

FINAL

ANNUAL GROUNDWATER MONITORING REPORT – 2013

**MARSH RUN PARK
NEW CUMBERLAND, FAIRVIEW TOWNSHIP,
YORK COUNTY, PENNSYLVANIA
FUDS No. C03PA040301**



**U.S. Army Corps of Engineers
Baltimore District**

EA® EA Engineering, Science,
and Technology, Inc.

JUNE 2014

17 June 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 – June 2013
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 June 2013 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 4 June 2013, 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 4 June 2013. 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 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 4 June 2013. 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. The groundwater 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. EPA Method 8260B. 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. One MS/MSD sample, one trip blank sample, and one duplicate sample were collected and submitted to the laboratory. No cVOCs were detected in the trip blank. Per USACE, data validation of the analyzed samples was not conducted.

The cVOC analytical results are summarized in Table 1. The analytical results were evaluated by comparing the current data to historical data for the site (Table 1, 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. Trichloroethene (TCE) was reported at an estimated

concentration of 0.9 J $\mu\text{g/L}$; TCE had previously been reported in MADW 41-52 at an estimated concentration between the method Detection Limit (DL) and the Limit of Quantitation (LOQ) in 15 July 2010. 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 $\mu\text{g/L}$ because the surrogate spike recoveries were out of compliance for volatile organic chemicals. 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 20.5 $\mu\text{g/L}$ in the sample collected from MW-9 (and its duplicate sample), which is greater than the ROD RAO/PADEP MSC of 5 $\mu\text{g/L}$. 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.

CONCLUSIONS

The results of this monitoring event are consistent with previous data measured at MADW 41-52 and MW-9. Additional sampling is scheduled for fall 2013.

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 410-329-5128.

Respectfully yours,

EA Engineering, Science and Technology,
Inc.



H. Gordon Porter, Project Manager

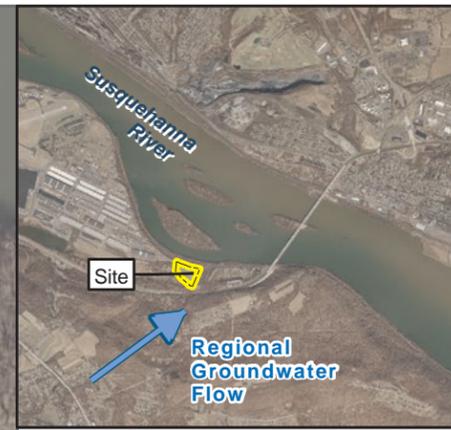
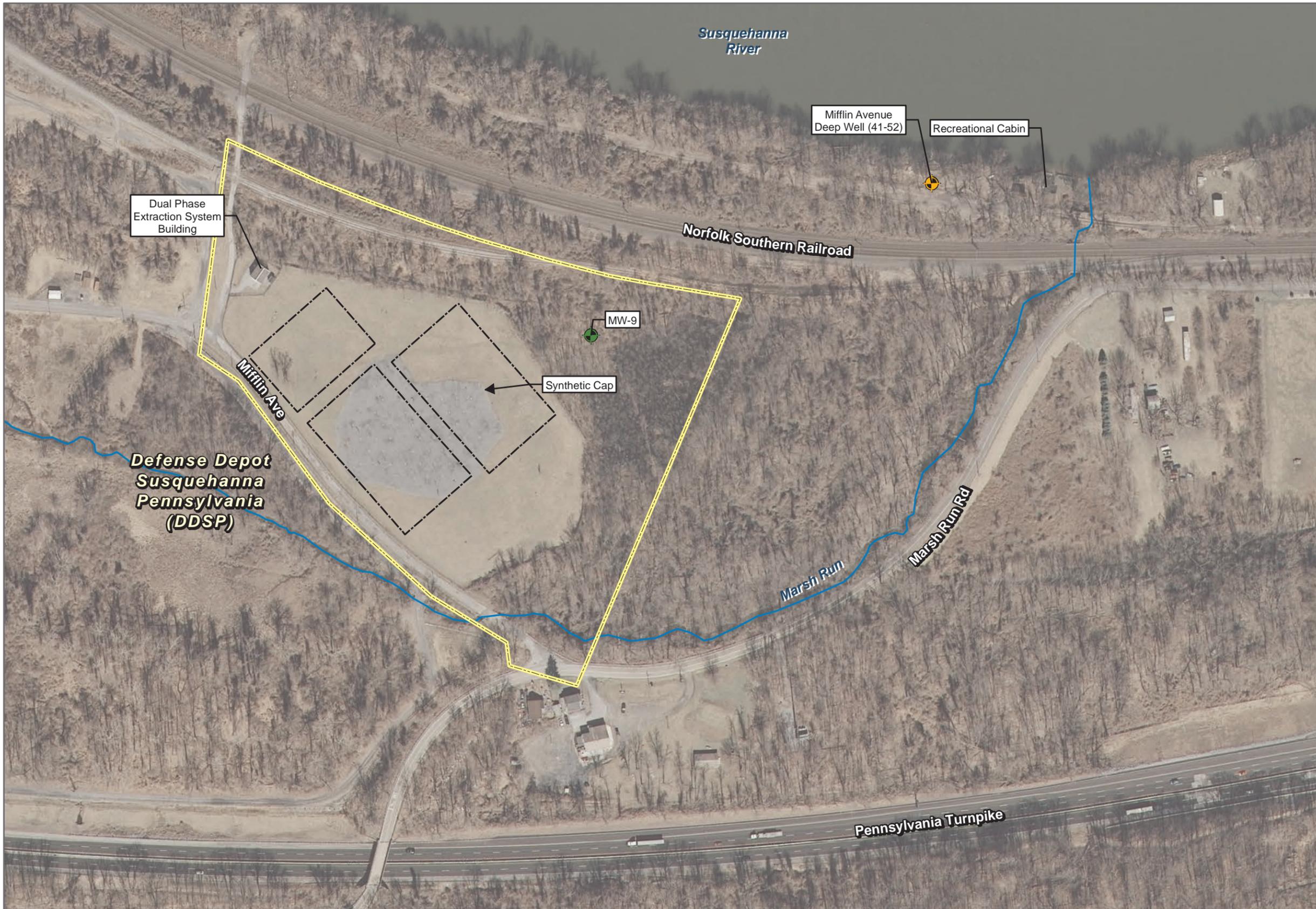
Figure 1 – June 2013 Sample Location

Table 1 – Groundwater Sample Results June 2013

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

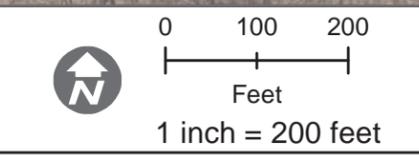


Figure 1
 Groundwater Sampling Locations

Path: \\LOVETON\FEDERAL\GISData\Northeast\Pennsylvania\MarshRun\Mxd\Sampling\June2013\SampleLocations\June2013.mxd

TABLE 1 - GROUNDWATER SAMPLE RESULTS JUNE 2013

				Sample Name	MADW 41-52	MW-9 (MS/MSD)	Dup-1
				Parent Sample			MW-9 (MS/MSD)
				Date	6/4/2013	6/4/2013	6/4/2013
Analyte	Unit	ROD RAOs for Groundwater ¹ /MCL	PADEP MSC	Result	Result	Result	Result
VOCs (SW846 8260B)							
cis-1,2-dichloroethene	µg/L	70	70	ND (0.75U)	6.1	6.1	6.1
Tetrachloroethene	µg/L	5	5	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)
trans-1,2-dichloroethene	µg/L	100	100	ND (0.75U)	2.9	2.8	2.8
Trichloroethene	µg/L	5	5	0.90 J	20.5	19.9	19.9
Vinyl chloride	µg/L	2	2	ND (0.75U)	ND (0.75U)	ND (0.75U)	ND (0.75U)

Notes:

MSC = Medium Specific Concentration.

