

August 26, 2016

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 2016

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 of 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 wells 1 & 5 samples where bellow MCL and SMCL with the exception of Iron, Manganese and Nitrate-Nitrogen.
- Down gradient wells had similar results with wells 17 & 18 (surface Mann's Run) showing highest concentration of chlorides 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 attributable 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)

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

www.lcswma.org

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

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

Respectfully Submitted,

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

Mark D. Reider
Director of Environmental Compliance

Enclosures

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



Date Prepared/Revised
08/25/2016

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 X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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:	7.94	ft	Measured from:	Land Surface	X	TOC
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Casing Stickup: 1.50 ft Elevation of Water Level: 445.46 ft./MSL

Sampling Depth:	33 ft	Volume of Water Column:	41.94 gal
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Total Well Depth: 36.5 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 4.0

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/19/2016 Sample Collection Time: 10:57

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): 2160122001 Final Lab Analysis CompletionDate: 8/4/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP007W

Sample Date 7/19/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	10	SM18-2321
CALCIUM, TOTAL	18.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	67.6	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	9.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.8	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.7	EPA 300.0
pH-FIELD (SU)	5.13	FIELD
pH-LAB (SU)	6.3	EPA 150.1
POTASSIUM, TOTAL	2.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	31.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	406	FIELD
SPEC. COND., LAB (umhos/cm)	380	EPA 120.1
SULFATE	15	EPA 300.0
ALKALINITY	10	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	434	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 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 7/19/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



Date Prepared/Revised
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QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP001W

X	Well	Spring	Stream	Other
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X 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: 28.15 ft

Measured from: Land Surface X TOC

Casing Stickup: 1.23 ft

Elevation of Water Level: 486.98 ft./MSL

Sampling Depth: 57 ft

Volume of Water Column:	56.03	gal
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Total Well Depth: 66.3 ft

Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: X 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): 7/19/2016

Sample Collection Time: 12:10

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): 2160122002 Final Lab Analysis CompletionDate: 8/4/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP001W

Sample Date 7/19/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.118	EPA 350.3
BICARBONATE	6	SM18-2321
CALCIUM, TOTAL	17	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	30.1	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	1100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	11	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	120	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	21.5	EPA 300.0
pH-FIELD (SU)	5.26	FIELD
pH-LAB (SU)	6.11	EPA 150.1
POTASSIUM, TOTAL	2.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	13.7	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	313	FIELD
SPEC. COND., LAB (umhos/cm)	268	EPA 120.1
SULFATE	2 ND	EPA 300.0
ALKALINITY	6	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	343	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	40.6	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 7/19/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



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

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP005W

☒ Well ☐ Spring ☐ Stream ☐ Other

☒ Upgradient/Upstream ☐ Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point Latitude: 39 ° 57 ' 11.17 "

Longitude: 76 ° 26 ' 7.08 "

Depth to Water Level: 42.42 ft

Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -0.37 ft

Elevation of Water Level: 471.01 ft./MSL

Sampling Depth: 130 ft

Volume of Water Column: 143.31 gal

Total Well Depth: 140 ft

Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No

Well Volumes Purged: 2.3

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

Spring Flow Rate: ☐ gpm

Sample Date (mm/dd/yy): 7/20/2016

Sample Collection Time: 9:55

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): 2160600001 Final Lab Analysis Completion Date: 8/5/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	14	SM18-2321
CALCIUM, TOTAL	15.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	57.6	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	8.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	56	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	11.5	EPA 300.0
pH-FIELD (SU)	5.25	FIELD
pH-LAB (SU)	6.54	EPA 150.1
POTASSIUM, TOTAL	2.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	29.8	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	362	FIELD
SPEC. COND., LAB (umhos/cm)	311	EPA 120.1
SULFATE	2 ND	EPA 300.0
ALKALINITY	14	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	215	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.2	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

^T Please indicate detection limit if analyte is not detected.

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

Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: 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: 104.25 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -1.37 ft Elevation of Water Level: 425.28 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 52.50 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): 7/20/2016 Sample Collection Time: 11:30

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): 2160600002 Final Lab Analysis Completion Date: 8/5/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP004W

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	26	SM18-2321
CALCIUM, TOTAL	21.3	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	43.2	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	6.5	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6.9	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	6.8	EPA 300.0
pH-FIELD (SU)	7.43	FIELD
pH-LAB (SU)	6.81	EPA 150.1
POTASSIUM, TOTAL	1.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	15.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	294	FIELD
SPEC. COND., LAB (umhos/cm)	251	EPA 120.1
SULFATE	5.1	EPA 300.0
ALKALINITY	26	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	174	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	SM 2130B

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Monitoring Point No. CWMP004W

Sample Date 7/20/2016

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ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.1	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



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Monitoring Point Number: CWMP003W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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: 43.45 ft Measured from: Land Surface X TOC

Casing Stickup: -1.29 ft Elevation of Water Level: 480.76 ft./MSL

Sampling Depth:	90 ft	Volume of Water Column:	46.34 gal
-----------------	-------	-------------------------	-----------

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

Well Purged: X 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): 7/20/2016 Sample Collection Time: 11:43

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

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

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2160600003 Final Lab Analysis CompletionDate: 8/5/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	16	SM18-2321
CALCIUM, TOTAL	30.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	9	EPA 410.4
CHLORIDE	81.8	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	10.1	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	14	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.9	EPA 300.0
pH-FIELD (SU)	5.89	FIELD
pH-LAB (SU)	6.57	EPA 150.1
POTASSIUM, TOTAL	1.7	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	20.5	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1041	FIELD
SPEC. COND., LAB (umhos/cm)	404	EPA 120.1
SULFATE	5.4	EPA 300.0
ALKALINITY	16	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	280	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	0.46	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 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	2.6	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



Date Prepared/Revised
08/25/2016

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: 89.82 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -1.19 ft Elevation of Water Level: 435.99 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 14.95 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): 7/20/2016 Sample Collection Time: 12:28

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): 2160600004 Final Lab Analysis Completion Date: 8/5/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP002W

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.122	EPA 350.3
BICARBONATE	63	SM18-2321
CALCIUM, TOTAL	52.1	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	11	EPA 410.4
CHLORIDE	111	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	15.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	990	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.5	EPA 300.0
pH-FIELD (SU)	5.9	FIELD
pH-LAB (SU)	6.61	EPA 150.1
POTASSIUM, TOTAL	2.9	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	22	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	603	FIELD
SPEC. COND., LAB (umhos/cm)	567	EPA 120.1
SULFATE	24.4	EPA 300.0
ALKALINITY	63	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	360	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	4.2	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	0.74	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 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	10.5	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1.3	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
08/25/2016

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP017S ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☒ Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

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

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

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

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

Total Well Depth: _____ ft Sampling Method: ☐ Pumped ☐ Bailed ☒ Grab

Well Purged: ☐ Yes ☒ No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/20/2016 Sample Collection Time: 10:45

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): 2160603001 Final Lab Analysis Completion Date: 8/5/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP017S

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	645	SM18-2321
CALCIUM, TOTAL	97.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	13	EPA 410.4
CHLORIDE	1420	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	150	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	139	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	85	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	35.4	EPA 300.0
pH-FIELD (SU)	7.99	FIELD
pH-LAB (SU)	8.36	EPA 150.1
POTASSIUM, TOTAL	24.8	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	615	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	5333	FIELD
SPEC. COND., LAB (umhos/cm)	4930	EPA 120.1
SULFATE	82.6	EPA 300.0
ALKALINITY	661	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	2830	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	5.4	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	1.32	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 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



Date Prepared/Revised
08/25/2016

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP018S ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☒ Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor

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

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

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

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

Total Well Depth: _____ ft Sampling Method: ☐ Pumped ☐ Bailed ☒ Grab

Well Purged: ☐ Yes ☒ No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/20/2016 Sample Collection Time: 10:26

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): 2160603002 Final Lab Analysis Completion Date: 8/5/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	500	SM18-2321
CALCIUM, TOTAL	85.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	20	EPA 410.4
CHLORIDE	898	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	103	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	34	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	26.1	EPA 300.0
pH-FIELD (SU)	7.93	FIELD
pH-LAB (SU)	8.5	EPA 150.1
POTASSIUM, TOTAL	23	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	441	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3874	FIELD
SPEC. COND., LAB (umhos/cm)	3600	EPA 120.1
SULFATE	46.2	EPA 300.0
ALKALINITY	544	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	2010	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	7.8	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	0.66	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 7/20/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



Date Prepared/Revised
08/25/2016

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: 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: 49.29 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 333.41 ft./MSL

Sampling Depth: 0 ft Volume of Water Column: 77.27 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): 7/21/2016 Sample Collection Time: 10:23

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): 2161030001 Final Lab Analysis Completion Date: 8/4/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 7/21/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	65	SM18-2321
CALCIUM, TOTAL	34.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	36.1	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	15100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	340	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	11	EPA 300.0
pH-FIELD (SU)	5.62	FIELD
pH-LAB (SU)	6.83	EPA 150.1
POTASSIUM, TOTAL	1.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	13.9	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	370	FIELD
SPEC. COND., LAB (umhos/cm)	317	EPA 120.1
SULFATE	5.1	EPA 300.0
ALKALINITY	65	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	221	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	495	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 7/21/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.5	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE



Date Prepared/Revised
08/25/2016

DEP USE ONLY

Date Received

FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP016W ☒ Well ☐ Spring ☐ Stream ☐ Other
☐ Upgradient/Upstream ☒ Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

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

Depth to Water Level: 12.27 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: 2.53 ft Elevation of Water Level: 299.70 ft./MSL

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

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

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 2.3

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/21/2016 Sample Collection Time: 14:15

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): 2161030002 Final Lab Analysis Completion Date: 8/4/2016

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 7/21/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	EPA 350.3
BICARBONATE	6	SM18-2321
CALCIUM, TOTAL	4.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	5 ND	EPA 410.4
CHLORIDE	3.4	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	330 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	1.1	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	28 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.6	EPA 300.0
pH-FIELD (SU)	5.24	FIELD
pH-LAB (SU)	6.8	EPA 150.1
POTASSIUM, TOTAL	0.56 ND	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	3.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	60	FIELD
SPEC. COND., LAB (umhos/cm)	52	EPA 120.1
SULFATE	11.5	EPA 300.0
ALKALINITY	6	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	57	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	6.89	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

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

Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 7/21/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

^T Please indicate detection limit if analyte is not detected.



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FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

SECTION B. FACILITY INFORMATION

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

Monitoring Point Number: CWMP009W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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: 9.54 ft Measured from: Land Surface X TOC

Casing Stickup: 2.70 ft Elevation of Water Level: 394.66 ft./MSL

Sampling Depth:	16 ft	Volume of Water Column:	6.63 gal
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Total Well Depth: 19.7 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 4.0

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/22/2016 Sample Collection Time: 11:40

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): 2161444001 Final Lab Analysis CompletionDate: 8/8/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	28.5	EPA 350.3
BICARBONATE	545	SM18-2321
CALCIUM, TOTAL	152	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	90	EPA 410.4
CHLORIDE	470	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	34700	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	72.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	12000	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.12	FIELD
pH-LAB (SU)	6.65	EPA 150.1
POTASSIUM, TOTAL	41.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	169	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2650	FIELD
SPEC. COND., LAB (umhos/cm)	2450	EPA 120.1
SULFATE	4.2	EPA 300.0
ALKALINITY	545	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1490	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	34.6	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	81.3	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 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	3.5	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	2.3	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



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General Reference: Section 273.284
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: CWMP010W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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	X	TOC
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Casing Stickup: 2.10 ft Elevation of Water Level: 351.92 ft./MSL

Sampling Depth:	17 ft	Volume of Water Column:	6.93 gal
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Total Well Depth: 19.6 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: X Yes No Well Volumes Purged: 1.7

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/22/2016 Sample Collection Time: 12:12

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

Laboratory(ies) Performing Analysis: ALS Environmental

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

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2161444002 Final Lab Analysis CompletionDate: 8/8/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP010W

Sample Date 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.296	EPA 350.3
BICARBONATE	366	SM18-2321
CALCIUM, TOTAL	103	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	53	EPA 410.4
CHLORIDE	504	EPA 300.0
FLUORIDE	0.5 ND	EPA 300.0
IRON, TOTAL (ug/l)	330 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	63.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1400	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.1	EPA 300.0
pH-FIELD (SU)	6.42	FIELD
pH-LAB (SU)	7.23	EPA 150.1
POTASSIUM, TOTAL	30.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	281	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2436	FIELD
SPEC. COND., LAB (umhos/cm)	2330	EPA 120.1
SULFATE	27.2	EPA 300.0
ALKALINITY	366	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1260	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	19.3	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	1.31	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. CWMP010W

Sample Date 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.



