13.2	-108.8			
1445	3.86	160	10.42	2.189	6.91	0.06	5.72	-103.3			
1450	3.86	160	10.43	2.198	6.91	1.26	4.77	-95.5			
1455	3.86	160	10.40	2.201	6.92	1.30	3.89	-96.0			
1500	3.86	160	10.41	2.201	6.92	1.31	3.53	-96.9			
1505	sampled										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

10      2.20      6.9      1.3      3.5

TEMP: nearest degree (ex. 10.1 = 10)  
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	EQUIPMENT USED WL METER <u>Hean</u> TURB. METER <u>HACH 2100Q</u> WQ METER <u>YSI 556 MPS</u> PUMP <u>Geopump</u> FILTERS <u>NO</u> TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MW18D021
Alkalinity	2320B	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Chloride	309	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Nitrate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Nitrite	354.1	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfide	4500	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Ethene, Ethane, Methane	RS1-175	No	4°C HCl	3 X 40 ml	<input type="checkbox"/>	<input type="checkbox"/>	
Total Organic Carbon	45.1	No	4°C H2SO4	250 ml AG	<input type="checkbox"/>	<input type="checkbox"/>	

**PURGE OBSERVATIONS**

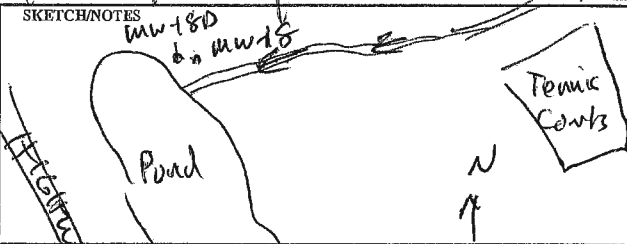
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 1.5

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: [Signature] Print Name: J. Loranowski

Checked By: [Signature] Date: 5/29/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072-MW019006	SAMPLE TIME 1535

LOCATION ID MW-19	DATE 5/22/2019
START TIME 1410	END TIME 1550
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING (INCHES)  1/8  3/8  1/2  5/8  OTHER 3/8" OD

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A

CAP

CASING

LOCKED

COLLAR

INITIAL DTW (BMP) 3.72 FT	FINAL DTW (BMP) 5.52 FT	PROT. CASING STICKUP (AGS) FLUSH-MOUNT FT	TOC/TOR DIFFERENCE 0.40 FT
WELL DEPTH (BMP) 6.50 FT	SCREEN LENGTH UNKNOWN FT	PID AMBIENT AIR NA PPM	REFILL TIMER SETTING NA SEC
WATER COLUMN 2.78 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) 0.90 GAL	PID WELL MOUTH NA PPM	DISCHARGE TIMER SETTING NA SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 0.46 GAL	TOTAL VOL. PURGED 2.09 GAL	DRAWDOWN/TOTAL PURGED 0.14	PRESSURE TO PUMP NA PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1424	BEGIN PURGING										
1435	4.25	140	12.72	0.689	7.16	5.97	22.5	105.5	NA	26	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     (KPA) 5/22/19                 </div>
1440	4.46	140	11.95	0.730	7.15	6.21	13.1	105.6			
1445	4.60	140	12.03	0.730	7.16	6.07	8.91	106.4			
1450	4.71	140	12.06	0.729	7.16	5.47	2.56	106.1			
1455	4.85	140	11.93	0.721	7.16	5.03	2.11	106.2			
1500	4.96	130	11.93	0.715	7.16	4.82	2.72	106.5			
1505	5.05	130	11.99	0.711	7.17	4.70	2.18	106.7			
1510	5.15	130	11.85	0.707	7.16	4.71	2.11	107.0			
1515	5.25	130	11.79	0.702	7.17	4.63E	2.52	107.3			
1520	5.34	130	11.76	0.700	7.17	4.53	2.59	107.5			
1525	5.43	130	11.79	0.697	7.17	4.45	2.45	107.6			
1530	5.52	130	11.68	0.693	7.17	4.43	2.42	107.7			
1535	COLLECT SAMPLES										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

12    0.693    7.2    4.4    2.4    110

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input checked="" type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL	<input checked="" type="checkbox"/> WL METER	<u>HERON DIPPER-T M200-70</u>
<input type="checkbox"/> SUBMERSIBLE	<input checked="" type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL	<input checked="" type="checkbox"/> TURB. METER	<u>HACH 2100Q 14024-31</u>
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input checked="" type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN	<input checked="" type="checkbox"/> WQ METER	<u>YSI 556 MPS 14045-05</u>
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TFLON BLADDER	<input checked="" type="checkbox"/> PUMP	<u>Geopump 800B-35</u>
	<input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input type="checkbox"/> OTHER _____	<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> FILTERS	NO. _____ TYPE _____

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTILE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010A	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

**PURGE OBSERVATIONS**

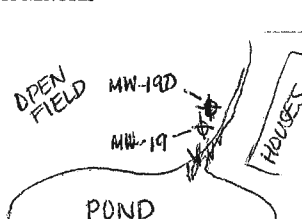
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 2.25

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



**NOTES**

PURGE WATER DESCRIPTION: PALE YELLOW, NO ODOR, SMALL AMOUNT OF WHITE PARTICULATES.

Sampler Signature: *Katie Amanin*

Print Name: KATIE AMANIN

Checked By: *Jerry Pauloff*

Date: 5/29/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072-MW19D017	SAMPLE TIME 1705

LOCATION ID MW-19D	DATE 5/22/2019
START TIME 1600	END TIME 1730
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING IN (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

INITIAL DTW (BMP) 3.38 FT FINAL DTW (BMP) 3.41 FT PROT. CASING STICKUP (AGS) FLUSH-MOUNTING

WELL DEPTH (BMP) 19.42 FT SCREEN LENGTH UNKNOWN PID AMBIENT AIR NA PPM REFILL TIMER SETTING NA SEC

WATER COLUMN 16.04 FT DRAWDOWN VOLUME 0.005 GAL PID WELL MOUTH NA PPM DISCHARGE TIMER SETTING NA SEC

CALCULATED GAL/VOL 2.63 GAL TOTAL VOL. PURGED 1.95 GAL DRAWDOWN/TOTAL PURGED 0.003 PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY YES NO N/A  
 CAP   
 CASING  READ BOX  
 LOCKED   
 COLLAR

ROADBOX FACTOR DIFFERENCE 0.60 FT

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<u>1604</u>	<b>BEGIN PURGING</b>										
<u>1615</u>	<u>3.41</u>	<u>150</u>	<u>11.68</u>	<u>1.076</u>	<u>7.04</u>	<u>0.64</u>	<u>30.5</u>	<u>107.4</u>	<u>NA</u>	<u>17</u>	<del>5/22/2019</del>
<u>1620</u>	<u>3.40</u>	<u>150</u>	<u>11.51</u>	<u>0.996</u>	<u>6.97</u>	<u>0.90</u>	<u>28.7</u>	<u>106.9</u>			
<u>1625</u>	<u>3.41</u>	<u>150</u>	<u>11.53</u>	<u>0.955</u>	<u>6.94</u>	<u>0.75</u>	<u>26.1</u>	<u>107.2</u>			
<u>1630</u>	<u>3.41</u>	<u>150</u>	<u>11.47</u>	<u>0.923</u>	<u>6.93</u>	<u>0.61</u>	<u>15.0</u>	<u>107.2</u>			
<u>1635</u>	<u>3.41</u>	<u>150</u>	<u>11.30</u>	<u>0.907</u>	<u>6.93</u>	<u>0.51</u>	<u>10.9</u>	<u>107.1</u>			
<u>1640</u>	<u>3.41</u>	<u>150</u>	<u>11.31</u>	<u>0.893</u>	<u>6.93</u>	<u>0.48</u>	<u>7.26</u>	<u>107.0</u>			
<u>1645</u>	<u>3.41</u>	<u>150</u>	<u>11.21</u>	<u>0.887</u>	<u>6.92</u>	<u>0.41</u>	<u>5.51</u>	<u>106.9</u>			
<u>1650</u>	<u>3.41</u>	<u>150</u>	<u>11.13</u>	<u>0.882</u>	<u>6.92</u>	<u>0.37</u>	<u>4.08</u>	<u>106.6</u>			
<u>1655</u>	<u>3.41</u>	<u>150</u>	<u>11.10</u>	<u>0.879</u>	<u>6.92</u>	<u>0.35</u>	<u>4.15</u>	<u>106.6</u>			
<u>1700</u>	<u>3.41</u>	<u>150</u>	<u>11.08</u>	<u>0.878</u>	<u>6.92</u>	<u>0.31</u>	<u>4.39</u>	<u>106.3</u>			
<u>1705</u>	<b>COLLECT SAMPLES</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

11 0.878 6.9 0.3 4.4 110

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC SUBMERSIBLE BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROB SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>HERA DIPPER-T M200-7D</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q M024-31</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS M015-05</u> <input checked="" type="checkbox"/> PUMP <u>Geopump SPP-35</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>YES</b>	<b>NO</b>	<b>NA</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

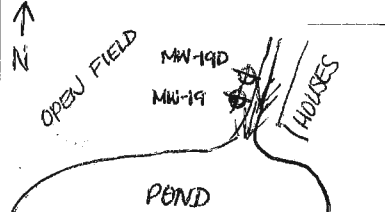
NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 2

to sampling or \_\_\_\_\_ mL for this sample location.

Sampler Signature: K. Ann Print Name: KATIE AMANN

**SKETCH/NOTES**



**NOTES**

**PURGE WATER DESCRIPTION:**  
 PALE ORANGE, ODORLESS, ORANGE PARTICULATES IN SUSPENSION.

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- MW020006	SAMPLE TIME 1040

LOCATION ID mw-20	DATE 5/24/19
START TIME 0930	END TIME 1050
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 4.20 FT	FINAL DTW (BMP) 6.46 FT	PROT. CASING STICKUP (AGS) 0 FT	TOC/TOR DIFFERENCE 0.25 FT
WELL DEPTH (BMP) 6.8 FT	SCREEN LENGTH 4.3 FT	PID AMBIENT AIR PPM	REFILL TIMER SETTING SEC
WATER COLUMN 2.1 FT	DRAWDOWN VOLUME .28 GAL	PID WELL MOUTH PPM	DISCHARGE TIMER SETTING SEC
CALCULATED GAL/VOL .34 GAL	TOTAL VOL. PURGED 1.9 GAL	DRAWDOWN/TOTAL PURGED .15	PRESSURE TO PUMP PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
0941	BEGIN PURGING										
0950	5.22	130	11.6	0.701	7.2	6.6	2.6	220	0.34		
0955	5.36	115	11.7	0.706	7.3	5.9	2.2	209			having trouble keeping rate low
1000	5.50	120	11.7	0.710	7.3	5.7	1.3	195			
1005	5.61	130	11.7	0.712	7.3	5.6	1.3	184			
1010	5.76	135	11.7	0.713	7.3	5.6	1.6	176			
1015	5.89	130	11.7	0.711	7.3	5.5	1.3	169			
1020	6.03	140	11.8	0.711	7.3	5.6	1.5	165			
1025	6.18	145	11.5	0.711	7.3	6.0	1.5	162			
1030	6.32	150	11.5	0.709	7.3	5.9	3.2	161			Parameters stable except for drawdown
1035	6.46	135	11.5	0.711	7.3	5.9	3.5	159			we purged >5x drawdown - going to collect sample

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

12    0.711    7.3    5.9    3.5    160

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLO BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>Itoron</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Alkalinity	2320B	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Chloride	300	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Nitrate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Nitrite	354.1	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfide	4500	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<input type="checkbox"/>	<input type="checkbox"/>	
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	<input type="checkbox"/>	<input type="checkbox"/>	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 1.8

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*Main Clubhouse*  
*Pavement*  
*Maintenance Garage*  
*mw 20*  
*Reunis Court*

Sampler Signature: *[Signature]* Print Name: Ferry Rowcliffe

Checked By: *[Signature]* Date: 7/25/19



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <u>MW20D020</u>	SAMPLE TIME 1200

LOCATION ID <u>MW-200</u>	DATE <u>5/24/19</u>
START TIME <u>1050</u>	END TIME <u>1215</u>
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<u>10/19/19</u>	—	—
<u>10/19/19</u>	—	—
<u>10/19/19</u>	—	—

INITIAL DTW (BMP) <u>5.08</u> FT	FINAL DTW (BMP) <u>5.82</u> FT	PROT. CASING STICKUP (AGS) <u>0</u> FT	TOC/TOR DIFFERENCE <u>0.31</u> FT
WELL DEPTH (BMP) <u>20.8</u> FT	SCREEN LENGTH <u>9.3</u> FT	PID AMBIENT AIR — PPM	REFILL TIMER SETTING — SEC
WATER COLUMN <u>15.72</u> FT	DRAWDOWN VOLUME <u>1.2</u> GAL	PID WELL MOUTH — PPM	DISCHARGE TIMER SETTING — SEC
CALCULATED GAL/VOL <u>2.5</u> GAL <small>(column X well diameter squared X 0.041)</small>	TOTAL VOL. PURGED <u>2.3</u> GAL <small>(mL per minute X total minutes X 0.00026 gal/mL)</small>	DRAWDOWN/TOTAL PURGED <u>105</u>	PRESSURE TO PUMP — PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CH <small>mS/cm (3%)</small>	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<u>1101</u>	<b>BEGIN PURGING</b>										
<u>1110</u>	<u>6.05</u>	<u>240</u>	<u>11.2</u>	<u>0.984</u>	<u>7.0</u>	<u>1.3</u>	<u>2.5</u>	<u>152</u>	<u>0.49</u>		
<u>1120</u>	<u>5.85</u>	<u>190</u>	<u>11.3</u>	<u>1.007</u>	<u>7.0</u>	<u>1.3</u>	<u>0.9</u>	<u>122</u>			
<u>1125</u>	<u>5.88</u>	<u>200</u>	<u>11.2</u>	<u>0.989</u>	<u>7.0</u>	<u>1.6</u>	<u>0.9</u>	<u>108</u>			
<u>1130</u>	<u>5.83</u>	<u>180</u>	<u>11.2</u>	<u>0.967</u>	<u>7.0</u>	<u>1.7</u>	<u>0.8</u>	<u>97</u>			
<u>1135</u>	<u>5.80</u>	<u>185</u>	<u>11.3</u>	<u>0.956</u>	<u>7.0</u>	<u>1.7</u>	<u>1.1</u>	<u>89</u>			
<u>1140</u>	<u>5.80</u>	<u>180</u>	<u>11.3</u>	<u>0.949</u>	<u>7.0</u>	<u>1.5</u>	<u>0.8</u>	<u>86</u>			
<u>1145</u>	<u>5.81</u>	<u>185</u>	<u>11.4</u>	<u>0.940</u>	<u>7.0</u>	<u>1.4</u>	<u>0.5</u>	<u>77</u>			
<u>1150</u>	<u>5.82</u>	<u>185</u>	<u>11.3</u>	<u>0.935</u>	<u>7.0</u>	<u>1.3</u>	<u>0.8</u>	<u>75</u>			
<u>1155</u>	<u>5.82</u>	<u>185</u>	<u>11.4</u>	<u>0.930</u>	<u>7.0</u>	<u>1.3</u>	<u>1.2</u>	<u>69</u>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

11    0.930    7.0    1.3    1.2    69

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <u>itron</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	—	—
Alkalinity	2320B	No	4°C	250 ml Poly	—	—	—
Chloride	300	No	4°C	250 ml Poly	—	—	—
Nitrate	300	No	4°C	—	—	—	—
Nitrite	354.1	No	4°C	—	—	—	—
Sulfate	300	No	4°C	—	—	—	—
Sulfide	4500	No	4°C	—	—	—	—
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly	—	—	—
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	—	—	—
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG	—	—	—

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED 2.7

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

Main Chubbuck

MW-200 | Maint. Gauge

MW-200

Sampler Signature: Jerry Rawcliffe Print Name: Jerry Rawcliffe

Checked By: [Signature] Date: 7/25/19

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072-MW021012	SAMPLE TIME 1005

LOCATION ID MW-21	DATE 5/21/2019
START TIME 0835	END TIME 1055
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER **WELL IS SEALED, CANNOT MEASURE DIAMETER**

TUBING (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER **TOP OF COMPRESSION FITTING/NUT**

INITIAL DTW (BMP) **UNKNOWN** FT FINAL DTW (BMP) **UNKNOWN** FT PROT. CASING STICKUP (AGS) **3.05** FT TOC/TOR DIFFERENCE **NA** FT

WELL DEPTH (BMP) **UNKNOWN** FT SCREEN LENGTH **UNKNOWN** FT PID AMBIENT AIR **NA** PPM REFILL TIMER SETTING **NA** SEC

WATER COLUMN **UNKNOWN** FT DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) **UNKNOWN** GAL PID WELL MOUTH **NA** PPM DISCHARGE TIMER SETTING **NA** SEC

CALCULATED GAL/VOL (column X well diameter squared X 0.041) **UNKNOWN** GAL TOTAL VOL. PURGED **2.15** GAL DRAWDOWN/TOTAL PURGED **UNKNOWN** PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
0901	BEGIN PURGING										
0910	CANNOT MEASURE	150	11.53	2.785	7.09	1.01	14.3	99.2	NA	UNKNOWN	PURGE WATER DESCRIPTION: PALE YELLOW, SLIGHT ODOR, SOME PARTICULATES ORANGE PARTICULATES PRESENT WATER LESS CLOUDY Sealed Well <del>5/21/2019</del>
0915		150	11.57	2.795	7.11	0.81	75.0	97.1			
0920		150	11.63	2.776	7.11	0.85	2.80	95.2			
0925		150	11.64	2.771	7.11	1.06	6.72	93.8			
0930		150	11.70	2.765	7.11	0.88	2.51	93.6			
0935		150	11.74	2.757	7.11	0.65	1.43	93.5			
0940		150	11.79	2.751	7.11	0.57	2.16	93.0			
0945		150	11.80	2.749	7.11	0.52	4.56	93.5			
0950		150	11.90	2.738	7.12	0.46	1.47	93.2			
0955		150	11.93	2.735	7.11	0.43	0.96	92.5			
1000		150	11.95	2.733	7.11	0.44	0.88	92.4			
1005	COLLECT SAMPLES										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures)[SF])**

12    2.73    7.1    0.4    0.9    92

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> WQ METER <input type="checkbox"/> PUMP <input type="checkbox"/> FILTERS	NO.    TYPE HACH 2100Q IDMD24-31 YSI 556 MPS IDMD15-65 Geopump MID 5008-35
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	67 X 40 ml VOA		YES	82802-MW021012 DUP
Alkalinity	2320B	No	4°C	250 ml Poly 125 ml		NO	NA
Chloride	300	No	4°C	250 ml Poly 125 ml			
Nitrate	300	No	4°C	125 ml POLY			
Nitrite	354.1	No	4°C	125 ml POLY			
Sulfate	300	No	4°C	125 ml POLY			
Sulfide	4500	No	4°C, NADH	500 ml POLY			
Fe, Mn	6010B	No	4°C HNO3	58 ml Poly 125 ml POLY			
Ethene, Ethane, Methane & CO <sub>2</sub>	RSK-175	No	4°C HCl, NADH	2 X 40 ml X 6			
Total Organic Carbon	415.1	No	4°C H2SO4	1250 ml AG 3 X 40 ml VOA			

**PURGE OBSERVATIONS**

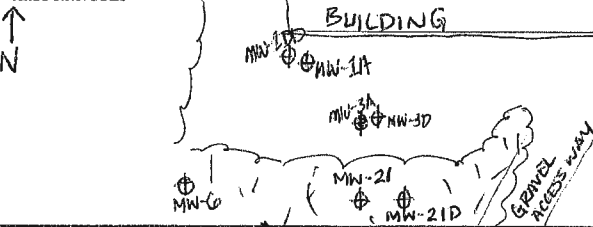
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **3.5 (approx)**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: *K. Amann* Print Name: **KATIE AMANN**

Checked By: *J. Rumbly* Date: **5/29/19**



511 Congress Street, Portland Maine 04101

FIGURE 4.17  
LOW FLOW GROUNDWATER SAMPLING RECORD  
NYSDEC QUALITY ASSURANCE PROJECT PLAN

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072-MW21D020	SAMPLE TIME 1205

LOCATION ID MW-21D	DATE 5/21/2019
START TIME 1100	END TIME 1230
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER UNKNOWN

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER MEASURED TO TOP OF COMPRESSION FITTINGS/NUT

INITIAL DTW (BMP) UNKNOWN FT FINAL DTW (BMP) UNKNOWN FT PROT. CASING STICKUP (AGS) 3.22 FT TOCTOR DIFFERENCE NA FT

WELL DEPTH (BMP) UNKNOWN FT SCREEN LENGTH UNKNOWN FT PID AMBIENT AIR NA PPM REFILL TIMER SETTING NA SEC

WATER COLUMN UNKNOWN FT DRAWDOWN VOLUME UNKNOWN GAL PID WELL MOUTH NA PPM DISCHARGE TIMER SETTING NA SEC

CALCULATED GAL/VOL UNKNOWN GAL TOTAL VOL. PURGED 2.60 GAL DRAWDOWN/TOTAL PURGED NA/UNKNOWN PSI

WELL INTEGRITY YES NO N/A  
 CAP     
 CASING     
 LOCKED     
 COLLAR

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP. CONDUCTANCE	pH (units)	DISS-O <sub>2</sub>	TURBIDITY (ntu)	REDOX (mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
3-5 Minutes	0.0-0.33 ft Drawdown	(mL/min)	(± 3 degrees)	CE	(± 0.1 units)	(mg/L)	(+/- 10% <10 ntu)	(+/- 10 mv)				
1106	BEGIN PURGING											
1115	<u>CANNOT MEASURE</u>	<u>200</u>	<u>13.37</u>	<u>3.107</u>	<u>7.14</u>	<u>1.24</u>	<u>17.9</u>	<u>74.6</u>	<u>NA</u>	<u>UNKNOWN</u>	<u>PURGE WATER DESCRIPTION: PALE ORANGE, SLIGHT ODDOR, CLEAR</u>	
1120		<u>200</u>	<u>13.44</u>	<u>2.949</u>	<u>7.13</u>	<u>0.84</u>	<u>2.51</u>	<u>78.1</u>			<u>Sealed Well</u>	
1125		<u>200</u>	<u>13.42</u>	<u>2.870</u>	<u>7.14</u>	<u>0.82</u>	<u>1.28</u>	<u>81.7</u>			<u>Sealed Well</u>	
1130		<u>200</u>	<u>13.45</u>	<u>2.814</u>	<u>7.14</u>	<u>0.65</u>	<u>1.34</u>	<u>83.6</u>				
1135		<u>200</u>	<u>13.40</u>	<u>2.772</u>	<u>7.14</u>	<u>0.58</u>	<u>1.05</u>	<u>84.7</u>				
1140		<u>200</u>	<u>13.34</u>	<u>2.749</u>	<u>7.14</u>	<u>0.50</u>	<u>0.81</u>	<u>85.3</u>				
1145		<u>200</u>	<u>13.31</u>	<u>2.738</u>	<u>7.14</u>	<u>0.50</u>	<u>0.76</u>	<u>85.5</u>				
1150		<u>200</u>	<u>13.29</u>	<u>2.733</u>	<u>7.14</u>	<u>0.42</u>	<u>0.79</u>	<u>85.8</u>				
1155		<u>200</u>	<u>13.29</u>	<u>2.727</u>	<u>7.14</u>	<u>0.38</u>	<u>0.91</u>	<u>86.1</u>				
1200		<u>200</u>	<u>13.23</u>	<u>2.724</u>	<u>7.13</u>	<u>0.41</u>	<u>0.90</u>	<u>86.2</u>				
1205	<u>COLLECT SAMPLES</u>											
1213	<u>STOPPED PUMP</u>											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

