

April 4, 2018

Charlene Sauls PG; Licensed Professional Geologist  
Pennsylvania Department of Environmental Protection  
Bureau of Waste Management  
909 Elmerton Avenue  
Harrisburg, PA 17110-8200

RE: Frey Farm Landfill (BWM Permit #101389)  
Groundwater Monitoring; Forms 19 Submittal

Dear Ms. Sauls:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program. Attached are the Forms 19, lab reports, and excel csv file for your LandLinks Access database. I have attached per your request:

1. USEPA MCL's exceedance report; Samples 2, 3, 28 & 33 exceeded the primary standard for nitrate, samples are consistent with historic data the cause is attributed to agricultural impacts. No other MCL's were exceeded.
2. USEPA SMCL's exceedance report; Samples 2W, 2SW, 3AW, 4AW, 5W, 17W, 18W, 26RW, 29W, 30RW, 31W, 32W, 33W exceeded the secondary standard for manganese, Samples 2DW, 2SW, 32W & 33W exceeded the secondary standard for iron, Samples 2DW, 4AW, 5W, 17W, 18W, & 26RW exceeded the secondary standard for total dissolved solids, and Samples 4AW, 5W, 17W, 18W & 26W exceeded the secondary standard for chlorides all samples are consistent with historic levels and exceedances are attributed to soil parent material, geologic conditions and historic land use. Well 2 DW had the highest chloride concentration measured and is attributed recent to excavation in the immediate area. No other SMCL's were exceeded.
3. A copy of the field sampling data sheets for all locations.

Other than mentioned above ground water monitoring concentrations where consistent with historic data no significant deviations were observed.

Please do not hesitate in contacting me if you have any questions or concerns at [www.lcswma.org](http://www.lcswma.org)  
MREIDER@LCSWMA.ORG.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "m. d. reider".

Mark D. Reider  
Director of Environmental Compliance

Enclosures:

cc: Bob Zorbaugh, Dan Brown, Bob Eshbach  
Ed Rawski, Randy Weiss (PADEP)

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**Lancaster County Solid Waste Management Authority**  
**Frey Farm Landfill**

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## *Exceedence Report*

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
FFMP002W	2297177005	02/22/2018	GW		
NITRATE-NITROGEN	mg/l	15.50	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
FFMP028W	2297177001	02/22/2018	GW		
NITRATE-NITROGEN	mg/l	21.10	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
FFMP033W	2296355004	02/20/2018	GW		
NITRATE-NITROGEN	mg/l	12.10	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
FFMP03AW	2296355003	02/20/2018	GW		
NITRATE-NITROGEN	mg/l	18.20	10.00	EPA-MCL	

**Lancaster County Solid Waste Management Authority**

**Frey Farm Landfill**

***Exceedence Report***

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP002W	2297177005	02/22/2018	GW		
MANGANESE, TOTAL	mg/l	0.25	0.05		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP005W	2296355001	02/20/2018	GW		
CHLORIDE	mg/l	278.00	250.00		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.06	0.05		EPA-SMCL
TDS (TOT. DISSOLVED SOLIDS)	mg/l	635.00	500.00		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP017W	2296256001	02/19/2018	GW		
CHLORIDE	mg/l	397.00	250.00		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.40	0.05		EPA-SMCL
TDS (TOT. DISSOLVED SOLIDS)	mg/l	844.00	500.00		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP018W	2296256002	02/19/2018	GW		
CHLORIDE	mg/l	695.00	250.00		EPA-SMCL
MANGANESE, TOTAL	mg/l	1.50	0.05		EPA-SMCL
TDS (TOT. DISSOLVED SOLIDS)	mg/l	1,250.00	500.00		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP029W	2296256006	02/19/2018	GW		
MANGANESE, TOTAL	mg/l	0.09	0.05		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP02DW	2297177004	02/22/2018	GW		
IRON, TOTAL	mg/l	0.33	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.45	0.05		EPA-SMCL
TDS (TOT. DISSOLVED SOLIDS)	mg/l	626.00	500.00		EPA-SMCL
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP02SW	2297177003	02/22/2018	GW		
IRON, TOTAL	mg/l	1.30	0.30		EPA-SMCL

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP031W	2297177006	02/22/2018	GW		
MANGANESE, TOTAL	mg/l	0.17	0.05	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP032W	2296355006	02/20/2018	GW		
IRON, TOTAL	mg/l	11.90	0.30	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.39	0.05	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP033W	2296355004	02/20/2018	GW		
IRON, TOTAL	mg/l	4.90	0.30	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.65	0.05	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP03AW	2296355003	02/20/2018	GW		
MANGANESE, TOTAL	mg/l	0.24	0.05	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP04AW	2296256005	02/19/2018	GW		
CHLORIDE	mg/l	335.00	250.00	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.16	0.05	EPA-SMCL	
TDS (TOT. DISSOLVED SOLIDS)	mg/l	885.00	500.00	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP26RW	2296355002	02/20/2018	GW		
CHLORIDE	mg/l	278.00	250.00	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.82	0.05	EPA-SMCL	
TDS (TOT. DISSOLVED SOLIDS)	mg/l	672.00	500.00	EPA-SMCL	
<b><i>Location ID</i></b>	<b><i>Sample Number</i></b>	<b><i>Sample Date</i></b>	<b><i>Sample Type</i></b>	<b><i>Sample Depth</i></b>	
FFMP30RW	2296256004	02/19/2018	GW		
MANGANESE, TOTAL	mg/l	1.50	0.05	EPA-SMCL	



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP017W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 8.5 " Longitude: 76 ° 27 ' 6.17 "

Depth to Water Level: 37.97 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.00 ft Elevation of Water Level: 442.73 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 165.27 gal

Total Well Depth: 150.5 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.9

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 10:43

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256001 Final Lab Analysis Completion Date: 2/28/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP017W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****ANALYTES****1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	49	SM20-2320B
CALCIUM, TOTAL	94.1	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	397	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	43.5	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	400	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	2.2	EPA 300
pH-FIELD (SU)	5.31	FIELD
pH-LAB (SU)	6.42	SM20-4500HB
POTASSIUM, TOTAL	5.7	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	76.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1445	FIELD
SPEC. COND., LAB (umhos/cm)	1330	SW846 9050A
SULFATE	52.2	EPA 300
ALKALINITY	49	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	844	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.9	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.14	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP017W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.





COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

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Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP018W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.62 " Longitude: 76 ° 27 ' 5.68 "

Depth to Water Level: 25.14 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.46 ft Elevation of Water Level: 447.06 ft./MSL

Sampling Depth: 40 ft Volume of Water Column: 17.16 gal

Total Well Depth: 51.43 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 2.7

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 11:13

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256002 Final Lab Analysis CompletionDate: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP018W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****ANALYTES****1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	7.22	D6919-09
BICARBONATE ALKALINITY	25	SM20-2320B
CALCIUM, TOTAL	104	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	13	EPA 410.4
CHLORIDE	695	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	38.5	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	1500	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	7.8	EPA 300
pH-FIELD (SU)	5.36	FIELD
pH-LAB (SU)	6.2	SM20-4500HB
POTASSIUM, TOTAL	40.3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	219	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	2436	FIELD
SPEC. COND., LAB (umhos/cm)	2210	SW846 9050A
SULFATE	46.1	EPA 300
ALKALINITY	25	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	1250	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.3	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP018W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



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Monitoring Point Number: FFMP019W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.58 " Longitude: 76 ° 27 ' 5.75 "

Depth to Water Level: 26.19 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.79 ft Elevation of Water Level: 445.76 ft./MSL

Sampling Depth: 49 ft Volume of Water Column: 69.58 gal

Total Well Depth: 132.79 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 2.0

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 11:48

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256003 Final Lab Analysis Completion Date: 2/28/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP019W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****ANALYTES****1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	75	SM20-2320B
CALCIUM, TOTAL	56.9	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	81.3	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	5.6	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.48	EPA 300
pH-FIELD (SU)	6.32	FIELD
pH-LAB (SU)	7.26	SM20-4500HB
POTASSIUM, TOTAL	1.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	10.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	471	FIELD
SPEC. COND., LAB (umhos/cm)	427	SW846 9050A
SULFATE	14.5	EPA 300
ALKALINITY	75	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	245	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP019W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP30RW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.52 " Longitude: 76 ° 27 ' 26.8 "

Depth to Water Level: 34.64 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.20 ft Elevation of Water Level: 527.66 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 81.30 gal

Total Well Depth: 90 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.5

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 13:06

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256004 Final Lab Analysis Completion Date: 2/28/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP30RW

Sample Date 2/19/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	28	SM20-2320B
CALCIUM, TOTAL	23	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	161	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	120	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	13.1	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	1500	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	6	EPA 300
pH-FIELD (SU)	5.11	FIELD
pH-LAB (SU)	6.23	SM20-4500HB
POTASSIUM, TOTAL	3.9	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	64.3	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	640	FIELD
SPEC. COND., LAB (umhos/cm)	600	SW846 9050A
SULFATE	14.1	EPA 300
ALKALINITY	28	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	334	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	2.89	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.



I.D. No 101389

Monitoring Point No. FFMP30RW

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP04AW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.4 " Longitude: 76 ° 27 ' 26.58 "

Depth to Water Level: 36.96 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.52 ft Elevation of Water Level: 523.76 ft./MSL

Sampling Depth: 146 ft Volume of Water Column: 388.55 gal

Total Well Depth: 301.52 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 14:13

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256005 Final Lab Analysis Completion Date: 2/28/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP04AW

Sample Date 2/19/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	213	SM20-2320B
CALCIUM, TOTAL	145	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	335	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	24.9	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	160	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.72	FIELD
pH-LAB (SU)	7.64	SM20-4500HB
POTASSIUM, TOTAL	2.5	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	83.5	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1523	FIELD
SPEC. COND., LAB (umhos/cm)	1390	SW846 9050A
SULFATE	44.5	EPA 300
ALKALINITY	213	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	885	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.2	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.47	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP04AW

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP029W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 12.93 " Longitude: 76 ° 27 ' 0.67 "

Depth to Water Level: 37.44 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.00 ft Elevation of Water Level: 439.86 ft./MSL

Sampling Depth: 55 ft Volume of Water Column: 30.93 gal

Total Well Depth: 58.5 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 3.7

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/19/2018 Sample Collection Time: 15:47

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296256006 Final Lab Analysis Completion Date: 2/28/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP029W

Sample Date 2/19/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	11	SM20-2320B
CALCIUM, TOTAL	33.4	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	166	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	19.6	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	92	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	4.4	EPA 300
pH-FIELD (SU)	5.05	FIELD
pH-LAB (SU)	6.19	SM20-4500HB
POTASSIUM, TOTAL	3.8	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	43.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	676	FIELD
SPEC. COND., LAB (umhos/cm)	629	SW846 9050A
SULFATE	9.7	EPA 300
ALKALINITY	13	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	346	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.28	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP029W

Sample Date 2/19/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP005W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 10.67 " Longitude: 76 ° 27 ' 21.3 "

Depth to Water Level: 53.41 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.70 ft Elevation of Water Level: 483.99 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 141.86 gal

Total Well Depth: 150 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.1

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 10:01

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355001 Final Lab Analysis Completion Date: 3/1/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_



I.D. No 101389

Monitoring Point No. FFMP005W

Sample Date 2/20/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.272	D6919-09
BICARBONATE ALKALINITY	47	SM20-2320B
CALCIUM, TOTAL	98	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	278	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	23.3	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	60	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	3.8	EPA 300
pH-FIELD (SU)	5.07	FIELD
pH-LAB (SU)	6.33	SM20-4500HB
POTASSIUM, TOTAL	2.7	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	54.9	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1157	FIELD
SPEC. COND., LAB (umhos/cm)	1060	SW846 9050A
SULFATE	50.5	EPA 300
ALKALINITY	47	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	635	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.99	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP005W

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP26RW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.03 " Longitude: 76 ° 27 ' 20.3 "

Depth to Water Level: 64.97 ft Measured from:  Land Surface  TOC

Casing Stickup: 3.30 ft Elevation of Water Level: 482.43 ft./MSL

Sampling Depth: 105 ft Volume of Water Column: 72.01 gal

Total Well Depth: 114 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 10:59

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355002 Final Lab Analysis Completion Date: 3/1/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 2/20/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.439	D6919-09
BICARBONATE ALKALINITY	41	SM20-2320B
CALCIUM, TOTAL	89.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	278	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	22.3	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	820	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	2.8	EPA 300
pH-FIELD (SU)	5.02	FIELD
pH-LAB (SU)	6	SM20-4500HB
POTASSIUM, TOTAL	11	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	66.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1201	FIELD
SPEC. COND., LAB (umhos/cm)	1070	SW846 9050A
SULFATE	72.9	EPA 300
ALKALINITY	41	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	672	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.8	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.51	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP26RW

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP03AW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 24.05 " Longitude: 76 ° 27 ' 30.58 "

Depth to Water Level: 55.37 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.20 ft Elevation of Water Level: 535.53 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 134.87 gal

Total Well Depth: 147.2 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.9

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 12:12

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355003 Final Lab Analysis CompletionDate: 3/1/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP03AW

Sample Date 2/20/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.352	D6919-09
BICARBONATE ALKALINITY	21	SM20-2320B
CALCIUM, TOTAL	17.1	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	25.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	12.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	240	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	18.2	EPA 300
pH-FIELD (SU)	4.82	FIELD
pH-LAB (SU)	5.86	SM20-4500HB
POTASSIUM, TOTAL	1.4	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	12.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	317	FIELD
SPEC. COND., LAB (umhos/cm)	261	SW846 9050A
SULFATE	3	EPA 300
ALKALINITY	15	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	146	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.76	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP03AW

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.





COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP033W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.09 " Longitude: 76 ° 27 ' 4.98 "

Depth to Water Level: 17.53 ft Measured from:  Land Surface  TOC

Casing Stickup: 0.49 ft Elevation of Water Level: 498.99 ft./MSL

Sampling Depth: 79 ft Volume of Water Column: 115.25 gal

Total Well Depth: 96 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 13:37

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355004 Final Lab Analysis Completion Date: 3/1/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP033W

Sample Date 2/20/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.58	D6919-09
BICARBONATE ALKALINITY	39	SM20-2320B
CALCIUM, TOTAL	24.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	37.2	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	4900	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	8.5	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	650	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	12.1	EPA 300
pH-FIELD (SU)	5.47	FIELD
pH-LAB (SU)	6.48	SM20-4500HB
POTASSIUM, TOTAL	1.6	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	13.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	338	FIELD
SPEC. COND., LAB (umhos/cm)	275	SW846 9050A
SULFATE	7.6	EPA 300
ALKALINITY	39	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	131	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	21.1	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP033W

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP015W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 36.43 " Longitude: 76 ° 27 ' 10.82 "

Depth to Water Level: 60.52 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 515.88 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 129.80 gal

Total Well Depth: 148.9 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 15:00

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355005 Final Lab Analysis Completion Date: 3/1/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP015W

Sample Date 2/20/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.354	D6919-09
BICARBONATE ALKALINITY	16	SM20-2320B
CALCIUM, TOTAL	7.7	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	6.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	6.8	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	5.3	EPA 300
pH-FIELD (SU)	4.78	FIELD
pH-LAB (SU)	6.26	SM20-4500HB
POTASSIUM, TOTAL	1.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	10.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	172	FIELD
SPEC. COND., LAB (umhos/cm)	141	SW846 9050A
SULFATE	23.1	EPA 300
ALKALINITY	16	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	103	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.79	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.18	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP015W

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP032W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 33.45 " Longitude: 76 ° 27 ' 17.71 "

Depth to Water Level: 51.18 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.06 ft Elevation of Water Level: 542.91 ft./MSL

Sampling Depth: 62 ft Volume of Water Column: 34.98 gal

Total Well Depth: 75 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.4

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/20/2018 Sample Collection Time: 15:42

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2296355006 Final Lab Analysis Completion Date: 3/2/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP032W

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****ANALYTES****1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	1.72	D6919-09
BICARBONATE ALKALINITY	73	SM20-2320B
CALCIUM, TOTAL	16.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	23.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	11900	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	4.8	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	390	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.55	FIELD
pH-LAB (SU)	7.57	SM20-4500HB
POTASSIUM, TOTAL	1.3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	15.5	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	237	FIELD
SPEC. COND., LAB (umhos/cm)	187	SW846 9050A
SULFATE	2.4	EPA 300
ALKALINITY	73	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	93	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.65	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	134	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.



I.D. No 101389

Monitoring Point No. FFMP032W

Sample Date 2/20/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP028W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 37 ° 57 ' 21.62 " Longitude: 76 ° 27 ' 0.1 "

Depth to Water Level: 5.21 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.50 ft Elevation of Water Level: 459.79 ft./MSL

Sampling Depth: 50 ft Volume of Water Column: \_\_\_\_\_ gal

Total Well Depth: 60 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 2.2

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate: \_\_\_\_\_ gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 9:36

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177001 Final Lab Analysis Completion Date: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP028W

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	34	SM20-2320B
CALCIUM, TOTAL	43.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	97.4	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	19.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	14	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	21.1	EPA 300
pH-FIELD (SU)	4.87	FIELD
pH-LAB (SU)	6.02	SM20-4500HB
POTASSIUM, TOTAL	2.7	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	31.8	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	669	FIELD
SPEC. COND., LAB (umhos/cm)	576	SW846 9050A
SULFATE	26.5	EPA 300
ALKALINITY	34	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	398	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.99	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.17	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP028W

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP025W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.07 " Longitude: 76 ° 27 ' 1.12 "

Depth to Water Level: 21.45 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.50 ft Elevation of Water Level: 455.35 ft./MSL

Sampling Depth: 39 ft Volume of Water Column: 27.24 gal

Total Well Depth: 40 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 2.4

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 10:09

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177002 Final Lab Analysis CompletionDate: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP025W

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	31	SM20-2320B
CALCIUM, TOTAL	43.9	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	134	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	23.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	3.6	EPA 300
pH-FIELD (SU)	5.51	FIELD
pH-LAB (SU)	6.25	SM20-4500HB
POTASSIUM, TOTAL	3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	35.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	717	FIELD
SPEC. COND., LAB (umhos/cm)	630	SW846 9050A
SULFATE	58.2	EPA 300
ALKALINITY	31	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	403	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.8	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.2	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP025W

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D<sup>o</sup> MM' SS.S")

Monitoring Point Number: FFMP02SW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.9 " Longitude: 76 ° 27 ' 1.58 "

Depth to Water Level: 14.49 ft Measured from:  Land Surface  TOC

Casing Stickup: \_\_\_\_\_ ft Elevation of Water Level: 495.41 ft./MSL

Sampling Depth: 18 ft Volume of Water Column: \_\_\_\_\_ gal

Total Well Depth: 25 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.6

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate: \_\_\_\_\_ gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 10:50

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177003 Final Lab Analysis Completion Date: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_



I.D. No 101389

Monitoring Point No. FFMP02SW

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	23	SM20-2320B
CALCIUM, TOTAL	13.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	65.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	1300	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	5	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	18	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	5	EPA 300
pH-FIELD (SU)	5.71	FIELD
pH-LAB (SU)	6.45	SM20-4500HB
POTASSIUM, TOTAL	4.9	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	53.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	437	FIELD
SPEC. COND., LAB (umhos/cm)	341	SW846 9050A
SULFATE	45.2	EPA 300
ALKALINITY	23	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	228	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	3.3	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	71.7	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP02SW

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
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**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP02DW  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County

Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.74 " Longitude: 76 ° 27 ' 1.49 "

Depth to Water Level: 21.38 ft Measured from:  Land Surface  TOC

Casing Stickup: \_\_\_\_\_ ft Elevation of Water Level: 488.22 ft./MSL

Sampling Depth: 120 ft Volume of Water Column: \_\_\_\_\_ gal

Total Well Depth: 152 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.4

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate: \_\_\_\_\_ gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 11:56

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177004 Final Lab Analysis Completion Date: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP02DW

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	135	SM20-2320B
CALCIUM, TOTAL	94.5	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	234	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	330	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	16.3	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	450	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	4.2	EPA 300
pH-FIELD (SU)	7	FIELD
pH-LAB (SU)	7.75	SM20-4500HB
POTASSIUM, TOTAL	2.1	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	79.8	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1173	FIELD
SPEC. COND., LAB (umhos/cm)	1060	SW846 9050A
SULFATE	31.9	EPA 300
ALKALINITY	135	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	626	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.76	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	3.63	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP02DW

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised  
03/22/2018

DEP USE ONLY

Date Received

**FORM 19**  
**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP002W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 32.25 " Longitude: 76 ° 27 ' 24.03 "

Depth to Water Level: 70.91 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.60 ft Elevation of Water Level: 542.29 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 144.94 gal

Total Well Depth: 169.6 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.7

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 12:37

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177005 Final Lab Analysis CompletionDate: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP002W

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	5 ND	SM20-2320B
CALCIUM, TOTAL	18.9	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	24.2	EPA 300
FLUORIDE	0.2	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	8.3	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	250	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	15.5	EPA 300
pH-FIELD (SU)	4.64	FIELD
pH-LAB (SU)	5.6	SM20-4500HB
POTASSIUM, TOTAL	3.1	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	16.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	325	FIELD
SPEC. COND., LAB (umhos/cm)	257	SW846 9050A
SULFATE	34.5	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	217	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.11	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP002W

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.





COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

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**MUNICIPAL WASTE LANDFILL**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

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General Reference: Section 273.284  
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

**SECTION A. APPLICANT IDENTIFIER**

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP031W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.2 " Longitude: 76 ° 27 ' 23.53 "

Depth to Water Level: 69.8 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.38 ft Elevation of Water Level: 542.86 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 103.10 gal

Total Well Depth: 140 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 0.7

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 13:43

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177006 Final Lab Analysis CompletionDate: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP031W

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	109	SM20-2320B
CALCIUM, TOTAL	54.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	22.9	EPA 300
FLUORIDE	0.2	EPA 300
IRON, TOTAL (ug/l)	270	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	3.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	170	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	1.4	EPA 300
pH-FIELD (SU)	7.61	FIELD
pH-LAB (SU)	8.13	SM20-4500HB
POTASSIUM, TOTAL	1.4	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	7.9	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	381	FIELD
SPEC. COND., LAB (umhos/cm)	308	SW846 9050A
SULFATE	42.4	EPA 300
ALKALINITY	109	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	222	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	2.91	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).  
Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP031W

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

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Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

**SECTION B. FACILITY INFORMATION**

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP016W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.15 " Longitude: 76 ° 27 ' 0.88 "

Depth to Water Level: 19.24 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.97 ft Elevation of Water Level: 455.36 ft./MSL

Sampling Depth: 135 ft Volume of Water Column: 191.75 gal

Total Well Depth: 149.8 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: \_\_\_\_\_

Sample Field Filtered (must be 0.45 micron)?:  Yes  No

Spring Flow Rate: \_\_\_\_\_ gpm

Sample Date (mm/dd/yy): 2/22/2018 Sample Collection Time: 14:02

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?:  Yes  No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2297177007 Final Lab Analysis Completion Date: 3/6/2018

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: \_\_\_\_\_

I.D. No 101389

Monitoring Point No. FFMP016W

Sample Date 2/22/2018

**FORM 19**  
**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES**

**ANALYTES**

**1-Q. Inorganics (Enter all data in mg/l except as noted)**

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	38	SM20-2320B
CALCIUM, TOTAL	55.5	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	135	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	85	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	20.1	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	17	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	4.4	EPA 300
pH-FIELD (SU)	6.51	FIELD
pH-LAB (SU)	6.64	SM20-4500HB
POTASSIUM, TOTAL	2.6	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	32.9	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	742	FIELD
SPEC. COND., LAB (umhos/cm)	669	SW846 9050A
SULFATE	62.3	EPA 300
ALKALINITY	38	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	440	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.6	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.27	SM 2130B

\* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

\*\* Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 101389

Monitoring Point No. FFMP016W

Sample Date 2/22/2018

**FORM 19****QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

March 8, 2018

Mr. Daniel Brown  
Lancaster County Solid Waste Authority  
1299 Hbg Pike, P.O. Box 4425  
Lancaster, PA 17604

## Certificate of Analysis

Project Name:	<b>FREY FARM</b>	Workorder:	<b>2297177</b>
Purchase Order:	<b>PO1000126</b>	Workorder ID:	<b>1ST QTR 2018 GWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, February 22, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

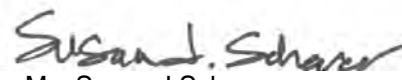
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Jordan Gallagher , Mr. Mark Reider , Mr. Jeff Musser

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



Ms. Susan J Scherer  
Project Coordinator

### ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay  
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

### SAMPLE SUMMARY

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2297177001	FFMP028W	Ground Water	2/22/2018 09:36	2/22/2018 16:21	Mr. Brian G Shade
2297177002	FFMP025W	Ground Water	2/22/2018 10:09	2/22/2018 16:21	Mr. Brian G Shade
2297177003	FFMP02SW	Ground Water	2/22/2018 10:50	2/22/2018 16:21	Mr. Brian G Shade
2297177004	FFMP02DW	Ground Water	2/22/2018 11:56	2/22/2018 16:21	Mr. Brian G Shade
2297177005	FFMP002W	Ground Water	2/22/2018 12:37	2/22/2018 16:21	Mr. Brian G Shade
2297177006	FFMP031W	Ground Water	2/22/2018 13:43	2/22/2018 16:21	Mr. Brian G Shade
2297177007	FFMP016W	Ground Water	2/22/2018 14:02	2/22/2018 16:21	Mr. Brian G Shade
2297177008	FIELD BLANK	Ground Water	2/22/2018 14:58	2/22/2018 16:21	Mr. Brian G Shade
2297177009	TRIP BLANK	Ground Water	2/22/2018 16:21	2/22/2018 16:21	Mr. Brian G Shade

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 Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey



**SAMPLE SUMMARY**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

**Lab ID:** 2297177001      **Date Collected:** 2/22/2018 09:36      **Matrix:** Ground Water  
**Sample ID:** FFMP028W      **Date Received:** 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 01:17	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 01:17	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			2/28/18 01:17	CJG	H
4-Bromofluorobenzene (S)	93.9		%	79 - 114	SW846 8260B			2/28/18 01:17	CJG	H
Dibromofluoromethane (S)	97.6		%	78 - 116	SW846 8260B			2/28/18 01:17	CJG	H
Toluene-d8 (S)	97.6		%	76 - 127	SW846 8260B			2/28/18 01:17	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	34		mg/L	5	S2320B-97			2/26/18 05:09	MSA	B
Alkalinity, Total	34	3	mg/L	5	S2320B-97			2/26/18 05:09	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 20:35	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 13:29	AK	A
Chloride	97.4		mg/L	2.0	EPA 300.0			2/23/18 07:40	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/23/18 07:40	CHW	B
Nitrate-N	21.1	4	mg/L	0.50	EPA 300.0			2/27/18 07:49	CHW	B
pH	6.02	1	pH_Units		S4500HB-11			2/26/18 05:09	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	576		umhos/cm	1	SW846 9050A			2/26/18 05:09	MSA	B
Sulfate	26.5		mg/L	2.0	EPA 300.0			2/23/18 07:40	CHW	B
Total Dissolved Solids	398		mg/L	5	S2540C-11			2/27/18 13:30	BMK	B
Total Organic Carbon (TOC)	0.99		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	0.17		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

### ALS Environmental Laboratory Locations Across North America

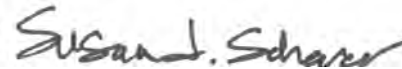
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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177001** Date Collected: 2/22/2018 09:36 Matrix: Ground Water  
Sample ID: **FFMP028W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	43.2		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
Magnesium, Total	19.2		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
Manganese, Total	0.014		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
Potassium, Total	2.7		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
Sodium, Total	31.8		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:47	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	5.210		Feet		Field			2/22/18 09:36	BGS	C
Elev Top MW Casing above MSL	465.00		Feet		Field			2/22/18 09:36	BGS	C
Flow Rate	3.00		gal/min		Field			2/22/18 09:36	BGS	C
Ground Water Elevation	459.790		ft/MSL		Field			2/22/18 09:36	BGS	C
pH, Field (SM4500B)	4.870		pH_Units		Field			2/22/18 09:36	BGS	C
Sample Depth	50.000		Feet		Field			2/22/18 09:36	BGS	C
Specific Conductance, Field	669		umhos/cm	1	Field			2/22/18 09:36	BGS	C
Temperature	10.78		Deg. C		Field			2/22/18 09:36	BGS	C
Total Well Depth	60.000		Feet		Field			2/22/18 09:36	BGS	C
Volume in Water Column	80.541		Gallons		Field			2/22/18 09:36	BGS	C
Water Level After Purge	35.010		Feet		Field			2/22/18 09:36	BGS	C
Well Volumes Purged	2.23		Vol		Field			2/22/18 09:36	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

**Lab ID:** 2297177002      **Date Collected:** 2/22/2018 10:09      **Matrix:** Ground Water  
**Sample ID:** FFMP025W      **Date Received:** 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Tetrachloroethene	ND	2,3, 4	ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/27/18 01:10	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 01:10	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	94		%	62 - 133	SW846 8260B			2/27/18 01:10	CJG	G
4-Bromofluorobenzene (S)	97.4		%	79 - 114	SW846 8260B			2/27/18 01:10	CJG	G
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			2/27/18 01:10	CJG	G
Toluene-d8 (S)	109		%	76 - 127	SW846 8260B			2/27/18 01:10	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	31		mg/L	5	S2320B-97			2/26/18 07:27	MSA	B
Alkalinity, Total	31	5	mg/L	5	S2320B-97			2/26/18 07:27	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 20:49	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 13:29	AK	A
Chloride	134		mg/L	2.0	EPA 300.0			2/23/18 07:52	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/23/18 07:52	CHW	B
Nitrate-N	3.6		mg/L	0.20	EPA 300.0			2/23/18 07:52	CHW	B
pH	6.25	1	pH_Units		S4500HB-11			2/26/18 07:27	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	630		umhos/cm	1	SW846 9050A			2/26/18 07:27	MSA	B
Sulfate	58.2		mg/L	2.0	EPA 300.0			2/23/18 07:52	CHW	B
Total Dissolved Solids	403		mg/L	5	S2540C-11			2/27/18 13:30	BMK	B
Total Organic Carbon (TOC)	1.8		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D

### ALS Environmental Laboratory Locations Across North America

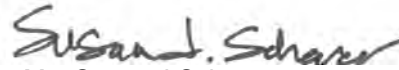
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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177002** Date Collected: 2/22/2018 10:09 Matrix: Ground Water  
Sample ID: **FFMP025W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Turbidity	0.20		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B
<b>METALS</b>										
Calcium, Total	43.9		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
Magnesium, Total	23.2		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
Potassium, Total	3.0		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
Sodium, Total	35.1		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:51	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	21.450		Feet		Field			2/22/18 10:09	BGS	C
Elev Top MW Casing above MSL	476.80		Feet		Field			2/22/18 10:09	BGS	C
Flow Rate	3.53		gal/min		Field			2/22/18 10:09	BGS	C
Ground Water Elevation	455.350		ft/MSL		Field			2/22/18 10:09	BGS	C
pH, Field (SM4500B)	5.510		pH_Units		Field			2/22/18 10:09	BGS	C
Sample Depth	39.000		Feet		Field			2/22/18 10:09	BGS	C
Specific Conductance, Field	717		umhos/cm	1	Field			2/22/18 10:09	BGS	C
Temperature	11.24		Deg. C		Field			2/22/18 10:09	BGS	C
Total Well Depth	41.500		Feet		Field			2/22/18 10:09	BGS	C
Volume in Water Column	29.474		Gallons		Field			2/22/18 10:09	BGS	C
Water Level After Purge	21.500		Feet		Field			2/22/18 10:09	BGS	C
Well Volumes Purged	2.39		Vol		Field			2/22/18 10:09	BGS	C

  
Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177003**

Date Collected: 2/22/2018 10:50

Matrix: Ground Water

Sample ID: **FFMP02SW**

Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 01:40	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 01:40	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	111		%	62 - 133	SW846 8260B			2/28/18 01:40	CJG	H
4-Bromofluorobenzene (S)	95.2		%	79 - 114	SW846 8260B			2/28/18 01:40	CJG	H
Dibromofluoromethane (S)	99.8		%	78 - 116	SW846 8260B			2/28/18 01:40	CJG	H
Toluene-d8 (S)	99.6		%	76 - 127	SW846 8260B			2/28/18 01:40	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	23		mg/L	5	S2320B-97			2/26/18 09:40	MSA	B
Alkalinity, Total	23	3	mg/L	5	S2320B-97			2/26/18 09:40	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 21:02	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 13:29	AK	A
Chloride	65.1		mg/L	2.0	EPA 300.0			2/23/18 08:05	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/23/18 08:05	CHW	B
Nitrate-N	5.0		mg/L	0.20	EPA 300.0			2/23/18 08:05	CHW	B
pH	6.45	1	pH_Units		S4500HB-11			2/26/18 09:40	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	341		umhos/cm	1	SW846 9050A			2/26/18 09:40	MSA	B
Sulfate	45.2		mg/L	2.0	EPA 300.0			2/23/18 08:05	CHW	B
Total Dissolved Solids	228		mg/L	5	S2540C-11			2/27/18 13:30	BMK	B
Total Organic Carbon (TOC)	3.3		mg/L	0.50	SW846 9060A			3/1/18 16:20	PAG	D
Turbidity	71.7		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

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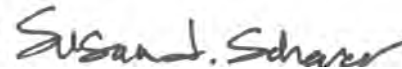
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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177003** Date Collected: 2/22/2018 10:50 Matrix: Ground Water  
Sample ID: **FFMP02SW** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed	By	Cntr
<b>METALS</b>									
Calcium, Total	13.6		mg/L	0.11	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
Iron, Total	1.3		mg/L	0.067	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
Magnesium, Total	5.0		mg/L	0.11	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
Manganese, Total	0.018		mg/L	0.0056	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
Potassium, Total	4.9		mg/L	0.56	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
Sodium, Total	53.7		mg/L	0.56	SW846 6010C	2/27/18 09:00 DXC	3/1/18 08:55	SRT	J1
<b>FIELD PARAMETERS</b>									
Depth to Water Level	14.490		Feet		Field		2/22/18 10:50	BGS	C
Elev Top MW Casing above MSL	509.90		Feet		Field		2/22/18 10:50	BGS	C
Flow Rate	0.87		gal/min		Field		2/22/18 10:50	BGS	C
Ground Water Elevation	495.410		ft/MSL		Field		2/22/18 10:50	BGS	C
pH, Field (SM4500B)	5.710		pH_Units		Field		2/22/18 10:50	BGS	C
Sample Depth	18.000		Feet		Field		2/22/18 10:50	BGS	C
Specific Conductance, Field	437		umhos/cm	1	Field		2/22/18 10:50	BGS	C
Temperature	10.06		Deg. C		Field		2/22/18 10:50	BGS	C
Total Well Depth	22.700		Feet		Field		2/22/18 10:50	BGS	C
Volume in Water Column	5.337		Gallons		Field		2/22/18 10:50	BGS	C
Water Level After Purge	17.780		Feet		Field		2/22/18 10:50	BGS	C
Well Volumes Purged	1.63		Vol		Field		2/22/18 10:50	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177004** Date Collected: 2/22/2018 11:56 Matrix: Ground Water  
Sample ID: **FFMP02DW** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 02:03	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:03	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	109		%	62 - 133	SW846 8260B			2/28/18 02:03	CJG	H
4-Bromofluorobenzene (S)	98.1		%	79 - 114	SW846 8260B			2/28/18 02:03	CJG	H
Dibromofluoromethane (S)	99.4		%	78 - 116	SW846 8260B			2/28/18 02:03	CJG	H
Toluene-d8 (S)	99		%	76 - 127	SW846 8260B			2/28/18 02:03	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	135		mg/L	5	S2320B-97			2/26/18 11:51	MSA	B
Alkalinity, Total	135	3	mg/L	5	S2320B-97			2/26/18 11:51	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 21:16	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 13:29	AK	A
Chloride	234		mg/L	5.0	EPA 300.0			2/27/18 10:00	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/23/18 08:17	CHW	B
Nitrate-N	4.2		mg/L	0.20	EPA 300.0			2/23/18 08:17	CHW	B
pH	7.75	1	pH_Units		S4500HB-11			2/26/18 11:51	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	1060		umhos/cm	1	SW846 9050A			2/26/18 11:51	MSA	B
Sulfate	31.9		mg/L	2.0	EPA 300.0			2/23/18 08:17	CHW	B
Total Dissolved Solids	626		mg/L	5	S2540C-11			2/27/18 13:30	BMK	B
Total Organic Carbon (TOC)	0.76		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	3.63		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

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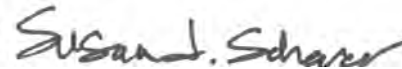


### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

 Lab ID: **2297177004** Date Collected: 2/22/2018 11:56 Matrix: Ground Water  
 Sample ID: **FFMP02DW** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	94.5		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
Iron, Total	0.33		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
Magnesium, Total	16.3		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
Manganese, Total	0.45		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
Potassium, Total	2.1		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
Sodium, Total	79.8		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 08:59	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	21.380		Feet		Field			2/22/18 11:56	BGS	C
Elev Top MW Casing above MSL	509.60		Feet		Field			2/22/18 11:56	BGS	C
Flow Rate	1.43		gal/min		Field			2/22/18 11:56	BGS	C
Ground Water Elevation	488.220		ft/MSL		Field			2/22/18 11:56	BGS	C
pH, Field (SM4500B)	7.000		pH_Units		Field			2/22/18 11:56	BGS	C
Sample Depth	120.000		Feet		Field			2/22/18 11:56	BGS	C
Specific Conductance, Field	1173		umhos/cm	1	Field			2/22/18 11:56	BGS	C
Temperature	10.37		Deg. C		Field			2/22/18 11:56	BGS	C
Total Well Depth	153.000		Feet		Field			2/22/18 11:56	BGS	C
Volume in Water Column	193.481		Gallons		Field			2/22/18 11:56	BGS	C
Water Level After Purge	48.200		Feet		Field			2/22/18 11:56	BGS	C
Well Volumes Purged	0.44		Vol		Field			2/22/18 11:56	BGS	C



 Ms. Susan J Scherer  
 Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177005**

Date Collected: 2/22/2018 12:37

Matrix: Ground Water

Sample ID: **FFMP002W**

Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 02:25	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:25	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	112		%	62 - 133	SW846 8260B			2/28/18 02:25	CJG	H
4-Bromofluorobenzene (S)	96.6		%	79 - 114	SW846 8260B			2/28/18 02:25	CJG	H
Dibromofluoromethane (S)	99.3		%	78 - 116	SW846 8260B			2/28/18 02:25	CJG	H
Toluene-d8 (S)	98.6		%	76 - 127	SW846 8260B			2/28/18 02:25	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			2/26/18 14:02	MSA	B
Alkalinity, Total	ND	4	mg/L	5	S2320B-97			2/26/18 14:02	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 21:30	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 13:29	AK	A
Chloride	24.2		mg/L	2.0	EPA 300.0			2/23/18 08:30	CHW	B
Fluoride	0.20		mg/L	0.20	EPA 300.0			2/23/18 08:30	CHW	B
Nitrate-N	15.5		mg/L	0.20	EPA 300.0			2/23/18 08:30	CHW	B
pH	5.60	1	pH_Units		S4500HB-11			2/26/18 14:02	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	257		umhos/cm	1	SW846 9050A			2/26/18 14:02	MSA	B
Sulfate	34.5		mg/L	2.0	EPA 300.0			2/23/18 08:30	CHW	B
Total Dissolved Solids	217	2	mg/L	5	S2540C-11			2/27/18 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	0.11		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