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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° MM' SS.S")

Monitoring Point Number: CWMP008W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

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

Depth to Water Level:	3.96	ft	Measured from:	Land Surface	X	TOC
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Casing Stickup: 2.80 ft Elevation of Water Level: 418.34 ft./MSL

Sampling Depth:	19 ft	Volume of Water Column:	3.07 gal
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Total Well Depth: 22.8 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: X Yes No Well Volumes Purged: 5.6

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 7/22/2016 Sample Collection Time: 12:45

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): 2161444003 Final Lab Analysis CompletionDate: 8/8/2016

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

Comments:

I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	9.92	EPA 350.3
BICARBONATE	533	SM18-2321
CALCIUM, TOTAL	86	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	49	EPA 410.4
CHLORIDE	65.3	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	33400	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	39.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	18300	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	5.98	FIELD
pH-LAB (SU)	6.5	EPA 150.1
POTASSIUM, TOTAL	12.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	68.4	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1207	FIELD
SPEC. COND., LAB (umhos/cm)	1090	EPA 120.1
SULFATE	5.3	EPA 300.0
ALKALINITY	533	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	634	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	14.9	SM18-5310B
TOTAL PHENOLICS (ug/l)	10 ND	SW846 9066
TURBIDITY (N.T.U.)	37.6	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

^T Please indicate detection limit if analyte is not detected.

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I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 7/22/2016

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	2.4	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	3.9	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 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.



August 4, 2016

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

Certificate of Analysis

Project Name: **2016-CRESWELL**Workorder: **2160122**

Purchase Order:

Workorder ID: **QUARTERLY CWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, July 19, 2016.

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

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

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

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

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

CC: Mr. Mark Reider , Mr. Jeff Musser

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

Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

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

**SAMPLE SUMMARY**

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2160122001	CWMP007W	Ground Water	7/19/2016 10:57	7/19/2016 16:21	Mr. Brian G Shade
2160122002	CWMP001W	Ground Water	7/19/2016 12:10	7/19/2016 16:21	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2160122 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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ALS Environmental



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

PROJECT SUMMARY

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Workorder Comments

See attached subcontracted total phenolics by SW9066 results from ALS Holland. SSL 08/04/16

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ANALYTICAL RESULTS

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160122001**
Sample ID: **CWMP007W**

Date Collected: 7/19/2016 10:57 Matrix: Ground Water
Date Received: 7/19/2016 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/20/16 14:58	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/20/16 14:58	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	102		%	62 - 133	SW846 8260B			7/20/16 14:58	DD	H
4-Bromofluorobenzene (S)	88		%	79 - 114	SW846 8260B			7/20/16 14:58	DD	H
Dibromofluoromethane (S)	88		%	78 - 116	SW846 8260B			7/20/16 14:58	DD	H
Toluene-d8 (S)	90.3		%	76 - 127	SW846 8260B			7/20/16 14:58	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	10		mg/L	5	S2320B-97			7/21/16 13:10	MSA	B
Alkalinity, Total	10	2	mg/L	5	S2320B-97			7/21/16 13:10	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/31/16 10:36	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 10:22	AK	A
Chloride	67.6		mg/L	2.0	EPA 300.0			7/20/16 17:02	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/16 17:02	MBW	B
Nitrate-N	10.7		mg/L	0.20	EPA 300.0			7/20/16 17:02	MBW	B
pH	6.30	1	pH_Units		SM4500B			7/21/16 13:10	MSA	B
Specific Conductance	380		umhos/cm	1	SW846 9050A			7/21/16 13:10	MSA	B
Sulfate	15.0		mg/L	2.0	EPA 300.0			7/20/16 17:02	MBW	B
Total Dissolved Solids	434		mg/L	5	S2540C-11			7/24/16 09:56	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/20/16 11:52	PAG	E
Turbidity	ND		NTU	0.10	S2130B-01			7/21/16 02:53	MSA	B

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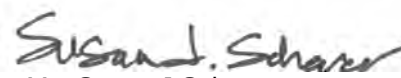
ANALYTICAL RESULTS

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160122001**
Sample ID: **CWMP007W**

Date Collected: 7/19/2016 10:57 Matrix: Ground Water
Date Received: 7/19/2016 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/4/16 12:42	SUB	G
METALS										
Calcium, Total	18.8		mg/L	0.11	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
Magnesium, Total	9.2		mg/L	0.11	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
Manganese, Total	0.0058		mg/L	0.0056	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
Potassium, Total	2.1		mg/L	0.56	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
Sodium, Total	31.1		mg/L	0.56	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:52	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	7.940		Feet		Field			7/19/16 10:56	BGS	D
Elev Top MW Casing above MSL	453.40		Feet		Field			7/19/16 10:56	BGS	D
Flow Rate	1.87		gal/min		Field			7/19/16 10:56	BGS	D
Ground Water Elevation	445.460		ft/MSL		Field			7/19/16 10:56	BGS	D
pH, Field (SM4500B)	5.130		pH_Units		Field			7/19/16 10:56	BGS	D
Sample Depth	33.000		Feet		Field			7/19/16 10:56	BGS	D
Specific Conductance, Field	406		umhos/cm	1	Field			7/19/16 10:56	BGS	D
Temperature	11.39		Deg. C		Field			7/19/16 10:56	BGS	D
Total Well Depth	36.500		Feet		Field			7/19/16 10:56	BGS	D
Volume in Water Column	41.983		Gallons		Field			7/19/16 10:56	BGS	D
Water Level After Purge	8.200		Feet		Field			7/19/16 10:56	BGS	D
Well Volumes Purged	4.00		Vol		Field			7/19/16 10:56	BGS	D


Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160122002**
Sample ID: **CWMP001W**

Date Collected: 7/19/2016 12:10 Matrix: Ground Water
Date Received: 7/19/2016 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/20/16 15:19	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/20/16 15:19	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	100		%	62 - 133	SW846 8260B			7/20/16 15:19	DD	H
4-Bromofluorobenzene (S)	87.8		%	79 - 114	SW846 8260B			7/20/16 15:19	DD	H
Dibromofluoromethane (S)	86.8		%	78 - 116	SW846 8260B			7/20/16 15:19	DD	H
Toluene-d8 (S)	89.7		%	76 - 127	SW846 8260B			7/20/16 15:19	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	S2320B-97			7/21/16 13:19	MSA	B
Alkalinity, Total	6	2	mg/L	5	S2320B-97			7/21/16 13:19	MSA	B
Ammonia-N	0.118		mg/L	0.100	D6919-09			7/31/16 10:56	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 10:22	AK	A
Chloride	30.1		mg/L	2.0	EPA 300.0			7/20/16 17:15	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/20/16 17:15	MBW	B
Nitrate-N	21.5	3	mg/L	0.50	EPA 300.0			7/22/16 01:08	MBW	B
pH	6.11	1	pH_Units		SM4500B			7/21/16 13:19	MSA	B
Specific Conductance	268		umhos/cm	1	SW846 9050A			7/21/16 13:19	MSA	B
Sulfate	ND		mg/L	2.0	EPA 300.0			7/20/16 17:15	MBW	B
Total Dissolved Solids	343		mg/L	5	S2540C-11			7/24/16 09:56	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/20/16 11:52	PAG	E
Turbidity	40.6		NTU	0.10	S2130B-01			7/21/16 02:53	MSA	B

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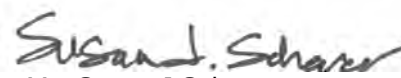
ANALYTICAL RESULTS

Workorder: 2160122 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160122002**
Sample ID: **CWMP001W**

Date Collected: 7/19/2016 12:10 Matrix: Ground Water
Date Received: 7/19/2016 16:21

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/4/16 12:42	SUB	
METALS										
Calcium, Total	17.0		mg/L	0.11	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
Iron, Total	1.1		mg/L	0.067	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
Magnesium, Total	11.0		mg/L	0.11	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
Manganese, Total	0.12		mg/L	0.0056	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
Potassium, Total	2.4		mg/L	0.56	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
Sodium, Total	13.7		mg/L	0.56	SW846 6010C	7/21/16 13:00	JPS	7/22/16 18:56	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	28.150		Feet		Field			7/19/16 12:10	BGS	D
Elev Top MW Casing above MSL	515.13		Feet		Field			7/19/16 12:10	BGS	D
Flow Rate	2.01		gal/min		Field			7/19/16 12:10	BGS	D
Ground Water Elevation	486.980		ft/MSL		Field			7/19/16 12:10	BGS	D
pH, Field (SM4500B)	5.260		pH_Units		Field			7/19/16 12:10	BGS	D
Sample Depth	57.000		Feet		Field			7/19/16 12:10	BGS	D
Specific Conductance, Field	313		umhos/cm	1	Field			7/19/16 12:10	BGS	D
Temperature	12.31		Deg. C		Field			7/19/16 12:10	BGS	D
Total Well Depth	66.300		Feet		Field			7/19/16 12:10	BGS	D
Volume in Water Column	56.081		Gallons		Field			7/19/16 12:10	BGS	D
Water Level After Purge	53.100		Feet		Field			7/19/16 12:10	BGS	D
Well Volumes Purged	2.15		Vol		Field			7/19/16 12:10	BGS	D


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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
2160122001	1	CWMP007W	SM4500B	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.				
2160122001	2	CWMP007W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160122002	1	CWMP001W	SM4500B	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.				
2160122002	2	CWMP001W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160122002	3	CWMP001W	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				

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CHAIN OF CUSTODY/

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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 Hamistaro Pike P.O. Box 4424

Lancaster, PA 17604

Contact: Mark Reid

Phone#: (717) 735-0193

Project Name/#: Creswell Quarterly Wells

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: _____

E-mail? ☒ Y ☐ N mreider@LCSWMA.com

Y.Y No: (717) 397-9973

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

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

7-10-17	MLD 2000
7-10-17	MLD 2000

2 Cameron	1210
1	1210

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Project Comments:

Relinquished By Company Name

Dr. J. R. Smith

3

5

* G=Grab; C=Composita

*Matrix: At=Air, TW=Drinking Water, GW=Groundwater, Ot=Oil, Ol=Other Liquid, Sl=Sludge, SO=Soil, WP=Worm, WW=Wastewater

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

Rev 8/04

ALS



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

Environmental

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC #: **1**
of
ALS Quote #: **1**

Client Name: ALS Middletown		Container Type: AG	Receipt Information (completed by Receiving Lab)	
Address: 34 Dogwood Lane		Container Size: 500mL	Cooler Temp: Therm ID:	
Middletown PA 17057		Preservative: H2SO4	No. of Coolers: Y N Initial	
Contact: Susan Scherer		Custody Seals Present?		
Phone#: (717) 702-2245		(if present) Seals Intact?		
Project Name#: LCSWMA-CWMP-Form 15Q		Received on Ice?		
Bill To: ALS Middletown		COC Labels Complete/Accurate?		
TAT ☐ Normal-Standard TAT is 10-12 business days.		Cont. in Good Cond.?		
☐ Rush-Subject to ALS approval and surcharges.		Correct Containers?		
Date Required: 8/5/2016		Correct Sample Volumes?		
Approved By: ☒ Y ☐ N ALMDT.Subcontract@ALSglobal.com		Correct Preservation?		
Email? ☒ Y ☐ N		Headspace/Volatiles?		
Fax? ☐ Y ☐ N		Courier/Tracking #:		
Sample Description/Location (as it will appear on the lab report)		Sample Date	Time	Sample/COC Comments
1) 2160122001	7/19/2016	1057	G	Subcontract to ALS Holland MI
2) 2160122002	7/19/2016	1210	G	
3) 1				
4) 1				
5) 1				
6) 1				
7) 1				
8) 1				
9) 1				
10) 1				
Project Comments:		ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:		
Reinquished By / Company Name		Date	Time	Received By / Company Name
1) <i>Adrian</i>		7/28/16	1545	
3)				
5)				
7)				
9)				
Deliverables		Special Processing		
☒ Standard		USACE		
☐ CLP-like		Navy		
☐ USACE		State Samples Collected In		
Reportable to PADEP?		Sample Disposal		
Yes ☐		Lab ☐		
PWSID #		Special ☐		
EDDS: Formal Type				

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

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

Rev 10/11

ALS



04-Aug-2016

Susan Scherer
ALS Environmental
34 Dogwood Lane
Middletown, PA 17057

Re: 2160122

Work Order: 16071677

Dear Susan,

ALS Environmental received 2 samples on 29-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Client Services Coordinator



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 389-6070 | FAX (616) 389-6185
ALS GROUP USA, CORP. Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS. RIGHT PARTNER.

