

August 24, 2017

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; 3rd Quarter 2017

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. Wells 9 and 10 had elevated TDS and chlorides which shows surface influence of Mann's Run. Wells 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 continue to decrease.

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

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](mailto:mreider@lcswma.org).

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "m. reider", is written in a cursive style.

Mark D. Reider  
Director of Environmental Compliance

Enclosures

cc: Bob Zorbaugh; Daniel Brown; Bob Eshbach  
Randy Weiss (PA DEP)

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF LAND RECYCLING AND WASTEDate Prepared/Revised  
08/23/2017

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: 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: 8.22 ft      Measured from:  Land Surface     TOC

Casing Stickup: 1.50 ft      Elevation of Water Level: 445.18 ft./MSL

Sampling Depth: 33 ft      Volume of Water Column: 41.53 gal

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

Well Purged:  Yes     No      Well Volumes Purged: 0.8

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

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 7/17/2017      Sample Collection Time: 11:18

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): 2246518001      Final Lab Analysis Completion Date: 7/25/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP007W

Sample Date 7/17/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	12	SM18-2321
CALCIUM, TOTAL	19.4	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	67	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	9.9	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.7	EPA 300.0
pH-FIELD (SU)	5.16	FIELD
pH-LAB (SU)	5.9	EPA 150.1
POTASSIUM, TOTAL	2.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	33.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	426	FIELD
SPEC. COND., LAB (umhos/cm)	339	EPA 120.1
SULFATE	15.6	EPA 300.0
ALKALINITY	12	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	263	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.8	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 7/17/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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 LAND RECYCLING AND WASTE

Date Prepared/Revised  
08/23/2017

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

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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<sup>o</sup> 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: 30.6 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.23 ft Elevation of Water Level: 484.53 ft./MSL

Sampling Depth: 57 ft Volume of Water Column: 52.43 gal

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

Well Purged:  Yes  No Well Volumes Purged: 2.2

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

Spring Flow Rate:      gpm

Sample Date (mm/dd/yy): 7/17/2017 Sample Collection Time: 12:48

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

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

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2246518002 Final Lab Analysis CompletionDate: 7/25/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP001W

Sample Date 7/17/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	5	SM18-2321
CALCIUM, TOTAL	17	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	33.2	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	840	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	11.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	61	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	21.1	EPA 300.0
pH-FIELD (SU)	5.13	FIELD
pH-LAB (SU)	5.87	EPA 150.1
POTASSIUM, TOTAL	2.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	15.9	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	335	FIELD
SPEC. COND., LAB (umhos/cm)	264	EPA 120.1
SULFATE	2 ND	EPA 300.0
ALKALINITY	5	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	256	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.74	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	33.5	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. CWMP001W

Sample Date 7/17/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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: CWMP005W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor TownshipSampling Point Latitude: 39 ° 57 ' 11.17 " Longitude: 76 ° 26 ' 7.08 "Depth to Water Level: 45.32 ft Measured from:  Land Surface  TOCCasing Stickup: -0.37 ft Elevation of Water Level: 468.11 ft./MSLSampling Depth: 130 ft Volume of Water Column: 139.05 galTotal Well Depth: 140 ft Sampling Method:  Pumped  Bailed  GrabWell Purged:  Yes  No Well Volumes Purged: 2.0Sample Field Filtered (must be 0.45 micron)?:  Yes  NoSpring Flow Rate:      gpmSample Date (mm/dd/yy): 7/18/2017 Sample Collection Time: 10:10Sample Collector's Name: Mr. Brian G ShadeSample Collector's Affiliation: ALS EnvironmentalLaboratory(ies) Performing Analysis: ALS EnvironmentalWere any holding times exceeded?:  Yes  No If yes, please explain in comments field.Lab Accreditation Number(s): 22-293Lab Sample Number(s): 2246826001 Final Lab Analysis Completion Date: 7/27/2017Name/Affiliation of Person who Filled Out Form: Mark D. Reider

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

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 7/18/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.182	EPA 350.3
BICARBONATE	16	SM18-2321
CALCIUM, TOTAL	19.4	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	90.1	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	10.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	66	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	11.3	EPA 300.0
pH-FIELD (SU)	5.09	FIELD
pH-LAB (SU)	5.67	EPA 150.1
POTASSIUM, TOTAL	2.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	40.8	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	485	FIELD
SPEC. COND., LAB (umhos/cm)	409	EPA 120.1
SULFATE	2.5	EPA 300.0
ALKALINITY	16	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	334	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.2	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.31	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 7/18/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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.



Date Prepared/Revised 08/23/2017
<b>DEP USE ONLY</b>
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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: 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: 13.17 ft      Measured from:  Land Surface     TOC

Casing Stickup: 2.53 ft      Elevation of Water Level: 298.8 ft./MSL

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

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

Well Purged:  Yes     No      Well Volumes Purged: 1.6

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

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

Sample Date (mm/dd/yy): 7/19/2017      Sample Collection Time: 10:24

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): 2247461001      Final Lab Analysis CompletionDate: 7/27/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 7/19/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	8	SM18-2321
CALCIUM, TOTAL	4.9	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	3	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	2100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	1.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	11	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.68	EPA 300.0
pH-FIELD (SU)	5.24	FIELD
pH-LAB (SU)	6.37	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)	66	FIELD
SPEC. COND., LAB (umhos/cm)	50	EPA 120.1
SULFATE	11.9	EPA 300.0
ALKALINITY	8	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	48	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.85	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	6.06	SM 2130B

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I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 7/19/2017

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<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
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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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: 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: 8.98 ft Measured from:  Land Surface  TOC

Casing Stickup: 2.10 ft Elevation of Water Level: 351.92 ft./MSL

Sampling Depth: \_\_\_\_\_ ft Volume of Water Column: 6.93 gal

Total Well Depth: 19.6 ft Sampling Method:  Pumped  Bailed  Grab

Well Purged:  Yes  No Well Volumes Purged: 1.4

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

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

Sample Date (mm/dd/yy): 7/19/2017 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): 2247461002 Final Lab Analysis Completion Date: 7/28/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP010W

Sample Date 7/19/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	307	SM18-2321
CALCIUM, TOTAL	87.4	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	57	EPA 410.4
CHLORIDE	556	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	900	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	59.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1100	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.5	EPA 300.0
pH-FIELD (SU)	6.33	FIELD
pH-LAB (SU)	7.05	EPA 150.1
POTASSIUM, TOTAL	24	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	271	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2404	FIELD
SPEC. COND., LAB (umhos/cm)	2330	EPA 120.1
SULFATE	34.4	EPA 300.0
ALKALINITY	307	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1460	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	20	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	7.26	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 7/19/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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 LAND RECYCLING AND WASTEDate Prepared/Revised  
08/23/2017

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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: 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: 9.52 ft      Measured from:  Land Surface     TOC

Casing Stickup: 2.70 ft      Elevation of Water Level: 394.68 ft./MSL

Sampling Depth: \_\_\_\_\_ ft      Volume of Water Column: 6.64 gal

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

Well Purged:  Yes     No      Well Volumes Purged: 4.1

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

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

Sample Date (mm/dd/yy): 7/19/2017      Sample Collection Time: 12:06

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

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

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2247461003      Final Lab Analysis Completion Date: 8/11/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 7/19/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	29.6	EPA 350.3
BICARBONATE	539	SM18-2321
CALCIUM, TOTAL	160	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	100	EPA 410.4
CHLORIDE	576	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	38100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	76.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	12900	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.16	FIELD
pH-LAB (SU)	6.47	EPA 150.1
POTASSIUM, TOTAL	36.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	159	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3014	FIELD
SPEC. COND., LAB (umhos/cm)	2630	EPA 120.1
SULFATE	5.6	EPA 300.0
ALKALINITY	539	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1840	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	29.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	151	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 7/19/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1.9	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 LAND RECYCLING AND WASTEDate Prepared/Revised  
08/23/2017

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## 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<sup>o</sup> MM' SS.S")

Monitoring Point Number: CWMP008W  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster CountyMunicipality: Manor TownshipSampling Point Latitude: 39 ° 57 ' 16.97 " Longitude: 76 ° 26 ' 47.58 "Depth to Water Level: 3.66 ft Measured from:  Land Surface  TOCCasing Stickup: 2.80 ft Elevation of Water Level: 418.64 ft./MSLSampling Depth: \_\_\_\_\_ ft Volume of Water Column: 3.12 galTotal Well Depth: 22.8 ft Sampling Method:  Pumped  Bailed  GrabWell Purged:  Yes  No Well Volumes Purged: 7.1Sample Field Filtered (must be 0.45 micron)?:  Yes  No

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

Sample Date (mm/dd/yy): 7/19/2017 Sample Collection Time: 12:42Sample Collector's Name: Mr. Brian G ShadeSample Collector's Affiliation: ALS EnvironmentalLaboratory(ies) Performing Analysis: ALS EnvironmentalWere any holding times exceeded?:  Yes  No If yes, please explain in comments field.Lab Accreditation Number(s): 22-293Lab Sample Number(s): 2247461004 Final Lab Analysis Completion Date: 8/11/2017Name/Affiliation of Person who Filled Out Form: Mark D. Reider

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

I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 7/19/2017

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

**ANALYTES**

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	5.89	EPA 350.3
BICARBONATE	465	SM18-2321
CALCIUM, TOTAL	72.7	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	34	EPA 410.4
CHLORIDE	53.5	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	27000	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	33.1	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	15900	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.08	FIELD
pH-LAB (SU)	6.39	EPA 150.1
POTASSIUM, TOTAL	9.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	50.5	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1076	FIELD
SPEC. COND., LAB (umhos/cm)	950	EPA 120.1
SULFATE	6.9	EPA 300.0
ALKALINITY	465	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	540	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	10.7	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	67.2	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. CWMP008W

Sample Date 7/19/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1.5	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	3.4	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 LAND RECYCLING AND WASTE



Date Prepared/Revised  
08/23/2017

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: 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: 62.41 ft Measured from:  Land Surface  TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 320.29 ft./MSL

Sampling Depth: \_\_\_\_\_ ft Volume of Water Column: 58.00 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): 7/20/2017 Sample Collection Time: 11:47

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

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

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2247811001 Final Lab Analysis Completion Date: 8/8/2017