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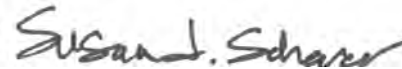
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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177005** Date Collected: 2/22/2018 12:37 Matrix: Ground Water  
Sample ID: **FFMP002W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	18.9		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
Magnesium, Total	8.3		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
Manganese, Total	0.25		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
Potassium, Total	3.1		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
Sodium, Total	16.1		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:13	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	70.910		Feet		Field			2/22/18 12:37	BGS	C
Elev Top MW Casing above MSL	613.20		Feet		Field			2/22/18 12:37	BGS	C
Flow Rate	1.03		gal/min		Field			2/22/18 12:37	BGS	C
Ground Water Elevation	542.290		ft/MSL		Field			2/22/18 12:37	BGS	C
pH, Field (SM4500B)	4.640		pH_Units		Field			2/22/18 12:37	BGS	C
Sample Depth	85.000		Feet		Field			2/22/18 12:37	BGS	C
Specific Conductance, Field	325		umhos/cm	1	Field			2/22/18 12:37	BGS	C
Temperature	11.35		Deg. C		Field			2/22/18 12:37	BGS	C
Total Well Depth	90.020		Feet		Field			2/22/18 12:37	BGS	C
Volume in Water Column	28.092		Gallons		Field			2/22/18 12:37	BGS	C
Water Level After Purge	82.410		Feet		Field			2/22/18 12:37	BGS	C
Well Volumes Purged	0.74		Vol		Field			2/22/18 12:37	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177006** Date Collected: 2/22/2018 13:43 Matrix: Ground Water  
Sample ID: **FFMP031W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 02:48	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 02:48	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	110		%	62 - 133	SW846 8260B			2/28/18 02:48	CJG	H
4-Bromofluorobenzene (S)	97.5		%	79 - 114	SW846 8260B			2/28/18 02:48	CJG	H
Dibromofluoromethane (S)	99.7		%	78 - 116	SW846 8260B			2/28/18 02:48	CJG	H
Toluene-d8 (S)	98.8		%	76 - 127	SW846 8260B			2/28/18 02:48	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	109		mg/L	5	S2320B-97			2/26/18 14:45	MSA	B
Alkalinity, Total	109	4	mg/L	5	S2320B-97			2/26/18 14:45	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 21:44	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 15:30	AK	A
Chloride	22.9		mg/L	2.0	EPA 300.0			2/23/18 08:42	CHW	B
Fluoride	0.20		mg/L	0.20	EPA 300.0			2/23/18 08:42	CHW	B
Nitrate-N	1.4		mg/L	0.20	EPA 300.0			2/23/18 08:42	CHW	B
pH	8.13	1	pH_Units		S4500HB-11			2/26/18 14:45	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	308		umhos/cm	1	SW846 9050A			2/26/18 14:45	MSA	B
Sulfate	42.4		mg/L	2.0	EPA 300.0			2/23/18 08:42	CHW	B
Total Dissolved Solids	222	2	mg/L	5	S2540C-11			2/27/18 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	2.91		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

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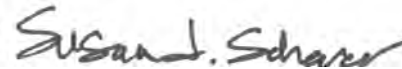
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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177006** Date Collected: 2/22/2018 13:43 Matrix: Ground Water  
Sample ID: **FFMP031W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	54.2		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
Iron, Total	0.27		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
Magnesium, Total	3.2		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
Manganese, Total	0.17		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
Sodium, Total	7.9		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:02	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	69.800		Feet		Field			2/22/18 13:43	BGS	C
Elev Top MW Casing above MSL	612.66		Feet		Field			2/22/18 13:43	BGS	C
Flow Rate	1.22		gal/min		Field			2/22/18 13:43	BGS	C
Ground Water Elevation	542.860		ft/MSL		Field			2/22/18 13:43	BGS	C
pH, Field (SM4500B)	7.610		pH_Units		Field			2/22/18 13:43	BGS	C
Sample Depth	130.000		Feet		Field			2/22/18 13:43	BGS	C
Specific Conductance, Field	381		umhos/cm	1	Field			2/22/18 13:43	BGS	C
Temperature	9.86		Deg. C		Field			2/22/18 13:43	BGS	C
Total Well Depth	142.700		Feet		Field			2/22/18 13:43	BGS	C
Volume in Water Column	107.163		Gallons		Field			2/22/18 13:43	BGS	C
Water Level After Purge	0.572		Feet		Field			2/22/18 13:43	BGS	C
Well Volumes Purged	0.69		Vol		Field			2/22/18 13:43	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177007**

Date Collected: 2/22/2018 14:02

Matrix: Ground Water

Sample ID: **FFMP016W**

Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Toluene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/28/18 03:11	CJG	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/28/18 03:11	CJG	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	110		%	62 - 133	SW846 8260B			2/28/18 03:11	CJG	H
4-Bromofluorobenzene (S)	95.4		%	79 - 114	SW846 8260B			2/28/18 03:11	CJG	H
Dibromofluoromethane (S)	99.5		%	78 - 116	SW846 8260B			2/28/18 03:11	CJG	H
Toluene-d8 (S)	98.3		%	76 - 127	SW846 8260B			2/28/18 03:11	CJG	H
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	38		mg/L	5	S2320B-97			2/26/18 14:54	MSA	B
Alkalinity, Total	38	4	mg/L	5	S2320B-97			2/26/18 14:54	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 21:58	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 15:30	AK	A
Chloride	135		mg/L	2.0	EPA 300.0			2/23/18 15:48	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/23/18 15:48	CHW	B
Nitrate-N	4.4		mg/L	0.20	EPA 300.0			2/23/18 15:48	CHW	B
pH	6.64	1	pH_Units		S4500HB-11			2/26/18 14:54	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	669		umhos/cm	1	SW846 9050A			2/26/18 14:54	MSA	B
Sulfate	62.3		mg/L	2.0	EPA 300.0			2/23/18 15:48	CHW	B
Total Dissolved Solids	440	2	mg/L	5	S2540C-11			2/27/18 14:00	BMK	B
Total Organic Carbon (TOC)	1.6		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	0.27		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

**ALS Environmental Laboratory Locations Across North America**

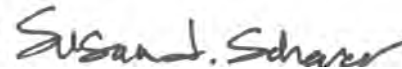
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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177007** Date Collected: 2/22/2018 14:02 Matrix: Ground Water  
Sample ID: **FFMP016W** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	55.5		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
Iron, Total	0.085		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
Magnesium, Total	20.1		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
Manganese, Total	0.017		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
Potassium, Total	2.6		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
Sodium, Total	32.9		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:24	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	19.240		Feet		Field			2/22/18 14:01	BGS	C
Elev Top MW Casing above MSL	474.60		Feet		Field			2/22/18 14:01	BGS	C
Ground Water Elevation	455.360		ft/MSL		Field			2/22/18 14:01	BGS	C
pH, Field (SM4500B)	6.510		pH_Units		Field			2/22/18 14:01	BGS	C
Sample Depth	135.000		Feet		Field			2/22/18 14:01	BGS	C
Specific Conductance, Field	742		umhos/cm	1	Field			2/22/18 14:01	BGS	C
Temperature	9.30		Deg. C		Field			2/22/18 14:01	BGS	C
Total Well Depth	149.800		Feet		Field			2/22/18 14:01	BGS	C
Volume in Water Column	340.762		Gallons		Field			2/22/18 14:01	BGS	C



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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177008** Date Collected: 2/22/2018 14:58 Matrix: Ground Water  
Sample ID: **FIELD BLANK** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Toluene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/27/18 23:00	CJG	B
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 23:00	CJG	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	109		%	62 - 133	SW846 8260B			2/27/18 23:00	CJG	B
4-Bromofluorobenzene (S)	96.6		%	79 - 114	SW846 8260B			2/27/18 23:00	CJG	B
Dibromofluoromethane (S)	98.1		%	78 - 116	SW846 8260B			2/27/18 23:00	CJG	B
Toluene-d8 (S)	99.1		%	76 - 127	SW846 8260B			2/27/18 23:00	CJG	B
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			2/26/18 15:05	MSA	B
Alkalinity, Total	ND	4	mg/L	5	S2320B-97			2/26/18 15:05	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			3/6/18 22:12	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			3/1/18 15:30	AK	A
Chloride	ND		mg/L	1.0	EPA 300.0			2/23/18 16:01	CHW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			2/23/18 16:01	CHW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			2/23/18 16:01	CHW	B
pH	6.47	1	pH_Units		S4500HB-11			2/26/18 15:05	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	3/5/18 12:00	NJA	3/5/18 16:41	NJA	F
Specific Conductance	ND		umhos/cm	1	SW846 9050A			2/28/18 01:28	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			2/23/18 16:01	CHW	B
Total Dissolved Solids	14	2	mg/L	5	S2540C-11			2/27/18 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			2/26/18 11:41	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			2/24/18 05:29	MSA	B

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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177008** Date Collected: 2/22/2018 14:58 Matrix: Ground Water  
Sample ID: **FIELD BLANK** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	ND		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	2/27/18 09:00	DXC	3/1/18 09:28	SRT	J1



Ms. Susan J Scherer  
Project Coordinator

#### ALS Environmental Laboratory Locations Across North America

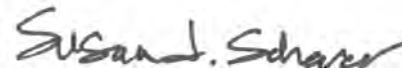
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**ANALYTICAL RESULTS**

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2297177009** Date Collected: 2/22/2018 16:21 Matrix: Ground Water  
Sample ID: **TRIP BLANK** Date Received: 2/22/2018 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Toluene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/27/18 23:23	CJG	B
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/27/18 23:23	CJG	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			2/27/18 23:23	CJG	B
4-Bromofluorobenzene (S)	96.5		%	79 - 114	SW846 8260B			2/27/18 23:23	CJG	B
Dibromofluoromethane (S)	96.1		%	78 - 116	SW846 8260B			2/27/18 23:23	CJG	B
Toluene-d8 (S)	97.9		%	76 - 127	SW846 8260B			2/27/18 23:23	CJG	B



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### ANALYTICAL RESULTS

Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2297177001</b>	1	FFMP028W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177001</b>	3	FFMP028W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2297177001</b>	4	FFMP028W	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
<b>2297177002</b>	1	FFMP025W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177002</b>	2	FFMP025W	SW846 8260B	Tetrachloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte Tetrachloroethene. The % Recovery was reported as 58.8 and the control limits were 72 to 124.				
<b>2297177002</b>	3	FFMP025W	SW846 8260B	Tetrachloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Tetrachloroethene. The % Recovery was reported as 57.7 and the control limits were 72 to 124.				
<b>2297177002</b>	4	FFMP025W	SW846 8260B	Tetrachloroethene
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte Tetrachloroethene. The % Recovery was reported as 64.3 and the control limits were 72 to 124.				
<b>2297177002</b>	5	FFMP025W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2297177003</b>	1	FFMP02SW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177003</b>	3	FFMP02SW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2297177004</b>	1	FFMP02DW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177004</b>	3	FFMP02DW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2297177005</b>	1	FFMP002W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177005</b>	2	FFMP002W	S2540C-11	Total Dissolved Solids
The LCS associated with this sample was recovered at 111%. The LCS control limit is 90 to 110%. A bias may exist with the result.				
<b>2297177005</b>	4	FFMP002W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2297177006</b>	1	FFMP031W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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### ANALYTICAL RESULTS

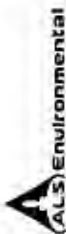
Workorder: 2297177 1ST QTR 2018 GWMP-FORM 19Q

<b>2297177006</b>	2	FFMP031W	S2540C-11	Total Dissolved Solids
The LCS associated with this sample was recovered at 111%. The LCS control limit is 90 to 110%. A bias may exist with the result.				
<b>2297177006</b>	4	FFMP031W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2297177007</b>	1	FFMP016W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177007</b>	2	FFMP016W	S2540C-11	Total Dissolved Solids
The LCS associated with this sample was recovered at 111%. The LCS control limit is 90 to 110%. A bias may exist with the result.				
<b>2297177007</b>	4	FFMP016W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2297177008</b>	1	FIELD BLANK	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2297177008</b>	2	FIELD BLANK	S2540C-11	Total Dissolved Solids
The LCS associated with this sample was recovered at 111%. The LCS control limit is 90 to 110%. A bias may exist with the result.				
<b>2297177008</b>	4	FIELD BLANK	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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**CHAIN OF CUSTODY / REQUEST FOR ANALYSIS**  
**ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.**

