
4 August 2014

Ms. Liza Finley
U.S. Army Corps of Engineers – Baltimore District
10 South Howard Street
10th Floor, Environmental and Munitions Design Center
Baltimore, Maryland 21201

**Subject: Final Periodic Monitoring Letter Report – April 2014
New Cumberland Army Depot Formerly Used Defense Site (FUDS)
at Marsh Run Park
FUDS No. C03PA040301
New Cumberland, Fairview Township, Pennsylvania**

Dear Ms. Finley,

EA Engineering, Science, and Technology, Inc. (EA) prepared this Letter Report to summarize the results of the April 2014 monitoring event as part of the monitoring program for the Marsh Run Park FUDS, Fairview Township, York County, Pennsylvania. This work was completed for the USACE – Baltimore District under contract W912DR-09-D-0018.

BACKGROUND

The objective is to monitor groundwater quality and support demonstration of attainment of the Record of Decision (ROD) Remedial Action Objectives (RAOs).

Two groundwater sampling locations were included in this monitoring event. One groundwater sample was collected from an offsite residential supply well (MADW 41-52) located on a recreational parcel along the Susquehanna River. The second sample was collected from monitoring well (MW-9), which is located in the northeastern portion of the Marsh Run Park FUDS area. The site and sampling locations are shown on Figure 1.

SUMMARY OF FIELD ACTIVITIES

On 23 April 2014, groundwater sampling was completed in accordance with the USACE-approved *May 2013 EA Sampling and Analysis Plan (SAP) for Marsh Run Park, New Cumberland, Fairview Township, York County, Pennsylvania*. The SAP consists of Volume I: Field Sampling Plan (FSP), Volume II: Quality Assurance Project Plan, and Volume III: Site Specific Addendum to the General Health and Safety Plan.

Groundwater Monitoring

The groundwater sample from MADW 41-52 was collected on 23 April 2014. MADW 41-52 is the supply well for a recreational cabin. The water sample was collected from the port at the bottom of the pressure tank located on the second level (attic) of the cabin, and the tap was allowed to run for 15 minutes prior to sample collection. The groundwater sample from MW-9 was collected on 23 April 2014. Field purging and sampling forms present the details regarding sample ID, depth, and collection interval (Attachment 1).

The groundwater samples were placed on ice, documented, and transported using standard chain-of-custody procedures and hand delivered to ALS Environmental in Middletown, Pennsylvania. Both samples were submitted for analysis of specific chlorinated volatile organic compounds (cVOCs), consisting of tetrachloroethene (PCE), trichloroethene (TCE), *cis*-1,2-dichloroethene (DCE), *trans*-1,2-DCE, and vinyl chloride via U.S. Environmental Protection Agency (EPA) Method 8260B. Both samples were also submitted for analysis of total metals: arsenic, barium, beryllium, cadmium, chromium (total), copper, iron, lead, manganese, and mercury, by U.S. EPA Method SW846 6020A. The groundwater sample from MADW 41-52 was also submitted for analysis of dissolved metals: arsenic, barium, beryllium, cadmium, chromium (total), copper, iron, lead, manganese, and mercury, by U.S. EPA Method SW846 6020A. One matrix spike/matrix spike duplicate sample, one trip blank sample, and one duplicate sample were submitted to the laboratory. The laboratory chain-of-custody is presented in Attachment 1.

Investigation derived wastes, such as personal protective equipment, were disposed as municipal waste.

ANALYTICAL RESULTS

Groundwater Sampling Results

Following receipt of the laboratory analysis results from ALS Environmental (Attachment 2), the data were submitted for validation to Environmental Data Services, Inc. (EDS) of Williamsburg, Virginia. No cVOCs were detected in the trip blank. The data validation report did not indicate any data usability issues with the analytical results.

The cVOC and metals analytical results are summarized in Table 1. The analytical results were evaluated by comparing the current data to historical data for the site (Tables 1 and 2, Attachment 3). The laboratory results were also evaluated relative to ROD RAOs/Federal Maximum Contaminant Levels (MCLs) and the Pennsylvania Department of Environmental Protection (PADEP) medium specific concentrations (MSCs) applicable under Act 2. For

analytes without established RAOs/MCLs or PADEP MSCs, Federal and PADEP Secondary Contaminant Levels (SMCLs) were used for data comparison.

No cVOCs were detected at concentrations greater than the ROD RAOs/PADEP MSCs (residential setting, used aquifer, total dissolved solids <2,500 parts per million) in the sample collected from MADW 41-52. TCE was reported at an estimated concentration of 1.2 µg/L; TCE had previously been reported in MADW 41-52 estimated concentrations between the method Detection Limit (DL) and the Limit of Quantitation (LOQ) on 15 July 2010, 8 November 2012, and 2 June 2013. In addition, for the 31 May 2011 MADW 41-52 sample, a “J” qualifier was assigned by the validator to the reported unqualified laboratory result of 2.3 µg/L because the surrogate spike recoveries were out of compliance for volatile organic compounds. The current result is consistent with historical results at MADW 41-52, where cVOC detections were reported at concentrations less than the ROD RAOs or PADEP MSCs.

TCE was reported at a concentration of 20.0 µg/L in the sample collected from MW-9 (and at 18.2 µg/L in its duplicate), which is greater than the ROD RAO/PADEP MSC of 5 µg/L. No other cVOCs were detected at concentrations greater than the ROD RAOs or PADEP MSCs in the samples collected from MW-9. The current results are consistent with historical results at MW-9, where TCE was reported at concentrations exceeding the ROD RAO/PADEP MSC and other cVOC detections were less than the ROD RAOs/PADEP MSCs.

In this event, the sample from MW-9 was analyzed for total metals concentrations, and the sample from MADW 41-52 was analyzed for both total and dissolved metal concentrations. All reported metals concentrations were compared to the dissolved metals MSCs¹ or MCLs. This is a conservative evaluation approach in that suspended solids in the water sample were included in the analysis of total metals. All reported concentrations were less than state and federal health standards for public drinking water, with the exception of the total lead concentration in MADW 41-52, as discussed below.

- The total measured lead concentration of 0.013 mg/L in MADW 41-52 is greater than the ROD RAO and the dissolved lead PADEP MSC of 0.005 mg/L. However, this concentration is less than the U.S. EPA Action Level established for lead of 0.015 mg/L (typically used to evaluate public water systems). The dissolved lead concentration reported in this well does not exceed the PADEP MSC.

The measured total iron concentration, 1.4 mg/L in MW-9 (and 1.6 mg/L in its duplicate), was greater than the state and federal SMCL of 0.30 mg/L. SMCLs are based on aesthetics such as

¹ PADEP MSCs for metals are applicable to dissolved metal concentrations.

smell, taste, odor, color, and staining potential rather than health based, and are non-enforceable for private water wells.

The reported metals concentrations were consistent with historical results, which are provided in Attachment 3.

CONCLUSIONS

The results of this monitoring event are consistent with previous data measured at MADW 41-52 and MW-9.

We appreciate the opportunity to continue to support the USACE on this project. Should you have any questions or comments, please do not hesitate to contact me directly at 410-329-5113.

Respectfully yours,

EA Engineering, Science and Technology,
Inc.



H. Gordon Porter, Project Manager

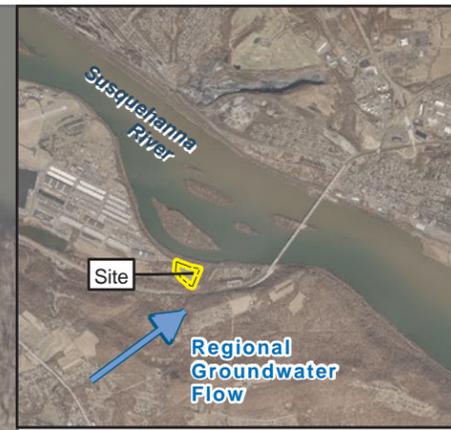
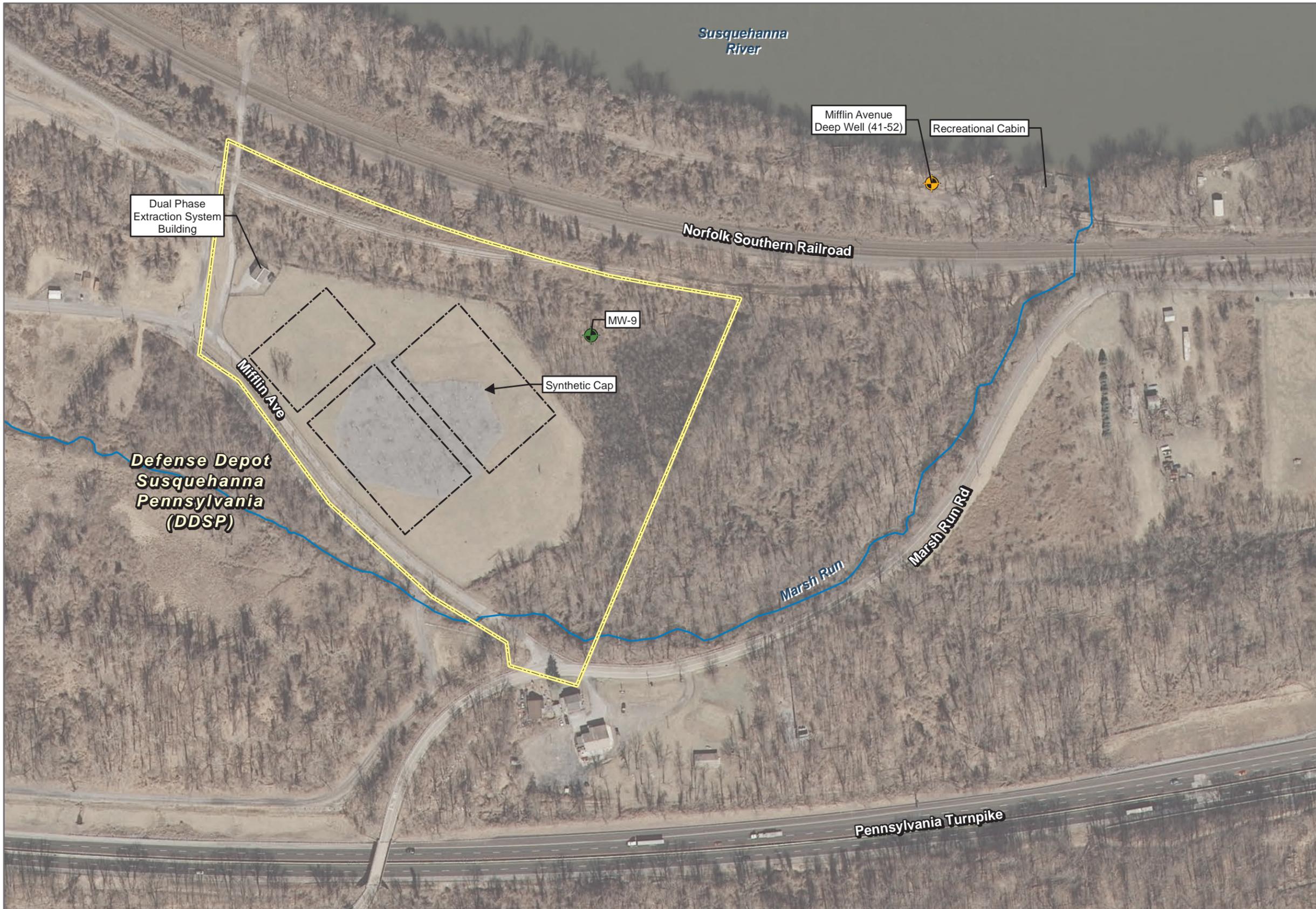
Figure 1 – April 2014 Sampling Locations

Table 1 – Groundwater Sample Results April 2014

Attachment 1 – Field Sampling Logs

Attachment 2 – Laboratory Analytical Reports

Attachment 3 – Historical Data



Legend

- Monitoring Well Sampling Location
- Recreational Property Well Sampling Location
- Proposed Soccer Fields
- Formerly Used Defense Site (FUDS) Boundary
- Stream

Aerial Photograph Source:
 PAMAP Program, PA Department of Conservation and Natural Resources,
 Bureau of Topographic and Geologic Survey, 2008



Marsh Run Park FUDS
 Fairview Township, New Cumberland, Pennsylvania
 FUDS Project No. C03PA040301

Project Number:
6233003

Date:
September 2013

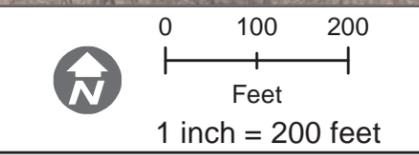


Figure 1
 Groundwater Sampling Locations

ATTACHMENT 1
FIELD SAMPLING LOGS

Location

MAPLE RUN PARK, NEW CUMBERLAND PA 23402 2014

Project / Client

YETTER / MW-9 GEOTECHNICAL SAMPLING

AM. PAPER CLASS 410F

PH:

0704-S9 Piled up ice for sample

0706-S9 core @ Westwood Drive

0728-gee when call of Mike Fitchell (USACE)

- no will be core ~ 1200 following, safety
needs to review opening, summer schedule

0801-DB8 NEXER (ASD) draped off @ Redwood Vot neck

0831-ETPAU WERT core site

0841-began pour @ bottom sink

- 4' of concrete of other tank set up

* Collected "MADW 452" @ CP15
for VOC, TBT/DBS METALS

0938-matched to MW-9

1021-began compression

1030-S9 captured sample on ladder pump could
falling due to small hole in tubing

1047-began pouring MW-9



EA Engineering, Science,
and Technology, Inc.

