DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON
4551 LLEWELLYN AVENUE, SUITE 5000
FORT GEORGE G. MEADE, MARYLAND 20755-5000

REPLY TO
ATTENTION OF:

July 8, 2013

Environmental Division

Mr. John Burchette
NPL/BRAC/Federal Facilities Branch
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Mr. Burchette:

Enclosed please find the July 2013 *Revised Final Off-Post Monitoring Well Sampling Report—Year 2* (Report) for your records. The Report was revised to include reponses to comments as an appendix . Copies of the Report have been furnished to Mick Butler (Fort George G. Meade), Francis Coulters (U.S. Army Environmental Command), Elisabeth Green (MDE), Timothy Peck (U.S. Army Corps of Engineers) and the Fort Meade Restoration Advisory Board.

If you have any questions, please feel free to contact Ms. Denise Tegtmeyer at (301) 677-9559 or me at (301) 677-9365.

Sincerely,

FOR:

Paul V. Fluck, PG, REP
Program Manager, Installation Restoration Program
Directorate of Public Works-Environmental Division

Enclosure

ARCADIS
Infrastructure · Water · Environment · Buildings

Paul Fluck
Installation Restoration Program
U.S. Army Garrison Fort George G. Meade
Directorate of Public Works-Environmental Division
4215 Roberts Ave., Room 320
Fort Meade, Maryland 20755-7068

ARCADIS U.S., Inc
824 Market Street
Suite 820
Wilmington,
Delaware 19801
Tel 302.884.6900
Fax 302.658.2068
www arcadis-us.com

Subject:
Revised Final Off-Post Monitoring Well Sampling Report—Year 2
Fort George G. Meade
Fort Meade, Maryland

ENVIRONMENT

Contract Number: W912DR-09-D-0021 Delivery Order 0004

Dear Mr. Fluck:

Date:
8 July 2013

Contact:
Dan Sheehan

Phone:
302.884.6919

Email:
Daniel.Sheehan@arcadis-us.com

Our ref:
02118175.0000

This 2013 Off-Post Monitoring Well Sampling Letter Report-Year 2 (Report) for monitoring wells (MW)-123s, MW-124s, MW-125d and MW-126d has been prepared on behalf of the United States (U.S.) Army to further remedial activities at Fort George G. Meade (FGGM), Maryland. This Report has been prepared by ARCADIS/Malcolm Pirnie, under U.S. Army Corps of Engineers (USACE) Baltimore District, Contract Number W912DR-09-D-0021 Delivery Order 0004.

The sections of this Report are as follows:

A. Background
B. Purpose
C. Monitoring Well Sampling
D. Data Analysis and Results
E. Investigation Derived Waste
F. References

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Table 1: Detections of COCs and Chloroform in Monitoring Wells 2004 - 2013
Table 2: Detections of VOCs in Monitoring Wells MW-123s, MW-125d, and MW-126d, 2013

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Figure 1: General Location of Off-Post Monitoring Wells

Attachments:

A. Laboratory Report
B. Data Validation Report
C. Investigation Derived Waste Manifest
D. Response to Comments

A. Background

As part of the Remedial Investigation (RI) of the Closed Sanitary Landfill (CSL) at FGGM, four groundwater monitoring wells (identified as MW-123s, MW-124s, MW-125d, and MW-126d), were installed in 2003 on the Anne Arundel County right-of-way just outside the southeastern boundary of the installation on the east edge of North Patuxent Road (**Figure 1**). There are two well clusters, each with a deep and shallow well (MW-125d/ MW-123s and MW-126d/ MW-124s), which were initially sampled in June 2004. The deep monitoring wells (MW-125d and MW-126d) were also sampled in March 2005 as part of the CSL RI. Upon completion of the RI in 2007, tetrachloroethylene (PCE), trichloroethylene (TCE), and carbon tetrachloride (CCl_4) were identified as contaminants within the Lower Patapsco aquifer (i.e., the aquifer associated with the deep wells), including at the subject well locations. Therefore, the constituents of concern (COCs) for this project were established as CCl_4, PCE, and TCE with cis-1,2-dichloroethene (cis-1,2-DCE) as a breakdown product of PCE and TCE.

Concentrations of CCl_4 and PCE were detected above their respective federal maximum contaminant levels (MCLs) in the deep wells beginning with the 2004 sampling event. TCE was detected above its MCL at MW-125d and MW-126d beginning in 2008. However, none of the COCs were detected in the shallow wells during these sampling events.

