

March 12, 2018

Ms. Charlene Sauls; Regional Hydrogeologist
Pennsylvania Department of Environmental Protection
Bureau of Land Recycling and Waste Management
909 Elmerton Avenue
Harrisburg, PA 17110-8200

REF: Creswell Landfill (BWM Permit #100008)
Groundwater Monitoring; 1st Quarter 2018

Dear Ms. Sauls:

Enclosed, as a PDF file, are the Form 19 reports for the sampling period completed at the above referenced facility. The laboratory results were reviewed to evaluate the quality of the data and historic trends.

- This sampling event was for the “Quarterly” Form 19 parameters, all the thirteen (13) GWMP locations were sampled.
- Enclosed, on CD, is a csv file that should be in the format compatible with your LandLinks software. Additionally, the CD includes a PDF file of all the Forms 19, PDF files of the laboratory reports, MCL and SMCL exceedance reports as you have requested.
- Up gradient well samples were below MCL and SMCL except for nitrate, iron, and manganese on well 1.
- Down gradient wells had similar results with 17 & 18 (surface Mann’s Run) showing high concentration of chlorides, TDS and nitrate-nitrogen related to surface influences and Turkey Hill discharge. Wells 5, 7 & 12 exceeded MCL for nitrate. Wells 9 and 10 had elevated TDS and chlorides which shows surface influence of Mann’s Run. Wells 2 & 5 show manganese, 8 thru 12 show iron and manganese above the SMCL which is due to natural geologic parent material.
- Wells 2, 3, 4, 8, 9 and 12 with historic VOCs concentrations detected either stabilized or continue to decrease.

Page 2 of 2
Creswell Landfill (BWM Permit #100008)

1299 HARRISBURG PIKE | PO BOX 4425 | LANCASTER, PA 17604
PHONE: 717-397-9968 | FAX: 717-397-9973

www.lcswma.org

In summary, we observed no unusual trends, and the values reported are generally consistent with historic or seasonal results.

Please do not hesitate in contacting me if you have any questions or concerns at mreider@lcswma.org.

Respectfully Submitted,



Mark D. Reider
Director of Environmental Compliance

Enclosures

cc: Bob Zorbaugh; Daniel Brown; Bob Eshbach; Jeff Musser; Jordan Gallagher
Randy Weiss (PA DEP)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT



Date Prepared/Revised
02/22/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP005W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.17 " Longitude: 76 ° 26 ' 7.08 "

Depth to Water Level: 46.91 ft Measured from: Land Surface TOC

Casing Stickup: -0.37 ft Elevation of Water Level: 466.52 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 136.72 gal

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

Well Purged: Yes No Well Volumes Purged: 2.6

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 1/15/2018 Sample Collection Time: 11:38

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): 2288582001 Final Lab Analysis Completion Date: 1/18/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 1/15/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.429	EPA 350.3
BICARBONATE	22	SM18-2321
CALCIUM, TOTAL	20	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	8	EPA 410.4
CHLORIDE	91.9	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	10.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	69	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.6	EPA 300.0
pH-FIELD (SU)	4.93	FIELD
pH-LAB (SU)	6.01	EPA 150.1
POTASSIUM, TOTAL	2.9	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	41	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	481	FIELD
SPEC. COND., LAB (umhos/cm)	426	EPA 120.1
SULFATE	2.7	EPA 300.0
ALKALINITY	22	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	271	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.41	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 100008

Monitoring Point No. CWMP005W

Sample Date 1/15/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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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General Reference: Section 273.284
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP001W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 27.43 " Longitude: 76 ° 26 ' 14.4 "

Depth to Water Level: 31.14 ft Measured from: Land Surface TOC

Casing Stickup: 1.23 ft Elevation of Water Level: 483.99 ft./MSL

Sampling Depth: 57 ft Volume of Water Column: 51.64 gal

Total Well Depth: 66.3 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 2.8

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 1/15/2018 Sample Collection Time: 13:10

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): 2288582002 Final Lab Analysis Completion Date: 1/18/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP001W

Sample Date 1/15/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.435	EPA 350.3
BICARBONATE	7	SM18-2321
CALCIUM, TOTAL	17.4	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	33	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	2000	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	11.7	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	85	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	22	EPA 300.0
pH-FIELD (SU)	4.91	FIELD
pH-LAB (SU)	5.9	EPA 150.1
POTASSIUM, TOTAL	2.7	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	15.8	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	326	FIELD
SPEC. COND., LAB (umhos/cm)	267	EPA 120.1
SULFATE	2.1	EPA 300.0
ALKALINITY	7	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	163	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	89.2	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 100008

Monitoring Point No. CWMP001W

Sample Date 1/15/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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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Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP007W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 24.53 " Longitude: 76 ° 26 ' 33.28 "

Depth to Water Level: 8.18 ft Measured from: Land Surface TOC

Casing Stickup: 1.50 ft Elevation of Water Level: 445.22 ft./MSL

Sampling Depth: 33 ft Volume of Water Column: 41.59 gal

Total Well Depth: 36.5 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 2.5

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 1/15/2018 Sample Collection Time: 14:20

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): 2288582003 Final Lab Analysis CompletionDate: 1/18/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP007W

Sample Date 1/15/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.441	EPA 350.3
BICARBONATE	14	SM18-2321
CALCIUM, TOTAL	18.9	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	69.2	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9.5	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6.3	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.9	EPA 300.0
pH-FIELD (SU)	4.73	FIELD
pH-LAB (SU)	6.12	EPA 150.1
POTASSIUM, TOTAL	2.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	33.3	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	419	FIELD
SPEC. COND., LAB (umhos/cm)	345	EPA 120.1
SULFATE	15.9	EPA 300.0
ALKALINITY	14	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	262	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
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 100008

Monitoring Point No. CWMP007W

Sample Date 1/15/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

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General Reference: Section 273.284
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP002W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.97 " Longitude: 76 ° 26 ' 12.3 "

Depth to Water Level: 71.01 ft Measured from: Land Surface TOC

Casing Stickup: -1.19 ft Elevation of Water Level: 454.8 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 42.58 gal

Total Well Depth: 100 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): 1/16/2018 Sample Collection Time: 13:00

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): 2288774001 Final Lab Analysis Completion Date: 1/27/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP002W

Sample Date 1/16/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	58	SM18-2321
CALCIUM, TOTAL	49.9	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	10	EPA 410.4
CHLORIDE	104	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	14.8	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1100	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.5	EPA 300.0
pH-FIELD (SU)	5.74	FIELD
pH-LAB (SU)	6.23	EPA 150.1
POTASSIUM, TOTAL	2.9	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	20.5	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1112	FIELD
SPEC. COND., LAB (umhos/cm)	530	EPA 120.1
SULFATE	25.9	EPA 300.0
ALKALINITY	58	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	380	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	4.1	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.46	SM 2130B

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Monitoring Point No. CWMP002W

Sample Date 1/16/2018

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ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	6.6	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: CWMP010W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 2.38 " Longitude: 76 ° 26 ' 57.92 "

Depth to Water Level: 8.88 ft Measured from: Land Surface TOC

Casing Stickup: 2.10 ft Elevation of Water Level: 352.02 ft./MSL

Sampling Depth: 17 ft Volume of Water Column: 7.00 gal

Total Well Depth: 19.6 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): 1/16/2018 Sample Collection Time: 14:01

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): 2288774002 Final Lab Analysis CompletionDate: 1/27/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP010W

Sample Date 1/16/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	208	SM18-2321
CALCIUM, TOTAL	48.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15	EPA 410.4
CHLORIDE	455	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	77	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	48	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	120	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	4.8	EPA 300.0
pH-FIELD (SU)	6.41	FIELD
pH-LAB (SU)	7.58	EPA 150.1
POTASSIUM, TOTAL	9.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	224	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2284	FIELD
SPEC. COND., LAB (umhos/cm)	1860	EPA 120.1
SULFATE	34.9	EPA 300.0
ALKALINITY	208	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1010	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	5.1	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.62	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 100008

Monitoring Point No. CWMP010W

Sample Date 1/16/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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
02/22/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP009W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 10.82 " Longitude: 76 ° 26 ' 55.8 "

Depth to Water Level: 9.27 ft Measured from: Land Surface TOC

Casing Stickup: 2.70 ft Elevation of Water Level: 394.93 ft./MSL

Sampling Depth: 16 ft Volume of Water Column: 6.81 gal

Total Well Depth: 19.7 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 24.8

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 1/16/2018 Sample Collection Time: 14:27