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

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



I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 7/20/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	66	SM18-2321
CALCIUM, TOTAL	33.7	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	36	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	162000	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9.5	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	390	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	11.5	EPA 300.0
pH-FIELD (SU)	5.68	FIELD
pH-LAB (SU)	6.42	EPA 150.1
POTASSIUM, TOTAL	1.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	13.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	398	FIELD
SPEC. COND., LAB (umhos/cm)	298	EPA 120.1
SULFATE	4.7	EPA 300.0
ALKALINITY	66	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	263	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.9	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1290	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 7/20/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.2	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 LAND RECYCLING AND WASTEDate Prepared/Revised  
08/23/2017

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: 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: 81.72 ft      Measured from:  Land Surface     TOC

Casing Stickup: -1.19 ft      Elevation of Water Level: 444.09 ft./MSL

Sampling Depth: 85 ft      Volume of Water Column: 26.85 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): 7/20/2017      Sample Collection Time: 12:22

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): 2247811002      Final Lab Analysis Completion Date: 8/7/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP002W

Sample Date 7/20/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	65	SM18-2321
CALCIUM, TOTAL	51.9	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	109	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	15.5	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1100	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.7	EPA 300.0
pH-FIELD (SU)	5.04	FIELD
pH-LAB (SU)	5.88	EPA 150.1
POTASSIUM, TOTAL	2.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	21	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	627	FIELD
SPEC. COND., LAB (umhos/cm)	553	EPA 120.1
SULFATE	26	EPA 300.0
ALKALINITY	65	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	439	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	2.5	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. CWMP002W

Sample Date 7/20/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	7.9	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	1.1	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 LAND RECYCLING AND WASTEDate Prepared/Revised  
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## 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: 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: 93.62 ft      Measured from:  Land Surface     TOC

Casing Stickup: -1.29 ft      Elevation of Water Level: 430.59 ft./MSL

Sampling Depth: 100 ft      Volume of Water Column: -27.35 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): 7/20/2017      Sample Collection Time: 12:38

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): 2247811003      Final Lab Analysis Completion Date: 7/31/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 7/20/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.102	EPA 350.3
BICARBONATE	18	SM18-2321
CALCIUM, TOTAL	28.7	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	74.8	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	9.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.9	EPA 300.0
pH-FIELD (SU)	5.09	FIELD
pH-LAB (SU)	5.97	EPA 150.1
POTASSIUM, TOTAL	1.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	18.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	423	FIELD
SPEC. COND., LAB (umhos/cm)	338	EPA 120.1
SULFATE	5.7	EPA 300.0
ALKALINITY	18	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	278	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.2	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.14	SM 2130B

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

T Please indicate detection limit if analyte is not detected.

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

Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 7/20/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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  
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## 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: 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: 128.77 ft      Measured from:  Land Surface     TOC

Casing Stickup: -1.37 ft      Elevation of Water Level: 400.76 ft./MSL

Sampling Depth: 130 ft      Volume of Water Column: 16.49 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): 7/20/2017      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): 2247811004      Final Lab Analysis Completion Date: 7/31/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP004W

Sample Date 7/20/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	27	SM18-2321
CALCIUM, TOTAL	20.6	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	44.1	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)	7.6	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	7.4	EPA 300.0
pH-FIELD (SU)	5.32	FIELD
pH-LAB (SU)	6.21	EPA 150.1
POTASSIUM, TOTAL	1.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	14.3	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	295	FIELD
SPEC. COND., LAB (umhos/cm)	233	EPA 120.1
SULFATE	6.2	EPA 300.0
ALKALINITY	27	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	197	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.2	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. CWMP004W

Sample Date 7/20/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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  
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## 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: 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): 7/21/2017      Sample Collection Time: 10:10

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): 2248018001      Final Lab Analysis Completion Date: 7/31/2017

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

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

I.D. No 100008

Monitoring Point No. CWMP017S

Sample Date 7/21/2017

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

**ANALYTES**

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

ANALYTE	VALUE <sup>T</sup>	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	660	SM18-2321
CALCIUM, TOTAL	84.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	22	EPA 410.4
CHLORIDE	1040	EPA 300.0
FLUORIDE	0.3	EPA 300.0
IRON, TOTAL (ug/l)	190	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	126	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	81	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	18.4	EPA 300.0
pH-FIELD (SU)	7.95	FIELD
pH-LAB (SU)	8.15	EPA 150.1
POTASSIUM, TOTAL	21.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	539	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	4741	FIELD
SPEC. COND., LAB (umhos/cm)	4290	EPA 120.1
SULFATE	93.5	EPA 300.0
ALKALINITY	660	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	2520	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	5.4	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.8	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 7/21/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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 LAND RECYCLING AND WASTEDate Prepared/Revised  
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## 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: CWMP018S  Well  Spring  Stream  Other  
 Upgradient/Upstream  Downgradient/Downstream

Location (County): Lancaster CountyMunicipality: ManorSampling Point Latitude: 39 ° 56 ' 55.11 " Longitude: 76 ° 26 ' 51.66 "Depth to Water Level: \_\_\_\_\_ ft Measured from:  Land Surface  TOCCasing Stickup: \_\_\_\_\_ ft Elevation of Water Level: #Error ft./MSLSampling Depth: 0 ft Volume of Water Column: #Error galTotal Well Depth: \_\_\_\_\_ ft Sampling Method:  Pumped  Bailed  GrabWell 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): 7/21/2017 Sample Collection Time: 9:52Sample Collector's Name: Mr. Brian G ShadeSample Collector's Affiliation: ALS EnvironmentalLaboratory(ies) Performing Analysis: ALS EnvironmentalWere any holding times exceeded?:  Yes  No If yes, please explain in comments field.Lab Accreditation Number(s): 22-293Lab Sample Number(s): 2248018002 Final Lab Analysis CompletionDate: 7/31/2017Name/Affiliation of Person who Filled Out Form: Mark D. Reider

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

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 7/21/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	494	SM18-2321
CALCIUM, TOTAL	87.6	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	26	EPA 410.4
CHLORIDE	860	EPA 300.0
FLUORIDE	0.28	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	111	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	16.9	EPA 300.0
pH-FIELD (SU)	8.42	FIELD
pH-LAB (SU)	8.51	EPA 150.1
POTASSIUM, TOTAL	23.3	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	458	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3926	FIELD
SPEC. COND., LAB (umhos/cm)	3560	EPA 120.1
SULFATE	56.9	EPA 300.0
ALKALINITY	546	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	2090	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	7.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.41	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. CWMP018S

Sample Date 7/21/2017

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

<b>ANALYTE</b>	<b>VALUE<sup>T</sup></b>	<b>ANALYSIS METHOD NUMBER</b>
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (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.

July 31, 2017

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

## Certificate of Analysis

Project Name: <b>2017-CRESWELL</b>	Workorder: <b>2246518</b>
Purchase Order:	Workorder ID: <b>QUARTERLY CWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, July 17, 2017.

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

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

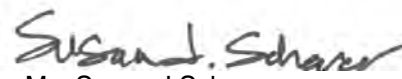
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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

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

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

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



Ms. Susan J Scherer  
Project Coordinator

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### SAMPLE SUMMARY

Workorder: 2246518 QUARTERLY CWMP-FORM 19Q

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Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2246518001	CWMP007W	Ground Water	7/17/2017 11:18	7/17/2017 15:54	Mr. Brian G Shade
2246518002	CWMP001W	Ground Water	7/17/2017 12:48	7/17/2017 15:54	Mr. Brian G Shade

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## SAMPLE SUMMARY

Workorder: 2246518 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: 2246518 QUARTERLY CWMP-FORM 19Q

Lab ID: **2246518001** Date Collected: 7/17/2017 11:18 Matrix: Ground Water  
Sample ID: **CWMP007W** Date Received: 7/17/2017 15:54

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/19/17 18:43	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/19/17 18:43	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)	106		%	62 - 133	SW846 8260B			7/19/17 18:43	TMP	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			7/19/17 18:43	TMP	G
Dibromofluoromethane (S)	92.8		%	78 - 116	SW846 8260B			7/19/17 18:43	TMP	G
Toluene-d8 (S)	95.4		%	76 - 127	SW846 8260B			7/19/17 18:43	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	12		mg/L	5	S2320B-97			7/18/17 08:49	MSA	B
Alkalinity, Total	12	2	mg/L	5	S2320B-97			7/18/17 08:49	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/21/17 07:29	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/19/17 18:18	AK	A
Chloride	67.0		mg/L	2.0	EPA 300.0			7/18/17 08:21	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/18/17 08:21	MBW	B
Nitrate-N	10.7		mg/L	0.20	EPA 300.0			7/18/17 08:21	MBW	B
pH	5.90	1	pH_Units		S4500HB-11			7/18/17 08:49	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/18/17 00:00	JLG	7/19/17 10:44	JLG	F
Specific Conductance	339		umhos/cm	1	SW846 9050A			7/18/17 08:49	MSA	B
Sulfate	15.6		mg/L	2.0	EPA 300.0			7/18/17 08:21	MBW	B
Total Dissolved Solids	263		mg/L	5	S2540C-11			7/19/17 18:32	JAS	B
Total Organic Carbon (TOC)	0.80		mg/L	0.50	SW846 9060A			7/25/17 11:43	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			7/19/17 02:10	MSA	B

**ALS Environmental Laboratory Locations Across North America**

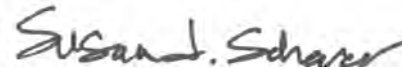
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### ANALYTICAL RESULTS

Workorder: 2246518 QUARTERLY CWMP-FORM 19Q

Lab ID: **2246518001** Date Collected: 7/17/2017 11:18 Matrix: Ground Water  
Sample ID: **CWMP007W** Date Received: 7/17/2017 15:54

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	19.4		mg/L	0.11	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
Magnesium, Total	9.9		mg/L	0.11	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
Manganese, Total	0.0060		mg/L	0.0056	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
Potassium, Total	2.1		mg/L	0.56	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
Sodium, Total	33.6		mg/L	0.56	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:44	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	8.220		Feet		Field			7/17/17 11:18	BGS	C
Elev Top MW Casing above MSL	453.40		Feet		Field			7/17/17 11:18	BGS	C
Flow Rate	2.01		gal/min		Field			7/17/17 11:18	BGS	C
Ground Water Elevation	445.180		ft/MSL		Field			7/17/17 11:18	BGS	C
pH, Field (SM4500B)	5.160		pH_Units		Field			7/17/17 11:18	BGS	C
Sample Depth	33.000		Feet		Field			7/17/17 11:18	BGS	C
Specific Conductance, Field	426		umhos/cm	1	Field			7/17/17 11:18	BGS	C
Temperature	11.19		Deg. C		Field			7/17/17 11:18	BGS	C
Total Well Depth	36.500		Feet		Field			7/17/17 11:18	BGS	C
Volume in Water Column	41.572		Gallons		Field			7/17/17 11:18	BGS	C
Water Level After Purge	9.130		Feet		Field			7/17/17 11:18	BGS	C
Well Volumes Purged	0.82		Vol		Field			7/17/17 11:18	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2246518 QUARTERLY CWMP-FORM 19Q