WELL PURGING AND SAMPLING RECORD

WELL ID MW-9 SAMPLE NO. MW-9 / FD-1
 WELL/SITE DESCRIPTION MARSH PLW PARK - WETLAND

DATE 04/23/2014 TIME 1045 AIR TEMP. 45°F CLOUDY

WELL DEPTH 54.46 ft CASING HEIGHT 1.85 ft
 WATER DEPTH 6.95 ft WELL DIAMETER 2 in
 WATER COL. HEIGHT 48.01 ft SANDPACK DIAM. — in
 EQUIVALENT VOLUME OF STANDING WATER 7.68 GAL (29.1 LT) (gal) (L)
 PUMP RATE 0.40 LPM (gpm) (LPM)
 PUMP TIME 55 min min
 WELL WENT DRY? () Yes (/) No PUMP TIME — min
 VOL. REMOVED 22.0 (gal) (L) RECOVERY TIME — min
 PURGE AGAIN? () Yes (/) No TOTAL VOL. REMOVED 22.0 (gal) (L)

Date	Time	Volume Removed	±0.1 pH	±3% Cond.	±3% Temp.	±10% ORP	±10% Turb.	±10% DO	Depth to Water from TOC	Pump Rate
		Unit: L	—	µS/cm	°C	mV	NTU	mg/L		LPM
4/23	1047	—	7.52	395	9.91	210.0	25.1	4.00	8.84	0.4
	1052	2.0	7.45	403	9.80	210.5	28.0	2.83	8.45	↓
	1057	4.0	7.41	427	9.80	208.8	36.0	2.54	7.80	↓
	1102	6.0	7.39	434	9.83	203.2	35.3	2.30	7.80	↓
	1107	8.0	7.38	437	9.88	199.9	36.8	2.03	7.80	0.4
	1112	10.0	7.38	438	9.90	199.2	37.1	1.94	7.80	↓
	1117	12.0	7.40	440	9.91	196.2	36.1	1.84	7.80	↓
	1122	14.0	7.39	442	9.97	194.7	37.3	1.72	7.82	↓
	1127	16.0	7.39	443	9.99	197.5	37.6	1.76	7.81	0.4
	1132	18.0	7.38	444	9.98	197.9	35.1	1.69	7.81	↓
	1137	20.0	7.38	444	9.99	197.9	35.8	1.61	7.80	↓
	1142	22.0	7.38	445	9.99	197.8	35.2	1.69	7.80	↓

COMMENTS INITIAL PIP @ WELL HEAD @ 0.0PPM 65 PSI COMPRESSOR @ 4CPM

SAMPLED @ 1145 - COLLECTED DUPLICATE (FD-1) AND MS/MSD

SIGNATURE [Signature]



WELL PURGING AND SAMPLING RECORD

WELL ID MARSH RUN PARK SAMPLE NO. MADW 41-52
 WELL/SITE DESCRIPTION YETTER CABIN

DATE 04/23/2014 TIME 0900 AIR TEMP. 47°F

WELL DEPTH _____ ft CASING HEIGHT _____ ft
 WATER DEPTH _____ ft WELL DIAMETER _____ in
 WATER COL. HEIGHT _____ ft SANDPACK DIAM. _____ in
 EQUIVALENT VOLUME OF STANDING WATER _____ (gal) (L)
 PUMP RATE _____ (gpm) (LPM)
 PUMP TIME _____ min
 WELL WENT DRY? () Yes () No PUMP TIME _____ min
 VOL. REMOVED _____ (gal) (L) RECOVERY TIME _____ min
 PURGE AGAIN? () Yes () No TOTAL VOL. REMOVED _____ (gal) (L)

Date	Time	Volume Removed	pH	Cond.	Temp.	ORP	Turb.	DO	Depth to Water from TOC	Pump Rate
		Unit: <u>—</u>								<u>—</u>
<u>4/23/14</u>	<u>0912</u>	<u>—</u>	<u>7.67</u>	<u>477</u>	<u>8.94</u>	<u>116.9</u>	<u>9.5</u>	<u>9.11</u>	<u>—</u>	<u>—</u>

COMMENTS SAMPLED @ SPIGOT BEFORE PRESSURE TANK
SAMPLE COLLECTED @ 0915

SIGNATURE



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

Courier: _____
 Tracking #: _____

Page 1 of 1

Co. Name: EA FARMER FINE, SERVICE, AND TEST.
 Contact (Report to): VICKIE PITMAN
 Address: 225 SHILLING CIRCLE
SUITE 400
HURT VALLEY, MD 21081

Phone: 410-329-5109

PO#: 7757

Project Name#: MESH RUN / 23303

ALS Quote #: _____

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

Email? -Y No. _____
 Fax? -Y No. _____

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time
1 <u>MADW 41-52</u>	<u>STAR FILTER DMS. MEAS</u>	<u>1/23/14 0915</u>	<u>600</u>
2 <u>MW-9</u>	<u>MEAS. ONLY FILTER: AS, BS, B.</u>	<u>1/15</u>	<u>1145</u>
3 <u>FD-1</u>	<u>Colg. filter, PL, M, B.</u>	<u>1/13/14</u>	<u>1300</u>
4 <u>TR-1</u>	<u>MEAS. ONLY FILTER: TCE/PCE</u>		
5	<u>filtering (Zinc, VC</u>		
6	<u>PLEASE INCLUDE A FULL PAPER WITH DRIVING AND EQUINE LEAD</u>		
7	<u>IN THE DEPARTMENT</u>		
8	<u>PLEASE SAMPLE MW-9 AS ISLAND SAMPLE</u>		

Container Type	Container Size	Preservative	ANALYSES/METHOD REQUESTED	Enter Number of Containers Per Analysis
<u>CG</u>	<u>PL</u>	<u>PL</u>		
<u>WA</u>	<u>500ml</u>	<u>IL</u>		
<u>HCl</u>	<u>MDs</u>	<u>-</u>		

Project Comments: _____

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
<u>STEVEN G. YONKAY</u>	<u>1/23/14</u>	<u>1323</u>	<u>DAVID N. WILSON</u>	<u>1/23/14</u>	<u>1300</u>

Receipt Information (Completed by Sample Receiver)	Performed by: <u>WJW</u>
Cooler Temp: <u>4°C</u>	Therm. ID: <u>71-21</u>
No. of Coolers: _____	Notes: _____

Correct containers?	Y	N
Correct sample volume?	Y	N
Received on ice?	Y	N
COC/Labels complete/accurate?	Y	N
Headspace/Volatiles?	Y	N
Container in good condition?	Y	N

Standard	CLP-like	NJ-Reduced	NJ-Full	Other	SDWA Forms? →	State Samples Collected In?
<input type="checkbox"/>	yes <input type="checkbox"/> no <input type="checkbox"/>	MD <input type="checkbox"/> NJ <input type="checkbox"/> NY <input type="checkbox"/> PA <input type="checkbox"/>				

DOD Criteria Required? 100

HEALTH AND SAFETY ACTIVITY REPORT

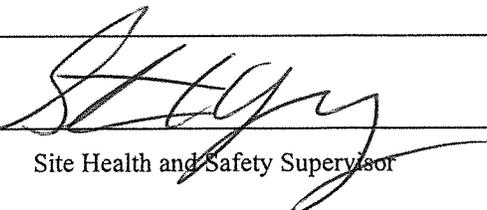
Site: MARSH RUN PARK Location: NEW GUARDIAN, PA

Weather Cond.: AM: 41° PARTLY SUNNY Onsite Hours: From 0716 To 1500

<u>Changes in PPE Levels*</u>	<u>Work Operations</u>	<u>Reasons for Change</u>
<u>NONE - MODIFIED "D"</u>	<u>YETTER CABIN / MW-9</u>	
	<u>GROUNDWATER SAMPLING</u>	<u>NONE</u>

<u>Site Safety and Health Plan Violations</u>	<u>Corrective Action Specified</u>	<u>Corrective Action Taken (yes/no)</u>
	<u>NONE</u>	

Observations and Comments:

Completed by:  Date: 23 APR 2014

Site Health and Safety Supervisor

*Only SSHO may change PPE levels, using only criteria specified in GHASP.

ATTACHMENT 2
LABORATORY ANALYTICAL REPORTS

May 8, 2014

Ms. Tara Lamond
EA Engineering-MD
225 Schilling Circle
Hunt Valley, MD 21031

Certificate of Analysis

Project Name:	2013-MARSH RUN - DOD PROJECT	Workorder:	2003169
Purchase Order:	7739	Workorder ID:	EMS027 MARSH RUN - DOD PROJECT

Dear Ms. Lamond:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, April 23, 2014.

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. Debra J. Musser (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

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



Ms. Debra J. Musser
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: 2003169 EMS027|MARSH RUN - DOD PROJECT

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2003169001	MADW 41-52	Ground Water	4/23/2014 09:15	4/23/2014 13:23	Mr. Steven Yankay
2003169002	MW-9	Ground Water	4/23/2014 11:45	4/23/2014 13:23	Mr. Steven Yankay
2003169003	FD-1	Ground Water	4/23/2014 13:00	4/23/2014 13:23	Mr. Steven Yankay
2003169004	TB-1	Ground Water	4/23/2014 13:23	4/23/2014 13:23	Mr. Steven Yankay

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".

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

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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: 2003169 EMS027|MARSH RUN - DOD PROJECT

Lab ID: **2003169001**
Sample ID: **MADW 41-52**

Date Collected: 4/23/2014 09:15 Matrix: Ground Water
Date Received: 4/23/2014 13:23

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
Trichloroethene	1.2		ug/L	1.0	0.75	0.33	SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	119		%	70 - 120			SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
4-Bromofluorobenzene (S)	105		%	75 - 120			SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
Dibromofluoromethane (S)	110		%	85 - 115			SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
Toluene-d8 (S)	109		%	85 - 120			SW846 8260B	5/2/14 JPA	5/2/14 13:17	JPA	B
METALS											
Arsenic, Total	0.0018J	J	mg/L	0.0030	0.0020	0.0010	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Arsenic, Dissolved	0.0016J	J	mg/L	0.0030	0.0020	0.0010	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Barium, Total	0.13		mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Barium, Dissolved	0.12		mg/L	0.0050	0.0033	0.0016	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Beryllium, Dissolved	0.00067U	U	mg/L	0.0010	0.00067	0.00030	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Cadmium, Dissolved	0.00067U	U	mg/L	0.0010	0.00067	0.00030	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Chromium, Total	0.0020J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Chromium, Dissolved	0.0023		mg/L	0.0020	0.0013	0.00066	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Copper, Total	0.097		mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Copper, Dissolved	0.020		mg/L	0.0050	0.0033	0.0016	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Iron, Total	0.16		mg/L	0.056	0.037	0.019	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Iron, Dissolved	0.033U	U	mg/L	0.050	0.033	0.016	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Lead, Total	0.013		mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Lead, Dissolved	0.0010J	J	mg/L	0.0020	0.0013	0.00066	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Manganese, Total	0.0035J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Manganese, Dissolved	0.0033U	U	mg/L	0.0050	0.0033	0.0016	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1
Mercury, Total	0.00013U	U	mg/L	0.00022	0.00013	0.00007	SW846 6020A	4/30/14 AAM	4/30/14 14:25	MO	F1
Mercury, Dissolved	0.00012J	J	mg/L	0.00020	0.00013	0.00006	SW846 6020A	5/7/14 MO	5/7/14 16:03	MO	E1

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ANALYTICAL RESULTS

Workorder: 2003169 EMS027|MARSH RUN - DOD PROJECT

Lab ID: **2003169001** Date Collected: 4/23/2014 09:15 Matrix: Ground Water
 Sample ID: **MADW 41-52** Date Received: 4/23/2014 13:23

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Debra J Musser
 Ms. Debra J. Musser
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2003169 EMS027|MARSH RUN - DOD PROJECT

Lab ID: **2003169002**

Date Collected: 4/23/2014 11:45 Matrix: Ground Water

Sample ID: **MW-9**

Date Received: 4/23/2014 13:23

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	7.6		ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
trans-1,2-Dichloroethene	2.8	1	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
Trichloroethene	20.0		ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98.7		%	70 - 120			SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
4-Bromofluorobenzene (S)	91.5		%	75 - 120			SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
Dibromofluoromethane (S)	93.8		%	85 - 115			SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
Toluene-d8 (S)	109		%	85 - 120			SW846 8260B	4/24/14 JPA	4/24/14 16:49	JPA	B
METALS											
Arsenic, Total	0.0092		mg/L	0.0030	0.0020	0.0010	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Barium, Total	0.41		mg/L	0.056	0.037	0.019	SW846 6020A	4/30/14 AAM	4/30/14 15:11	MO	K1
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Chromium, Total	0.0012J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Copper, Total	0.0037J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Iron, Total	1.4		mg/L	0.056	0.037	0.019	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Lead, Total	0.0020J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Manganese, Total	0.016		mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1
Mercury, Total	0.00013U	U	mg/L	0.00022	0.00013	0.00007	SW846 6020A	4/30/14 AAM	4/30/14 14:32	MO	K1

4



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ANALYTICAL RESULTS

Workorder: 2003169 EMS027|MARSH RUN - DOD PROJECT

 Lab ID: **2003169003**

Date Collected: 4/23/2014 13:00 Matrix: Ground Water

 Sample ID: **FD-1**

Date Received: 4/23/2014 13:23

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	6.4		ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
trans-1,2-Dichloroethene	4.2	1	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
Trichloroethene	18.2		ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	100		%	70 - 120			SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
4-Bromofluorobenzene (S)	120		%	75 - 120			SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
Dibromofluoromethane (S)	93.8		%	85 - 115			SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
Toluene-d8 (S)	107		%	85 - 120			SW846 8260B	4/24/14 JPA	4/24/14 17:11	JPA	B
METALS											
Arsenic, Total	0.0095		mg/L	0.0030	0.0020	0.0010	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Barium, Total	0.36		mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Chromium, Total	0.0012J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Copper, Total	0.0025J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Iron, Total	1.6		mg/L	0.056	0.037	0.019	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Lead, Total	0.0012J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Manganese, Total	0.0094		mg/L	0.0056	0.0037	0.0019	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1
Mercury, Total	0.00013U	U	mg/L	0.00022	0.00013	0.00007	SW846 6020A	4/30/14 AAM	4/30/14 14:42	MO	E1



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ANALYTICAL RESULTS

Workorder: 2003169 EMS027|MARSH RUN - DOD PROJECT

Lab ID: **2003169004**

Date Collected: 4/23/2014 13:23 Matrix: Ground Water

Sample ID: **TB-1**

Date Received: 4/23/2014 13:23

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	98.3		%	70 - 120			SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
4-Bromofluorobenzene (S)	91.2		%	75 - 120			SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
Dibromofluoromethane (S)	89		%	85 - 115			SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B
Toluene-d8 (S)	106		%	85 - 120			SW846 8260B	4/24/14 JPA	4/24/14 15:43	JPA	B



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PARAMETER QUALIFIERS

#	Lab ID	Sample ID	Analytical Method	Analyte
1	2003169001	MADW 41-52	SW846 8260B	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260B was outside of control limits. The % Recovery was reported as 129 and the control limits were 75 to 120. This result was reported at a dilution of 1.				
1	2003169002	MW-9	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 204 and the control limits were 60 to 140.				
1	2003169003	FD-1	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 204 and the control limits were 60 to 140.				

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**DATA VALIDATION SUMMARY REPORT
MARSH RUN PARK, FAIRVIEW TOWNSHIP, PENNSYLVANIA**

Client: EA Engineering, Science & Technology, Inc., Hunt Valley, Maryland
 SDG: EMS-027
 Laboratory: Analytical Laboratory Services, Middletown, Pennsylvania
 Site: Marsh Run Park, Fairview Township, Pennsylvania
 Date: June 1, 2014

VOCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	MADW 41-52	2003169001	Water
2	MW-9	2003169002	Water
2MS	MW-9MS	2003169002MS	Water
2MSD	MW-9MSD	2003169002MSD	Water
3	FD-1	2003169003	Water
4	TB-1	2003169004	Water

Metals (T/D)			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1T	MADW 41-52	2003169001	Water
1D	MADW 41-52	2003169001	Water
1DMS	MADW 41-52MS	2003169001MS	Water
1DMSD	MADW 41-52MSD	2003169001MSD	Water
2T	MW-9	2003169002	Water
2TMS	MW-9MS	2003169002MS	Water
2TMSD	MW-9MSD	2003169002MSD	Water
3T	FD-1	2003169003	Water

A full data validation was performed on the analytical data for three water samples and one aqueous trip blank sample collected on April 23, 2014 by EA Engineering at the Marsh Run Park site in Fairview Township, Pennsylvania. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis

VOCs
 Total & Dissolved Metals/Hg

Method References

USEPA SW-846 Method 8260B
 USEPA SW-846 Method 6020A

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic and Inorganic Data Review as follows:

- The USEPA “Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review,” June 2008;
- The USEPA “Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,” January 2010;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectroscopy (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Tentatively Identified Compounds (TICs)
- Field Duplicate sample precision

Inorganics

- Holding times and sample preservation
- ICP/MS Tuning
- Initial and continuing calibration verifications
- Method blank and field blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike Analysis
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Volatile Organic Compounds (VOC)

Holding Times

- The samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and mean RRF values.

Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF values.

Method Blank

- The method blanks were free of contamination.

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
TB-1	ND	-	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable %R and RPD values.

Laboratory Control Samples

- The LCS samples exhibited acceptable %R values except the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
LCS-2007600	trans-1,2-Dichloroethene	204%	J	2, 3

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	VOCs			Qualifier
	MW-9 ug/L	FD-1 ug/L	RPD	
cis-1,2-Dichloroethene	7.6	6.4	17%	None
trans-1,2-Dichloroethene	2.8	4.2	40%	
Trichloroethene	20.0	18.2	9%	

Total & Dissolved Metals/Hg

Holding Times

- All samples were prepared and analyzed within 28 days for mercury and 180 days for all other metals.

ICP-MS Tuning

- All criteria were met.

Initial Calibration Verification

- All initial calibration criteria were met.

Continuing Calibration Verification

- All continuing calibration criteria were met.

Method Blank

- The method blanks were free of contamination.

Field Blank

- A field QC sample was not analyzed in this data package.

ICP Interference Check Sample

- The ICP Interference check sample exhibited acceptable %R values.

Laboratory Control Samples

- The LCS sample exhibited acceptable recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable %R and RPD values.

ICP Serial Dilution

- ICP serial dilution percent differences (%D) were within acceptance limits.

ICP-MS Internal Standards

- All criteria were met.

Field Duplicate Sample Precision

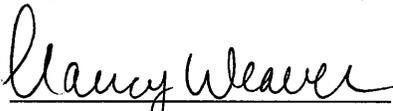
- Field duplicate results are summarized below.

Total Metals/Hg				
Compound	MW-9 mg/L	FD-1 mg/L	RPD	Qualifier
Arsenic	0.0092	0.0095	3%	None
Barium	0.41	0.36	13%	
Chromium	0.0012	0.0012	0%	
Copper	0.0037	0.0025	39%	
Iron	1.4	1.6	13%	
Lead	0.0020	0.0012	50%	
Manganese	0.016	0.0094	52%	

Compound Quantitation

- EDS Sample ID #2T was analyzed at a 10X dilution for barium due to high concentrations. No action was required.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: 
Nancy Weaver
Senior Chemist

Dated: 6/2/14

Data Qualifiers

- U = The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method.
- UJ = The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.
- J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).
- J+ = The result is an estimated quantity, but the result may be biased high.
- J- = The result is an estimated quantity, but the result may be biased low.
- R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MADW 41-52

Lab Name: ALS Global Contract: _____

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EMS-027

Matrix (soil/water): WATER Lab Sample ID: 2003169001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 314050206.D

Level (low/med): _____ Date Received: 4/23/14

% Moisture: not dec. 100.0 Date Analyzed: 5/2/14

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	1.2	
75-01-4	Vinyl Chloride	0.75	U

NW 6/1/14

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

2

SAMPLE NO.

MW-9

Lab Name: ALS Global Contract: _____

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EMS-027

Matrix (soil/water): WATER Lab Sample ID: 2003169002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 314042418.D

Level (low/med): _____ Date Received: 4/23/14

% Moisture: not dec. 100.0 Date Analyzed: 4/24/14

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
156-59-2	cis-1,2-Dichloroethene	7.6	
156-60-5	trans-1,2-Dichloroethene	2.8	
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	20.0	
75-01-4	Vinyl Chloride	0.75	U

MW 6/1/14
Form I VOA-1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

3

SAMPLE NO.

FD-1

Lab Name: ALS Global Contract: _____

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EMS-027

Matrix (soil/water): WATER Lab Sample ID: 2003169003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 314042419.D

Level (low/med): _____ Date Received: 4/23/14

% Moisture: not dec. 100.0 Date Analyzed: 4/24/14

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
156-59-2	cis-1,2-Dichloroethene	6.4	
156-60-5	trans-1,2-Dichloroethene	4.2	
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	18.2	
75-01-4	Vinyl Chloride	0.75	U

MW 6/1/14
Form I VOA-1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

4

SAMPLE NO.

TB-1

Lab Name: ALS Global Contract: _____

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EMS-027

Matrix (soil/water): WATER Lab Sample ID: 2003169004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 314042415.D

Level (low/med): _____ Date Received: 4/23/14

% Moisture: not dec. 100.0 Date Analyzed: 4/24/14

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	0.75	U
75-01-4	Vinyl Chloride	0.75	U

MW 6/1/14

6020 3015

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-027 Method Type: 6020 3015

Sample ID: 2003169001

Client ID: MADW 41-52

Matrix: GROUND WATER

Date Received: 4/23/2014

Level: LOW

% Solids:

Sample Wt/Vol: 45.00

Final Vol: 50.0

Prep Batch ID: 5084

Prep Date: 4/30/2014

Total/Dissolved: TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0018	mg/L	J		M	0.0030	0.0020	0.0010	1.00	4/30/2014	14:25:27
Barium	7440-39-3	0.13	mg/L			M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:25:27
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0010	0.00070	0.00030	1.00	4/30/2014	14:25:27
Cadmium	7440-43-9	0.0007	mg/L	U		M	0.0011	0.0007	0.0004	1.00	4/30/2014	14:25:27
Chromium	7440-47-3	0.0020	mg/L	J		M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:25:27
Copper	7440-50-8	0.097	mg/L			M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:25:27
Iron	7439-89-6	0.16	mg/L			M	0.056	0.037	0.019	1.00	4/30/2014	14:25:27
Lead	7439-92-1	0.013	mg/L			M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:25:27
Manganese	7439-96-5	0.0035	mg/L	J		M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:25:27
Mercury	7439-97-6	0.00013	mg/L	U		M	0.00022	0.00013	0.00007	1.00	4/30/2014	14:25:27

Comments:

MW 6/1/14

6020 3015

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-027 Method Type: 6020 3015

Sample ID: 2003169002		Client ID: MW-9	
Matrix: GROUND WATER	Date Received: 4/23/2014	Level: LOW	
% Solids:	Sample Wt/Vol: 45.00	Final Vol: 50.0	
Prep Batch ID: 5084	Prep Date: 4/30/2014	Total/Dissolved: TOTAL	

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0092	mg/L			M	0.0030	0.0020	0.0010	1.00	4/30/2014	14:32:34
Barium	7440-39-3	0.41	mg/L			M	0.056	0.037	0.019	10.00	4/30/2014	15:11:44
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0010	0.00070	0.00030	1.00	4/30/2014	14:32:34
Cadmium	7440-43-9	0.0007	mg/L	U		M	0.0011	0.0007	0.0004	1.00	4/30/2014	14:32:34
Chromium	7440-47-3	0.0012	mg/L	J		M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:32:34
Copper	7440-50-8	0.0037	mg/L	J		M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:32:34
Iron	7439-89-6	1.4	mg/L			M	0.056	0.037	0.019	1.00	4/30/2014	14:32:34
Lead	7439-92-1	0.0020	mg/L	J		M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:32:34
Manganese	7439-96-5	0.016 J	mg/L			M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:32:34
Mercury	7439-97-6	0.00013	mg/L	U		M	0.00022	0.00013	0.00007	1.00	4/30/2014	14:32:34

Comments: _____

MW 6/1/14

6020 3015

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-027 Method Type: 6020 3015

Sample ID: 2003169003 Client ID: FD-1
 Matrix: GROUND WATER Date Received: 4/23/2014 Level: LOW
 % Solids: Sample Wt/Vol: 45.00 Final Vol: 50.0
 Prep Batch ID: 5084 Prep Date: 4/30/2014 Total/Dissolved: TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0095	mg/L			M	0.0030	0.0020	0.0010	1.00	4/30/2014	14:42:59
Barium	7440-39-3	0.36	mg/L			M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:42:59
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0010	0.00070	0.00030	1.00	4/30/2014	14:42:59
Cadmium	7440-43-9	0.0007	mg/L	U		M	0.0011	0.0007	0.0004	1.00	4/30/2014	14:42:59
Chromium	7440-47-3	0.0012	mg/L	J		M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:42:59
Copper	7440-50-8	0.0025	mg/L	J		M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:42:59
Iron	7439-89-6	1.6	mg/L			M	0.056	0.037	0.019	1.00	4/30/2014	14:42:59
Lead	7439-92-1	0.0012	mg/L	J		M	0.0022	0.0015	0.0007	1.00	4/30/2014	14:42:59
Manganese	7439-96-5	0.0094 J	mg/L			M	0.0056	0.0037	0.0019	1.00	4/30/2014	14:42:59
Mercury	7439-97-6	0.00013	mg/L	U		M	0.00022	0.00013	0.00007	1.00	4/30/2014	14:42:59

Comments: _____

aw 6/1/14

6020 DISS

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-027 Method Type: 6020 DISS

Sample ID: 2003169001

Client ID: MADW 41-52

Matrix: GROUND WATER

Date Received: 4/23/2014

Level: LOW

% Solids:

Sample Wt/Vol: 100.00

Final Vol: 100.0

Prep Batch ID: 6298

Prep Date: 5/7/2014

Total/Dissolved: DISSOLVED

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0016	mg/L	J		M	0.0030	0.0020	0.0010	1.00	5/7/2014	16:03:04
Barium	7440-39-3	0.12	mg/L			M	0.0050	0.0033	0.0016	1.00	5/7/2014	16:03:04
Beryllium	7440-41-7	0.00067	mg/L	U		M	0.001	0.00067	0.00033	1.00	5/7/2014	16:03:04
Cadmium	7440-43-9	0.00067	mg/L	U		M	0.0010	0.00067	0.00033	1.00	5/7/2014	16:03:04
Chromium	7440-47-3	0.0023	mg/L			M	0.0020	0.0013	0.0007	1.00	5/7/2014	16:03:04
Copper	7440-50-8	0.020	mg/L			M	0.0050	0.0033	0.0016	1.00	5/7/2014	16:03:04
Iron	7439-89-6	0.033	mg/L	U		M	0.050	0.033	0.016	1.00	5/7/2014	16:03:04
Lead	7439-92-1	0.0010	mg/L	J		M	0.0020	0.0013	0.0007	1.00	5/7/2014	16:03:04
Manganese	7439-96-5	0.0033	mg/L	U		M	0.0050	0.0033	0.0016	1.00	5/7/2014	16:03:04
Mercury	7439-97-6	0.00012	mg/L	J		M	0.00020	0.00013	0.00007	1.00	5/7/2014	16:03:04

Comments: _____

MW 6/11/14



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

Environmental
Co. Name: EA ENGINEERING, SCIENCE, AND TECH.
Contact (Report to): VICKIE PITMAN
Address: 225 SCHILLING CIRCLE
SUITE 400
HUNT VALLEY, MD 21031
Phone: 410-329-5109

Bill to (if different than Report to):
PO#: 7739
Project Name/ID: MUSH Run / 623303
ALS Quote #: —
TAT: Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
Email? Y N Website: www.eaest.com
Fax? Y N

Sample Description/Location <small>(as it will appear on the lab report)</small>	COC Comments	Sample Date	Military Time
1 MADW 41-52	*LAB FILTER DKS. MEALS	4/23/14	0915
2 MW-9	MEALS ONLY PERMIT: AS, BS, BE	4/23/14	1145
3 FD-1	CG, G, TE, Pb, Mn, Hg	4/23/14	1300
4 TB-1	MEALS ONLY PERMIT: TCE/PCE		
5	CRIBS 12/E, VC		
6 PLEASE INCLUDE A FULL RAW DATA PACKAGE AND EQUUS END			
7 IN THE DEBRIS			
8 USE SAMPLE MW-9 AS AS/AFD SAMPLE			

Project Comments: in 4-23-14 0057

Date	Time	Received By / Company Name	Date	Time
4/23/14	1323	2 <u>Steven Nank</u> ALS	4/23/14	1327



Page 1 of 1
Courier: _____
Tracking #: _____
* 2 0 0 3 1 6 9 *

Receipt Information (Completed by Client/Received by ALS)
Performed by: John
Cooler Temp: 4°C
Therm. ID: TH-21
No. of Coolers: _____
Notes: _____

Correct containers?	Y	N
Correct sample volume?	Y	N
Received on ice?	Y	N
COC Labels complete/accurate?	Y	N
Container in good condition?	Y	N

Circle appropriate Y or N.

ANALYSES/METHOD REQUESTED

CG	PL	PL	PL
VOA	SOA	IL	
HCI	HIDS	-	

Enter Number of Containers Per Analysis

VOC (BZC/B) - TCE/PCE, CRIBS 12/E, VC	3
CG, G, TE, Pb, Mn, Hg only	1
MEALS (6020) - AS, BS, BE	3
CG, G, TE, Pb, Mn, Hg only	1

Container Type	CG	PL	PL	PL
Container Size	VOA	SOA	IL	
Preservative	HCI	HIDS	-	

State Services: MD NJ NY PA

Standard CLP-like NJ-Reduced NJ-Full LEVEL 4

ALS FIELD SERVICES: Pickup Labor Composite Sampling Rental Equipment Other: _____

SAMPLED BY (Please Print): STEVEN G. YANKAY

Relinquished By / Company Name: EA

EDS: Required? If yes, format type: Other _____

DOD Criteria Required? DOD QSM

* G=Grab; C=Composite
**Matrix: Air=Air; DW=Drinking Water; GW=Groundwater; Or=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG=Amber Glass; CG=Clear Glass; PL=Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.



**ATTACHMENT 3
HISTORICAL DATA**

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-1	4/2/2002	ND	14.0	88.0	16.0	ND
	8/2/2002	ND	7.0	42	5.6	ND
	10/9/2002	ND	3.6	7.1	ND	ND
	2/24/2003	ND	9.2	37.2	5.5	ND
	5/19/2003	ND	9.7	23.4	3.5	ND
	8/18/2003	ND	7.0	20.3	3.0	ND
	11/3/2003	ND	7.1	12.6	1.9	ND
	2/23/2004	ND	5.6	4.4	ND	ND
	5/10/2004	ND	3.6	2.7	ND	ND
	9/13/2004	ND	8.6 ^(c)	7.7 ^(c)	1.1 ^(c)	ND
	11/8/2004	ND	9.2	14.1	2.2 ^(c)	ND
	3/24/2005	ND	10.5	14.0	2.4	ND
	6/1/2005	ND	9.7	11.4	2.0	ND
	8/24/2005	ND	11.6	18.0	3.9	ND
	11/22/2005	ND	8.2	12.6	2.5	ND
	3/9/2006	ND	7.2	7.1	1.2	ND
	11/22/2006	ND	19.1	37.7	7.3	ND
	3/26/2008	ND	9.8	20.2	3.2	ND
	3/30/2009	ND	19.2	59.0	9.8	ND
	6/2/2011	ND (0.75 U)	15.8	72.0	8.9	0.88 J
MW-1A	4/2/2002	ND	2.6	16.0	2.7	ND
	8/1/2002	ND	1.6	6.3	ND	ND
	10/9/2002	ND	1.3	6.0	ND	ND
	2/25/2003	ND	1.3 ^(c)	10.7	1.7	ND
MW-1A (dup) ^(a)	2/25/2003	ND	1.4 ^(c)	10.3	1.7	ND
	5/19/2003	ND	1.4	10.8	2.0	ND
MW-1A ^(a)	5/19/2003	ND	1.4	9.4	1.8	ND
	8/18/2003	ND	1.9	10.3	1.8	ND
MW-1A (dup) ^(a)	8/18/2003	ND	2.1	9.3	1.7	ND
	11/3/2003	ND	1.6	5.9	ND	ND
MW-1A (dup) ^(a)	11/3/2003	ND	1.8	6.0	1.3	ND
	2/23/2004	ND	2.7	7.7	1.5	ND
MW-1A (dup) ^(a)	2/23/2004	ND	2.5	7.4	1.6	ND
	5/10/2004	ND	ND	6.9	1.2	ND
MW-1A (dup)*	5/10/2004	ND	ND	6.7	1.2	ND
	9/13/2004	ND	2.2 ^(c)	3.8 ^(c)	ND	ND
	11/8/2004	ND	4.2	7.8	1.3	ND
	3/9/2006	ND	13.5	25.3	5.2	ND
	11/22/2006	ND	16.2	35.2	7.4	ND
	3/26/2008	ND	14.0	43.9	7.8	ND
	3/30/2009	ND	12.4	40.7	6.8	ND
	5/31/2011	ND (0.75 U)	10.7 J	53.1 J	6.1 J	0.37 J

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2-DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-2	4/2/2002	ND	1.1	2.5	ND	ND
MW-2 (dup) ^(a)	4/2/2002	ND	1.0	2.3	ND	ND
	7/31/2002	ND	ND	ND	ND	ND
	10/9/2002	ND	ND	2.3	ND	ND
	2/26/2003	ND	ND	2.8	ND	ND
	5/20/2003	ND	ND	1.9	ND	ND
	8/20/2003	ND	ND	1.2	ND	ND
	11/4/2003	ND	ND	1.5	ND	ND
	2/24/2004	ND	ND	1.1	ND	ND
	5/12/2004	ND	ND	1.8	ND	ND
	9/13/2004	ND	ND	1.7 ^(c)	ND	ND
	11/9/2004	ND	ND	1.0	ND	ND
	3/25/2005	ND	ND	1.4	ND	ND
	6/1/2005	ND	ND	ND	ND	ND
	8/25/2005	ND	ND	ND	ND	ND
	11/22/2005	ND	ND	1.1	ND	ND
	3/9/2006	ND	ND	1.1	ND	ND
	11/21/2006	ND	ND	1.1	ND	ND
	3/26/2008	ND	ND	1.7	ND	ND
	3/31/2009	ND	ND	1.6	ND	ND
	6/1/2011	ND (0.75 U)	0.79 J	1.1	ND (0.75 U)	ND (0.75 U)
MW-2A	4/3/2002	ND	ND	ND	ND	ND
	7/31/2002	ND	ND	1.4	ND	ND
MW-2A (dup) ^(a)	7/31/2002	ND	ND	1.2	ND	ND
	10/8/2002	ND	1.1	ND	ND	ND
	2/26/2003	ND	1.4	ND	ND	ND
	5/20/2003	ND	ND	ND	ND	ND
	8/20/2003	ND	1.6	ND	ND	ND
	11/4/2003	ND	1.6	ND	ND	ND
	2/24/2004	ND	ND	ND	ND	ND
	5/12/2004	ND	ND	ND	ND	ND
	9/13/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	3/9/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	1.1	ND	ND	ND
	3/26/2008	ND	1.0	ND	ND	ND
	3/31/2009	ND	ND	ND	ND	ND
	6/1/2011	ND (0.75 U)	0.84 J	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-3A	4/3/2002	ND	ND	1.6	ND	ND
MW-3A (dup) ^(a)	4/3/2002	ND	ND	1.6	ND	ND
	8/1/2002	ND	ND	2.0	1.1	ND
	10/8/2002	ND	ND	3.6	1.9	ND
	2/26/2003	ND	ND	ND	ND	ND
	5/19/2003	ND	ND	ND	ND	ND
	8/19/2003	ND	ND	ND	ND	ND
	11/3/2003	ND	ND	ND	ND	ND
	2/24/2004	ND	ND	ND	ND	ND
	5/10/2004	ND	ND	ND	ND	ND
	9/13/2004	ND	ND	ND	ND	ND
	11/8/2004	ND	ND	ND	ND	ND
	3/9/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	3/26/2008	ND	ND	ND	ND	ND
	4/3/2009	ND	ND	ND	ND	ND
	5/31/2011	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)
MW-4	4/2/2002	6.2	557	65.0	26.0	ND
	8/1/2002	1.7	248	108	32	2.3
	10/10/2002	1.7	339	114	36	ND
MW-4 (dup) ^(a)	10/10/2002	1.8	313	116	37	ND
	2/25/2003	1.7	256	69	22	ND
	5/19/2003	2.9	217	88.0	31.9	ND
	8/19/2003	2.2	288	92.1	31.2	ND
	11/4/2003	ND	147	34.8	10.1	ND
	2/23/2004	2.3	352	119	42.1	ND
	5/12/2004	1.9	429	120	43.1	ND
	9/14/2004	ND	156	34.4	10.8	ND
	11/8/2004	2.2	313	101	37.3	ND
	3/25/2005	2.4	303	111	37.2	ND
	6/1/2005	2.8	434	166	56.5	ND
	8/24/2005	2.2	387	146	50.4	ND
	11/22/2005	2.0	226	33.8	11.5	ND
	3/8/2006	2.3	348^(e)	139^(e)	49.2	ND
	11/22/2006	1.6	145	14.8	5.8	ND
MW-4 (dup) ^(a)	11/22/2006	1.6	145	13.9	5.5	ND
	6/1/2007	2.3	320	83.7	27.5	ND
	6/15/2007	0.5	77.1	26.8	7.2	ND
	3/26/2008	ND	66.4	13.3	4.6	ND
	3/31/2009	ND	91.0^(f)	35.4	10.1 ^(f)	ND
	6/1/2011	ND (0.75 U)	35.3 J	15.0 J	3.3	ND (0.75 U)
MW-4 (dup) ^(a)	6/1/2011	ND (0.75 U)	36	15.5	3.4	ND (0.75 U)

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-4A	4/2/2002	ND	5.7	1.3	ND	ND
	8/2/2002	ND	24.0	10.0	4.1	ND
	10/10/2002	ND	33	13	3.1	ND
	2/25/2003	ND	7.9 ^(c)	17	1.1	ND
	5/19/2003	ND	3.4	ND	ND	ND
	8/19/2003	ND	1.5	3.4	ND	ND
	11/4/2003	ND	ND	1.6	ND	ND
	2/23/2004	ND	1.2	ND	ND	ND
	5/12/2004	ND	ND	ND	ND	ND
	9/14/2004	ND	ND	1.5	ND	ND
	11/8/2004	ND	1.5	ND	ND	ND
	3/25/2005	ND	1.8	ND	ND	ND
	6/1/2005	ND	2.8	ND	ND	ND
	8/25/2005	ND	4.4	1.4	ND	ND
	11/22/2005	ND	31.9	8.7	2.1	ND
	3/8/2006	ND	5.3	11.5	ND	ND
	11/22/2006	ND	14.8	4.9	ND	ND
	4/3/2009	ND	ND	ND	ND	ND
	6/1/2011	ND (3.8 UJ)	ND (3.8 UJ)	ND (3.8 UJ)	ND (3.8 UJ)	ND (3.8 UJ)
MW-5	4/4/2002	ND	ND	ND	ND	ND
	7/29/2002	ND	ND	ND	ND	ND
	10/14/2002	ND	ND	ND	ND	ND
	2/27/2003	ND	ND	ND	ND	ND
	5/22/2003	ND	ND	ND	ND	ND
	8/21/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/25/2004	ND	ND	ND	ND	ND
	5/11/2004	ND	ND	ND	ND	ND
	9/15/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	3/24/2005	ND	ND	ND	ND	ND
	5/31/2005	ND	ND	ND	ND	ND
	8/23/2005	ND	ND	ND	ND	ND
	11/21/2005	ND	ND	ND	ND	ND
	3/7/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	4/1/2009	ND	ND	ND	ND	ND

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2-DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-5A	4/4/2002	ND	ND	ND	ND	ND
	7/29/2002	ND	ND	ND	ND	ND
	10/14/2002	ND	ND	ND	ND	ND
	2/28/2003	ND	ND	ND	ND	ND
	5/22/2003	ND	ND	ND	ND	ND
	8/21/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/25/2004	ND	ND	ND	ND	ND
	5/11/2004	ND	ND	ND	ND	ND
	9/15/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	3/24/2005	ND	ND	ND	ND	ND
	5/31/2005	ND	ND	ND	ND	ND
	8/23/2005	ND	ND	ND	ND	ND
	11/21/2005	ND	ND	ND	ND	ND
	3/7/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	4/1/2009	ND	ND	ND	ND ^(e)	ND
MW-5A (dup) ^(g)	4/1/2009	ND	ND	ND	ND	ND
MW-6	4/4/2002	ND	ND	ND	ND	ND
MW-6 (dup) ^(a)	4/4/2002	ND	ND	ND	ND	ND
	7/30/2002	ND	ND	ND	ND	ND
	10/11/2002	ND	ND	ND	ND	ND
	2/27/2003	ND	ND	ND	ND	ND
	5/21/2003	ND	ND	ND	ND	ND
	8/21/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/25/2004	ND	ND	ND	ND	ND
MW-6	5/11/2004	ND	ND	ND	ND	ND
	9/15/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	4/1/2009	ND	ND	ND	ND	ND

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-6A	4/4/2002	ND	ND	ND	ND	ND
	7/30/2002	ND	ND	ND	ND	ND
	10/11/2002	ND	ND	ND	ND	ND
	2/26/2003	ND	ND	ND	ND	ND
	5/21/2003	ND	ND	ND	ND	ND
	8/21/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/25/2004	ND	ND	ND	ND	ND
	5/11/2004	ND	ND	ND	ND	ND
	9/15/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	4/1/2009	ND	ND	ND	ND	ND
MW-7	4/4/2002	ND	ND	ND	ND	ND
	7/30/2002	ND	ND	ND	ND	ND
	10/14/2002	ND	ND	ND	ND	ND
	2/28/2003	ND	ND	ND	ND	ND
	5/22/2003	ND	ND	ND	ND	ND
	8/21/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/25/2004	ND	ND	ND	ND	ND
	5/11/2004	ND	ND	ND	ND	ND
	9/15/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	4/1/2009	ND	ND	ND	ND	ND
MW-7A	4/3/2002	ND	ND	ND	ND	ND
	7/31/2002	ND	ND	ND	ND	ND
	10/10/2002	ND	ND	ND	ND	ND
	2/25/2003	ND	ND	ND	ND	ND
	5/20/2003	ND	ND	ND	ND	ND
	8/20/2003	ND	ND	ND	ND	ND
	11/5/2003	ND	ND	ND	ND	ND
	2/24/2004	ND	ND	ND	ND	ND
	5/10/2004	ND	ND	ND	ND	ND
	9/14/2004	ND	ND	ND	ND	ND
	11/8/2004	ND	ND	1.5	ND	ND
	4/1/2009	ND	ND	ND	ND	ND

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-8 ^(b)	5/21/2003	2.4	376	449.0	99.7	2.5
	8/18/2003	1.5	276	371	81.9	2.5
	11/3/2003	2.0	302	423	104	3.4
	2/23/2004	ND	334	507	126	2.9
	5/11/2004	1.5	386	476	106	2.0
	9/13/2004	2.4 ^(c)	412 ^(c)	570	115 ^(c)	1.6
MW-8 (dup) ^(a)	9/13/2004	2.7 ^(c)	373 ^(c)	549	120 ^(c)	1.4
	11/8/2004	1.8	315	507	91	1.1
MW-8 (dup) ^(a)	11/8/2004	1.7	321	525	92.5	1.1
	3/24/2005	2.2	280	426	99.8	2.0
MW-8 (dup) ^(a)	3/24/2005	2.0	289	438	97.6	2.0
	6/1/2005	1.5	326	514 ^(c)	111	2.6
	8/24/2005	1.4	309	453	84.6	1.9
MW-8 (dup) ^(a)	8/24/2005	1.9	285	418	92.6	2.2
	11/22/2005	1.1	254	457	81.7	1.6
	3/8/2006	1.4	259	357	83.1	1.5
MW-8 (dup) ^(a)	3/8/2006	1.5	259	359	86.9	1.5
	11/22/2006	1.9	261	386	73.8	1.1
	6/1/2007	2.1	236	376	76.7	ND
	6/15/2007	1.9	229	206	51.3	ND
	3/27/2008	2.1	271	368	83.2	2.1
	4/2/2009	1.9	269	328	65.6	1.5
	7/15/2010	0.85J	307	316	64.2	0.56J
	11/9/2010	ND (3.8U)	264	280	51.3	ND (3.8U)
	6/1/2011	0.93 J	199 J	197 J	40.0 J	0.75 J
MW-8A ^(b)	5/20/2003	ND	ND	ND	ND	ND
	8/18/2003	ND	ND	ND	ND	ND
	11/3/2003	ND	ND	ND	ND	ND
	2/23/2004	ND	ND	ND	ND	ND
	5/11/2004	ND	ND	ND	ND	ND
	9/13/2004	ND	ND	ND	ND	ND
	11/8/2004	ND	ND	ND	ND	ND
	3/8/2006	ND	ND	ND	ND	ND
	11/22/2006	ND	ND	ND	ND	ND
	3/26/2008	ND	ND	ND	ND	ND
MW-8 (dup) ^(a)	3/26/2008	ND	ND	ND	ND	ND
	4/2/2009	ND	ND	2.9	ND	ND
	6/1/2011	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)
MW-8 (dup) ^(a)	6/1/2011	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2-DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-9 ^(b)	5/21/2003	ND	13.0	3.4	1.7	ND
	8/19/2003	ND	19.4	4.6	2.3	ND
	11/4/2003	ND	22.2	4.8	2.8	ND
	2/24/2004	ND	19.0	3.3	2.1	ND
	5/10/2004	ND	19.5	5.2	2.7	ND
	9/14/2004	ND	19.7	3.9	2.2	ND
	11/9/2004	ND	17.5	3.0	2.0	ND
	3/24/2005	ND	16.6	3.7	2.0	ND
	6/1/2005	ND	22.1	5.3	3.0	ND
	8/25/2005	ND	29.4	8.8	4.8	ND
	11/21/2005	ND	22.2	5.1	3.3	ND
	3/8/2006	ND	21.9	4.5	2.5	ND
	11/22/2006	ND	16.7	3.7	2.0	ND
	3/27/2008	ND	14.0	2.7	1.5	ND
	4/2/2009	ND	10.6	2.4	1.4	ND
	7/15/2010	ND	16.2	3.4	2.3	ND
	11/9/2010	ND	15.8	2.8	1.7	ND
	6/1/2011	ND (0.75 UJ)	17.1 J	5.7 J	1.3 J	ND (0.75 UJ)
	6/4/2013	ND (0.75 U)	20.5	6.1	2.9	ND (0.75 U)
	10/9/2013	ND (0.75 U)	22.1	7.4	3.4	ND (0.75 U)
4/23/2014	ND (0.75 U)	20.0	7.6	2.8	ND (0.75 U)	
MW-9A ^(b)	5/21/2003	ND	ND	ND	ND	ND
	8/19/2003	ND	ND	ND	ND	ND
	11/4/2003	ND	ND	ND	ND	ND
	2/24/2004	ND	ND	ND	ND	ND
	5/10/2004	ND	ND	ND	ND	ND
	9/14/2004	ND	ND	ND	ND	ND
	11/9/2004	ND	ND	ND	ND	ND
	3/8/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	3/27/2008	ND	ND	ND	ND	ND
	4/2/2009	ND	ND	ND	ND	ND
6/1/2011	ND (0.75 UJ)	ND (0.75 UJ)	ND (0.75 UJ)	ND (0.75 UJ)	ND (0.75 UJ)	
MW-10 ^(d)	4/18/2005	ND	ND	ND	ND	ND
	6/1/2005	ND	ND	ND	ND	ND
	8/24/2005	ND	ND	ND	ND	ND
	11/22/2005	ND	ND	ND	ND	ND
	3/9/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	3/26/2008	ND	ND	ND	ND	ND
	3/30/2009	ND	ND	ND	ND	ND

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2-DCE 100 µg/L	Vinyl Chloride 2 µg/L
MW-11 ^(d)	4/18/2005	ND	1.5	ND	ND	ND
	6/1/2005	ND	ND	ND	ND	ND
	8/24/2005	ND	ND	ND	ND	ND
	11/22/2005	ND	8.9	2.3	ND	ND
	3/9/2006	ND	3.0	1.8	ND	ND
	11/20/2006	ND	2.1	1.4	ND	ND
	3/26/2008	ND	2.7	2.5	ND	ND
	3/30/2009	ND	ND	ND	ND	ND
MW-12 ^(d)	4/18/2005	ND	8.3	ND	ND	ND
	5/31/2005	ND	14.4	1.3	ND	ND
	8/23/2005	ND	30.4	2.0	ND	ND
	11/21/2005	ND	17.6	1.7	ND	ND
	3/7/2006	ND	16.7	2.3	ND	ND
	11/20/2006	ND	15.0	3.0	ND	ND
	3/27/2008	ND	4.9	2.1	ND	ND
	4/2/2009	ND	3.7	2.9	2.0	ND
	5/31/2011	ND (0.75 UJ)	6.3 J	2.0 J	0.87 J	ND (0.75 UJ)
MW-13 ^(d)	4/18/2005	ND	1.1	ND	ND	ND
MW-13 (dup) ^(a)	4/18/2005	ND	1.1	ND	ND	ND
	5/31/2005	ND	ND	ND	ND	ND
MW-13 (dup) ^(a)	5/31/2005	ND	1.0	ND	ND	ND
	8/25/2005	ND	12.3	2.2	ND	ND
	11/21/2005	ND	8.9	2.1	ND	ND
MW-13 (dup) ^(a)	11/21/2005	ND	9.8	2.7	ND	ND
	3/10/2006	ND	2.5	ND	ND	ND
	11/21/2006	ND	3.8	1.6	ND	ND
	3/27/2008	ND	1.8	1.2	ND	ND
	4/3/2009	ND	ND	ND	ND	ND
MW-14 ^(d)	4/18/2005	ND	ND	ND	ND	ND
	5/31/2005	ND	ND	ND	ND	ND
	8/25/2005	ND	ND	ND	ND	ND
	11/21/2005	ND	ND	ND	ND	ND
	3/10/2006	ND	ND	ND	ND	ND
	11/21/2006	ND	ND	ND	ND	ND
	3/27/2008	ND	1.8	ND	ND	ND
	4/3/2009	ND	ND	ND	ND	ND
MW-14 (dup) ^(g)	4/3/2009	ND	ND	ND	ND	ND
	7/15/2010	ND	ND	ND	ND	ND
	11/9/2010	ND	ND	ND	ND	ND
	5/31/2011	ND (0.75 UJ)	0.46 J	ND (0.75 UJ)	ND (0.75 UJ)	ND (0.75 UJ)
MW-15	7/15/2010	ND	0.85 J	1.6	ND	ND
	11/9/2010	ND	0.55J	0.63J	ND	ND
	5/31/2011	ND (0.75 UJ)	1.4 J	2.1 J	0.36 J	ND (0.75 UJ)

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2- DCE 100 µg/L	Vinyl Chloride 2 µg/L
PW-1	NS	NS	NS	NS	NS	NS
EW-1	4/3/2009	ND	23.3	60.7 ^(e)	10.4	ND
EW-2	3/31/2009	ND	11.9^(f)	554	42.5 ^(f)	14.9
EW-3	4/3/2009	ND	18.8	29.0	4.2	ND
270A	3/30/2009	ND	ND	ND	ND	ND
270B	3/30/2009	ND	ND	ND	ND	ND
284A	3/30/2009	ND	ND	ND	ND	ND
284B	3/30/2009	ND	ND	ND	ND	ND
288A	3/30/2009	ND	ND	ND	ND	ND
288B	3/30/2009	ND	ND	ND	ND	ND
302A	3/30/2009	ND	ND	ND	ND	ND
302B	3/30/2009	ND	ND	ND	ND	ND
305	1/29/2003	ND	ND	ND	ND	ND
305	3/30/2009	ND	ND	ND	ND	ND
RW-305	6/14/2012	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)
MADW 41-52	7/15/2010	ND	0.64 J	ND	ND	ND
DUP-1 (MADW 41-52)	7/15/2010	ND	ND	ND	ND	ND
	11/9/2010	ND	ND	1.2	ND	ND
	5/31/2011	ND (0.75 UJ)	2.3 J	ND (0.75 UJ)	ND (0.75 UJ)	ND (0.75 UJ)
	6/14/2012	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)
	11/8/2012	ND (0.75U)	0.50 J	ND (0.75U)	ND (0.75U)	ND (0.75 UJ)
	6/2/2013	ND (0.75U)	0.90 J	ND (0.75U)	ND (0.75U)	ND (0.75 U)
	10/9/2013	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)
	4/23/2014	ND (0.75U)	1.2	ND (0.75U)	ND (0.75U)	ND (0.75U)
MADW 121-132	7/15/2010	ND	17.5	ND	ND	ND
	11/9/2010	ND	17.4	0.37J	ND	ND
DUP-1 (MADW 121-132)	11/9/2010	ND	17.2	0.40J	ND	ND
	5/31/2011	ND (0.75 UJ)	18.0 J	0.59 J	ND (0.75 UJ)	ND (0.75 UJ)
MADW 170-181	7/15/2010	3.5	432	7.6	3.9	ND
	11/9/2010	3.8	580	9.1	4.4	ND
	5/31/2011	3.0	358	6.7	3.3	ND (0.75U)
MADW 184-195	7/15/2010	0.90 J	270	6.4	3.0	ND
	11/9/2010	1.9	351	7.7	3.5	ND
	5/31/2011	1.5	245	13.6	3.0	ND (0.75 U)

Attachment 3, Table 1 - Historical VOC Results

Monitoring Well	Date	PCE 5 µg/L	TCE 5 µg/L	Cis 1,2-DCE 70 µg/L	Trans 1,2-DCE 100 µg/L	Vinyl Chloride 2 µg/L
MACW ¹	8/21/2003	ND	10.8	ND	ND	ND
	11/3/2003	ND	21.2	ND	ND	ND
	2/23/2004	ND	23.4	ND	ND	ND
	5/10/2004	ND	13.3	ND	ND	ND
	9/13/2004	ND	16.0^(c)	ND	ND	ND
	11/9/2004	ND	3.0	ND	ND	ND
	3/24/2005	ND	7.8	ND	ND	ND
	4/18/2005	ND	21.1	ND	ND	ND
	5/31/2005	ND	15.4	ND	ND	ND
	8/23/2005	ND	29.5	ND	ND	ND
	11/21/2005	ND	18.0	ND	ND	ND
	3/7/2006	ND	30.1	ND	ND	ND
	11/20/2006	ND	23.2	ND	ND	ND
	3/28/2008	ND	9.8	ND	ND	ND
	3/31/2009	ND	6.8	ND	ND	ND
	7/15/2010	ND	10.0	ND	ND	ND
	11/9/2010	ND	4.6	ND	ND	ND
	5/31/2011	ND (0.75 U)	20.4	ND (0.75 U)	ND (0.75 U)	ND (0.75 U)

Notes:

Shaded and **Bolded** results represent exceedances of 2011 PADEP RDC MSC/Record of Decision (ROD) Remedial Action Objectives (RAOS)

¹ Monitoring well MACW was abandoned on 26 August 2011.

PADEP = Pennsylvania Department of Environmental Protection

MSC = Medium Specific Concentration

RDC = Residential Direct Contact

ND = Not detected above the laboratory limit of detection (LOD)

NA = Not available

NS = Not sampled

a) Duplicate samples were submitted to the laboratory as blind duplicates.

b) Wells installed February 2003.

c) This compound was recovered above quality control criteria in the QC associated with this sample. The data user is cautioned that results may be biased high.

d) Wells installed March 2005.

e) This compound failed set criteria for the associated matrix spike and/or matrix spike duplicate but passed in the laboratory control sample, satisfying method criteria.

f) Laboratory result may be biased higher than the actual result

g) Duplicate samples were submitted as field duplicates

All analytical results are in micrograms per liter (µg/L)

TCE = Trichloroethene

Cis 1,2-DCE = Cis 1,2-dichloroethylene

Trans 1,2-DCE = Trans 1,2-dichloroethylene

PCE = Tetrachloroethene

U = Not detected. The associated number indicates the laboratory LOD.

J = Analyte present. Indicates an estimated value between the method Detection Limit (DL) and the Limit of Quantitation (LOQ) for the analyte.

UJ = Not detected. LOQ may be inaccurate or imprecise.

MADW = Mifflin Avenue Deep Well

MACW = Mifflin Avenue Cabin Well (previously referred to as the Mifflin Avenue Residential Well)

Attachment 3, Table 2 - Historical Metals Results

Sample ID	Date	Analyte (PADEP MSC/ROD RAO) [mg/L]								
		Arsenic (0.01/0.05)	Barium (2/1)	Beryllium (0.004/0.0005)	Cadmium (0.005/0.01)	Chromium (0.1/0.05)	Copper (1/1.3)	Iron (0.3*/NA)	Lead (0.005/0.005)	Manganese (0.3*/NA)
MW-1	4/2/2002	ND	0.56	ND	ND	0.007	ND	3.5	ND	0.16
	8/2/2002	ND	0.3	ND	ND	ND	ND	0.26	ND	0.2
	10/9/2002	ND	0.3	ND	ND	ND	ND	0.16	ND	0.006
	2/24/2003	ND	0.31	ND	ND	ND	ND	0.5	ND	0.023
	5/19/2003	ND	0.358	ND	ND	ND	ND	1.06	ND	0.035
	8/18/2003	ND	0.371	ND	ND	ND	ND	0.91	ND	0.45
	11/3/2003	ND	0.308	ND	ND	ND	ND	0.45	ND	0.018
	2/23/2004	ND	0.327	ND	ND	ND	ND	1.81	ND	0.047
	5/10/2004	ND	0.301	ND	ND	ND	0.025	0.68	ND	0.023
	9/13/2004	ND	0.31	ND	ND	0.008	0.013	0.59	ND	0.02
	11/8/2004	ND	0.364	ND	ND	ND	ND	1	ND	0.023
**	6/2/2011	ND (0.0020 U)	0.095 J	ND (0.00067 U)	ND (0.00067 U)	ND (0.0013 U)	0.0057 B	0.20 B	ND (0.0013 U)	0.060 B
MW-1A	4/2/2002	ND	0.04	ND	ND	ND	0.018	0.1	ND	0.008
	8/1/2002	ND	0.052	ND	ND	ND	ND	0.87	ND	0.043
	10/9/2002	ND	0.6	ND	ND	ND	ND	1.4	ND	0.063
	2/25/2003	ND	0.046	ND	ND	ND	ND	0.4	ND	0.08
MW-1A (DUP)	2/25/2003	ND	0.05	ND	ND	ND	ND	0.94	ND	0.131
	5/19/2003	ND	0.049	ND	ND	ND	ND	0.26	ND	0.057
MW-1A (DUP)	5/19/2003	ND	0.045	ND	ND	ND	ND	0.12	ND	0.076
	8/18/2003	ND	0.053	ND	ND	ND	ND	ND	ND	0.014
MW-1A (DUP)	8/18/2003	ND	0.053	ND	ND	ND	ND	ND	ND	0.014
	11/3/2003	ND	0.047	ND	ND	ND	ND	ND	ND	0.093
MW-1A (DUP)	11/3/2003	ND	0.047	ND	ND	ND	ND	ND	ND	0.091
	2/23/2004	ND	0.047	ND	ND	ND	ND	0.15	ND	0.038
MW-1A (DUP)	2/23/2004	ND	0.046	ND	ND	ND	ND	0.15	ND	0.041
	5/10/2004	ND	0.051	ND	ND	ND	0.015	0.12	ND	0.028
	9/13/2004	ND	0.052	ND	ND	ND	ND	0.13	ND	0.03
	11/8/2004	ND	0.056	ND	ND	ND	ND	0.08	ND	0.409
MW-1A (DUP)	5/10/2004	ND	0.05	ND	ND	ND	0.015	0.11	ND	0.025
**	6/1/2011	ND (0.0020 U)	0.033 J	ND (0.00067 U)	ND (0.00067 U)	0.0014 J	ND (0.0033 U)	0.13	ND (0.0013 U)	0.0088
MW-2	4/2/2002	ND	0.16	ND	ND	ND	ND	0.16	ND	ND
	7/31/2002	ND	0.1	ND	ND	ND	ND	ND	ND	ND
	10/9/2002	ND	0.18	ND	ND	ND	ND	ND	ND	ND
	2/26/2003	ND	0.15	ND	ND	ND	ND	ND	ND	ND
	5/20/2003	ND	0.13	ND	ND	ND	ND	ND	ND	ND
	8/20/2003	ND	0.126	ND	ND	ND	ND	0.22	ND	ND
	11/4/2003	ND	0.117	ND	ND	ND	ND	ND	ND	ND
	2/24/2004	ND	0.12	ND	ND	ND	ND	ND	ND	ND
	5/12/2004	ND	0.131	ND	ND	ND	ND	ND	ND	ND
	9/13/2004	ND	0.109	ND	ND	ND	ND	ND	ND	ND
	11/9/2004	ND	0.117	ND	ND	ND	ND	ND	ND	ND
MW-2 (DUP)	4/2/2002	ND	0.16	ND	ND	ND	ND	ND	ND	ND
**	6/1/2011	0.0014 K	0.10 J	ND (0.00067 U)	ND (0.00067 U)	ND (0.0013 U)	ND (0.0033)	0.24	ND (0.0013 U)	ND (0.0033 U)
MW-2A	4/3/2002	ND	0.08	ND	ND	ND	0.033	0.23	ND	0.098
	7/31/2002	ND	0.07	ND	0.002	ND	0.029	1.2	ND	2.4
	10/8/2002	ND	0.07	ND	0.002	ND	0.19	0.91	ND	2.6
	2/26/2003	ND	0.042	ND	ND	ND	0.04	1.02	0.007	0.103
	5/20/2003	ND	0.068	ND	ND	ND	0.05	2.11	0.007	1.23
	8/20/2003	ND	0.099	ND	ND	ND	0.065	1.02	ND	1.05
	11/4/2003	ND	0.084	ND	ND	ND	0.035	1.15	ND	0.58
	2/24/2004	ND	0.061	ND	ND	ND	0.042	4.3	0.008	0.166
	5/12/2004	ND	0.1	ND	ND	ND	0.105	15.6	0.03	1.4
	9/13/2004	ND	0.129	ND	ND	ND	0.09	3.65	0.009	1.16
	11/9/2004	ND	0.15	ND	ND	ND	0.064	3.55	ND	0.888
MW-2A (DUP)	7/31/2002	ND	0.07	ND	0.002	ND	0.027	1.1	ND	2.4
**	6/1/2011	0.0020 J	0.087 J	ND (0.00067 U)	ND (0.00067 U)	0.00095 J	0.021	0.31	ND (0.0013 U)	0.24

Attachment 3, Table 2 - Historical Metals Results

Sample ID	Date	Analyte (PADEP MSC/ROD RAO) [mg/L]								
		Arsenic (0.01/0.05)	Barium (2/1)	Beryllium (0.004/0.0005)	Cadmium (0.005/0.01)	Chromium (0.1/0.05)	Copper (1/1.3)	Iron (0.3*/NA)	Lead (0.005/0.005)	Manganese (0.3*/NA)
MW-3	4/3/2002	ND	0.07	ND	ND	ND	ND	ND	ND	ND
MW-3 (DUP)	4/3/2002	ND	0.07	ND	ND	ND	ND	ND	ND	ND
	8/1/2002	ND	0.078	ND	ND	ND	ND	ND	ND	ND
MW-3	10/8/2002	ND	0.088	ND	ND	ND	ND	ND	ND	ND
	2/26/2003	ND	0.052	ND	ND	ND	ND	ND	ND	ND
	5/19/2003	ND	0.078	ND	ND	ND	ND	ND	ND	ND
	8/19/2003	ND	0.053	ND	ND	0.008	ND	ND	ND	ND
	11/3/2003	ND	0.059	ND	ND	ND	ND	ND	ND	ND
	2/24/2004	ND	0.043	ND	ND	ND	ND	ND	ND	ND
	5/10/2004	ND	0.052	ND	ND	ND	ND	0.08	ND	ND
	9/13/2004	ND	0.052	ND	ND	ND	ND	ND	ND	ND
	11/8/2004	ND	0.072	ND	ND	ND	ND	ND	ND	ND
MW-3A **	5/31/2011	ND (0.0020 U)	0.084 J	ND (0.00067 U)	0.0003 J	0.011	0.0018 J	0.26	ND (0.0013 U)	ND
MW-4	4/2/2002	ND	0.21	ND	ND	ND	ND	ND	ND	ND
	8/1/2002	ND	0.21	ND	ND	ND	ND	ND	ND	ND
	10/10/2002	ND	0.22	ND	ND	ND	ND	ND	ND	ND
MW-4 (DUP)	10/10/2002	ND	0.23	ND	ND	ND	ND	ND	ND	ND
	2/25/2003	ND	0.19	ND	ND	ND	ND	ND	ND	ND
	5/19/2003	ND	0.189	ND	ND	ND	ND	ND	ND	ND
	8/19/2003	ND	0.189	ND	ND	ND	ND	ND	ND	ND
	11/4/2003	ND	0.168	ND	ND	0.014	ND	ND	ND	ND
	2/23/2004	ND	0.186	ND	ND	ND	ND	ND	ND	ND
	5/12/2004	ND	0.191	ND	ND	ND	ND	ND	ND	ND
	9/14/2004	ND	0.164	ND	ND	ND	ND	ND	ND	ND
	11/8/2004	ND	0.186	ND	ND	ND	ND	ND	ND	ND
	** 6/1/2011	ND (0.0020 U)	0.14 J	ND (0.00067 U)	ND (0.00067 U)	0.0029	ND (0.0033 U)	0.16 B	ND (0.0013 U)	0.074 B
MW-4A	4/2/2002	0.062	0.88	0.17	0.028	0.98	0.15	160	0.31	2.2
	8/2/2002	ND	0.082	ND	ND	ND	ND	7.6	0.021	1.6
	10/10/2002	ND	0.099	ND	ND	0.007	ND	12	0.27	1.1
	2/25/2003	0.01	0.144	ND	ND	0.011	0.018	25	0.03	2.2
	5/19/2003	ND	0.088	ND	ND	0.011	0.021	14.7	0.024	0.335
	8/19/2003	0.014	0.046	ND	ND	ND	ND	15.3	ND	3.19
	11/4/2003	ND	0.056	ND	ND	ND	0.031	11.6	ND	3.97
	2/23/2004	ND	0.039	ND	ND	ND	0.063	4.6	0.03	0.216
	5/12/2004	ND	0.048	ND	ND	ND	0.04	5.23	0.019	0.306
	9/14/2004	ND	0.051	ND	ND	ND	0.02	8.92	ND	4.7
	11/8/2004	ND	0.049	ND	ND	ND	0.034	2.71	0.008	1.39
	** 6/1/2011	0.002	0.031 J	ND (0.0067 U)	ND (0.0067 U)	0.0016 J	ND (0.0033 U)	1.3	ND (0.0013 U)	0.43
MW-5	4/4/2002	ND	0.05	ND	ND	ND	ND	0.3	ND	0.01
	7/29/2002	ND	0.22	ND	ND	ND	ND	0.33	ND	0.064
	10/14/2002	ND	0.29	ND	ND	ND	ND	ND	ND	0.013
	2/27/2003	ND	0.26	ND	ND	ND	ND	0.07	ND	ND
	5/22/2003	ND	0.23	ND	0.001	ND	0.014	ND	ND	0.01
	8/21/2003	ND	0.252	ND	ND	0.05	0.012	0.6	ND	0.032
	11/5/2003	ND	0.288	ND	ND	0.151	ND	1.3	ND	0.357
	2/25/2004	ND	0.256	ND	ND	0.573	0.037	5.53	ND	0.087
	5/11/2004	ND	0.212	ND	ND	0.074	0.049	0.69	ND	0.013
	9/15/2004	ND	0.237	ND	ND	0.097	0.039	0.93	ND	0.017
	11/9/2004	ND	0.168	ND	0.002	0.023	0.053	1.36	0.025	0.033
MW-5A	4/4/2002	ND	0.14	ND	0.006	ND	ND	33	0.012	4.8
	7/29/2002	ND	0.14	ND	ND	ND	ND	29	ND	4.1
	10/14/2002	ND	0.14	ND	ND	ND	ND	26	ND	4.1
	2/28/2003	ND	0.22	ND	0.003	0.017	0.03	41.8	0.015	4.38
	5/22/2003	ND	0.18	ND	0.002	0.009	ND	35.2	0.011	4.57
	8/21/2003	ND	0.143	ND	ND	ND	ND	29.3	ND	4.25
	11/5/2003	ND	0.148	ND	ND	ND	0.011	36.9	ND	4.76
	2/25/2004	ND	0.146	ND	ND	ND	0.011	31.4	ND	4.57
	5/11/2004	ND	0.147	ND	ND	ND	0.012	30.2	ND	4.42

Attachment 3, Table 2 - Historical Metals Results

Sample ID	Date	Analyte (PADEP MSC/ROD RAO) [mg/L]								
		Arsenic (0.01/0.05)	Barium (2/1)	Beryllium (0.004/0.0005)	Cadmium (0.005/0.01)	Chromium (0.1/0.05)	Copper (1/1.3)	Iron (0.3*/NA)	Lead (0.005/0.005)	Manganese (0.3*/NA)
MW-6	9/15/2004	ND	0.16	ND	ND	ND	0.041	23	ND	3.85
	11/9/2004	ND	0.148	ND	ND	ND	0.039	28.1	ND	3.72
	4/4/2002	ND	0.5	ND	ND	ND	ND	ND	ND	0.06
MW-6 (DUP)	4/4/2002	ND	0.43	ND	ND	ND	ND	0.09	ND	0.03
	7/30/2002	ND	0.063	ND	ND	ND	ND	2.6	ND	0.19
MW-6	10/11/2002	ND	0.52	ND	ND	ND	ND	ND	ND	0.088
	2/27/2003	ND	0.519	ND	ND	ND	ND	ND	ND	0.057
	5/21/2003	ND	0.485	ND	ND	ND	ND	ND	ND	0.024
	8/21/2003	ND	0.472	ND	ND	0.008	ND	0.31	ND	0.043
	11/5/2003	ND	0.515	ND	ND	ND	ND	0.47	ND	0.054
	2/25/2004	ND	0.448	ND	ND	ND	ND	0.09	ND	0.026
	5/11/2004	ND	0.444	ND	ND	ND	ND	0.08	ND	0.013
	9/15/2004	ND	0.41	ND	ND	ND	ND	ND	ND	0.019
	11/9/2004	ND	0.295	ND	ND	ND	0.013	0.97	0.007	0.044
MW-6A	4/4/2002	ND	0.059	ND	ND	ND	ND	0.82	ND	0.01
	7/30/2002	ND	0.5	ND	ND	ND	ND	ND	ND	0.096
	10/11/2002	ND	0.076	ND	ND	ND	ND	3.1	ND	0.33
	2/26/2003	ND	0.069	ND	ND	ND	0.028	0.85	0.009	0.022
	5/21/2003	ND	0.085	ND	ND	ND	0.062	4.37	0.032	0.172
	8/21/2003	ND	0.1	ND	ND	ND	0.124	1.92	0.02	0.054
	11/5/2003	ND	0.062	ND	ND	ND	ND	1.89	ND	0.216
	2/25/2004	ND	0.052	ND	ND	ND	0.014	1.06	ND	1.02
	5/11/2004	ND	0.073	ND	ND	ND	ND	1.32	ND	0.92
	9/15/2004	ND	0.074	ND	ND	0.006	0.538	4.69	0.055	0.138
	11/9/2004	ND	0.064	ND	ND	ND	ND	2.96	ND	0.737
MW-7	4/4/2002	ND	0.42	ND	ND	ND	ND	ND	ND	0.027
	7/30/2002	ND	0.24	ND	ND	ND	0.012	ND	ND	ND
	10/14/2002	ND	0.27	ND	ND	ND	ND	ND	ND	ND
	2/28/2003	ND	0.362	ND	ND	ND	ND	ND	ND	ND
	5/22/2003	ND	0.246	ND	ND	ND	ND	ND	ND	ND
	8/21/2003	ND	0.257	ND	ND	ND	ND	ND	ND	ND
	11/5/2003	ND	0.248	ND	ND	0.009	ND	0.15	ND	ND
	2/25/2004	ND	0.228	ND	ND	ND	ND	0.1	ND	ND
	5/11/2004	ND	0.251	ND	ND	0.015	ND	0.08	ND	ND
	9/15/2004	ND	0.25	ND	ND	ND	ND	0.39	ND	ND
	11/9/2004	ND	0.257	ND	ND	0.006	ND	0.33	ND	ND
MW-7A	4/3/2002	ND	0.092	ND	ND	ND	ND	ND	ND	ND
	7/31/2002	ND	0.54	ND	ND	ND	ND	ND	ND	0.13
	10/10/2002	ND	0.51	ND	ND	ND	ND	ND	ND	0.16
	2/25/2003	ND	0.332	ND	ND	ND	0.044	1.54	ND	0.038
	5/20/2003	ND	0.119	ND	ND	ND	0.018	0.11	ND	ND
	8/20/2003	ND	0.115	ND	ND	ND	ND	ND	ND	ND
	11/5/2003	ND	0.119	ND	ND	ND	0.017	0.48	ND	0.014
	2/24/2004	ND	0.1	ND	ND	ND	ND	ND	ND	ND
	5/10/2004	ND	0.084	ND	ND	ND	0.02	0.09	ND	ND
	9/14/2004	ND	0.114	ND	ND	ND	ND	0.22	ND	0.046
	11/8/2004	ND	0.135	ND	ND	ND	ND	0.11	ND	0.317

Attachment 3, Table 2 - Historical Metals Results

Sample ID	Date	Analyte (PADEP MSC/ROD RAO) [mg/L]								
		Arsenic (0.01/0.05)	Barium (2/1)	Beryllium (0.004/0.0005)	Cadmium (0.005/0.01)	Chromium (0.1/0.05)	Copper (1/1.3)	Iron (0.3*/NA)	Lead (0.005/0.005)	Manganese (0.3*/NA)
MW-8	5/21/2003	ND	0.134	ND	ND	ND	ND	6.19	ND	0.223
	8/18/2003	ND	0.143	ND	ND	ND	ND	3.32	ND	0.429
	11/3/2003	ND	0.126	ND	ND	ND	ND	4.94	ND	0.178
	2/23/2004	ND	0.12	ND	ND	ND	ND	0.8	ND	0.085
	5/11/2004	ND	0.108	ND	ND	ND	ND	0.19	ND	0.066
	9/13/2004	ND	0.106	ND	ND	ND	ND	0.08	ND	0.049
MW-8 (DUP)	9/13/2004	ND	0.105	ND	ND	ND	ND	0.1	ND	0.049
	11/8/2004	ND	0.106	ND	ND	ND	ND	0.1	ND	0.051
MW-8 (DUP)	11/8/2004	ND	0.109	ND	ND	ND	ND	0.13	ND	0.058
**	6/1/2011	0.0017 J	0.071 J	ND (0.0067 U)	ND (0.0067 U)	0.004	ND (0.0033 U)	0.20	ND (0.0013 U)	0.046
MW-8A	5/20/2003	ND	0.043	ND	ND	ND	ND	0.26	ND	0.217
	8/18/2003	ND	0.048	ND	ND	ND	ND	0.25	ND	0.063
	11/3/2003	ND	0.046	ND	ND	ND	ND	0.23	ND	0.037
	2/23/2004	ND	0.046	ND	ND	ND	ND	0.2	ND	0.01
	5/11/2004	ND	0.05	ND	ND	ND	ND	0.25	ND	0.012
	9/13/2004	ND	0.062	ND	ND	ND	ND	ND	ND	ND
	11/8/2004	ND	0.054	ND	ND	ND	ND	ND	ND	ND
MW-8A (DUP)**	6/1/2011	ND	0.087 J	ND	ND	0.0015 J	0.02	0.32	ND	0.24
MW-9	5/21/2003	ND	0.217	ND	ND	ND	ND	2.26	ND	0.046
	8/19/2003	ND	0.338	ND	ND	ND	ND	0.76	ND	0.025
MW-9	11/4/2003	0.011	0.358	ND	ND	ND	ND	0.19	ND	0.01
	2/24/2004	ND	0.339	ND	ND	ND	ND	ND	ND	ND
	5/10/2004	0.01	0.367	ND	ND	ND	0.012	ND	0.009	ND
	9/14/2004	ND	0.346	ND	ND	ND	ND	ND	ND	ND
	11/9/2004	0.01	0.356	ND	ND	ND	ND	0.13	ND	ND
**	6/1/2011	0.0012 K	0.40 J	ND (0.00067 U)	ND (0.00067 U)	ND (0.0013 U)	ND (0.0033 U)	0.25	ND (0.0013 U)	ND (0.0033 U)
	4/23/2014	0.0092	0.41	ND (0.00070U)	ND (0.00070U)	0.0012 J	0.0037 J	1.4	0.0020 J	0.016
MW-9A	5/21/2003	ND	0.04	ND	ND	ND	ND	1.15	ND	0.189
	8/19/2003	ND	0.054	ND	0.002	ND	ND	1.6	ND	0.322
	11/4/2003	ND	0.039	ND	ND	ND	0.015	0.17	ND	0.119
	2/24/2004	ND	0.07	ND	ND	ND	ND	0.14	ND	0.024
	5/10/2004	ND	0.087	ND	ND	0.01	0.013	6.71	ND	0.18
	9/14/2004	ND	0.061	ND	ND	ND	ND	2.56	ND	0.152
	11/9/2004	ND	0.047	ND	ND	ND	ND	1.22	ND	0.052
**	6/1/2011	ND (0.0020 U)	0.018 J	ND (0.00067 U)	ND (0.00067 U)	ND (0.0013 U)	0.0047 J	0.081	ND (0.0013 U)	0.088
EW-1	** 3/31/2009	ND	ND	0.115	ND	ND	ND	8.331	ND	0.391
MADW 41-52	7/15/2010**	0.0044J	0.12	ND	ND	ND	ND	ND	0.0032J	0.031
	5/31/2011	0.0015 K	0.14 K	0.00031 J (0.0007 U)	ND (0.0007 U)	0.0016 J (0.0037 U)	ND (0.0037 U)	0.18	ND (0.0015 U)	ND (0.0037 U)
	6/14/2012	0.0014J	0.099	ND (0.00070U)	ND (0.00070U)	ND (0.0015U)	0.057	0.084	0.0052	0.031
	11/8/2012	ND (0.0020 U)	0.11	ND (0.00070 U)	ND (0.00070 U)	0.0013 J	0.098	0.42	0.011	0.067
	10/9/2013	ND (0.0020 U)	0.071	ND (0.00070 U)	ND (0.00070 U)	0.0037	0.098	0.18	0.0057	0.066
**	10/9/2013	ND (0.0020 U)	0.068	ND (0.00067 U)	ND (0.00067 U)	0.0013 J	0.086	ND (0.033 U)	0.0016 J	0.032
	4/23/2014	0.0018 J	0.13	ND (0.00070 U)	ND (0.00070 U)	0.0020 J	0.097	0.15	0.013	0.0035 J
**	4/23/2014	0.0016 J	0.12	ND (0.00067 U)	ND (0.00067 U)	0.0023	0.020	ND (0.033 U)	0.0010 J	ND (0.0033 U)

Attachment 3, Table 2 - Historical Metals Results

		Analyte (PADEP MSC/ROD RAO) [mg/L]								
Sample ID	Date	Arsenic (0.01/0.05)	Barium (2/1)	Beryllium (0.004/0.0005)	Cadmium (0.005/0.01)	Chromium (0.1/0.05)	Copper (1/1.3)	Iron (0.3*/NA)	Lead (0.005/0.005)	Manganese (0.3*/NA)
MACW ¹	8/21/2003	ND	0.07	ND	ND	ND	ND	ND	ND	ND
	11/3/2003	ND	0.075	ND	ND	ND	0.013	0.23	ND	ND
	2/23/2004	ND	0.075	ND	ND	ND	ND	1.48	ND	0.055
	5/10/2004	ND	0.067	ND	ND	ND	0.028	0.53	ND	ND
	9/13/2004	ND	0.065	ND	ND	ND	ND	0.1	ND	ND
	11/9/2004	ND	0.059	ND	ND	ND	ND	ND	ND	ND
	3/31/2009	ND	0.064	ND	ND	ND	ND	0.049	ND	ND
	7/15/2010	ND (0.0059 U)	0.073	ND (0.0029 U)	ND (0.0014 U)	ND (0.0014U)	0.04	ND (0.045 U)	0.0094	ND (0.0037 U)
	11/9/2010	0.0035	0.06	ND (0.0007 U)	ND (0.0007 U)	0.0016J	0.0024 J	1.2	ND (0.0015 U)	0.028
	5/31/2011	0.0011 K	0.077 K	0.00033 J	ND (0.0007 U)	0.0016 J	0.088	0.36 K	0.011 K	0.043 K
MW-15 **	5/31/2011	0.0029 J	0.30 J	ND (0.00067 U)	ND (0.00067 U)	0.0011 J	ND (0.0033 U)	0.18	ND (0.0013 U)	ND (0.0033 U)
RW-305	3/31/2009	ND	ND	ND	ND	ND	ND	0.077	ND	ND
	6/14/2012	0.0010J	0.12	ND (0.00070U)	ND (0.00070U)	0.0036	0.0098	0.059	0.00077J	0.0068

Notes:

¹ Monitoring well MACW was abandoned on 26 August 2011.

ND = Not detected above the laboratory limit of detection (LOD)

K = Analyte present. Reported value may be biased high. Actual value is expected lower.

J = Analyte present. Indicates an estimated value between the method Detection Limit (DL) and the Limit of Quantitation (LOQ) for the analyte.

B = Not detected substantially above the level reported in laboratory or field blanks.

MW-5, 5A, 6, 6A, 7, and 7A are located offsite and upgradient. Wells with an "A" designator are overburden wells.

All concentrations are total metals unless noted

All concentrations are milligrams per liter (mg/L)

Analysis included target analyte list metals, only detected metals shown on table

ROD = Record of Decision

RAO = Remedial Action Objective, valid for overburden wells

* = Secondary contaminant MSC, included for reference

** = Dissolved concentrations

PADEP = Pennsylvania Department of Environmental Protection

MSC = Medium specific concentration

NA = Not Applicable (no RAO required for analyte)

Shading indicates concentration above primary MSC, **bold text** indicates concentration exceeds RAO. Note that the MSCs are applicable only to the dissolved fraction,

but shading has been added to those concentrations in the total fraction exceeding the MSC for reference.

U = Not detected. The associated number indicates the laboratory LOD.

MADW = Mifflin Avenue Deep Well

MACW = Mifflin Avenue Cabin Well (previously referred to as the Mifflin Avenue Residential Well)