13    2.72    7.1    0.4    0.9    86

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLOON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <input type="checkbox"/> TURB. METER <u>HACH 2100Q ID MD24-21</u> <input checked="" type="checkbox"/> WG METER <u>YSI 556 MPS ID MC15-05</u> <input type="checkbox"/> PUMP <u>Geopump SDB-35</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	9 X 40 ml	YES	YES	828072-MW21D020 MS 828072-MW21D020 MSD
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354-1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415-1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

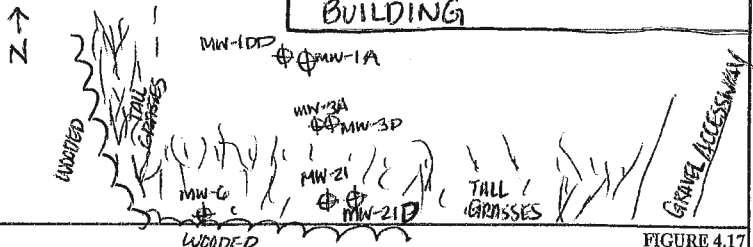
PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS (APPROXIMATE) GENERATED 2.75

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: Katie Amann Print Name: KATIE AMANN

Checked By: J. Rawliff Date: 5/29/19



511 Congress Street, Portland Maine 04101

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>6P2151008</b>	SAMPLE TIME <b>W20</b>

LOCATION ID <b>6P2-151</b>	DATE <b>5/23/19</b>
START TIME <b>0810</b>	END TIME <b>1021</b>
SITE NAME/NUMBER 828072	PAGE 1 OF 2

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  YES  NO  N/A

CAP  YES  NO  N/A

CASING  YES  NO  N/A

LOCKED  YES  NO  N/A

COLLAR  YES  NO  N/A

INITIAL DTW (BMP) <b>2.42</b> FT	FINAL DTW (BMP) <b>3.32</b> FT	PROT. CASING STICKUP (AGS) <b>2.3</b> FT	TOC/TOR DIFFERENCE <b>NA</b> FT
WELL DEPTH (BMP) <b>8.55</b> FT	SCREEN LENGTH <b>NA</b> FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN <b>6.13</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>0.04</b> GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>0.25</b> GAL	TOTAL VOL. PURGED <b>3.6</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.018</b>	PRESSURE TO PUMP _____ PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS-O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>0942</b>	<b>BEGIN PURGING</b>										
<b>0950</b>	<b>3.05</b>	<b>135</b>	<b>12.1</b>	<b>1.375</b>	<b>6.7</b>	<b>1.2</b>	<b>24</b>	<b>-86</b>	<b>0.67</b>		
<b>0955</b>	<b>3.11</b>	<b>145</b>	<b>12.1</b>	<b>1.382</b>	<b>6.8</b>	<b>2.4</b>	<b>6.6</b>	<b>-99</b>			<i>Having trouble getting rate low</i>
<b>0900</b>	<b>3.13</b>	<b>155</b>	<b>12.2</b>	<b>1.390</b>	<b>6.8</b>	<b>2.7</b>	<b>3.3</b>	<b>-102</b>			
<b>0905</b>	<b>3.17</b>	<b>150</b>	<b>12.2</b>	<b>1.346</b>	<b>6.8</b>	<b>2.3</b>	<b>1.7</b>	<b>-112</b>			
<b>0910</b>	<b>3.22</b>	<b>155</b>	<b>12.3</b>	<b>1.258</b>	<b>6.8</b>	<b>1.6</b>	<b>1.4</b>	<b>-111</b>			
<b>0915</b>	<b>3.28</b>	<b>160</b>	<b>12.4</b>	<b>1.130</b>	<b>6.8</b>	<b>1.5</b>	<b>8.1</b>	<b>-105</b>			
<b>0920</b>	<b>3.28</b>	<b>155</b>	<b>12.4</b>	<b>1.000</b>	<b>6.8</b>	<b>1.4</b>	<b>16</b>	<b>-105</b>			
<b>0925</b>	<b>3.29</b>	<b>155</b>	<b>12.5</b>	<b>0.909</b>	<b>6.8</b>	<b>1.3</b>	<b>28</b>	<b>-100</b>			
<b>0930</b>	<b>3.28</b>	<b>150</b>	<b>12.6</b>	<b>0.832</b>	<b>6.8</b>	<b>1.2</b>	<b>39</b>	<b>-98</b>			
<b>0935</b>	<b>3.29</b>	<b>150</b>	<b>12.6</b>	<b>0.795</b>	<b>6.9</b>	<b>1.1</b>	<b>43</b>	<b>-94</b>			
<b>0940</b>	<b>3.31</b>	<b>155</b>	<b>12.7</b>	<b>0.761</b>	<b>6.9</b>	<b>1.1</b>	<b>48</b>	<b>-89</b>			
<b>0945</b>	<b>3.32</b>	<b>155</b>	<b>12.8</b>	<b>0.742</b>	<b>6.9</b>	<b>1.1</b>	<b>45</b>	<b>-88</b>			
<b>0950</b>	<b>3.30</b>	<b>150</b>	<b>12.8</b>	<b>0.738</b>	<b>6.9</b>	<b>0.9</b>	<b>40</b>	<b>-84</b>			
<b>0955</b>	<b>3.31</b>	<b>150</b>	<b>12.9</b>	<b>0.715</b>	<b>6.9</b>	<b>0.8</b>	<b>36</b>	<b>-80</b>			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

**13    0.677    7.0    0.6    20    -76**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>Deionized</i>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <input checked="" type="checkbox"/> TURB. METER <i>HACH 2100Q</i> <input checked="" type="checkbox"/> WQ METER <i>YSI 556 MPS</i> <input checked="" type="checkbox"/> PUMP <i>Cleopump</i> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Alkalinity	2320B	No	4°C	250 ml Poly			
<input type="checkbox"/> Chloride	300	No	4°C	250 ml Poly			
<input type="checkbox"/> Nitrate	300	No	4°C				
<input type="checkbox"/> Nitrite	354.1	No	4°C				
<input type="checkbox"/> Sulfate	300	No	4°C				
<input type="checkbox"/> Sulfide	4500	No	4°C				
<input type="checkbox"/> Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
<input type="checkbox"/> Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
<input type="checkbox"/> Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **3.6**

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*Handwritten notes and sketches:*  
 - A sketch of a well casing with a riser pipe and a screen.  
 - Notes: **6P2 25/20 mw-9/90 mw-8/80**  
 - Notes: **6P2 5/50**  
 - Notes: **6P2-151**  
 - Notes: **6P2-10**

Sampler Signature: *Jerry Rawcliffe* Print Name: **Jerry Rawcliffe**

Checked By: *[Signature]* Date: **7/20/19**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072- GPZ151008      SAMPLE TIME: 1020

LOCATION ID: GPZ-151      DATE: 5/22/19  
 START TIME: 0810      END TIME: 1021  
 SITE NAME/NUMBER: 828072      PAGE: 2 OF 2

WELL DIAMETER (INCHES)  1     2     4     6     8     OTHER \_\_\_\_\_  
 TUBING ID (INCHES)     1/8     1/4     3/8     1/2     5/8     OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP)     TOP OF RISER (TOR)     TOP OF CASING (TOC)     OTHER \_\_\_\_\_

WELL INTEGRITY  
 YES    NO    N/A  
 CAP              
 CASING              
 LOCKED              
 COLLAR           

INITIAL DTW (BMP): 2.42 FT      FINAL DTW (BMP): 3.32 FT      PROT. CASING STICKUP (AGS): 2.3 FT      TOC/TOR DIFFERENCE: NA FT  
 WELL DEPTH (BMP): 8.55 FT      SCREEN LENGTH: UNK FT      PID AMBIENT AIR: \_\_\_\_\_ PPM      REFILL TIMER SETTING: \_\_\_\_\_ SEC  
 WATER COLUMN: 6.13 FT      DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): 0.4 GAL      PID WELL MOUTH: \_\_\_\_\_ PPM      DISCHARGE TIMER SETTING: \_\_\_\_\_ SEC  
 CALCULATED GAL/VOL: 0.25 GAL      TOTAL VOL. PURGED: 3.6 GAL      DRAWDOWN/TOTAL PURGED: 0.11 PSI      PRESSURE TO PUMP: \_\_\_\_\_ PSI  
(column X well diameter squared X 0.041)      (mL per minute X total minutes X 0.00026 gal/mL)

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SF- CONDUCTAN CE	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP- INTAKE DEPTH	Comments
<u>0842</u>	BEGIN PURGING										
<u>1000</u>	<u>3.33</u>	<u>155</u>	<u>12.9</u>	<u>0.649</u>	<u>7.0</u>	<u>0.7</u>	<u>30</u>	<u>-77</u>	<u>0.34</u>		
<u>1005</u>	<u>3.35</u>	<u>160</u>	<u>13.0</u>	<u>0.685</u>	<u>7.0</u>	<u>0.6</u>	<u>29</u>	<u>-75</u>			
<u>1010</u>	<u>3.31</u>	<u>150</u>	<u>13.1</u>	<u>0.679</u>	<u>7.0</u>	<u>0.6</u>	<u>24</u>	<u>-76</u>			
<u>1015</u>	<u>3.32</u>	<u>150</u>	<u>13.0</u>	<u>0.677</u>	<u>7.0</u>	<u>0.6</u>	<u>20</u>	<u>-76</u>			
/											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])**

13    0.677    7.0    0.6    20    -76

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP:  PERISTALTIC     SUBMERSIBLE     BLADDER     OTHER \_\_\_\_\_  
 DECON FLUIDS USED:  LIQUINOX     DEIONIZED WATER     POTABLE WATER     NITRIC ACID     OTHER: Deduck  
 TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING     HDPE TUBING     LDPE TUBING     HDPE TUBING     OTHER \_\_\_\_\_  
 S. STEEL PUMP MATERIAL    PVC PUMP MATERIAL    GEOPROBE SCREEN    TEFLON BLADDER    OTHER \_\_\_\_\_  
 EQUIPMENT USED:  WL METER     TURB. METER: HACH 2100Q     WQ METER: YSI 556 MPS     PUMP: Geopump     FILTERS: NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Alkalinity	2320B	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Chloride	300	No	4°C	250 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Nitrate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Nitrite	354.1	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfate	300	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Sulfide	4500	No	4°C		<input type="checkbox"/>	<input type="checkbox"/>	
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly	<input type="checkbox"/>	<input type="checkbox"/>	
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml	<input type="checkbox"/>	<input type="checkbox"/>	
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG	<input type="checkbox"/>	<input type="checkbox"/>	

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED: YES  NO   
 NO-PURGE METHOD UTILIZED: YES  NO   
 NUMBER OF GALLONS GENERATED: 3.6  
 to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*See Page 1*

Sampler Signature: Jerry Rawcliffe      Print Name: Jerry Rawcliffe  
 Checked By: [Signature]      Date: 7/15/19



# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	5/24/19
SAMPLE ID 828072- GPZ10012	SAMPLE TIME 0850

LOCATION ID GPZ-10	DATE 5/23/19 - 5/24/19
START TIME 1021	END TIME 5/24/19 0855
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 4.25 FT	FINAL DTW (BMP) 15.55 FT	PROT. CASING STICKUP (AGS) _____ FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 15.55 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN 11.3 FT	DRAWDOWN VOLUME _____ GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) .45 GAL	TOTAL VOL. PURGED _____ GAL	DRAWDOWN/TOTAL PURGED _____	PRESSURE TO PUMP _____ PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm 3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1026	BEGIN PURGING										
1030	—	—	10.6	2.744	7.2	1.6	350	37	1.43		Phone call from Chuck S.
1040	15.55	Well purged dry while on the phone with Chuck S. Will check after sampling GPZ-25/20 and collect grab. IP well has redrilled.									
5/24/19 0850	4.29	Collected grab sample of recharge.									

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

TEMP: nearest degree (ex. 10.1 = 10)  
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input checked="" type="checkbox"/> NITRIC ACID <input type="checkbox"/> OTHER <u>Dedical</u>	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <u>Heron</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED \_\_\_\_\_

to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**

*Handwritten notes:*  
 GPZ-25/20 mm-940 mm-8100 GPZ 5/56  
 GPZ 65/60  
 GPZ-151  
 GPZ-10  
 SURFACE

Sampler Signature: *[Signature]* Print Name: Jerry Rawichle

Checked By: *[Signature]* Date: 7/25/19

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- 6P2251014	SAMPLE TIME 1220

LOCATION ID 6P2-251	DATE 5/23/19
START TIME 1045	END TIME 1225
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES NO N/A CAP _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> CASING _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> LOCKED _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COLLAR _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TUBING ID (INCHES) <input type="checkbox"/> 1/8 <input checked="" type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> CASING _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> LOCKED _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> COLLAR _____ <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
MEASUREMENT POINT (MP) <input checked="" type="checkbox"/> TOP OF RISER (TOR) <input type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	TOC/TOR DIFFERENCE _____ FT
INITIAL DTW (BMP) <input type="text" value="11.41"/> FT	FINAL DTW (BMP) <input type="text" value="12.55"/> FT
WELL DEPTH (BMP) <input type="text" value="15.1"/> FT	SCREEN LENGTH <input type="text" value="UNK"/> FT
WATER COLUMN <input type="text" value="3.09"/> FT	PID CASING STICKUP (AGS) <input type="text" value="22"/> FT
CALCULATED GAL/VOL <input type="text" value="0.15"/> GAL	PID AMBIENT AIR _____ PPM
	PID WELL MOUTH _____ PPM
	DRAWDOWN VOLUME <input type="text" value="105"/> GAL
	TOTAL VOL. PURGED <input type="text" value="1.7"/> GAL
	DRAWDOWN/ TOTAL PURGED <input type="text" value="1.03"/>
	DISCHARGE TIMER SETTING _____ SEC
	REFILL TIMER SETTING _____ SEC
	PRESSURE TO PUMP <input type="text" value="✓"/> PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)											
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
BEGIN PURGING											
1118											
1130	12.09	120	9.8	1.701	6.5	5.1	10.7	-85	0.86		Riser was moved & damaged. Phone call to Slum. Revis - set up traps
1140	12.31	120	9.8	1.699	6.5	2.6	6.3	-85			
1150	12.46	120	9.8	1.699	6.5	1.8	5.3	-84			
1155	12.52	120	9.7	1.701	6.5	1.6	3.0	-83			
1200	12.53	110	9.7	1.700	6.5	1.4	2.9	-88			
1205	12.54	105	9.8	1.701	6.5	1.4	4.2	-84			
1210	12.54	110	9.7	1.705	6.5	1.5	4.4	-81			
1215	12.55	110	9.8	1.704	6.5	1.5	3.1	-86			

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])									
			10	1.70	6.5	1.5	3.1	-80	

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION			
TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER <u>Heron</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

PURGE OBSERVATIONS PURGE WATER CONTAINERIZED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO NO-PURGE METHOD UTILIZED <input type="checkbox"/> YES <input type="checkbox"/> NO	NUMBER OF GALLONS GENERATED <u>1.7</u> to sampling or _____ mL for this sample location.
Sampler Signature: <u>Jerry Raweloff</u> Checked By: <u>[Signature]</u>	Print Name: <u>Jerry Raweloff</u> Date: <u>7/25/19</u>

SKETCH/NOTES

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- GP220020	SAMPLE TIME 5/24 0905

LOCATION ID GP2-2D	DATE 5/23/19
START TIME 1225	END TIME 5/24 0910
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES NO N/A
TUBING ID (INCHES) <input type="checkbox"/> 1/8 <input checked="" type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP _____
MEASUREMENT POINT (MP) <input checked="" type="checkbox"/> TOP OF RISER (TOR) <input type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	CASING _____
INITIAL DTW (BMP) 12.88 FT	FINAL DTW (BMP) 20.08 FT
PROT. CASING STICKUP (AGS) 2.7 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 20.75 FT	SCREEN LENGTH 19.8 FT
PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN 17.87 FT	DRAWDOWN VOLUME _____ GAL
PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL 0.71 GAL	TOTAL VOL. PURGED 0.9 GAL
(column X well diameter squared X 0.041)	DRAWDOWN/ TOTAL PURGED _____
	PRESSURE TO PUMP _____ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1230	BEGIN PURGING										
1240	19.70	120	10.6	1.240	7.3	4.0	26	-35	0.62		Drew down to
1250	20.03	60	11.2	1.264	7.3	4.7	24	-49			intake lowered
1300	20.51	60	11.3	1.272	7.3	4.1	34	-39			stabilized and reduced
1304	20.70	Purge well dry - will grab sample recharge.									rate to minimum
1410	20.24	Will collect grab on Friday if well has recharged.									
5/24/19 0900	20.08	Very little recharge - collected grab sample anyway									
NOT STABILIZED											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

11	1.27	7.3	4.1	34	-39
----	------	-----	-----	----	-----

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (5.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

<b>EQUIPMENT DOCUMENTATION</b>	<b>TYPE OF PUMP</b>	<b>DECON FLUIDS USED</b>	<b>TUBING/PUMP/BLADDER MATERIALS</b>	<b>EQUIPMENT USED</b>
<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input checked="" type="checkbox"/> NITRIC ACID <input type="checkbox"/> OTHER <u>Deionated</u>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL METER <u>Genon</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

<b>PURGE OBSERVATIONS</b>	<b>SKETCH/NOTES</b>
PURGE WATER CONTAINERIZED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
NO-PURGE METHOD UTILIZED <input type="checkbox"/> YES <input type="checkbox"/> NO	
NUMBER OF GALLONS GENERATED <u>0.9</u>	
Sampler Signature: <u>Jerry Raweloff</u> Print Name: <u>Jerry Raweloff</u>	
Checked By: <u>[Signature]</u> Date: <u>7/20/19</u>	



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>GPZ5S016</b>	SAMPLE TIME <b>1000</b>

LOCATION ID <b>GPZ-5S</b>	DATE <b>5/23/2019</b>
START TIME <b>0840</b>	END TIME <b>1008</b>
SITE NAME/NUMBER 828072	PAGE <b>1 OF 1</b>

WELL DIAMETER (INCHES)  1     2     4     6     8     OTHER \_\_\_\_\_

TUBING ID (INCHES)     1/8     1/4     3/8     1/2     5/8     OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)     TOP OF RISER (TOR)     TOP OF CASING (TOC)     OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

INITIAL DTW (BMP) <b>12.61</b> FT	FINAL DTW (BMP) <b>13.84</b> FT	RISER PROT. CASING STICKUP (AGS) <b>1.6</b> FT	TOC/TOR DIFFERENCE <b>NA</b> FT
WELL DEPTH (BMP) <b>18.45</b> FT	SCREEN LENGTH <b>UNKNOWN</b>	PID AMBIENT AIR <b>NA</b> PPM	REFILL TIMER SETTING <b>NA</b> SEC
WATER COLUMN <b>5.84</b> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) <b>0.05</b> GAL	PID WELL MOUTH <b>NA</b> PPM	DISCHARGE TIMER SETTING <b>NA</b> SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) <b>0.24</b> GAL	TOTAL VOL. PURGED <b>1.79</b> GAL	DRAWDOWN/ TOTAL PURGED <b>0.028</b>	PRESSURE TO PUMP <b>NA</b> PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
<b>0848</b>	<b>BEGIN PURGING</b>										
<b>0855</b>	<b>13.73</b>	<b>115</b>	<b>10.27</b>	<b>2.412</b>	<b>6.31</b>	<b>1.36</b>	<b>5.48</b>	<b>112.4</b>	<b>NA</b>	<b>216</b>	
<b>0900</b>	<b>13.65</b>	<b>115</b>	<b>10.76</b>	<b>2.393</b>	<b>6.32</b>	<b>1.76</b>	<b>6.24</b>	<b>113.8</b>			
<b>0905</b>	<b>13.68</b>	<b>115</b>	<b>10.60</b>	<b>2.392</b>	<b>6.34</b>	<b>2.10</b>	<b>4.86</b>	<b>114.2</b>			
<b>0910</b>	<b>13.73</b>	<b>115</b>	<b>10.63</b>	<b>2.387</b>	<b>6.36</b>	<b>1.44</b>	<b>3.63</b>	<b>114.2</b>			
<b>0915</b>	<b>13.77</b>	<b>115</b>	<b>10.52</b>	<b>2.394</b>	<b>6.37</b>	<b>1.14</b>	<b>3.03</b>	<b>114.8</b>			
<b>0920</b>	<b>13.82</b>	<b>115</b>	<b>10.44</b>	<b>2.393</b>	<b>6.37</b>	<b>0.92</b>	<b>2.79</b>	<b>115.6</b>			
<b>0925</b>	<b>13.77</b>	<b>115</b>	<b>10.34</b>	<b>2.396</b>	<b>6.38</b>	<b>0.76</b>	<b>2.01</b>	<b>116.3</b>			
<b>0930</b>	<b>13.78</b>	<b>115</b>	<b>10.46</b>	<b>2.392</b>	<b>6.39</b>	<b>0.63</b>	<b>2.08</b>	<b>116.5</b>			
<b>0935</b>	<b>13.80</b>	<b>115</b>	<b>10.48</b>	<b>2.386</b>	<b>6.39</b>	<b>0.56</b>	<b>2.75</b>	<b>116.5</b>			
<b>0940</b>	<b>13.81</b>	<b>115</b>	<b>10.65</b>	<b>2.384</b>	<b>6.40</b>	<b>0.47</b>	<b>3.39</b>	<b>116.7</b>			
<b>0945</b>	<b>13.82</b>	<b>115</b>	<b>10.67</b>	<b>2.381</b>	<b>6.41</b>	<b>0.43</b>	<b>2.92</b>	<b>116.7</b>			
<b>0950</b>	<b>13.84</b>	<b>115</b>	<b>10.40</b>	<b>2.384</b>	<b>6.40</b>	<b>0.42</b>	<b>2.81</b>	<b>116.7</b>			
<b>1000</b>	<b>COLLECT SAMPLES</b>										
<b>1005</b>	<b>STOPPED PUMP</b>										

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))**

10    2.38    6.4    0.4    2.8    120

TEMP: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

<input checked="" type="checkbox"/> PERISTALTIC	<input checked="" type="checkbox"/> LIQUINOX	<input checked="" type="checkbox"/> SILICON TUBING	<input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL
<input type="checkbox"/> SUBMERSIBLE	<input checked="" type="checkbox"/> DEIONIZED WATER	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> PVC PUMP MATERIAL
<input type="checkbox"/> BLADDER	<input type="checkbox"/> POTABLE WATER	<input type="checkbox"/> LDPE TUBING	<input type="checkbox"/> GEOPROBE SCREEN
<input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> NITRIC ACID	<input type="checkbox"/> HDPE TUBING	<input type="checkbox"/> TEFLON-BLADDER
	<input checked="" type="checkbox"/> OTHER <b>Dedicated</b>	<input type="checkbox"/> OTHER _____	<input type="checkbox"/> OTHER _____

EQUIPMENT USED  
 WL METER **HERON DIPPER-1 M200-70**  
 TURB. METER **HACH 2100Q MD24-31**  
 WQ METER **YSI 556 MPS MD15-05**  
 PUMP **Geopump S300B-35**  
 FILTERS NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>YES</b>	<b>NO</b>	<b>NA</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RGK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

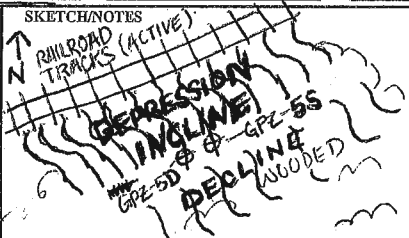
**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED  YES     NO

NO-PURGE METHOD UTILIZED  YES     NO

NUMBER OF GALLONS GENERATED **≈ 2**

to sampling or \_\_\_\_\_ mL for this sample location.