 Lab ID: **2246518002** Date Collected: 7/17/2017 12:48 Matrix: Ground Water  
 Sample ID: **CWMP001W** Date Received: 7/17/2017 15:54

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/19/17 19:06	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/19/17 19:06	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			7/19/17 19:06	TMP	G
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			7/19/17 19:06	TMP	G
Dibromofluoromethane (S)	95.1		%	78 - 116	SW846 8260B			7/19/17 19:06	TMP	G
Toluene-d8 (S)	96.8		%	76 - 127	SW846 8260B			7/19/17 19:06	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	5		mg/L	5	S2320B-97			7/18/17 10:36	MSA	B
Alkalinity, Total	5	2	mg/L	5	S2320B-97			7/18/17 10:36	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/21/17 08:26	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/19/17 18:18	AK	A
Chloride	33.2		mg/L	2.0	EPA 300.0			7/18/17 08:35	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/18/17 08:35	MBW	B
Nitrate-N	21.1		mg/L	0.50	EPA 300.0			7/19/17 05:51	MBW	B
pH	5.87	1	pH_Units		S4500HB-11			7/18/17 10:36	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/18/17 00:00	JLG	7/19/17 10:44	JLG	F
Specific Conductance	264		umhos/cm	1	SW846 9050A			7/18/17 10:36	MSA	B
Sulfate	ND		mg/L	2.0	EPA 300.0			7/18/17 08:35	MBW	B
Total Dissolved Solids	256		mg/L	5	S2540C-11			7/19/17 18:32	JAS	B
Total Organic Carbon (TOC)	0.74		mg/L	0.50	SW846 9060A			7/25/17 11:43	PAG	D
Turbidity	33.5		NTU	0.10	S2130B-01			7/19/17 02:10	MSA	B

### ALS Environmental Laboratory Locations Across North America

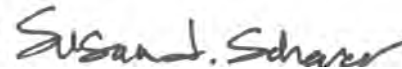
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### ANALYTICAL RESULTS

Workorder: 2246518 QUARTERLY CWMP-FORM 19Q

Lab ID: **2246518002** Date Collected: 7/17/2017 12:48 Matrix: Ground Water  
Sample ID: **CWMP001W** Date Received: 7/17/2017 15:54

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	17.0		mg/L	0.11	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
Iron, Total	0.84		mg/L	0.067	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
Magnesium, Total	11.6		mg/L	0.11	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
Manganese, Total	0.061		mg/L	0.0056	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
Potassium, Total	2.4		mg/L	0.56	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
Sodium, Total	15.9		mg/L	0.56	SW846 6010C	7/20/17 06:15	LXC	7/24/17 10:54	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	30.600		Feet		Field			7/17/17 12:48	BGS	C
Elev Top MW Casing above MSL	515.13		Feet		Field			7/17/17 12:48	BGS	C
Flow Rate	1.96		gal/min		Field			7/17/17 12:48	BGS	C
Ground Water Elevation	484.530		ft/MSL		Field			7/17/17 12:48	BGS	C
pH, Field (SM4500B)	5.130		pH_Units		Field			7/17/17 12:48	BGS	C
Sample Depth	57.000		Feet		Field			7/17/17 12:48	BGS	C
Specific Conductance, Field	335		umhos/cm	1	Field			7/17/17 12:48	BGS	C
Temperature	12.27		Deg. C		Field			7/17/17 12:48	BGS	C
Total Well Depth	66.300		Feet		Field			7/17/17 12:48	BGS	C
Volume in Water Column	52.479		Gallons		Field			7/17/17 12:48	BGS	C
Water Level After Purge	54.320		Feet		Field			7/17/17 12:48	BGS	C
Well Volumes Purged	2.24		Vol		Field			7/17/17 12:48	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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



**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2246518001</b>	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.				
<b>2246518001</b>	2	CWMP007W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2246518002</b>	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.				
<b>2246518002</b>	2	CWMP001W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				

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



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

Generated by ALS  
34 Dogwood Lane • Middletown, PA 17057 • Fax: 717.944.5511 • FSC: 717.944.1430

Client Name: Lancaster County Solid Waste MA		Container Type	AG	AM	CG	PL	PL	PL	PL	PL	PL	id by Receiving Lab)	
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container Size	40 ml	500 ml	40 ml	500 ml	500 ml	1 L	500 ml	500 ml	500 ml	Therm ID: 291	
Lancaster, PA 17604		Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None	None	None	No. of Coolers: 3	
Contact: Mark Reider		ANALYSES/METHOD REQUESTED											
Phone#: (717) 735-0193		Enter Number of Containers Per Sample or Field Results Below.											
Project Name#: Creswell Form 19Q Wells		Field Measurements											
Bill To: Lancaster County Solid Waste MA		Sample Depth for AUX Data											
TAT <input checked="" type="checkbox"/> Normal-Standard TAT is 10-12 business days.		R260 - Form 19Q											
Date Required: <input type="checkbox"/> Rush-Subject to ALS approval and surcharges.		O-H											
Email? <input checked="" type="checkbox"/> -Y mreider@LCSWMA.com		TOC											
Fax? <input checked="" type="checkbox"/> -Y No.: (717) 397-9973		Matrix											
Approved By:		G or C											
Sample Description/Location		Sample Date		Time		Date		Time		Date		Time	
1. CWMPO07W		7-17-07		1116		7-17-07		1116		7-17-07		1116	
2. CWMPO03W		7-17-07		1249		7-17-07		1249		7-17-07		1249	
3. CWMPO03W													
4. CWMPO03W													
5. Bottles labeled													
6. AS CWMPO01W													
7. SE 7-17-07													
8.													
9.													
10.													
Project Comments:		LOGGED BY (signature):		7-17-17		7-17-17		7-17-17		7-17-17		7-17-17	
Relinquished By / Company Name		Date		Time		Date		Time		Date		Time	
1. Bob Schaefer ALS		7-17-07		1554		7-17-07		1554		7-17-07		1554	
3.													
5.													
7.													
9.													
Cooler Temp:		Custody Seals Present?		(if present) Seals Intact?		Received on ice?		COC Labels Complete/Accurate?		Cont. in Good Cond.?		Correct Containers?	
291		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
No. of Coolers:		Correct Sample Volumes?		Correct Preservation?		Headspace/Volatiles?		Counter/Tracking #:		Sample/COC Comments		ALS Field Services: <input type="checkbox"/> Pickup <input type="checkbox"/> Labor	
3		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input type="checkbox"/> Composite_Sampling <input type="checkbox"/> Rental_Equipment	
Initial: DUN		Special Processing		Standard		CLP-like		USACE		State Samples Collected In		USACE <input type="checkbox"/>	
N		Navy <input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		PA <input checked="" type="checkbox"/>		NY <input type="checkbox"/>	
Y		Sample Disposal		Reportable to PADEP?		Yes <input type="checkbox"/>		PWSID #		Lab <input checked="" type="checkbox"/>		NC <input type="checkbox"/>	
N		Special								Special <input type="checkbox"/>			
EDDS: Formal Type:													

\* G=Grab; C=Composite \*\*Matrix: A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; QI=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater  
ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057  
Rev B/04

August 1, 2017

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

## Certificate of Analysis

Project Name: <b>2017-CRESWELL</b>	Workorder: <b>2246826</b>
Purchase Order:	Workorder ID: <b>QUARTERLY CWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, July 18, 2017.

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

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

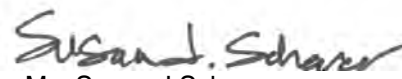
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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

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

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

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

  
Ms. Susan J Scherer  
Project Coordinator

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### SAMPLE SUMMARY

Workorder: 2246826 QUARTERLY CWMP-FORM 19Q

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Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2246826001	CWMP005W	Ground Water	7/18/2017 10:10	7/18/2017 15:59	Mr. Brian G Shade

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**SAMPLE SUMMARY**

Workorder: 2246826 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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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

**ANALYTICAL RESULTS**

Workorder: 2246826 QUARTERLY CWMP-FORM 19Q

Lab ID: **2246826001** Date Collected: 7/18/2017 10:10 Matrix: Ground Water  
Sample ID: **CWMP005W** Date Received: 7/18/2017 15:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/20/17 18:13	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/20/17 18:13	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			7/20/17 18:13	TMP	G
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			7/20/17 18:13	TMP	G
Dibromofluoromethane (S)	96		%	78 - 116	SW846 8260B			7/20/17 18:13	TMP	G
Toluene-d8 (S)	97.8		%	76 - 127	SW846 8260B			7/20/17 18:13	TMP	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	16		mg/L	5	S2320B-97			7/19/17 03:24	MSA	B
Alkalinity, Total	16	2	mg/L	5	S2320B-97			7/19/17 03:24	MSA	B
Ammonia-N	0.182		mg/L	0.100	D6919-09			7/22/17 02:42	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/19/17 18:18	AK	A
Chloride	90.1		mg/L	2.0	EPA 300.0			7/19/17 14:01	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/19/17 14:01	MBW	B
Nitrate-N	11.3		mg/L	0.20	EPA 300.0			7/19/17 14:01	MBW	B
pH	5.67	1	pH_Units		S4500HB-11			7/19/17 03:24	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/19/17 00:00	JLG	7/19/17 10:44	JLG	F
Specific Conductance	409		umhos/cm	1	SW846 9050A			7/19/17 03:24	MSA	B
Sulfate	2.5		mg/L	2.0	EPA 300.0			7/19/17 14:01	MBW	B
Total Dissolved Solids	334		mg/L	5	S2540C-11			7/19/17 18:32	JAS	B
Total Organic Carbon (TOC)	1.2		mg/L	0.50	SW846 9060A			7/27/17 00:36	PAG	D
Turbidity	0.31		NTU	0.10	S2130B-01			7/19/17 03:07	MSA	B

**ALS Environmental Laboratory Locations Across North America**

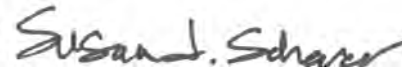
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay  
Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown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