MS = Matrix spike.

MSD = Matrix spike duplicate.

µg/L = micrograms per liter.

ND = Below the laboratory limit of detection (LOD).

PADEP = Pennsylvania Department of Environmental Protection.

RAO = Remedial Action Objective.

ROD = Record of Decision.

VOC = volatile organic compounds.

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.

Shaded and **Bolded** Results Represent Exceedances of Screening Criteria.

¹ EA. 1991. Final Record of Decision of the New Cumberland Army Depot's Former Landfill, Marsh Run Park, Fairview Township, York County, Pennsylvania. June.

**ATTACHMENT 1
FIELD SAMPLING LOGS**

Location DDSP / MARSH RUN Date 6.3.2013
 Project / Client M.R. ABANDONMENT / USACE

1530 Begin Grouting (WD-2 ≈ 65-70 gal)
 Ethan Approved Displace to Ground Surface.

During Morning TAILGATE MEETING;
 1600 Grout MW-1 ≈ 9 Gallons. Clean Grout.
 This Grout Run WAS FULL Batch to 9 gal.
 TOTAL Grout MIXED TODAY 1.5 FULL BATCHES.

90 GAL H₂O + 94 LB X 15 BAGS CEMENT + 1.5 BATCH BEN.

CLEAN UP TRASH, PLACE PUMPS IN SUEDE.

EA 15' wells ≈ 0.4 BAG EA 50' well ≈ 1.33 BAGS.

100' well ≈ 7.7 BAGS OF CEMENT. WELL

ABANDONMENT FORMS FILLED BY EICHERBACH

0430 DEMOB. CALL w/ UPDATE TO M. DOEMAN

1630 ~~1830~~ 1830 Drop off Equip + Truck END DAY

[Signature]
 6.4.13

Location DDSP / MARSH RUN Date 6.4.2013
 Project / Client M.R. ABANDONMENT / USACE

0530 Meet Brian Shedd @ OFFICE. LOAD
 UP UP TRUCK 801 w/ EQUIPMENT.
 0600 DEPART OFFICE 0700 ARRIVE AT SITE
 OPEN GATES. 0715 DRILLERS ARRIVE AT SITE
 H: S MEETING TOPICS SAME AS PREVIOUS DAY.
 SLIP TRIP FALL. UNEVEN GROUND. HOUSE KEEPING
 HEAT STRESS. COLD BEVS. AVAILABLE. PPE
 SHARP OBJECTS. PINCH POINTS. HAND SAFETY
 EQUIPMENT EXCLUSION ZONE. ELECTRICAL.
 OVERHEAD WORK. RRAILROAD SAFETY.

0800 Some DEBRIS REMOVAL

0830 Ethan ARRIVE AT SITE

Pull Pumps from MW-8 + MW 8A

Mix 1/2 BATCH OF Grout + (30, 5, 1/2)

EW-1 TD-101' SWL 14.9' to 4" PVC 7.7 BAGS

MW-9A TD 15.85' SWL 9.75' to 2" PVC 0.5 BAGS

MW-9 TD 57.2' SWL 11.95' to 2" PVC 1.33 BAGS

Brian Shedd NOTES from MATW 41-52 Sample

09:40 Begin Purge from Kitchen Sink

10:04 Purge Complete. Collect H₂O for YSI READINGS

OC M/CM DO PH ORP NTU

14.65 0.427 5.16 6.52 141.4 1.3

10:04 Sample Collected for VOC's From K-SINK

EW-1 APPROVED Sample POINT (ALL PVC LINES)

SD 6.4.2013

Location DDSP / MARSH RUN Date 6-4-2013

Project / Client M.R. ABANDONMENT / USACE

Faucet Aerator WAS REMOVED prior to Sampling.
 EW-2 TD: 101.8 SWL: 18.7 TOC 7.7 BAGS 4" PVC
 1/2 BATCH GROUT MIXED HALF WAY. Filling EW-2
 UN-2 TD 52.7 SWL 17.7 TOC Hole Plug + 3.85 BAGS
 4" PVC, MIXED 1/2 BATCH GROUT (# OF BAGS
 REFERS TO BAGS OF CEMENT 10 = FULL BATCH)
 OP-1/WPI TD 11.3 SWL 7.2 2" STEEL Ø .33 BAGS
 MW-3A TD 17.5 SWL 1.3 TOC 2" PVC Ø .5 BAGS
 11:30 Mike Dorman (EAPM) ARRIVES AT SITE
 11:35 Liza Finley (USACE SM) ARRIVES AT SITE
 11:45 Drillers Break for Lunch (STANDBY)
 11:50 Chris Larson (USACE) ARRIVES.
 No more grouting work until RR ACCESS OR
 Permission to Sample MW-9 w/ Liza Finley)
 RAILROAD Representative Approves Work.
 1:30 Mobilize to RAILROAD Tracks. Clear
 Debris + Veg from MW-10 + MW 11
 Dig out Base + Cut off casing w/ grinder
 1500 mix full batch of Grout.
 MW-10 TD 38' SWL 23' TOC 6" open Hole plug + Full BATCH
 1540 mix full batch of Grout. move to MW 11
 Liza + Ehan + M. Dorman, oversee Sampling of
 MW-9 w/ B. Shedd (refer to Data sheet.)
 MW-11 TD 41' SWL 25.45. 6" open Hole. Hole Plug
 + 7.5 BAGS in. top off + Clean Grout.