NOTES

PURGE WATER DESCRIPTION: COLORLESS, ODORLESS, CLEAR.

Sampler Signature: *K. Amanu*    Print Name: **KATIE AMANU**

Checked By: *Jerry Pembuff*    Date: **5/23/19**



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>GPZ5D023</b>	SAMPLE TIME <b>1135</b>

LOCATION ID <b>GPZ-5D</b>	DATE <b>5/23/2019</b>
START TIME <b>1010</b>	END TIME <b>1200</b>
SITE NAME/NUMBER 828072	PAGE <b>1 OF 1</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY

YES	NO	N/A
—	<input checked="" type="checkbox"/>	—
—	<input checked="" type="checkbox"/>	—
—	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CAP \_\_\_\_\_  
CASING \_\_\_\_\_  
LOCKED \_\_\_\_\_  
COLLAR \_\_\_\_\_

INITIAL DTW (BMP) <b>11.40</b> FT	FINAL DTW (BMP) <b>11.97</b> FT	RISER BROK. CASING STICKUP (AGS) <b>0</b> FT	TOCTOR DIFFERENCE <b>NA</b> FT
WELL DEPTH (BMP) <b>25.00</b> FT	SCREEN LENGTH <b>UNK</b> FT	PID AMBIENT AIR <b>NA</b> PPM	REFILL TIMER SETTING <b>NA</b> SEC
WATER COLUMN <b>13.60</b> FT	DRAWDOWN VOLUME <b>0.023</b> GAL	PID WELL MOUTH <b>NA</b> PPM	DISCHARGE TIMER SETTING <b>NA</b> SEC
CALCULATED GAL/VOL <b>0.56</b> GAL	TOTAL VOL. PURGED <b>2.15</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.0011</b>	PRESSURE TO PUMP <b>NA</b> PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP. CONDUCTAN	pH (units)	DISS. O <sub>2</sub>	TURBIDITY (ntu)	REDOX (mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1021	BEGIN PURGING										
1030	11.99	140	11.99	3.029	6.70	2.26	49.6	85.2	NA	N23	
1035	12.01	140	11.98	3.013	6.73	0.94	28.9	84.5			
1040	11.94	125	11.92	2.993	6.74	0.63	28.0	85.7			
1045	11.93	125	12.00	2.962	6.75	0.44	26.0	87.4			
1050	11.96	125	11.92	2.948	6.77	0.36	27.3	89.0			
1055	11.95	125	12.00	2.920	6.78	0.32	18.9	90.5			
1100	11.95	125	11.83	2.909	6.79	0.29	24.3	91.7			
1105	11.97	125	11.76	2.884	6.81	0.29	14.0	92.3			
1110	11.96	125	11.75	2.877	6.82	0.27	12.2	92.7			
1115	11.97	125	11.75	2.860	6.83	0.26	9.51	93.3			
1120	11.95	125	11.79	2.853	6.84	0.25	7.50	93.5			
1125	11.96	125	11.92	2.841	6.85	0.25	7.12	93.7			
1130	11.97	125	12.20	2.827	6.86	0.24	7.74	93.9			
1135	COLLECT SAMPLES										

REDUCED PUMP SPEED TO TRY TO REDUCE DRAWDOWN

WPA 5/23/2019

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

12      2.83      6.9      0.2      7.7      94

TEMP: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION											
TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input checked="" type="checkbox"/> LIQUINOX <input checked="" type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>										
TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____										
<table border="1"> <tr> <td><input checked="" type="checkbox"/> WL METER</td> <td>HEARON DIPPERT M200-70</td> </tr> <tr> <td><input checked="" type="checkbox"/> TURB. METER</td> <td>HACH 2100Q M024-31</td> </tr> <tr> <td><input checked="" type="checkbox"/> WQ METER</td> <td>YSI 556 MPS M015-015</td> </tr> <tr> <td><input checked="" type="checkbox"/> PUMP</td> <td>Geopump SC08-35</td> </tr> <tr> <td><input type="checkbox"/> FILTERS</td> <td>NO. _____ TYPE _____</td> </tr> </table>		<input checked="" type="checkbox"/> WL METER	HEARON DIPPERT M200-70	<input checked="" type="checkbox"/> TURB. METER	HACH 2100Q M024-31	<input checked="" type="checkbox"/> WQ METER	YSI 556 MPS M015-015	<input checked="" type="checkbox"/> PUMP	Geopump SC08-35	<input type="checkbox"/> FILTERS	NO. _____ TYPE _____
<input checked="" type="checkbox"/> WL METER	HEARON DIPPERT M200-70										
<input checked="" type="checkbox"/> TURB. METER	HACH 2100Q M024-31										
<input checked="" type="checkbox"/> WQ METER	YSI 556 MPS M015-015										
<input checked="" type="checkbox"/> PUMP	Geopump SC08-35										
<input type="checkbox"/> FILTERS	NO. _____ TYPE _____										

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	R6K-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	413.1	No	4°C H2SO4	250 ml AG			

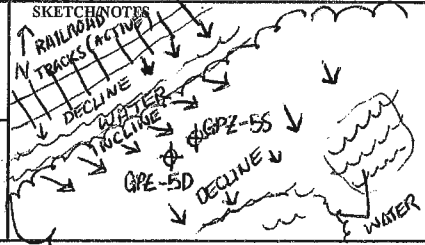
PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **2.25**

to sampling or \_\_\_\_\_ mL for this sample location.



NOTES: SOFT BOTTOM

- PURGE WATER INITIAL GRAY-BROWN IN COLOR, CLOUDY, SLIGHT ODOR
- WATER BECAME COLORLESS AFTER ~20 MINUTES OF PURGING.
- WELL RISER STICK-UP PORTION BROKEN OFF; WELL IS FLUSH WITH GROUND SURFACE.

Sampler Signature: *K. Amann* Print Name: **KATIE AMANN**

Checked By: *Jerry Pauloff* Date: **5/29/19**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- <b>GPZ68017</b>	SAMPLE TIME <b>1445</b>

LOCATION ID <b>GPZ-6S</b>	DATE <b>5/23/2019</b>
START TIME <b>1350</b>	END TIME <b>1512</b>
SITE NAME/NUMBER 828072	PAGE <b>1 OF 1</b>

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

WELL INTEGRITY  
YES NO N/A  
 YES  NO  N/A

CAP  YES  NO  N/A  
CASING  YES  NO  N/A  
LOCKED  YES  NO  N/A  
COLLAR  YES  NO  N/A

**← STICK UP RISER, NO PROTECTIVE CASING**

INITIAL DTW (BMP) <b>9.55</b> FT	FINAL DTW (BMP) <b>11.72</b> FT	RISER PROT. CASING STICKUP (AGS) <b>0.6</b> FT	TOC/TOR DIFFERENCE <b>NA</b> FT
WELL DEPTH (BMP) <b>19.38</b> FT	SCREEN LENGTH <b>UNK</b> FT	PID AMBIENT AIR <b>NA</b> PPM	REFILL TIMER SETTING <b>NA</b> SEC
WATER COLUMN <b>9.83</b> FT	DRAWDOWN VOLUME <b>0.09</b> GAL	PID WELL MOUTH <b>NA</b> PPM	DISCHARGE TIMER SETTING <b>NA</b> SEC
CALCULATED GAL/VOL <b>0.40</b> GAL	TOTAL VOL. PURGED <b>1.51</b> GAL	DRAWDOWN/TOTAL PURGED <b>0.06</b>	PRESSURE TO PUMP <b>NA</b> PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
<b>1356</b>	BEGIN PURGING											
<b>1405</b>	<b>10.54</b>	<b>150</b>	<b>9.60</b>	<b>2.087</b>	<b>6.58</b>	<b>1.15</b>	<b>13.2</b>	<b>58.3</b>	<b>NA</b>	<b>217</b>	<del>DATA 5/23/19</del>	
<b>1410</b>	<b>10.85</b>	<b>150</b>	<b>9.42</b>	<b>2.090</b>	<b>6.58</b>	<b>0.73</b>	<b>10.7</b>	<b>58.0</b>				
<b>1415</b>	<b>11.06</b>	<b>150</b>	<b>9.24</b>	<b>2.095</b>	<b>6.59</b>	<b>0.54</b>	<b>6.31</b>	<b>57.4</b>				
<b>1420</b>	<b>11.20</b>	<b>150</b>	<b>9.48</b>	<b>2.089</b>	<b>6.60</b>	<b>0.43</b>	<b>6.18</b>	<b>57.4</b>				
<b>1425</b>	<b>11.35</b>	<b>140</b>	<b>9.59</b>	<b>2.092</b>	<b>6.60</b>	<b>0.43</b>	<b>5.49</b>	<b>59.8</b>				
<b>1430</b>	<b>11.50</b>	<b>140</b>	<b>9.52</b>	<b>2.093</b>	<b>6.60</b>	<b>0.38</b>	<b>5.72</b>	<b>61.7</b>				
<b>1435</b>	<b>11.62</b>	<b>140</b>	<b>9.54</b>	<b>2.093</b>	<b>6.60</b>	<b>0.37</b>	<b>5.85</b>	<b>63.5</b>				
<b>1440</b>	<b>11.72</b>	<b>140</b>	<b>9.57</b>	<b>2.090</b>	<b>6.61</b>	<b>0.31</b>	<b>5.54</b>	<b>63.8</b>				
<b>1445</b>	COLLECT SAMPLES											

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

**10      2.09      6.6      0.3      5.5      64**

TEMP.: nearest degree (ex. 10.1 = 10)  
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
pH: nearest tenth (ex. 5.53 = 5.5)  
DO: nearest tenth (ex. 3.51 = 3.5)  
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input checked="" type="checkbox"/> LIQUINOX <input checked="" type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <b>Indicated</b>	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	S. STEEL PUMP MATERIAL PVC PUMP MATERIAL GEOPROBE SCREEN TEFLON BLADDER OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER <b>HEXON DIPPER-T M200-10</b> <input checked="" type="checkbox"/> TURB. METER <b>HACH 2100Q M024-31</b> <input checked="" type="checkbox"/> WQ METER <b>YSI 556 MPS M015-05</b> <input checked="" type="checkbox"/> PUMP <b>Geopump SCOB-35</b> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATIO N METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	YES	NO	NA
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	254.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO <sub>3</sub>	50 ml Poly			
Ethane, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H <sub>2</sub> SO <sub>4</sub>	250 ml AG			

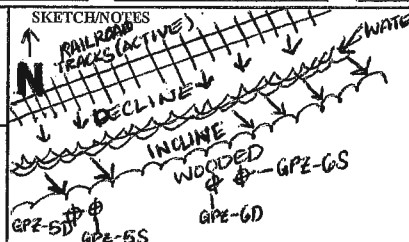
PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED  YES  NO

NO-PURGE METHOD UTILIZED  YES  NO

NUMBER OF GALLONS GENERATED **1.75**

to sampling or location.



NOTES

\*PURGE WATER DESCRIPTION:  
OLIVE-GRAY, ODD, SUSPENDED GRAY PARTICULATES.

Sampler Signature: *Katie Annmann* Print Name: **KATIE ANNMAN**

Checked By: *Jerry Puliff* Date: **5/29/19**



**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072- **GPZ6D026**      SAMPLE TIME: **1640**

LOCATION ID: **GPZ-6D**      DATE: **5/23/2019**  
 START TIME: **1315**      END TIME: **1710**  
 SITE NAME/NUMBER: 828072      PAGE: **1** OF **1**

WELL DIAMETER (INCHES)  1     2     4     6     8     OTHER \_\_\_\_\_  
 TUBING ID (INCHES)     1/8     1/4     3/8     1/2     5/8     OTHER \_\_\_\_\_  
 MEASUREMENT POINT (MP)     TOP OF RISER (TOR)     TOP OF CASING (TOC)     OTHER \_\_\_\_\_

WELL INTEGRITY  
 YES    NO    N/A  
 CAP \_\_\_\_\_  
 CASING  PVC RISER, NO PROTECTIVE CASING  
 LOCKED \_\_\_\_\_  
 COLLAR \_\_\_\_\_

INITIAL DTW (BMP): **14.25** FT      FINAL DTW (BMP): **14.54** FT      RISER PROTECT CASING STICKUP (AGS): **2.6** FT      TOC/TOR DIFFERENCE: **NA** FT  
 WELL DEPTH (BMP): **28.90** FT      SCREEN LENGTH: \_\_\_\_\_ FT      PID AMBIENT AIR: **NA** PPM      REFILL TIMER SETTING: **NA** SEC  
 WATER COLUMN: **14.65** FT      DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): **0.012** GAL      PID WELL MOUTH: **NA** PPM      DISCHARGE TIMER SETTING: **NA** SEC  
 CALCULATED GAL/VOL (column X well diameter squared X 0.041): **0.60** GAL      TOTAL VOL. PURGED: **2.18** GAL      DRAWDOWN/TOTAL PURGED: **0.005**      PRESSURE TO PUMP: **NA** PSI

**FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)**

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE mS/cm (3%)	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments	
<b>1525</b>	<b>BEGIN PURGING</b>											
<b>1540</b>	<b>14.50</b>	<b>140</b>	<b>12.20</b>	<b>2.029</b>	<b>7.06</b>	<b>0.64</b>	<b>60.3</b>	<b>92.7</b>	<b>NA</b>	<b>226</b>	<del>TABLE</del> <b>5/23/2019</b>	
<b>1545</b>	<b>14.51</b>	<b>140</b>	<b>12.33</b>	<b>2.074</b>	<b>7.07</b>	<b>0.51</b>	<b>35.5</b>	<b>93.8</b>				
<b>1550</b>	<b>14.52</b>	<b>140</b>	<b>12.04</b>	<b>2.134</b>	<b>7.08</b>	<b>0.42</b>	<b>20.1</b>	<b>94.8</b>				
<b>1555</b>	<b>14.53</b>	<b>140</b>	<b>12.38</b>	<b>2.178</b>	<b>7.10</b>	<b>0.35</b>	<b>12.7</b>	<b>95.6</b>				
<b>1600</b>	<b>14.54</b>	<b>140</b>	<b>12.23</b>	<b>2.219</b>	<b>7.10</b>	<b>0.30</b>	<b>8.09</b>	<b>96.2</b>				
<b>1605</b>	<b>14.53</b>	<b>140</b>	<b>12.23</b>	<b>2.224</b>	<b>7.10</b>	<b>0.27</b>	<b>7.06</b>	<b>97.1</b>				
<b>1610</b>	<b>14.54</b>	<b>140</b>	<b>12.17</b>	<b>2.238</b>	<b>7.11</b>	<b>0.27</b>	<b>7.14</b>	<b>98.0</b>				
<b>1615</b>	<b>14.54</b>	<b>140</b>	<b>12.25</b>	<b>2.244</b>	<b>7.11</b>	<b>0.25</b>	<b>5.70</b>	<b>98.2</b>				
<b>1620</b>	<b>14.54</b>	<b>140</b>	<b>12.36</b>	<b>2.271</b>	<b>7.11</b>	<b>0.23</b>	<b>5.81</b>	<b>98.4</b>				
<b>1625</b>	<b>14.54</b>	<b>140</b>	<b>12.22</b>	<b>2.280</b>	<b>7.12</b>	<b>0.24</b>	<b>4.50</b>	<b>99.2</b>				
<b>1630</b>	<b>14.54</b>	<b>140</b>	<b>12.34</b>	<b>2.284</b>	<b>7.12</b>	<b>0.23</b>	<b>4.98</b>	<b>99.0</b>				
<b>1635</b>	<b>14.54</b>	<b>140</b>	<b>12.23</b>	<b>2.298</b>	<b>7.12</b>	<b>0.21</b>	<b>4.16</b>	<b>100.1</b>				
<b>1640</b>	<b>COLLECT SAMPLES</b>											

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

**12    2.30    7.1    0.2    4.2    100**

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

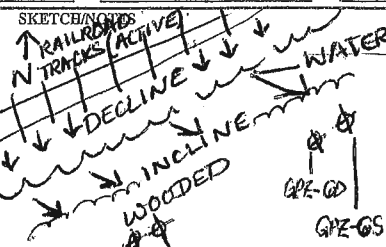
TYPE OF PUMP:  PERISTALTIC SUBMERSIBLE BLADDER     OTHER \_\_\_\_\_  
 DECON FLUIDS USED:  LIQUINOX     DEIONIZED WATER     POTABLE WATER     NITRIC ACID     OTHER: **Deductor**  
 TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING     HDPE TUBING     LDPE TUBING     HDPE TUBING     OTHER \_\_\_\_\_  
 S. STEEL PUMP MATERIAL    PVC PUMP MATERIAL    GEOPROBE SCREEN    TEFLON BLADDER    OTHER \_\_\_\_\_  
 EQUIPMENT USED: WL METER: **HEARN DIPPER-TM200-70**    TURB. METER: **HACH 2100Q M024-31**    WQ METER: **YSI 556 MPS M015-05**    PUMP: **Geopump SC08-35**    FILTERS: NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<b>YES</b>	<b>NO</b>	<b>NA</b>
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	390	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED: YES  NO   
 NO-PURGE METHOD UTILIZED: YES  NO   
 NUMBER OF GALLONS GENERATED: **2.25**  
 to sampling or \_\_\_\_\_ mL for this sample location.



NOTES: **SOFT BOTTOM**  
 PURGE WATER DESCRIPTION: **GRAY, ODOR, CLOUDY. BECAME COLORLESS AND CLEAR AFTER ~ 15 MINUTES OF PURGING**

Sampler Signature: *K. Mann*      Print Name: **KATIE MANN**  
 Checked By: *Jerry Pauloff*      Date: **5/29/19**

**LOW FLOW GROUNDWATER SAMPLING RECORD**

PROJECT NAME: Erdle Perforating Company  
 PROJECT NUMBER: 3617137306.02  
 SAMPLE ID: 828072- GP275010  
 SAMPLE TIME: 1320

LOCATION ID: GP2-75  
 DATE: 5/22/19  
 START TIME: 1205  
 END TIME: 1325  
 SITE NAME/NUMBER: 828072  
 PAGE: 1 OF 1

WELL DIAMETER (INCHES)  1  2  4  6  8  OTHER \_\_\_\_\_

TUBING ID (INCHES)  1/8  1/4  3/8  1/2  5/8  OTHER \_\_\_\_\_

MEASUREMENT POINT (MP)  TOP OF RISER (TOR)  TOP OF CASING (TOC)  OTHER \_\_\_\_\_

INITIAL DTW (BMP): 6.02 FT    FINAL DTW (BMP): 6.44 FT    PROT. CASING STICKUP (AGS): 2.7 FT    TOC/TOR DIFFERENCE: NA FT

WELL DEPTH (BMP): 10.5 FT    SCREEN LENGTH: UNK FT    PID AMBIENT AIR: \_\_\_\_\_ PPM    REFILL TIMER SETTING: \_\_\_\_\_ SEC

WATER COLUMN: 4.48 FT    DRAWDOWN VOLUME: 1.02 GAL    PID WELL MOUTH: \_\_\_\_\_ PPM    DISCHARGE TIMER SETTING: \_\_\_\_\_ SEC

CALCULATED GAL/VOL: 0.18 GAL    TOTAL VOL. PURGED: 1.65 GAL    DRAWDOWN/TOTAL PURGED: .01    PRESSURE TO PUMP: \_\_\_\_\_ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1215	BEGIN PURGING										
1225	6.33	90	10.5	1.024	7.2	2.3	4.2	85	0.51		
1235	6.34	100	10.3	0.868	7.2	1.7	2.9	73			
1240	6.37	100	10.3	0.834	7.0	1.4	1.6	72			Had to check w/ Toleno l.
1250	6.41	110	10.3	0.826	7.0	1.7	0.7	72			
1255	6.43	115	10.3	0.829	7.2	1.6	1.1	70			
1300	6.45	120	10.3	0.830	7.2	1.6	1.6	71	0.41		
1305	6.44	105	10.4	0.831	7.3	1.6	1.3	71			
1310	6.44	105	10.4	0.836	7.3	1.6	1.0	71			
1315	6.44	105	10.4	0.837	7.3	1.6	1.1	73			

**FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures [SF])**

10    0.837    7.3    1.6    1.1    73

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

**EQUIPMENT DOCUMENTATION**

TYPE OF PUMP:  PERISTALTIC SUBMERSIBLE BLADDER  OTHER \_\_\_\_\_

DECON FLUIDS USED:  LIQUINOX  DEIONIZED WATER  POTABLE WATER  NITRIC ACID  OTHER: Dedicated

TUBING/PUMP/BLADDER MATERIALS:  SILICON TUBING  HDPE TUBING  LDPE TUBING  HDPE TUBING  OTHER \_\_\_\_\_

EQUIPMENT USED:  WL METER: Wenon  TURB. METER: HACH 2100Q  WQ METER: YSI 556 MPS  PUMP: Geopump  FILTERS: NO. \_\_\_\_\_ TYPE \_\_\_\_\_

**ANALYTICAL PARAMETERS**

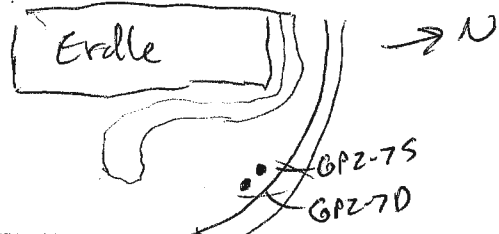
PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml		<input checked="" type="checkbox"/>	
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40 ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

**PURGE OBSERVATIONS**

PURGE WATER CONTAINERIZED: YES  NO  NUMBER OF GALLONS GENERATED: 1.5

NO-PURGE METHOD UTILIZED: YES  NO  to sampling or \_\_\_\_\_ mL for this sample location.