**ANALYTICAL RESULTS**

Workorder: 2246826 QUARTERLY CWMP-FORM 19Q

Lab ID: **2246826001** Date Collected: 7/18/2017 10:10 Matrix: Ground Water  
Sample ID: **CWMP005W** Date Received: 7/18/2017 15:59

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed	By	Cntr
<b>METALS</b>									
Calcium, Total	19.4		mg/L	0.11	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
Magnesium, Total	10.4		mg/L	0.11	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
Manganese, Total	0.066		mg/L	0.0056	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
Potassium, Total	2.5		mg/L	0.56	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
Sodium, Total	40.8		mg/L	0.56	SW846 6010C	7/19/17 05:15 LXC	7/19/17 12:15	TSS	J1
<b>FIELD PARAMETERS</b>									
Depth to Water Level	45.320		Feet		Field		7/18/17 10:14	BGS	C
Elev Top MW Casing above MSL	513.43		Feet		Field		7/18/17 10:14	BGS	C
Flow Rate	3.89		gal/min		Field		7/18/17 10:14	BGS	C
Ground Water Elevation	468.110		ft/MSL		Field		7/18/17 10:14	BGS	C
pH, Field (SM4500B)	5.090		pH_Units		Field		7/18/17 10:14	BGS	C
Sample Depth	130.000		Feet		Field		7/18/17 10:14	BGS	C
Specific Conductance, Field	485		umhos/cm	1	Field		7/18/17 10:14	BGS	C
Temperature	11.15		Deg. C		Field		7/18/17 10:14	BGS	C
Total Well Depth	138.920		Feet		Field		7/18/17 10:14	BGS	C
Volume in Water Column	137.592		Gallons		Field		7/18/17 10:14	BGS	C
Water Level After Purge	50.200		Feet		Field		7/18/17 10:14	BGS	C
Well Volumes Purged	1.98		Vol		Field		7/18/17 10:14	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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

**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2246826001</b>	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.

<b>2246826001</b>	2	CWMP005W	S2320B-97	Alkalinity, Total
-------------------	---	----------	-----------	-------------------

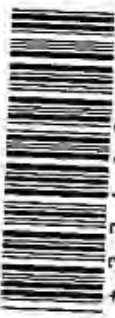
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO<sub>3</sub>/L.

---

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





Generated by ALS

**CHAIN OF CUSTODY/  
REQUEST FOR ANALYSIS**

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

34 Dogwood Lane • Middletown, PA 17057 • 717-944-5541 • 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  
 Project Name#: Creswell Form 19Q Wells  
 Bill To: Lancaster County Solid Waste MA

Cooler Temp: 0 Therm ID: 291  
 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?

ANALYSES/METHOD REQUESTED									
Container Type	AG	AN	CG	PL	PL	PL	PL	PL	PL
40 ml	H2SO4	HCl	HCl	500 ml	H2SO4	HNO3	500 ml	500 ml	500 ml
40 ml	HCl	H2SO4	HCl	500 ml	H2SO4	HNO3	500 ml	500 ml	500 ml
None				None			None	1 L	500 ml
									None

Courier/Tracking #: \_\_\_\_\_  
 Sample/COC Comments

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.																		
			TOC	O-OH	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.	TDS	Alkalinity, HCO3									
1. CWMR005W	7-18-17	1010	2	1	2	X	X	1	1	1	1										
2.																					
3.																					
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					

ALS Field Services:  Pickup  Labor  
 Composite Sampling  Rental Equipment  
 Other:

Project Comments:	LOGGED BY (signature):		REVIEWED BY (signature):	
	Date	Time	Date	Time
1. Relinquished By Company Name ACS	7-18-17	1559	7-18-17	1514
3.				
5.				
7.				
9.				

Special Processing  
 USACE   
 Navy   
 Reportable to PADEP? Yes  No   
 PWSID # \_\_\_\_\_  
 EDDS: Format Type \_\_\_\_\_

State Samples Collected In	Special Processing	
	USACE	Navy
NY	<input type="checkbox"/>	<input type="checkbox"/>
NJ	<input type="checkbox"/>	<input type="checkbox"/>
PA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NC	<input type="checkbox"/>	<input type="checkbox"/>

ALS Field Services:  Pickup  Labor  
 Composite Sampling  Rental Equipment  
 Other:

Project Comments:	LOGGED BY (signature):		REVIEWED BY (signature):	
	Date	Time	Date	Time
1. Relinquished By Company Name ACS	7-18-17	1559	7-18-17	1514
3.				
5.				
7.				
9.				

ALS Field Services:  Pickup  Labor  
 Composite Sampling  Rental Equipment  
 Other:

Project Comments:	LOGGED BY (signature):		REVIEWED BY (signature):	
	Date	Time	Date	Time
1. Relinquished By Company Name ACS	7-18-17	1559	7-18-17	1514
3.				
5.				
7.				
9.				



August 14, 2017

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

## Certificate of Analysis

Project Name: <b>2017-CRESWELL</b>	Workorder: <b>2247461</b>
Purchase Order:	Workorder ID: <b>QUARTERLY CWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, July 19, 2017.

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

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

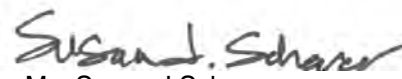
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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

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

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



Ms. Susan J Scherer  
Project Coordinator

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### SAMPLE SUMMARY

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2247461001	CWMP016W	Ground Water	7/19/2017 10:24	7/19/2017 15:05	Mr. Brian G Shade
2247461002	CWMP010W	Ground Water	7/19/2017 11:38	7/19/2017 15:05	Mr. Brian G Shade
2247461003	CWMP009W	Ground Water	7/19/2017 12:06	7/19/2017 15:05	Mr. Brian G Shade
2247461004	CWMP008W	Ground Water	7/19/2017 12:42	7/19/2017 15:05	Mr. Brian G Shade
2247461005	Field Blank	Water	7/19/2017 14:00	7/19/2017 15:05	Mr. Brian G Shade
2247461006	Trip Blank	Water	7/19/2017 15:05	7/19/2017 15:05	Mr. Brian G Shade

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

**SAMPLE SUMMARY**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

**Notes**

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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: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461001** Date Collected: 7/19/2017 10:24 Matrix: Ground Water  
Sample ID: **CWMP016W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 13:00	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:00	DD	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			7/21/17 13:00	DD	G
4-Bromofluorobenzene (S)	95.2		%	79 - 114	SW846 8260B			7/21/17 13:00	DD	G
Dibromofluoromethane (S)	92.8		%	78 - 116	SW846 8260B			7/21/17 13:00	DD	G
Toluene-d8 (S)	95.4		%	76 - 127	SW846 8260B			7/21/17 13:00	DD	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	8		mg/L	5	S2320B-97			7/21/17 00:03	MSA	B
Alkalinity, Total	8	2	mg/L	5	S2320B-97			7/21/17 00:03	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/25/17 10:53	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	3.0		mg/L	2.0	EPA 300.0			7/20/17 12:52	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/17 12:52	MBW	B
Nitrate-N	0.68		mg/L	0.20	EPA 300.0			7/20/17 12:52	MBW	B
pH	6.37	1	pH_Units		S4500HB-11			7/21/17 00:03	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	F
Specific Conductance	50		umhos/cm	1	SW846 9050A			7/21/17 00:03	MSA	B
Sulfate	11.9		mg/L	2.0	EPA 300.0			7/20/17 12:52	MBW	B
Total Dissolved Solids	48		mg/L	5	S2540C-11			7/24/17 19:51	JAS	B
Total Organic Carbon (TOC)	0.85		mg/L	0.50	SW846 9060A			7/27/17 00:36	PAG	D
Turbidity	6.06		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	B

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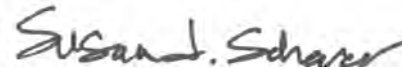
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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461001** Date Collected: 7/19/2017 10:24 Matrix: Ground Water  
Sample ID: **CWMP016W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed	By	Cntr
<b>METALS</b>									
Calcium, Total	4.9		mg/L	0.11	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
Iron, Total	2.1		mg/L	0.067	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
Magnesium, Total	1.2		mg/L	0.11	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
Manganese, Total	0.011		mg/L	0.0056	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
Sodium, Total	3.3		mg/L	0.56	SW846 6010C	7/24/17 07:00 LXC	7/26/17 16:27	TSS	J1
<b>FIELD PARAMETERS</b>									
Depth to Water Level	13.170		Feet		Field		7/19/17 10:24	BGS	C
Elev Top MW Casing above MSL	311.97		Feet		Field		7/19/17 10:24	BGS	C
Flow Rate	2.34		gal/min		Field		7/19/17 10:24	BGS	C
Ground Water Elevation	298.800		ft/MSL		Field		7/19/17 10:24	BGS	C
pH, Field (SM4500B)	5.240		pH_Units		Field		7/19/17 10:24	BGS	C
Sample Depth	71.000		Feet		Field		7/19/17 10:24	BGS	C
Specific Conductance, Field	66		umhos/cm	1	Field		7/19/17 10:24	BGS	C
Temperature	10.28		Deg. C		Field		7/19/17 10:24	BGS	C
Total Well Depth	73.520		Feet		Field		7/19/17 10:24	BGS	C
Volume in Water Column	88.715		Gallons		Field		7/19/17 10:24	BGS	C
Water Level After Purge	20.050		Feet		Field		7/19/17 10:24	BGS	C
Well Volumes Purged	1.58		Vol		Field		7/19/17 10:24	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461002** Date Collected: 7/19/2017 11:38 Matrix: Ground Water  
Sample ID: **CWMP010W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 13:22	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:22	DD	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			7/21/17 13:22	DD	G
4-Bromofluorobenzene (S)	97.9		%	79 - 114	SW846 8260B			7/21/17 13:22	DD	G
Dibromofluoromethane (S)	93.5		%	78 - 116	SW846 8260B			7/21/17 13:22	DD	G
Toluene-d8 (S)	96.9		%	76 - 127	SW846 8260B			7/21/17 13:22	DD	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	307		mg/L	5	S2320B-97			7/21/17 02:06	MSA	B
Alkalinity, Total	307	2	mg/L	5	S2320B-97			7/21/17 02:06	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/25/17 11:12	CMM	A
Chemical Oxygen Demand (COD)	57		mg/L	7	EPA 410.4			7/20/17 19:30	AK	A
Chloride	556		mg/L	10.0	EPA 300.0			7/21/17 06:33	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/17 13:04	MBW	B
Nitrate-N	8.5		mg/L	0.20	EPA 300.0			7/20/17 13:04	MBW	B
pH	7.05	1	pH_Units		S4500HB-11			7/21/17 02:06	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	F
Specific Conductance	2330		umhos/cm	1	SW846 9050A			7/21/17 02:06	MSA	B
Sulfate	34.4		mg/L	2.0	EPA 300.0			7/20/17 13:04	MBW	B
Total Dissolved Solids	1460		mg/L	5	S2540C-11			7/24/17 19:51	JAS	B
Total Organic Carbon (TOC)	20.0		mg/L	2.5	SW846 9060A			7/28/17 10:28	PAG	D
Turbidity	7.26		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	B