D 1 6-4-13

Location DDSP / MARSH RUN Date 6-4-2013

Project / Client M.R. ABANDONMENT / USACE

Demobilize Vehicles from RR Property -
 USACE REPS DEMOB from site
 M. Dorman DESIGNATES DEBRIS to BE
 Removed from site per Liza Request.
 M. Dorman DEPART from SITE.
 Debbie Drillers and WELL DATA.
 B. Shedd + I Retrieve Sampling Equipment
 from MW-9 Transfer purge H2O from
 5 gal Buckets to Waste H2O Drum.
 1740 Depart site to OFFICE
 1900 ARRIVE AT OFFICE + UNLOAD EQUIP
 B. Shedd Retains Custody of Sample
 Cooler to ship FET-BA tomorrow.
 Sample taken too LATE IN DAY
 to Deliver directly to LAB.
 1930 Transfer Vehicle. Finalize
 Paperwork 2000 END DAY
 Photo Log:

#1 + #2 MW-8 + MW-8A	EW-1
#3 MW-8A + MW-8	#8 EW-2 + UN-2
#4 MW-8A	#9 + 10 MW-3A
#5 MW-8	#11 OP-1/WPI
#6 EW-2	#12 MW-11
#7 UN-2	#13 MW-10

D 1 6-4-13



FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Well ID: MW-9 Site Name: Marsh Run Park
Well Condition: Good Site Location: New Cumberland, PA
Gauge Date: 6/4/13 Weather: Sunny, 80°F
Gauge Time: 1330 Purge Date: 6/4/13
Well Diameter: Purge Time: 1400
Purge Method: Dedicated Bladder Pump Sampler's Name: Brian Shedd

Well Gauging and Tubing Placement

Well Depth (ft): 53.40 Screening Interval (ft): 23-60
Depth to Water (ft): 10.05 Depth to tubing intake (ft): -

Final Purging and Sampling Data

Total quantity of water removed (gal): 8 gallons
Sampler(s): Brian Shedd
Sampling date: 6/4/13 Sampling time: 1530 *2
Split sample? No If yes, with whom? -
Comments/Observations: #1-Pump controller stopped working, switched to manual bladder pump actuation and purge restarted

Stablization Goal: +-0.1 units +-3% +-3% +-10% +-10% +- 10mV

Table with 11 columns: Time, Depth to Water (ft), Rate (gal/min), Volume Purged (mL), pH, Temperature (°C), Conductivity (µmhos/cm), Turbidity (NTU), Dissolved Oxygen (mg/L), Eh (mV). Rows include Beginning, 1-7, and a handwritten #1 next to row 2.

ATTACHMENT 2
LABORATORY ANALYTICAL REPORTS

June 13, 2013

Ms. Vicki Pitman
EA Engineering-MD
225 Schilling Circle
Hunt Valley, MD 21031

Certificate of Analysis

Project Name:	2011-DOD USACE - MARSH RUN	Workorder:	1030517
Purchase Order:	7739	Workorder ID:	EMS024 Marsh Run Park

Dear Ms. Pitman,

Enclosed are the analytical results for samples received by the laboratory on Thursday, June 06, 2013.

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 Denise Brooks (Project Coordinator) or Anna G Milliken (Technical Manager) 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 York: 978 Loucks Mill Road, York, PA 17402 717-505-5280

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.


Anna G Milliken
Technical Manager

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: 1030517 EMS024|Marsh Run Park

Discard Date: 06/27/2013

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
1030517001	MW-9 (MS/MSD)	Ground Water	6/4/13 15:30	6/6/13 07:20	Customer
1030517002	DUP-1	Ground Water	6/4/13 00:00	6/6/13 07:20	Customer
1030517003	MADW 41-52	Ground Water	6/4/13 19:05	6/6/13 07:20	Customer
1030517004	Trip Blank	Ground Water	6/6/13 07:20	6/6/13 07:20	Customer

Workorder Comments:

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.

Standard Acronyms/Flags

J, B	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

ALS Environmental Laboratory Locations Across North America

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

ANALYTICAL RESULTS

Workorder: 1030517 EMS024|Marsh Run Park

Lab ID: 1030517001 **Date Collected:** 6/4/2013 15:30 **Matrix:** Ground Water
Sample ID: MW-9 (MS/MSD) **Date Received:** 6/6/2013 07:20

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	6.1	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:05	DD	B
trans-1,2-Dichloroethene	2.9	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:05	DD	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:05	DD	B
Trichloroethene	20.5	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:05	DD	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:05	DD	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108	%		70-120			SW846 8260B		6/12/13 03:05	DD	B
4-Bromofluorobenzene (S)	106	%		75-120			SW846 8260B		6/12/13 03:05	DD	B
Dibromofluoromethane (S)	93.8	%		85-115			SW846 8260B		6/12/13 03:05	DD	B
Toluene-d8 (S)	102	%		85-120			SW846 8260B		6/12/13 03:05	DD	B

Sample Comments:

Per client request on 6/13/13 the sample ID has been modified to MW9 from MW19 which was written in the c-o-c. The wrong sample ID was written on the c-o-c. DLB


Anna G Milliken
Technical Manager

ALS Environmental Laboratory Locations Across North America

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

ANALYTICAL RESULTS

Workorder: 1030517 EMS024|Marsh Run Park

Lab ID: 1030517002 **Date Collected:** 6/4/2013 00:00 **Matrix:** Ground Water
Sample ID: DUP-1 **Date Received:** 6/6/2013 07:20

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	6.1	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:22	DD	B
trans-1,2-Dichloroethene	2.8	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:22	DD	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:22	DD	B
Trichloroethene	19.9	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:22	DD	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 03:22	DD	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	104	%		70-120			SW846 8260B		6/12/13 03:22	DD	B
4-Bromofluorobenzene (S)	104	%		75-120			SW846 8260B		6/12/13 03:22	DD	B
Dibromofluoromethane (S)	93	%		85-115			SW846 8260B		6/12/13 03:22	DD	B
Toluene-d8 (S)	99.2	%		85-120			SW846 8260B		6/12/13 03:22	DD	B

Sample Comments:


Anna G Milliken
Technical Manager

ALS Environmental Laboratory Locations Across North America

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

ANALYTICAL RESULTS

Workorder: 1030517 EMS024|Marsh Run Park

Lab ID: 1030517004 **Date Collected:** 6/6/2013 07:20 **Matrix:** Ground Water
Sample ID: Trip Blank **Date Received:** 6/6/2013 07:20

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 02:48	DD	B
trans-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 02:48	DD	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 02:48	DD	B
Trichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 02:48	DD	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		6/12/13 02:48	DD	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	111	%		70-120			SW846 8260B		6/12/13 02:48	DD	B
4-Bromofluorobenzene (S)	117	%		75-120			SW846 8260B		6/12/13 02:48	DD	B
Dibromofluoromethane (S)	97.8	%		85-115			SW846 8260B		6/12/13 02:48	DD	B
Toluene-d8 (S)	106	%		85-120			SW846 8260B		6/12/13 02:48	DD	B

Sample Comments:


Anna G Milliken
Technical Manager

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

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

Client: EA Engineering, Science & Technology, Inc., Sparks, Maryland
 SDG: EMS-024
 Laboratory: Analytical Laboratory Services, Middletown, Pennsylvania
 Site: Marsh Run Park, Fairview Township, Pennsylvania
 Date: July 19, 2013

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	MW-9	1030517001	Water
1MS	MW-9MS	1030517001MS	Water
1MSD	MW-9MSD	1030517001MSD	Water
2	DUP-1	1030517002	Water
3	MADW 41-52	1030517003	Water
4	TRIP BLANK	1030517004	Water

* Note: the COC incorrectly listed EDS Sample ID #1 as MW-19

A full data validation was performed on the analytical data for three water samples and one aqueous trip blank sample collected on June 4-6, 2013 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

Method References
USEPA SW-846 Method 8260B

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the USEPA Region III data validation guidelines as follows:

- The USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review," September 1994;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Holding times and sample preservation
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries

- Laboratory Control Sample (LCS) recoveries
- Method blank and field blank contamination
- Gas Chromatography (GC)/Mass Spectroscopy (MS) tuning
- Initial and continuing calibration summaries
- Compound Quantitation
- Internal standard area and retention time summary forms
- Field Duplicate sample precision

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

Volatile Organic Compounds (VOC)

Holding Times

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

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.