In November 2008, FGGM redeveloped and re-sampled the two deep monitoring wells, MW-125d and MW-126d, as part of the Army's continual effort to monitor groundwater associated with the CSL. The results of this sampling event showed concentrations of CCl_4 from MW-125d and CCl_4, TCE, and PCE from MW-126d all had increased in concentration from the 2004 sampling event results and were all above their respective MCL. Thus, the U.S. Environmental Protection Agency (USEPA) issued the Interim Measure Required letter to FGGM (USEPA, 2009), requiring FGGM to conduct interim measure activities for monitoring wells MW-125d and MW-126d. Results of these interim measures are presented in the *Final FGGM Off-Post Well Investigation Interim Measures Report* (ARCADIS/Malcolm Pirnie, 2011a).

As part of the interim measure activities, the Army sampled the four wells in April 2009 and June 2009 for Volatile Organic Compounds (VOCs). As stated above, the Interim Measures Required letter only required activities to be conducted at monitoring wells MW-125d and MW-126d. Monitoring wells MW-123s and MW-124s (associated with the Upper Patapsco aquifer) were also sampled to ensure all contamination was confined to the Lower Patapsco aquifer. The results of these sampling events showed concentrations of CCl_4 in MW-125d at concentrations consistently above the MCL. In MW-126d the concentrations of CCl_4 and TCE consistently exceeded their respective MCLs, and PCE exceeded the MCL during the June 2009 event. Chloroform was detected in both MW-125d and MW-126d, and cis-1,2-DCE was detected in MW-126d. However, neither compound was detected above its respective MCL **(Table 1).** None of the COCs were detected in either of the shallow wells in the 2009 sampling events.

In early January 2012, all wells were redeveloped. On 31 January 2012 and 1 February 2012 monitoring wells MW-123s, MW-125d, MW-124s, and MW-126d were sampled. Consistent with previous sampling events, there were no detections of the COCs in either of the shallow wells (MW-123s and MW-124s). Both CCl_4 and PCE concentrations exceeded their respective MCLs in MW-126d. However, while there were detections of VOCs in MW-125d in 2012, no COCs were detected at concentrations above their respective MCLs (**Table 1**).

B. Purpose

This Off-Post Monitoring Well Sampling Report—Year 2 documents analytical results for Year 2 of the annual monitoring well sampling program. All sampling activities were conducted in accordance with the *Final Off-Post Monitoring Well Repair and Sampling Work Plan* (ARCADIS/Malcolm Pirnie, 2011b).

C. Monitoring Well Sampling

MW-123s and MW-125d were sampled on 30 January 2013; MW-124s and MW-126d were sampled on 31 January 2013.

Groundwater samples were collected using the low-flow method an average rate of approximately 150 milliliters/minute. Groundwater was collected directly into laboratory prepared VOC sample vials. Quality Assurance / Quality Control samples were collected in accordance with the *Final Off-Post Monitoring Well Repair and Sampling Work Plan* (ARCADIS/Malcolm Pirnie, 2011b).

D. Data Analysis and Results

Groundwater samples were analyzed using USEPA method SW846/8260 for the full Target Compound List (TCL) for VOCs. Data analyses were completed by a National Environmental Laboratory Accreditation Program (NELAP) laboratory., with a turnaround time of five business days. A third-party data quality review and validation was conducted on all samples (100%). The data validation was performed under USEPA Region III, Level M3 guidelines. The analyses were validated using the following documents, as applicable to each method:

- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 22, 2009
- USEPA Region III Innovative Approaches for Data Validation, June 1995
- USEPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

VOC detections for the sampled wells are shown in **Table 2**. The following compounds were detected at concentrations below their respective MCL in the corresponding wells:

- cis-1,2-DCE (MW-126d);
- Chloroform (MW-125d and MW-126d);
- PCE (MW-125d);

- Toluene (MW-125d); and
- TCE (MW-125d and MW-126d)

Although carbon disulfide was reported as being detected in the groundwater samples collected from three of the wells, it was also detected at similar concentrations in the equipment blank (0.25 µg/L) and in the trip blank (0.28 µg/L) during the January 2013 sampling event. As such, these results were qualified by the data validator. Because carbon disulfide has not been detected in any of the wells during previous sampling events and was found in the QA/QC samples, it is concluded to be a laboratory contaminant and not present in the groundwater of the area.