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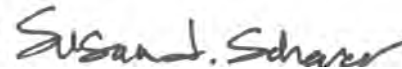
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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461002** Date Collected: 7/19/2017 11:38 Matrix: Ground Water  
Sample ID: **CWMP010W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	87.4		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
Iron, Total	0.90		mg/L	0.067	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
Magnesium, Total	59.6		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
Manganese, Total	1.1		mg/L	0.0056	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
Potassium, Total	24.0		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
Sodium, Total	271		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:31	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	8.980		Feet		Field			7/19/17 11:38	BGS	C
Elev Top MW Casing above MSL	360.90		Feet		Field			7/19/17 11:38	BGS	C
Flow Rate	2.44		gal/min		Field			7/19/17 11:38	BGS	C
Ground Water Elevation	351.920		ft/MSL		Field			7/19/17 11:38	BGS	C
pH, Field (SM4500B)	6.330		pH_Units		Field			7/19/17 11:38	BGS	C
Sample Depth	17.000		Feet		Field			7/19/17 11:38	BGS	C
Specific Conductance, Field	2404		umhos/cm	1	Field			7/19/17 11:38	BGS	C
Temperature	12.94		Deg. C		Field			7/19/17 11:38	BGS	C
Total Well Depth	19.600		Feet		Field			7/19/17 11:38	BGS	C
Volume in Water Column	6.903		Gallons		Field			7/19/17 11:38	BGS	C
Water Level After Purge	17.000		Feet		Field			7/19/17 11:38	BGS	C
Well Volumes Purged	1.42		Vol		Field			7/19/17 11:38	BGS	C



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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461003** Date Collected: 7/19/2017 12:06 Matrix: Ground Water  
Sample ID: **CWMP009W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	1.9		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
1,1-Dichloroethane	2.4		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 13:44	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 13:44	DD	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)	102		%	62 - 133	SW846 8260B			7/21/17 13:44	DD	G
4-Bromofluorobenzene (S)	90.9		%	79 - 114	SW846 8260B			7/21/17 13:44	DD	G
Dibromofluoromethane (S)	90.7		%	78 - 116	SW846 8260B			7/21/17 13:44	DD	G
Toluene-d8 (S)	93.8		%	76 - 127	SW846 8260B			7/21/17 13:44	DD	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	539		mg/L	5	S2320B-97			7/21/17 02:52	MSA	B
Alkalinity, Total	539	2	mg/L	5	S2320B-97			7/21/17 02:52	MSA	B
Ammonia-nitrogen, Total	29.6		mg/L	0.10	S4500NH3D	8/10/17 00:00	CMM	8/11/17 13:00	NJA	A
Chemical Oxygen Demand (COD)	100		mg/L	7	EPA 410.4			7/20/17 19:30	AK	A
Chloride	576		mg/L	10.0	EPA 300.0			7/20/17 13:29	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/17 13:16	MBW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			7/20/17 13:16	MBW	B
pH	6.47	1	pH_Units		S4500HB-11			7/21/17 02:52	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	F
Specific Conductance	2630		umhos/cm	1	SW846 9050A			7/21/17 02:52	MSA	B
Sulfate	5.6		mg/L	2.0	EPA 300.0			7/20/17 13:16	MBW	B
Total Dissolved Solids	1840		mg/L	5	S2540C-11			7/24/17 19:51	JAS	B
Total Organic Carbon (TOC)	29.5		mg/L	0.50	SW846 9060A			7/27/17 00:36	PAG	D
Turbidity	151		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	B

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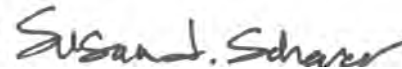
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### ANALYTICAL RESULTS

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461003** Date Collected: 7/19/2017 12:06 Matrix: Ground Water  
Sample ID: **CWMP009W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	160		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
Iron, Total	38.1		mg/L	0.067	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
Magnesium, Total	76.3		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
Manganese, Total	12.9		mg/L	0.0056	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
Potassium, Total	36.4		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
Sodium, Total	159		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:34	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	9.520		Feet		Field			7/19/17 12:06	BGS	C
Elev Top MW Casing above MSL	404.20		Feet		Field			7/19/17 12:06	BGS	C
Flow Rate	1.69		gal/min		Field			7/19/17 12:06	BGS	C
Ground Water Elevation	394.680		ft/MSL		Field			7/19/17 12:06	BGS	C
pH, Field (SM4500B)	6.160		pH_Units		Field			7/19/17 12:06	BGS	C
Sample Depth	16.000		Feet		Field			7/19/17 12:06	BGS	C
Specific Conductance, Field	3014		umhos/cm	1	Field			7/19/17 12:06	BGS	C
Temperature	13.31		Deg. C		Field			7/19/17 12:06	BGS	C
Total Well Depth	19.700		Feet		Field			7/19/17 12:06	BGS	C
Volume in Water Column	6.617		Gallons		Field			7/19/17 12:06	BGS	C
Water Level After Purge	11.170		Feet		Field			7/19/17 12:06	BGS	C
Well Volumes Purged	4.09		Vol		Field			7/19/17 12:06	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461004** Date Collected: 7/19/2017 12:42 Matrix: Ground Water  
Sample ID: **CWMP008W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	1.5		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
1,1-Dichloroethane	3.4		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 14:06	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 14:06	DD	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)	102		%	62 - 133	SW846 8260B			7/21/17 14:06	DD	G
4-Bromofluorobenzene (S)	93.2		%	79 - 114	SW846 8260B			7/21/17 14:06	DD	G
Dibromofluoromethane (S)	93.2		%	78 - 116	SW846 8260B			7/21/17 14:06	DD	G
Toluene-d8 (S)	93.3		%	76 - 127	SW846 8260B			7/21/17 14:06	DD	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	465		mg/L	5	S2320B-97			7/21/17 03:04	MSA	B
Alkalinity, Total	465	2	mg/L	5	S2320B-97			7/21/17 03:04	MSA	B
Ammonia-nitrogen, Total	5.89		mg/L	0.10	S4500NH3D	8/10/17 00:00	CMM	8/11/17 13:00	NJA	A
Chemical Oxygen Demand (COD)	34		mg/L	7	EPA 410.4			7/20/17 19:30	AK	A
Chloride	53.5		mg/L	2.0	EPA 300.0			7/20/17 13:41	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/17 13:41	MBW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			7/20/17 13:41	MBW	B
pH	6.39	1	pH_Units		S4500HB-11			7/21/17 03:04	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	F
Specific Conductance	950		umhos/cm	1	SW846 9050A			7/21/17 03:04	MSA	B
Sulfate	6.9		mg/L	2.0	EPA 300.0			7/20/17 13:41	MBW	B
Total Dissolved Solids	540		mg/L	5	S2540C-11			7/24/17 19:51	JAS	B
Total Organic Carbon (TOC)	10.7		mg/L	1.0	SW846 9060A			7/28/17 10:28	PAG	D
Turbidity	67.2		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	B

**ALS Environmental Laboratory Locations Across North America**

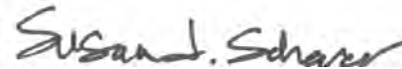
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### ANALYTICAL RESULTS

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461004** Date Collected: 7/19/2017 12:42 Matrix: Ground Water  
Sample ID: **CWMP008W** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	72.7		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
Iron, Total	27.0		mg/L	0.067	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
Magnesium, Total	33.1		mg/L	0.11	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
Manganese, Total	15.9		mg/L	0.0056	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
Potassium, Total	9.1		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
Sodium, Total	50.5		mg/L	0.56	SW846 6010C	7/24/17 07:00	LXC	7/26/17 16:37	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	3.660		Feet		Field			7/19/17 14:42	BGS	C
Elev Top MW Casing above MSL	422.30		Feet		Field			7/19/17 14:42	BGS	C
Flow Rate	1.08		gal/min		Field			7/19/17 14:42	BGS	C
Ground Water Elevation	418.640		ft/MSL		Field			7/19/17 14:42	BGS	C
pH, Field (SM4500B)	6.080		pH_Units		Field			7/19/17 14:42	BGS	C
Sample Depth	19.000		Feet		Field			7/19/17 14:42	BGS	C
Specific Conductance, Field	1076		umhos/cm	1	Field			7/19/17 14:42	BGS	C
Temperature	13.28		Deg. C		Field			7/19/17 14:42	BGS	C
Total Well Depth	22.800		Feet		Field			7/19/17 14:42	BGS	C
Volume in Water Column	3.062		Gallons		Field			7/19/17 14:42	BGS	C
Water Level After Purge	16.330		Feet		Field			7/19/17 14:42	BGS	C
Well Volumes Purged	7.08		Vol		Field			7/19/17 14:42	BGS	C



Ms. Susan J Scherer  
Project Coordinator

#### ALS Environmental Laboratory Locations Across North America

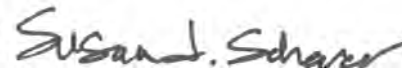
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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461005** Date Collected: 7/19/2017 14:00 Matrix: Water  
Sample ID: **Field Blank** Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 11:32	DD	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 11:32	DD	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)	98.3		%	62 - 133	SW846 8260B			7/21/17 11:32	DD	A
4-Bromofluorobenzene (S)	95.4		%	79 - 114	SW846 8260B			7/21/17 11:32	DD	A
Dibromofluoromethane (S)	89.7		%	78 - 116	SW846 8260B			7/21/17 11:32	DD	A
Toluene-d8 (S)	94.4		%	76 - 127	SW846 8260B			7/21/17 11:32	DD	A



Ms. Susan J Scherer  
Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2247461 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247461006**