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): 2288774003 Final Lab Analysis Completion Date: 1/27/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 1/16/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	28	EPA 350.3
BICARBONATE	534	SM18-2321
CALCIUM, TOTAL	166	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	97	EPA 410.4
CHLORIDE	750	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	38300	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	80.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	13800	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	5.98	FIELD
pH-LAB (SU)	6.76	EPA 150.1
POTASSIUM, TOTAL	35.8	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	158	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3115	FIELD
SPEC. COND., LAB (umhos/cm)	2780	EPA 120.1
SULFATE	6.2	EPA 300.0
ALKALINITY	534	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1540	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	32	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	20.5	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 100008

Monitoring Point No. CWMP009W

Sample Date 1/16/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1.7	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	2.4	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
02/22/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP008W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 16.97 " Longitude: 76 ° 26 ' 47.58 "

Depth to Water Level: 2.96 ft Measured from: Land Surface TOC

Casing Stickup: 2.80 ft Elevation of Water Level: 419.34 ft./MSL

Sampling Depth: 19 ft Volume of Water Column: 3.24 gal

Total Well Depth: 22.8 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 20.0

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 1/16/2018 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): 2288774004 Final Lab Analysis Completion Date: 1/27/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 1/16/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	5.57	EPA 350.3
BICARBONATE	421	SM18-2321
CALCIUM, TOTAL	65.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	27	EPA 410.4
CHLORIDE	49.7	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	22500	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	29.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	14300	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	5.99	FIELD
pH-LAB (SU)	6.72	EPA 150.1
POTASSIUM, TOTAL	8.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	42.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	953	FIELD
SPEC. COND., LAB (umhos/cm)	847	EPA 120.1
SULFATE	8	EPA 300.0
ALKALINITY	421	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	451	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	9	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	3.57	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 100008

Monitoring Point No. CWMP008W

Sample Date 1/16/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	3.5	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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP012W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 1.48 " Longitude: 76 ° 26 ' 36.02 "

Depth to Water Level: 57.02 ft Measured from: Land Surface TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 325.68 ft./MSL

Sampling Depth: 0 ft Volume of Water Column: 65.91 gal

Total Well Depth: 101.9 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): 1/17/2018 Sample Collection Time: 10:35

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): 2289017001 Final Lab Analysis Completion Date: 1/29/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 1/17/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.958	EPA 350.3
BICARBONATE	71	SM18-2321
CALCIUM, TOTAL	32.1	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	34	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	15700	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	90	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	11.6	EPA 300.0
pH-FIELD (SU)	5.61	FIELD
pH-LAB (SU)	6.35	EPA 150.1
POTASSIUM, TOTAL	1.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	12.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	388	FIELD
SPEC. COND., LAB (umhos/cm)	301	EPA 120.1
SULFATE	4	EPA 300.0
ALKALINITY	71	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	203	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	228	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 100008

Monitoring Point No. CWMP012W

Sample Date 1/17/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.1	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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP003W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 20.17 " Longitude: 76 ° 26 ' 8.37 "

Depth to Water Level: 99.87 ft Measured from: Land Surface TOC

Casing Stickup: -1.29 ft Elevation of Water Level: 424.34 ft./MSL

Sampling Depth: 100 ft Volume of Water Column: -36.53 gal

Total Well Depth: 75 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): 1/17/2018 Sample Collection Time: 11:49

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): 2289017002 Final Lab Analysis CompletionDate: 1/29/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 1/17/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	1.17	EPA 350.3
BICARBONATE	23	SM18-2321
CALCIUM, TOTAL	28.7	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	78.5	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9.8	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.4	EPA 300.0
pH-FIELD (SU)	5.85	FIELD
pH-LAB (SU)	6.11	EPA 150.1
POTASSIUM, TOTAL	1.7	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	19.2	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	419	FIELD
SPEC. COND., LAB (umhos/cm)	340	EPA 120.1
SULFATE	5.8	EPA 300.0
ALKALINITY	23	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	226	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.67	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.25	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 100008

Monitoring Point No. CWMP003W

Sample Date 1/17/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	2.1	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
02/22/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP004W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 17.9 " Longitude: 76 ° 26 ' 7.05 "

Depth to Water Level: 106.42 ft Measured from: Land Surface TOC

Casing Stickup: -1.37 ft Elevation of Water Level: 423.11 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 49.32 gal

Total Well Depth: 140 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): 1/17/2018 Sample Collection Time: 12:04

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): 2289017003 Final Lab Analysis CompletionDate: 1/29/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP004W

Sample Date 1/17/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	1.04	EPA 350.3
BICARBONATE	26	SM18-2321
CALCIUM, TOTAL	20.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	43.5	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	6.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	8	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	6.8	EPA 300.0
pH-FIELD (SU)	5.75	FIELD
pH-LAB (SU)	6.35	EPA 150.1
POTASSIUM, TOTAL	1.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	14.2	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	289	FIELD
SPEC. COND., LAB (umhos/cm)	233	EPA 120.1
SULFATE	6.3	EPA 300.0
ALKALINITY	26	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	160	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
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 100008

Monitoring Point No. CWMP004W

Sample Date 1/17/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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
02/22/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP016W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 56 ' 55.57 " Longitude: 76 ° 26 ' 50.59 "

Depth to Water Level: 12.87 ft Measured from: Land Surface TOC

Casing Stickup: 2.53 ft Elevation of Water Level: 299.10 ft./MSL

Sampling Depth: 71 ft Volume of Water Column: _____ gal

Total Well Depth: 78.03 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.8

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 1/17/2018 Sample Collection Time: 13:58

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): 2289017004 Final Lab Analysis Completion Date: 1/29/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 1/17/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	1.2	EPA 350.3
BICARBONATE	8	SM18-2321
CALCIUM, TOTAL	5.1	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	2.5	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	240	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	1.1	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.68	EPA 300.0
pH-FIELD (SU)	5.12	FIELD
pH-LAB (SU)	6.52	EPA 150.1
POTASSIUM, TOTAL	0.56 ND	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	3.3	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	67	FIELD
SPEC. COND., LAB (umhos/cm)	53	EPA 120.1
SULFATE	11.2	EPA 300.0
ALKALINITY	8	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	30	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	3.24	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 100008

Monitoring Point No. CWMP016W

Sample Date 1/17/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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 02/22/2018
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: Creswell Landfill
Facility ID (as issued by DEP): 100008

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: CWMP017S Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 20.41 " Longitude: 76 ° 26 ' 45.1 "

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

Casing Stickup: _____ ft Elevation of Water Level: #Error ft./MSL

Sampling Depth: 0 ft Volume of Water Column: #Error gal

Total Well Depth: _____ 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): 1/18/2018 Sample Collection Time: 11:11

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): 2289514001 Final Lab Analysis CompletionDate: 1/30/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP017S

Sample Date 1/18/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.166	EPA 350.3
BICARBONATE	227	SM18-2321
CALCIUM, TOTAL	44.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7	EPA 410.4
CHLORIDE	384	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	96	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	52.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	110	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	14.1	EPA 300.0
pH-FIELD (SU)	7.76	FIELD
pH-LAB (SU)	7.73	EPA 150.1
POTASSIUM, TOTAL	14.7	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	161	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2696	FIELD
SPEC. COND., LAB (umhos/cm)	1470	EPA 120.1
SULFATE	29	EPA 300.0
ALKALINITY	227	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	640	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	3.7	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.24	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 100008

Monitoring Point No. CWMP017S

Sample Date 1/18/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP018S Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor

Sampling Point: Latitude: 39 ° 56 ' 55.11 " Longitude: 76 ° 26 ' 51.66 "

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

Casing Stickup: _____ ft Elevation of Water Level: #Error ft./MSL

Sampling Depth: 0 ft Volume of Water Column: #Error gal

Total Well Depth: _____ 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): 1/18/2018 Sample Collection Time: 11:53

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): 2289514002 Final Lab Analysis CompletionDate: 1/30/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 1/18/2018

FORM 19
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES
ANALYTES

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

ANALYTE	VALUE ^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.403	EPA 350.3
BICARBONATE	355	SM18-2321
CALCIUM, TOTAL	65.6	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	22	EPA 410.4
CHLORIDE	588	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	79.7	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	140	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	17.6	EPA 300.0
pH-FIELD (SU)	6.84	FIELD
pH-LAB (SU)	8.33	EPA 150.1
POTASSIUM, TOTAL	21.7	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	242	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2497	FIELD
SPEC. COND., LAB (umhos/cm)	2190	EPA 120.1
SULFATE	30.4	EPA 300.0
ALKALINITY	365	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1130	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	7.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.28	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 100008

Monitoring Point No. CWMP018S

Sample Date 1/18/2018

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	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.