As shown in **Table 2,** both CCl_4 and PCE exceeded their respective MCLs in MW-126d and CCl_4 exceeded the MCL in MW-125d. As shown in **Table 1,** the concentrations of CCl_4 in MW-125d have increased from 3.5 micrograms per liter (µg/L) to 11.5 µg/L since the 2012 sampling event. Similarly, concentrations of CCl_4 in MW-126d have also increased since the 2012 sampling event (64.3 µg/L in February 2012 to 73.4 µg/L in January 2013). PCE concentrations have decreased in MW-126d from 9.2 µg/L in February 2012 to 6.5 µg/L in January 2013, but remain above the MCL of 5 µg/L. PCE in MW-125d has either been qualified or not detected above the method detection limit in the two 2009 and the January 2012 samples; however, PCE was detected at 4.6 µg/L in January 2013; however, below the MCL of 5 µg/L. There were no detections of the COCs in either of the shallow wells (MW-123s and MW-124s).

The full laboratory report is presented in **Attachment A**. The full data validation report is reported in **Attachment B**. Year 3 groundwater sampling is planned for early 2014. In addition, MW-123s, MW-124s, MW-125d, and MW-126d are included in operable unit 4 (OU4) and will be evaluated in the upcoming OU4 RI and Feasibility Study (FS).

E. Investigation Derived Waste

Approximately 13 gallons of purge water were generated during the January 2013 groundwater sampling activities and collected in five gallon buckets. The buckets were transported to FGGM and emptied into an empty 55-gallon drum during classification. All purge water was determined to be non-hazardous (based on results of detections in the monitoring wells) and was combined with nonhazardous purge water from the OU4 investigation prior to being transported to an off-Post treatment facility on 7 March 2013, by a licensed waste hauler/processor/disposal facility. The manifest is presented in **Attachment C.**

F. References

ARCADIS/Malcolm Pirnie. 2011a. *Final FGGM Offpost Well Investigation Interim Measures Report.* September 2011.

ARCADIS/Malcolm Pirnie. 2011b. *Final Off-Post Monitoring Well Repair and Sampling Work Plan.* October 2011.

USEPA III, 2004. *USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review.*

USEPA III, 2009. "Interim Measure Required" letter from U.S. Environmental Protection Agency to Fort George G. Meade dated 29 January 2009.

Sincerely,

ARCADIS U.S., Inc..

Daniel P. Sheehan, PE, BCEE
Project Manager

CC:
Mick Butler, Fort George G. Meade Environmental Division
Francis Coulters, United States Army Environmental Command

TABLES

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Table 1: Detections of COCs and Chloroform in Monitoring Wells 2004 - 2013

Well No.	Round	Date Collected	Compound Detected (MCL)				
			Chloroform (80 µg/L)	CCl_4 (5 µg/L)	cis-1,2-DCE (70 µg/L)	PCE (5 µg/L)	TCE (5 µg/L)
MW-123s	1	4/16/09	ND	ND	ND	ND	ND
	2	6/18/09	ND	ND	ND	ND	ND
	--	1/31/12	ND	ND	ND	ND	ND
	--	1/30/13	ND	ND	ND	ND	ND
MW-124s	1	4/16/09	ND	ND	ND	ND	ND
	2	6/18/09	ND	ND	ND	ND	ND
	--	1/31/12	ND	ND	ND	ND	ND
	--	1/31/13	ND	ND	ND	ND	ND
MW-125d	--	2004	--	21.3	--	2.8	0.5
	--	11/7/08	1 J	25	< 0.8	5	1 J
	1	4/16/09	ND	20.3	ND	0.66J	ND
	2	6/18/09	1.0	17.0	ND	ND	ND
	--	1/31/12	ND	3.5	ND	0.83J	0.52J
	--	1/30/13	1.6B	11.5J	ND	4.6J	1.6J
MW-126d	--	2004	--	4.1	--	12.4	3.5
	--	11/7/08	2 J	51	3 J	51	16
	1	4/16/09	ND	21.8	0.69J	11.5	4.9
	2	6/18/09	1.6	65.8	2.3	31.4	13.1
	--	2/1/12	ND	64.3	0.75J	9.2	3.2
	--	1/31/13	1.5B	73.4J	0.65J	6.5J	2.1J

Note: Values in parenthesis indicate the associated MCL

Round 1 and 2 are the 16 April 2009 and 18 June 2009, respectively, two Interim Measures sampling events.

ND = Not Detected at or above the reporting detection limit

Cells shaded gray exceed the MCL.

µg/L = micrograms per liter

J= estimated concentration below the method detection limit

B= compound was not detected substantially above the level reported in laboratory or field blanks

Table 2: Detections of VOCs in Monitoring Wells MW-123s, MW-124s, MW-125d, and MW-126d (2013)

Well No.	Date Collected	Compound Detected (MCL)						
		Carbon Disulfide (5 µg/L)	CCl_4 (5 µg/L)	cis-1,2-DCE (70 µg/L)	Chloroform (70 µg/L)	PCE (5 µg/L)	Toluene (1,000 µg/L)	TCE (5 µg/L)
MW-123s	1/30/13	0.23JB	ND	ND	ND	ND	ND	ND
MW-124s	1/31/13	0.23JB	ND	ND	ND	ND	ND	ND
MW-125d	1/30/13	0.24JB	11.5J	ND	1.6B	4.6J	0.36J	1.6J
MW-126d	1/31/13	ND	73.4J	0.65J	1.5B	6.5J	ND	2.1J

Note: Values in parenthesis indicate the associated MCL. Only the detected concentrations are presented in this table. There were no detections in shallow well MW-124s.
ND = Not Detected at or above the reporting detection limit
Cells shaded gray exceed the MCL.
µg/L =micrograms per liter
J= estimated concentration below the method detection limits defined by Department of Defense Quality Service Manual Version 4.2 but are within the laboratory's acceptance limits which are below the MCLs set for the COCs for the project.
B= compound was not detected substantially above the level reported in laboratory or field blanks

Figures

PROMM PROMM PRPMM

QPOTMM QPOTMM

N

Odenton Rd
Morgan Dr
Odenton Rd
Academy Rd
Lofkus Rd
North Patuxent Rd
Skyline Ave
Becknel Ave
Railroad Ave
Beverly Ave
Sarrento Ave
1st Ave
Odenton Rd
Dovetail Ln
Gill St
Damascus St
Saran Ct
Telegraph Rd
Darwin St
Stonefruit Ct
Treasure Dr
Pitt Ct
Ransom Dr
Aaron Cir
Tab St
Monterey Ave
Rita Dr
Piney Orchard Pky
Patricia Ct
Jo Ann Dr
June Dr
Prince Charles Ave
Saint Andrews Ln
Saltoun Ave
Baird Ln

MW-125d
MW-123s
MW-124s
MW-126d

AREA SHOWN

PROMM PROMM PRPMM

cçã=dÉçêÖÉ=dkÑ É~ÇÉ
l ÑÑmçëí=j çåãçêåÖ=t Éää
p~ã éäáåÖ=i ÉíÉê=oÉéçã=—=vÉ~ê=O

cáÖìêÉ=N
dÉåÉê~ä çÅ~íáçå=çÑ ÑÑmçëí=j çåãçêåÖ=t Éääë

i ÉÖÉåÇ

- Installation Boundary
- Deep Monitoring Well
- Shallow Monitoring Well
- Railroad

0 100 200
Meters

Data Sources: ESRI, World Imagery, 2003
FGGM, GIS Data, 2005

Coordinate System: UTM Zone 18
Datum: NAD 1983
Units: Meters

ARCADIS

ATTACHMENT A

Laboratory Report

ATTACHMENT C

Investigation Derived Waste Manifest

ATTACHMENT D

Response to Comments

Response to Comments Table						
Draft Off-Post Monitoring Well Sampling Letter Report—Year 2						
April 2013						
Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification N = Comment noted, no action required or taken						
Comment Number	**Commenter**	**Page(s)**	**Section**	**Comment**	**Response Code**	**Response**
1	EPA RPM		General	The method detection limits appear to be above the MCLs for some of the COCs. In future sampling events please ensure that the MDLs are below the MCLs.	N	As a point of clarification, the reporting limits provided by the analytical laboratory (provided in Attachment A of the report) were actually below the MCLs for all site COCs. However, the results were J-qualified by the data validator (See Attachment B) due to surrogate spike recoveries that fell slightly outside the QAPP limits (as defined by DoD Quality Service Manual Version 4.2 (QSM)). It should be noted, however, that these surrogate spike recoveries were actually within the laboratory's in-house acceptance limits (i.e., the default acceptance limits for non-DoD applications) and would therefore normally be acceptable as "unqualified" data. Accordingly, we believe that the reported analytical results for the site COCs are accurate. To clarify this in the report, we will revise the J-qualifier footnote in Table 1 (data summary table) to indicate that the results were qualified by data validation due to surrogate recoveries being slightly outside the QAPP limits.
2	MDE		General	It appears that, during data validation, all detections were given a J -flag based on poor recovery of surrogate spikes. Therefore, detections in all samples (even those above the Maximum Contaminant Level) are listed as estimated. Please discuss whether these data should still be used, given the J-flag on all detections, in the text.	N	