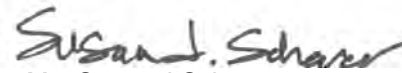
Date Collected: 7/19/2017 15:05

Matrix: Water

Sample ID: **Trip Blank**

Date Received: 7/19/2017 15:05

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/21/17 11:54	DD	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/21/17 11:54	DD	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)	100		%	62 - 133	SW846 8260B			7/21/17 11:54	DD	A
4-Bromofluorobenzene (S)	95.4		%	79 - 114	SW846 8260B			7/21/17 11:54	DD	A
Dibromofluoromethane (S)	91.6		%	78 - 116	SW846 8260B			7/21/17 11:54	DD	A
Toluene-d8 (S)	95.4		%	76 - 127	SW846 8260B			7/21/17 11:54	DD	A



Ms. Susan J Scherer

Project Coordinator

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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2247461001</b>	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.				
<b>2247461001</b>	2	CWMP016W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247461002</b>	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.				
<b>2247461002</b>	2	CWMP010W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247461003</b>	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.				
<b>2247461003</b>	2	CWMP009W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247461004</b>	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.				
<b>2247461004</b>	2	CWMP008W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				

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

Generated by ALS  
 SS  
 CO: ALS

1 of 1  
 \* 2 2 4 7 4 6 1 \*

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

Project Name#: Creswell Form 19Q Wells  
 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?  X-Y mreider@LCSWMA.com  
 Fax?  X-Y No: (717) 397-9973

Container Type	AG	AN	CG	PL	PL	PL	PL
40 ml	500 ml	500 ml	40 ml	500 ml	1 L	500 ml	500 ml
Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None

Field Measurements	Sample Depth for AUX Data	Total Metals: Ca, Fe, Mn, Mg, K, Na	PH, NO3, Cl, F, SPC, SO4, Turb	Alkalinity, HCO3
8260 - Form 19Q				

Cooler Temp: 5 Therm ID: JG  
 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?

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.										Sample/COC Comments		
			G	GW	2	1	1	2	X	X	1	1		1	
1. CWMPO6W	7-14-17	1024	1	1	2	1	1	1	1	1	1	1	1	1	
2. CWMPO10W		1138	1	1	2	1	1	1	1	1	1	1	1	1	
3. CWMPO9W		1206	1	1	2	1	1	1	1	1	1	1	1	1	
4. CWMPO8W		1242	1	1	2	1	1	1	1	1	1	1	1	1	
5. Field Blank		1400	1	1	2	1	1	1	1	1	1	1	1	1	
6. Trip Blank		1505	1	1	2	1	1	1	1	1	1	1	1	1	
7.															
8.															
9.															
10.															

Project Comments:  
 Relinquished By / Company Name: *ASB Small ALS*  
 Date: 7-17-17  
 Time: 1005Z  
 Received By / Company Name: *[Signature]*  
 Date: 7-19-17  
 Time: 1505  
 Reportable to PADEP? Yes  No   
 PWSID #  
 EDDS: Format Type

Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=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



August 11, 2017

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

## Certificate of Analysis

Project Name: <b>2017-CRESWELL</b>	Workorder: <b>2247811</b>
Purchase Order:	Workorder ID: <b>QUARTERLY CWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, July 20, 2017.

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

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

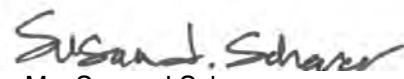
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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

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

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



Ms. Susan J Scherer  
Project Coordinator

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**SAMPLE SUMMARY**

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2247811001	CWMP012W	Ground Water	7/20/2017 11:47	7/20/2017 15:23	Mr. Brian G Shade
2247811002	CWMP002W	Ground Water	7/20/2017 12:22	7/20/2017 15:23	Mr. Brian G Shade
2247811003	CWMP003W	Ground Water	7/20/2017 12:38	7/20/2017 15:23	Mr. Brian G Shade
2247811004	CWMP004W	Ground Water	7/20/2017 13:10	7/20/2017 15:23	Mr. Brian G Shade
2247811005	Field Blank	Ground Water	7/20/2017 14:00	7/20/2017 15:23	Mr. Brian G Shade
2247811006	Trip Blank	Ground Water	7/20/2017 15:23	7/20/2017 15:23	Mr. Brian G Shade

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**SAMPLE SUMMARY**

Workorder: 2247811 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: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811001**  
Sample ID: **CWMP012W**

Date Collected: 7/20/2017 11:47 Matrix: Ground Water  
Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
1,1-Dichloroethane	1.2		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 13:11	DD	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:11	DD	E
<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			7/25/17 13:11	DD	E
4-Bromofluorobenzene (S)	97.5		%	79 - 114	SW846 8260B			7/25/17 13:11	DD	E
Dibromofluoromethane (S)	97.6		%	78 - 116	SW846 8260B			7/25/17 13:11	DD	E
Toluene-d8 (S)	93.8		%	76 - 127	SW846 8260B			7/25/17 13:11	DD	E
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	66		mg/L	5	S2320B-97			7/22/17 04:03	MSA	C
Alkalinity, Total	66	1	mg/L	5	S2320B-97			7/22/17 04:03	MSA	C
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 16:19	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	36.0		mg/L	2.0	EPA 300.0			7/21/17 16:09	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/17 16:09	MBW	C
Nitrate-N	11.5		mg/L	0.20	EPA 300.0			7/21/17 16:09	MBW	C
pH	6.42	2	pH_Units		S4500HB-11			7/22/17 04:03	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	I
Specific Conductance	298		umhos/cm	1	S2510B-97			7/22/17 04:03	MSA	C
Sulfate	4.7		mg/L	2.0	EPA 300.0			7/21/17 16:09	MBW	C
Total Dissolved Solids	263		mg/L	5	S2540C-11			7/25/17 17:56	JAS	C
Total Organic Carbon (TOC)	1.9		mg/L	0.50	S5310B-00			8/8/17 10:39	PAG	G
Turbidity	1290		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	C

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**ANALYTICAL RESULTS**

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811001** Date Collected: 7/20/2017 11:47 Matrix: Ground Water  
Sample ID: **CWMP012W** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	33.7		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
Iron, Total	162		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
Magnesium, Total	9.5		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
Manganese, Total	0.39		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
Sodium, Total	13.6		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:45	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	62.410		Feet		Field			7/20/17 11:47	BGS	B
pH, Field (SM4500B)	5.680		pH_Units		Field			7/20/17 11:47	BGS	B
Specific Conductance, Field	398		umhos/cm	1	Field			7/20/17 11:47	BGS	B
Temperature	14.14		Deg. C		Field			7/20/17 11:47	BGS	B



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

 Lab ID: **2247811002** Date Collected: 7/20/2017 12:22 Matrix: Ground Water  
 Sample ID: **CWMP002W** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Bromoform	ND	3	ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Chloroethane	3.6		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Chloroform	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,1-Dichloroethane	7.9		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/25/17 12:49	DD	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Styrene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 12:49	DD	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/25/17 12:49	DD	E
1,1,1-Trichloroethane	1.1		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/25/17 12:49	DD	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:49	DD	E
<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: 2247811 QUARTERLY CWMP-FORM 19Q

**Lab ID:** 2247811002      **Date Collected:** 7/20/2017 12:22      **Matrix:** Ground Water  
**Sample ID:** CWMP002W      **Date Received:** 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	106		%	62 - 133	SW846 8260B			7/25/17 12:49	DD	E
4-Bromofluorobenzene (S)	92.6		%	79 - 114	SW846 8260B			7/25/17 12:49	DD	E
Dibromofluoromethane (S)	96.4		%	78 - 116	SW846 8260B			7/25/17 12:49	DD	E
Toluene-d8 (S)	92.2		%	76 - 127	SW846 8260B			7/25/17 12:49	DD	E
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	65		mg/L	5	S2320B-97			7/22/17 04:30	MSA	C
Alkalinity, Total	65	1	mg/L	5	S2320B-97			7/22/17 04:30	MSA	C
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 16:38	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	109		mg/L	2.0	EPA 300.0			7/21/17 16:23	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/17 16:23	MBW	C
Nitrate-N	3.7		mg/L	0.20	EPA 300.0			7/21/17 16:23	MBW	C
pH	5.88	2	pH_Units		S4500HB-11			7/22/17 04:30	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	I
Specific Conductance	553		umhos/cm	1	S2510B-97			7/22/17 04:30	MSA	C
Sulfate	26.0		mg/L	2.0	EPA 300.0			7/21/17 16:23	MBW	C
Total Dissolved Solids	439		mg/L	5	S2540C-11			7/25/17 17:56	JAS	C
Total Organic Carbon (TOC)	2.5		mg/L	0.50	S5310B-00			8/7/17 10:17	PAG	G
Turbidity	ND		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	C
<b>METALS</b>										
Calcium, Total	51.9		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
Magnesium, Total	15.5		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
Manganese, Total	1.1		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
Potassium, Total	2.6		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
Sodium, Total	21.0		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:48	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	81.720		Feet		Field			7/20/17 12:22	BGS	B
Elev Top MW Casing above MSL	525.81		Feet		Field			7/20/17 12:22	BGS	B
Ground Water Elevation	444.090		ft/MSL		Field			7/20/17 12:22	BGS	B
pH, Field (SM4500B)	5.040		pH_Units		Field			7/20/17 12:22	BGS	B
Sample Depth	85.000		Feet		Field			7/20/17 12:22	BGS	B
Specific Conductance, Field	627		umhos/cm	1	Field			7/20/17 12:22	BGS	B
Temperature	12.47		Deg. C		Field			7/20/17 12:22	BGS	B
Total Well Depth	100.000		Feet		Field			7/20/17 12:22	BGS	B

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**ANALYTICAL RESULTS**

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811002** Date Collected: 7/20/2017 12:22 Matrix: Ground Water  
Sample ID: **CWMP002W** Date Received: 7/20/2017 15:23

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: 2247811 QUARTERLY CWMP-FORM 19Q