Client Name: Lancaster County Solid Waste MA  
 Address: 1299 Harrisburg Pike, P.O. Box 4424  
 Lancaster, PA 17604  
 Contact: Mark Reider  
 Phone#: (717) 735-0193

Project Name#: Frey Farm Quarterly (GWMP)  
 Bill To: Lancaster County Solid Waste MA

TAT  Normal-Standard TAT is 10-12 business days.  
 Rush-Subject to ALS approval and surcharges.  
 Date Required: \_\_\_\_\_ Approved By: \_\_\_\_\_  
 Email?  Y  N [mreider@LCSWMA.com](mailto:mreider@LCSWMA.com)  
 Fax?  Y  N No.: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time
1. FFMP022W	2/27/18	0936
2. FFMP025W		1009
3. FFMP025W		1050
4. FFMP022W		1156
5. FFMP002W		1227
6. FFMP021W		1343
7. FFMP010N		1402
8. Field Blank		1458
9. Trip Blank		1624
10		

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
<i>[Signature]</i>	3/22/18	1624	ALS	2-27	1624

Container Type / Preservative	AG	AN	CG	PL	PL	PL	PL	PL
40 ml	500 ml	40 ml	500 ml	500 ml	500 ml	500 ml	500 ml	500 ml
HCl	H2SO4	HCl	HNO3	HNO3	None	None	None	None

Matrix	TOC	O-OH	VOC - Form 190	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	PH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate
G GW	2	1	2	X	X	1	1	1	1

COC #: \_\_\_\_\_  
 ALS QU: \_\_\_\_\_  
 Cooler Temp: 25 Therm ID: 318  
 No. of Coolers: Y N  
 Custody Seals Present? \_\_\_\_\_  
 (if present) Seals Intact? \_\_\_\_\_  
 Received on ice? \_\_\_\_\_  
 COC Labels Complete/Accurate? \_\_\_\_\_  
 Cont. in Good Cond.? \_\_\_\_\_  
 Correct Containers? \_\_\_\_\_  
 Correct Sample Volumes? \_\_\_\_\_  
 Correct Preservation? \_\_\_\_\_  
 Headspace/Volatiles? \_\_\_\_\_  
 Counter/Tracking #: \_\_\_\_\_  
 Sample/COC Comments: \_\_\_\_\_

ALS Field Services:  Pickup  Labor  
 Composite\_Sampling  Rental\_Equipment  
 Other: \_\_\_\_\_

Special Processing: USACE  Navy   
 State Samples Collected In: NY  NJ  PA  NC   
 Reportable to PADEP? Yes  No   
 Lab  Special   
 PWSID #: \_\_\_\_\_  
 EDDS: Format Type: \_\_\_\_\_



March 7, 2018

Mr. Daniel Brown  
Lancaster County Solid Waste Authority  
1299 Hbg Pike, P.O. Box 4425  
Lancaster, PA 17604

## Certificate of Analysis

Project Name:	<b>FREY FARM</b>	Workorder:	<b>2296256</b>
Purchase Order:	<b>PO1000126</b>	Workorder ID:	<b>1ST QTR 2018 GWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, February 19, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

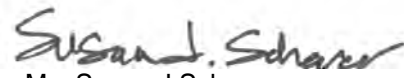
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Jordan Gallagher , Mr. Mark Reider , Mr. Jeff Musser

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*

  
Ms. Susan J Scherer  
Project Coordinator

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### SAMPLE SUMMARY

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2296256001	FFMP017W	Ground Water	2/19/2018 10:43	2/19/2018 16:43	Mr. Brian G Shade
2296256002	FFMP018W	Ground Water	2/19/2018 11:13	2/19/2018 16:43	Mr. Brian G Shade
2296256003	FFMP019W	Ground Water	2/19/2018 11:48	2/19/2018 16:43	Mr. Brian G Shade
2296256004	FFMP30RW	Ground Water	2/19/2018 13:06	2/19/2018 16:43	Mr. Brian G Shade
2296256005	FFMP04AW	Ground Water	2/19/2018 14:13	2/19/2018 16:43	Mr. Brian G Shade
2296256006	FFMP029W	Ground Water	2/19/2018 15:47	2/19/2018 16:43	Mr. Brian G Shade
2296256007	FIELD BLANK	Ground Water	2/19/2018 15:55	2/19/2018 16:43	Mr. Brian G Shade
2296256008	TRIP BLANK	Ground Water	2/19/2018 16:43	2/19/2018 16:43	Mr. Brian G Shade

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**SAMPLE SUMMARY**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256001** Date Collected: 2/19/2018 10:43 Matrix: Ground Water  
Sample ID: **FFMP017W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
1,1-Dichloroethene	ND	2,3	ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 11:51	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:51	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	99.4		%	62 - 133	SW846 8260B			2/21/18 11:51	TMP	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			2/21/18 11:51	TMP	G
Dibromofluoromethane (S)	97.5		%	78 - 116	SW846 8260B			2/21/18 11:51	TMP	G
Toluene-d8 (S)	93.8		%	76 - 127	SW846 8260B			2/21/18 11:51	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	49		mg/L	5	S2320B-97			2/26/18 06:15	MSA	B
Alkalinity, Total	49	4	mg/L	5	S2320B-97			2/26/18 06:15	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			2/28/18 07:16	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	397		mg/L	5.0	EPA 300.0			2/24/18 14:44	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 15:44	CHW	B
Nitrate-N	2.2		mg/L	0.20	EPA 300.0			2/20/18 15:44	CHW	B
pH	6.42	1	pH_Units		S4500HB-11			2/22/18 14:10	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	1330		umhos/cm	1	SW846 9050A			2/22/18 14:10	MSA	B
Sulfate	52.2		mg/L	2.0	EPA 300.0			2/20/18 15:44	CHW	B
Total Dissolved Solids	844		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.9		mg/L	0.50	SW846 9060A			2/21/18 11:43	PAG	D
Turbidity	0.14		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

### ALS Environmental Laboratory Locations Across North America

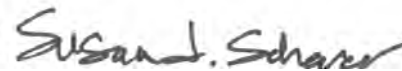
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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256001** Date Collected: 2/19/2018 10:43 Matrix: Ground Water  
Sample ID: **FFMP017W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	94.1		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
Magnesium, Total	43.5		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
Manganese, Total	0.40		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
Potassium, Total	5.7		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
Sodium, Total	76.6		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:46	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	37.970		Feet		Field			2/19/18 10:43	BGS	C
Elev Top MW Casing above MSL	480.70		Feet		Field			2/19/18 10:43	BGS	C
Flow Rate	2.04		gal/min		Field			2/19/18 10:43	BGS	C
Ground Water Elevation	442.730		ft/MSL		Field			2/19/18 10:43	BGS	C
pH, Field (SM4500B)	5.310		pH_Units		Field			2/19/18 10:43	BGS	C
Sample Depth	135.000		Feet		Field			2/19/18 10:43	BGS	C
Specific Conductance, Field	1445		umhos/cm	1	Field			2/19/18 10:43	BGS	C
Temperature	10.53		Deg. C		Field			2/19/18 10:43	BGS	C
Total Well Depth	150.500		Feet		Field			2/19/18 10:43	BGS	C
Volume in Water Column	165.419		Gallons		Field			2/19/18 10:43	BGS	C
Water Level After Purge	44.340		Feet		Field			2/19/18 10:43	BGS	C
Well Volumes Purged	0.86		Vol		Field			2/19/18 10:43	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

 Lab ID: **2296256002** Date Collected: 2/19/2018 11:13 Matrix: Ground Water  
 Sample ID: **FFMP018W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 12:09	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:09	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98.9		%	62 - 133	SW846 8260B			2/21/18 12:09	TMP	G
4-Bromofluorobenzene (S)	95		%	79 - 114	SW846 8260B			2/21/18 12:09	TMP	G
Dibromofluoromethane (S)	95.8		%	78 - 116	SW846 8260B			2/21/18 12:09	TMP	G
Toluene-d8 (S)	92.5		%	76 - 127	SW846 8260B			2/21/18 12:09	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	25		mg/L	5	S2320B-97			2/26/18 06:24	MSA	B
Alkalinity, Total	25	2	mg/L	5	S2320B-97			2/26/18 06:24	MSA	B
Ammonia-N	7.22		mg/L	0.100	D6919-09			3/6/18 03:18	CMM	A
Chemical Oxygen Demand (COD)	13		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	695		mg/L	10.0	EPA 300.0			2/24/18 14:57	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 17:04	CHW	B
Nitrate-N	7.8		mg/L	0.20	EPA 300.0			2/20/18 17:04	CHW	B
pH	6.20	1	pH_Units		S4500HB-11			2/22/18 14:19	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	2210		umhos/cm	1	SW846 9050A			2/22/18 14:19	MSA	B
Sulfate	46.1		mg/L	2.0	EPA 300.0			2/20/18 17:04	CHW	B
Total Dissolved Solids	1250		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.3		mg/L	0.50	SW846 9060A			2/27/18 17:03	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

### ALS Environmental Laboratory Locations Across North America

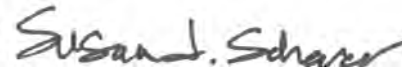
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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256002** Date Collected: 2/19/2018 11:13 Matrix: Ground Water  
Sample ID: **FFMP018W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	104		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
Magnesium, Total	38.5		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
Manganese, Total	1.5		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
Potassium, Total	40.3		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
Sodium, Total	219		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:50	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	25.140		Feet		Field			2/19/18 11:13	BGS	C
Elev Top MW Casing above MSL	472.20		Feet		Field			2/19/18 11:13	BGS	C
Flow Rate	4.64		gal/min		Field			2/19/18 11:13	BGS	C
Ground Water Elevation	447.060		ft/MSL		Field			2/19/18 11:13	BGS	C
pH, Field (SM4500B)	5.360		pH_Units		Field			2/19/18 11:13	BGS	C
Sample Depth	40.000		Feet		Field			2/19/18 11:13	BGS	C
Specific Conductance, Field	2436		umhos/cm	1	Field			2/19/18 11:13	BGS	C
Temperature	13.14		Deg. C		Field			2/19/18 11:13	BGS	C
Total Well Depth	51.460		Feet		Field			2/19/18 11:13	BGS	C
Volume in Water Column	17.108		Gallons		Field			2/19/18 11:13	BGS	C
Water Level After Purge	27.400		Feet		Field			2/19/18 11:13	BGS	C
Well Volumes Purged	2.71		Vol		Field			2/19/18 11:13	BGS	C



Ms. Susan J Scherer  
Project Coordinator

### ALS Environmental Laboratory Locations Across North America

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**ANALYTICAL RESULTS**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256003**

Date Collected: 2/19/2018 11:48

Matrix: Ground Water

Sample ID: **FFMP019W**

Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 12:27	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:27	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	99.7		%	62 - 133	SW846 8260B			2/21/18 12:27	TMP	G
4-Bromofluorobenzene (S)	98.4		%	79 - 114	SW846 8260B			2/21/18 12:27	TMP	G
Dibromofluoromethane (S)	101		%	78 - 116	SW846 8260B			2/21/18 12:27	TMP	G
Toluene-d8 (S)	95.2		%	76 - 127	SW846 8260B			2/21/18 12:27	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	75		mg/L	5	S2320B-97			2/26/18 06:34	MSA	B
Alkalinity, Total	75	2	mg/L	5	S2320B-97			2/26/18 06:34	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			2/28/18 07:46	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	81.3		mg/L	2.0	EPA 300.0			2/20/18 17:17	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 17:17	CHW	B
Nitrate-N	0.48		mg/L	0.20	EPA 300.0			2/20/18 17:17	CHW	B
pH	7.26	1	pH_Units		S4500HB-11			2/22/18 14:29	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	427		umhos/cm	1	SW846 9050A			2/22/18 14:29	MSA	B
Sulfate	14.5		mg/L	2.0	EPA 300.0			2/20/18 17:17	CHW	B
Total Dissolved Solids	245		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SW846 9060A			2/21/18 11:43	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

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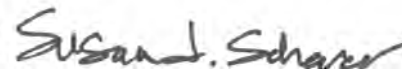


### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256003** Date Collected: 2/19/2018 11:48 Matrix: Ground Water  
Sample ID: **FFMP019W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	56.9		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
Magnesium, Total	5.6		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
Potassium, Total	1.2		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
Sodium, Total	10.6		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:54	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	26.190		Feet		Field			2/19/18 11:48	BGS	C
Elev Top MW Casing above MSL	471.95		Feet		Field			2/19/18 11:48	BGS	C
Flow Rate	4.61		gal/min		Field			2/19/18 11:48	BGS	C
Ground Water Elevation	445.760		ft/MSL		Field			2/19/18 11:48	BGS	C
pH, Field (SM4500B)	6.320		pH_Units		Field			2/19/18 11:48	BGS	C
Sample Depth	49.000		Feet		Field			2/19/18 11:48	BGS	C
Specific Conductance, Field	471		umhos/cm	1	Field			2/19/18 11:48	BGS	C
Temperature	11.69		Deg. C		Field			2/19/18 11:48	BGS	C
Total Well Depth	132.790		Feet		Field			2/19/18 11:48	BGS	C
Volume in Water Column	69.290		Gallons		Field			2/19/18 11:48	BGS	C
Water Level After Purge	34.320		Feet		Field			2/19/18 11:48	BGS	C
Well Volumes Purged	2.00		Vol		Field			2/19/18 11:48	BGS	C