**SKETCH/NOTES**



Sampler Signature: Jerry Rawch Print Name: Jerry Rawch PFE  
 Checked By: [Signature] Date: 7/25/19

# LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company	
PROJECT NUMBER 3617137306.02	
SAMPLE ID 828072- 6PZ7D028	SAMPLE TIME 1440

LOCATION ID 6PZ-7D	DATE 5/22/19
START TIME 1325	END TIME 1455
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> N/A <input type="checkbox"/>		
TUBING ID (INCHES) <input type="checkbox"/> 1/8 <input checked="" type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/>		
MEASUREMENT POINT (MP) <input checked="" type="checkbox"/> TOP OF RISER (TOR) <input type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	CASING LOCKED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/>		
INITIAL DTW (BMP) <u>5.98</u> FT	FINAL DTW (BMP) <u>6.25</u> FT	PROT. CASING STICKUP (AGS) <u>2.4</u> FT	TOC/TOR DIFFERENCE <u>NA</u> FT
WELL DEPTH (BMP) <u>19.1</u> FT	SCREEN LENGTH <u>UNK</u> FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN <u>13.1</u> FT	DRAWDOWN VOLUME <u>.011</u> GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL <u>0.52</u> GAL	TOTAL VOL. PURGED <u>2.5</u> GAL	DRAWDOWN/ TOTAL PURGED <u>.004</u>	PRESSURE TO PUMP _____ PSI

### FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTAN CE (mS/cm (3%))	pH (units) (+/- 0.1 units)	DISS. O <sub>2</sub> (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	Salinity %	PUMP INTAKE DEPTH	Comments
1325	BEGIN PURGING										
1336	6.26	150	10.2	1.210	7.1	0.8	390	-49			Very turbid 1.5 liter reddish gray. Reddish tubing cap ≈ 4"
1345	6.23	130	10.4	1.184	7.0	1.2	690	-58			
1358	6.23	125	10.8	1.180	7.0	1.4	260	-60			
1400	6.24	130	10.8	1.177	7.0	1.3	180	-59			
1408	6.24	140	10.6	1.176	7.0	1.3	120	-56			
1410	6.25	135	10.6	1.169	7.1	1.2	74	-55			
1415	6.25	140	10.6	1.166	7.1	1.1	54	-54			
1420	6.26	140	10.5	1.166	7.1	1.1	46	-55			
1425	6.25	135	10.5	1.166	7.0	1.1	34	-53			
1430	6.25	140	10.5	1.164	7.1	1.0	27	-57			
1435	6.25	140	10.5	1.164	7.0	1.0	22	-58			

### FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

11      1.16      7.0      1.0      22      -58

TEMP.: nearest degree (ex. 10.1 = 10)  
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)  
 pH: nearest tenth (ex. 5.53 = 5.5)  
 DO: nearest tenth (ex. 3.51 = 3.5)  
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)  
 ORP: 2 SF (44.1 = 44, 191 = 190)

### EQUIPMENT DOCUMENTATION

<b>TYPE OF PUMP</b> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> OTHER _____	<b>DECON FLUIDS USED</b> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<b>TUBING/PUMP/BLADDER MATERIALS</b> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> OTHER _____	<b>EQUIPMENT USED</b> <input checked="" type="checkbox"/> WL METER <u>Wetron</u> <input checked="" type="checkbox"/> TURB. METER <u>HACH 2100Q</u> <input checked="" type="checkbox"/> WQ METER <u>YSI 556 MPS</u> <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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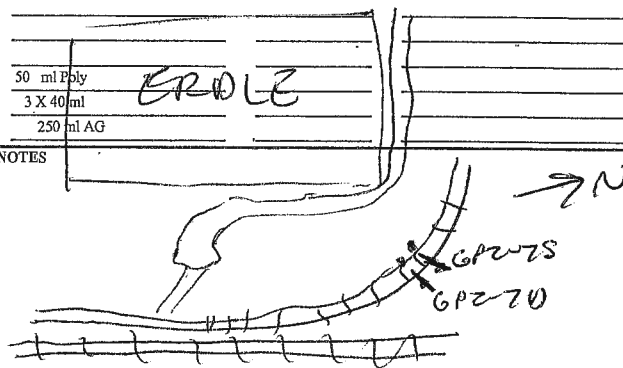
### ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTER	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOCs	8260C	No	4°C HCl	3 X 40 ml	<input checked="" type="checkbox"/>		
Alkalinity	2320B	No	4°C	250 ml Poly			
Chloride	300	No	4°C	250 ml Poly			
Nitrate	300	No	4°C				
Nitrite	354.1	No	4°C				
Sulfate	300	No	4°C				
Sulfide	4500	No	4°C				
Fe, Mn	6010B	No	4°C HNO3	50 ml Poly			
Ethene, Ethane, Methane	RSK-175	No	4°C HCl	3 X 40ml			
Total Organic Carbon	415.1	No	4°C H2SO4	250 ml AG			

### PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	NUMBER OF GALLONS GENERATED	<u>2.3</u>
NO-PURGE METHOD UTILIZED	YES <input type="checkbox"/> NO <input type="checkbox"/>	to sampling or _____ mL for this sample location.	

### SKETCH/NOTES



Sampler Signature: Jerry Rawcliffe Print Name: Jerry Rawcliffe  
 Checked By: [Signature] Date: 7/26/19



511 Congress Street, Portland Maine 04101

FIGURE 4.17  
 LOW FLOW GROUNDWATER SAMPLING RECORD  
 NYSDEC QUALITY ASSURANCE PROJECT PLAN

**ATTACHMENT 2**

**DATA USABILILTY SUMMARY REPORT**

**CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING EVENT  
ERDLE PERFORATING COMPANY SITE  
GATES, NEW YORK**

## 1.0 INTRODUCTION

Groundwater samples were collected at the Erdle Perforating Company Site in Gates, New York, in May 2019 and submitted for off-site laboratory analysis. Sample analyses included in this review were performed by ALS Environmental located in Rochester, New York, using the following United States Environmental Protection Agency (USEPA) method:

- Volatile organic compounds (VOCs) by USEPA Method 8260C

Results were reported in the following sample delivery groups (SDGs):

- R1904580
- R1904744
- R1904745

Sample event information included in this Category A review is presented in the following tables:

- Table 1 – Summary of Samples and Analytical Methods
- Table 2 – Summary of Analytical Results
- Table 3 – Summary of Qualification Actions

A summary of table notes applicable to Tables 1, 2, and 3 is presented just before Table 1.

Laboratory deliverables included:

- Category B deliverables as defined in the New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocols (NYSDEC, 2005).

The Category A review included the following evaluations. Data review checklists and applicable laboratory QC summary forms are provided as Attachment A.

- Lab Report Narrative Review
- Data Package Completeness and COC records (Table 1 verification)
- Sample Preservation and Holding Times
- QC Blanks
- Laboratory Control Samples (LCS)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD) (if applicable)
- Field Duplicates (if applicable)
- Surrogates (if applicable)



- Reporting Limits
- Electronic Data Qualification and Verification

The following laboratory or data review qualifiers are used in the final data presentation:

U = target analyte is not detected above the reported detection limit

J = concentration is estimated

Results are interpreted to be usable as reported by the laboratory or as qualified in the following section.

## 2.0 POTENTIAL DATA LIMITATIONS

Based on the Category A Review the data meet the data quality objectives; however, the following potential limitations were identified:

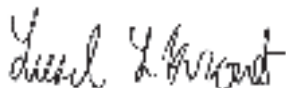
- Low level detections of acetone in samples 828072-MW006008, 828072-MW008023, 828072-MW02D020, 828072-MW03A008, 828072-MW05D010, 828072-MW06D015, 828072-MW08D033, and 828072-MW09D035 were qualified non detect (U) at the reporting limit based on a detection in the associated trip blank. Qualified results are included in Table 3 with reason code BL2.
- Low level detections of carbon disulfide in samples 828072-MW008023 and 828072-MW009025 were qualified non detect (U) at the reporting limit based on a detection in the associated method blank. Qualified results are included in Table 3 with reason code BL1.
- Low level detections of acetone in samples 828072-GPZ1D014, 828072-GPZ1S1008, 828072-GPZ2D020, 828072-GPZ2S1014, 828072-GPZ5S016, 828072-GPZ6D026, 828072-MW007015, 828072-MW019006, 828072-MW020006, 828072-MW07D022, 828072-MW16D020, and 828072-MW20D020 were qualified non detect (U) at the reporting limit based on a detection in the associated method blank. Qualified results are included in Table 3 with reason code BL1.
- The reporting limit for bromomethane in sample 828072-GPZ6D026 was qualified estimated (UJ) based on low recovery in the associated MS/MSD. Qualified results are included in Table 3 with reason code MSL.
- A subset of samples was analyzed at dilution due to high concentrations of target compounds. Non-detect results are reported with elevated reporting limits as presented in Table 2.

### Reference:

NYSDEC, 2005. "Analytical Services Protocols"; July 2005.

Data Validator: Liesel Krout

July 22, 2019



Reviewed by: Julie Ricardi

July 24, 2019

A handwritten signature in cursive script that reads "Julie Ricardi".

**Table Notes:**Sample Type (QC Code)

FS – field sample  
FD – field duplicate  
TB – trip blank  
EB – equipment blank  
FB – field blank

Matrix

GW – ground water  
BW – blank water  
TW – tap water  
SV – soil vapor  
SED - sediment

Units

mg/L – milligrams per liter  
µg/L – micrograms per liter  
mg/kg – milligrams per kilogram  
µg/kg – micrograms per kilogram  
µg/m<sup>3</sup> – micrograms per cubic meter

Qualifiers

U – not detected above quantitation limit  
J – estimated quantity  
J+ - estimated quantity, biased high  
J- - estimated quantity, biased low  
R – data unusable

Fraction

T – total  
D – dissolved  
N – normal

Qualification Reason Codes

BL1 – method blank qualifier  
BL2 – field or trip blank qualifier  
CCV – continuing calibration verification recovery outside limits  
CCV%D – continuing calibration verification percent difference exceeds goal  
CCVRRF – continuing calibration relative response factor low  
CI – chromatographic interference present  
DCPD – dual column percent difference exceeds limit  
E – result exceeds calibration range  
FD – field duplicate precision goal exceeded  
FP – false positive interference  
HT – holding time for prep or analysis exceeded  
HTG – holding time for prep or analysis grossly exceeded  
ICV – initial calibration verification recovery outside limit  
ICVRRF – initial calibration verification relative response factor low  
ICVRSD – initial calibration verification % relative standard deviation exceeds goal  
ISH – internal standard response greater than limit  
ISL – internal standard response less than limit  
LCSH – laboratory control sample recovery high  
LCSL – laboratory control sample recovery low  
LCSRPD – laboratory control sample/duplicate relative % difference precision goal exceeded  
LD – lab duplicate precision goal exceeded  
MSH – matrix spike and/or MS duplicate recovery high  
MSL – matrix spike and/or MS duplicate recovery low  
MSRPD – matrix spike/duplicate relative % difference precision goal exceeded  
N – analyte identification is not certain  
PEM – performance evaluation mixture exceeds limit  
PM – sample percent moisture exceeds EPA guideline  
SD – serial dilution result exceeds percent difference limit  
SP – sample preservation/collection does not meet method requirement  
SSH – surrogate recovery high  
SSL – surrogate recovery low  
TD – dissolved concentration exceeds total

TABLE 1 - SUMMARY OF SAMPLES AND ANALYTICAL METHODS  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Lab SDG	Loc Name	Field Sample ID	Media	Sample Date	Method Class		VOCs
					Analysis Method	Qc Code	SW8260C Param_Count
R1904580	MW-1A	828072-MW01A008	GW	5/21/2019	FS		60
R1904580	MW-21	828072-MW021012 D	GW	5/21/2019	FD		60
R1904580	MW-21	828072-MW21012	GW	5/21/2019	FS		60
R1904580	MW-21D	828072-MW21D020	GW	5/21/2019	FS		60
R1904580	MW-2A	828072-MW02A008	GW	5/21/2019	FS		60
R1904580	MW-2A	828072-MW02A008D	GW	5/21/2019	FD		60
R1904580	MW-2D	828072-MW02D020	GW	5/21/2019	FS		60
R1904580	MW-3A	828072-MW03A008	GW	5/21/2019	FS		60
R1904580	MW-3D	828072-MW03D014	GW	5/21/2019	FS		60
R1904580	MW-5	828072-MW005006	GW	5/21/2019	FS		60
R1904580	MW-5D	828072-MW05D010	GW	5/20/2019	FS		60
R1904580	MW-6	828072-MW006008	GW	5/21/2019	FS		60
R1904580	MW-6D	828072-MW06D015	GW	5/21/2019	FS		60
R1904580	MW-8	828072-MW008023	GW	5/21/2019	FS		60
R1904580	MW-8D	828072-MW08D033	GW	5/21/2019	FS		60
R1904580	MW-9	828072-MW009025	GW	5/21/2019	FS		60
R1904580	MW-9D	828072-MW09D035	GW	5/21/2019	FS		60
R1904580	QC	828072-TB1	BW	5/20/2019	TB		60
R1904744	MW-11	828072-MW011012	GW	5/23/2019	FS		60
R1904744	MW-11D	828072-MW11D023	GW	5/23/2019	FS		60
R1904744	MW-13	828072-MW013006	GW	5/22/2019	FS		60
R1904744	MW-13D	828072-MW13D12	GW	5/23/2019	FS		60
R1904744	MW-13D	828072-MW13D12 DUP	GW	5/23/2019	FD		60
R1904744	MW-13DD	828072-MW13DD040	GW	5/23/2019	FS		60
R1904744	MW-14	828072-MW014016	GW	5/23/2019	FS		60
R1904744	MW-14D	828072-MW14D033	GW	5/23/2019	FS		60
R1904744	MW-15	828072-MW015006	GW	5/22/2019	FS		60
R1904744	MW-15D	828072-MW15D023	GW	5/22/2019	FS		60
R1904744	MW-17	828072-MW017007	GW	5/22/2019	FS		60
R1904744	MW-17D	828072-MW17D023	GW	5/23/2019	FS		60
R1904744	MW-18	828072-MW018010	GW	5/22/2019	FS		60
R1904744	MW-18D	828072-MW18D021	GW	5/22/2019	FS		60
R1904744	MW-1DD	828072-MW01DD038	GW	5/22/2019	FS		60
R1904744	MW-4	828072-MW004008	GW	5/22/2019	FS		60
R1904744	MW-4D	828072-MW04D020	GW	5/22/2019	FS		60
R1904745	GPZ-1D	828072-GPZ1D014	GW	5/24/2019	FS		60
R1904745	GPZ-1S1	828072-GPZ1S1008	GW	5/23/2019	FS		60
R1904745	GPZ-2D	828072-GPZ2D020	GW	5/24/2019	FS		60
R1904745	GPZ-2S1	828072-GPZ2S1014	GW	5/23/2019	FS		60

TABLE 1 - SUMMARY OF SAMPLES AND ANALYTICAL METHODS  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Lab SDG	Loc Name	Field Sample ID	Media	Sample Date	Method Class		VOCs
					Analysis Method	Qc Code	SW8260C Param_Count
R1904745	GPZ-5D	828072-GPZ5D023	GW	5/23/2019	FS		60
R1904745	GPZ-5S	828072-GPZ5S016	GW	5/23/2019	FS		60
R1904745	GPZ-6D	828072-GPZ6D026	GW	5/23/2019	FS		60
R1904745	GPZ-6S	828072-GPZ6S017	GW	5/23/2019	FS		60
R1904745	GPZ-7D	828072-GPZ7D028	GW	5/22/2019	FS		60
R1904745	GPZ-7S	828072-GPZ7S010	GW	5/22/2019	FS		60
R1904745	MW-10	828072-MW010016	GW	5/22/2019	FS		60
R1904745	MW-12	828072-MW012011	GW	5/23/2019	FS		60
R1904745	MW-16	828072-MW016007	GW	5/24/2019	FS		60
R1904745	MW-16D	828072-MW16D020	GW	5/24/2019	FS		60
R1904745	MW-19	828072-MW019006	GW	5/22/2019	FS		60
R1904745	MW-19D	828072-MW19D017	GW	5/22/2019	FS		60
R1904745	MW-20	828072-MW020006	GW	5/24/2019	FS		60
R1904745	MW-20D	828072-MW20D020	GW	5/24/2019	FS		60
R1904745	MW-7	828072-MW007015	GW	5/22/2019	FS		60
R1904745	MW-7D	828072-MW07D022	GW	5/22/2019	FS		60
R1904745	QC	828072-TB2	BW	5/22/2019	TB		60

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code	MW-1A R1904580 5/21/2019 828072-MW01A008 FS		MW-21 R1904580 5/21/2019 828072-MW021012 FS		MW-21 R1904580 5/21/2019 828072-MW021012 D FD		MW-21D R1904580 5/21/2019 828072-MW21D020 FS	
				Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result
SW8260C	N	1,1,1-Trichloroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	10	U	0.85	J	0.82	J	0.7	J
SW8260C	N	1,1-Dichloroethene	ug/l	10	U	0.3	J	0.27	J	0.27	J
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	20	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	400	U	40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	160	U	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	50	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	19	J	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	20	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	530	U	5	U	5	U	5	U
SW8260C	N	Benzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	3.1	J	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	4.5	J	70	U	69	U	40	U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	16	U	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	3.7	J	0.63	J	0.66	J	0.56	J
SW8260C	N	trans-1,3-Dichloropropene	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	2.2	J	4.3	U	4	U	1.9	U
SW8260C	N	Trichlorofluoromethane	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	11	U	5.4	U	6.2	U	2.4	U
SW8260C	N	Xylene, o	ug/l	10	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	20	U	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code	MW-2A R1904580 5/21/2019 828072-MW02A008 FS		MW-2A R1904580 5/21/2019 828072-MW02A008D FD		MW-2D R1904580 5/21/2019 828072-MW02D020 FS		MW-3A R1904580 5/21/2019 828072-MW03A008 FS	
				Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result
SW8260C	N	1,1,1-Trichloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,1-Dichloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,1-Dichloroethene	ug/l	14	J	14	J	1	U	10	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	20	U	20	U	1	U	3.4	J
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	40	U	40	U	2	U	20	U
SW8260C	N	1,2-Dibromoethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,2-Dichloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,2-Dichloropropane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	1,4-Dioxane	ug/l	800	U	800	U	40	U	400	U
SW8260C	N	2-Butanone	ug/l	100	U	100	U	5	U	10	J
SW8260C	N	2-Hexanone	ug/l	100	U	100	U	5	U	50	U
SW8260C	N	4-iso-Propyltoluene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	100	U	100	U	5	U	7.5	J
SW8260C	N	Acetic acid, methyl ester	ug/l	40	U	40	U	2	U	20	U
SW8260C	N	Acetone	ug/l	100	U	100	U	5	U	50	U
SW8260C	N	Benzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Bromochloromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Bromodichloromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Bromoform	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Bromomethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Carbon disulfide	ug/l	20	U	20	U	0.43	J	10	U
SW8260C	N	Carbon tetrachloride	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Chlorobenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Chloroethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Chloroform	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Chloromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	6800		8500		9.9		75	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Cyclohexane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Dibromochloromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Dichlorodifluoromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Ethylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Isopropylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Methyl cyclohexane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Methylene chloride	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	n-Butylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Naphthalene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Propylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	sec-Butylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Styrene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	tert-Butylbenzene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Tetrachloroethene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Toluene	ug/l	20	U	20	U	1	U	4.5	J
SW8260C	N	trans-1,2-Dichloroethene	ug/l	43		52		1	U	10	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Trichloroethene	ug/l	530		800		0.57	J	10	U
SW8260C	N	Trichlorofluoromethane	ug/l	20	U	20	U	1	U	10	U
SW8260C	N	Vinyl chloride	ug/l	660		730		1.6		53	
SW8260C	N	Xylene, o	ug/l	20	U	20	U	1	U	3.1	J
SW8260C	N	Xylenes (m&p)	ug/l	40	U	40	U	2	U	3.5	J