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
Project: 2160122
Work Order: 16071677

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
16071677-01	2160122001	Groundwater		07/19/16 10:57	07/29/16 09:00	☐
16071677-02	2160122002	Groundwater		07/19/16 12:10	07/29/16 09:00	☐

Sample Summary Page 1 of 1

ALS

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
Project: 2160122
WorkOrder: 16071677

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
•	Value exceeds Regulatory Limit
n	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

QF Page 1 of 1

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
 Project: 2160122
 Sample ID: 2160122001
 Collection Date: 07/19/16 10:57 AM

Work Order: 16071677
 Lab ID: 16071677-01
 Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9056		Prep: E420.x / 8/3/16		Analyst: JB
Phenolics, Total	U		0.0033	0.011	mg/L	1	08/04/16 12:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 2

ALS

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
Project: 2160122
Sample ID: 2160122002
Collection Date: 07/19/16 12:10 PM

Work Order: 16071677
Lab ID: 16071677-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/3/16		Analyst: JB
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/04/16 12:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 2 of 2

ALS

ALS Group USA, Corp

Client: ALS Environmental
Work Order: 16071677
Project: 2160122

Date: 04-Aug-16

QC BATCH REPORT

Batch ID: 89550 Instrument ID LACHAT Method: E420.4

MBLK	Sample ID: MBLK-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962265		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total U 0.010

MBLK	Sample ID: MBLK-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962282		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total U 0.010

LCS	Sample ID: LCS-89550-89550					Units: mg/L		Analysis Date: 08/04/16 12:42 PM		
Client ID:	Run ID: LACHAT_160804A					SeqNo: 3962266		Prep Date: 08/03/16		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total 0.1068 0.010 0.1 0 107 90-110 0

LCS	Sample ID: LCS-89550-89550					Units: mg/L		Analysis Date: 08/04/16 12:42 PM		
Client ID:	Run ID: LACHAT_160804A					SeqNo: 3962283		Prep Date: 08/03/16		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total 0.1068 0.010 0.1 0 107 75-110 0

MS	Sample ID: 1608035-12C MS					Units: mg/L		Analysis Date: 08/04/16 12:42 PM		
Client ID:	Run ID: LACHAT_160804A					SeqNo: 3962280		Prep Date: 08/03/16		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total 0.2518 0.025 0.25 0.01005 96.7 90-110 0

MSD	Sample ID: 1608035-12C MSD					Units: mg/L		Analysis Date: 08/04/16 12:42 PM		
Client ID:	Run ID: LACHAT_160804A					SeqNo: 3962281		Prep Date: 08/03/16		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Phenolics, Total 0.2464 0.025 0.25 0.01005 94.5 90-110 0.2518 2.17 20

The following samples were analyzed in this batch:

16071677-01A 16071677-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 1

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

COC #: 16071677	1 of 1
ALS Quote #	

[illegible]

Sample Receipt Checklist

Client Name: ALS - MIDDLETOWN

Date/Time Received: 29-Jul-16 09:00

Work Order: 16071677

Received by: DS

Checklist completed by: Dave Shan
eSignature

29-Jul-16
Date

Reviewed by: Tam Barnish
eSignature

29-Jul-16
Date

Matrices: Groundwater

Carrier name: FedEx

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 4.0/4.0 c SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 7/29/2016 10:12:51 AM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☒ No ☐ N/A ☐

pH adjusted? Yes ☐ No ☒ N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:



August 5, 2016

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

Certificate of Analysis

Project Name: **2016-CRESWELL**Workorder: **2160600**

Purchase Order:

Workorder ID: **QUARTERLY CWMP-FORM 19Q-RR**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, July 20, 2016.

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

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

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

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

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

CC: Mr. Mark Reider , Mr. Jeff Musser

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

Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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**SAMPLE SUMMARY**

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2160600001	CWMP005W	Ground Water	7/20/2016 09:55	7/20/2016 15:33	Mr. Brian G Shade
2160600002	CWMP004W	Ground Water	7/20/2016 11:30	7/20/2016 15:33	Mr. Brian G Shade
2160600003	CWMP003W	Ground Water	7/20/2016 11:43	7/20/2016 15:33	Mr. Brian G Shade
2160600004	CWMP002W	Ground Water	7/20/2016 12:28	7/20/2016 15:33	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

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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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

PROJECT SUMMARY

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Workorder Comments

See attached subcontracted total phenolics by SW9066 results from ALS Holland. SSL 08/05/16

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600001**
Sample ID: **CWMP005W**

Date Collected: 7/20/2016 09:55 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 01:51	SYB	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 01:51	SYB	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	99.6		%	62 - 133	SW846 8260B			7/22/16 01:51	SYB	H
4-Bromofluorobenzene (S)	88		%	79 - 114	SW846 8260B			7/22/16 01:51	SYB	H
Dibromofluoromethane (S)	87.9		%	78 - 116	SW846 8260B			7/22/16 01:51	SYB	H
Toluene-d8 (S)	88.2		%	76 - 127	SW846 8260B			7/22/16 01:51	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	14		mg/L	5	S2320B-97			7/22/16 20:36	MSA	J
Alkalinity, Total	14	2	mg/L	5	S2320B-97			7/22/16 20:36	MSA	J
Ammonia-N	ND		mg/L	0.100	D6919-09			7/31/16 17:07	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 10:22	AK	A
Chloride	57.6		mg/L	2.0	EPA 300.0			7/21/16 12:15	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 12:15	MBW	B
Nitrate-N	11.5		mg/L	0.20	EPA 300.0			7/21/16 12:15	MBW	B
pH	6.54	1	pH_Units		SM4500B			7/22/16 20:36	MSA	J
Specific Conductance	311		umhos/cm	1	SW846 9050A			7/22/16 20:36	MSA	J
Sulfate	ND		mg/L	2.0	EPA 300.0			7/21/16 12:15	MBW	B
Total Dissolved Solids	215		mg/L	5	S2540C-11			7/25/16 10:12	ML	B
Total Organic Carbon (TOC)	1.2		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	0.10		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B

Sub'd-ALSH Labs Cert 68-03827

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600001**
Sample ID: **CWMP005W**

Date Collected: 7/20/2016 09:55 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	15.2		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
Magnesium, Total	8.3		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
Manganese, Total	0.056		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
Potassium, Total	2.4		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
Sodium, Total	29.8		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:45	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	42.420		Feet		Field			7/20/16 09:55	BGS	D
Elev Top MW Casing above MSL	513.43		Feet		Field			7/20/16 09:55	BGS	D
Flow Rate	4.14		gal/min		Field			7/20/16 09:55	BGS	D
Ground Water Elevation	471.010		ft/MSL		Field			7/20/16 09:55	BGS	D
pH, Field (SM4500B)	5.250		pH_Units		Field			7/20/16 09:55	BGS	D
Sample Depth	130.000		Feet		Field			7/20/16 09:55	BGS	D
Specific Conductance, Field	362		umhos/cm	1	Field			7/20/16 09:55	BGS	D
Temperature	11.55		Deg. C		Field			7/20/16 09:55	BGS	D
Total Well Depth	138.920		Feet		Field			7/20/16 09:55	BGS	D
Volume in Water Column	141.855		Gallons		Field			7/20/16 09:55	BGS	D
Water Level After Purge	43.840		Feet		Field			7/20/16 09:55	BGS	D
Well Volumes Purged	2.34		Vol		Field			7/20/16 09:55	BGS	D

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600002**
Sample ID: **CWMP004W**

Date Collected: 7/20/2016 11:30 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Bromoform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Chloroform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,1-Dichloroethane	1.1		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/22/16 02:13	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Styrene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/22/16 02:13	SYB	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/22/16 02:13	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:13	SYB	H
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600002**
Sample ID: **CWMP004W**

Date Collected: 7/20/2016 11:30 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	100		%	62 - 133	SW846 8260B			7/22/16 02:13	SYB	H
4-Bromofluorobenzene (S)	86.9		%	79 - 114	SW846 8260B			7/22/16 02:13	SYB	H
Dibromofluoromethane (S)	86.7		%	78 - 116	SW846 8260B			7/22/16 02:13	SYB	H
Toluene-d8 (S)	89.2		%	76 - 127	SW846 8260B			7/22/16 02:13	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	26		mg/L	5	S2320B-97			7/22/16 20:45	MSA	B
Alkalinity, Total	26	2	mg/L	5	S2320B-97			7/22/16 20:45	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/31/16 17:26	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	43.2		mg/L	2.0	EPA 300.0			7/21/16 13:31	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 13:31	MBW	B
Nitrate-N	6.8		mg/L	0.20	EPA 300.0			7/21/16 13:31	MBW	B
pH	6.81	1	pH_Units		SM4500B			7/22/16 20:45	MSA	B
Specific Conductance	251		umhos/cm	1	SW846 9050A			7/22/16 20:45	MSA	B
Sulfate	5.1		mg/L	2.0	EPA 300.0			7/21/16 13:31	MBW	B
Total Dissolved Solids	174		mg/L	5	S2540C-11			7/25/16 10:12	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	ND		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B
Sub'd-ALSH Labs Cert 68-03827										
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	21.3		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
Magnesium, Total	6.5		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
Manganese, Total	0.0069		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
Sodium, Total	15.1		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:30	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	104.250		Feet		Field			7/20/16 11:30	BGS	D
Elev Top MW Casing above MSL	529.53		Feet		Field			7/20/16 11:30	BGS	D
Ground Water Elevation	425.280		ft/MSL		Field			7/20/16 11:30	BGS	D
pH, Field (SM4500B)	7.430		pH_Units		Field			7/20/16 11:30	BGS	D
Sample Depth	130.000		Feet		Field			7/20/16 11:30	BGS	D
Specific Conductance, Field	294		umhos/cm	1	Field			7/20/16 11:30	BGS	D
Temperature	12.75		Deg. C		Field			7/20/16 11:30	BGS	D

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600002**
Sample ID: **CWMP004W**

Date Collected: 7/20/2016 11:30 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Total Well Depth	140.000		Feet		Field			7/20/16 11:30	BGS	D

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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600003**
Sample ID: **CWMP003W**

Date Collected: 7/20/2016 11:43 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Bromoform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Chloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Chloroform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,1-Dichloroethane	2.6		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/22/16 02:35	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Styrene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/22/16 02:35	SYB	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/22/16 02:35	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:35	SYB	H
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600003**
Sample ID: **CWMP003W**

Date Collected: 7/20/2016 11:43 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	98.9		%	62 - 133	SW846 8260B			7/22/16 02:35	SYB	H
4-Bromofluorobenzene (S)	86.9		%	79 - 114	SW846 8260B			7/22/16 02:35	SYB	H
Dibromofluoromethane (S)	84.4		%	78 - 116	SW846 8260B			7/22/16 02:35	SYB	H
Toluene-d8 (S)	87.3		%	76 - 127	SW846 8260B			7/22/16 02:35	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	16		mg/L	5	S2320B-97			7/22/16 20:54	MSA	B
Alkalinity, Total	16	2	mg/L	5	S2320B-97			7/22/16 20:54	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			7/31/16 18:25	TES	A
Chemical Oxygen Demand (COD)	9		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	81.8		mg/L	2.0	EPA 300.0			7/21/16 13:44	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 13:44	MBW	B
Nitrate-N	8.9		mg/L	0.20	EPA 300.0			7/21/16 13:44	MBW	B
pH	6.57	1	pH_Units		SM4500B			7/22/16 20:54	MSA	B
Specific Conductance	404		umhos/cm	1	SW846 9050A			7/22/16 20:54	MSA	B
Sulfate	5.4		mg/L	2.0	EPA 300.0			7/21/16 13:44	MBW	B
Total Dissolved Solids	280		mg/L	5	S2540C-11			7/25/16 10:12	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	0.46		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B
Sub'd-ALSH Labs Cert 68-03827										
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	30.2		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
Magnesium, Total	10.1		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
Manganese, Total	0.014		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
Potassium, Total	1.7		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
Sodium, Total	20.5		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:34	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	43.450		Feet		Field			7/19/16 13:17	BGS	D
Elev Top MW Casing above MSL	538.00		Feet		Field			7/19/16 13:17	BGS	D
Flow Rate	2.35		gal/min		Field			7/19/16 13:17	BGS	D
Ground Water Elevation	494.550		ft/MSL		Field			7/19/16 13:17	BGS	D
pH, Field (SM4500B)	5.890		pH_Units		Field			7/19/16 13:17	BGS	D
Sample Depth	90.000		Feet		Field			7/19/16 13:17	BGS	D
Specific Conductance, Field	1041		umhos/cm	1	Field			7/19/16 13:17	BGS	D

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**ANALYTICAL RESULTS**

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600003**
Sample ID: **CWMP003W**Date Collected: 7/20/2016 11:43 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Temperature	13.41		Deg. C		Field			7/19/16 13:17	BGS	D
Total Well Depth	100.700		Feet		Field			7/19/16 13:17	BGS	D
Volume in Water Column	84.158		Gallons		Field			7/19/16 13:17	BGS	D
Water Level After Purge	44.250		Feet		Field			7/19/16 13:17	BGS	D
Well Volumes Purged	1.40		Vol		Field			7/19/16 13:17	BGS	D

Ms. Susan J Scherer
Project Coordinator**ALS Environmental Laboratory Locations Across North America**Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600004**
Sample ID: **CWMP002W**

Date Collected: 7/20/2016 12:28 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Bromoform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Bromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Chloroethane	4.8		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Chloroform	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Chloromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,4-Dichlorobenzene	1.3		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,1-Dichloroethane	10.5		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			7/22/16 02:57	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Styrene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			7/22/16 02:57	SYB	H
1,1,1-Trichloroethane	1.3		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			7/22/16 02:57	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:57	SYB	H
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600004**
Sample ID: **CWMP002W**