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
TRIP BLANK	None - ND	-	-	-	-

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD, and/or correlation coefficients and mean RRF values.

Continuing Calibration

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

Compound Quantitation

- All criteria were met.

Internal Standard (IS) Area Performance

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

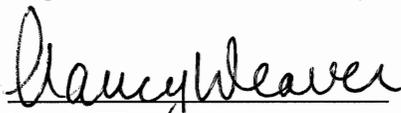
Field Duplicate Sample Precision

- Field duplicate results are summarized below.

Compound	MW-9 ug/L	DUP-1 ug/L	RPD	Qualifier
cis-1,2-Dichloroethene	6.1	6.1	0%	None
trans-1,2-Dichloroethene	2.9	2.8	4%	
Trichloroethene	20.5	19.9	3%	

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

Signed:


Nancy Weaver
Senior Chemist

Dated:

7/22/13

Data Qualifiers

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
- N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts..
- J = Analyte present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected higher.
- UJ = Not detected. Quantitation limit may be inaccurate or imprecise.
- UL = Not detected. Quantitation limit is probably higher.
- Q = No analytical result.
- NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MW-9

Lab Name: ALS - Middletown Contract: _____

Lab Code: PA-010 Case No.: _____ SAS No.: _____ SDG No.: EMS-024

Matrix (soil/water): WATER Lab Sample ID: 1030517001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15061163.D

Level (low/med): _____ Date Received: 6/6/13

% Moisture: not dec. 100.0 Date Analyzed: 6/12/13

GC Column: RTXVMS 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	6.1	
156-60-5	trans-1,2-Dichloroethene	2.9	
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	20.5	
75-01-4	Vinyl Chloride	0.75	U

NW 7/19/13

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

DUP-1

Lab Name: ALS - Middletown Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: EMS-024

Matrix (soil/water): WATER Lab Sample ID: 1030517002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15061164.D

Level (low/med): Date Received: 6/6/13

% Moisture: not dec. 100.0 Date Analyzed: 6/12/13

GC Column: RTXVMS 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	6.1	
156-60-5	trans-1,2-Dichloroethene	2.8	
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	19.9	
75-01-4	Vinyl Chloride	0.75	U

NW 7/19/13

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MADW 41-52

Lab Name: ALS - Middletown Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: EMS-024

Matrix (soil/water): WATER Lab Sample ID: 1030517003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15061165.D

Level (low/med): Date Received: 6/6/13

% Moisture: not dec. 100.0 Date Analyzed: 6/12/13

GC Column: RTXVMS 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	0.90		J
75-01-4	Vinyl Chloride	0.75		U

NW 7/19/13
Form I VOA-1

4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Trip Blank

Lab Name: ALS - Middletown Contract: _____

Lab Code: PA-010 Case No.: _____ SAS No.: _____ SDG No.: EMS-024

Matrix (soil/water): WATER Lab Sample ID: 1030517004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15061162.D

Level (low/med): _____ Date Received: 6/6/13

% Moisture: not dec. 100.0 Date Analyzed: 6/12/13

GC Column: RTXVMS 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

NW 7/19/13
Form I VOA-1

**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
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
	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)
	MW-9A ^(b)	5/21/2003	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)
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)
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	ND (0.0007 U)	0.0016 J	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
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

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)
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)

27 June 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 – October 2013
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 October 2013 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 9 October 2013, 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 9 October 2013. 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 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 9 October 2013. 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 groundwater 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. The groundwater sample from MADW 41-52 was also submitted for analysis of total and dissolved metals: arsenic, barium, beryllium, cadmium, chromium (total), copper, iron, lead, manganese, and mercury, by U.S. EPA Method SW846 6020A. One trip blank sample was submitted to the laboratory for analysis of cVOCs. 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 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 in the sample collected from MADW 41-52. The current results are 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 22.1 µg/L in the sample collected from MW-9, which is greater than the ROD RAO/PADEP MSC (residential setting, used aquifer, total dissolved solids <2,500 parts per million) 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 MADW 41-52 was tested for both total and dissolved metal concentrations, and both 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, as discussed below.

- The total measured lead concentration of 0.0057 mg/L 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.

Although the measured total iron concentration in MADW 41-52 was previously (in November 2012) above the state and federal SMCL of 0.30 mg/L, the current result (0.18 mg/L) does not exceed the SMCL. SMCLs are based on aesthetics such as smell, taste, odor, color, and staining potential rather than health based, and are non-enforceable for private water wells.

The reported metals concentrations in MADW 41-52 were consistent with historical results, which are provided in Attachment 3.

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

CONCLUSIONS

The results of this monitoring event are consistent with previous data measured at MADW 41-52 and MW-9. Additional sampling is scheduled for spring 2014.