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code	MW-3D R1904580 5/21/2019 828072-MW03D014 FS		MW-5 R1904580 5/21/2019 828072-MW005006 FS		MW-5D R1904580 5/20/2019 828072-MW05D010 FS		MW-6 R1904580 5/21/2019 828072-MW006008 FS		
				Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,1,2-Trichloroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,1-Dichloroethane	ug/l	5	U	0.4	J	0.5	J	1	U	
SW8260C	N	1,1-Dichloroethene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	10	U	2	U	2	U	2	U	
SW8260C	N	1,2-Dibromoethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2-Dichlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2-Dichloroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,2-Dichloropropane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,3-Dichlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,4-Dichlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	1,4-Dioxane	ug/l	200	U	40	U	40	U	40	U	
SW8260C	N	2-Butanone	ug/l	140	U	5	U	5	U	5	U	
SW8260C	N	2-Hexanone	ug/l	25	U	5	U	5	U	5	U	
SW8260C	N	4-iso-Propyltoluene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	4-Methyl-2-pentanone	ug/l	3.9	J	5	U	5	U	5	U	
SW8260C	N	Acetic acid, methyl ester	ug/l	10	U	2	U	2	U	2	U	
SW8260C	N	Acetone	ug/l	630	U	8.7	U	5	U	5	U	
SW8260C	N	Benzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Bromochloromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Bromodichloromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Bromoform	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Bromomethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Carbon disulfide	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Carbon tetrachloride	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Chlorobenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Chloroethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Chloroform	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Chloromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	cis-1,2-Dichloroethene	ug/l	530	U	0.42	J	0.4	J	0.69	J	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Cyclohexane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Dibromochloromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Dichlorodifluoromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Ethylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Isopropylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Methyl cyclohexane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Methyl Tertbutyl Ether	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Methylene chloride	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	n-Butylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Naphthalene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Propylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	sec-Butylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Styrene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	tert-Butylbenzene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Tetrachloroethene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Toluene	ug/l	6.3	U	1	U	1	U	1	U	
SW8260C	N	trans-1,2-Dichloroethene	ug/l	2.3	J	1	U	1	U	1	U	
SW8260C	N	trans-1,3-Dichloropropene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Trichloroethene	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Trichlorofluoromethane	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Vinyl chloride	ug/l	230	U	1	U	1	U	0.47	J	
SW8260C	N	Xylene, o	ug/l	5	U	1	U	1	U	1	U	
SW8260C	N	Xylenes (m&p)	ug/l	10	U	2	U	2	U	2	U	



TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDL PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location	MW-6D	MW-8	MW-8D	MW-9		
			Lab SDG	R1904580	R1904580	R1904580			
			Sample Date	5/21/2019	5/21/2019	5/21/2019			
Field Sample ID			828072-MW06D015	828072-MW008023	828072-MW008D033	828072-MW009025			
Qc Code			FS	FS	FS	FS			
Units			Result	Qualifier	Result	Qualifier	Result	Qualifier	
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.92	J	1.5		0.8	J
SW8260C	N	1,1-Dichloroethene	ug/l	0.99	J	0.38	J	0.98	J
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	5	U	5	U	5	U
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	0.36	J	1	U	0.35	J
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	220		150		200	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	2.2		3.4		2.3	
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	18		0.34	J	130	
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	11		33		6.9	
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

			Location	MW-9D	QC
			Lab SDG	R1904580	R1904580
			Sample Date	5/21/2019	5/20/2019
			Field Sample ID	828072-MW09D035	828072-TB1
			Qc Code	FS	TB
Method	Fraction	Parameter	Units	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.27	J
SW8260C	N	1,1-Dichloroethene	ug/l	0.26	J
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U
SW8260C	N	2-Butanone	ug/l	5	U
SW8260C	N	2-Hexanone	ug/l	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U
SW8260C	N	Acetone	ug/l	5	J
SW8260C	N	Benzene	ug/l	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U
SW8260C	N	Bromoform	ug/l	1	U
SW8260C	N	Bromomethane	ug/l	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U
SW8260C	N	Chloroethane	ug/l	1	U
SW8260C	N	Chloroform	ug/l	1	U
SW8260C	N	Chloromethane	ug/l	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	70	U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U
SW8260C	N	Cyclohexane	ug/l	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U
SW8260C	N	Methylene chloride	ug/l	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U
SW8260C	N	Naphthalene	ug/l	1	U
SW8260C	N	Propylbenzene	ug/l	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U
SW8260C	N	Styrene	ug/l	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U
SW8260C	N	Toluene	ug/l	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	3.6	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U
SW8260C	N	Trichloroethene	ug/l	16	U
SW8260C	N	Trichlorofluoromethane	ug/l	1	U
SW8260C	N	Vinyl chloride	ug/l	3.2	U
SW8260C	N	Xylene, o	ug/l	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code Units	MW-11 R1904744 5/23/2019 828072-MW011012 FS		MW-11D R1904744 5/23/2019 828072-MW11D023 FS		MW-13 R1904744 5/22/2019 828072-MW013006 FS		MW-13D R1904744 5/23/2019 828072-MW13D12 FS	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,1,2-Trichloroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,1-Dichloroethane	ug/l	1 U		0.88 J		1 U		0.9 J	
SW8260C	N	1,1-Dichloroethene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2 U		2 U		2 U		2 U	
SW8260C	N	1,2-Dibromoethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2-Dichlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2-Dichloroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,2-Dichloropropane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,3-Dichlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,4-Dichlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	1,4-Dioxane	ug/l	40 U		40 U		40 U		40 U	
SW8260C	N	2-Butanone	ug/l	5 U		5 U		5 U		5 U	
SW8260C	N	2-Hexanone	ug/l	5 U		5 U		5 U		5 U	
SW8260C	N	4-iso-Propyltoluene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	4-Methyl-2-pentanone	ug/l	5 U		5 U		5 U		5 U	
SW8260C	N	Acetic acid, methyl ester	ug/l	2 U		2 U		2 U		2 U	
SW8260C	N	Acetone	ug/l	2.8 J		5 U		5 U		2.4 J	
SW8260C	N	Benzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Bromochloromethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Bromodichloromethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Bromoform	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Bromomethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Carbon disulfide	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Carbon tetrachloride	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Chlorobenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Chloroethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Chloroform	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Chloromethane	ug/l	0.31 J		0.39 J		1 U		1 U	
SW8260C	N	cis-1,2-Dichloroethene	ug/l	1 U		73		1 U		120	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Cyclohexane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Dibromochloromethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Dichlorodifluoromethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Ethylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Isopropylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Methyl cyclohexane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Methylene chloride	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	n-Butylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Naphthalene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Propylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	sec-Butylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Styrene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	tert-Butylbenzene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Tetrachloroethene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Toluene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1 U		0.79 J		1 U		0.48 J	
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Trichloroethene	ug/l	1 U		1 U		1 U		0.27 J	
SW8260C	N	Trichlorofluoromethane	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Vinyl chloride	ug/l	1 U		110		1 U		19	
SW8260C	N	Xylene, o	ug/l	1 U		1 U		1 U		1 U	
SW8260C	N	Xylenes (m&p)	ug/l	2 U		2 U		2 U		2 U	

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code Units	MW-13D R1904744 5/23/2019 828072-MW13D12 DUP FD		MW-13DD R1904744 5/23/2019 828072-MW13DD040 FS		MW-14 R1904744 5/23/2019 828072-MW014016 FS		MW-14D R1904744 5/23/2019 828072-MW14D033 FS	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.92	J	1		0.76	J	1.4	
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	0.48	J	1	U	0.5	J
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U	40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	2.2	J	5	U	3	J	2.9	J
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	0.4	J	0.3	J
SW8260C	N	cis-1,2-Dichloroethene	ug/l	130		190		63		160	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	0.54	J	1.1		0.23	J	0.64	J
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	0.25	J	26		0.42	J	16	
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	18		13		15		4.7	
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code Units	MW-15 R1904744 5/22/2019 828072-MW015006 FS		MW-15D R1904744 5/22/2019 828072-MW15D023 FS		MW-17 R1904744 5/22/2019 828072-MW017007 FS		MW-17D R1904744 5/23/2019 828072-MW17D023 FS	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,1,2-Trichloroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,1-Dichloroethane	ug/l	1 U		1.8 J		1 U		1 U	
SW8260C	N	1,1-Dichloroethene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2 U		4 U		2 U		2 U	
SW8260C	N	1,2-Dibromoethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2-Dichlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2-Dichloroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,2-Dichloropropane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,3-Dichlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,4-Dichlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	1,4-Dioxane	ug/l	40 U		80 U		40 U		40 U	
SW8260C	N	2-Butanone	ug/l	5 U		10 U		5 U		5 U	
SW8260C	N	2-Hexanone	ug/l	5 U		10 U		5 U		5 U	
SW8260C	N	4-iso-Propyltoluene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	4-Methyl-2-pentanone	ug/l	5 U		10 U		5 U		5 U	
SW8260C	N	Acetic acid, methyl ester	ug/l	2 U		4 U		2 U		2 U	
SW8260C	N	Acetone	ug/l	2.4 J		10 U		4.2 J		3.9 J	
SW8260C	N	Benzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Bromochloromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Bromodichloromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Bromoform	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Bromomethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Carbon disulfide	ug/l	1 U		2 U		1 U		0.91 J	
SW8260C	N	Carbon tetrachloride	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Chlorobenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Chloroethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Chloroform	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Chloromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	cis-1,2-Dichloroethene	ug/l	0.41 J		260		1 U		0.67 J	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Cyclohexane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Dibromochloromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Dichlorodifluoromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Ethylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Isopropylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Methyl cyclohexane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Methylene chloride	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	n-Butylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Naphthalene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Propylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	sec-Butylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Styrene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	tert-Butylbenzene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Tetrachloroethene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Toluene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1 U		0.96 J		1 U		1 U	
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Trichloroethene	ug/l	1 U		0.4 J		1 U		1 U	
SW8260C	N	Trichlorofluoromethane	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Vinyl chloride	ug/l	1 U		24		1 U		5	
SW8260C	N	Xylene, o	ug/l	1 U		2 U		1 U		1 U	
SW8260C	N	Xylenes (m&p)	ug/l	2 U		4 U		2 U		2 U	

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDLE PERFORATING COMPANY  
GATES, NEW YORK

Method	Fraction	Parameter	Location Lab SDG Sample Date Field Sample ID Qc Code Units	MW-18 R1904744 5/22/2019 828072-MW018010 FS		MW-18D R1904744 5/22/2019 828072-MW18D021 FS		MW-1DD R1904744 5/22/2019 828072-MW01DD038 FS		MW-4 R1904744 5/22/2019 828072-MW004008 FS	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	1	U	1.3		1	U	1	U
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U	40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	3.5	J	3.5	J	3.8	J	3.6	J
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	2.5		1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	1.3		150		1	U	1.1	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1	U	0.69	J	1	U	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	1	U	1	U	1	U	1.3	
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	1.8		61		1	U	0.31	J
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
 CATEGORY A REVIEW REPORT  
 MAY 2019 GROUNDWATER SAMPLING  
 ERDLE PERFORATING COMPANY  
 GATES, NEW YORK

			Location	MW-4D	
			Lab SDG	R1904744	
			Sample Date	5/22/2019	
			Field Sample ID	828072-MW04D020	
			Qc Code	FS	
Method	Fraction	Parameter	Units	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.31	J
SW8260C	N	1,1-Dichloroethene	ug/l	1	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U
SW8260C	N	2-Butanone	ug/l	5	U
SW8260C	N	2-Hexanone	ug/l	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U
SW8260C	N	Acetone	ug/l	5	U
SW8260C	N	Benzene	ug/l	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U
SW8260C	N	Bromoform	ug/l	1	U
SW8260C	N	Bromomethane	ug/l	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U
SW8260C	N	Chloroethane	ug/l	1	U
SW8260C	N	Chloroform	ug/l	1	U
SW8260C	N	Chloromethane	ug/l	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	3.1	
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U
SW8260C	N	Cyclohexane	ug/l	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U
SW8260C	N	Methylene chloride	ug/l	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U
SW8260C	N	Naphthalene	ug/l	1	U
SW8260C	N	Propylbenzene	ug/l	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U
SW8260C	N	Styrene	ug/l	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U
SW8260C	N	Toluene	ug/l	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	0.33	J
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U
SW8260C	N	Trichloroethene	ug/l	3.5	
SW8260C	N	Trichlorofluoromethane	ug/l	1	U
SW8260C	N	Vinyl chloride	ug/l	0.34	J
SW8260C	N	Xylene, o	ug/l	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDL PERFORATING COMPANY  
GATES, NEW YORK

			Location	GPZ-1D		GPZ-1S1		GPZ-2D		GPZ-2S1	
			Lab SDG	R1904745		R1904745		R1904745		R1904745	
			Sample Date	5/24/2019		5/23/2019		5/24/2019		5/23/2019	
			Field Sample ID	828072-GPZ1D014		828072-GPZ1S1008		828072-GPZ2D020		828072-GPZ2S1014	
			Qc Code	FS		FS		FS		FS	
Method	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	6.5		1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethene	ug/l	0.3	J	1	U	1	U	1	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U	40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	5	U	1.3	J	0.86	J	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	0.7	J	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	180		1	U	1	U	1	U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1.4		1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	0.62	J	1	U	1	U	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	24		1	U	1	U	1	U
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	40		1	U	1	U	1	U
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U



TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
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Method	Fraction	Parameter	Location	GPZ-5D		GPZ-5S		GPZ-6D		GPZ-6S	
			Lab SDG	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
			Sample Date	R1904745 5/23/2019		R1904745 5/23/2019		R1904745 5/23/2019		R1904745 5/23/2019	
			Field Sample ID	828072-GPZ5D023		828072-GPZ5S016		828072-GPZ6D026		828072-GPZ6S017	
			Qc Code	FS		FS		FS		FS	
			Units								
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.78	J	0.21	J	5.2		1	U
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	40	U	40	U	26	J	40	U
SW8260C	N	2-Butanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	1	U	0.36	J
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	1	U	0.29	J
SW8260C	N	cis-1,2-Dichloroethene	ug/l	34		8.2		83		1	U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	0.46	J	1	U	0.47	J	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	7		0.89	J	1.3		1	U
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	10		0.69	J	24		1	U
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDL PERFORATING COMPANY  
GATES, NEW YORK

			Location	GPZ-7D		GPZ-7S		MW-10		MW-12	
			Lab SDG	R1904745		R1904745		R1904745		R1904745	
			Sample Date	5/22/2019		5/22/2019		5/22/2019		5/23/2019	
			Field Sample ID	828072-GPZ7D028		828072-GPZ7S010		828072-MW010016		828072-MW012011	
			Qc Code	FS		FS		FS		FS	
Method	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	14		1	U	1	U	1	U
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	1,4-Dioxane	ug/l	480		40	U	40	U	40	U
SW8260C	N	2-Butanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	4-iso-Propyltoluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2	U	2	U	2	U	2	U
SW8260C	N	Acetone	ug/l	5	U	5	U	5	U	5	U
SW8260C	N	Benzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	9.6		1	U	1	U	1	U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	0.82	J	1	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	n-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Naphthalene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Propylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	sec-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	tert-Butylbenzene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	0.56	J	1	U	1	U	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	240		1	U	1	U	1	U
SW8260C	N	Xylene, o	ug/l	1	U	1	U	1	U	1	U
SW8260C	N	Xylenes (m&p)	ug/l	2	U	2	U	2	U	2	U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
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			Location	MW-16	MW-16D	MW-19	MW-19D
			Lab SDG	R1904745	R1904745	R1904745	R1904745
			Sample Date	5/24/2019	5/24/2019	5/22/2019	5/22/2019
			Field Sample ID	828072-MW016007	828072-MW16D020	828072-MW019006	828072-MW19D017
			Qc Code	FS	FS	FS	FS
Method	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1 U		1 U	
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1 U		1 U	
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1 U		1 U	
SW8260C	N	1,1,2-Trichloroethane	ug/l	1 U		1 U	
SW8260C	N	1,1-Dichloroethane	ug/l	1 U	0.74 J	1 U	
SW8260C	N	1,1-Dichloroethene	ug/l	1 U		1 U	
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1 U		1 U	
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1 U		1 U	
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1 U		1 U	
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2 U		2 U	
SW8260C	N	1,2-Dibromoethane	ug/l	1 U		1 U	
SW8260C	N	1,2-Dichlorobenzene	ug/l	1 U		1 U	
SW8260C	N	1,2-Dichloroethane	ug/l	1 U		1 U	
SW8260C	N	1,2-Dichloropropane	ug/l	1 U		1 U	
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1 U		1 U	
SW8260C	N	1,3-Dichlorobenzene	ug/l	1 U		1 U	
SW8260C	N	1,4-Dichlorobenzene	ug/l	1 U		1 U	
SW8260C	N	1,4-Dioxane	ug/l	40 U		40 U	
SW8260C	N	2-Butanone	ug/l	5 U		5 U	
SW8260C	N	2-Hexanone	ug/l	5 U		5 U	
SW8260C	N	4-iso-Propyltoluene	ug/l	1 U		1 U	
SW8260C	N	4-Methyl-2-pentanone	ug/l	5 U		5 U	
SW8260C	N	Acetic acid, methyl ester	ug/l	2 U		2 U	
SW8260C	N	Acetone	ug/l	5 U		5 U	
SW8260C	N	Benzene	ug/l	1 U		1 U	
SW8260C	N	Bromochloromethane	ug/l	1 U		1 U	
SW8260C	N	Bromodichloromethane	ug/l	1 U		1 U	
SW8260C	N	Bromoform	ug/l	1 U		1 U	
SW8260C	N	Bromomethane	ug/l	1 U		1 U	
SW8260C	N	Carbon disulfide	ug/l	1 U		1 U	
SW8260C	N	Carbon tetrachloride	ug/l	1 U		1 U	
SW8260C	N	Chlorobenzene	ug/l	1 U		1 U	
SW8260C	N	Chloroethane	ug/l	1 U		1 U	
SW8260C	N	Chloroform	ug/l	1 U		1 U	
SW8260C	N	Chloromethane	ug/l	1 U		1 U	
SW8260C	N	cis-1,2-Dichloroethene	ug/l	1 U	60	1 U	0.47 J
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1 U		1 U	
SW8260C	N	Cyclohexane	ug/l	1 U		1 U	
SW8260C	N	Dibromochloromethane	ug/l	1 U		1 U	
SW8260C	N	Dichlorodifluoromethane	ug/l	1 U		1 U	
SW8260C	N	Ethylbenzene	ug/l	1 U		1 U	
SW8260C	N	Isopropylbenzene	ug/l	1 U		1 U	
SW8260C	N	Methyl cyclohexane	ug/l	1 U		1 U	
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1 U		1 U	
SW8260C	N	Methylene chloride	ug/l	1 U		1 U	
SW8260C	N	n-Butylbenzene	ug/l	1 U		1 U	
SW8260C	N	Naphthalene	ug/l	1 U		1 U	
SW8260C	N	Propylbenzene	ug/l	1 U		1 U	
SW8260C	N	sec-Butylbenzene	ug/l	1 U		1 U	
SW8260C	N	Styrene	ug/l	1 U		1 U	
SW8260C	N	tert-Butylbenzene	ug/l	1 U		1 U	
SW8260C	N	Tetrachloroethene	ug/l	1 U		1 U	
SW8260C	N	Toluene	ug/l	1 U		1 U	
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1 U	0.6 J	1 U	
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1 U		1 U	
SW8260C	N	Trichloroethene	ug/l	1 U		1 U	
SW8260C	N	Trichlorofluoromethane	ug/l	1 U		1 U	
SW8260C	N	Vinyl chloride	ug/l	1 U	46	1 U	0.32 J
SW8260C	N	Xylene, o	ug/l	1 U		1 U	
SW8260C	N	Xylenes (m&p)	ug/l	2 U		2 U	

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
 CATEGORY A REVIEW REPORT  
 MAY 2019 GROUNDWATER SAMPLING  
 ERDL PERFORATING COMPANY  
 GATES, NEW YORK

			Location Lab SDG Sample Date Field Sample ID Qc Code	MW-20 R1904745 5/24/2019 828072-MW020006 FS	MW-20D R1904745 5/24/2019 828072-MW20D020 FS	MW-7 R1904745 5/22/2019 828072-MW007015 FS	MW-7D R1904745 5/22/2019 828072-MW07D022 FS
Method	Fraction	Parameter	Units	Result	Qualifier		
SW8260C	N	1,1,1-Trichloroethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,1-Dichloroethane	ug/l	1 U		1 U	0.65 J
SW8260C	N	1,1-Dichloroethene	ug/l	1 U		1 U	1 U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2 U		2 U	2 U
SW8260C	N	1,2-Dibromoethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,2-Dichloroethane	ug/l	1 U		1 U	1 U
SW8260C	N	1,2-Dichloropropane	ug/l	1 U		1 U	1 U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	1,4-Dioxane	ug/l	40 U		40 U	40 U
SW8260C	N	2-Butanone	ug/l	5 U		5 U	5 U
SW8260C	N	2-Hexanone	ug/l	5 U		5 U	5 U
SW8260C	N	4-iso-Propyltoluene	ug/l	1 U		1 U	1 U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5 U		5 U	5 U
SW8260C	N	Acetic acid, methyl ester	ug/l	2 U		2 U	2 U
SW8260C	N	Acetone	ug/l	5 U		5 U	5 U
SW8260C	N	Benzene	ug/l	1 U		1 U	1 U
SW8260C	N	Bromochloromethane	ug/l	1 U		1 U	1 U
SW8260C	N	Bromodichloromethane	ug/l	1 U		1 U	1 U
SW8260C	N	Bromoform	ug/l	1 U		1 U	1 U
SW8260C	N	Bromomethane	ug/l	1 U		1 U	1 U
SW8260C	N	Carbon disulfide	ug/l	1 U		1 U	1 U
SW8260C	N	Carbon tetrachloride	ug/l	1 U		1 U	1 U
SW8260C	N	Chlorobenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Chloroethane	ug/l	1 U		1 U	1 U
SW8260C	N	Chloroform	ug/l	1 U		1 U	1 U
SW8260C	N	Chloromethane	ug/l	1 U		1 U	1 U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	1 U		0.67 J	2.4
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1 U		1 U	1 U
SW8260C	N	Cyclohexane	ug/l	1 U		1 U	1 U
SW8260C	N	Dibromochloromethane	ug/l	1 U		1 U	1 U
SW8260C	N	Dichlorodifluoromethane	ug/l	1 U		1 U	1 U
SW8260C	N	Ethylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Isopropylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Methyl cyclohexane	ug/l	1 U		1 U	1 U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1 U		1 U	1 U
SW8260C	N	Methylene chloride	ug/l	1 U		1 U	1 U
SW8260C	N	n-Butylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Naphthalene	ug/l	1 U		1 U	1 U
SW8260C	N	Propylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	sec-Butylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Styrene	ug/l	1 U		1 U	1 U
SW8260C	N	tert-Butylbenzene	ug/l	1 U		1 U	1 U
SW8260C	N	Tetrachloroethene	ug/l	1 U		1 U	1 U
SW8260C	N	Toluene	ug/l	1 U		1 U	1 U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1 U		1 U	1 U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1 U		1 U	1 U
SW8260C	N	Trichloroethene	ug/l	1 U		1 U	3.5
SW8260C	N	Trichlorofluoromethane	ug/l	1 U		1 U	1 U
SW8260C	N	Vinyl chloride	ug/l	1 U		0.33 J	3.1
SW8260C	N	Xylene, o	ug/l	1 U		1 U	1 U
SW8260C	N	Xylenes (m&p)	ug/l	2 U		2 U	2 U