 Lab ID: **2247811003** Date Collected: 7/20/2017 12:38 Matrix: Ground Water  
 Sample ID: **CWMP003W** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Bromoform	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Chloroform	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,1-Dichloroethane	2.4		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/25/17 13:33	DD	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Styrene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 13:33	DD	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/25/17 13:33	DD	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/25/17 13:33	DD	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:33	DD	E
<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: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811003** Date Collected: 7/20/2017 12:38 Matrix: Ground Water  
Sample ID: **CWMP003W** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			7/25/17 13:33	DD	E
4-Bromofluorobenzene (S)	99.2		%	79 - 114	SW846 8260B			7/25/17 13:33	DD	E
Dibromofluoromethane (S)	99.1		%	78 - 116	SW846 8260B			7/25/17 13:33	DD	E
Toluene-d8 (S)	92.9		%	76 - 127	SW846 8260B			7/25/17 13:33	DD	E
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	18		mg/L	5	S2320B-97			7/22/17 04:38	MSA	C
Alkalinity, Total	18	1	mg/L	5	S2320B-97			7/22/17 04:38	MSA	C
Ammonia-N	0.102		mg/L	0.100	D6919-09			7/24/17 16:57	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	74.8		mg/L	2.0	EPA 300.0			7/21/17 18:01	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/17 18:01	MBW	C
Nitrate-N	8.9		mg/L	0.20	EPA 300.0			7/21/17 18:01	MBW	C
pH	5.97	2	pH_Units		S4500HB-11			7/22/17 04:38	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	I
Specific Conductance	338		umhos/cm	1	S2510B-97			7/22/17 04:38	MSA	C
Sulfate	5.7		mg/L	2.0	EPA 300.0			7/21/17 18:01	MBW	C
Total Dissolved Solids	278		mg/L	5	S2540C-11			7/25/17 17:56	JAS	C
Total Organic Carbon (TOC)	1.2		mg/L	0.50	S5310B-00			7/31/17 14:08	PAG	G
Turbidity	0.14		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	C
<b>METALS</b>										
Calcium, Total	28.7		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
Magnesium, Total	9.6		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
Sodium, Total	18.6		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:52	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	93.620		Feet		Field			7/20/17 12:38	BGS	B
Elev Top MW Casing above MSL	524.21		Feet		Field			7/20/17 12:38	BGS	B
Ground Water Elevation	430.590		ft/MSL		Field			7/20/17 12:38	BGS	B
pH, Field (SM4500B)	5.090		pH_Units		Field			7/20/17 12:38	BGS	B
Sample Depth	100.000		Feet		Field			7/20/17 12:38	BGS	B
Specific Conductance, Field	423		umhos/cm	1	Field			7/20/17 12:38	BGS	B
Temperature	13.38		Deg. C		Field			7/20/17 12:38	BGS	B
Total Well Depth	140.000		Feet		Field			7/20/17 12:38	BGS	B

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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811003** Date Collected: 7/20/2017 12:38 Matrix: Ground Water  
 Sample ID: **CWMP003W** Date Received: 7/20/2017 15:23

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: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811004** Date Collected: 7/20/2017 13:10 Matrix: Ground Water  
Sample ID: **CWMP004W** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Bromoform	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Chloroform	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/25/17 13:55	DD	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Styrene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 13:55	DD	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/25/17 13:55	DD	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/25/17 13:55	DD	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 13:55	DD	E
<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: 2247811 QUARTERLY CWMP-FORM 19Q

**Lab ID:** 2247811004      **Date Collected:** 7/20/2017 13:10      **Matrix:** Ground Water  
**Sample ID:** CWMP004W      **Date Received:** 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			7/25/17 13:55	DD	E
4-Bromofluorobenzene (S)	97.3		%	79 - 114	SW846 8260B			7/25/17 13:55	DD	E
Dibromofluoromethane (S)	96.8		%	78 - 116	SW846 8260B			7/25/17 13:55	DD	E
Toluene-d8 (S)	92.8		%	76 - 127	SW846 8260B			7/25/17 13:55	DD	E
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	27		mg/L	5	S2320B-97			7/22/17 04:47	MSA	C
Alkalinity, Total	27	1	mg/L	5	S2320B-97			7/22/17 04:47	MSA	C
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 17:16	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	44.1		mg/L	2.0	EPA 300.0			7/21/17 18:15	MBW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/17 18:15	MBW	C
Nitrate-N	7.4		mg/L	0.20	EPA 300.0			7/21/17 18:15	MBW	C
pH	6.21	2	pH_Units		S4500HB-11			7/22/17 04:47	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	I
Specific Conductance	233		umhos/cm	1	S2510B-97			7/22/17 04:47	MSA	C
Sulfate	6.2		mg/L	2.0	EPA 300.0			7/21/17 18:15	MBW	C
Total Dissolved Solids	197		mg/L	5	S2540C-11			7/25/17 17:56	JAS	C
Total Organic Carbon (TOC)	1.2		mg/L	0.50	S5310B-00			7/31/17 14:08	PAG	G
Turbidity	ND		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	C
<b>METALS</b>										
Calcium, Total	20.6		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
Magnesium, Total	6.3		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
Manganese, Total	0.0076		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
Potassium, Total	1.2		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
Sodium, Total	14.3		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:55	TSS	J1
<b>FIELD PARAMETERS</b>										
Depth to Water Level	128.770		Feet		Field			7/20/17 13:10	BGS	B
Elev Top MW Casing above MSL	529.53		Feet		Field			7/20/17 13:10	BGS	B
Ground Water Elevation	400.760		ft/MSL		Field			7/20/17 13:10	BGS	B
pH, Field (SM4500B)	5.320		pH_Units		Field			7/20/17 13:10	BGS	B
Sample Depth	130.000		Feet		Field			7/20/17 13:10	BGS	B
Specific Conductance, Field	295		umhos/cm	1	Field			7/20/17 13:10	BGS	B
Temperature	12.30		Deg. C		Field			7/20/17 13:10	BGS	B
Total Well Depth	140.000		Feet		Field			7/20/17 13:10	BGS	B

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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811004** Date Collected: 7/20/2017 13:10 Matrix: Ground Water  
 Sample ID: **CWMP004W** Date Received: 7/20/2017 15:23

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: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811005**

Date Collected: 7/20/2017 14:00

Matrix: Ground Water

Sample ID: **Field Blank**

Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Bromoform	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Chloroform	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/25/17 12:05	DD	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Styrene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 12:05	DD	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/25/17 12:05	DD	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/25/17 12:05	DD	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:05	DD	E
<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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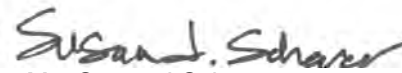
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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

 Lab ID: **2247811005** Date Collected: 7/20/2017 14:00 Matrix: Ground Water  
 Sample ID: **Field Blank** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			7/25/17 12:05	DD	E
4-Bromofluorobenzene (S)	98.6		%	79 - 114	SW846 8260B			7/25/17 12:05	DD	E
Dibromofluoromethane (S)	97.2		%	78 - 116	SW846 8260B			7/25/17 12:05	DD	E
Toluene-d8 (S)	91.9		%	76 - 127	SW846 8260B			7/25/17 12:05	DD	E
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			7/22/17 04:55	MSA	B
Alkalinity, Total	ND	1	mg/L	5	S2320B-97			7/22/17 04:55	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 17:35	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	ND		mg/L	1.0	EPA 300.0			7/21/17 18:29	MBW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			7/21/17 18:29	MBW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			7/21/17 18:29	MBW	B
pH	6.26	2	pH_Units		S4500HB-11			7/22/17 04:55	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	H
Specific Conductance	ND		umhos/cm	1	S2510B-97			7/22/17 04:55	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			7/21/17 18:29	MBW	B
Total Dissolved Solids	21		mg/L	5	S2540C-11			7/25/17 17:56	JAS	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	S5310B-00			7/31/17 14:08	PAG	F
Turbidity	0.14		NTU	0.10	S2130B-01			7/21/17 01:25	MSA	B
<b>METALS</b>										
Calcium, Total	ND		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 17:58	TSS	I1



 Ms. Susan J Scherer  
 Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

 Lab ID: **2247811006**

Date Collected: 7/20/2017 15:23

Matrix: Ground Water

 Sample ID: **Trip Blank**

Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Bromoform	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Chloroform	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/25/17 12:27	DD	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Styrene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 12:27	DD	A
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/25/17 12:27	DD	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	A
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/25/17 12:27	DD	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 12:27	DD	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>

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### ANALYTICAL RESULTS

Workorder: 2247811 QUARTERLY CWMP-FORM 19Q

Lab ID: **2247811006** Date Collected: 7/20/2017 15:23 Matrix: Ground Water  
Sample ID: **Trip Blank** Date Received: 7/20/2017 15:23

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			7/25/17 12:27	DD	A
4-Bromofluorobenzene (S)	97.6		%	79 - 114	SW846 8260B			7/25/17 12:27	DD	A
Dibromofluoromethane (S)	98.3		%	78 - 116	SW846 8260B			7/25/17 12:27	DD	A
Toluene-d8 (S)	94		%	76 - 127	SW846 8260B			7/25/17 12:27	DD	A

*Susan J. Scherer*  
Ms. Susan J Scherer  
Project Coordinator

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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2247811001</b>	1	CWMP012W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247811001</b>	2	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.				
<b>2247811002</b>	1	CWMP002W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247811002</b>	2	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.				
<b>2247811002</b>	3	CWMP002W	SW846 8260B	Bromoform
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte Bromoform. The % Recovery was reported as 68.4 and the control limits were 70 to 123.				
<b>2247811003</b>	1	CWMP003W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247811003</b>	2	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.				
<b>2247811004</b>	1	CWMP004W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247811004</b>	2	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.				
<b>2247811005</b>	1	Field Blank	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2247811005</b>	2	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.				

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

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

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

Project Name#: Creswell Form 19Q Wells  
 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@ALCSWMA.com  
 Fax?  Y No.: (717) 397-9973

Container Type	AG	AN	CG	PL	PL	PL	PL
Container Size	500 ml	500 ml	40 ml	500 ml	500 ml	1 L	500 ml
Preservation	H2SO4	H2SO4	HCl	H2SO4	HNO3	None	None
TOC							
O-OH							
B260 - Form 19Q							
Field Measurements							
Sample Depth for AUX Data							
Total Metals: Ca, Fe, Mn, Mg, K, Na							
PH, NO3, Cl, F, SPC, SO4, Turb.							
TDS							
Alkalinity, HCO3							

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.																	
			G	GW	2	1	X	X	1	1	1	1								
1. CWMPO012W	7-20-17	8:47																		
2. CWMPO02W		12:22																		
3. CWMPO03W		12:38																		
4. CWMPO04W		13:00																		
5. Field Blank		14:00																		
6. Trip Blank		15:22																		
7.																				
8.																				
9.																				
10.																				