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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256004** Date Collected: 2/19/2018 13:06 Matrix: Ground Water  
Sample ID: **FFMP30RW** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 12:46	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 12:46	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98.5		%	62 - 133	SW846 8260B			2/21/18 12:46	TMP	G
4-Bromofluorobenzene (S)	94.6		%	79 - 114	SW846 8260B			2/21/18 12:46	TMP	G
Dibromofluoromethane (S)	97.7		%	78 - 116	SW846 8260B			2/21/18 12:46	TMP	G
Toluene-d8 (S)	89.4		%	76 - 127	SW846 8260B			2/21/18 12:46	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	28		mg/L	5	S2320B-97			2/26/18 06:43	MSA	B
Alkalinity, Total	28	2	mg/L	5	S2320B-97			2/26/18 06:43	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			2/28/18 08:31	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	161		mg/L	2.0	EPA 300.0			2/20/18 17:31	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 17:31	CHW	B
Nitrate-N	6.0		mg/L	0.20	EPA 300.0			2/20/18 17:31	CHW	B
pH	6.23	1	pH_Units		S4500HB-11			2/22/18 15:15	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	600		umhos/cm	1	SW846 9050A			2/22/18 15:15	MSA	B
Sulfate	14.1		mg/L	2.0	EPA 300.0			2/20/18 17:31	CHW	B
Total Dissolved Solids	334		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.0		mg/L	0.50	SW846 9060A			2/21/18 11:43	PAG	D
Turbidity	2.89		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

### ALS Environmental Laboratory Locations Across North America

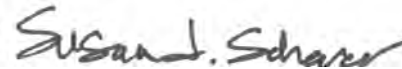
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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256004** Date Collected: 2/19/2018 13:06 Matrix: Ground Water  
Sample ID: **FFMP30RW** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	23.0		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
Iron, Total	0.12		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
Magnesium, Total	13.1		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
Manganese, Total	1.5		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
Potassium, Total	3.9		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
Sodium, Total	64.3		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 14:57	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	34.640		Feet		Field			2/19/18 13:06	BGS	C
Elev Top MW Casing above MSL	562.30		Feet		Field			2/19/18 13:06	BGS	C
Flow Rate	2.22		gal/min		Field			2/19/18 13:06	BGS	C
Ground Water Elevation	527.660		ft/MSL		Field			2/19/18 13:06	BGS	C
pH, Field (SM4500B)	5.110		pH_Units		Field			2/19/18 13:06	BGS	C
Sample Depth	85.000		Feet		Field			2/19/18 13:06	BGS	C
Specific Conductance, Field	640		umhos/cm	1	Field			2/19/18 13:06	BGS	C
Temperature	11.11		Deg. C		Field			2/19/18 13:06	BGS	C
Total Well Depth	94.200		Feet		Field			2/19/18 13:06	BGS	C
Volume in Water Column	87.553		Gallons		Field			2/19/18 13:06	BGS	C
Water Level After Purge	56.520		Feet		Field			2/19/18 13:06	BGS	C
Well Volumes Purged	1.52		Vol		Field			2/19/18 13:06	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256005** Date Collected: 2/19/2018 14:13 Matrix: Ground Water  
Sample ID: **FFMP04AW** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 13:04	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 13:04	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			2/21/18 13:04	TMP	G
4-Bromofluorobenzene (S)	98		%	79 - 114	SW846 8260B			2/21/18 13:04	TMP	G
Dibromofluoromethane (S)	102		%	78 - 116	SW846 8260B			2/21/18 13:04	TMP	G
Toluene-d8 (S)	96		%	76 - 127	SW846 8260B			2/21/18 13:04	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	213		mg/L	5	S2320B-97			2/26/18 07:37	MSA	B
Alkalinity, Total	213	2	mg/L	5	S2320B-97			2/26/18 07:37	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			2/28/18 08:46	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	335		mg/L	5.0	EPA 300.0			2/24/18 15:11	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 17:44	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			2/20/18 17:44	CHW	B
pH	7.64	1	pH_Units		S4500HB-11			2/22/18 15:25	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	1390		umhos/cm	1	SW846 9050A			2/22/18 15:25	MSA	B
Sulfate	44.5		mg/L	2.0	EPA 300.0			2/20/18 17:44	CHW	B
Total Dissolved Solids	885		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.2		mg/L	0.50	SW846 9060A			2/21/18 11:43	PAG	D
Turbidity	0.47		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

**ALS Environmental Laboratory Locations Across North America**

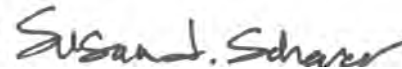
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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256005** Date Collected: 2/19/2018 14:13 Matrix: Ground Water  
Sample ID: **FFMP04AW** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	145		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
Magnesium, Total	24.9		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
Manganese, Total	0.16		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
Potassium, Total	2.5		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
Sodium, Total	83.5		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:01	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	36.960		Feet		Field			2/19/18 14:13	BGS	C
Elev Top MW Casing above MSL	560.72		Feet		Field			2/19/18 14:13	BGS	C
Flow Rate	2.05		gal/min		Field			2/19/18 14:13	BGS	C
Ground Water Elevation	523.760		ft/MSL		Field			2/19/18 14:13	BGS	C
pH, Field (SM4500B)	6.720		pH_Units		Field			2/19/18 14:13	BGS	C
Sample Depth	146.000		Feet		Field			2/19/18 14:13	BGS	C
Specific Conductance, Field	1523		umhos/cm	1	Field			2/19/18 14:13	BGS	C
Temperature	10.89		Deg. C		Field			2/19/18 14:13	BGS	C
Total Well Depth	148.500		Feet		Field			2/19/18 14:13	BGS	C
Volume in Water Column	163.964		Gallons		Field			2/19/18 14:13	BGS	C
Water Level After Purge	85.740		Feet		Field			2/19/18 14:13	BGS	C
Well Volumes Purged	0.75		Vol		Field			2/19/18 14:13	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256006**

Date Collected: 2/19/2018 15:47

Matrix: Ground Water

Sample ID: **FFMP029W**

Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 13:22	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 13:22	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			2/21/18 13:22	TMP	G
4-Bromofluorobenzene (S)	95.6		%	79 - 114	SW846 8260B			2/21/18 13:22	TMP	G
Dibromofluoromethane (S)	101		%	78 - 116	SW846 8260B			2/21/18 13:22	TMP	G
Toluene-d8 (S)	91.7		%	76 - 127	SW846 8260B			2/21/18 13:22	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	11		mg/L	5	S2320B-97			2/22/18 15:34	MSA	B
Alkalinity, Total	13	2	mg/L	5	S2320B-97			2/26/18 07:46	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			2/28/18 09:01	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	166		mg/L	2.0	EPA 300.0			2/20/18 17:58	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/20/18 17:58	CHW	B
Nitrate-N	4.4		mg/L	0.20	EPA 300.0			2/20/18 17:58	CHW	B
pH	6.19	1	pH_Units		S4500HB-11			2/22/18 15:34	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	629		umhos/cm	1	SW846 9050A			2/22/18 15:34	MSA	B
Sulfate	9.7		mg/L	2.0	EPA 300.0			2/20/18 17:58	CHW	B
Total Dissolved Solids	346		mg/L	5	S2540C-11			2/22/18 13:00	BMK	B
Total Organic Carbon (TOC)	1.0		mg/L	0.50	SW846 9060A			2/21/18 11:43	PAG	D
Turbidity	0.28		NTU	0.10	S2130B-01			2/21/18 04:16	MSA	B

**ALS Environmental Laboratory Locations Across North America**

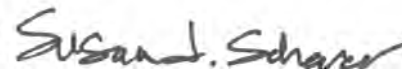
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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256006** Date Collected: 2/19/2018 15:47 Matrix: Ground Water  
Sample ID: **FFMP029W** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	33.4		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
Magnesium, Total	19.6		mg/L	0.11	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
Manganese, Total	0.092		mg/L	0.0056	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
Potassium, Total	3.8		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
Sodium, Total	43.6		mg/L	0.56	SW846 6010C	2/20/18 09:00	DXC	2/21/18 15:05	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	37.440		Feet		Field			2/19/18 15:47	BGS	C
Elev Top MW Casing above MSL	477.30		Feet		Field			2/19/18 15:47	BGS	C
Flow Rate	2.50		gal/min		Field			2/19/18 15:47	BGS	C
Ground Water Elevation	439.860		ft/MSL		Field			2/19/18 15:47	BGS	C
pH, Field (SM4500B)	5.050		pH_Units		Field			2/19/18 15:47	BGS	C
Sample Depth	55.000		Feet		Field			2/19/18 15:47	BGS	C
Specific Conductance, Field	676		umhos/cm	1	Field			2/19/18 15:47	BGS	C
Temperature	12.20		Deg. C		Field			2/19/18 15:47	BGS	C
Total Well Depth	60.500		Feet		Field			2/19/18 15:47	BGS	C
Volume in Water Column	33.898		Gallons		Field			2/19/18 15:47	BGS	C
Water Level After Purge	45.060		Feet		Field			2/19/18 15:47	BGS	C
Well Volumes Purged	3.69		Vol		Field			2/19/18 15:47	BGS	C



Ms. Susan J Scherer  
Project Coordinator

#### ALS Environmental Laboratory Locations Across North America

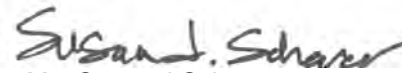
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**ANALYTICAL RESULTS**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256007** Date Collected: 2/19/2018 15:55 Matrix: Ground Water  
Sample ID: **FIELD BLANK** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 11:15	TMP	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:15	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	99.5		%	62 - 133	SW846 8260B			2/21/18 11:15	TMP	A
4-Bromofluorobenzene (S)	98.3		%	79 - 114	SW846 8260B			2/21/18 11:15	TMP	A
Dibromofluoromethane (S)	99.1		%	78 - 116	SW846 8260B			2/21/18 11:15	TMP	A
Toluene-d8 (S)	95.6		%	76 - 127	SW846 8260B			2/21/18 11:15	TMP	A



Ms. Susan J Scherer  
Project Coordinator

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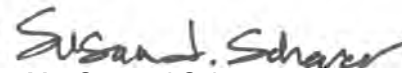


**ANALYTICAL RESULTS**

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296256008** Date Collected: 2/19/2018 16:43 Matrix: Ground Water  
Sample ID: **TRIP BLANK** Date Received: 2/19/2018 16:43

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 11:33	TMP	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 11:33	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	104		%	62 - 133	SW846 8260B			2/21/18 11:33	TMP	A
4-Bromofluorobenzene (S)	99.2		%	79 - 114	SW846 8260B			2/21/18 11:33	TMP	A
Dibromofluoromethane (S)	101		%	78 - 116	SW846 8260B			2/21/18 11:33	TMP	A
Toluene-d8 (S)	91.7		%	76 - 127	SW846 8260B			2/21/18 11:33	TMP	A



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2296256 1ST QTR 2018 GWMP-FORM 19Q

**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2296256001</b>	1	FFMP017W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256001</b>	2	FFMP017W	SW846 8260B	1,1-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 63 to 128.				
<b>2296256001</b>	3	FFMP017W	SW846 8260B	1,1-Dichloroethene
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 134 and the control limits were 63 to 128.				
<b>2296256001</b>	4	FFMP017W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2296256002</b>	1	FFMP018W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256002</b>	2	FFMP018W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2296256003</b>	1	FFMP019W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256003</b>	2	FFMP019W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2296256004</b>	1	FFMP30RW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256004</b>	2	FFMP30RW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2296256005</b>	1	FFMP04AW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256005</b>	2	FFMP04AW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
<b>2296256006</b>	1	FFMP029W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
<b>2296256006</b>	2	FFMP029W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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1 of 1

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**CHAIN OF CUSTODY/  
REQUEST FOR ANALYSIS**  
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /  
SAMPLER. INSTRUCTIONS ON THE BACK.

ALS Environmental  
34 Dogwood Lane • Middletown, PA 17057 • Fax: 717-944-1200 • www.alspa.com

Client Name: Lancaster County Solid Waste MA  
Address: 1299 Harrisburg Pike, P.O. Box 4124  
Lancaster, PA 17604

Contact: Mark Reider  
Phone#: (717) 735-0193

Project Name#: Frey Farm Amend - SUS  
Bill To: Lancaster County Solid Waste MA

TAT  Normal-Standard TAT is 10-12 business days.  
 Rush-Subject to ALS approval and surcharges.