Lancaster County Solid Waste Management Authority
Creswell Landfill

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>	
CWMP001W	2288582002	01/15/2018	GW		
NITRATE-NITROGEN	mg/l	22.00	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP005W	2288582001	01/15/2018	GW		
NITRATE-NITROGEN	mg/l	10.60	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP007W	2288582003	01/15/2018	GW		
NITRATE-NITROGEN	mg/l	10.90	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP012W	2289017001	01/17/2018	GW		
NITRATE-NITROGEN	mg/l	11.60	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP017S	2289514001	01/18/2018	GW		
NITRATE-NITROGEN	mg/l	14.10	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP018S	2289514002	01/18/2018	GW		
NITRATE-NITROGEN	mg/l	17.60	10.00	EPA-MCL	

Lancaster County Solid Waste Management Authority
Creswell Landfill

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>	
CWMP001W	2288582002	01/15/2018	GW		
IRON, TOTAL	mg/l	2.00	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.09	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP002W	2288774001	01/16/2018	GW		
MANGANESE, TOTAL	mg/l	1.10	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP005W	2288582001	01/15/2018	GW		
MANGANESE, TOTAL	mg/l	0.07	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP008W	2288774004	01/16/2018	GW		
IRON, TOTAL	mg/l	22.50	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	14.30	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP009W	2288774003	01/16/2018	GW		
CHLORIDE	mg/l	750.00	250.00		EPA-SMCL
IRON, TOTAL	mg/l	38.30	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	13.80	0.05		EPA-SMCL
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,540.00	500.00		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP010W	2288774002	01/16/2018	GW		
CHLORIDE	mg/l	455.00	250.00		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.12	0.05		EPA-SMCL
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,010.00	500.00		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP012W	2289017001	01/17/2018	GW		
IRON, TOTAL	mg/l	15.70	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.09	0.05		EPA-SMCL

<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>	
CWMP017S	2289514001	01/18/2018	GW		
CHLORIDE	mg/l	384.00	250.00	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.11	0.05	EPA-SMCL	
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	640.00	500.00	EPA-SMCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP018S	2289514002	01/18/2018	GW		
CHLORIDE	mg/l	588.00	250.00	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.14	0.05	EPA-SMCL	
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,130.00	500.00	EPA-SMCL	

January 30, 2018

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2288774
Purchase Order:	PO1000127	Workorder ID:	QUARTERLY CWMP-FORM 19Q

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, January 16, 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.

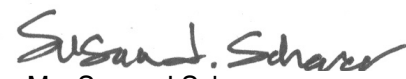
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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: Mr. Mark Reider , Mr. Daniel Brown , 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: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2288774001	CWMP002W	Ground Water	1/16/2018 13:00	1/16/2018 16:08	Mr. Brian G Shade
2288774002	CWMP010W	Ground Water	1/16/2018 14:01	1/16/2018 16:08	Mr. Brian G Shade
2288774003	CWMP009W	Ground Water	1/16/2018 14:27	1/16/2018 16:08	Mr. Brian G Shade
2288774004	CWMP008W	Ground Water	1/16/2018 15:00	1/16/2018 16:08	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2288774 QUARTERLY CWMP-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: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774001** Date Collected: 1/16/2018 13:00 Matrix: Ground Water
Sample ID: **CWMP002W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Bromoform	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Bromomethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Chloroethane	2.3		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Chloroform	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Chloromethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,1-Dichloroethane	6.6		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			1/17/18 16:30	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Styrene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/17/18 16:30	DD	H
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			1/17/18 16:30	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	H
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			1/17/18 16:30	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 16:30	DD	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>

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774001** Date Collected: 1/16/2018 13:00 Matrix: Ground Water
 Sample ID: **CWMP002W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
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Susan J. Scherer
 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774002** Date Collected: 1/16/2018 14:01 Matrix: Ground Water
Sample ID: **CWMP010W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/17/18 16:52	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 16:52	DD	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			1/17/18 16:52	DD	H
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			1/17/18 16:52	DD	H
Dibromofluoromethane (S)	95.1		%	78 - 116	SW846 8260B			1/17/18 16:52	DD	H
Toluene-d8 (S)	92.4		%	76 - 127	SW846 8260B			1/17/18 16:52	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	208		mg/L	5	S2320B-97			1/17/18 09:33	MSA	B
Alkalinity, Total	208	2	mg/L	5	S2320B-97			1/17/18 09:33	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			1/27/18 14:50	CMM	A
Chemical Oxygen Demand (COD)	15		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	455		mg/L	10.0	EPA 300.0			1/17/18 05:55	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/17/18 05:44	CHW	B
Nitrate-N	4.8		mg/L	0.20	EPA 300.0			1/17/18 05:44	CHW	B
pH	7.58	1	pH_Units		S4500HB-11			1/17/18 09:33	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	G
Specific Conductance	1860		umhos/cm	1	SW846 9050A			1/17/18 09:33	MSA	B
Sulfate	34.9		mg/L	2.0	EPA 300.0			1/17/18 05:44	CHW	B
Total Dissolved Solids	1010		mg/L	5	S2540C-11			1/19/18 11:30	BMK	B
Total Organic Carbon (TOC)	5.1		mg/L	0.50	SW846 9060A			1/17/18 13:49	PAG	E
Turbidity	1.62		NTU	0.10	S2130B-01			1/17/18 01:58	MSA	B

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774002** Date Collected: 1/16/2018 14:01 Matrix: Ground Water
Sample ID: **CWMP010W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	48.5		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
Iron, Total	0.077		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
Magnesium, Total	48.0		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
Manganese, Total	0.12		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
Potassium, Total	9.6		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
Sodium, Total	224		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:25	SRT	K1
FIELD PARAMETERS										
Depth to Water Level	8.880		Feet		Field			1/16/18 14:04	CLT	D
Elev Top MW Casing above MSL	360.90		Feet		Field			1/16/18 14:04	CLT	D
Flow Rate	1.08		gal/min		Field			1/16/18 14:04	CLT	D
Ground Water Elevation	352.020		ft/MSL		Field			1/16/18 14:04	CLT	D
pH, Field (SM4500B)	6.410		pH_Units		Field			1/16/18 14:04	CLT	D
Sample Depth	17.000		Feet		Field			1/16/18 14:04	CLT	D
Specific Conductance, Field	2284		umhos/cm	1	Field			1/16/18 14:04	CLT	D
Temperature	8.82		Deg. C		Field			1/16/18 14:04	CLT	D
Total Well Depth	19.600		Feet		Field			1/16/18 14:04	CLT	D
Volume in Water Column	6.968		Gallons		Field			1/16/18 14:04	CLT	D
Water Level After Purge	16.370		Feet		Field			1/16/18 14:04	CLT	D
Well Volumes Purged	2.01		Vol		Field			1/16/18 14:04	CLT	D



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774003** Date Collected: 1/16/2018 14:27 Matrix: Ground Water
Sample ID: **CWMP009W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	1.7		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
1,1-Dichloroethane	2.4		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/17/18 17:14	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 17:14	DD	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			1/17/18 17:14	DD	H
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			1/17/18 17:14	DD	H
Dibromofluoromethane (S)	93.4		%	78 - 116	SW846 8260B			1/17/18 17:14	DD	H
Toluene-d8 (S)	93.7		%	76 - 127	SW846 8260B			1/17/18 17:14	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	534		mg/L	5	S2320B-97			1/17/18 10:12	MSA	B
Alkalinity, Total	534	2	mg/L	5	S2320B-97			1/17/18 10:12	MSA	B
Ammonia-N	28.0		mg/L	0.100	D6919-09			1/27/18 15:45	CMM	A
Chemical Oxygen Demand (COD)	97		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	750		mg/L	10.0	EPA 300.0			1/17/18 06:19	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/17/18 06:07	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			1/17/18 06:07	CHW	B
pH	6.76	1	pH_Units		S4500HB-11			1/17/18 10:12	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	G
Specific Conductance	2780		umhos/cm	1	SW846 9050A			1/17/18 10:12	MSA	B
Sulfate	6.2		mg/L	2.0	EPA 300.0			1/17/18 06:07	CHW	B
Total Dissolved Solids	1540		mg/L	5	S2540C-11			1/19/18 11:30	BMK	B
Total Organic Carbon (TOC)	32.0		mg/L	5.0	SW846 9060A			1/18/18 12:53	PAG	E
Turbidity	20.5		NTU	0.10	S2130B-01			1/17/18 01:58	MSA	B