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS  
 CATEGORY A REVIEW REPORT  
 MAY 2019 GROUNDWATER SAMPLING  
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 GATES, NEW YORK

			Location	QC
			Lab SDG	R1904745
			Sample Date	5/22/2019
			Field Sample ID	828072-TB2
			Qc Code	TB
Method	Fraction	Parameter	Units	
SW8260C	N	1,1,1-Trichloroethane	ug/l	1 U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1 U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1 U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1 U
SW8260C	N	1,1-Dichloroethane	ug/l	1 U
SW8260C	N	1,1-Dichloroethene	ug/l	1 U
SW8260C	N	1,2,3-Trichlorobenzene	ug/l	1 U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1 U
SW8260C	N	1,2,4-Trimethylbenzene	ug/l	1 U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	2 U
SW8260C	N	1,2-Dibromoethane	ug/l	1 U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1 U
SW8260C	N	1,2-Dichloroethane	ug/l	1 U
SW8260C	N	1,2-Dichloropropane	ug/l	1 U
SW8260C	N	1,3,5-Trimethylbenzene	ug/l	1 U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1 U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1 U
SW8260C	N	1,4-Dioxane	ug/l	40 U
SW8260C	N	2-Butanone	ug/l	5 U
SW8260C	N	2-Hexanone	ug/l	5 U
SW8260C	N	4-iso-Propyltoluene	ug/l	1 U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5 U
SW8260C	N	Acetic acid, methyl ester	ug/l	2 U
SW8260C	N	Acetone	ug/l	4.2 J
SW8260C	N	Benzene	ug/l	1 U
SW8260C	N	Bromochloromethane	ug/l	1 U
SW8260C	N	Bromodichloromethane	ug/l	1 U
SW8260C	N	Bromoform	ug/l	1 U
SW8260C	N	Bromomethane	ug/l	1 U
SW8260C	N	Carbon disulfide	ug/l	1 U
SW8260C	N	Carbon tetrachloride	ug/l	1 U
SW8260C	N	Chlorobenzene	ug/l	1 U
SW8260C	N	Chloroethane	ug/l	1 U
SW8260C	N	Chloroform	ug/l	1 U
SW8260C	N	Chloromethane	ug/l	1 U
SW8260C	N	cis-1,2-Dichloroethene	ug/l	1 U
SW8260C	N	cis-1,3-Dichloropropene	ug/l	1 U
SW8260C	N	Cyclohexane	ug/l	1 U
SW8260C	N	Dibromochloromethane	ug/l	1 U
SW8260C	N	Dichlorodifluoromethane	ug/l	1 U
SW8260C	N	Ethylbenzene	ug/l	1 U
SW8260C	N	Isopropylbenzene	ug/l	1 U
SW8260C	N	Methyl cyclohexane	ug/l	1 U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1 U
SW8260C	N	Methylene chloride	ug/l	1 U
SW8260C	N	n-Butylbenzene	ug/l	1 U
SW8260C	N	Naphthalene	ug/l	1 U
SW8260C	N	Propylbenzene	ug/l	1 U
SW8260C	N	sec-Butylbenzene	ug/l	1 U
SW8260C	N	Styrene	ug/l	1 U
SW8260C	N	tert-Butylbenzene	ug/l	1 U
SW8260C	N	Tetrachloroethene	ug/l	1 U
SW8260C	N	Toluene	ug/l	1 U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1 U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1 U
SW8260C	N	Trichloroethene	ug/l	1 U
SW8260C	N	Trichlorofluoromethane	ug/l	1 U
SW8260C	N	Vinyl chloride	ug/l	1 U
SW8260C	N	Xylene, o	ug/l	1 U
SW8260C	N	Xylenes (m&p)	ug/l	2 U

TABLE 3 - SUMMARY OF QUALIFICATION ACTIONS  
CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING  
ERDL PERFORATING COMPANY  
GATES, NEW YORK

Lab SDG	Analysis Method	Location	Lab Sample ID	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
R1904580	SW8260C	MW-6	R1904580-006	828072-MW006008	Acetone	2.4	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-8	R1904580-004	828072-MW008023	Acetone	4.4	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-8	R1904580-004	828072-MW008023	Carbon disulfide	0.39	BJ	1	U	BL1	ug/l
R1904580	SW8260C	MW-9	R1904580-019	828072-MW009025	Carbon disulfide	0.33	J	1	U	BL1	ug/l
R1904580	SW8260C	MW-2D	R1904580-009	828072-MW02D020	Acetone	2.9	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-3A	R1904580-007	828072-MW03A008	Acetone	25	J	50	U	BL2	ug/l
R1904580	SW8260C	MW-5D	R1904580-001	828072-MW05D010	Acetone	2.2	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-6D	R1904580-016	828072-MW06D015	Acetone	2.2	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-8D	R1904580-003	828072-MW08D033	Acetone	4	J	5	U	BL2	ug/l
R1904580	SW8260C	MW-9D	R1904580-018	828072-MW09D035	Acetone	2.3	J	5	U	BL2	ug/l
R1904745	SW8260C	GPZ-1D	R1904745-008	828072-GPZ1D014	Acetone	2.5	J	5	U	BL1	ug/l
R1904745	SW8260C	GPZ-1S1	R1904745-005	828072-GPZ1S1008	Acetone	4.8	J	5	U	BL1	ug/l
R1904745	SW8260C	GPZ-2D	R1904745-009	828072-GPZ2D020	Acetone	3.9	J	5	U	BL1	ug/l
R1904745	SW8260C	GPZ-2S1	R1904745-006	828072-GPZ2S1014	Acetone	3.8	J	5	U	BL1	ug/l
R1904745	SW8260C	GPZ-5S	R1904745-016	828072-GPZ5S016	Acetone	2.4	J	5	U	BL1	ug/l
R1904745	SW8260C	GPZ-6D	R1904745-019	828072-GPZ6D026	Bromomethane	1	U	1	UJ	MSL	ug/l
R1904745	SW8260C	GPZ-6D	R1904745-019	828072-GPZ6D026	Acetone	2.2	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-7	R1904745-012	828072-MW007015	Acetone	4.2	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-19	R1904745-014	828072-MW019006	Acetone	2.3	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-20	R1904745-010	828072-MW020006	Acetone	2.6	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-7D	R1904745-013	828072-MW07D022	Acetone	2.4	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-16D	R1904745-021	828072-MW16D020	Acetone	2.5	J	5	U	BL1	ug/l
R1904745	SW8260C	MW-20D	R1904745-011	828072-MW20D020	Acetone	3.8	J	5	U	BL1	ug/l

**CATEGORY A REVIEW REPORT  
MAY 2019 GROUNDWATER SAMPLING EVENT  
ERDLE PERFORATING COMPANY SITE  
GATES, NEW YORK**

**ATTACHMENT A**

# VOCs

## PROJECT CATEGORY A REVIEW RECORD

Project: Erdle Perforating Site 828072

Method: SW-846 8260B

Laboratory: ALS Rochester, NY

SDG(s): R1904580

Date: 07/16/2019

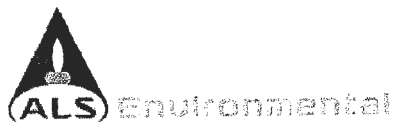
Reviewer: Liesel Knout

Review Level  CATEGORY A

1.  **Case Narrative Review and COC/Data Package Completeness** COMMENTS  
Were problems noted? *Yes; see attached*  
Were all the samples on the COC analyzed for the requested analyses?  YES  NO (circle one)  
Are Field Sample IDs and Locations assigned correctly?  YES  NO (circle one)
2.  **Holding time and Sample Collection**  
All samples were analyzed within the 14 day holding time.  YES  NO (circle one)
3.  **QC Blanks**  
Are method blanks free of contamination? YES  NO (circle one) *see attached*  
Are Trip blanks free of contamination? YES  NO (circle one) *see attached*  
Are Rinse blanks free of contamination? YES  NO  NA (circle one)
4.  **Matrix Spike - Region II limits (water and soil 70-130%, water RPD 20, soil RPD 35)**  
Were MS/MSDs submitted/analyzed?  YES  NO  
Were all results within the Region II limits?  YES  NO  NA (circle one)
5.  **Field Duplicates - Region II Limits (water RPD 50, soil RPD 100)**  
Were Field Duplicates submitted/analyzed?  YES  NO  
Were all results within Region II Limits?  YES  NO  NA (circle one)
6.  **Reporting Limits: Were samples analyzed at a dilution?**  YES  NO (circle one) *some see attached; corrected in val file; elevated RLs (5x-20x) for NO results in subset of samples*
7.  **Electronic Data Review and Edits**  
Does the EDD match the Form Is?  YES  NO (circle one)
8.  **Table Review**  
Table 1 (Samples and Analytical Methods)  
Table 2 (Analytical Results)  
Table 3 (Qualification Actions)  
Were all tables produced and reviewed?  YES  NO (circle one)  
Table 4 (TICs) Did lab report TICs? YES  NO (circle one)

a. LCS - see attached; deviation from Reg II limits





Client: Wood E&IS - Portland ME  
Project: Erdle Perforating Site 828072  
Sample Matrix: Water

Service Request: R1904580  
Date Received: 05/22/2019

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

**Sample Receipt:**

Eighteen water samples were received for analysis at ALS Environmental on 05/22/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

**Subcontracted Analytical Parameters:**

One or more samples were subcontracted to another laboratory for testing. The certified analytical report from the subcontractor has been included in its entirety at the end of this report and includes the name and address of the subcontracted laboratory.

**Volatiles by GC/MS:**

Method 8260C, 636788: Sample(s) required dilution due to the foaming nature of the matrix. The reporting limits are adjusted to reflect the dilution. *Okay*

Method 8260C, 05/29/2019: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

**Volatiles by GC:**

No significant anomalies were noted with this analysis.

*okay - no impact*

*Jamark...*

*LUK 07/16/2019*

Approved by \_\_\_\_\_

Date 06/10/2019

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

Client: Wood E&IS - Portland ME  
Project: Erdle Perforating Site 828072/3617137306.02  
Sample Matrix: Water  
Sample Name: Method Blank  
Lab Code: RQ1905037-04

Service Request: R1904580  
Date Collected: NA  
Date Received: NA

Units: ug/L  
Basis: NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C  
Prep Method: EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0 U	1.0	0.21	1	05/24/19 10:46	
1,1,2,2-Tetrachloroethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,1,2-Trichloroethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,1-Dichloroethane (1,1-DCA)	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,1-Dichloroethene (1,1-DCE)	1.0 U	1.0	0.25	1	05/24/19 10:46	
1,2,3-Trichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,2,4-Trichlorobenzene	1.0 U	1.0	0.25	1	05/24/19 10:46	
1,2,4-Trimethylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,2-Dibromo-3-chloropropane (DBCP)	2.0 U	2.0	0.45	1	05/24/19 10:46	
1,2-Dibromoethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,2-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,2-Dichloroethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,2-Dichloropropane	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,3,5-Trimethylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,3-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,4-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
1,4-Dioxane	40 U	40	13	1	05/24/19 10:46	
2-Butanone (MEK)	5.0 U	5.0	0.78	1	05/24/19 10:46	
2-Hexanone	5.0 U	5.0	0.20	1	05/24/19 10:46	
4-Isopropyltoluene	1.0 U	1.0	0.20	1	05/24/19 10:46	
4-Methyl-2-pentanone	5.0 U	5.0	0.20	1	05/24/19 10:46	
Acetone	5.0 U	5.0	2.1	1	05/24/19 10:46	
Benzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
Bromochloromethane	1.0 U	1.0	0.24	1	05/24/19 10:46	
Bromodichloromethane	1.0 U	1.0	0.22	1	05/24/19 10:46	
Bromoform	1.0 U	1.0	0.25	1	05/24/19 10:46	
Bromomethane	1.0 U	1.0	0.70	1	05/24/19 10:46	
Carbon Disulfide	1.0 U	1.0	0.25	1	05/24/19 10:46	
Carbon Tetrachloride	1.0 U	1.0	0.34	1	05/24/19 10:46	
Chlorobenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
Chloroethane	1.0 U	1.0	0.23	1	05/24/19 10:46	
Chloroform	1.0 U	1.0	0.24	1	05/24/19 10:46	
Chloromethane	1.0 U	1.0	0.28	1	05/24/19 10:46	
Cyclohexane	1.0 U	1.0	0.26	1	05/24/19 10:46	
Dibromochloromethane	1.0 U	1.0	0.20	1	05/24/19 10:46	
Dichlorodifluoromethane (CFC 12)	nd	0.30 J	0.21	1	05/24/19 10:46	
Dichloromethane	1.0 U	1.0	0.36	1	05/24/19 10:46	
Ethylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
Isopropylbenzene (Cumene)	1.0 U	1.0	0.20	1	05/24/19 10:46	
Methyl Acetate	2.0 U	2.0	0.33	1	05/24/19 10:46	
Methyl tert-Butyl Ether	1.0 U	1.0	0.20	1	05/24/19 10:46	
Methylcyclohexane	1.0 U	1.0	0.20	1	05/24/19 10:46	

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Analytical Report

**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072/3617137306.02  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** RQ1905037-04

**Service Request:** R1904580  
**Date Collected:** NA  
**Date Received:** NA

**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Naphthalene	1.0 U	1.0	0.24	1	05/24/19 10:46	
Styrene	1.0 U	1.0	0.20	1	05/24/19 10:46	
Tetrachloroethene (PCE)	1.0 U	1.0	0.21	1	05/24/19 10:46	
Toluene	1.0 U	1.0	0.20	1	05/24/19 10:46	
Trichloroethene (TCE)	1.0 U	1.0	0.20	1	05/24/19 10:46	
Trichlorofluoromethane (CFC 11)	0.27 J	1.0	0.24	1	05/24/19 10:46	
Vinyl Chloride	1.0 U	1.0	0.20	1	05/24/19 10:46	
cis-1,2-Dichloroethene	1.0 U	1.0	0.23	1	05/24/19 10:46	
cis-1,3-Dichloropropene	1.0 U	1.0	0.20	1	05/24/19 10:46	
m,p-Xylenes	2.0 U	2.0	0.20	1	05/24/19 10:46	
n-Butylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
n-Propylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
o-Xylene	1.0 U	1.0	0.20	1	05/24/19 10:46	
sec-Butylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
tert-Butylbenzene	1.0 U	1.0	0.20	1	05/24/19 10:46	
trans-1,2-Dichloroethene	1.0 U	1.0	0.20	1	05/24/19 10:46	
trans-1,3-Dichloropropene	1.0 U	1.0	0.23	1	05/24/19 10:46	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85 - 122	05/24/19 10:46	
Dibromofluoromethane	97	89 - 119	05/24/19 10:46	
Toluene-d8	101	87 - 121	05/24/19 10:46	

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dba ALS Environmental

Analytical Report

**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072/3617137306.02  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** RQ1905155-04

**Service Request:** R1904580  
**Date Collected:** NA  
**Date Received:** NA

**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0 U	1.0	0.21	1	05/28/19 22:38	
1,1,2,2-Tetrachloroethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,1,2-Trichloroethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,1-Dichloroethane (1,1-DCA)	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,1-Dichloroethene (1,1-DCE)	1.0 U	1.0	0.25	1	05/28/19 22:38	
1,2,3-Trichlorobenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,2,4-Trichlorobenzene	1.0 U	1.0	0.25	1	05/28/19 22:38	
1,2,4-Trimethylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,2-Dibromo-3-chloropropane (DBCP)	2.0 U	2.0	0.45	1	05/28/19 22:38	
1,2-Dibromoethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,2-Dichlorobenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,2-Dichloroethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,2-Dichloropropane	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,3,5-Trimethylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,3-Dichlorobenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,4-Dichlorobenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
1,4-Dioxane	40 U	40	13	1	05/28/19 22:38	
2-Butanone (MEK)	5.0 U	5.0	0.78	1	05/28/19 22:38	
2-Hexanone	5.0 U	5.0	0.20	1	05/28/19 22:38	
4-Isopropyltoluene	1.0 U	1.0	0.20	1	05/28/19 22:38	
4-Methyl-2-pentanone	5.0 U	5.0	0.20	1	05/28/19 22:38	
Acetone	5.0 U	5.0	2.1	1	05/28/19 22:38	
Benzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
Bromochloromethane	1.0 U	1.0	0.24	1	05/28/19 22:38	
Bromodichloromethane	1.0 U	1.0	0.22	1	05/28/19 22:38	
Bromoform	1.0 U	1.0	0.25	1	05/28/19 22:38	
Bromomethane	1.0 U	1.0	0.70	1	05/28/19 22:38	
Carbon Disulfide	U subset 0.29 U	1.0	0.25	1	05/28/19 22:38	
Carbon Tetrachloride	1.0 U	1.0	0.34	1	05/28/19 22:38	
Chlorobenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
Chloroethane	1.0 U	1.0	0.23	1	05/28/19 22:38	
Chloroform	1.0 U	1.0	0.24	1	05/28/19 22:38	
Chloromethane	1.0 U	1.0	0.28	1	05/28/19 22:38	
Cyclohexane	1.0 U	1.0	0.26	1	05/28/19 22:38	
Dibromochloromethane	1.0 U	1.0	0.20	1	05/28/19 22:38	
Dichlorodifluoromethane (CFC 12)	1.0 U	1.0	0.21	1	05/28/19 22:38	
Dichloromethane	1.0 U	1.0	0.36	1	05/28/19 22:38	
Ethylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
Isopropylbenzene (Cumene)	1.0 U	1.0	0.20	1	05/28/19 22:38	
Methyl Acetate	2.0 U	2.0	0.33	1	05/28/19 22:38	
Methyl tert-Butyl Ether	1.0 U	1.0	0.20	1	05/28/19 22:38	
Methylcyclohexane	1.0 U	1.0	0.20	1	05/28/19 22:38	

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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072/3617137306.02  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** RQ1905155-04

**Service Request:** R1904580  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
Naphthalene	1.0 U	1.0	0.24	1	05/28/19 22:38	
Styrene	1.0 U	1.0	0.20	1	05/28/19 22:38	
Tetrachloroethene (PCE)	1.0 U	1.0	0.21	1	05/28/19 22:38	
Toluene	1.0 U	1.0	0.20	1	05/28/19 22:38	
Trichloroethene (TCE)	1.0 U	1.0	0.20	1	05/28/19 22:38	
Trichlorofluoromethane (CFC 11)	1.0 U	1.0	0.24	1	05/28/19 22:38	
Vinyl Chloride	1.0 U	1.0	0.20	1	05/28/19 22:38	
cis-1,2-Dichloroethene	1.0 U	1.0	0.23	1	05/28/19 22:38	
cis-1,3-Dichloropropene	1.0 U	1.0	0.20	1	05/28/19 22:38	
m,p-Xylenes	nd	2.0	0.20	1	05/28/19 22:38	
n-Butylbenzene	0.21 J	1.0	0.20	1	05/28/19 22:38	
n-Propylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
o-Xylene	1.0 U	1.0	0.20	1	05/28/19 22:38	
sec-Butylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
tert-Butylbenzene	1.0 U	1.0	0.20	1	05/28/19 22:38	
trans-1,2-Dichloroethene	1.0 U	1.0	0.20	1	05/28/19 22:38	
trans-1,3-Dichloropropene	1.0 U	1.0	0.23	1	05/28/19 22:38	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85 - 122	05/28/19 22:38	
Dibromofluoromethane	98	89 - 119	05/28/19 22:38	
Toluene-d8	100	87 - 121	05/28/19 22:38	

LUK 07/16/2019

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Analytical Report

**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072/3617137306.02  
**Sample Matrix:** Water  
**Sample Name:** 828072-TB1  
**Lab Code:** R1904580-011

**Service Request:** R1904580  
**Date Collected:** 05/20/19 12:00  
**Date Received:** 05/22/19 11:15

**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0 U	1.0	0.21	1	05/24/19 11:38	
1,1,2,2-Tetrachloroethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,1,2-Trichloroethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,1-Dichloroethane (1,1-DCA)	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,1-Dichloroethene (1,1-DCE)	1.0 U	1.0	0.25	1	05/24/19 11:38	
1,2,3-Trichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,2,4-Trichlorobenzene	1.0 U	1.0	0.25	1	05/24/19 11:38	
1,2,4-Trimethylbenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,2-Dibromo-3-chloropropane (DBCP)	2.0 U	2.0	0.45	1	05/24/19 11:38	
1,2-Dibromoethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,2-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,2-Dichloroethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,2-Dichloropropane	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,3,5-Trimethylbenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,3-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,4-Dichlorobenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
1,4-Dioxane	40 U	40	13	1	05/24/19 11:38	
2-Butanone (MEK)	5.0 U	5.0	0.78	1	05/24/19 11:38	
2-Hexanone	5.0 U	5.0	0.20	1	05/24/19 11:38	
4-Isopropyltoluene	1.0 U	1.0	0.20	1	05/24/19 11:38	
4-Methyl-2-pentanone	5.0 U	5.0	0.20	1	05/24/19 11:38	
Acetone	3.5 J	5.0	2.1	1	05/24/19 11:38	
Benzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
Bromochloromethane	1.0 U	1.0	0.24	1	05/24/19 11:38	
Bromodichloromethane	1.0 U	1.0	0.22	1	05/24/19 11:38	
Bromoform	1.0 U	1.0	0.25	1	05/24/19 11:38	
Bromomethane	1.0 U	1.0	0.70	1	05/24/19 11:38	
Carbon Disulfide	1.0 U	1.0	0.25	1	05/24/19 11:38	
Carbon Tetrachloride	1.0 U	1.0	0.34	1	05/24/19 11:38	
Chlorobenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
Chloroethane	1.0 U	1.0	0.23	1	05/24/19 11:38	
Chloroform	1.0 U	1.0	0.24	1	05/24/19 11:38	
Chloromethane	1.0 U	1.0	0.28	1	05/24/19 11:38	
Cyclohexane	1.0 U	1.0	0.26	1	05/24/19 11:38	
Dibromochloromethane	1.0 U	1.0	0.20	1	05/24/19 11:38	
Dichlorodifluoromethane (CFC 12)	1.0 U	1.0	0.21	1	05/24/19 11:38	
Dichloromethane	1.0 U	1.0	0.36	1	05/24/19 11:38	
Ethylbenzene	1.0 U	1.0	0.20	1	05/24/19 11:38	
Isopropylbenzene (Cumene)	1.0 U	1.0	0.20	1	05/24/19 11:38	
Methyl Acetate	2.0 U	2.0	0.33	1	05/24/19 11:38	
Methyl tert-Butyl Ether	1.0 U	1.0	0.20	1	05/24/19 11:38	
Methylcyclohexane	1.0 U	1.0	0.20	1	05/24/19 11:38	

U subset 3.5 J

LLK 07/16/2019

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Wood E&IS - Portland ME  
Project: Erdle Perforating Site 828072/3617137306.02  
Sample Matrix: Water

Service Request: R1904580  
Date Analyzed: 05/28/19

Lab Control Sample Summary  
Volatile Organic Compounds by GC/MS

Units:ug/L  
Basis:NA

Lab Control Sample  
RQ1905155-03

70-130

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	8260C	21.2	20.0	106	75-125
1,1,2,2-Tetrachloroethane	8260C	21.4	20.0	107	78-126
1,1,2-Trichloroethane	8260C	19.8	20.0	99	82-121
1,1,2-Trichloro-1,2,2-trifluoroethane	8260C	21.8	20.0	109	67-124
1,1-Dichloroethane (1,1-DCA)	8260C	22.5	20.0	112	80-124
1,1-Dichloroethene (1,1-DCE)	8260C	22.0	20.0	110	71-118
1,2,3-Trichlorobenzene	8260C	20.9	20.0	104	67-136
1,2,4-Trichlorobenzene	8260C	20.4	20.0	102	75-132
1,2,4-Trimethylbenzene	8260C	21.6	20.0	108	81-126
1,2-Dibromo-3-chloropropane (DBCP)	8260C	21.8	20.0	109	55-136
1,2-Dibromoethane	8260C	20.0	20.0	100	82-127
1,2-Dichlorobenzene	8260C	20.4	20.0	102	80-119
1,2-Dichloroethane	8260C	19.9	20.0	99	71-127
1,2-Dichloropropane	8260C	20.4	20.0	102	80-119
1,3,5-Trimethylbenzene	8260C	21.5	20.0	107	81-128
1,3-Dichlorobenzene	8260C	20.4	20.0	102	83-121
1,4-Dichlorobenzene	8260C	19.6	20.0	98	79-119
1,4-Dioxane	8260C	433	400	108	44-154
2-Butanone (MEK) J+	8260C	27.1	20.0	136	61-137
2-Hexanone	8260C	22.0	20.0	110	63-124
4-Isopropyltoluene	8260C	21.5	20.0	107	78-133
4-Methyl-2-pentanone	8260C	23.8	20.0	119	66-124
Acetone	8260C	21.8	20.0	109	40-161
Benzene	8260C	21.6	20.0	108	79-119
Bromochloromethane	8260C	20.7	20.0	103	81-126
Bromodichloromethane	8260C	21.3	20.0	106	81-123
Bromoform	8260C	22.6	20.0	113	65-146
Bromomethane	8260C	22.4	20.0	112	42-166
Carbon Disulfide	8260C	22.9	20.0	115	66-128
Carbon Tetrachloride	8260C	20.8	20.0	104	70-127
Chlorobenzene	8260C	20.3	20.0	101	80-121
Chloroethane	8260C	19.2	20.0	96	62-131
Chloroform	8260C	21.8	20.0	109	79-120

(nd)

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LLK 07/16/2019

Sample ID	828072-MW02A008		
Compound	Result	Dup	RPD
trans-1,2-Dichloroethene	43	52	18.94737
Vinyl chloride	660	730	10.07194
1,1-Dichloroethene	14	14	0
Trichloroethene	530	800	40.6015
cis-1,2-Dichloroethene	6800	8500	22.22222

RPD < 50 ✓

LLK 07/16/2019



Sample ID	828072-MW21012		
Compound	Result	Dup	RPD
cis-1,2-Dichloroethene	70	69	1.438849
trans-1,2-Dichloroethene	0.63	0.66	4.651163
Vinyl chloride	5.4	6.2	13.7931
1,1-Dichloroethane	0.85	0.82	3.592814
1,1-Dichloroethene	0.30	0.27	10.52632
Trichloroethene	4.3	4.0	

RPD < 50 ✓

LLK 07/16/2019

# VOCs

## PROJECT CATEGORY A REVIEW RECORD

Project: *Ende Perforating Site 828072*

Method : SW-846 8260B

Laboratory: *ALS Rochester, NY*

SDG(s): *R1904744*

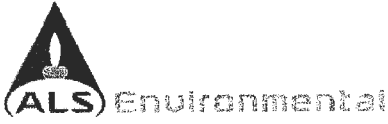
Date: *07/16/2019*

Reviewer: *Liesel Krut*

Review Level  CATEGORY A

1.  **Case Narrative Review and COC/Data Package Completeness** COMMENTS  
Were problems noted? *Yes; see attached*  
Were all the samples on the COC analyzed for the requested analyses?  YES NO (circle one)  
Are Field Sample IDs and Locations assigned correctly?  YES NO (circle one)
2.  **Holding time and Sample Collection**  
All samples were analyzed within the 14 day holding time.  YES NO (circle one)
3.  **QC Blanks**  
Are method blanks free of contamination?  YES NO (circle one)  
Are Trip blanks free of contamination? YES NO (circle one) *NA*  
Are Rinse blanks free of contamination? YES NO  NA (circle one)
4.  **Matrix Spike - Region II limits (water and soil 70-130%, water RPD 20, soil RPD 35)**  
Were MS/MSDs submitted/analyzed?  YES NO  
Were all results within the Region II limits?  YES NO NA (circle one)
5.  **Field Duplicates - Region II Limits (water RPD 50, soil RPD 100)**  
Were Field Duplicates submitted/analyzed?  YES NO *see attached*  
Were all results within Region II Limits?  YES NO NA (circle one)
6.  **Reporting Limits: Were samples analyzed at a dilution?**  YES NO (circle one)
7.  **Electronic Data Review and Edits**  
Does the EDD match the Form Is?  YES NO (circle one) *↓ just 828072-MWIS0023 elevated RL's (2X) for (nd) results*
8.  **Table Review**  
**Table 1** (Samples and Analytical Methods)  
**Table 2** (Analytical Results)  
**Table 3** (Qualification Actions)  
Were all tables produced and reviewed?  YES NO (circle one)  
**Table 4** (TICs) Did lab report TICs? YES  NO (circle one)

9.  **LCS - all within Region II limits (70-130)**



**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072  
**Sample Matrix:** Water

**Service Request:** R1904744  
**Date Received:** 05/24/2019

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

**Sample Receipt:**

Seventeen water samples were received for analysis at ALS Environmental on 05/24/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

*see attached*

**Volatiles by GC/MS:**

Method 8260C, 06/03/2019: The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). Since there were no detections of the analyte(s) in the associated field samples, the quantitation is not affected. The data quality was not significantly affected and no further corrective action was taken.

Method 8260C, 05/30/2019: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

*[Handwritten Signature]*

Approved by \_\_\_\_\_

Date 06/07/2019

*LLK 07/22/2019*



# Cooler Receipt and Preservation Check Form

R1904744

5

Wood EB18 - Portland ME  
Erdle Perforating Site 828072



Project/Client Wood Eng Folder Number \_\_\_\_\_

Cooler received on 5/24/19 by: DW

COURIER: ALS UPS FEDEX VELOCITY CLIENT

1	Were Custody seals on outside of cooler?	Y <input checked="" type="checkbox"/>
2	Custody papers properly completed (ink, signed)?	<input checked="" type="checkbox"/> N
3	Did all bottles arrive in good condition (unbroken)?	<input checked="" type="checkbox"/> N
4	Circle: <del>Wet Ice</del> Dry Ice Gel packs present?	<input checked="" type="checkbox"/> N

5a	Perchlorate samples have required headspace?	Y N <input checked="" type="checkbox"/> N/A
5b	Did <del>VOA</del> vials, Alk, or Sulfide have sig* bubbles?	<input checked="" type="checkbox"/> N N/A
6	Where did the bottles originate?	AKS/ROC CLIENT
7	Soil VOA received as:	Bulk Encore 5035set <del>etc</del>

8. Temperature Readings Date: 5/24/19 Time: 1510 ID: IR#7 IR#10 From: Temp Blank Sample Bottle

Observed Temp (°C)	<u>6.4</u>						
Correction Factor (°C)	<u>+0.3</u>						
Corrected Temp (°C)	<u>6.7</u>						
Temp from: Type of bottle	<u>HO vial</u>						
Within 0-6°C?	Y <input checked="" type="checkbox"/>	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

*okay professional judgement ok 5/24/19*

If out of Temperature, note packing/ice condition: \_\_\_\_\_ Ice melted Poorly Packed (described below) Same Day Rule  
& Client Approval to Run Samples: \_\_\_\_\_ Standing Approval Client aware at drop-off Client notified by: \_\_\_\_\_

All samples held in storage location: R-002 by DW on 5/24/19 at 1510  
5035 samples placed in storage location: \_\_\_\_\_ by \_\_\_\_\_ on \_\_\_\_\_ at \_\_\_\_\_

Cooler Breakdown/Preservation Check\*\*: Date: 5/24/19 Time: 2015 by: DW

- 9. Were all bottle labels complete (i.e. analysis, preservation, etc.)?  YES NO
- 10. Did all bottle labels and tags agree with custody papers?  YES NO
- 11. Were correct containers used for the tests indicated?  YES NO
- 12. Were 5035 vials acceptable (no extra labels, not leaking)?  YES NO
- 13. Air Samples: Cassettes / Tubes Intact with MS?  Canisters Pressurized  Tedlar® Bags Inflated  N/A

pH	Lot of test paper	Reagent	Preserved?		Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
			Yes	No						
≥12		NaOH								
≥10		HNO <sub>3</sub>								
≥8		H <sub>2</sub> SO <sub>4</sub>								
<4		NaHSO <sub>4</sub>								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608, CN), ascorbic (phenol).					
		Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>								
		Zn Acetate	-	-						
		HCl	**	**	<u>4117010</u>	<u>5710</u>				

\*\*VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).

Bottle lot numbers: 8-383-002  
Explain all Discrepancies/ Other Comments:

*\* See C.O.C*  
*\*\* Not enough ice provided for samples.*

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: DW  
PC Secondary Review: NMS 5/28/19 \*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

*LK 07/22/2019*

Sample ID	828072-MW13D12		
Compound	Result	Dup	RPD
cis-1,2-Dichloroethene	120	130	8
trans-1,2-Dichloroethen	0.48	0.54	11.76471
Acetone	2.4	2.2	8.695652
Vinyl chloride	19	18	5.405405
1,1-Dichloroethane	0.90	0.92	2.197802
Trichloroethene	0.27	0.25	7.692308

RPD < 50 ✓

LLX 07/22/2009

# VOCs

## PROJECT CATEGORY A REVIEW RECORD

Project: Erdle Perborating Site 828072

Method: SW-846 8260B

Laboratory: ALS Rochester, NY

SDG(s): R1904745

Date: 07/16/2019

Reviewer: Lresel Kout

Review Level  CATEGORY A

1.  **Case Narrative Review and COC/Data Package Completeness** COMMENTS  
Were problems noted? *Yes; see attached*  
Were all the samples on the COC analyzed for the requested analyses?  YES  NO (circle one)  
Are Field Sample IDs and Locations assigned correctly?  YES  NO (circle one)
2.  **Holding time and Sample Collection**  
All samples were analyzed within the 14 day holding time.  YES  NO (circle one)
3.  **QC Blanks**  
Are method blanks free of contamination?  YES  NO (circle one)  
Are Trip blanks free of contamination?  YES  NO (circle one) *see attached*  
Are Rinse blanks free of contamination?  YES  NO  NA (circle one)
4.  **Matrix Spike - Region II limits (water and soil 70-130%, water RPD 20, soil RPD 35)**  
Were MS/MSDs submitted/analyzed?  YES  NO  
Were all results within the Region II limits?  YES  NO  NA (circle one) *see attached*
5.  **Field Duplicates - Region II Limits (water RPD 50, soil RPD 100)**  
Were Field Duplicates submitted/analyzed?  YES  NO  
Were all results within Region II Limits?  YES  NO  NA (circle one)
6.  **Reporting Limits: Were samples analyzed at a dilution?**  YES  NO (circle one)
7.  **Electronic Data Review and Edits**  
Does the EDD match the Form Is?  YES  NO (circle one)  
*just 828072-GPE 7D028  
\*only vinyl chloride result kept & see attached val file*
8.  **Table Review**  
Table 1 (Samples and Analytical Methods)  
Table 2 (Analytical Results)  
Table 3 (Qualification Actions)  
Were all tables produced and reviewed?  YES  NO (circle one)  
Table 4 (TICs) Did lab report TICs?  YES  NO (circle one)

*all LCS - all within Reg. II limits - no quals (70-130)*



**Client:** Wood E&IS - Portland ME  
**Project:** Erdle Perforating Site 828072  
**Sample Matrix:** Water

**Service Request:** R1904745  
**Date Received:** 05/24/2019

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

**Sample Receipt:**

Twenty one water samples were received for analysis at ALS Environmental on 05/24/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Volatiles by GC/MS:**

Method 8260C, 05/31/2019: The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). Since there were no detections of the analyte(s) in the associated field samples, the quantitation is not affected. The data quality was not significantly affected and no further corrective action was taken.

Method 8260C, 05/31/2019: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method 8260C, : The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). Since there were no detections of the analyte(s) in the associated field samples, the quantitation is not affected. The data quality was not significantly affected and no further corrective action was taken.

*→ okay no impact*

*Jamara [Signature]*

*LWX 07/16/2019*

Approved by \_\_\_\_\_

Date 06/06/2019

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

Client: Wood E&IS - Portland ME  
Project: Erdle Perforating Site 828072/3617137306.02  
Sample Matrix: Water  
Sample Name: 828072-TB2  
Lab Code: R1904745-004

Service Request: R1904745  
Date Collected: 05/22/19 09:00  
Date Received: 05/24/19 14:55

Units: ug/L  
Basis: NA

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Volatile Organic Compounds by GC/MS

Analysis Method: 8260C  
Prep Method: EPA 5030C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0 U	1.0	0.21	1	05/31/19 12:08	
1,1,2,2-Tetrachloroethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,1,2-Trichloroethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,1-Dichloroethane (1,1-DCA)	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,1-Dichloroethene (1,1-DCE)	1.0 U	1.0	0.25	1	05/31/19 12:08	
1,2,3-Trichlorobenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,2,4-Trichlorobenzene	1.0 U	1.0	0.25	1	05/31/19 12:08	
1,2,4-Trimethylbenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,2-Dibromo-3-chloropropane (DBCP)	2.0 U	2.0	0.45	1	05/31/19 12:08	
1,2-Dibromoethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,2-Dichlorobenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,2-Dichloroethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,2-Dichloropropane	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,3,5-Trimethylbenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,3-Dichlorobenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,4-Dichlorobenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
1,4-Dioxane	40 U	40	13	1	05/31/19 12:08	
2-Butanone (MEK)	5.0 U	5.0	0.78	1	05/31/19 12:08	
2-Hexanone	5.0 U	5.0	0.20	1	05/31/19 12:08	
4-Isopropyltoluene	1.0 U	1.0	0.20	1	05/31/19 12:08	
4-Methyl-2-pentanone	5.0 U	5.0	0.20	1	05/31/19 12:08	
Acetone	4.2 J	5.0	2.1	1	05/31/19 12:08	
Benzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
Bromochloromethane	1.0 U	1.0	0.24	1	05/31/19 12:08	
Bromodichloromethane	1.0 U	1.0	0.22	1	05/31/19 12:08	
Bromoform	1.0 U	1.0	0.25	1	05/31/19 12:08	
Bromomethane	1.0 U	1.0	0.70	1	05/31/19 12:08	
Carbon Disulfide	1.0 U	1.0	0.25	1	05/31/19 12:08	
Carbon Tetrachloride	1.0 U	1.0	0.34	1	05/31/19 12:08	
Chlorobenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
Chloroethane	1.0 U	1.0	0.23	1	05/31/19 12:08	
Chloroform	1.0 U	1.0	0.24	1	05/31/19 12:08	
Chloromethane	1.0 U	1.0	0.28	1	05/31/19 12:08	
Cyclohexane	1.0 U	1.0	0.26	1	05/31/19 12:08	
Dibromochloromethane	1.0 U	1.0	0.20	1	05/31/19 12:08	
Dichlorodifluoromethane (CFC 12)	1.0 U	1.0	0.21	1	05/31/19 12:08	
Dichloromethane	1.0 U	1.0	0.36	1	05/31/19 12:08	
Ethylbenzene	1.0 U	1.0	0.20	1	05/31/19 12:08	
Isopropylbenzene (Cumene)	1.0 U	1.0	0.20	1	05/31/19 12:08	
Methyl Acetate	2.0 U	2.0	0.33	1	05/31/19 12:08	
Methyl tert-Butyl Ether	1.0 U	1.0	0.20	1	05/31/19 12:08	
Methylcyclohexane	1.0 U	1.0	0.20	1	05/31/19 12:08	

U Subset

LUK 07/16/2019



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Wood E&IS - Portland ME  
Project: Erdle Perforating Site 828072/3617137306.02  
Sample Matrix: Water

Service Request: R1904745  
Date Collected: 05/23/19  
Date Received: 05/24/19  
Date Analyzed: 06/1/19  
Date Extracted: NA

Duplicate Matrix Spike Summary  
Volatile Organic Compounds by GC/MS

Sample Name: 828072-GPZ6D026  
Lab Code: R1904745-019  
Analysis Method: 8260C  
Prep Method: EPA 5030C

Units: ug/L  
Basis: NA

Matrix Spike 70-130 Duplicate Matrix Spike  
RQ1905443-05 RQ1905443-06

RPD < 20

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane (TCA)	1.0 U	44.5	50.0	89	44.2	50.0	88	74-127	<1	30
1,1,2,2-Tetrachloroethane	1.0 U	52.6	50.0	105	54.9	50.0	110	72-122	4	30
1,1,2-Trichloroethane	1.0 U	47.0	50.0	94	48.1	50.0	96	82-121	2	30
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U	44.7	50.0	89	46.8	50.0	94	50-147	5	30
1,1-Dichloroethane (1,1-DCA)	5.2	56.0	50.0	102	54.0	50.0	98	74-132	4	30
1,1-Dichloroethene (1,1-DCE)	1.0 U	43.0	50.0	86	46.0	50.0	92	71-118	7	30
1,2,3-Trichlorobenzene	1.0 U	46.8	50.0	94	48.5	50.0	97	59-129	4	30
1,2,4-Trichlorobenzene	1.0 U	45.9	50.0	92	46.7	50.0	93	69-122	2	30
1,2,4-Trimethylbenzene	1.0 U	46.8	50.0	94	45.9	50.0	92	73-133	2	30
1,2-Dibromo-3-chloropropane (DBCP)	2.0 U	43.9	50.0	88	46.8	50.0	94	37-150	6	30
1,2-Dibromoethane	1.0 U	49.3	50.0	99	49.2	50.0	98	67-127	<1	30
1,2-Dichlorobenzene	1.0 U	45.1	50.0	90	45.5	50.0	91	77-120	<1	30
1,2-Dichloroethane	1.0 U	46.7	50.0	93	47.1	50.0	94	68-130	1	30
1,2-Dichloropropane	1.0 U	51.9	50.0	104	51.5	50.0	103	79-124	<1	30
1,3,5-Trimethylbenzene	1.0 U	46.2	50.0	92	45.3	50.0	91	81-131	2	30
1,3-Dichlorobenzene	1.0 U	44.9	50.0	90	45.3	50.0	91	83-121	<1	30
1,4-Dichlorobenzene	1.0 U	43.9	50.0	88	43.9	50.0	88	82-120	<1	30
1,4-Dioxane	26 J	1130	1000	110	1120	1000	109	44-154	<1	30
2-Butanone (MEK)	5.0 U	61.1	50.0	122	61.0	50.0	122	61-137	<1	30
2-Hexanone	5.0 U	58.6	50.0	117	61.2	50.0	122	56-132	4	30
4-Isopropyltoluene	1.0 U	45.7	50.0	91	45.0	50.0	90	78-133	2	30
4-Methyl-2-pentanone	5.0 U	61.8	50.0	124	62.9	50.0	126	60-141	2	30
Acetone	2.2 J	45.5	50.0	87	56.4	50.0	108	35-183	21	30
Benzene	1.0 U	51.2	50.0	102	49.5	50.0	99	76-129	3	30
Bromochloromethane	1.0 U	47.0	50.0	94	46.9	50.0	94	80-122	<1	30
Bromodichloromethane	1.0 U	46.2	50.0	92	46.5	50.0	93	78-133	<1	30
Bromoform	1.0 U	38.4	50.0	77	38.9	50.0	78	58-133	1	30
Bromomethane	1.0 U	34.5	50.0	69	35.1	50.0	70	10-184	2	30
Carbon Disulfide	1.0 U	49.9	50.0	100	47.8	50.0	96	59-140	4	30
Carbon Tetrachloride	1.0 U	38.7	50.0	77	40.6	50.0	81	65-135	5	30
Chlorobenzene	1.0 U	46.6	50.0	93	44.4	50.0	89	76-125	5	30
Chloroethane	1.0 U	37.0	50.0	74	37.8	50.0	76	48-146	2	30
Chloroform	1.0 U	48.2	50.0	96	47.2	50.0	94	75-130	2	30
Chloromethane	1.0 U	56.3	50.0	113	52.8	50.0	106	55-160	6	30
Cyclohexane	1.0 U	53.4	50.0	107	50.9	50.0	102	52-145	5	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

LLK 07/16/2019

**ATTACHMENT 3**

**BIOCHLOR SCORING SHEETS**

<b>Natural Attenuation Screening Protocol</b> <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	<b>Interpretation</b>		<b>Score</b>	<b>Score: 20</b> <b>MW-2A</b> <b>Scroll to End of Table</b>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
		Strong evidence for anaerobic biodegradation* of chlorinated organics	>20	

Analysis	Concentration in Most Contam. Zone	Interpretation	* reductive		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input type="radio"/>	<input checked="" type="radio"/>	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input checked="" type="radio"/>	<input type="radio"/>	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	3
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input checked="" type="radio"/>	<input type="radio"/>	3
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	1
	<-100mV	Reductive pathway likely	<input type="radio"/>	<input checked="" type="radio"/>	0
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input checked="" type="radio"/>	<input type="radio"/>	2
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input checked="" type="radio"/>	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input type="radio"/>	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input checked="" type="radio"/>	<input type="radio"/>	2
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input checked="" type="radio"/>	<input type="radio"/>	2
	>0.1 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form

<b>Natural Attenuation Screening Protocol</b> <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	Interpretation		Score	<b>Score: 23</b> <b>MW-3A</b> <b>Scroll to End of Table</b>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
	<b>Strong evidence for anaerobic biodegradation* of chlorinated organics</b>		<b>&gt;20</b>	

Analysis	Concentration in Most Contam. Zone	Interpretation	* reductive		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input type="radio"/>	<input checked="" type="radio"/>	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input checked="" type="radio"/>	<input type="radio"/>	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	3
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input checked="" type="radio"/>	<input type="radio"/>	3
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	1
	<-100mV	Reductive pathway likely	<input type="radio"/>	<input checked="" type="radio"/>	0
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input checked="" type="radio"/>	<input type="radio"/>	2
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input checked="" type="radio"/>	0
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input checked="" type="radio"/>	0
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input checked="" type="radio"/>	<input type="radio"/>	2
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input checked="" type="radio"/>	<input type="radio"/>	2
	>0.1 mg/L	Daughter product of VC/ethene	<input checked="" type="radio"/>	<input type="radio"/>	3
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form

<b>Natural Attenuation Screening Protocol</b> <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	Interpretation		Score	<b>Score: 9</b> <b>MW-6</b> <i>Scroll to End of Table</i>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
		Strong evidence for anaerobic biodegradation* of chlorinated organics	>20	

Analysis	Concentration in Most Contam. Zone	Interpretation	* reductive dechlorination		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input checked="" type="radio"/>	<input type="radio"/>	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input type="radio"/>	<input checked="" type="radio"/>	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
	<-100mV	Reductive pathway likely	<input type="radio"/>	<input checked="" type="radio"/>	0
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input type="radio"/>	<input checked="" type="radio"/>	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input type="radio"/>	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input type="radio"/>	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input checked="" type="radio"/>	<input type="radio"/>	2
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
	>0.1 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form

<b>Natural Attenuation Screening Protocol</b>  <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	Interpretation		Score	<b>Score: 10</b>  <b>MW-8</b>  <i>Scroll to End of Table</i>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
Strong evidence for anaerobic biodegradation* of chlorinated organics		>20		

Analysis	Concentration in Most Contam. Zone	Interpretation	* reductive dechlorination		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input type="radio"/>	<input checked="" type="radio"/>	0
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input checked="" type="radio"/>	<input type="radio"/>	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input type="radio"/>	<input checked="" type="radio"/>	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	1
	<-100mV	Reductive pathway likely	<input type="radio"/>	<input checked="" type="radio"/>	0
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input type="radio"/>	<input checked="" type="radio"/>	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input type="radio"/>	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input type="radio"/>	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input checked="" type="radio"/>	<input type="radio"/>	2
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
	>0.1 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form

<b>Natural Attenuation Screening Protocol</b> <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	<b>Interpretation</b>		<b>Score</b>	<b>Score: 13</b> <b>MW-8D</b> <b>Scroll to End of Table</b>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
		Strong evidence for anaerobic biodegradation* of chlorinated organics	>20	

Analysis	Concentration in Most Contam. Zone	Interpretation	Interpretation		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input checked="" type="radio"/>	<input type="radio"/>	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	2
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input checked="" type="radio"/>	<input type="radio"/>	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input type="radio"/>	<input checked="" type="radio"/>	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input checked="" type="radio"/>	<input type="radio"/>	1
	<-100mV	Reductive pathway likely	<input checked="" type="radio"/>	<input type="radio"/>	2
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input type="radio"/>	<input checked="" type="radio"/>	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input type="radio"/>	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input type="radio"/>	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input type="radio"/>	<input checked="" type="radio"/>	0
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
	>0.1 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form

<b>Natural Attenuation Screening Protocol</b> <small>The following is taken from the USEPA protocol (USEPA, 1998). The results of this scoring process have no regulatory significance.</small>	Interpretation		Score	<b>Score: 10</b> <b>MW-21</b> <i>Scroll to End of Table</i>
	Inadequate evidence for anaerobic biodegradation* of chlorinated organics		0 to 5	
	Limited evidence for anaerobic biodegradation* of chlorinated organics		6 to 14	
	Adequate evidence for anaerobic biodegradation* of chlorinated organics		15 to 20	
	Strong evidence for anaerobic biodegradation* of chlorinated organics		>20	

Analysis	Concentration in Most Contam. Zone	Interpretation	Interpretation		Points Awarded
			Yes	No	
Oxygen*	<0.5 mg/L	Tolerated, suppresses the reductive pathway at higher concentrations	<input checked="" type="radio"/>	<input type="radio"/>	3
	> 5mg/L	Not tolerated; however, VC may be oxidized aerobically	<input type="radio"/>	<input checked="" type="radio"/>	0
Nitrate*	<1 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Iron II*	>1 mg/L	Reductive pathway possible; VC may be oxidized under Fe(III)-reducing conditions	<input checked="" type="radio"/>	<input type="radio"/>	3
Sulfate*	<20 mg/L	At higher concentrations may compete with reductive pathway	<input type="radio"/>	<input checked="" type="radio"/>	0
Sulfide*	>1 mg/L	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
Methane*	>0.5 mg/L	Ultimate reductive daughter product, VC Accumulates	<input type="radio"/>	<input checked="" type="radio"/>	0
Oxidation Reduction Potential* (ORP)	<50 millivolts (mV)	Reductive pathway possible	<input type="radio"/>	<input checked="" type="radio"/>	0
	<-100mV	Reductive pathway likely	<input type="radio"/>	<input checked="" type="radio"/>	0
pH*	5 < pH < 9	Optimal range for reductive pathway	<input checked="" type="radio"/>	<input type="radio"/>	0
TOC	>20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	<input type="radio"/>	<input checked="" type="radio"/>	0
Temperature*	>20°C	At T >20°C biochemical process is accelerated	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Dioxide	>2x background	Ultimate oxidative daughter product	<input type="radio"/>	<input checked="" type="radio"/>	0
Alkalinity	>2x background	Results from interaction of carbon dioxide with aquifer minerals	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloride*	>2x background	Daughter product of organic chlorine	<input type="radio"/>	<input checked="" type="radio"/>	0
Hydrogen	>1 nM	Reductive pathway possible, VC may accumulate	<input type="radio"/>	<input type="radio"/>	
Volatile Fatty Acids	>0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	<input type="radio"/>	<input type="radio"/>	
BTEX*	>0.1 mg/L	Carbon and energy source; drives dechlorination	<input type="radio"/>	<input checked="" type="radio"/>	0
PCE*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
TCE*		Daughter product of PCE <sup>a/</sup>	<input type="radio"/>	<input checked="" type="radio"/>	0
DCE*		Daughter product of TCE. If cis is greater than 80% of total DCE it is likely a daughter product of TCE <sup>a/</sup> ; 1,1-DCE can be a chem. reaction product of TCA	<input checked="" type="radio"/>	<input type="radio"/>	2
VC*		Daughter product of DCE <sup>a/</sup>	<input checked="" type="radio"/>	<input type="radio"/>	2
1,1,1-Trichloroethane*		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
DCA		Daughter product of TCA under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Carbon Tetrachloride		Material released	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroethane*		Daughter product of DCA or VC under reducing conditions	<input type="radio"/>	<input checked="" type="radio"/>	0
Ethene/Ethane	>0.01 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
	>0.1 mg/L	Daughter product of VC/ethene	<input type="radio"/>	<input checked="" type="radio"/>	0
Chloroform		Daughter product of Carbon Tetrachloride	<input type="radio"/>	<input checked="" type="radio"/>	0
Dichloromethane		Daughter product of Chloroform	<input type="radio"/>	<input checked="" type="radio"/>	0

\* required analysis.

a/ Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

SCORE

Reset

End of Form



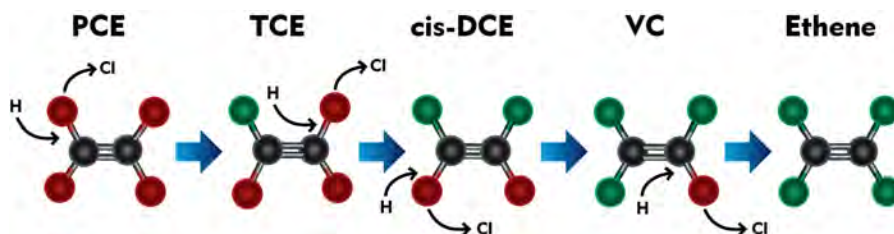
**ATTACHMENT 4**

**MICROBAC RESULTS**

## DHC Interpretation

### *Dehalococcoides* 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	<i>Dehalococcoides</i> spp.	Observation
	$\geq 10^4$ (cells/mL)	Lu et al. proposed that a concentration of $1 \times 10^4$ DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10).  Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to $10^4$ DHC cells/mL.
	$10^1$ to $< 10^4$ (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations.  When the DHC population is below the $10^4$ cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	$< 10^1$ (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

## DHC Functional Genes (*tceA*, *bvcA*, *vcrA*)

A “stall” where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate *cis*-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, *cis*-DCE, and vinyl chloride (12-15).

### Functional Gene

### Observation

#### TCE Reductase

- tceA* gene** The *tceA* gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*.
- Absence of *tceA* does not preclude the potential for reductive dechlorination of TCE in the field since the *tceA* gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*).
- Detection of the *tceA* gene provides an additional line of evidence indicating the potential for dechlorination of TCE.

#### Vinyl Chloride Reductase

- bvcA* gene** The *bvcA* gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16).
- Presence of *bvcA* gene indicates the potential for reductive dechlorination of VC to ethene.
- Absence of both *bvcA* and *vcrA* genes suggests VC may accumulate.
- An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10<sup>4</sup> cells/mL. The *bvcA* gene was detected in over 50% of these samples.
- Van Der Zaan et al (17) noted that the *bvcA* gene was the only VC reductase gene detected at three of their sites.
- Alfred Spormann’s laboratory at Stanford University (18) reported that the *bvcA* gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvcA* gene for complete reductive dechlorination.
- 
- vcrA* gene** The *vcrA* gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14).
- Presence of *vcrA* gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene.
- Absence of both *bvcA* and *vcrA* genes suggest VC may accumulate.
- As with the *bvcA* gene, detection of the *vcrA* gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

## Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

### Microbial Insights, Inc.

2340 Stock Creek Blvd. Rockford, TN 37853-3044  
 Tel. (865) 573-8188 Fax. (865) 573-8133

### CENSUS

<b>Client:</b> Company Name	<b>MI Project Number:</b> Unique Laboratory Identifier
Project: Your Project Name	Date Received: Date Samples Arrived

### Sample Information

Client Sample ID:	Sample A	Sample B	Sample C
Sample Date:	00/00/0000	00/00/0000	00/00/0000
Units:	cells/mL	cells/mL	cells/mL
Analyst:	Intials	Intials	Intials

### Dechlorinating Bacteria

	DHC	1.84E+05	2.76E+02	2.28E+01 (J)
<i>Dehalococcoides spp.</i>				
Functional Genes				
tceA Reductase	TCE	6.00E+01	3.23E+01	<4.00E-01
bvcA Reductase	BVC	1.17E+04	1.81E+01	<4.00E-01
vcrA Reductase	VCR	8.42E+04	1.74E+02	<4.00E-01

**"J" value**  
 Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

**< value**  
 The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

**"I" value**  
 QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

### Legend:

NA = Not Analyzed    NS = Not Sampled    J = Estimated gene copies below PQL but above LQL  
 < = Result not detected

## Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
<b>Date of Extraction</b>	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
<b>Laboratory Method Blanks</b>	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. <i>Dehalococcoides</i> ) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
<b>Laboratory Control Samples (LCS)</b>	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
<b>Negative Controls</b>	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

## References

1. Freedman, D. L. and J. M. Gossett. 1989. Biological reductive dechlorination of tetrachloroethylene and trichloroethylene to ethylene under methanogenic conditions. *Applied and Environmental Microbiology* 55(9): 2144-2151.
2. DiStefano, T. D., J.M. Gossett, and S.H. Zinder. 1991. Reductive dechlorination of high concentrations of tetrachlorethene to ethene by an anaerobic enrichment culture in the absence of methanogenesis. *Applied and Environmental Microbiology* 57(8): 2287-2292.
3. Gerritse, J., V. Renard, T. M. Pedro Gomes, P. A. Lawson, M. D. Collins, and J. C. Gottschal. 1996. *Desulfitobacterium* sp. Strain PCE1, an anaerobic bacterium that can grow by reductive dechlorination of tetrachloroethene or ortho-chlorinated phenols. *Archives of Microbiology* 165(2): 132-140.
4. Gerritse, J., O. Drzyzga, G. Kloetstra, M. Keijmel, L. P. Wiersum, R. Hutson, M. D. Collins, and J. C. Gottschal. 1999. Influence of different electron donors and acceptors on dehalorespiration of tetrachloroethene by *Desulfitobacterium frappieri* TCE1. *Applied and Environmental Microbiology* 65(12): 5212-5221.
5. Holliger, C., G. Schraa, A.J.M. Stams, and A.J.B. Zehnder. 1993. A highly purified enrichment culture couples the reductive dechlorination of tetrachloroethene to growth. *Applied and Environmental Microbiology* 59 (9): 2991-2997.
6. Krumholz, L. R., R. Sharp, and S. S. Fishbain. 1996. A freshwater anaerobe coupling acetate oxidation to tetrachloroethylene dehalogenation. *Applied and Environmental Microbiology* 62(11): 4108-4113.
7. Löffler, F.E., R.A. Sanford, and J.M. Tiedje. 1996. Initial characterization of a reductive dehalogenase from *Desulfitobacterium chlororespirans* Co23. *Applied and Environmental Microbiology* 62(10): 3809-3813.

8. Maymó-Gatell, X., T. Anguish, and S.H. Zinder. 1999. Reductive dechlorination of chlorinated ethenes and 1,2-dichloroethane by *Dehalococcoides ethenogenes* 195. *Applied and Environmental Microbiology* 65(7): 3108–3113.
9. Hendrickson, E.R., J. Payne, R.M. Young, M.G. Starr, M.P. Perry, S. Fahnestock, D.E. Ellis, and R.C. Eversole. 2002. Molecular analysis of *Dehalococcoides* 16S ribosomal DNA from chloroethene-contaminated sites throughout North America and Europe. *Applied and Environmental Microbiology* 68(2): 485-495.
10. Lu, X., J.T. Wilson, and D.H. Kampbell. 2006. Relationship between *Dehalococcoides* DNA in ground water and rates of reductive dechlorination at field scale. *Water Research* 40:3131-3140.
11. Adrian, L, U. Szewzyk, J. Wecke, and H. Görsch. 2000. Bacterial dehalorespiration with chlorinated benzenes. *Nature* 408(6812): 580-583.
12. Holmes, V.F., J. He, P.K.H. Lee, and L. Alvarez-Cohen. 2006. Discrimination of multiple *Dehalococcoides* strains in a trichloroethene enrichment by quantification of their reductive dehalogenase genes. *Applied and Environmental Microbiology* 72(9): 5877-5883.
13. Lee, P.K.H., D.R. Johnson, V.F. Holmes, J. He, and L. Alvarez-Cohen. 2006. Reductive dehalogenase gene expression as a biomarker for physiological activity of *Dehalococcoides* spp. *Applied and Environmental Microbiology* 72(9): 6161-6168.
14. Müller, J.A., B.M. Rosner, G. von Avendroth, G. Meshulam-Simon, P.L. McCarty, and A.M. Spormann. 2004. Molecular identification of the catabolic vinyl chloride reductase from *Dehalococcoides* sp. strain VS and its environmental distribution. *Applied and Environmental Microbiology* 70(8): 4880-4888.
15. Ritalahti, K.M., B.K. Amos, Y. Sung, Q. Wu, S.S. Koenigsberg, and F.E. Löffler. 2006. Quantitative PCR targeting 16S rRNA and reductive dehalogenase genes simultaneously monitors multiple *Dehalococcoides* strains. *Applied and Environmental Microbiology* 72(4): 2765-2774.
16. Krajmalnik-Brown, R., T. Hölscher, I. N. Thomson, F. M. Saunders, K. M. Ritalahti, and F. E. Löffler. 2004. Genetic identification of a putative vinyl chloride reductase in *Dehalococcoides* sp. strain BAV1. *Applied and Environmental Microbiology* 70:6347–6351.
17. van der Zaan, B., F. Hannes, N. Hoekstra, H. Rijnaarts, W.M. de Vos, H. Smidt, and J. Gerritse. 2010. Correlation of *Dehalococcoides* 16S rRNA and chloroethene-reductive dehalogenase genes with geochemical conditions in chloroethene-contaminated groundwater. *Applied and Environmental Microbiology* 76(3):843-850.
18. Behrens, S., M.F., Azizian, P.J. McMurdie, A. Sabalowsky, M.E. Dolan, L. Semprini, and A.M. Spormann. 2008. Monitoring abundance and expression of *Dehalococcoides* species chloroethene-reductive dehalogenases in a tetrachloroethene-dechlorinating flow column. *Applied and Environmental Microbiology* 74(18):5695-5703.
19. Sung, Y., K. M. Ritalahti, R. P. Apkarian, and F. E. Löffler. 2006. Quantitative PCR confirms purity of strain GT, a novel trichloroethene (TCE)-to-ethene respiring *Dehalococcoides* isolate. *Appl. Environ. Microbiol.* 72:1980-1987



Microbac Laboratories, Inc., Oak Ridge

CERTIFICATE OF ANALYSIS

Z9E0212

Revised Report: Amended to fix sample name.

John Wood Group, Plc Company

Project Name: 3617137306

Charles Staples
511 Congress Street, Ste. 200
Portland, ME 04101

Project / PO Number: C012506648
Received: 05/23/2019
Reported: 05/31/2019

Analytical Testing Parameters

Table with 2 rows: Client Sample ID: 828072-MW2A008, Sample Matrix: Water, Lab Sample ID: Z9E0212-01, Collection Date: 05/22/2019 15:10

Table with 10 columns: Molecular - QPCR, Result, RL, Units, Dilution, Note, Prepared, Analyzed, Analyst. Rows include Dehalobacter spp. (DHb), Dehalococcoides spp. (DHc), Trichloroethene Reductase (tceA), Vinyl Chloride Reductase (bvcA), Vinyl Chloride Reductase (vcrA).

Table with 2 rows: Client Sample ID: 828072-MW3A008, Sample Matrix: Water, Lab Sample ID: Z9E0212-02, Collection Date: 05/22/2019 15:20

Table with 10 columns: Molecular - QPCR, Result, RL, Units, Dilution, Note, Prepared, Analyzed, Analyst. Rows include Dehalobacter spp. (DHb), Dehalococcoides spp. (DHc), Trichloroethene Reductase (tceA), Vinyl Chloride Reductase (bvcA), Vinyl Chloride Reductase (vcrA).



Microbac Laboratories, Inc., Oak Ridge

CERTIFICATE OF ANALYSIS

Z9E0212

<b>Client Sample ID:</b> 828072-MW08D033	<b>Collection Date:</b> 05/22/2019 16:20
<b>Sample Matrix:</b> Water	
<b>Lab Sample ID:</b> Z9E0212-03	

Molecular - QPCR	Result	RL	Units	Dilution	Note	Prepared	Analyzed	Analyst
<b>QPCR</b>								
Dehalobacter spp. (DHb)	81000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Dehalococcoides spp. (DHc)	201000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Trichloroethene Reductase (tceA)	1600		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Vinyl Chloride Reductase (bvcA)	18000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Vinyl Chloride Reductase (vcrA)	70500		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB

<b>Client Sample ID:</b> 828072-MW008023	<b>Collection Date:</b> 05/22/2019 16:30
<b>Sample Matrix:</b> Water	
<b>Lab Sample ID:</b> Z9E0212-04	

Molecular - QPCR	Result	RL	Units	Dilution	Note	Prepared	Analyzed	Analyst
<b>QPCR</b>								
Dehalobacter spp. (DHb)	3650000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Dehalococcoides spp. (DHc)	2510000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Trichloroethene Reductase (tceA)	<100		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Vinyl Chloride Reductase (bvcA)	398000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB
Vinyl Chloride Reductase (vcrA)	1540000		gene copies/L	1		05/28/19 0935	05/31/19 1359	RWB

Definitions

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included.

Reviewed and Approved By:

Maraea Clark  
Project Manager  
Reported: 05/31/2019 16:48



**CHAIN OF CUSTODY**

Page 1 of 1



Project ID: 3617137306  
 Permit #: \_\_\_\_\_  
 If drinking water, State Reported?:  Yes  No

Report To: Charles Staples  
 Address: 511 Congress Street, Ste.200  
Portland,ME 04101  
 Phone: (207) 828-3571 Fax: \_\_\_\_\_  
 E-mail: charles.staples@woodplc.com

Invoice To: Same  
 Address: \_\_\_\_\_  
 P.O. #: C012506648  
 Quote #: \_\_\_\_\_

- (1) Sample Matrix codes  
 AR = Air OL = Oil SW = Storm Water  
 DW = Dr. Water PC = Paint Chip WP = Wipe  
 FO = Food SB = Swab WW = Waste Water  
 FT = Filter SD = Soil/Solid FB = Field Blank  
 GW = Gr. Water SL = Sludge TB = Trip Blank

- (2) Sample Type codes  
 G = Grab C = Composite

(1)	(2)	# of Containers	ANALYSIS REQUIRED											
			DHc-qPCR	bvca-qPCR	tceA-qPCR	vcrA-qPCR	Dehalobacter-qPCR							
			Please Mark Testing Required Below (X)											

**FOR LAB CHECK-IN ONLY**  
 Temp Rec'd: \_\_\_\_\_ °C  
 Prop. Preserved:    Y    N  
 Customer #: \_\_\_\_\_  
 Project: Product Analysis  
 Proj. Mgr: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	(1)	(2)	# of Containers	DHc-qPCR	bvca-qPCR	tceA-qPCR	vcrA-qPCR	Dehalobacter-qPCR										
828072-MW2A008	5/22/19	1510	GW	G	1	X	X	X	X	X										
828072-MW3A008		1520	GW	G	1	X	X	X	X	X										
828072-MW08D033		1600	GW	G	1	X	X	X	X	X										
828072-MW08D023		1630	GW	G	1	X	X	X	X	X										

Special instructions / notes:

Samples collected by [please print]:  
Jerry Rawcliffe

**PRIORITY** (addl. fee)  
 Same Day (+200%)  
 Next Day (+100%)  
 2 Day (+50%)  
 3 Day (+25%)  
 4 Day (+10%)

All rush priority orders require prior approval.

Relinquished By: Jerry Rawcliffe  
 Relinquished By: \_\_\_\_\_  
 Relinquished By: \_\_\_\_\_

Date: 5/22/19 Time: 1810  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received By: RED BX  
ARBILL #  
8142 3270 8180  
 Received By: \_\_\_\_\_  
 Received By: \_\_\_\_\_