Date Required: \_\_\_\_\_ Approved By: \_\_\_\_\_  
Email?  -Y  -N  
Fax?  -Y No.: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time
1. FFMP017W	2/19/18	1043
2. FFMP018W		1113
3. FFMP019W		1148
4. FFMP30RW		1306
5. FFMP04AW		1413
6. FFMP029W		1547
7. Field Blank		1555
8. Trip Blank		1619
9		
10		

Matrix	Enter Number of Containers Per Sample of Field Results Below.									
	TOC	O-H	VOC (Form 19A)	Field Measurements	Sample Depth for AUX Data	Dissolved: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, Ni, Cd, Se, Ag, Hg, Ca	Metals: Fe, Mn, Na, Ba, Cr, Cu, Pb, Mg, K, Zn, Ni, Cd, Se, Ag, Hg, Ca	PH, Cl, SPC, F, SO4, TDS, NO3	Turb.	Alkalinity, HCO3
G GW	2	1	2	X	X	1	1	1	1	1

Project Comments: This is a Farm lot  
cont. SUS export

ALS Field Services:  Pickup  Labor  
 Composite\_Sampling  Rental\_Equipment  
 Other.

Special Processing: USACE  Navy   
State Samples Collected in: NY  NJ  PA  NC

Deliverables: Standard  CLP-like  USACE   
Reportable to PADEP? Yes  No   
PWSID # \_\_\_\_\_  
EDDS: Formal Type \_\_\_\_\_

LOGGED BY (signature):	DATE	TIME	RECEIVED BY / COMPANY NAME	DATE	TIME

\* G=Grab, C=Composite \*\*Matrix - AL=Air, DW=Drinking Water, GW=Groundwater, OL=Oil, OI=Other Liquid, SL=Sludge, SO=Soil, WP=Wipe, WW=Wastewater  
ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057





March 6, 2018

Mr. Daniel Brown  
Lancaster County Solid Waste Authority  
1299 Hbg Pike, P.O. Box 4425  
Lancaster, PA 17604

## Certificate of Analysis

Project Name:	<b>FREY FARM</b>	Workorder:	<b>2296355</b>
Purchase Order:	<b>PO1000126</b>	Workorder ID:	<b>1ST QTR 2018 GWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, February 20, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

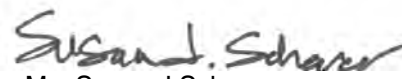
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

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ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. Jordan Gallagher , Mr. Mark Reider , Mr. Jeff Musser

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



Ms. Susan J Scherer  
Project Coordinator

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### SAMPLE SUMMARY

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2296355001	FFMP005W	Ground Water	2/20/2018 10:01	2/20/2018 17:09	Mr. Brian G Shade
2296355002	FFMP26RW	Ground Water	2/20/2018 10:59	2/20/2018 17:09	Mr. Brian G Shade
2296355003	FFMP03AW	Ground Water	2/20/2018 12:12	2/20/2018 17:09	Mr. Brian G Shade
2296355004	FFMP033W	Ground Water	2/20/2018 13:37	2/20/2018 17:09	Mr. Brian G Shade
2296355005	FFMP015W	Ground Water	2/20/2018 15:00	2/20/2018 17:09	Mr. Brian G Shade
2296355006	FFMP032W	Ground Water	2/20/2018 15:42	2/20/2018 17:09	Mr. Brian G Shade
2296355007	FIELD BLANK	Ground Water	2/20/2018 16:15	2/20/2018 17:09	Mr. Brian G Shade
2296355008	TRIP BLANK	Ground Water	2/20/2018 17:09	2/20/2018 17:09	Mr. Brian G Shade

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**SAMPLE SUMMARY**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355001**

Date Collected: 2/20/2018 10:01

Matrix: Ground Water

Sample ID: **FFMP005W**

Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 01:26	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 01:26	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.4		%	62 - 133	SW846 8260B			2/21/18 01:26	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			2/21/18 01:26	CJG	G
Dibromofluoromethane (S)	84.7		%	78 - 116	SW846 8260B			2/21/18 01:26	CJG	G
Toluene-d8 (S)	84.9		%	76 - 127	SW846 8260B			2/21/18 01:26	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	47		mg/L	5	S2320B-97			2/26/18 10:00	MSA	B
Alkalinity, Total	47	2	mg/L	5	S2320B-97			2/26/18 10:00	MSA	B
Ammonia-N	0.272		mg/L	0.100	D6919-09			3/1/18 22:45	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	278		mg/L	5.0	EPA 300.0			2/24/18 13:49	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/21/18 17:08	CHW	B
Nitrate-N	3.8		mg/L	0.20	EPA 300.0			2/21/18 17:08	CHW	B
pH	6.33	1	pH_Units		S4500HB-11			2/22/18 19:36	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	1060		umhos/cm	1	SW846 9050A			2/22/18 19:36	MSA	B
Sulfate	50.5		mg/L	2.0	EPA 300.0			2/21/18 17:08	CHW	B
Total Dissolved Solids	635		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	0.99		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

**ALS Environmental Laboratory Locations Across North America**

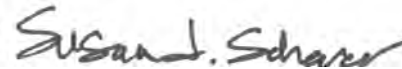
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### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355001** Date Collected: 2/20/2018 10:01 Matrix: Ground Water  
Sample ID: **FFMP005W** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	98.0		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
Magnesium, Total	23.3		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
Manganese, Total	0.060		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
Potassium, Total	2.7		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
Sodium, Total	54.9		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:24	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	53.410		Feet		Field			2/20/18 10:01	BGS	C
Elev Top MW Casing above MSL	537.40		Feet		Field			2/20/18 10:01	BGS	C
Flow Rate	2.58		gal/min		Field			2/20/18 10:01	BGS	C
Ground Water Elevation	483.990		ft/MSL		Field			2/20/18 10:01	BGS	C
pH, Field (SM4500B)	5.070		pH_Units		Field			2/20/18 10:01	BGS	C
Sample Depth	135.000		Feet		Field			2/20/18 10:01	BGS	C
Specific Conductance, Field	1157		umhos/cm	1	Field			2/20/18 10:01	BGS	C
Temperature	11.07		Deg. C		Field			2/20/18 10:01	BGS	C
Total Well Depth	149.700		Feet		Field			2/20/18 10:01	BGS	C
Volume in Water Column	141.546		Gallons		Field			2/20/18 10:01	BGS	C
Water Level After Purge	82.420		Feet		Field			2/20/18 10:01	BGS	C
Well Volumes Purged	1.09		Vol		Field			2/20/18 10:01	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355002**

Date Collected: 2/20/2018 10:59

Matrix: Ground Water

Sample ID: **FFMP26RW**

Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 01:48	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 01:48	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	88.6		%	62 - 133	SW846 8260B			2/21/18 01:48	CJG	G
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			2/21/18 01:48	CJG	G
Dibromofluoromethane (S)	87.3		%	78 - 116	SW846 8260B			2/21/18 01:48	CJG	G
Toluene-d8 (S)	87.1		%	76 - 127	SW846 8260B			2/21/18 01:48	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	41		mg/L	5	S2320B-97			2/26/18 10:08	MSA	B
Alkalinity, Total	41	2	mg/L	5	S2320B-97			2/26/18 10:08	MSA	B
Ammonia-N	0.439		mg/L	0.100	D6919-09			3/1/18 23:00	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 19:50	AK	A
Chloride	278		mg/L	5.0	EPA 300.0			2/24/18 14:05	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/21/18 18:10	CHW	B
Nitrate-N	2.8		mg/L	0.20	EPA 300.0			2/21/18 18:10	CHW	B
pH	6.00	1	pH_Units		S4500HB-11			2/22/18 20:02	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	1070		umhos/cm	1	SW846 9050A			2/22/18 20:02	MSA	B
Sulfate	72.9		mg/L	2.0	EPA 300.0			2/21/18 18:10	CHW	B
Total Dissolved Solids	672		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	1.8		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	0.51		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

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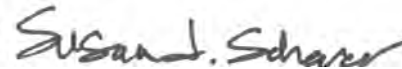


### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355002** Date Collected: 2/20/2018 10:59 Matrix: Ground Water  
Sample ID: **FFMP26RW** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	89.6		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
Magnesium, Total	22.3		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
Manganese, Total	0.82		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
Potassium, Total	11.0		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
Sodium, Total	66.7		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:46	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	64.970		Feet		Field			2/20/18 10:59	BGS	C
Elev Top MW Casing above MSL	547.40		Feet		Field			2/20/18 10:59	BGS	C
Flow Rate	2.05		gal/min		Field			2/20/18 10:59	BGS	C
Ground Water Elevation	482.430		ft/MSL		Field			2/20/18 10:59	BGS	C
pH, Field (SM4500B)	5.020		pH_Units		Field			2/20/18 10:59	BGS	C
Sample Depth	105.000		Feet		Field			2/20/18 10:59	BGS	C
Specific Conductance, Field	1201		umhos/cm	1	Field			2/20/18 10:59	BGS	C
Temperature	10.59		Deg. C		Field			2/20/18 10:59	BGS	C
Total Well Depth	118.300		Feet		Field			2/20/18 10:59	BGS	C
Volume in Water Column	78.395		Gallons		Field			2/20/18 10:59	BGS	C
Water Level After Purge	81.280		Feet		Field			2/20/18 10:59	BGS	C
Well Volumes Purged	1.05		Vol		Field			2/20/18 10:59	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355003** Date Collected: 2/20/2018 12:12 Matrix: Ground Water  
Sample ID: **FFMP03AW** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 02:10	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:10	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	88.2		%	62 - 133	SW846 8260B			2/21/18 02:10	CJG	G
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			2/21/18 02:10	CJG	G
Dibromofluoromethane (S)	85.1		%	78 - 116	SW846 8260B			2/21/18 02:10	CJG	G
Toluene-d8 (S)	82.3		%	76 - 127	SW846 8260B			2/21/18 02:10	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	21		mg/L	5	S2320B-97			2/26/18 10:17	MSA	B
Alkalinity, Total	15	2	mg/L	5	S2320B-97			2/22/18 20:10	MSA	B
Ammonia-N	0.352		mg/L	0.100	D6919-09			3/1/18 23:15	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 22:16	AK	A
Chloride	25.7		mg/L	2.0	EPA 300.0			2/21/18 08:12	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/21/18 08:12	CHW	B
Nitrate-N	18.2		mg/L	0.20	EPA 300.0			2/21/18 08:12	CHW	B
pH	5.86	1	pH_Units		S4500HB-11			2/22/18 20:10	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	261		umhos/cm	1	SW846 9050A			2/22/18 20:10	MSA	B
Sulfate	3.0		mg/L	2.0	EPA 300.0			2/21/18 08:12	CHW	B
Total Dissolved Solids	146		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	0.76		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

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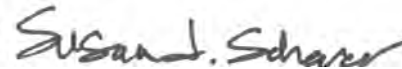


### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355003** Date Collected: 2/20/2018 12:12 Matrix: Ground Water  
Sample ID: **FFMP03AW** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	17.1		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
Magnesium, Total	12.2		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
Manganese, Total	0.24		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
Sodium, Total	12.6		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:49	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	55.370		Feet		Field			2/20/18 12:12	BGS	C
Elev Top MW Casing above MSL	590.90		Feet		Field			2/20/18 12:12	BGS	C
Flow Rate	1.94		gal/min		Field			2/20/18 12:12	BGS	C
Ground Water Elevation	535.530		ft/MSL		Field			2/20/18 12:12	BGS	C
pH, Field (SM4500B)	4.820		pH_Units		Field			2/20/18 12:12	BGS	C
Sample Depth	130.000		Feet		Field			2/20/18 12:12	BGS	C
Specific Conductance, Field	317		umhos/cm	1	Field			2/20/18 12:12	BGS	C
Temperature	11.69		Deg. C		Field			2/20/18 12:12	BGS	C
Total Well Depth	148.400		Feet		Field			2/20/18 12:12	BGS	C
Volume in Water Column	136.754		Gallons		Field			2/20/18 12:12	BGS	C
Water Level After Purge	85.880		Feet		Field			2/20/18 12:12	BGS	C
Well Volumes Purged	0.85		Vol		Field			2/20/18 12:12	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355004**

Date Collected: 2/20/2018 13:37

Matrix: Ground Water

Sample ID: **FFMP033W**

Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 02:32	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:32	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	88.8		%	62 - 133	SW846 8260B			2/21/18 02:32	CJG	G
4-Bromofluorobenzene (S)	137	2	%	79 - 114	SW846 8260B			2/21/18 02:32	CJG	G
Dibromofluoromethane (S)	84.6		%	78 - 116	SW846 8260B			2/21/18 02:32	CJG	G
Toluene-d8 (S)	82.1		%	76 - 127	SW846 8260B			2/21/18 02:32	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	39		mg/L	5	S2320B-97			2/26/18 10:26	MSA	B
Alkalinity, Total	39	3	mg/L	5	S2320B-97			2/26/18 10:26	MSA	B
Ammonia-N	0.580		mg/L	0.100	D6919-09			3/1/18 23:30	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 22:16	AK	A
Chloride	37.2		mg/L	2.0	EPA 300.0			2/24/18 14:20	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/24/18 14:20	CHW	B
Nitrate-N	12.1	4	mg/L	0.20	EPA 300.0			2/24/18 14:20	CHW	B
pH	6.48	1	pH_Units		S4500HB-11			2/22/18 20:19	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	275		umhos/cm	1	SW846 9050A			2/22/18 20:19	MSA	B
Sulfate	7.6		mg/L	2.0	EPA 300.0			2/24/18 14:20	CHW	B
Total Dissolved Solids	131		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	21.1		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