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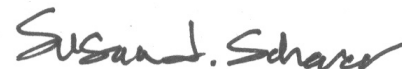
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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774003** Date Collected: 1/16/2018 14:27 Matrix: Ground Water
Sample ID: **CWMP009W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	166		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
Iron, Total	38.3		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
Magnesium, Total	80.6		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
Manganese, Total	13.8		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
Potassium, Total	35.8		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
Sodium, Total	158		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:36	SRT	K1
FIELD PARAMETERS										
Depth to Water Level	9.270		Feet		Field			1/16/18 14:27	CLT	D
Elev Top MW Casing above MSL	404.20		Feet		Field			1/16/18 14:27	CLT	D
Flow Rate	1.55		gal/min		Field			1/16/18 14:27	CLT	D
Ground Water Elevation	394.930		ft/MSL		Field			1/16/18 14:27	CLT	D
pH, Field (SM4500B)	5.980		pH_Units		Field			1/16/18 14:27	CLT	D
Sample Depth	16.000		Feet		Field			1/16/18 14:27	CLT	D
Specific Conductance, Field	3115		umhos/cm	1	Field			1/16/18 14:27	CLT	D
Temperature	9.20		Deg. C		Field			1/16/18 14:27	CLT	D
Total Well Depth	19.700		Feet		Field			1/16/18 14:27	CLT	D
Volume in Water Column	1.000		Gallons		Field			1/16/18 14:27	CLT	D
Water Level After Purge	11.670		Feet		Field			1/16/18 14:27	CLT	D
Well Volumes Purged	24.75		Vol		Field			1/16/18 14:27	CLT	D



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: 2288774004 **Date Collected:** 1/16/2018 15:00 **Matrix:** Ground Water
Sample ID: CWMP008W **Date Received:** 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
1,1-Dichloroethane	3.5		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/17/18 17:36	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/17/18 17:36	DD	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			1/17/18 17:36	DD	H
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			1/17/18 17:36	DD	H
Dibromofluoromethane (S)	93.2		%	78 - 116	SW846 8260B			1/17/18 17:36	DD	H
Toluene-d8 (S)	94.2		%	76 - 127	SW846 8260B			1/17/18 17:36	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	421		mg/L	5	S2320B-97			1/17/18 10:23	MSA	B
Alkalinity, Total	421	2	mg/L	5	S2320B-97			1/17/18 10:23	MSA	B
Ammonia-N	5.57		mg/L	0.100	D6919-09			1/27/18 15:59	CMM	A
Chemical Oxygen Demand (COD)	27		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	49.7		mg/L	10.0	EPA 300.0			1/18/18 05:18	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/19/18 05:00	CHW	B
Nitrate-N	ND	3	mg/L	0.20	EPA 300.0			1/19/18 05:00	CHW	B
pH	6.72	1	pH_Units		S4500HB-11			1/17/18 10:23	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	G
Specific Conductance	847		umhos/cm	1	SW846 9050A			1/17/18 10:23	MSA	B
Sulfate	8.0		mg/L	2.0	EPA 300.0			1/19/18 05:00	CHW	B
Total Dissolved Solids	451		mg/L	5	S2540C-11			1/19/18 11:30	BMK	B
Total Organic Carbon (TOC)	9.0		mg/L	0.50	SW846 9060A			1/17/18 13:49	PAG	E
Turbidity	3.57		NTU	0.10	S2130B-01			1/17/18 01:58	MSA	B

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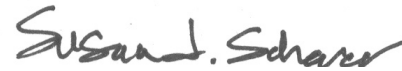
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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288774004** Date Collected: 1/16/2018 15:00 Matrix: Ground Water
Sample ID: **CWMP008W** Date Received: 1/16/2018 16:08

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	65.2		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
Iron, Total	22.5		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
Magnesium, Total	29.4		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
Manganese, Total	14.3		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
Potassium, Total	8.6		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
Sodium, Total	42.6		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:40	SRT	K1
FIELD PARAMETERS										
Depth to Water Level	2.960		Feet		Field			1/16/18 15:00	CLT	D
Elev Top MW Casing above MSL	422.30		Feet		Field			1/16/18 15:00	CLT	D
Flow Rate	1.00		gal/min		Field			1/16/18 15:00	CLT	D
Ground Water Elevation	419.340		ft/MSL		Field			1/16/18 15:00	CLT	D
pH, Field (SM4500B)	5.990		pH_Units		Field			1/16/18 15:00	CLT	D
Sample Depth	19.000		Feet		Field			1/16/18 15:00	CLT	D
Specific Conductance, Field	953		umhos/cm	1	Field			1/16/18 15:00	CLT	D
Temperature	11.42		Deg. C		Field			1/16/18 15:00	CLT	D
Total Well Depth	22.800		Feet		Field			1/16/18 15:00	CLT	D
Volume in Water Column	1.000		Gallons		Field			1/16/18 15:00	CLT	D
Water Level After Purge	14.610		Feet		Field			1/16/18 15:00	CLT	D
Well Volumes Purged	20.00		Vol		Field			1/16/18 15:00	CLT	D



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288774 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2288774001	1	CWMP002W	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.				
2288774001	2	CWMP002W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288774002	1	CWMP010W	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.				
2288774002	2	CWMP010W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288774003	1	CWMP009W	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.				
2288774003	2	CWMP009W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288774004	1	CWMP008W	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.				
2288774004	2	CWMP008W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288774004	3	CWMP008W	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				

ALS Environmental Laboratory Locations Across North America

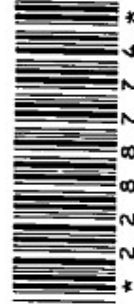
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**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/
SAMPLER. INSTRUCTIONS ON THE BACK.

COC
ALS

1 of 1



★ 2 2 8 8 7 7 4 ★

34 Dogwood Lane • Middletown, PA 17057 • 717-944-5511 • Fax: 717-944-1430

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 Creswell - KAM
Project Name#: Free-Form-Quarterny (GWMP) 1/16/14
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 mreider@LCSWMA.com
Fax? Y No.: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	G or C	Matrix	TOC	O-H	VOC - Form 190	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	PH, CI, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate
1. GWMP 002W	1-16-14	1360	G	GW	2	1	2	X	X	1	1	1	1
2. GWMP010W		1401											
3. GWMP009W		1427											
4. GWMP008W		1500											
5.													
6.													
7.													
8.													
9.													
10.													

Enter Number of Containers Per Sample or Field Results Below.

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other:

Project Comments:

Relinquished By / Company Name: ALS
Date: 1/16/14
Time: 2:00 PM
Received By / Company Name: AMS
Date: 1/16
Time: 6:08

LOGGED BY (signature): _____
REVIEWED BY (signature): _____

Standard CLP-like USACE
Deliverables: USACE Navy
Special Processing: USACE Navy
State Samples Collected in: NY NJ PA NC

Reportable to PADEP? Yes No
Sample Disposal: Lab Special
PWSID #: _____
EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

January 30, 2018

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name: 2018-CRESWELL	Workorder: 2288582
Purchase Order: PO1000127	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Monday, January 15, 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.