Date Collected: 7/20/2016 12:28 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	102		%	62 - 133	SW846 8260B			7/22/16 02:57	SYB	H
4-Bromofluorobenzene (S)	88.1		%	79 - 114	SW846 8260B			7/22/16 02:57	SYB	H
Dibromofluoromethane (S)	85.9		%	78 - 116	SW846 8260B			7/22/16 02:57	SYB	H
Toluene-d8 (S)	88.9		%	76 - 127	SW846 8260B			7/22/16 02:57	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	63		mg/L	5	S2320B-97			7/22/16 21:37	MSA	B
Alkalinity, Total	63	2	mg/L	5	S2320B-97			7/22/16 21:37	MSA	B
Ammonia-N	0.122		mg/L	0.100	D6919-09			7/31/16 18:44	TES	A
Chemical Oxygen Demand (COD)	11		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	111		mg/L	2.0	EPA 300.0			7/21/16 13:56	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 13:56	MBW	B
Nitrate-N	3.5		mg/L	0.20	EPA 300.0			7/21/16 13:56	MBW	B
pH	6.61	1	pH_Units		SM4500B			7/22/16 21:37	MSA	B
Specific Conductance	567		umhos/cm	1	SW846 9050A			7/22/16 21:37	MSA	B
Sulfate	24.4		mg/L	2.0	EPA 300.0			7/21/16 13:56	MBW	B
Total Dissolved Solids	360		mg/L	5	S2540C-11			7/25/16 10:12	ML	B
Total Organic Carbon (TOC)	4.2		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	0.74		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B
Sub'd-ALSH Labs Cert 68-03827										
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	52.1		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
Magnesium, Total	15.3		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
Manganese, Total	0.99		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
Potassium, Total	2.9		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
Sodium, Total	22.0		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 17:57	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	89.820		Feet		Field			7/20/16 12:28	BGS	D
Elev Top MW Casing above MSL	525.81		Feet		Field			7/20/16 12:28	BGS	D
Ground Water Elevation	435.990		ft/MSL		Field			7/20/16 12:28	BGS	D
pH, Field (SM4500B)	5.900		pH_Units		Field			7/20/16 12:28	BGS	D
Sample Depth	85.000		Feet		Field			7/20/16 12:28	BGS	D
Specific Conductance, Field	603		umhos/cm	1	Field			7/20/16 12:28	BGS	D
Temperature	12.56		Deg. C		Field			7/20/16 12:28	BGS	D

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**ANALYTICAL RESULTS**

Workorder: 2160600 QUARTERLY CWMP-FORM 19Q-RR VOC

Lab ID: **2160600004**
Sample ID: **CWMP002W**Date Collected: 7/20/2016 12:28 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Total Well Depth	100.000		Feet		Field			7/20/16 12:28	BGS	D

Ms. Susan J Scherer
Project Coordinator**ALS Environmental Laboratory Locations Across North America**Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
2160600001	1	CWMP005W	SM4500B	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.				
2160600001	2	CWMP005W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160600002	1	CWMP004W	SM4500B	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.				
2160600002	2	CWMP004W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160600003	1	CWMP003W	SM4500B	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.				
2160600003	2	CWMP003W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160600004	1	CWMP002W	SM4500B	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.				
2160600004	2	CWMP002W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

Environmental

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC #: _____

1 of 1

ALS Quote #: _____

1

Client Name: ALS Middletown		Container Type	AG	Receipt Information (completed by Receiving Lab)	
Address: 34 Dogwood Lane		500mL		Cooler Temp: _____	Therm ID: _____
Middletown PA 17057		H2SO4		No. of Coolers: _____	Y N Initial
Contact: Susan Scherer		Custody Seals Present? _____			
Phone#: (717) 702-2245		(if present) Seals intact? _____			
Project Name#: LCSWMA-CWMP-Form 19Q		Received on Ice? _____			
Bill To: ALS Middletown		COC Labels Completed/Accurate? _____			
TAT		Cont. In Good Cond.? _____			
Normal-Standard TAT is 10-12 business days.		Correct Containers? _____			
Rush-Subject to ALS approval and surcharges.		Correct Sample Volumes? _____			
Date Required: 8/5/2016		Correct Preservation? _____			
Approved By: _____		Headspace/Volatiles? _____			
Email? X-Y ALMDT.Subcontract@ALSGlobal.com		Courier/Tracking #: _____			
Fax? X-Y No. _____		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.	
1) 2160600001		7/20/2016	0955	G	GW 1
2) 2160600002		7/20/2016	1130	G	GW 1
3) 2160600003		7/20/2016	1143	G	GW 1
4) 2160600004		7/20/2016	1228	G	GW 1
5) _____					
6) _____					
7) _____					
8) _____					
9) _____					
10) _____					
Project Comments:		ALS Field Services: _____ Pickup _____ Labor _____ Composite Sampling _____ Rental Equipment _____ Other _____			
Relinquished By / Company Name		Date	Time	Received By / Company Name	Date
1) _____		7/20/16	1545	2	
3) _____				4	
5) _____				6	
7) _____				8	
9) _____				10	
Special Processing		State Samples Collected In			
USACE		NY			
Navy		NJ			
Sample Disposal		PA			
Lab		NC			
Special					
Reportable to PADEP?		Yes _____ No _____			
PWSID #		EDDS: Format Type			



05-Aug-2016

Susan Scherer
ALS Environmental
34 Dogwood Lane
Middletown, PA 17057

Re: 2160600

Work Order: 16071706

Dear Susan,

ALS Environmental received 4 samples on 29-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Client Services Coordinator



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6115
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company



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ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental

Project: 2160600

Work Order: 16071706

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
16071706-01	2160600001	Groundwater		07/20/16 09:55	07/29/16 09:00	☐
16071706-02	2160600002	Groundwater		07/20/16 11:30	07/29/16 09:00	☐
16071706-03	2160600003	Groundwater		07/20/16 11:43	07/29/16 09:00	☐
16071706-04	2160600004	Groundwater		07/20/16 12:28	07/29/16 09:00	☐

Sample Summary Page 1 of 1

ALS

Client: ALS Environmental
Project: 2160600
WorkOrder: 16071706

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160600
Sample ID: 2160600001
Collection Date: 07/20/16 09:55 AM

Work Order: 16071706
Lab ID: 16071706-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/4/16		Analyst: JB
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 4

ALS

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160600
Sample ID: 2160600002
Collection Date: 07/20/16 11:30 AM

Work Order: 16071706
Lab ID: 16071706-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9055		Prep: E420.x / 8/4/16		Analyst: JB
Phenolics, Total	0.0093	J	0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 2 of 4

ALS

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160600
Sample ID: 2160600003
Collection Date: 07/20/16 11:43 AM

Work Order: 16071706
Lab ID: 16071706-03
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/4/16		Analyst: JB
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 3 of 4

ALS

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160600
Sample ID: 2160600004
Collection Date: 07/20/16 12:28 PM

Work Order: 16071706
Lab ID: 16071706-04
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/4/16		Analyst: JB
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 4 of 4

ALS

ALS Group USA, Corp

Client: ALS Environmental
Work Order: 16071706
Project: 2160600

Date: 05-Aug-16

QC BATCH REPORT

Batch ID: 89616 Instrument ID LACHAT Method: E420.4

MBLK	Sample ID: MBLK-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964081		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.003899	0.010								J

MBLK	Sample ID: MBLK-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964114		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.003899	0.010								J

LCS	Sample ID: LCS-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964082		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09474	0.010	0.1	0	94.7	90-110	0			

LCS	Sample ID: LCS-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964115		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09474	0.010	0.1	0	94.7	75-110	0			

MS	Sample ID: 1608114-09D MS				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964112		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2329	0.025	0.25	0.0088	89.6	90-110	0			S

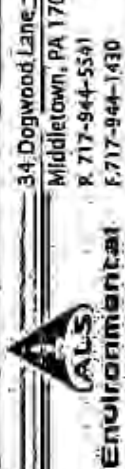
MSD	Sample ID: 1608114-09D MSD					Units: mg/L		Analysis Date: 08/05/16 10:27 AM		
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964113		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2435	0.025	0.25	0.0088	93.9	90-110	0.2329	4.44	20	

The following samples were analyzed in this batch:

16071706-01A	16071706-02A	16071706-03A
16071706-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 1



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

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

COC #:

11-007-7000

ALSI Quote #:

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

[illegible]

*Merch - Air-Air, CW=Drinking Water, GW=Groundwater, Q=Oil, OL=Other Liquid, SL=Sludge, SO=Soil, WP=Wipe, WW=Wastewater
 ALSO ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

REV 10/11

ALS

Sample Receipt Checklist

Client Name: ALS - MIDDLETOWN

Date/Time Received: 29-Jul-16 09:00

Work Order: 16071708

Received by: MEB

Checklist completed by Meghan Broadbent
eSignature

29-Jul-16
Date

Reviewed by: Tom Brannish
eSignature

29-Jul-16
Date

Matrices: water

Carrier name: FedEx

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 24/24 SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 7/29/2016 12:13:10 PM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☒ No ☐ N/A ☐

pH adjusted? Yes ☐ No ☒ N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:



ALS Environmental



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

August 8, 2016

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

Certificate of Analysis

Project Name: **2016-CRESWELL**

Workorder: **2161444**

Purchase Order:

Workorder ID: **QUARTERLY CWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, July 22, 2016.

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

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

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

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

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

CC: Mr. Mark Reider , Mr. 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: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2161444001	CWMP009W	Ground Water	7/22/2016 11:40	7/22/2016 15:02	Mr. Brian G Shade
2161444002	CWMP010W	Ground Water	7/22/2016 12:12	7/22/2016 15:02	Mr. Brian G Shade
2161444003	CWMP008W	Ground Water	7/22/2016 12:45	7/22/2016 15:02	Mr. Brian G Shade
2161444004	Field Blank	Ground Water	7/22/2016 13:45	7/22/2016 15:02	Mr. Brian G Shade
2161444005	Trip Blank	Water	7/22/2016 15:02	7/22/2016 15:02	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2161444 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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ALS Environmental



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

PROJECT SUMMARY

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Workorder Comments

See attached subcontracted total phenolics by SW9066 results from ALS Holland. SSL 08/08/16

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ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444001**
Sample ID: **CWMP009W**

Date Collected: 7/22/2016 11:40 Matrix: Ground Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	3.5		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
1,1-Dichloroethane	2.3		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/26/16 12:54	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 12:54	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98		%	62 - 133	SW846 8260B			7/26/16 12:54	DD	H
4-Bromofluorobenzene (S)	88.4		%	79 - 114	SW846 8260B			7/26/16 12:54	DD	H
Dibromofluoromethane (S)	85.5		%	78 - 116	SW846 8260B			7/26/16 12:54	DD	H
Toluene-d8 (S)	88.1		%	76 - 127	SW846 8260B			7/26/16 12:54	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	545		mg/L	5	S2320B-97			7/25/16 12:26	MSA	B
Alkalinity, Total	545	3	mg/L	5	S2320B-97			7/25/16 12:26	MSA	B
Ammonia-N	28.5		mg/L	0.100	D6919-09			8/3/16 21:16	TES	A
Chemical Oxygen Demand (COD)	90		mg/L	5	EPA 410.4			8/1/16 00:30	JAM	A
Chloride	470		mg/L	5.0	EPA 300.0			7/23/16 10:07	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/23/16 10:07	MBW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			7/23/16 10:07	MBW	B
pH	6.65	1	pH_Units		SM4500B			7/25/16 12:26	MSA	B
Specific Conductance	2450		umhos/cm	1	SW846 9050A			7/25/16 12:26	MSA	B
Sulfate	4.2		mg/L	2.0	EPA 300.0			7/23/16 10:07	MBW	B
Total Dissolved Solids	1490	2	mg/L	5	S2540C-11			7/27/16 09:18	ML	B
Total Organic Carbon (TOC)	34.6		mg/L	10.0	SW846 9060A			7/26/16 16:30	PAG	E
Turbidity	81.3		NTU	0.10	S2130B-01			7/23/16 04:27	MSA	B

Sub'd-ALSH Labs Cert 68-03827

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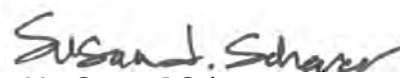
ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444001**
Sample ID: **CWMP009W**

Date Collected: 7/22/2016 11:40 Matrix: Ground Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/8/16 10:56	SUB	G
METALS										
Calcium, Total	152		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
Iron, Total	34.7		mg/L	0.33	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
Magnesium, Total	72.3		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
Manganese, Total	12.0		mg/L	0.028	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
Potassium, Total	41.5		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
Sodium, Total	169		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:42	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	9.540		Feet		Field			7/22/16 11:40	BGS	D
Elev Top MW Casing above MSL	404.20		Feet		Field			7/22/16 11:40	BGS	D
Flow Rate	1.64		gal/min		Field			7/22/16 11:40	BGS	D
Ground Water Elevation	394.660		ft/MSL		Field			7/22/16 11:40	BGS	D
pH, Field (SM4500B)	6.120		pH_Units		Field			7/22/16 11:40	BGS	D
Sample Depth	16.000		Feet		Field			7/22/16 11:40	BGS	D
Specific Conductance, Field	2650		umhos/cm	1	Field			7/22/16 11:40	BGS	D
Temperature	13.56		Deg. C		Field			7/22/16 11:40	BGS	D
Total Well Depth	19.700		Feet		Field			7/22/16 11:40	BGS	D
Volume in Water Column	6.604		Gallons		Field			7/22/16 11:40	BGS	D
Water Level After Purge	11.720		Feet		Field			7/22/16 11:40	BGS	D
Well Volumes Purged	3.98		Vol		Field			7/22/16 11:40	BGS	D


Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444002**
Sample ID: **CWMP010W**

Date Collected: 7/22/2016 12:12 Matrix: Ground Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/26/16 13:16	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 13:16	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			7/26/16 13:16	DD	H
4-Bromofluorobenzene (S)	87.8		%	79 - 114	SW846 8260B			7/26/16 13:16	DD	H
Dibromofluoromethane (S)	87.6		%	78 - 116	SW846 8260B			7/26/16 13:16	DD	H
Toluene-d8 (S)	89.4		%	76 - 127	SW846 8260B			7/26/16 13:16	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	366		mg/L	5	S2320B-97			7/25/16 12:38	MSA	B
Alkalinity, Total	366	2	mg/L	5	S2320B-97			7/25/16 12:38	MSA	B
Ammonia-N	0.296		mg/L	0.100	D6919-09			8/3/16 21:36	TES	A
Chemical Oxygen Demand (COD)	53		mg/L	5	EPA 410.4			8/1/16 00:30	JAM	A
Chloride	504		mg/L	10.0	EPA 300.0			7/26/16 07:59	MBW	B
Fluoride	ND		mg/L	0.50	EPA 300.0			7/23/16 10:20	MBW	B
Nitrate-N	8.1		mg/L	0.50	EPA 300.0			7/23/16 10:20	MBW	B
pH	7.23	1	pH_Units		SM4500B			7/25/16 12:38	MSA	B
Specific Conductance	2330		umhos/cm	1	SW846 9050A			7/25/16 12:38	MSA	B
Sulfate	27.2		mg/L	5.0	EPA 300.0			7/23/16 10:20	MBW	B
Total Dissolved Solids	1260		mg/L	5	S2540C-11			7/27/16 09:18	ML	B
Total Organic Carbon (TOC)	19.3		mg/L	5.0	SW846 9060A			7/27/16 12:35	PAG	E
Turbidity	1.31		NTU	0.10	S2130B-01			7/23/16 04:27	MSA	B

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444002**

Date Collected: 7/22/2016 12:12

Matrix: Ground Water

Sample ID: **CWMP010W**

Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/8/16 10:56	SUB	G
METALS										
Calcium, Total	103		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
Iron, Total	ND		mg/L	0.33	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
Magnesium, Total	63.2		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
Manganese, Total	1.4		mg/L	0.028	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
Potassium, Total	30.2		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
Sodium, Total	281		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:50	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	8.980		Feet		Field			7/22/16 12:12	BGS	D
Elev Top MW Casing above MSL	360.90		Feet		Field			7/22/16 12:12	BGS	D
Flow Rate	1.09		gal/min		Field			7/22/16 12:12	BGS	D
Ground Water Elevation	351.920		ft/MSL		Field			7/22/16 12:12	BGS	D
pH, Field (SM4500B)	6.420		pH_Units		Field			7/22/16 12:12	BGS	D
Sample Depth	17.000		Feet		Field			7/22/16 12:12	BGS	D
Specific Conductance, Field	2436		umhos/cm	1	Field			7/22/16 12:12	BGS	D
Temperature	14.84		Deg. C		Field			7/22/16 12:12	BGS	D
Total Well Depth	19.600		Feet		Field			7/22/16 12:12	BGS	D
Volume in Water Column	6.903		Gallons		Field			7/22/16 12:12	BGS	D
Water Level After Purge	16.450		Feet		Field			7/22/16 12:12	BGS	D
Well Volumes Purged	1.74		Vol		Field			7/22/16 12:12	BGS	D

Ms. Susan J Scherer

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444003**
Sample ID: **CWMP008W**

Date Collected: 7/22/2016 12:45 Matrix: Ground Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	2.4		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
1,1-Dichloroethane	3.9		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/26/16 13:38	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 13:38	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			7/26/16 13:38	DD	H
4-Bromofluorobenzene (S)	89.6		%	79 - 114	SW846 8260B			7/26/16 13:38	DD	H
Dibromofluoromethane (S)	89.5		%	78 - 116	SW846 8260B			7/26/16 13:38	DD	H
Toluene-d8 (S)	89.8		%	76 - 127	SW846 8260B			7/26/16 13:38	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	533		mg/L	5	S2320B-97			7/25/16 12:50	MSA	B
Alkalinity, Total	533	2	mg/L	5	S2320B-97			7/25/16 12:50	MSA	B
Ammonia-N	9.92		mg/L	0.100	D6919-09			8/3/16 21:56	TES	A
Chemical Oxygen Demand (COD)	49		mg/L	5	EPA 410.4			8/1/16 00:30	JAM	A
Chloride	65.3		mg/L	2.0	EPA 300.0			7/23/16 10:32	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/23/16 10:32	MBW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			7/23/16 10:32	MBW	B
pH	6.50	1	pH_Units		SM4500B			7/25/16 12:50	MSA	B
Specific Conductance	1090		umhos/cm	1	SW846 9050A			7/25/16 12:50	MSA	B
Sulfate	5.3		mg/L	2.0	EPA 300.0			7/23/16 10:32	MBW	B
Total Dissolved Solids	634		mg/L	5	S2540C-11			7/27/16 09:18	ML	B
Total Organic Carbon (TOC)	14.9		mg/L	2.0	SW846 9060A			7/26/16 16:30	PAG	E
Turbidity	37.6		NTU	0.10	S2130B-01			7/23/16 04:27	MSA	B

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444003**
Sample ID: **CWMP008W**

Date Collected: 7/22/2016 12:45 Matrix: Ground Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/8/16 10:56	SJB	G
METALS										
Calcium, Total	86.0		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
Iron, Total	33.4		mg/L	0.33	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
Magnesium, Total	39.6		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
Manganese, Total	18.3		mg/L	0.028	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
Potassium, Total	12.2		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
Sodium, Total	68.4		mg/L	2.8	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:54	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	3.960		Feet		Field			7/22/16 12:45	BGS	D
Elev Top MW Casing above MSL	422.30		Feet		Field			7/22/16 12:45	BGS	D
Flow Rate	0.85		gal/min		Field			7/22/16 12:45	BGS	D
Ground Water Elevation	418.340		ft/MSL		Field			7/22/16 12:45	BGS	D
pH, Field (SM4500B)	5.980		pH_Units		Field			7/22/16 12:45	BGS	D
Sample Depth	19.000		Feet		Field			7/22/16 12:45	BGS	D
Specific Conductance, Field	1207		umhos/cm	1	Field			7/22/16 12:45	BGS	D
Temperature	13.57		Deg. C		Field			7/22/16 12:45	BGS	D
Total Well Depth	22.800		Feet		Field			7/22/16 12:45	BGS	D
Volume in Water Column	3.014		Gallons		Field			7/22/16 12:45	BGS	D
Water Level After Purge	16.360		Feet		Field			7/22/16 12:45	BGS	D
Well Volumes Purged	5.61		Vol		Field			7/22/16 12:45	BGS	D

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444004**

Date Collected: 7/22/2016 13:45

Matrix: Ground Water

Sample ID: **Field Blank**

Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/26/16 10:42	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 10:42	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	97.7		%	62 - 133	SW846 8260B			7/26/16 10:42	DD	H
4-Bromofluorobenzene (S)	90.3		%	79 - 114	SW846 8260B			7/26/16 10:42	DD	H
Dibromofluoromethane (S)	87.6		%	78 - 116	SW846 8260B			7/26/16 10:42	DD	H
Toluene-d8 (S)	90.1		%	76 - 127	SW846 8260B			7/26/16 10:42	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			7/25/16 13:34	MSA	B
Alkalinity, Total	ND	2	mg/L	5	S2320B-97			7/25/16 13:34	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/3/16 22:16	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			8/1/16 00:30	JAM	A
Chloride	ND		mg/L	1.0	EPA 300.0			7/23/16 10:45	MBW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			7/23/16 10:45	MBW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			7/23/16 10:45	MBW	B
pH	5.89	1	pH_Units		SM4500B			7/25/16 13:34	MSA	B
Specific Conductance	ND		umhos/cm	1	SW846 9050A			7/25/16 13:34	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			7/23/16 10:45	MBW	B
Total Dissolved Solids	ND	3	mg/L	5	S2540C-11			7/31/16 12:43	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/26/16 16:30	PAG	E
Turbidity	ND		NTU	0.10	S2130B-01			7/23/16 04:27	MSA	B

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**ANALYTICAL RESULTS**

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444004**

Date Collected: 7/22/2016 13:45

Matrix: Ground Water

Sample ID: **Field Blank**

Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/8/16 10:56	SUB	G
METALS										
Calcium, Total	ND		mg/L	0.11	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1
Iron, Total	ND		mg/L	0.067	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:57	TSS	C1

Ms. Susan J Scherer

Project Coordinator

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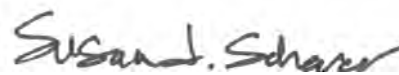
ANALYTICAL RESULTS

Workorder: 2161444 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161444005**
Sample ID: **Trip Blank**

Date Collected: 7/22/2016 15:02 Matrix: Water
Date Received: 7/22/2016 15:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/26/16 10:20	DD	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	DD	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/26/16 10:20	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)	96.1		%	62 - 133	SW846 8260B			7/26/16 10:20	DD	A
4-Bromofluorobenzene (S)	88.2		%	79 - 114	SW846 8260B			7/26/16 10:20	DD	A
Dibromofluoromethane (S)	86.5		%	78 - 116	SW846 8260B			7/26/16 10:20	DD	A
Toluene-d8 (S)	86.2		%	76 - 127	SW846 8260B			7/26/16 10:20	DD	A



Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

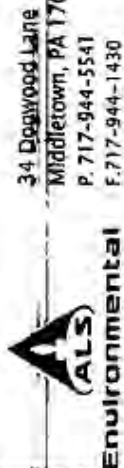
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown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

**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
2161444001	1	CWMP009W	SM4500B	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.				
2161444001	2	CWMP009W	S2540C-11	Total Dissolved Solids
The RPD associated with this sample was recovered at 5.2%. The RPD is outside method acceptance limits of 5.0%. The results used to calculate the RPD were 1493 and 1417 mg/L.				
2161444001	3	CWMP009W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2161444002	1	CWMP010W	SM4500B	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.				
2161444002	2	CWMP010W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2161444003	1	CWMP008W	SM4500B	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.				
2161444003	2	CWMP008W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2161444004	1	Field Blank	SM4500B	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.				
2161444004	2	Field Blank	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2161444004	3	Field Blank	S2540C-11	Total Dissolved Solids
The sample was originally run within hold time, but required further analysis that exceeded hold time.				

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



CHAIN OF CUSTODY/L

REQUEST FOR ANALYSIS

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

COC.#.

of

ALS Quote #:

54

Client Name: ALS Middletown		Container Type	AG	Receipt Information (Completed by Receiving Lab)	
Address: 34 Dogwood Lane Middletown PA 17057		Container Size	500mL	Cooler Temp:	Therm ID:
Contact: Susan Scherer		Preservative	H2SO4	No. of Coolers:	Y N Initial
ANALYSES/METHOD REQUESTED Project Name#: LCSWMA-CWMP-Form 19Q Bill To: ALS Middletown TAT ☐ Normal-Standard TAT is 10-12 business days. ☐ Rush-Subject to ALS approval and surcharges. Date Required: 8/5/2016 Approved By: Email? ☒ Y ☐ N ALMDT.Subcontract@ALSGlobal.com Fax? ☐ Y ☐ N No. Phenols, Total SW/846-9066					
Sample Description/Location (as it will appear on the lab report)		Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.	
1) 2161444001		7/22/2016	1140	G	1
2) 2161444002		7/22/2016	1212	G	1
3) 2161444003		7/22/2016	1245	G	1
4) 2161444004		7/22/2016	1345	G	1
5)					
6)					
7)					
8)					
9)					
10)					
Project Comments:		LOGGED BY (signature):		Special Processing	
Relinquished By / Company Name		Date	Time	USACE	State Samples Collected In
<i>John J. Scherer</i>		7/28/16	1545	☒ Standard ☐ CLP-like ☐ USACE	☐ NY ☐ NJ ☒ PA ☐ NC
Received By / Company Name		Date	Time	USACE	Sample Disposal
Reportable to PADEP?		Yes	No	Lab	Special
PWSID #		EDDS: Formal Type			
10					

* G=Grab; C=Composite

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

Rev 10/11

ALS



08-Aug-2016

Susan Scherer
ALS Environmental
34 Dogwood Lane
Middletown, PA 17057

Re: 2161444

Work Order: 16071719

Dear Susan,

ALS Environmental received 4 samples on 29-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Client Services Coordinator