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

LOGGED BY (signature): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

REVIEWED BY (signature): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

Received By / Company Name: AS 7/20/17 Date: 7-20-17 Time: 15:22

Relinquished By / Company Name: AS Date: 7-20-17 Time: 15:22

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

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

Sample Disposal: Lab  Special

Reportable to PADEP? Yes  No   
 PWSID #: \_\_\_\_\_

EDDS: Formal Type: \_\_\_\_\_



August 2, 2017

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

## Certificate of Analysis

Project Name: <b>2017-CRESWELL</b>	Workorder: <b>2248018</b>
Purchase Order:	Workorder ID: <b>QUARTERLY CWMP-FORM 19Q</b>

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, July 21, 2017.

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

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

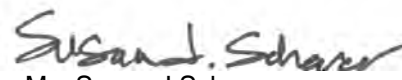
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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

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

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

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

  
Ms. Susan J Scherer  
Project Coordinator

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**SAMPLE SUMMARY**

Workorder: 2248018 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2248018001	CWMP017S	Ground Water	7/21/2017 10:10	7/21/2017 17:29	Mr. Brian G Shade
2248018002	CWMP018S	Ground Water	7/21/2017 09:52	7/21/2017 17:29	Mr. Brian G Shade

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**SAMPLE SUMMARY**

Workorder: 2248018 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: 2248018 QUARTERLY CWMP-FORM 19Q

**Lab ID:** 2248018001      **Date Collected:** 7/21/2017 10:10      **Matrix:** Ground Water  
**Sample ID:** CWMP017S      **Date Received:** 7/21/2017 17:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 23:15	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 23:15	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)	107		%	62 - 133	SW846 8260B			7/25/17 23:15	CJG	G
4-Bromofluorobenzene (S)	94.3		%	79 - 114	SW846 8260B			7/25/17 23:15	CJG	G
Dibromofluoromethane (S)	98.7		%	78 - 116	SW846 8260B			7/25/17 23:15	CJG	G
Toluene-d8 (S)	92.3		%	76 - 127	SW846 8260B			7/25/17 23:15	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	660		mg/L	5	S2320B-97			7/25/17 06:30	MSA	B
Alkalinity, Total	660	2	mg/L	5	S2320B-97			7/25/17 06:30	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 18:33	AK	A
Chemical Oxygen Demand (COD)	22		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	1040		mg/L	25.0	EPA 300.0			7/22/17 12:22	MBW	B
Fluoride	0.30		mg/L	0.20	EPA 300.0			7/22/17 12:10	MBW	B
Nitrate-N	18.4		mg/L	0.20	EPA 300.0			7/22/17 12:10	MBW	B
pH	8.15	1	pH_Units		S4500HB-11			7/25/17 06:30	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/26/17 11:01	JLG	F
Specific Conductance	4290		umhos/cm	1	SW846 9050A			7/25/17 06:30	MSA	B
Sulfate	93.5		mg/L	2.0	EPA 300.0			7/22/17 12:10	MBW	B
Total Dissolved Solids	2520		mg/L	5	S2540C-11			7/26/17 15:36	JAS	B
Total Organic Carbon (TOC)	5.4		mg/L	0.50	SW846 9060A			7/31/17 14:08	PAG	D
Turbidity	0.80		NTU	0.10	S2130B-01			7/21/17 21:40	MSA	B

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**ANALYTICAL RESULTS**

Workorder: 2248018 QUARTERLY CWMP-FORM 19Q

Lab ID: **2248018001** Date Collected: 7/21/2017 10:10 Matrix: Ground Water  
Sample ID: **CWMP017S** Date Received: 7/21/2017 17:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	84.5		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
Iron, Total	0.19		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
Magnesium, Total	126		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
Manganese, Total	0.081		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
Potassium, Total	21.2		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
Sodium, Total	539		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:05	TSS	J1
<b>FIELD PARAMETERS</b>										
Dissolved Oxygen	6.800		mg/L	0.010	Field			7/21/17 10:10	BGS	C
Flow Rate	178.40		gal/min		Field			7/21/17 10:10	BGS	C
pH, Field (SM4500B)	7.950		pH_Units		Field			7/21/17 10:10	BGS	C
Specific Conductance, Field	4741		umhos/cm	1	Field			7/21/17 10:10	BGS	C
Temperature	25.33		Deg. C		Field			7/21/17 10:10	BGS	C



Ms. Susan J Scherer  
Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2248018 QUARTERLY CWMP-FORM 19Q

**Lab ID:** 2248018002      **Date Collected:** 7/21/2017 09:52      **Matrix:** Ground Water  
**Sample ID:** CWMP018S      **Date Received:** 7/21/2017 17:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>VOLATILE ORGANICS</b>										
Benzene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/25/17 23:37	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/25/17 23:37	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)	108		%	62 - 133	SW846 8260B			7/25/17 23:37	CJG	G
4-Bromofluorobenzene (S)	95.4		%	79 - 114	SW846 8260B			7/25/17 23:37	CJG	G
Dibromofluoromethane (S)	101		%	78 - 116	SW846 8260B			7/25/17 23:37	CJG	G
Toluene-d8 (S)	92.1		%	76 - 127	SW846 8260B			7/25/17 23:37	CJG	G
<b>WET CHEMISTRY</b>										
Alkalinity, Bicarbonate	494		mg/L	5	S2320B-97			7/25/17 06:42	MSA	B
Alkalinity, Total	546	2	mg/L	5	S2320B-97			7/25/17 06:42	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/24/17 18:52	AK	A
Chemical Oxygen Demand (COD)	26		mg/L	7	EPA 410.4			7/24/17 09:59	AK	A
Chloride	860		mg/L	10.0	EPA 300.0			7/22/17 12:46	MBW	B
Fluoride	0.28		mg/L	0.20	EPA 300.0			7/22/17 12:34	MBW	B
Nitrate-N	16.9		mg/L	0.20	EPA 300.0			7/22/17 12:34	MBW	B
pH	8.51	1	pH_Units		S4500HB-11			7/25/17 06:42	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	7/25/17 00:00	JLG	7/25/17 10:26	JLG	F
Specific Conductance	3560		umhos/cm	1	SW846 9050A			7/25/17 06:42	MSA	B
Sulfate	56.9		mg/L	2.0	EPA 300.0			7/22/17 12:34	MBW	B
Total Dissolved Solids	2090		mg/L	5	S2540C-11			7/26/17 15:36	JAS	B
Total Organic Carbon (TOC)	7.5		mg/L	0.50	SW846 9060A			7/31/17 14:08	PAG	D
Turbidity	0.41		NTU	0.10	S2130B-01			7/21/17 21:40	MSA	B

### ALS Environmental Laboratory Locations Across North America

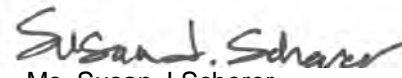
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**Vancouver** · Waterloo · Winnipeg · Yellowknife    **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York    **Mexico:** Monterrey

**ANALYTICAL RESULTS**

Workorder: 2248018 QUARTERLY CWMP-FORM 19Q

Lab ID: **2248018002** Date Collected: 7/21/2017 09:52 Matrix: Ground Water  
Sample ID: **CWMP018S** Date Received: 7/21/2017 17:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>METALS</b>										
Calcium, Total	87.6		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
Magnesium, Total	111		mg/L	0.11	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
Potassium, Total	23.3		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
Sodium, Total	458		mg/L	0.56	SW846 6010C	7/26/17 05:40	LXC	7/26/17 18:16	TSS	J1
<b>FIELD PARAMETERS</b>										
Dissolved Oxygen	7.790		mg/L	0.010	Field			7/21/17 09:52	BGS	C
Flow Rate	254.00		gal/min		Field			7/21/17 09:52	BGS	C
pH, Field (SM4500B)	8.420		pH_Units		Field			7/21/17 09:52	BGS	C
Specific Conductance, Field	3926		umhos/cm	1	Field			7/21/17 09:52	BGS	C
Temperature	21.99		Deg. C		Field			7/21/17 09:52	BGS	C



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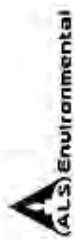
**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2248018001</b>	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.				
<b>2248018001</b>	2	CWMP017S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				
<b>2248018002</b>	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.				
<b>2248018002</b>	2	CWMP018S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO <sub>3</sub> /L.				

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# CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC #: **ALS Q1**



1 of 1

**Client Name:** Lancaster County Solid Waste MA  
**Address:** 1299 Harrisburg Pike, P.O. Box 4424  
Lancaster, PA 17604  
**Contact:** Brooks Norris  
**Phone#:** (717) 397-9968

**Project Name#:** Marris Run Quarterly (Streams)  
**Bill To:** Lancaster County Solid Waste MA

Normal-Standard TAT is 10-12 business days,  
 Rush-Subject to ALS approval and surcharges.  
**Date Required:** \_\_\_\_\_ **Approved By:** \_\_\_\_\_  
**Email#:**  Y  N **bnorris@LCSWMA.com**  
**Fax#:**  Y  N **(717) 397-9973**

Container Type	AG	AN	CG	PL	PL	PL	PL
125 ml	500 ml	500 ml	40 ml	500 ml	500 ml	1 L	500 ml
Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None

ANALYSES/METHOD REQUESTED							
Field Measurements	NH3-N, COD	Total Metals: Fe, Mn, Ca, Mg, K, Na	PH, Cl, F, SPC, SO4, Turb, TDS	Alkalinity, HCO3	NO3	TOC	O-OH
Form 190 VOC							

Sample Description/Location <small>(as it will appear on the lab report)</small>	Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.											
			G	GW	1	2	X	1	1	1	1	1		
1 CWMP017S	7-21-17	1010	G	GW	1	2	X	1	1	1	1	1	1	1
2 CWMP018S	7-21-17	0952	G	GW	1	2	X	1	1	1	1	1	1	1
3														
4														
5														
6														
7														
8														
9														
10														

**Project Comments:** \_\_\_\_\_

**LOGGED BY (signature):** \_\_\_\_\_

**REVIEWED BY (signature):** \_\_\_\_\_

Date	Time	Received By / Company Name	Date	Time
7-21-17	1729	[Signature]	7-21-17	1729

**Cooler Temp:** 30q **Therm ID:** 30q

**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?

**Receipt Information:** \_\_\_\_\_

**ALS Field Services:**  Pickup  Labor  
 Composite Sampling  Rental Equipment  
 Other: \_\_\_\_\_

**Special Processing:** USACE  Navy   
 USACE

**State Samples Collected In:** NY  NJ  PA  NC

**Reportable to PADEP?** Yes  No   
**Sample Disposal:** Lab  Special

**PWSID #:** \_\_\_\_\_

**EDDS: Format Type:** \_\_\_\_\_

**Matrix:** G=Grab; C=Composite; \*\*Matrix - AF=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