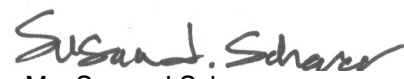
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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: Mr. Mark Reider , Mr. Daniel Brown , 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: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2288582001	CWMP005W	Ground Water	1/15/2018 11:38	1/15/2018 16:36	Mr. Brian G Shade
2288582002	CWMP001W	Ground Water	1/15/2018 13:10	1/15/2018 16:36	Mr. Brian G Shade
2288582003	CWMP007W	Ground Water	1/15/2018 14:20	1/15/2018 16:36	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2288582 QUARTERLY CWMP-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: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: 2288582001	Date Collected: 1/15/2018 11:38	Matrix: Ground Water
Sample ID: CWMP005W	Date Received: 1/15/2018 16:36	

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/16/18 17:06	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:06	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)	107		%	62 - 133	SW846 8260B			1/16/18 17:06	TMP	G
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			1/16/18 17:06	TMP	G
Dibromofluoromethane (S)	92.6		%	78 - 116	SW846 8260B			1/16/18 17:06	TMP	G
Toluene-d8 (S)	95.1		%	76 - 127	SW846 8260B			1/16/18 17:06	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	22		mg/L	5	S2320B-97			1/18/18 02:19	MSA	B
Alkalinity, Total	22	2	mg/L	5	S2320B-97			1/18/18 02:19	MSA	B
Ammonia-N	0.429		mg/L	0.100	D6919-09			1/27/18 00:06	CMM	A
Chemical Oxygen Demand (COD)	8		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	91.9		mg/L	2.0	EPA 300.0			1/16/18 05:17	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/16/18 05:17	MBW	B
Nitrate-N	10.6		mg/L	0.20	EPA 300.0			1/16/18 05:17	MBW	B
pH	6.01	1	pH_Units		S4500HB-11			1/16/18 11:29	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	426		umhos/cm	1	SW846 9050A			1/16/18 11:29	MSA	B
Sulfate	2.7		mg/L	2.0	EPA 300.0			1/16/18 05:17	MBW	B
Total Dissolved Solids	271		mg/L	5	S2540C-11			1/18/19 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/16/18 14:28	PAG	D
Turbidity	1.41		NTU	0.10	S2130B-01			1/17/18 01:48	MSA	B

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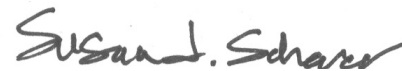
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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288582001** Date Collected: 1/15/2018 11:38 Matrix: Ground Water
Sample ID: **CWMP005W** Date Received: 1/15/2018 16:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	20.0		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
Magnesium, Total	10.2		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
Manganese, Total	0.069		mg/L	0.0056	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
Potassium, Total	2.9		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
Sodium, Total	41.0		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:54	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	46.910		Feet		Field			1/15/18 11:38	CLT	C
Elev Top MW Casing above MSL	513.43		Feet		Field			1/15/18 11:38	CLT	C
Flow Rate	4.40		gal/min		Field			1/15/18 11:38	CLT	C
Ground Water Elevation	466.520		ft/MSL		Field			1/15/18 11:38	CLT	C
pH, Field (SM4500B)	4.930		pH_Units		Field			1/15/18 11:38	CLT	C
Sample Depth	130.000		Feet		Field			1/15/18 11:38	CLT	C
Specific Conductance, Field	481		umhos/cm	1	Field			1/15/18 11:38	CLT	C
Temperature	10.91		Deg. C		Field			1/15/18 11:38	CLT	C
Total Well Depth	138.920		Feet		Field			1/15/18 11:38	CLT	C
Volume in Water Column	135.255		Gallons		Field			1/15/18 11:38	CLT	C
Water Level After Purge	51.030		Feet		Field			1/15/18 11:38	CLT	C
Well Volumes Purged	2.60		Vol		Field			1/15/18 11:38	CLT	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: 2288582002 **Date Collected:** 1/15/2018 13:10 **Matrix:** Ground Water
Sample ID: CWMP001W **Date Received:** 1/15/2018 16:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/16/18 17:28	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:28	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)	107		%	62 - 133	SW846 8260B			1/16/18 17:28	TMP	G
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			1/16/18 17:28	TMP	G
Dibromofluoromethane (S)	93		%	78 - 116	SW846 8260B			1/16/18 17:28	TMP	G
Toluene-d8 (S)	95.1		%	76 - 127	SW846 8260B			1/16/18 17:28	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	7		mg/L	5	S2320B-97			1/16/18 13:17	MSA	B
Alkalinity, Total	7	2	mg/L	5	S2320B-97			1/16/18 13:17	MSA	B
Ammonia-N	0.435		mg/L	0.100	D6919-09			1/27/18 00:19	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	33.0		mg/L	2.0	EPA 300.0			1/16/18 05:31	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/16/18 05:31	MBW	B
Nitrate-N	22.0		mg/L	1.0	EPA 300.0			1/16/18 05:45	MBW	B
pH	5.90	1	pH_Units		S4500HB-11			1/16/18 13:17	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	267		umhos/cm	1	SW846 9050A			1/16/18 13:17	MSA	B
Sulfate	2.1		mg/L	2.0	EPA 300.0			1/16/18 05:31	MBW	B
Total Dissolved Solids	163		mg/L	5	S2540C-11			1/18/19 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/16/18 14:28	PAG	D
Turbidity	89.2		NTU	0.10	S2130B-01			1/17/18 01:48	MSA	B

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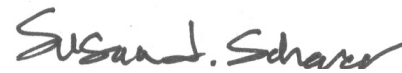
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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288582002** Date Collected: 1/15/2018 13:10 Matrix: Ground Water
Sample ID: **CWMP001W** Date Received: 1/15/2018 16:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	17.4		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
Iron, Total	2.0		mg/L	0.067	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
Magnesium, Total	11.7		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
Manganese, Total	0.085		mg/L	0.0056	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
Potassium, Total	2.7		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
Sodium, Total	15.8		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 10:57	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	31.140		Feet		Field			1/15/18 13:10	CLT	C
Elev Top MW Casing above MSL	515.13		Feet		Field			1/15/18 13:10	CLT	C
Flow Rate	1.83		gal/min		Field			1/15/18 13:10	CLT	C
Ground Water Elevation	483.990		ft/MSL		Field			1/15/18 13:10	CLT	C
pH, Field (SM4500B)	4.910		pH_Units		Field			1/15/18 13:10	CLT	C
Sample Depth	57.000		Feet		Field			1/15/18 13:10	CLT	C
Specific Conductance, Field	326		umhos/cm	1	Field			1/15/18 13:10	CLT	C
Temperature	11.23		Deg. C		Field			1/15/18 13:10	CLT	C
Total Well Depth	66.300		Feet		Field			1/15/18 13:10	CLT	C
Volume in Water Column	51.685		Gallons		Field			1/15/18 13:10	CLT	C
Water Level After Purge	52.900		Feet		Field			1/15/18 13:10	CLT	C
Well Volumes Purged	2.80		Vol		Field			1/15/18 13:10	CLT	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: 2288582003 **Date Collected:** 1/15/2018 14:20 **Matrix:** Ground Water
Sample ID: CWMP007W **Date Received:** 1/15/2018 16:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/16/18 17:50	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/16/18 17:50	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)	108		%	62 - 133	SW846 8260B			1/16/18 17:50	TMP	G
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			1/16/18 17:50	TMP	G
Dibromofluoromethane (S)	91.7		%	78 - 116	SW846 8260B			1/16/18 17:50	TMP	G
Toluene-d8 (S)	94.3		%	76 - 127	SW846 8260B			1/16/18 17:50	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	14		mg/L	5	S2320B-97			1/16/18 13:50	MSA	B
Alkalinity, Total	14	2	mg/L	5	S2320B-97			1/16/18 13:50	MSA	B
Ammonia-N	0.441		mg/L	0.100	D6919-09			1/27/18 00:33	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	69.2		mg/L	2.0	EPA 300.0			1/16/18 05:59	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/16/18 05:59	MBW	B
Nitrate-N	10.9		mg/L	0.20	EPA 300.0			1/16/18 05:59	MBW	B
pH	6.12	1	pH_Units		S4500HB-11			1/16/18 13:50	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	345		umhos/cm	1	SW846 9050A			1/16/18 13:50	MSA	B
Sulfate	15.9		mg/L	2.0	EPA 300.0			1/16/18 05:59	MBW	B
Total Dissolved Solids	262		mg/L	5	S2540C-11			1/18/19 14:00	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/16/18 14:28	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			1/17/18 01:48	MSA	B

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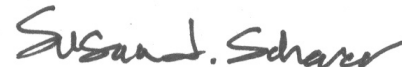
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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

Lab ID: **2288582003** Date Collected: 1/15/2018 14:20 Matrix: Ground Water
Sample ID: **CWMP007W** Date Received: 1/15/2018 16:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	18.9		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
Magnesium, Total	9.5		mg/L	0.11	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
Manganese, Total	0.0063		mg/L	0.0056	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
Potassium, Total	2.5		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
Sodium, Total	33.3		mg/L	0.56	SW846 6010C	1/16/18 02:10	LXC	1/17/18 11:01	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	8.180		Feet		Field			1/15/18 14:20	CLT	C
Elev Top MW Casing above MSL	453.40		Feet		Field			1/15/18 14:20	CLT	C
Flow Rate	1.74		gal/min		Field			1/15/18 14:20	CLT	C
Ground Water Elevation	445.220		ft/MSL		Field			1/15/18 14:20	CLT	C
pH, Field (SM4500B)	4.730		pH_Units		Field			1/15/18 14:20	CLT	C
Sample Depth	33.000		Feet		Field			1/15/18 14:20	CLT	C
Specific Conductance, Field	419		umhos/cm	1	Field			1/15/18 14:20	CLT	C
Temperature	11.41		Deg. C		Field			1/15/18 14:20	CLT	C
Total Well Depth	36.500		Feet		Field			1/15/18 14:20	CLT	C
Volume in Water Column	41.630		Gallons		Field			1/15/18 14:20	CLT	C
Water Level After Purge	8.950		Feet		Field			1/15/18 14:20	CLT	C
Well Volumes Purged	2.51		Vol		Field			1/15/18 14:20	CLT	C



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ANALYTICAL RESULTS

Workorder: 2288582 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2288582001	1	CWMP005W	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.				
2288582001	2	CWMP005W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288582002	1	CWMP001W	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.				
2288582002	2	CWMP001W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2288582003	1	CWMP007W	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.				
2288582003	2	CWMP007W	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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Mexico: Monterrey

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

COC # **ALS Q**
 1 of 1
 * 2 2 8 8 5 8 2 *

Receipt Information (completed by receiving Lab)
 Cooler Temp: 5 Therm ID: 462
 No. of Coolers: Y N Initial CR
 Custody Seals Present? (If present) Seals Intact? Y N
 Received on Ice? X
 COC Labels Complete/Accurate? X
 Cont. in Good Cond.? X
 Correct Containers? X
 Correct Sample Volumes? X
 Correct Preservation? X
 Headspace/Volatiles? X
 Courier Tracking #: _____ Sample/COC Comments _____

Matrix	TOC	O-H	8260 - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Total Metals: Ca, Fe, Mn, Mg, K, Na	pH, NO3, Cl, F, SPC, SO4, Turb,	Alkalinity, HCO3	ANALYSES/METHOD REQUESTED	
										AG	AN
Container Type	AG	AN	CG	PL	PL	PL	PL	PL	PL	PL	PL
G	2	1	2	X	X	1	1	1	1	500 ml	500 ml
GW	2	1	2	X	X	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml
I	1	1	1	1	1	1	1	1	1	500 ml	500 ml

Project Comments: _____
 LOGGED BY (signature): _____
 REVIEWED BY (signature): _____
 Relinquished By / Company Name: _____ Date: 1/15/18
 Received By / Company Name: _____ Date: 1-15-18
 State Samples Collected in: NY NJ PA NC
 Special Processing: USACE Navy USACE
 Reportable to PADEP? Yes No
 Sample Disposal: Lab Special
 PWSID #: _____
 EDDS: Formal Type: _____



January 31, 2018

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2289017
Purchase Order:	PO1000127	Workorder ID:	QUARTERLY CWMP-FORM 19Q

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, January 17, 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.

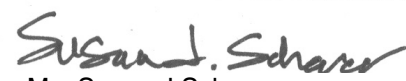
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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: Mr. Mark Reider , Mr. Daniel Brown , 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: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2289017001	CWMP012W	Ground Water	1/17/2018 10:35	1/17/2018 16:01	Mr. Brian G Shade
2289017002	CWMP003W	Ground Water	1/17/2018 11:49	1/17/2018 16:01	Mr. Brian G Shade
2289017003	CWMP004W	Ground Water	1/17/2018 12:04	1/17/2018 16:01	Mr. Brian G Shade
2289017004	CWMP016W	Ground Water	1/17/2018 13:58	1/17/2018 16:01	Mr. Brian G Shade
2289017005	Field Blank	Water	1/17/2018 14:22	1/17/2018 16:01	Mr. Brian G Shade
2289017006	Trip Blank	Water	1/17/2018 16:01	1/17/2018 16:01	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2289017 QUARTERLY CWMP-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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PROJECT SUMMARY

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Sample Comments

Lab ID: 2289017003

Sample ID: CWMP004W

Sample Type: SAMPLE

The sample submitted for volatiles analysis contained headspace. The method requires that the samples be collected without headspace in order to prevent the loss of volatile organics. Results reported should be considered estimated.

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017001** Date Collected: 1/17/2018 10:35 Matrix: Ground Water
Sample ID: **CWMP012W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
1,1-Dichloroethane	1.1		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/19/18 01:37	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 01:37	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)	97.8		%	62 - 133	SW846 8260B			1/19/18 01:37	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			1/19/18 01:37	CJG	G
Dibromofluoromethane (S)	107		%	78 - 116	SW846 8260B			1/19/18 01:37	CJG	G
Toluene-d8 (S)	97.9		%	76 - 127	SW846 8260B			1/19/18 01:37	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	71		mg/L	5	S2320B-97			1/18/18 05:05	MSA	B
Alkalinity, Total	71	2	mg/L	5	S2320B-97			1/18/18 05:05	MSA	B
Ammonia-N	0.958		mg/L	0.100	D6919-09			1/29/18 05:00	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	34.0		mg/L	2.0	EPA 300.0			1/18/18 05:48	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/18/18 05:48	CHW	B
Nitrate-N	11.6		mg/L	0.20	EPA 300.0			1/18/18 05:48	CHW	B
pH	6.35	1	pH_Units		S4500HB-11			1/18/18 05:05	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	301		umhos/cm	1	SW846 9050A			1/18/18 05:05	MSA	B
Sulfate	4.0		mg/L	2.0	EPA 300.0			1/18/18 05:48	CHW	B
Total Dissolved Solids	203		mg/L	5	S2540C-11			1/22/18 13:30	BMK	B
Total Organic Carbon (TOC)	1.5		mg/L	0.50	SW846 9060A			1/18/18 12:53	PAG	D
Turbidity	228		NTU	0.10	S2130B-01			1/17/18 23:36	MSA	B

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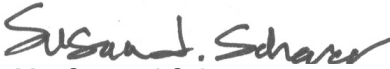
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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017001** Date Collected: 1/17/2018 10:35 Matrix: Ground Water
Sample ID: **CWMP012W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	32.1		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
Iron, Total	15.7		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
Magnesium, Total	9.0		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
Manganese, Total	0.090		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
Sodium, Total	12.6		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 11:55	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	57.020		Feet		Field			1/17/18 10:35	CLT	C
pH, Field (SM4500B)	5.610		pH_Units		Field			1/17/18 10:35	CLT	C
Specific Conductance, Field	388		umhos/cm	1	Field			1/17/18 10:35	CLT	C
Temperature	8.77		Deg. C		Field			1/17/18 10:35	CLT	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017002** Date Collected: 1/17/2018 11:49 Matrix: Ground Water
 Sample ID: **CWMP003W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017003** Date Collected: 1/17/2018 12:04 Matrix: Ground Water
Sample ID: **CWMP004W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Bromoform	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Bromomethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Chloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Chloroform	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Chloromethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			1/19/18 02:13	CJG	D
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Styrene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Toluene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			1/19/18 02:13	CJG	D
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			1/19/18 02:13	CJG	D
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 02:13	CJG	D
<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>

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: 2289017003 **Date Collected:** 1/17/2018 12:04 **Matrix:** Ground Water
Sample ID: CWMP004W **Date Received:** 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	91.6		%	62 - 133	SW846 8260B			1/19/18 02:13	CJG	D
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			1/19/18 02:13	CJG	D
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			1/19/18 02:13	CJG	D
Toluene-d8 (S)	96.8		%	76 - 127	SW846 8260B			1/19/18 02:13	CJG	D
WET CHEMISTRY										
Alkalinity, Bicarbonate	26		mg/L	5	S2320B-97			1/18/18 05:22	MSA	B
Alkalinity, Total	26	2	mg/L	5	S2320B-97			1/18/18 05:22	MSA	B
Ammonia-N	1.04		mg/L	0.100	D6919-09			1/29/18 05:28	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	43.5		mg/L	2.0	EPA 300.0			1/18/18 06:18	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/18/18 06:18	CHW	B
Nitrate-N	6.8		mg/L	0.20	EPA 300.0			1/18/18 06:18	CHW	B
pH	6.35	1	pH_Units		S4500HB-11			1/18/18 05:22	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	233		umhos/cm	1	SW846 9050A			1/18/18 05:22	MSA	B
Sulfate	6.3		mg/L	2.0	EPA 300.0			1/18/18 06:18	CHW	B
Total Dissolved Solids	160		mg/L	5	S2540C-11			1/22/18 13:30	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/18/18 12:53	PAG	D
Turbidity	0.18		NTU	0.10	S2130B-01			1/17/18 23:36	MSA	B
METALS										
Calcium, Total	20.5		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
Magnesium, Total	6.3		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
Manganese, Total	0.0080		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
Sodium, Total	14.2		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:02	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	106.420		Feet		Field			1/17/18 12:04	CLT	C
Elev Top MW Casing above MSL	529.53		Feet		Field			1/17/18 12:04	CLT	C
Ground Water Elevation	423.110		ft/MSL		Field			1/17/18 12:04	CLT	C
pH, Field (SM4500B)	5.750		pH_Units		Field			1/17/18 12:04	CLT	C
Sample Depth	130.000		Feet		Field			1/17/18 12:04	CLT	C
Specific Conductance, Field	289		umhos/cm	1	Field			1/17/18 12:04	CLT	C
Temperature	12.00		Deg. C		Field			1/17/18 12:04	CLT	C
Total Well Depth	140.000		Feet		Field			1/17/18 12:04	CLT	C

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017003** Date Collected: 1/17/2018 12:04 Matrix: Ground Water
 Sample ID: **CWMP004W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Susan J. Scherer
 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: 2289017004 **Date Collected:** 1/17/2018 13:58 **Matrix:** Ground Water
Sample ID: CWMP016W **Date Received:** 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/19/18 02:31	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 02:31	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)	96.5		%	62 - 133	SW846 8260B			1/19/18 02:31	CJG	G
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			1/19/18 02:31	CJG	G
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			1/19/18 02:31	CJG	G
Toluene-d8 (S)	95.7		%	76 - 127	SW846 8260B			1/19/18 02:31	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	8		mg/L	5	S2320B-97			1/18/18 06:29	MSA	B
Alkalinity, Total	8	2	mg/L	5	S2320B-97			1/18/18 06:29	MSA	B
Ammonia-N	1.20		mg/L	0.100	D6919-09			1/29/18 05:41	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	2.5		mg/L	2.0	EPA 300.0			1/18/18 06:34	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/18/18 06:34	CHW	B
Nitrate-N	0.68		mg/L	0.20	EPA 300.0			1/18/18 06:34	CHW	B
pH	6.52	1	pH_Units		S4500HB-11			1/18/18 06:29	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	53		umhos/cm	1	SW846 9050A			1/18/18 06:29	MSA	B
Sulfate	11.2		mg/L	2.0	EPA 300.0			1/18/18 06:34	CHW	B
Total Dissolved Solids	30		mg/L	5	S2540C-11			1/22/18 13:30	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/18/18 12:53	PAG	D
Turbidity	3.24		NTU	0.10	S2130B-01			1/17/18 23:36	MSA	B

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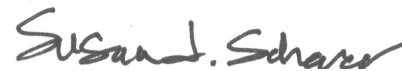
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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017004** Date Collected: 1/17/2018 13:58 Matrix: Ground Water
Sample ID: **CWMP016W** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	5.1		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
Iron, Total	0.24		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
Magnesium, Total	1.1		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
Sodium, Total	3.3		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:06	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	12.870		Feet		Field			1/17/18 13:58	CLT	C
Elev Top MW Casing above MSL	311.97		Feet		Field			1/17/18 13:58	CLT	C
Flow Rate	2.27		gal/min		Field			1/17/18 13:58	CLT	C
Ground Water Elevation	299.100		ft/MSL		Field			1/17/18 13:58	CLT	C
pH, Field (SM4500B)	5.120		pH_Units		Field			1/17/18 13:58	CLT	C
Sample Depth	71.000		Feet		Field			1/17/18 13:58	CLT	C
Specific Conductance, Field	67		umhos/cm	1	Field			1/17/18 13:58	CLT	C
Temperature	10.33		Deg. C		Field			1/17/18 13:58	CLT	C
Total Well Depth	73.520		Feet		Field			1/17/18 13:58	CLT	C
Volume in Water Column	89.156		Gallons		Field			1/17/18 13:58	CLT	C
Water Level After Purge	22.000		Feet		Field			1/17/18 13:58	CLT	C
Well Volumes Purged	1.78		Vol		Field			1/17/18 13:58	CLT	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: 2289017005 **Date Collected:** 1/17/2018 14:22 **Matrix:** Water
Sample ID: Field Blank **Date Received:** 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/19/18 00:43	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 00:43	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)	96.1		%	62 - 133	SW846 8260B			1/19/18 00:43	CJG	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			1/19/18 00:43	CJG	G
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			1/19/18 00:43	CJG	G
Toluene-d8 (S)	95.6		%	76 - 127	SW846 8260B			1/19/18 00:43	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			1/18/18 05:42	MSA	B
Alkalinity, Total	ND	2	mg/L	5	S2320B-97			1/18/18 05:42	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			1/30/18 15:23	NJA	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			1/23/18 17:11	AK	A
Chloride	ND		mg/L	1.0	EPA 300.0			1/18/18 06:49	CHW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			1/18/18 06:49	CHW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			1/18/18 06:49	CHW	B
pH	6.29	1	pH_Units		S4500HB-11			1/18/18 05:42	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/24/18 11:00	NJA	1/24/18 15:09	NJA	F
Specific Conductance	ND		umhos/cm	1	SW846 9050A			1/23/18 01:16	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			1/18/18 06:49	CHW	B
Total Dissolved Solids	11		mg/L	5	S2540C-11			1/22/18 13:30	BMK	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			1/22/18 11:25	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			1/17/18 23:36	MSA	B

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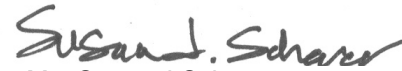
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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017005** Date Collected: 1/17/2018 14:22 Matrix: Water
Sample ID: **Field Blank** Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	ND		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	1/18/18 05:55	LXC	1/18/18 12:09	SRT	J1



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289017006**

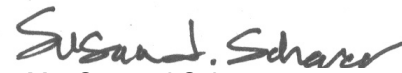
Date Collected: 1/17/2018 16:01

Matrix: Water

Sample ID: **Trip Blank**

Date Received: 1/17/2018 16:01

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Toluene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/19/18 21:39	CJG	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	CJG	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/19/18 21:39	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)	97		%	62 - 133	SW846 8260B			1/19/18 21:39	CJG	A
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			1/19/18 21:39	CJG	A
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			1/19/18 21:39	CJG	A
Toluene-d8 (S)	99.9		%	76 - 127	SW846 8260B			1/19/18 21:39	CJG	A



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ANALYTICAL RESULTS

Workorder: 2289017 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2289017001	1	CWMP012W	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.				
2289017001	2	CWMP012W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2289017002	1	CWMP003W	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.				
2289017002	2	CWMP003W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2289017003	1	CWMP004W	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.				
2289017003	2	CWMP004W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2289017004	1	CWMP016W	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.				
2289017004	2	CWMP016W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2289017005	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.				
2289017005	2	Field Blank	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /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.

COC # **ALS C**

1 of 1



* 2 2 8 9 0 1 7 *

Therm ID: **402**

No. of Coolers: **Y N**

Cooler Temp: **52**

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?

Headspace/Volatiles?

Courier Tracking #: _____

Sample/COC Comments

ALS Field Services: Pickup Labor Rental_Equipment

Composite_Sampling Other:

Special Processing

Standard CLP-like USACE

USACE Navy

Reportable to PADEP? Yes No

Sample Disposal Lab X PA NC

Special

State Samples Collected in NY NJ PA NC

Deliverables Standard CLP-like USACE

Reportable to PADEP? Yes No

PWSID # _____

EDDS: Format Type _____

LOGGED BY (signature): _____

REVIEWED BY (signature): _____

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **11:00**

Received By / Company Name **Patricia Brown ALS**

Date **1-17**

Time **16:01**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **11:49**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **12:04**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **13:58**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **14:22**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **11:05**

Relinquished By / Company Name **ALS**

Date **1/17/18**

Time **11:05**

Relinquished By / Company Name **ALS**

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Date **1/17/18**

Time **11:05**

Relinquished By / Company Name **ALS**

Date **1/17/18**

January 31, 2018

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2289514
Purchase Order:	PO1000127	Workorder ID:	QUARTERLY CWMP-FORM 19Q

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Thursday, January 18, 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.