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9283 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental

Project: 2161444

Work Order: 16071719

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
16071719-01	2161444001	Groundwater		07/22/16 11:40	07/29/16 09:00	☐
16071719-02	2161444002	Groundwater		07/22/16 12:12	07/29/16 09:00	☐
16071719-03	2161444003	Groundwater		07/22/16 12:45	07/29/16 09:00	☐
16071719-04	2161444004	Groundwater		07/22/16 13:45	07/29/16 09:00	☐

Sample Summary Page 1 of 1

ALS

Client: ALS Environmental
Project: 2161444
WorkOrder: 16071719

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental
Project: 2161444
Sample ID: 2161444001
Collection Date: 07/22/16 11:40 AM

Work Order: 16071719
Lab ID: 16071719-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066				Analyst: JJG
Phenolics, Total	0.0075	J	0.0030	0.010	mg/L	1	08/08/16 10:56

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 4

ALS

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental
Project: 2161444
Sample ID: 2161444002
Collection Date: 07/22/16 12:12 PM

Work Order: 16071719
Lab ID: 16071719-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066				Analyst: JJG
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/08/16 10:56

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 2 of 4

ALS

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental
Project: 2161444
Sample ID: 2161444003
Collection Date: 07/22/16 12:45 PM

Work Order: 16071719
Lab ID: 16071719-03
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL							
Phenolics, Total	U		Method: SW9066 0.0030	0.010	mg/L	1	Analyst: JJG 08/08/16 10:56

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 3 of 4

ALS

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental
Project: 2161444
Sample ID: 2161444004
Collection Date: 07/22/16 01:45 PM

Work Order: 16071719
Lab ID: 16071719-04
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066				Analyst: JJG
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/08/16 10:56

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 4 of 4

ALS

ALS Group USA, Corp

Date: 08-Aug-16

Client: ALS Environmental
 Work Order: 16071719
 Project: 2161444

QC BATCH REPORT

Batch ID: 89690B Instrument ID: LACHAT Method: SW9066

MBLK	Sample ID: MBLK-89690-89690B	Units: mg/L	Analysis Date: 08/08/16 10:56 AM
Client ID:	Run ID: LACHAT_160808A	SeqNo: 3966747	Prep Date: 08/05/16 DF: 1
Analyte	Result	PQL	SPK Val
			SPK Ref Value
			%REC
			Control Limit
			RPD Ref Value
			%RPD
			RPD Limit
			Qual

Phenolics, Total U 0.010

LCS	Sample ID: LCS-89690-89690B	Units: mg/L	Analysis Date: 08/08/16 10:56 AM
Client ID:	Run ID: LACHAT_160808A	SeqNo: 3966748	Prep Date: 08/05/16 DF: 1
Analyte	Result	PQL	SPK Val
			SPK Ref Value
			%REC
			Control Limit
			RPD Ref Value
			%RPD
			RPD Limit
			Qual

Phenolics, Total 0.09949 0.010 0.1 0 99.5 75-110 0

The following samples were analyzed in this batch:

16071719-01A	16071719-02A	16071719-03A
16071719-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 1



AES
Environmental
34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**

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

COC.#: A15 QU

COC.#	1607119	1
PAIS QUOTE#		1

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Sample Description/Location: <u>1216144001</u> Sample Date: <u>7/22/2016</u> Time: <u>14:00</u> <u>1216144002</u> <u>7/22/2016</u> <u>14:12</u> <u>1216144003</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144004</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144005</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144006</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144007</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144008</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144009</u> <u>7/22/2016</u> <u>14:45</u> <u>1216144010</u> <u>7/22/2016</u> <u>14:45</u>																																																																																																																																																																																																																																																																																																							

G=Grub D=Composite **Materials - A=Air, D=W=Drinking Water, G=W=Groundwater, O=Oil, OL=Other Liquid, S=S=Sludge, SO=Soil, WP=Wipe, WW=Wastewater

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

Sample Receipt Checklist

Client Name: ALS - MIDDLETOWN

Date/Time Received: 29-Jul-16 09:00

Work Order: 16071719

Received by: MEB

Checklist completed by Myhan Broadbent
eSignature

29-Jul-16
Date

Reviewed by: Tom Bravish
eSignature

29-Jul-16
Date

Matrices: water

Carrier name: FedEx

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 2.8/2.8 SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 7/29/2016 1:09:29 PM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☒ No ☐ N/A ☐

pH adjusted? Yes ☐ No ☒ N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:



August 16, 2016

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

Certificate of Analysis

Project Name: **2016-CRESWELL**Workorder: **2161030**

Purchase Order:

Workorder ID: **QUARTERLY CWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, July 21, 2016.

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

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

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

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

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

CC: Mr. Mark Reider , Mr. 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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**ALS Environmental**

34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2161030001	CWMP012W	Ground Water	7/21/2016 10:23	7/21/2016 16:07	Mr. Brian G Shade
2161030002	CWMP016W	Ground Water	7/21/2016 14:15	7/21/2016 16:07	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Notes

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

Standard Acronyms/Flags

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

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PROJECT SUMMARY

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Workorder Comments

See attached subcontracted total phenolics by SW9066 results from ALS Holland. SSL 08/04/16

Sample Comments

Lab ID: 2161030002

Sample ID: CWMP016W

Sample Type: SAMPLE

This sample was re-analyzed for total metals (calcium, magnesium, potassium, and sodium) based on an email request from Dan Brown noting the reported results did not match historical values. The report includes this data. SJS 08/16/16

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ANALYTICAL RESULTS

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161030001**
Sample ID: **CWMP012W**

Date Collected: 7/21/2016 10:23 Matrix: Ground Water
Date Received: 7/21/2016 16:07

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
1,1-Dichloroethane	1.5		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 12:43	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 12:43	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98.2		%	62 - 133	SW846 8260B			7/22/16 12:43	DD	H
4-Bromofluorobenzene (S)	90.1		%	79 - 114	SW846 8260B			7/22/16 12:43	DD	H
Dibromofluoromethane (S)	85.9		%	78 - 116	SW846 8260B			7/22/16 12:43	DD	H
Toluene-d8 (S)	90		%	76 - 127	SW846 8260B			7/22/16 12:43	DD	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	65		mg/L	5	S2320B-97			7/24/16 23:57	MSA	B
Alkalinity, Total	65	2	mg/L	5	S2320B-97			7/24/16 23:57	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/2/16 20:34	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	36.1		mg/L	2.0	EPA 300.0			7/22/16 15:19	BSL	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/22/16 15:19	BSL	B
Nitrate-N	11.0		mg/L	0.20	EPA 300.0			7/22/16 15:19	BSL	B
pH	6.83	1	pH_Units		SM4500B			7/24/16 23:57	MSA	B
Specific Conductance	317		umhos/cm	1	SW846 9050A			7/24/16 23:57	MSA	B
Sulfate	5.1		mg/L	2.0	EPA 300.0			7/22/16 15:19	BSL	B
Total Dissolved Solids	221		mg/L	5	S2540C-11			7/26/16 11:44	ML	B
Total Organic Carbon (TOC)	1.1		mg/L	1.0	SW846 9060A			7/25/16 11:38	PAG	E
Turbidity	495		NTU	0.10	S2130B-01			7/23/16 03:43	MSA	B

Sub'd-ALSH Labs Cert 68-03827

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ANALYTICAL RESULTS

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161030001**
Sample ID: **CWMP012W**

Date Collected: 7/21/2016 10:23 Matrix: Ground Water
Date Received: 7/21/2016 16:07

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/4/16 12:42	SUB	G
METALS										
Calcium, Total	34.2		mg/L	0.11	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
Iron, Total	15.1		mg/L	0.067	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
Magnesium, Total	9.4		mg/L	0.11	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
Manganese, Total	0.34		mg/L	0.0056	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
Potassium, Total	1.6		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
Sodium, Total	13.9		mg/L	0.56	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:22	TSS	C1
FIELD PARAMETERS										
Depth to Water Level	49.290		Feet		Field			7/21/16 10:23	BGS	D
pH, Field (SM4500B)	5.620		pH_Units		Field			7/21/16 10:23	BGS	D
Specific Conductance, Field	370		umhos/cm	1	Field			7/21/16 10:23	BGS	D
Temperature	14.80		Deg. C		Field			7/21/16 10:23	BGS	D

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161030002**
Sample ID: **CWMP016W**

Date Collected: 7/21/2016 14:15 Matrix: Ground Water
Date Received: 7/21/2016 16:07

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 13:05	DD	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 13:05	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	97.6		%	62 - 133	SW846 8260B			7/22/16 13:05	DD	H
4-Bromofluorobenzene (S)	87.2		%	79 - 114	SW846 8260B			7/22/16 13:05	DD	H
Dibromofluoromethane (S)	85.4		%	78 - 116	SW846 8260B			7/22/16 13:05	DD	H
Toluene-d8 (S)	89.2		%	76 - 127	SW846 8260B			7/22/16 13:05	DD	H
Sub'd-ALSH Labs Cert 68-03827										
Phenolics	ND		mg/L	0.01	SW846 9066			8/4/16 12:42	SUB	G
METALS										
Calcium, Total	4.5		mg/L	0.11	SW846 6010C	8/3/16 13:30	JPS	8/4/16 08:22	TSS	C
Iron, Total	ND		mg/L	0.33	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:37	TSS	C1
Magnesium, Total	1.1		mg/L	0.11	SW846 6010C	8/3/16 13:30	JPS	8/4/16 08:22	TSS	C
Manganese, Total	ND		mg/L	0.028	SW846 6010C	7/25/16 17:20	TSS	7/27/16 18:37	TSS	C1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	8/3/16 13:30	JPS	8/4/16 08:22	TSS	C
Sodium, Total	3.1		mg/L	0.56	SW846 6010C	8/3/16 13:30	JPS	8/4/16 08:22	TSS	C
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	S2320B-97			7/25/16 00:07	MSA	B
Alkalinity, Total	6	2	mg/L	5	S2320B-97			7/25/16 00:07	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/2/16 20:54	TES	A
Chemical Oxygen Demand (COD)	ND		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	3.4		mg/L	2.0	EPA 300.0			7/22/16 15:33	BSL	B

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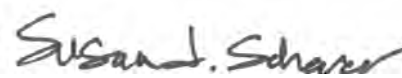
ANALYTICAL RESULTS

Workorder: 2161030 QUARTERLY CWMP-FORM 19Q

Lab ID: **2161030002**
Sample ID: **CWMP016W**

Date Collected: 7/21/2016 14:15 Matrix: Ground Water
Date Received: 7/21/2016 16:07

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Fluoride	ND		mg/L	0.20	EPA 300.0			7/22/16 15:33	BSL	B
Nitrate-N	0.60		mg/L	0.20	EPA 300.0			7/22/16 15:33	BSL	B
pH	6.80	1	pH_Units		SM4500B			7/25/16 00:07	MSA	B
Specific Conductance	52		umhos/cm	1	SW846 9050A			7/25/16 00:07	MSA	B
Sulfate	11.5		mg/L	2.0	EPA 300.0			7/22/16 15:33	BSL	B
Total Dissolved Solids	57		mg/L	5	S2540C-11			7/26/16 11:26	ML	B
Total Organic Carbon (TOC)	ND		mg/L	1.0	SW846 9060A			7/25/16 11:38	PAG	E
Turbidity	6.89		NTU	0.10	S2130B-01			7/23/16 03:43	MSA	B
FIELD PARAMETERS										
Depth to Water Level	12.270		Feet		Field			7/21/16 14:15	BGS	D
Elev Top MW Casing above MSL	311.97		Feet		Field			7/21/16 14:15	BGS	D
Flow Rate	2.49		gal/min		Field			7/21/16 14:15	BGS	D
Ground Water Elevation	299.700		ft/MSL		Field			7/21/16 14:15	BGS	D
pH, Field (SM4500B)	5.240		pH_Units		Field			7/21/16 14:15	BGS	D
Sample Depth	71.000		Feet		Field			7/21/16 14:15	BGS	D
Specific Conductance, Field	60		umhos/cm	1	Field			7/21/16 14:15	BGS	D
Temperature	10.60		Deg. C		Field			7/21/16 14:15	BGS	D
Total Well Depth	73.520		Feet		Field			7/21/16 14:15	BGS	D
Volume in Water Column	90.038		Gallons		Field			7/21/16 14:15	BGS	D
Water Level After Purge	21.910		Feet		Field			7/21/16 14:15	BGS	D
Well Volumes Purged	2.35		Vol		Field			7/21/16 14:15	BGS	D


Ms. Susan J Scherer
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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
--------	---	-----------	-------------------	---------

2161030001	1	CWMP012W	SM4500B	pH
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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.

2161030001	2	CWMP012W	S2320B-97	Alkalinity, Total
-------------------	---	----------	-----------	-------------------

The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.

2161030002	1	CWMP016W	SM4500B	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.

2161030002	2	CWMP016W	S2320B-97	Alkalinity, Total
-------------------	---	----------	-----------	-------------------

The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.