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

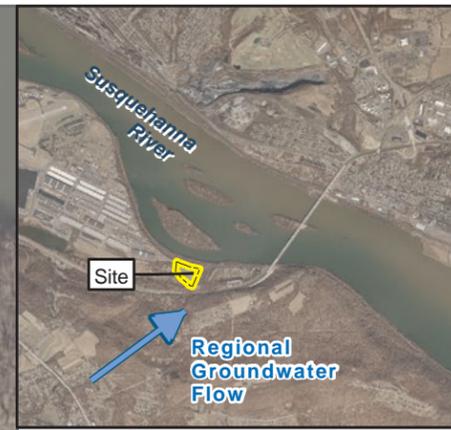
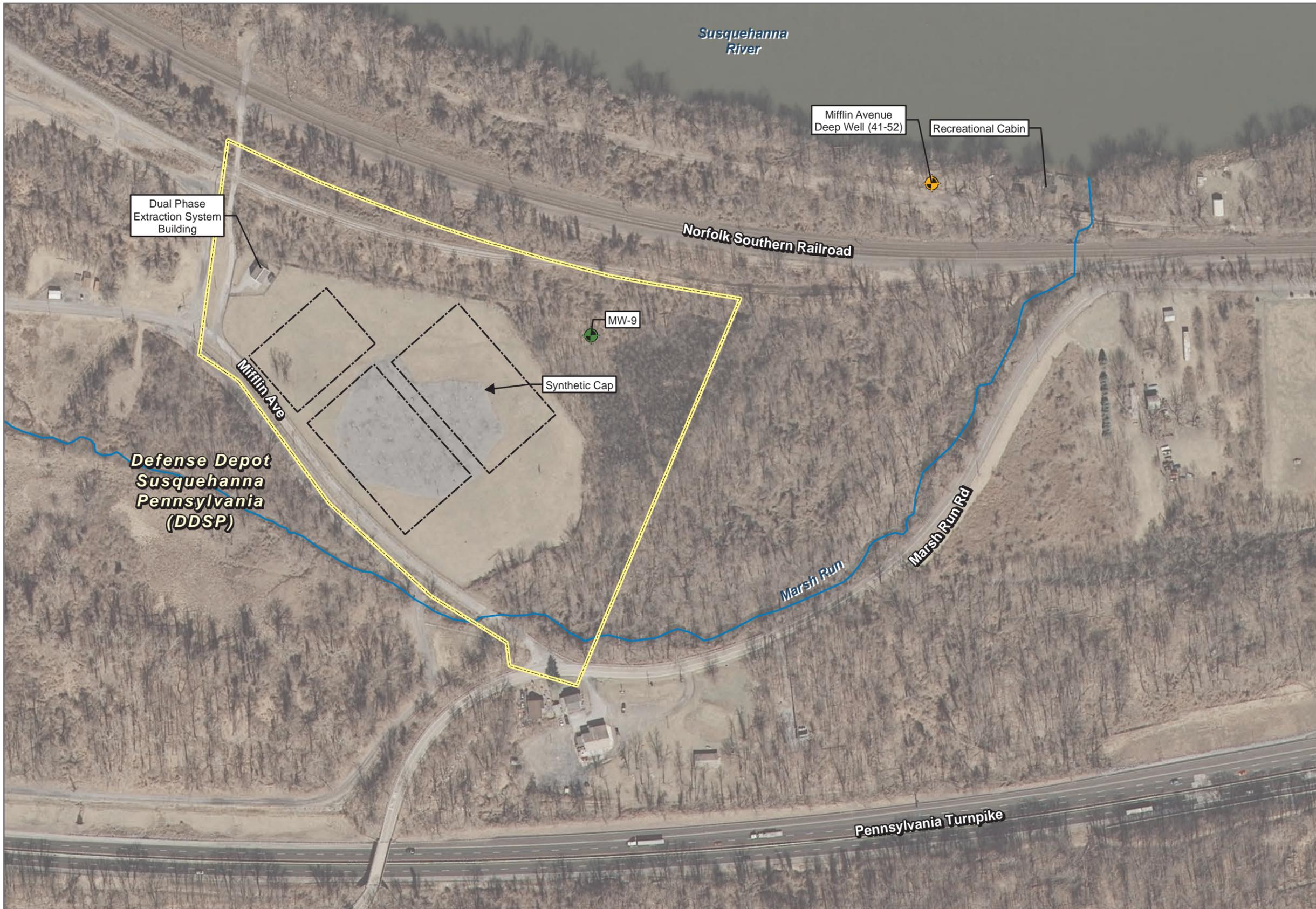
Figure 1 – October 2013 Sampling Locations

Table 1 – Groundwater Sample Results October 2013

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

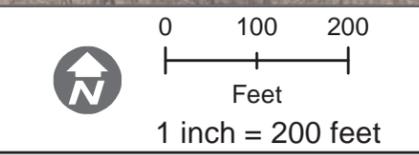


Figure 1
 Groundwater Sampling Locations

Path: \\LOVETON\FEDERAL\GISData\Northeast\Pennsylvania\MarshRun\Mxd\Sampling\June2013\SampleLocations\June2013.mxd

TABLE 1 - GROUNDWATER SAMPLE RESULTS OCTOBER 2013

				Sample Name	MADW 41-52	MW-9
				Date	10/9/2013	10/9/2013
Analyte	Unit	ROD RAOs for Groundwater ¹	PADEP MSC ²	Result	Result	Result
VOCs (SW846 8260B)						
cis-1,2-dichloroethene	µg/L	70	70	ND (0.75 U)		7.4
Tetrachloroethene	µg/L	5	5	ND (0.75 U)		ND (0.75 U)
trans-1,2-dichloroethene	µg/L	100	100	ND (0.75 U)		3.4
Trichloroethene	µg/L	5	5	ND (0.75 U)		22.1
Vinyl chloride	µg/L	2	2	ND (0.75 U)		ND (0.75 U)
Metals (SW846 6020A)³						
Arsenic, Total	mg/L	0.05	0.01	ND (0.0020 U)		NA
Arsenic, Dissolved	mg/L	0.05	0.01	ND (0.0020 U)		NA
Barium, Total	mg/L	5	2	0.071		NA
Barium, Dissolved	mg/L	5	2	0.068		NA
Beryllium, Total	mg/L	0.0005	0.004	ND (0.00070 U)		NA
Beryllium, Dissolved	mg/L	0.0005	0.004	ND (0.00067 U)		NA
Cadmium, Total	mg/L	0.005	0.005	ND (0.00070 U)		NA
Cadmium, Dissolved	mg/L	0.005	0.005	ND (0.00067 U)		NA
Chromium, Total	mg/L	0.1	0.1	0.0037		NA
Chromium, Dissolved	mg/L	0.1	0.1	0.0013 J		NA
Copper, Total	mg/L	1.3	1	0.098		NA
Copper, Dissolved	mg/L	1.3	1	0.086		NA
Iron, Total	mg/L	0.3 ⁴	---	0.18		NA
Iron, Dissolved	mg/L	0.3 ⁴	---	ND (0.033 U)		NA
Lead, Total	mg/L	0.005	0.005	0.0057		NA
Lead, Dissolved	mg/L	0.005	0.005	0.0016 J		NA
Manganese, Total	mg/L	---	0.3	0.066		NA
Manganese, Dissolved	mg/L	---	0.3	0.032		NA
Mercury, Total	mg/L	0.002	0.002	0.000084 J		NA
Mercury, Dissolved	mg/L	0.002	0.002	0.00015 B		NA

Notes:

MSC = Medium Specific Concentration.

mg/L = Milligrams per liter.

MCL = Maximum Contaminant Level for Drinking Water

µg/L = Micrograms per liter.

NA = Not Analyzed

ND = Below the laboratory limit of detection (LOD).

PADEP = Pennsylvania Department of Environmental Protection.

VOC = Volatile organic compounds.

RAO = Remedial Action Objective

ROD = Record of Decision

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.

B = Analyte was detected in an associated blank, and the sample result is not substantially above the level reported in the blank. Note the qualifier for this result was changed from J to B by the data validator.

Shaded and **Bolded** Results Represent Exceedances of Screening Criteria.

¹ EA. 1991. Final Record of Decision of the New Cumberland Army Depot's Former Landfill, Marsh Run Park, Fairview Township, York County, Pennsylvania. June.

² PADEP MSCs for metals are established as dissolved metals concentrations (January 2011).

³ Samples for total metals analysis were unfiltered; samples for dissolved metal analysis were filtered at the laboratory prior to analysis.

⁴ PADEP Secondary Maximum Contaminant Level (SMCL) (non-enforceable for private wells).

ATTACHMENT 1
FIELD SAMPLING LOGS

9 Oct. 2013

- 845 met Mike @ park & ride

picked up air compressor & control box

picked up lab bottles

↳ wrong size metals ^{250 ml} in order, fixed to count

1000 → left lab

1030 → on site

481 Cal

- Conductivity

Stand = 1,413

2nd cal = 1,417

pH - cal = 4

cal = 7

cal = 10

ORP cal = 200

Turbidity Bench - cal = 0

cal = 10

initial

1,250

1,417

4.13

6.58

9.95

214.5

0.0

9.84

Final

1,413

1,413

4.00

6.99

10.0

200.0

0.04

10.0

out of range

1115 - move to Yellow Fa Cabin

1132 - Start purge 5 min readings

↳ 1150 sampled, used amber to gather 1/2

1215 move to trailer area for lunch, Clyde off

↳ site

↳ ~ 1310 Clyde stuck in traffic on 83 waiting for him to start MW-9

1310 → move to MW-9, setup for sampling

1420 → sampled

~~1450~~ ↳ demobe equipment

1315 → to lab

1600 → sampled to lab, drop off



EA Engineering, Science,
and Technology, Inc.

WELL PURGING AND SAMPLING RECORD

WELL ID MADW 41-52 SAMPLE NO. MADW 41-52
 WELL/SITE DESCRIPTION Recreational cabin well

DATE 10/19/13 TIME 1130 AIR TEMP. 50's

WELL DEPTH 52 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 1.5 (gpm) (LPM)
 PUMP TIME _____ min
 WELL WENT DRY? () Yes () No PUMP TIME 15 min
 VOL. REMOVED _____ (gal) (L) RECOVERY TIME _____ min
 PURGE AGAIN? () Yes () No TOTAL VOL. REMOVED 22.5 (gal) (L)

Stablization Goal: +-0.1 units +-3% +-3% +- 10mV +-10% +-10%

Date	Time	Volume Removed	pH	Cond.	Temp.	ORP	Turb.	DO	Depth to Water from TOC	Pump Rate
		Unit: gal								
10/19/13	1132		8.00	6565	15.23	172.5	2.18	3.85	NA	1000 mL / 10 sec
	1137	7.5	6.64	1344	15.92	178.3	3.03	2.90	↓	↓
	1142	15	6.50	1329	16.13	180.9	2.15	2.81	↓	↓
	1147	22.5	6.26	316	15.73	175.5	1.98	3.00	↓	↓

1.5 gpm
24c. min
4c/10 sec

COMMENTS Sampled @ 1150
purged @ sink sampled @ seisot before
pressure tank

SIGNATURE [Signature]



EA Engineering, Science,
and Technology, Inc.

WELL PURGING AND SAMPLING RECORD

WELL ID MW-9 SAMPLE NO. MW-9
 WELL/SITE DESCRIPTION Locked, stuck up

DATE 10/19/13 TIME 1330 AIR TEMP. 60.5

WELL DEPTH 60ft ft CASING HEIGHT _____ ft
 WATER DEPTH 8.28 ft WELL DIAMETER 2 in
 WATER COL. HEIGHT 57.72 ft SANDPACK DIAM. _____ in
 EQUIVALENT VOLUME OF STANDING WATER 8.4 (gal) (L)
 PUMP RATE _____ 400 (gpm) (LPM)
 PUMP TIME _____ 45 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)
 Stabilization Goal: +-0.1 units +-3% +-3% +- 10mV +-10% +-10%

Date	Time	Volume Removed	pH	Cond.	Temp.	ORP	Turb.	DO	Depth to Water from TOC	Pump Rate
		Unit: L								mL/min
10/19/13	1355	0	8.47	438	13.82	173.5	1.75	1.22	9.56	400
	1400	2L	7.66	466	13.04	142.3	15.8	1.44	9.58	
	1405	4	7.63	482	12.83	142.8	16.4	1.67	9.60	
	1410	6	7.74	496	12.78	136.4	16.9	1.60	9.75	
	1415	8	7.69	499	12.76	129.9	14.6	1.68	9.77	
	1420	10	7.75	502	12.81	130.2	12.4	1.65	9.79	
	1425	12	7.68	504	12.87	125.9	12.2	1.87	9.76	
	1430	14	7.34	503	12.81	125.7	11.06	1.49	9.80	
	1435	16	7.37	503	12.69	124.3	10.66	1.63	9.82	
	1440	18	7.47	505	12.75	127.1	10.70	1.42	9.86	✓

COMMENTS Sampled @ 1440
psi ~ 28
400 lpm lowest achievable

SIGNATURE [Signature]

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

Page 1 of 1
 Courier: _____
 Tracking #: _____

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

Environmental

Co. Name: EA
 Contact (Report to): Vicki Pittman
 Address: 225 Schilling Circle
Sube 400
Hunt Valley MD 21031

Phone: 410.329.5109
 PO#: 7739

Project Name#: MicroRun 1623303 ALS Quote #: _____
 Date Required: _____ Approved By: _____
 TAT: Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.

Email? Y N
 Fax? Y N

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	Enter Number of Containers Per Analysis
1 MADW-41-52	lab filter dissolved metals	10/19/13	1150	g gw X1 X1
2 MW-9	metals only report AS	10/19/13	1140	g gw X3
3 Trip Blank	Ba, Be, Cd, Cr, Cu			g w X3
4	Fe, Pb, Mn, Hg			
5	VOCs report only			
6	TCE, PCE, cisB			
7	brass, 2, D, Chloro			
8	vinyl chloride			

SAMPLED BY (Please Print): Denise Wilk
 Received By / Company Name: AS
 Date: 10/19/13 Time: 1100
 Date: 10/23/13 Time: 1600

1 Album 100
 3
 5
 7
 9

ANALYSIS/METHOD REQUESTED
 VOC - 8260 PCE, TCE, cisB, 2, D, Chloro, Vinyl Chloride, Total Metals - As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Dissolved Metals - As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Total Metals - As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Dissolved Metals - As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Hg

ALS FIELD SERVICES
 Custody seals Present? Y N
 (If present) Seals Intact? Y N
 Received on Ice? Y N
 COC/Labels complete/accurate? Y N
 Container in good condition? Y N
 Correct containers? Y N
 Correct sample volume? Y N
 Correct preservation? Y N
 Headspace/Volatiles? Y N
 Circle appropriate Y or N.

ALS FIELD SERVICES
 State Samples Collected in? MO NJ NY PA
 Format? Standard CLP-like NJ-Reduced NJ-Full Lead Other
 If yes, format type: _____
 Data Deliverables: Standard CLP-like NJ-Reduced NJ-Full Lead Other
 If yes, format type: _____
 EDSS Required? Y N
 DOD Criteria Required? DOD QSM

Identified by Sample Function? _____
 Prepared by: DWAB
 Cooler Temp: 5
 Therm. ID: TALG
 No. of Coolers: _____
 Notes: _____

Barcode: * 1 0 5 2 3 7 9 *

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
 * G=Grab; C=Composite
 **Matrix: Air=Air; DW=Drinking Water; GW=Groundwater; OH=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, Box., etc. Preservative: HCl, HNO3, NaOH, etc.
 Rev 01-2013

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

ATTACHMENT 2
LABORATORY ANALYTICAL REPORTS

October 25, 2013

Ms. Denise Wilt
EA Engineering-York PA
One Marketway West, Suite 4C
York, PA 17401

Certificate of Analysis

Project Name:	2013-MARSH RUN - DOD PROJECT	Workorder:	1052379
Purchase Order:	7739	Workorder ID:	EMS025 2013-MARSH

Dear Ms. Wilt,

Enclosed are the analytical results for samples received by the laboratory on Wednesday, October 09, 2013.

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 Debra 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 York: 978 Loucks Mill Road, York, PA 17402 717-505-5280

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.


Debra 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: 1052379 EMS025|2013-MARSH RUN-DODPROJE

Discard Date: 11/08/2013

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
1052379001	MADW-41-52	Ground Water	10/9/13 11:50	10/9/13 16:00	Denise Wilt
1052379002	MW-9	Ground Water	10/9/13 14:40	10/9/13 16:00	Denise Wilt
1052379003	Trip Blank	Ground Water	10/9/13 16:00	10/9/13 16:00	Denise Wilt

Workorder Comments:

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, B	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

ALS Environmental Laboratory Locations Across North America

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

ANALYTICAL RESULTS

Workorder: 1052379 EMS025|2013-MARSH RUN-DODPROJE

Lab ID: 1052379001 **Date Collected:** 10/9/2013 11:50 **Matrix:** Ground Water
Sample ID: MADW-41-52 **Date Received:** 10/9/2013 16:00

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:37	DD	B
trans-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:37	DD	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:37	DD	B
Trichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:37	DD	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:37	DD	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	91.9	%		70-120			SW846 8260B		10/16/13 03:37	DD	B
4-Bromofluorobenzene (S)	95.4	%		75-120			SW846 8260B		10/16/13 03:37	DD	B
Dibromofluoromethane (S)	88.5	%		85-115			SW846 8260B		10/16/13 03:37	DD	B
Toluene-d8 (S)	96.3	%		85-120			SW846 8260B		10/16/13 03:37	DD	B
METALS											
Arsenic, Total	0.0020 U	mg/L		0.0030	0.0020	0.0010	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Arsenic, Dissolved	0.0020 U	mg/L		0.0030	0.0020	0.0010	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Barium, Total	0.071	mg/L		0.0056	0.0037	0.0019	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Barium, Dissolved	0.068	mg/L		0.0050	0.0033	0.0016	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Beryllium, Total	0.00070 U	mg/L		0.0010	0.00070	0.00030	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Beryllium, Dissolved	0.00067 U	mg/L		0.0010	0.00067	0.00030	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Cadmium, Total	0.00070 U	mg/L		0.0011	0.00070	0.00037	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Cadmium, Dissolved	0.00067 U	mg/L		0.0010	0.00067	0.00030	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Chromium, Total	0.0037	mg/L		0.0022	0.0015	0.00074	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Chromium, Dissolved	0.0013J	mg/L		0.0020	0.0013	0.00066	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Copper, Total	0.098	mg/L		0.0056	0.0037	0.0019	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Copper, Dissolved	0.086	mg/L		0.0050	0.0033	0.0016	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Iron, Total	0.18	mg/L		0.056	0.037	0.019	SW846 6020A	10/25/13	10/25/13 11:04	MW O	F2
Iron, Dissolved	0.033U	mg/L		0.050	0.033	0.016	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1
Lead, Total	0.0057	mg/L		0.0022	0.0015	0.00074	SW846 6020A	10/14/13	10/24/13 10:19	MW O	F1
Lead, Dissolved	0.0016J	mg/L		0.0020	0.0013	0.00066	SW846 6020A	10/24/13	10/24/13 12:55	MW O	E1

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

ANALYTICAL RESULTS

Workorder: 1052379 EMS025|2013-MARSH RUN-DODPROJE

Lab ID: 1052379002 **Date Collected:** 10/9/2013 14:40 **Matrix:** Ground Water
Sample ID: MW-9 **Date Received:** 10/9/2013 16:00

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	7.4	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:54	DD	B
trans-1,2-Dichloroethene	3.4	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:54	DD	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:54	DD	B
Trichloroethene	22.1	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:54	DD	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/16/13 03:54	DD	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	95	%		70-120			SW846 8260B		10/16/13 03:54	DD	B
4-Bromofluorobenzene (S)	96.3	%		75-120			SW846 8260B		10/16/13 03:54	DD	B
Dibromofluoromethane (S)	91.6	%		85-115			SW846 8260B		10/16/13 03:54	DD	B
Toluene-d8 (S)	97.8	%		85-120			SW846 8260B		10/16/13 03:54	DD	B

Sample Comments:


Debra 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

ANALYTICAL RESULTS

Workorder: 1052379 EMS025|2013-MARSH RUN-DODPROJE

Lab ID: 1052379003 **Date Collected:** 10/9/2013 16:00 **Matrix:** Ground Water
Sample ID: Trip Blank **Date Received:** 10/9/2013 16:00

Parameters	Results	Units	Footnotes	LOQ	LOD	DL	Method	Prepared	Analyzed	By	Cntr
VOLATILE ORGANICS											
cis-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/15/13 21:52	TMP	B
trans-1,2-Dichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/15/13 21:52	TMP	B
Tetrachloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/15/13 21:52	TMP	B
Trichloroethene	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/15/13 21:52	TMP	B
Vinyl Chloride	0.75U	ug/L		1.0	0.75	0.33	SW846 8260B		10/15/13 21:52	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Units</i>	<i>Footnotes</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.8	%		70-120			SW846 8260B		10/15/13 21:52	TMP	B
4-Bromofluorobenzene (S)	103	%		75-120			SW846 8260B		10/15/13 21:52	TMP	B
Dibromofluoromethane (S)	88.3	%		85-115			SW846 8260B		10/15/13 21:52	TMP	B
Toluene-d8 (S)	98.9	%		85-120			SW846 8260B		10/15/13 21:52	TMP	B

Sample Comments:


Debra 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

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

Client: EA Engineering, Science & Technology, Inc., Hunt Valley, Maryland
 SDG: EMS-025
 Laboratory: Analytical Laboratory Services, Middletown, Pennsylvania
 Site: Marsh Run Park, Fairview Township, Pennsylvania
 Date: December 11, 2013

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	MADW-41-52	1052379001	Water
1MS*	MADW-41-52MS	1052379001MS	Water
1MSD*	MADW-41-52MSD	1052379001MSD	Water
2†	MW-9	1052379002	Water
3†	TRIP BLANK	1052379003	Water

* - Total and Dissolved Metals and Mercury only

† - VOC only

A full data validation was performed on the analytical data for two water samples and one aqueous trip blank sample collected on October 9, 2013 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 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, the USEPA Region III data validation guidelines as follows:

- The USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review," September 1994;
- The USEPA Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses," April 1993;
- and the reviewer's professional judgment.

The following items/criteria were reviewed for this report:

Organics

- Holding times and sample preservation

- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- Method blank and field blank contamination
- Gas Chromatography (GC)/Mass Spectroscopy (MS) tuning
- Initial and continuing calibration summaries
- Compound Quantitation
- Internal standard area and retention time summary forms
- 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/Matrix Spike Duplicate (MS/MSD) recoveries
- ICP Serial Dilution
- ICP-MS Internal Standards
- Field Duplicate sample precision
- Compound Quantitation

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 sample was analyzed within 14 days for a preserved water sample.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

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

- A MS/MSD sample was not analyzed.

Laboratory Control Samples

- The LCS samples exhibited acceptable %R 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
TRIP BLANK	ND	-	-	-	-

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.

Compound Quantitation

- All criteria were met.

Internal Standard (IS) Area Performance

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

Field Duplicate Sample Precision

- Field duplicate samples were not analyzed.

Dissolved Metals/Antimony/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 exhibited the following contamination.

Dissolved Metals and Mercury					
Blank ID	Compound	Conc. mg/L	Action Level mg/L	Qualifier	Affected Samples
MB	Mercury	0.000088	0.00088	B	1D

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 except the following.

Dissolved Metals and Mercury			
MS/MSD Sample ID	Compound	MS %R/MSD %R/ RPD	Qualifier
1	Mercury	131%/124%/OK	None - See MB

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 samples were not analyzed.

Compound Quantitation

- All criteria were met.

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

Signed: Nancy Weaver Dated: 12/12/13
Nancy Weaver
Senior Chemist

Data Qualifiers

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
- N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts..
- J = Analyte present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected higher.
- UJ = Not detected. Quantitation limit may be inaccurate or imprecise.
- UL = Not detected. Quantitation limit is probably higher.
- Q = No analytical result.
- NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

MADW-41-52

Lab Name: ALS - Middletown Contract: _____

Lab Code: PA-010 Case No.: _____ SAS No.: _____ SDG No.: EMS-025

Matrix (soil/water): WATER Lab Sample ID: 1052379001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15101566.D

Level (low/med): _____ Date Received: 10/9/13

% Moisture: not dec. 100.0 Date Analyzed: 10/16/13

GC Column: RTXVMS 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

NW 12/11/13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

2

SAMPLE NO.

MW-9

Lab Name: ALS - Middletown Contract: _____

Lab Code: PA-010 Case No.: _____ SAS No.: _____ SDG No.: EMS-025

Matrix (soil/water): WATER Lab Sample ID: 1052379002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15101567.D

Level (low/med): _____ Date Received: 10/9/13

% Moisture: not dec. 100.0 Date Analyzed: 10/16/13

GC Column: RTXVMS 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	7.4	
156-60-5	trans-1,2-Dichloroethene	3.4	
127-18-4	Tetrachloroethene	0.75	U
79-01-6	Trichloroethene	22.1	
75-01-4	Vinyl Chloride	0.75	U

MW 12/11/13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

3

SAMPLE NO.

Trip Blank

Lab Name: ALS - Middletown Contract: _____

Lab Code: PA-010 Case No.: _____ SAS No.: _____ SDG No.: EMS-025

Matrix (soil/water): WATER Lab Sample ID: 1052379003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 15101517.D

Level (low/med): _____ Date Received: 10/9/13

% Moisture: not dec. 100.0 Date Analyzed: 10/15/13

GC Column: RTXVMS 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

NW 12/11/13

6020 3015

17

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-025 Method Type: 6020 3015

Sample ID: 1052379001

Client ID: MADW-41-52

Matrix: GROUND WATER

Date Received: 10/9/2013

Level: LOW

% Solids:

Sample Wt/Vol: 45.00

Final Vol: 50.0

Prep Batch ID: 554900

Prep Date: 10/14/2013

Total/Dissolved: TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0030	0.0020	0.0010	1.00	10/24/2013	10:19:32
Barium	7440-39-3	0.071	mg/L			M	0.0056	0.0037	0.0019	1.00	10/24/2013	10:19:32
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0010	0.00070	0.00030	1.00	10/24/2013	10:19:32
Cadmium	7440-43-9	0.0007	mg/L	U		M	0.0011	0.0007	0.0004	1.00	10/24/2013	10:19:32
Chromium	7440-47-3	0.0037	mg/L			M	0.0022	0.0015	0.0007	1.00	10/24/2013	10:19:32
Copper	7440-50-8	0.098	mg/L			M	0.0056	0.0037	0.0019	1.00	10/24/2013	10:19:32
Iron	7439-89-6	0.18	mg/L			M	0.056	0.037	0.019	1.00	10/25/2013	11:04:34
Lead	7439-92-1	0.0057	mg/L			M	0.0022	0.0015	0.0007	1.00	10/24/2013	10:19:32
Manganese	7439-96-5	0.066	mg/L			M	0.0056	0.0037	0.0019	1.00	10/24/2013	10:19:32
Mercury	7439-97-6	0.00008	mg/L	J		M	0.00022	0.00013	0.00007	1.00	10/24/2013	10:19:32

Comments: _____

NW12/11/13

6020 DISS

1D

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client: EA Engineering-MD SDG No.: EMS-025 Method Type: 6020 DISS

Sample ID: 1052379001

Client ID: MADW-41-52

Matrix: GROUND WATER

Date Received: 10/9/2013

Level: LOW

% Solids:

Sample Wt/Vol: 100.00

Final Vol: 100.0

Prep Batch ID: 557471

Prep Date: 10/24/2013

Total/Dissolved: DISSOLVED

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical	
											Date	Time
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0030	0.0020	0.0010	1.00	10/24/2013	12:55:3
Barium	7440-39-3	0.068	mg/L			M	0.0050	0.0033	0.0016	1.00	10/24/2013	12:55:3
Beryllium	7440-41-7	0.00067	mg/L	U		M	0.001	0.00067	0.00033	1.00	10/24/2013	12:55:3
Cadmium	7440-43-9	0.00067	mg/L	U		M	0.0010	0.00067	0.00033	1.00	10/24/2013	12:55:3
Chromium	7440-47-3	0.0013	mg/L	J		M	0.0020	0.0013	0.0007	1.00	10/24/2013	12:55:3
Copper	7440-50-8	0.086	mg/L			M	0.0050	0.0033	0.0016	1.00	10/24/2013	12:55:3
Iron	7439-89-6	0.033	mg/L	U		M	0.050	0.033	0.016	1.00	10/24/2013	12:55:3
Lead	7439-92-1	0.0016	mg/L	J		M	0.0020	0.0013	0.0007	1.00	10/24/2013	12:55:3
Manganese	7439-96-5	0.032	mg/L			M	0.0050	0.0033	0.0016	1.00	10/24/2013	12:55:3
Mercury	7439-97-6	0.00015	mg/L	<i>AB</i>		M	0.00020	0.00013	0.00007	1.00	10/24/2013	12:55:3

Comments:

NW 12/11/13

**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)	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) ^(e)	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
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

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-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
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

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-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)
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)
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)

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-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
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)

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-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)
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)
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
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

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-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)
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	ND (0.0007 U)	0.0016 J	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
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

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)
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)