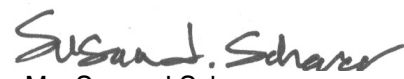
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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: Mr. Mark Reider , Mr. Daniel Brown , 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: 2289514 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2289514001	CWMP017S	Ground Water	1/18/2018 11:11	1/18/2018 15:22	Mr. Brian G Shade
2289514002	CWMP018S	Ground Water	1/18/2018 11:53	1/18/2018 15:22	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2289514 QUARTERLY CWMP-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: 2289514 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289514001** Date Collected: 1/18/2018 11:11 Matrix: Ground Water
Sample ID: **CWMP017S** Date Received: 1/18/2018 15:22

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Toluene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/20/18 01:53	CJG	F
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/20/18 01:53	CJG	F
<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)	94.8		%	62 - 133	SW846 8260B			1/20/18 01:53	CJG	F
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			1/20/18 01:53	CJG	F
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			1/20/18 01:53	CJG	F
Toluene-d8 (S)	97.3		%	76 - 127	SW846 8260B			1/20/18 01:53	CJG	F
WET CHEMISTRY										
Alkalinity, Bicarbonate	227		mg/L	5	S2320B-97			1/23/18 00:39	MSA	B
Alkalinity, Total	227	2	mg/L	5	S2320B-97			1/23/18 00:39	MSA	B
Ammonia-N	0.166		mg/L	0.100	D6919-09			1/30/18 18:29	NJA	A
Chemical Oxygen Demand (COD)	7		mg/L	7	EPA 410.4			1/23/18 12:00	AK	A
Chloride	384		mg/L	25.0	EPA 300.0			1/19/18 11:50	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/19/18 11:37	CHW	B
Nitrate-N	14.1		mg/L	0.20	EPA 300.0			1/19/18 11:37	CHW	B
pH	7.73	1	pH_Units		S4500HB-11			1/23/18 00:39	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/29/18 11:00	NJA	1/29/18 15:47	NJA	E
Specific Conductance	1470		umhos/cm	1	SW846 9050A			1/23/18 00:39	MSA	B
Sulfate	29.0		mg/L	2.0	EPA 300.0			1/19/18 11:37	CHW	B
Total Dissolved Solids	640		mg/L	5	S2540C-11			1/23/18 14:00	BMK	B
Total Organic Carbon (TOC)	3.7		mg/L	0.50	SW846 9060A			1/22/18 11:25	PAG	D
Turbidity	1.24		NTU	0.10	S2130B-01			1/19/18 23:46	MSA	B

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ANALYTICAL RESULTS

Workorder: 2289514 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289514001** Date Collected: 1/18/2018 11:11 Matrix: Ground Water
Sample ID: **CWMP017S** Date Received: 1/18/2018 15:22

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	44.2		mg/L	0.11	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
Iron, Total	0.096		mg/L	0.067	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
Magnesium, Total	52.4		mg/L	0.11	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
Manganese, Total	0.11		mg/L	0.0056	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
Potassium, Total	14.7		mg/L	0.56	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
Sodium, Total	161		mg/L	0.56	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:49	SRT	I1
FIELD PARAMETERS										
Dissolved Oxygen	13.340		mg/L	0.010	Field			1/18/18 11:53	BGS	C
Flow Rate	125.75		gal/min		Field			1/18/18 11:53	BGS	C
pH, Field (SM4500B)	7.760		pH_Units		Field			1/18/18 11:53	BGS	C
Specific Conductance, Field	2696		umhos/cm	1	Field			1/18/18 11:53	BGS	C
Temperature	6.54		Deg. C		Field			1/18/18 11:53	BGS	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2289514 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289514002** Date Collected: 1/18/2018 11:53 Matrix: Ground Water
Sample ID: **CWMP018S** Date Received: 1/18/2018 15:22

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Toluene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Total Xylenes	ND		ug/L	3.0	SW846 8260B			1/20/18 02:11	CJG	F
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Trichloroethene	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			1/20/18 02:11	CJG	F
<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)	96.2		%	62 - 133	SW846 8260B			1/20/18 02:11	CJG	F
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			1/20/18 02:11	CJG	F
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			1/20/18 02:11	CJG	F
Toluene-d8 (S)	99.3		%	76 - 127	SW846 8260B			1/20/18 02:11	CJG	F
WET CHEMISTRY										
Alkalinity, Bicarbonate	355		mg/L	5	S2320B-97			1/23/18 02:02	MSA	B
Alkalinity, Total	365	2	mg/L	5	S2320B-97			1/23/18 02:02	MSA	B
Ammonia-N	0.403		mg/L	0.100	D6919-09			1/30/18 18:43	NJA	A
Chemical Oxygen Demand (COD)	22		mg/L	7	EPA 410.4			1/23/18 12:00	AK	A
Chloride	588		mg/L	25.0	EPA 300.0			1/19/18 12:16	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			1/19/18 12:03	CHW	B
Nitrate-N	17.6		mg/L	0.20	EPA 300.0			1/19/18 12:03	CHW	B
pH	8.33	1	pH_Units		S4500HB-11			1/23/18 02:02	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	1/29/18 11:00	NJA	1/29/18 15:47	NJA	E
Specific Conductance	2190		umhos/cm	1	SW846 9050A			1/23/18 02:02	MSA	B
Sulfate	30.4		mg/L	2.0	EPA 300.0			1/19/18 12:03	CHW	B
Total Dissolved Solids	1130		mg/L	5	S2540C-11			1/23/18 14:00	BMK	B
Total Organic Carbon (TOC)	7.5		mg/L	0.50	SW846 9060A			1/22/18 11:25	PAG	D
Turbidity	1.28		NTU	0.10	S2130B-01			1/19/18 23:46	MSA	B

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ANALYTICAL RESULTS

Workorder: 2289514 QUARTERLY CWMP-FORM 19Q

Lab ID: **2289514002** Date Collected: 1/18/2018 11:53 Matrix: Ground Water
Sample ID: **CWMP018S** Date Received: 1/18/2018 15:22

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	65.6		mg/L	0.11	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
Iron, Total	0.10		mg/L	0.067	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
Magnesium, Total	79.7		mg/L	0.11	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
Manganese, Total	0.14		mg/L	0.0056	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
Potassium, Total	21.7		mg/L	0.56	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
Sodium, Total	242		mg/L	0.56	SW846 6010C	1/25/18 03:55	LXC	1/30/18 10:53	SRT	I1
FIELD PARAMETERS										
Dissolved Oxygen	14.160		mg/L	0.010	Field			1/18/18 11:11	BGS	C
Flow Rate	242.28		gal/min		Field			1/18/18 11:11	BGS	C
pH, Field (SM4500B)	6.840		pH_Units		Field			1/18/18 11:11	BGS	C
Specific Conductance, Field	2497		umhos/cm	1	Field			1/18/18 11:11	BGS	C
Temperature	-1.47		Deg. C		Field			1/18/18 11:11	BGS	C



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

ANALYTICAL RESULTS

Workorder: 2289514 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2289514001	1	CWMP017S	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.				
2289514001	2	CWMP017S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2289514002	1	CWMP018S	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.				
2289514002	2	CWMP018S	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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34 Dogwood Lane • Middletown, PA 17057 • Phone: 717-944-5543 • Fax: 717-944-1430
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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 Harnsburg Pike, P.O. Box 4424
 Lancaster, PA 17604

Contact: Brooks Norris
 Phone#: (717) 397-9968

Project Name#: Manns Run Quarterly (Streams)
 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 bnorris@LCSWMA.com
 Fax? Y No: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)

Sample Date Time

1 CWMP017S 1/18/18 1111

2 CWMP018S J- 1153

3

4

5

6

7

8

9

10

Project Comments:

Relinquished By / Company Name Date Time

1 *[Signature]* 1/18/18 1522

3

5

7

9

COC
ALS

1 of 1
* 2 2 8 9 5 1 4 *

Generated by ALS
 Cooler Temp: _____ Therm ID: 402
 No. of Coolers: _____ Y N Initial
 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?

Courier Tracking #: _____
 Sample/COC Comments

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other:

Standard
 CLP-like
 USACE
 Navy
 USACE
 Navy

State Samples Collected In
 NY
 NJ
 PA
 NC

Reportable to PADEP?
 Yes
 Lab
 Special

EDDS: Format Type
 PWSID # _____

Deliverables Data

Form 190 VOC
 Field Measurements
 NH3-N, COD
 Total Metals: Fe, Mn, Ca, Mg, K, Na
 pH, Cl, F, SPC, SO4, Turb, TDS,
 NO3
 Alkalinity, HCO3

Enter Number of Containers Per Sample or Field Results Below.

Matrix

G or C

LOGGED BY (signature): _____

REVIEWED BY (signature): _____

Date Time

Received By / Company Name

1/18/18 1522

Chlorine Wastewater AS

4

6

8

10