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34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

Environmental

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

COC #: 1
ALS Quote #: 1 of 1

Client Name: ALS Middletown		Container Type: AG	Receipt Information (completed by Receiving Lab)	
Address: 34 Dogwood Lane		Container Size: 500mL	Cooler Temp: _____	Therm ID: _____
Middletown PA 17057		Preservative: H2SO4	No. of Coolers: _____	Y N Initial
Contact: Susan Scherer		Custody Seals Present? _____		
Phone#: (717) 702-2245		(If present) Seals Intact? _____		
Project Name#: LCSWMA-CWMP-Form 190		Received on Ice? _____		
Bill To: ALS Middletown		COC/Labels Complete/Accurate? _____		
TAT ☐ Normal-Standard TAT is 10-12 business days.		Cont. in Good Cond.? _____		
Rush-Subject to ALS approval and surcharges.		Correct Containers? _____		
Date Required: 8/5/2016		Correct Sample Volumes? _____		
Approved By: _____		Correct Preservation? _____		
Email? ☒ Y ☐ N ALMDI.Subcontract@ALSGlobal.com		Headspace/Volatiles? _____		
Fax? ☐ Y ☐ N		Courier Tracking #: _____		
Sample Description/Location (as it will appear on the lab report)		Sample Date	Time	Enter Number of Containers Per Sample or Field Results Below.
1) 2161030001		7/21/2016	1023	G GW 1
2) 2161030002		7/21/2016	1415	G GW 1
3) _____				
4) _____				
5) _____				
6) _____				
7) _____				
8) _____				
9) _____				
10) _____				
Project Comments:		ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other: _____		
Relinquished By / Company Name		Date	Time	Received By / Company Name
[Signature]		7/28/16	1545	
1				
3				
5				
7				
9				
Reportable to PADEP?		Special Processing		
Yes ☐ No ☐		USACE ☐ Navy ☐		
PWSID # _____		Sample Disposal		
EDDS: Formal Type _____		Lab ☐ Special ☐		
PA 17057		State Samples Collected In		
		NY ☐ NJ ☐ PA ☒ NC ☐		



04-Aug-2016

Susan Scherer
ALS Environmental
34 Dogwood Lane
Middletown, PA 17057

Re: 2161030

Work Order: 16071676

Dear Susan,

ALS Environmental received 2 samples on 29-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

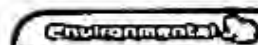
Tom Beamish
Client Services Coordinator



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 48424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company



www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental

Project: 2161030

Work Order: 16071676

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
16071676-01	2161030001	Groundwater		07/21/16 10:23	07/29/16 09:00	☐
16071676-02	2161030002	Groundwater		07/21/16 14:15	07/29/16 09:00	☐

Sample Summary Page 1 of 1

ALS

Client: ALS Environmental
Project: 2161030
WorkOrder: 16071676

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
Project: 2161030
Sample ID: 2161030001
Collection Date: 07/21/16 10:23 AM

Work Order: 16071676
Lab ID: 16071676-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9056		Prep: E420.x / 8/3/16		Analyst: JB
Phenolics, Total	U		0.0033	0.011	mg/L	1	08/04/16 12:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 2

ALS

ALS Group USA, Corp

Date: 04-Aug-16

Client: ALS Environmental
Project: 2161030
Sample ID: 2161030002
Collection Date: 07/21/16 02:15 PM

Work Order: 16071676
Lab ID: 16071676-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/3/16		Analyst: JB
Phenolics, Total	U		0.0030	0.010	mg/L	1	08/04/16 12:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 2 of 2

ALS

ALS Group USA, Corp

Client: ALS Environmental
Work Order: 16071676
Project: 2161030

Date: 04-Aug-16

QC BATCH REPORT

Batch ID: 89550 Instrument ID LACHAT Method: E420.4

MBLK	Sample ID: MBLK-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962265		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	U	0.010								

MBLK	Sample ID: MBLK-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962282		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	U	0.010								

LCS	Sample ID: LCS-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962266		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.1068	0.010	0.1	0	107	90-110	0			

LCS	Sample ID: LCS-89550-89550				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962283		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.1068	0.010	0.1	0	107	75-110	0			

MS	Sample ID: 1608035-12C MS				Units: mg/L		Analysis Date: 08/04/16 12:42 PM			
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962280		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2518	0.025	0.25	0.01005	96.7	90-110	0			

MSD	Sample ID: 1608035-12C MSD					Units: mg/L		Analysis Date: 08/04/16 12:42 PM		
Client ID:	Run ID: LACHAT_160804A				SeqNo: 3962281		Prep Date: 08/03/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2464	0.025	0.25	0.01005	94.5	90-110	0.2518	2.17	20	

The following samples were analyzed in this batch:

16071676-01A 16071676-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 1



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5547
F. 717-944-1430

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

COC #:	16071676	1	of
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ALLEGORICAL

Receipt Information (Completed by Receiving Lab)									
Cooler Temp: 40 Therm ID: Y M Initial									
No. of Coolers: Y M Initial									
Certified State Permit? ☐ (if present) State Permit? ☐ Received on Ice? ☐ COC Labels Complete/Accurate? ☐ Cool. In Good Cond.? ☐ Correct Containers? ☐ Correct Sample Volumes? ☐ Correct Preservation? ☐ Holdover/Volatility? ☐									
Content Tracking #									
Sample/COC Comments									
Subcontract to ALS Holland MI									
ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rejected Equipment ☐ Other									
Standard ☐ Special Processing ☐ State Samples Collected in ☐ SUPPLY ☐ USACE ☐ Navy ☐ NY ☐ USACE ☐ Sample Disposal ☐ Lab ☐ PA ☐ Reportable to PADEP? ☐ Yes ☐ No ☐ Special ☐ PMSID ☐ EDIS ☐									
ANALYSES/METHOD REQUESTED									
Enter Number of Containers Per Sample or Field Results Below									
1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12) 13) 14) 15) 16) 17) 18) 19) 20) 21) 22) 23) 24) 25) 26) 27) 28) 29) 30) 31) 32) 33) 34) 35) 36) 37) 38) 39) 40) 41) 42) 43) 44) 45) 46) 47) 48) 49) 50) 51) 52) 53) 54) 55) 56) 57) 58) 59) 60) 61) 62) 63) 64) 65) 66) 67) 68) 69) 70) 71) 72) 73) 74) 75) 76) 77) 78) 79) 80) 81) 82) 83) 84) 85) 86) 87) 88) 89) 90) 91) 92) 93) 94) 95) 96) 97) 98) 99) 100)									
Client Name: ALS Michigan Address: 3400 Woodlawn Modesto, PA 17057 Contact: (800) 828-1111 Phone: (717) 702-2215 Project Name: USMMA/ALS/MF/PA/190 Email: ALS@ALS-Michigan.com Date Required: 8/5/2016 Approved By: [Signature] Email: [Email] Fax: [Fax]									
Sample Description/Location (as it will appear on the lab report) Sample Date Time 1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12) 13) 14) 15) 16) 17) 18) 19) 20) 21) 22) 23) 24) 25) 26) 27) 28) 29) 30) 31) 32) 33) 34) 35) 36) 37) 38) 39) 40) 41) 42) 43) 44) 45) 46) 47) 48) 49) 50) 51) 52) 53) 54) 55) 56) 57) 58) 59) 60) 61) 62) 63) 64) 65) 66) 67) 68) 69) 70) 71) 72) 73) 74) 75) 76) 77) 78) 79) 80) 81) 82) 83) 84) 85) 86) 87) 88) 89) 90) 91) 92) 93) 94) 95) 96) 97) 98) 99) 100)									
Ralliquished By / Company Name Date Time 1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12) 13) 14) 15) 16) 17) 18) 19) 20) 21) 22) 23) 24) 25) 26) 27) 28) 29) 30) 31) 32) 33) 34) 35) 36) 37) 38) 39) 40) 41) 42) 43) 44) 45) 46) 47) 48) 49) 50) 51) 52) 53) 54) 55) 56) 57) 58) 59) 60) 61) 62) 63) 64) 65) 66) 67) 68) 69) 70) 71) 72) 73) 74) 75) 76) 77) 78) 79) 80) 81) 82) 83) 84) 85) 86) 87) 88) 89) 90) 91) 92) 93) 94) 95) 96) 97) 98) 99) 100)									

Matrix: A=Air; DW=Dominating Winter; GW=Groundwater; OF=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

G=Galn; Co=Composite:

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

Rev 10/11

Sample Receipt Checklist

Client Name: ALS - MIDDLETOWN

Date/Time Received: 29-Jul-16 09:00

Work Order: 16071676

Received by: DS

Checklist completed by *Diana Shu*
eSignature

29-Jul-16
Date

Reviewed by: *Tom Brumial*
eSignature

29-Jul-16
Date

Matrices: Groundwater

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☒	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☒
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	
All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☒	No ☐	
Sample(s) received on ice?	Yes ☒	No ☐	

Temperature(s)/Thermometer(s):

4.0/4.0 c

SR2

Cooler(s)/Kiln(s):

Date/Time sample(s) sent to storage:

7/29/2016 10:08:38 AM

Water - VOA vials have zero headspace?

Yes ☐

No ☐

No VOA vials submitted ☒

Water - pH acceptable upon receipt?

Yes ☒

No ☐

N/A ☐

pH adjusted?

Yes ☐

No ☒

N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action:



August 24, 2016

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

Certificate of Analysis

Project Name: **2016-CRESWELL**Workorder: **2160603**

Purchase Order:

Workorder ID: **QUARTERLY CWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, July 20, 2016.

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

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

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

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

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

CC: Mr. Mark Reider , Mr. 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: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2160603001	CWMP017S	Ground Water	7/20/2016 10:45	7/20/2016 15:33	Mr. Brian G Shade
2160603002	CWMP018S	Ground Water	7/20/2016 10:26	7/20/2016 15:33	Mr. Brian G Shade
2160603003	Trip Blank	Water	7/20/2016 15:33	7/20/2016 15:33	Mr. Brian G Shade
2160603004	Field Blank	Water	7/20/2016 14:40	7/20/2016 15:33	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2160603 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



PROJECT SUMMARY

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Workorder Comments

See attached subcontracted total phenolics by SW9066 results from ALS Holland. SSL 08/05/16

Sample Comments

Lab ID: 2160603001

Sample ID: CWMP017S

Sample Type: SAMPLE

The following analytes; Chloride, TDS, Calcium, Magnesium, Potassium, and Sodium were reanalyzed for accuracy per client request. The subsequent reanalysis confirmed the original results.

The results reported do not meet historical trends. However, upon review of all analytical data the specific conductance recorded in the lab and in the field correlates to higher cation and anion concentrations.

Lab ID: 2160603002

Sample ID: CWMP018S

Sample Type: SAMPLE

The following analytes; Chloride, TDS, Alkalinity, Magnesium, Bicarbonate, and Sodium were reanalyzed for accuracy per client request. The subsequent reanalysis confirmed the original results.

The results reported do not meet historical trends. However, upon review of all analytical data the specific conductance recorded in the lab and in the field correlates to higher cation and anion concentrations.

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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: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603001**
Sample ID: **CWMP017S**

Date Collected: 7/20/2016 10:45 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 07:50	SYB	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 07:50	SYB	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			7/22/16 07:50	SYB	H
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			7/22/16 07:50	SYB	H
Dibromofluoromethane (S)	111		%	78 - 116	SW846 8260B			7/22/16 07:50	SYB	H
Toluene-d8 (S)	102		%	76 - 127	SW846 8260B			7/22/16 07:50	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	645		mg/L	5	S2320B-97			7/22/16 22:11	MSA	B
Alkalinity, Total	661	2	mg/L	5	S2320B-97			7/22/16 22:11	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/1/16 07:35	TES	A
Chemical Oxygen Demand (COD)	13		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	1420		mg/L	25.0	EPA 300.0			7/22/16 20:12	BSL	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 14:34	MBW	B
Nitrate-N	35.4		mg/L	1.0	EPA 300.0			7/21/16 14:47	MBW	B
pH	8.36	1	pH_Units		SM4500B			7/22/16 22:11	MSA	B
Specific Conductance	4930		umhos/cm	1	SW846 9050A			7/22/16 22:11	MSA	B
Sulfate	82.6		mg/L	2.0	EPA 300.0			7/21/16 14:34	MBW	B
Total Dissolved Solids	2830		mg/L	5	S2540C-11			7/25/16 13:31	ML	B
Total Organic Carbon (TOC)	5.4		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	1.32		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B

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ANALYTICAL RESULTS

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603001**
Sample ID: **CWMP017S**

Date Collected: 7/20/2016 10:45 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	97.2		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
Iron, Total	0.15		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
Magnesium, Total	139		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
Manganese, Total	0.085		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
Potassium, Total	24.8		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
Sodium, Total	615		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:08	TSS	C1
FIELD PARAMETERS										
Dissolved Oxygen	8.090		mg/L	0.010	Field			7/20/16 10:45	BGS	D
Flow Rate	266.28		gal/min		Field			7/20/16 10:45	BGS	D
pH, Field (SM4500B)	7.990		pH_Units		Field			7/20/16 10:45	BGS	D
Specific Conductance, Field	5333		umhos/cm	1	Field			7/20/16 10:45	BGS	D
Temperature	24.44		Deg. C		Field			7/20/16 10:45	BGS	D