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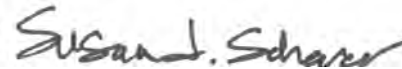
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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355004** Date Collected: 2/20/2018 13:37 Matrix: Ground Water  
Sample ID: **FFMP033W** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	24.2		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
Iron, Total	4.9		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
Magnesium, Total	8.5		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
Manganese, Total	0.65		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
Potassium, Total	1.6		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
Sodium, Total	13.6		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:53	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	17.530		Feet		Field			2/20/18 13:37	BGS	C
Elev Top MW Casing above MSL	516.52		Feet		Field			2/20/18 13:37	BGS	C
Flow Rate	2.00		gal/min		Field			2/20/18 13:37	BGS	C
Ground Water Elevation	498.990		ft/MSL		Field			2/20/18 13:37	BGS	C
pH, Field (SM4500B)	5.470		pH_Units		Field			2/20/18 13:37	BGS	C
Sample Depth	79.000		Feet		Field			2/20/18 13:37	BGS	C
Specific Conductance, Field	338		umhos/cm	1	Field			2/20/18 13:37	BGS	C
Temperature	12.58		Deg. C		Field			2/20/18 13:37	BGS	C
Total Well Depth	100.000		Feet		Field			2/20/18 13:37	BGS	C
Volume in Water Column	121.231		Gallons		Field			2/20/18 13:37	BGS	C
Water Level After Purge	24.540		Feet		Field			2/20/18 13:37	BGS	C
Well Volumes Purged	0.99		Vol		Field			2/20/18 13:37	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355005**

Date Collected: 2/20/2018 15:00

Matrix: Ground Water

Sample ID: **FFMP015W**

Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 02:54	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 02:54	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	88.2		%	62 - 133	SW846 8260B			2/21/18 02:54	CJG	G
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			2/21/18 02:54	CJG	G
Dibromofluoromethane (S)	85.5		%	78 - 116	SW846 8260B			2/21/18 02:54	CJG	G
Toluene-d8 (S)	82.6		%	76 - 127	SW846 8260B			2/21/18 02:54	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	16		mg/L	5	S2320B-97			2/26/18 10:35	MSA	B
Alkalinity, Total	16	2	mg/L	5	S2320B-97			2/26/18 10:35	MSA	B
Ammonia-N	0.354		mg/L	0.100	D6919-09			3/1/18 23:45	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 22:16	AK	A
Chloride	8.0		mg/L	2.0	EPA 300.0			2/21/18 11:47	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/21/18 11:47	CHW	B
Nitrate-N	5.3		mg/L	0.20	EPA 300.0			2/21/18 11:47	CHW	B
pH	6.26	1	pH_Units		S4500HB-11			2/22/18 20:28	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	141		umhos/cm	1	SW846 9050A			2/22/18 20:28	MSA	B
Sulfate	23.1		mg/L	2.0	EPA 300.0			2/21/18 11:47	CHW	B
Total Dissolved Solids	103		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	0.79		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	0.18		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

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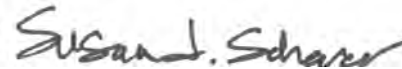
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### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355005** Date Collected: 2/20/2018 15:00 Matrix: Ground Water  
Sample ID: **FFMP015W** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	7.7		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
Magnesium, Total	6.2		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
Manganese, Total	0.0068		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
Potassium, Total	1.2		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
Sodium, Total	10.1		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 12:57	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	60.520		Feet		Field			2/20/18 15:00	BGS	C
Elev Top MW Casing above MSL	576.40		Feet		Field			2/20/18 15:00	BGS	C
Flow Rate	2.14		gal/min		Field			2/20/18 15:00	BGS	C
Ground Water Elevation	515.880		ft/MSL		Field			2/20/18 15:00	BGS	C
pH, Field (SM4500B)	4.780		pH_Units		Field			2/20/18 15:00	BGS	C
Sample Depth	135.000		Feet		Field			2/20/18 15:00	BGS	C
Specific Conductance, Field	172		umhos/cm	1	Field			2/20/18 15:00	BGS	C
Temperature	11.94		Deg. C		Field			2/20/18 15:00	BGS	C
Total Well Depth	149.900		Feet		Field			2/20/18 15:00	BGS	C
Volume in Water Column	131.389		Gallons		Field			2/20/18 15:00	BGS	C
Water Level After Purge	117.430		Feet		Field			2/20/18 15:00	BGS	C
Well Volumes Purged	0.98		Vol		Field			2/20/18 15:00	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355006** Date Collected: 2/20/2018 15:42 Matrix: Ground Water  
Sample ID: **FFMP032W** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 03:16	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 03:16	CJG	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	88		%	62 - 133	SW846 8260B			2/21/18 03:16	CJG	G
4-Bromofluorobenzene (S)	111		%	79 - 114	SW846 8260B			2/21/18 03:16	CJG	G
Dibromofluoromethane (S)	85		%	78 - 116	SW846 8260B			2/21/18 03:16	CJG	G
Toluene-d8 (S)	78		%	76 - 127	SW846 8260B			2/21/18 03:16	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	73		mg/L	5	S2320B-97			2/26/18 10:45	MSA	B
Alkalinity, Total	73	2	mg/L	5	S2320B-97			2/26/18 10:45	MSA	B
Ammonia-N	1.72		mg/L	0.100	D6919-09			3/2/18 00:00	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			2/27/18 22:16	AK	A
Chloride	23.1		mg/L	2.0	EPA 300.0			2/21/18 15:38	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			2/21/18 15:38	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			2/21/18 15:38	CHW	B
pH	7.57	1	pH_Units		S4500HB-11			2/22/18 20:38	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	2/27/18 13:14	NJA	2/27/18 16:39	NJA	F
Specific Conductance	187		umhos/cm	1	SW846 9050A			2/22/18 20:38	MSA	B
Sulfate	2.4		mg/L	2.0	EPA 300.0			2/21/18 15:38	CHW	B
Total Dissolved Solids	93		mg/L	5	S2540C-11			2/23/18 11:15	BMK	B
Total Organic Carbon (TOC)	0.65		mg/L	0.50	SW846 9060A			2/21/18 12:38	PAG	D
Turbidity	134		NTU	0.10	S2130B-01			2/21/18 04:46	MSA	B

**ALS Environmental Laboratory Locations Across North America**

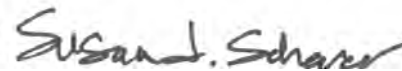
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### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355006** Date Collected: 2/20/2018 15:42 Matrix: Ground Water  
Sample ID: **FFMP032W** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	16.2		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
Iron, Total	11.9		mg/L	0.067	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
Magnesium, Total	4.8		mg/L	0.11	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
Manganese, Total	0.39		mg/L	0.0056	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
Potassium, Total	1.3		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
Sodium, Total	15.5		mg/L	0.56	SW846 6010C	2/26/18 02:20	LXC	2/26/18 13:00	SRT	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	51.180		Feet		Field			2/20/18 15:42	BGS	C
Elev Top MW Casing above MSL	594.09		Feet		Field			2/20/18 15:42	BGS	C
Flow Rate	0.95		gal/min		Field			2/20/18 15:42	BGS	C
Ground Water Elevation	542.910		ft/MSL		Field			2/20/18 15:42	BGS	C
pH, Field (SM4500B)	6.550		pH_Units		Field			2/20/18 15:42	BGS	C
Sample Depth	62.000		Feet		Field			2/20/18 15:42	BGS	C
Specific Conductance, Field	237		umhos/cm	1	Field			2/20/18 15:42	BGS	C
Temperature	13.57		Deg. C		Field			2/20/18 15:42	BGS	C
Total Well Depth	77.600		Feet		Field			2/20/18 15:42	BGS	C
Volume in Water Column	38.837		Gallons		Field			2/20/18 15:42	BGS	C
Water Level After Purge	57.760		Feet		Field			2/20/18 15:42	BGS	C
Well Volumes Purged	0.39		Vol		Field			2/20/18 15:42	BGS	C



Ms. Susan J Scherer  
Project Coordinator

#### ALS Environmental Laboratory Locations Across North America

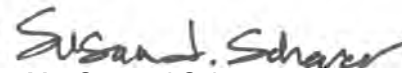
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**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355007** Date Collected: 2/20/2018 16:15 Matrix: Ground Water  
Sample ID: **FIELD BLANK** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 04:43	CJG	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 04:43	CJG	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.4		%	62 - 133	SW846 8260B			2/21/18 04:43	CJG	A
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			2/21/18 04:43	CJG	A
Dibromofluoromethane (S)	83.5		%	78 - 116	SW846 8260B			2/21/18 04:43	CJG	A
Toluene-d8 (S)	80.9		%	76 - 127	SW846 8260B			2/21/18 04:43	CJG	A



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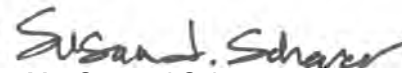


**ANALYTICAL RESULTS**

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

Lab ID: **2296355008** Date Collected: 2/20/2018 17:09 Matrix: Ground Water  
Sample ID: **TRIP BLANK** Date Received: 2/20/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Toluene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			2/21/18 05:05	CJG	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			2/21/18 05:05	CJG	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	92.3		%	62 - 133	SW846 8260B			2/21/18 05:05	CJG	A
4-Bromofluorobenzene (S)	100		%	79 - 114	SW846 8260B			2/21/18 05:05	CJG	A
Dibromofluoromethane (S)	84.2		%	78 - 116	SW846 8260B			2/21/18 05:05	CJG	A
Toluene-d8 (S)	83		%	76 - 127	SW846 8260B			2/21/18 05:05	CJG	A



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### ANALYTICAL RESULTS

Workorder: 2296355 1ST QTR 2018 GWMP-FORM 19Q

**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
2296355001	1	FFMP005W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355001	2	FFMP005W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
2296355002	1	FFMP26RW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355002	2	FFMP26RW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
2296355003	1	FFMP03AW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355003	2	FFMP03AW	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
2296355004	1	FFMP033W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355004	2	FFMP033W	SW846 8260B	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260B was outside of control limits. The % Recovery was reported as 137 and the control limits were 79 to 114. This result was reported at a dilution of 1.				
2296355004	3	FFMP033W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
2296355004	4	FFMP033W	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2296355005	1	FFMP015W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355005	2	FFMP015W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
2296355006	1	FFMP032W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2296355006	2	FFMP032W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				

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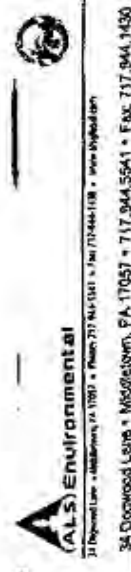
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COC #: 2296355  
ALS Quo

Generated by ALS  
CHAIN OF CUSTODY/  
REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /  
SAMPLER. INSTRUCTIONS ON THE BACK.



34 Dogwood Lane • Middletown, PA 17057 • 717.944.5561 • Fax: 717.944.1430  
www.alsenv.com

Client Name: Lancaster County Solid Waste MA  
Address: 1299 Harrisburg Pike, P.O. Box 4424  
Lancaster, PA 17604

Contact: Mark Reider  
Phone#: (717) 735-0193  
Project Name#: Frey Farm Quarterly (GWMP)  
Bill To: Lancaster County Solid Waste MA

TAT  Normal-Standard TAT is 10-12 business days.  
Date Required:  Rush-Subject to ALS approval and surcharges.  
Approved By: \_\_\_\_\_  
Email?  Y mreider@LCSWMA.com  
Fax?  Y No.: (717) 387-9973

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time
1. FFMPO05W	2/24/18	1001
2. FFMPO26RW		1054
3. FFMPO3AW		1212
4. FFMPO33W		1237
5. FFMPO15W		1500
6. FFMPO32W		1542
7. Field Blank		1615
8. Trip Blank		1709
9.		
10.		

Enter Number of Containers Per Sample or Field Results Below.			ANALYSES/METHOD REQUESTED		
Matrix	Field Measurements	VOC - Form 190	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, CI, SpC, F, SO4, TDS, NO3, Turb.
G					
GW					

Receipt information: \* 2296355 \*  
 Cooler Temp: 0.5 Therm ID: 318  
 No. of Coolers: Y N Initial: [Signature]  
 Custody Seats Present? (if present) Seats Intact? Received on Ice? COC Labels Complete/Accurate? Cont. in Good Cond.? Correct Containers? Correct Sample Volumes? Correct Preservation? Headspaces/Volatiles?  
 Courier/Tracking #: \_\_\_\_\_ Sample/COC Comments: \_\_\_\_\_  
 ALS Field Services:  Pickup  Labor  Composite\_Sampling  Rental\_Equipment  Other: \_\_\_\_\_  
 Standard Deliverables:  Standard  CLP-line  USACE  
 Special Processing:  USACE  Navy  State Samples Collected In:  NY  NJ  PA  NC  
 Reportable to PADEP?  Yes  No Lab  X Special   
 RWSID #: \_\_\_\_\_ EDDS: Format Type: \_\_\_\_\_  
 Project Comments: Relinquished By / Company Name: [Signature] ALS  
 Date: 2/24/18 Time: 1709  
 Received By / Company Name: [Signature] ALS  
 Date: 2/20/18 Time: 1709  
 Logged By (signature): \_\_\_\_\_  
 Reviewed By (signature): \_\_\_\_\_