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ANALYTICAL RESULTS

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603002**
Sample ID: **CWMP018S**

Date Collected: 7/20/2016 10:26 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 08:08	SYB	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 08:08	SYB	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	100		%	62 - 133	SW846 8260B			7/22/16 08:08	SYB	H
4-Bromofluorobenzene (S)	98.7		%	79 - 114	SW846 8260B			7/22/16 08:08	SYB	H
Dibromofluoromethane (S)	110		%	78 - 116	SW846 8260B			7/22/16 08:08	SYB	H
Toluene-d8 (S)	100		%	76 - 127	SW846 8260B			7/22/16 08:08	SYB	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	500		mg/L	5	S2320B-97			8/4/16 06:49	MSA	B
Alkalinity, Total	544	3	mg/L	5	S2320B-97			8/4/16 06:49	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/1/16 07:54	TES	A
Chemical Oxygen Demand (COD)	20		mg/L	5	EPA 410.4			7/27/16 12:51	AK	A
Chloride	898		mg/L	10.0	EPA 300.0			7/21/16 15:12	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			7/21/16 14:59	MBW	B
Nitrate-N	26.1		mg/L	1.0	EPA 300.0			7/21/16 15:12	MBW	B
pH	8.50	1	pH_Units		SM4500B			7/24/16 13:13	MSA	B
Specific Conductance	3600		umhos/cm	1	SW846 9050A			7/24/16 13:13	MSA	B
Sulfate	46.2		mg/L	2.0	EPA 300.0			7/21/16 14:59	MBW	B
Total Dissolved Solids	2010		mg/L	5	S2540C-11			7/25/16 13:31	ML	B
Total Organic Carbon (TOC)	7.8		mg/L	1.0	SW846 9060A			7/21/16 15:08	PAG	E
Turbidity	0.66		NTU	0.10	S2130B-01			7/22/16 04:00	MSA	B

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ANALYTICAL RESULTS

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603002**
Sample ID: **CWMP018S**

Date Collected: 7/20/2016 10:26 Matrix: Ground Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Phenolics	ND		mg/L	0.01	SW846 9066			8/5/16 10:27	SUB	G
METALS										
Calcium, Total	85.8		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
Iron, Total	0.10		mg/L	0.067	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
Magnesium, Total	103		mg/L	0.11	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
Manganese, Total	0.034		mg/L	0.0056	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
Potassium, Total	23.0		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
Sodium, Total	441		mg/L	0.56	SW846 6010C	7/25/16 03:00	ZMC	7/27/16 18:13	TSS	C1
FIELD PARAMETERS										
Dissolved Oxygen	9.460		mg/L	0.010	Field			7/20/16 10:26	BGS	D
Flow Rate	159.45		gal/min		Field			7/20/16 10:26	BGS	D
pH, Field (SM4500B)	7.930		pH_Units		Field			7/20/16 10:26	BGS	D
Specific Conductance, Field	3874		umhos/cm	1	Field			7/20/16 10:26	BGS	D
Temperature	19.80		Deg. C		Field			7/20/16 10:26	BGS	D

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ANALYTICAL RESULTS

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603003**

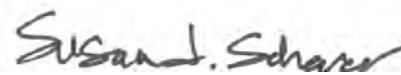
Date Collected: 7/20/2016 15:33

Matrix: Water

Sample ID: **Trip Blank**

Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 02:09	SYB	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:09	SYB	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)	93.7		%	62 - 133	SW846 8260B			7/22/16 02:09	SYB	A
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			7/22/16 02:09	SYB	A
Dibromofluoromethane (S)	108		%	78 - 116	SW846 8260B			7/22/16 02:09	SYB	A
Toluene-d8 (S)	105		%	76 - 127	SW846 8260B			7/22/16 02:09	SYB	A



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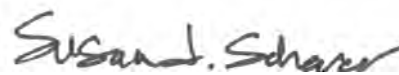
ANALYTICAL RESULTS

Workorder: 2160603 QUARTERLY CWMP-FORM 19Q

Lab ID: **2160603004**
Sample ID: **Field Blank**

Date Collected: 7/20/2016 14:40 Matrix: Water
Date Received: 7/20/2016 15:33

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Toluene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			7/22/16 02:26	SYB	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			7/22/16 02:26	SYB	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)	91.1		%	62 - 133	SW846 8260B			7/22/16 02:26	SYB	A
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			7/22/16 02:26	SYB	A
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			7/22/16 02:26	SYB	A
Toluene-d8 (S)	104		%	76 - 127	SW846 8260B			7/22/16 02:26	SYB	A



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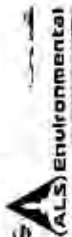
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**PARAMETER QUALIFIERS**

Lab ID	#	Sample ID	Analytical Method	Analyte
2160603001	1	CWMP017S	SM4500B	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.				
2160603001	2	CWMP017S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2160603002	1	CWMP018S	SM4500B	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.				
2160603002	3	CWMP018S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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34 Dogwood Lane • Middletown, PA 17057 • Tel: 717-944-1081 • Fax: 717-944-1430

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

CO: ALS

1 of 1

* 2 1 6 0 6 0 3 *

Client Name: Lancaster County Solid Waste MA		Container Type	AG	AN	CG	PL	PL	PL	PL				
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container Size	125 ml	500 ml	40 ml	500 ml	500 ml	1 L	500 ml				
Lancaster, PA 17604		Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None				
Contact: Brooks Norris		ANALYSES/METHOD REQUESTED											
Phone#: (717) 397-9968		Form 190 VOC Field Measurements NH3-N, COD Total Metals: Fe, Mn, Ca, Mg, K, Na pH, Cl, F, SPC, SO4, Turb, TDS Alkalinity, HCO3											
Project Name#: Marns Run Quarterly (Streams)													
Bill To: Lancaster County Solid Waste MA													
TAT ☒ Normal-Standard TAT is 10-12 business days. ☐ Rush-Subject to ALS approval and surcharges.													
Date Required: _____ Approved By: _____													
Email? ☒ Y ☐ N Email: bnormis@LCSWMA.com													
Fax? ☒ Y ☐ N No.: (717) 397-9973													
Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	G or C	Matrix	TOC	O-OH	Form 190 VOC	Field Measurements	NH3-N, COD	Total Metals: Fe, Mn, Ca, Mg, K, Na	pH, Cl, F, SPC, SO4, Turb, TDS	Alkalinity, HCO3	
1 CWMMP017S	7-20-16	1045	G	GW	1	1	2	X	1	1	1	1	
2 CWMMP018S	+	1026	G	GW	1	1	2	X	1	1	1	1	
3 Trip Blank	I	1037	I	I									
4 Field Blank	I	1440	I	I									
5													
6													
7													
8													
9													
10													
Project Comments:		LOGGED BY (signature): <u>[Signature]</u> Date: <u>7-21-16</u> Time: <u>1015</u> REVIEWED BY (signature): <u>[Signature]</u> Date: <u>7-21-16</u> Time: <u>1015</u>											
Relinquished By/Company Name		Date	Time	Received By / Company Name		Date	Time						
1 <u>Brooks Norris</u> <u>ALS</u>		7-20-16	1033	1 <u>Brooks Norris</u> <u>ALS</u>		7-20-16	1533						
3				4									
5				6									
7				8									
9				10									
State Samples Collected In		Standard ☐ CLP-like ☐ USACE ☐ Navy ☐ PA ☐ NC ☐ Sample Disposal ☐ Lab ☒ Special ☐											
ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other: _____													

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

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

Rev 8/04



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

Environmental

CHAIN OF CUSTODY/

REQUEST FOR ANALYSIS

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

COC #:

1

of

1

ALS Quote #:

Client Name: ALS Middletown		Container Type	AG	Receipt Information (Completed by Receiving Lab)	
Address: 34 Dogwood Lane		Container Size	500mL	Cooler Temp:	Therm ID:
Middletown PA 17057		Preservative	H2SO4	No. of Coolers:	Y N Initial
Contact: Susan Scherer		Custody Seals Present?			
Phone#: (717) 702-2245		(If present) Seals Intact?			
Project Name/ID: LCSWMA-CWMP-Form 19Q		Received on Ice?			
Bill To: ALS Middletown		COC Labels Complete/Accurate?			
TAT		Cont. in Good Cond.?			
Normal-Standard TAT is 10-12 business days.		Correct Containers?			
Rush-Subject to ALS approval and surcharges.		Correct Sample Volumes?			
Date Required: 8/5/2016		Correct Preservation?			
Email? ☒ Y ☐ N ALMDT.Subcontract@ALSGlobal.com		Headspace/Volatiles?			
Fax? ☐ Y ☐ N		Courier Tracking #:			
Sample Description/Location (as it will appear on the lab report)		Sample Date	Time	Samples/COC Comments	
1) 2160603001		7/20/2016	1045	Subcontract to ALS Holland MI	
2) 2160603002		7/20/2016	1026		
3)					
4)					
5)					
6)					
7)					
8)					
9)					
10)					
Project Comments:		LOGGED BY (signature):		ALS Field Services: Pickup Labor Composite Sampling Rental Equipment Other:	
Relinquished By / Company Name		Date	Time	Special Processing	
7/28/16		7/28/16	1545	USAGE Navy	
3				State Samples Collected-In	
5				NY NJ PA NC	
7				Sample Disposal Lab Special	
9				Reportable to PADEP? Yes PWSID # EDDS: Format Type	

* G=Grab, C=Composite

**Matrix - AL=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 10/11

ALS



05-Aug-2016

Susan Scherer
ALS Environmental
34 Dogwood Lane
Middletown, PA 17057

Re: **2160603**

Work Order: **16071688**

Dear Susan,

ALS Environmental received 2 samples on 29-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Client Services Coordinator



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9283 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP. Part of the ALS Laboratory Group A Campbell Brothers Limited Company



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RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental

Project: 2160603

Work Order: 16071688

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
16071688-01	2160603001	Groundwater		07/20/16 10:45	07/29/16 09:00	☐
16071688-02	2160603002	Groundwater		07/20/16 10:26	07/29/16 09:00	☐

Sample Summary Page 1 of 1

ALS

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160603
WorkOrder: 16071688

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

QF Page 1 of 1

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160603
Sample ID: 2160603001
Collection Date: 07/20/16 10:45 AM

Work Order: 16071688
Lab ID: 16071688-01
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066			Prep: E420.x / 8/4/16	Analyst: JB
Phenolics, Total	0.0081	J	0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 2

ALS

ALS Group USA, Corp

Date: 05-Aug-16

Client: ALS Environmental
Project: 2160603
Sample ID: 2160603002
Collection Date: 07/20/16 10:26 AM

Work Order: 16071688
Lab ID: 16071688-02
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PHENOLICS, TOTAL			Method: SW9066		Prep: E420.x / 8/4/16		Analyst: JB
Phenolics, Total	0.0040	J	0.0030	0.010	mg/L	1	08/05/16 10:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 2 of 2

ALS

ALS Group USA, Corp

Client: ALS Environmental
Work Order: 16071688
Project: 2160603

Date: 05-Aug-16

QC BATCH REPORT

Batch ID: 89616 Instrument ID LACHAT Method: E420.4

MBLK		Sample ID: MBLK-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM		
Client ID:		Run ID: LACHAT_160805A				SeqNo: 3964081		Prep Date: 08/04/16		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.003899	0.010								J

MBLK	Sample ID: MBLK-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964114		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.003899	0.010								J

LCS	Sample ID: LCS-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964082		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09474	0.010	0.1	0	94.7	90-110	0			

LCS	Sample ID: LCS-89616-89616				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964115		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09474	0.010	0.1	0	94.7	75-110	0			

MS	Sample ID: 1608114-09D MS				Units: mg/L		Analysis Date: 08/05/16 10:27 AM			
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964112		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2329	0.025	0.25	0.0088	89.6	90-110	0			S

MSD	Sample ID: 1608114-09D MSD					Units: mg/L		Analysis Date: 08/05/16 10:27 AM		
Client ID:	Run ID: LACHAT_160805A				SeqNo: 3964113		Prep Date: 08/04/16		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.2435	0.025	0.25	0.0088	93.9	90-110	0.2329	4.44	20	

The following samples were analyzed in this batch:

16071688-01A 16071688-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 1



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

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

COC #:	10071587	1
ALSC quote #:		of 1

[illegible]

10/10/11

Sample Receipt Checklist

Client Name: ALS - MIDDLETOWN

Date/Time Received: 29-Jul-16 09:00

Work Order: 16071588

Received by: MEB

Checklist completed by Meghan Broadbent
eSignature

29-Jul-16
Date

Reviewed by: Tam Bernial
eSignature

29-Jul-16
Date

Matrices: water

Carrier name: FedEx

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 2.4/2.4 SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 7/29/2016 10:40:36 AM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☒ No ☐ N/A ☐

pH adjusted? Yes ☐ No ☒ N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

Corrective Action: