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December 11, 2015

Environmental Division

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

Dear Mr. Stroud:

Enclosed please find the page replacements necessary to amend the December 2014 *Final Remedial Action Completion Report (RACR)* for FGGM-93, Manor View Dump Site, at Fort George G. Meade. The page replacements reflect changes based on the *Revised Final Remedial Design* (August 2015). To prepare the revised RACR document, please follow these actions:

- Replace cover, spine, and cover page;
- Replace the Executive Summary and Sections 1 through 8; and
- Replace the report CD.

Copies of the page replacements have also been furnished to Fran Coulters (U.S. Army Environmental Command), Elisabeth Green (Maryland Department of the Environment), Dan LaHart and Christopher Williams (Anne Arundel County Schools), and the Fort George G. Meade Restoration Advisory Board.

If you have any questions, please feel free to contact Denise Tegtmeyer at (301) 677-9559 or me at (301) 677-7999.

Sincerely,

A handwritten signature in black ink, appearing to read "G. B. Knight".

George B. Knight, PG  
Program Manager, Installation Restoration Program  
Directorate of Public Works-Environmental Division

Enclosure

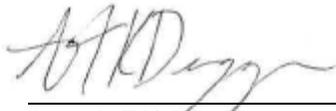


## REVISED FINAL Remedial Action Completion Report

FGGM 93, Manor  
View Dump Site,  
Fort George G.  
Meade, Maryland

December 2015





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Staff Engineer



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## Revised Final Remedial Action Completion Report

FGGM 93 Manor View Dump Site  
Fort George G. Meade, Maryland

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Date:  
December 2015

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## Table of Contents

<b>Executive Summary</b>	<b>ES-1</b>
<b>1. Overview</b>	<b>1</b>
1.1 Site Location and History	1
1.2 Chronology of Events	2
<b>2. Remedial Action Objectives</b>	<b>5</b>
<b>3. Remedial Action</b>	<b>6</b>
<b>4. Demonstration of Completion</b>	<b>7</b>
4.1 Long Term Monitoring	7
4.1.1 Groundwater Sampling	7
4.1.2 In-Situ Soil Gas Monitoring	7
4.1.3 Indoor Air Sampling	8
4.2 Land Use Control Implementation	8
4.3 Annual Site Inspection	9
4.4 Analytical Results	9
4.4.1 Groundwater Analytical Results	9
4.4.2 In-Situ Soil Gas Monitoring	11
4.4.3 Indoor Air Analytical Results	11
4.5 Annual Inspection Findings	12
4.6 Deviations from the Remedial Design	14
<b>5. Ongoing Activities</b>	<b>15</b>
<b>6. Community Relations</b>	<b>16</b>
<b>7. Certification Statement</b>	<b>18</b>
<b>8. References</b>	<b>19</b>

### Tables

Table 1	Long-term Monitoring Program Summary
Table 2	Well Construction Details and Groundwater Elevations

## Table of Contents

Table 3	Groundwater Monitoring Results - Constituents of Concern
Table 4	Soil Gas Monitoring Results
Table 5	Three Volume Purge Summary – August 2014
Table 6	Indoor Air Monitoring Results

### Figures

Figure 1	Site Location Map
Figure 2	Manor View Dump Site, Site Location Map
Figure 3	Manor View Dump Site, Site Map
Figure 4	Debris/Fill Footprint
Figure 5	Monitoring Well Locations
Figure 6	Soil Gas Monitoring Locations
Figure 7	Indoor Air Sample Locations Site School
Figure 8	Extent of Land Use Controls
Figure 9	Groundwater Contours August 2014
Figure 10	Groundwater Analytical Results – Metals
Figure 11	Groundwater Analytical Results – VOCs
Figure 12	Soil Gas Monitoring Results – August 2014
Figure 13	Indoor Air Sample Results and Additional Sample Locations

### Appendices

Appendix A	Photo Log
Appendix B	Safety Data Sheets for Chemicals Stored near the Manor View Elementary School Crawl Space
Appendix C	Inspection Forms
Appendix D	Field Forms
Appendix E	Laboratory Reports (Provided on CD)
Appendix F	Well Abandonment Form
Appendix G	Fact Sheet
Appendix H	Response to Comments

### Acronyms and Abbreviations

%	percent
µg/L	micrograms per liter
µg/m <sup>3</sup>	microgram per cubic meter
amsl	above mean sea level
ARCADIS	ARCADIS U.S. Inc.
C&D	Construction and Demolition
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DCE	Dichloroethene
EE/CA	Engineering Evaluation/Cost Analysis
FGGM	Fort George G. Meade
FGGM 93	Manor View Dump Site
FS	Feasibility Study
ft	feet
HHRA	Human Health Risk Assessment
ICs	Institutional Controls
IRP	Installation Restoration Program
LEL	Lower Explosive Limit
LTM	Long Term Monitoring
LUC	Land Use Controls
MDE	Maryland Department of the Environment
MGW	Methane Generating Waste
MW	Monitoring Well
NCP	National Oil and Hazardous Substance Contingency Plan
NTCRA	Non-time Critical Removal Action

**List of Acronyms and Abbreviations (continued)**

PA/SI	Preliminary Assessment/Site Investigation
PP	Proposed Plan
RAB	Restoration Advisory Board
RAOs	Remedial Action Objectives
RD	Remedial Design
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
Site	FGGM 93, Manor View Dump Site
SOPs	Standard Operating Procedures
TCE	Trichloroethene
U.S.	United States
USEPA	United States Environmental Protection Agency
VC	Vinyl Chloride

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

### Executive Summary

This Remedial Action Completion Report summarizes the implementation of the selected remedy at Fort George G. Meade (FGGM), Manor View Dump Site (herein referred to as FGGM 93 or the Site) to address unacceptable risk identified under future use scenarios due to exposure to contaminants in groundwater, soil, and indoor air, and the remaining buried waste at the Site. Environmental impacts at the Site are a result of landfilled material discovered at the Site in 2003.

Subsequent to the alternatives analysis conducted in the Feasibility Study (ARCADIS, 2014a), a Record of Decision (ROD; United States [U.S.] Army, 2014a) authorizing the selected remedy was signed by the U.S. Army and U.S. Environmental Protection Agency on September 30, 2014. The remedy selected within the ROD was Alternative 2: Maintenance of Existing Soil Cover, Land Use Controls (LUCs), and Long-term Monitoring (LTM). A Remedial Design (U.S. Army, 2015) was developed to direct the implementation of the selected remedy. Implementation of the selected remedy was conducted August through October 2014 and included the following components:

- Semi-annual LTM of contaminants of concern (COCs) in groundwater (i.e., arsenic, cadmium, chromium, cobalt, lead, selenium, thallium, trichloroethene [TCE] and vinyl chloride [VC]);
- Semi-annual LTM of soil gas for methane;
- Annual LTM of indoor air in the crawl space at Manor View Elementary for TCE and its daughter products (i.e., 1,1-dichloroethene [DCE], cis-1,2-DCE, trans-1,2-DCE, and VC);
- Annual site inspections including operational testing of the methane monitors located in the crawl space at the Manor View Elementary School and in the housing units adjacent to the western portion of the Site and maintenance of the soil cover; and
- Implementation of LUCs.

The Remedial Action Objectives were met (as documented in this report) through the implementation of LTM, completion of the annual inspection, and implementation of LUCs.

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

### 1. Overview

ARCADIS U.S. Inc. (ARCADIS) has been retained by the United States (U.S.) Army Environmental Command to perform Installation Restoration Program (IRP) activities at Fort George G. Meade (FGGM), located in Anne Arundel County, Maryland. This work is being conducted under a Performance Based Contract associated with the IRP at FGGM. The full scope of services for this contract is defined in Contract W91ZLK-05-D-0015: Task 0005.

The IRP activities at FGGM are conducted under the U.S. Army's Defense Environmental Restoration Program and operate principally under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 and National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 Code of Federal Regulations [CFR] 300). FGGM was placed on the National Priorities List on July 28, 1998. Coordination and input are provided by the U.S. Environmental Protection Agency (USEPA) Region III, and as appropriate, by the other signatories of the FGGM Federal Facility Agreement, including the Architect of the Capitol and the Department of Interior. Input and coordination from Maryland Department of the Environment (MDE) was also solicited.

This Remedial Action Completion Report has been prepared to document the implementation of the selected remedy for FGGM 93, Manor View Dump Site [herein referred to as FGGM 93 or "the Site"] as specified in the Record of Decision for the Site (ROD; U.S. Army, 2014a).

#### 1.1 Site Location and History

FGGM is located midway between the cities of Baltimore, Maryland, and Washington D.C. in Anne Arundel County, Maryland, as shown on **Figure 1**. The Site is located near the intersection of MacArthur Road and 2nd Corps Boulevard in the northern portion of FGGM. A Site location map is provided as **Figure 2**, and an aerial map of the Site is presented on **Figure 3**. The Site is bounded by a group of residential housing and an open field to the north, 2nd Corps Boulevard to the south, Hayden Drive to the west, and Manor View Elementary School located at 2900 MacArthur Road to the east.

Landfilled material at the Site was discovered in 2003 during excavation and earth moving activities associated with the housing privatization initiative. Following the discovery of landfilled material, various field activities were completed to determine the

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

nature and extent of the waste mass. Materials recovered in test pits and soil borings were dated as originating from the 1940s, and classified into two general categories: methane generating waste (MGW) and construction and demolition (C&D) debris/fill.

Results of these preliminary assessment/site investigation activities identified elevated methane concentrations in soil gas. In July and August 2005, a passive gas collection trench was installed along the western and northern extent of the Site to intercept methane migrating from the waste to the housing units and vent it to the atmosphere. In October 2005, soil gas samples were collected to determine the effectiveness of the passive collection trench. Elevated methane concentrations were observed near the housing units; thus for protection of the residents, the affected housing units located north and west of the Site were evacuated in December 2005 (URS, 2008). The housing units were reoccupied in Spring 2015.

The MGW was determined to occupy an approximately one-acre area confined to the western portion of the Site; bounded to the east by the north/south oriented drainage swale and to the north and west by the Potomac Place Housing Area. Methane was consistently observed at concentrations exceeding the Lower Explosive Limit (LEL) of 5 percent (%) in various soil gas monitoring locations in this area. This portion of the Site was the focus of a Non-Time Critical Removal Action (NTCRA) conducted in 2012 (ARCADIS, 2012), which included the excavation and off-Site disposal of approximately 27,700 tons of non-hazardous MGW and soil (**Figure 4**). Following achievement of the vertical and horizontal excavation limits, the Site was backfilled utilizing stockpiled overburden soil, followed by a minimum of 18 inches of clean imported common fill, and 6 inches of top soil to support vegetative growth. The western portion of the Site is currently a vacant grassed lot.

The remaining approximate nine acres of the Site (eastern portion of the Site) contains debris/fill and typically consists of C&D debris including rubble and burned material/ash which is more inorganic in nature and does not significantly contribute to methane generation through decomposition. The buried C&D debris remains on the eastern portion of the Site beneath a vegetative soil cover approximately 2 to 8 feet (ft) thick.

### 1.2 Chronology of Events

The following is a brief chronology of events associated with the Site:

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

Date	Event
Approximately 1920s-1940s	Site was used as a landfill.
2003	Methane generating waste discovered.
April 2003	Field investigations in support of the Preliminary Assessment/Site Investigation (PA/SI) were completed and included surface and subsurface soil sampling, completion of a geophysical survey, and construction and logging of test pits.
July - August 2005	Passive trench system installed to vent methane.
December 2005	Nearby residences evacuated and the passive system was converted to an active system with vapor extraction.
2004 - 2005	Field investigations in support of the Remedial Investigation (RI) were completed and included the collection of soil, groundwater, soil gas, indoor/ambient air, sediment, and surface water samples. Additionally, testing of the vapor extraction system was conducted.
November 2008	PA/SI and RI field activities documented in the Final RI (URS, 2008).
2009 - 2012	Supplemental field investigations including groundwater monitoring conducted in 2009, 2011, and 2012; additional sediment sampling conducted in 2010; and pre-design cone penetrometer testing conducted in 2010.
October 2011	Final Engineering Evaluation/Cost Analysis (EE/CA) issued.
October 27/28, 2011	Public notice of the availability of the EE/CA for review and comment published.
November 1 - 30, 2011	Public comment period on the EE/CA.
November 9, 2011	Public Meeting to discuss the NTCRA at the Manor View Elementary School.
December 2011	Action Memorandum issued.
February 2012	NTCRA Work Plan submitted (ARCADIS, 2012).
February 2012 - August 2012	Implementation of the NTCRA
October 2012	Final Interim Removal Action Report documenting completion of the NTCRA issued (ARCADIS, 2013).

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

Date	Event
March 12, 2014	Final RI Report Final Addendum issued presenting the revised Human Health Risk Assessment (HHRA) for FGGM 93 (ARCADIS, 2014b).
March 19, 2014	Final Feasibility Study (FS), Revision 1 issued (ARCADIS, 2014a).
March 2014	Proposed Plan (PP) issued to the public for review (U.S. Army, 2014b).
March 20 - April 19, 2014	30-day public comment period for the PP.
March 27, 2014	PP public meeting.
June 27, 2014	Final PP issued (U.S. Army 2014b)
September 30, 2014	Final ROD signed by the Army and USEPA (U.S. Army 2014a).
August 2014 – October 2014	Implementation of the selected remedy.
Spring 2015	Nearby residences reoccupied.
August 21, 2015	Revised Final Remedial Design (RD) submitted to regulators (U.S. Army, 2015)

## **Remedial Action Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

### **2. Remedial Action Objectives**

The Remedial Action Objectives (RAOs), as stated in the ROD (U.S. Army, 2014a), are based on human health and environmental risks, and provided the basis for the formulation and development of the selected remedy. The RAOs for the selected remedy at the Site are as follows:

- To prevent human exposure to groundwater until contaminant levels in groundwater have been reduced to levels that allow for unlimited use and unrestricted exposure;
- To protect human health and the welfare of the surrounding community from the safety hazard posed by methane gas through ensuring the continued effectiveness of the NTCRA;
- To prevent the exposure of buried waste and contaminants in soil that may pose a physical or chemical hazard; and
- To protect the occupants of the school from the potential of vapor intrusion via the crawl space.

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

**3. Remedial Action**

Implementation of the selected remedy was conducted in August and October 2014 in accordance with the RD (U.S. Army, 2015) and consisted of the following components:

- Completion of one semi-annual groundwater sampling event including the collection of groundwater samples from all Site monitoring wells for analysis of constituents of concern (COCs) in groundwater (i.e., arsenic, cadmium, chromium, cobalt, lead, selenium, thallium, trichloroethene [TCE] and vinyl chloride [VC]);
- Completion of one semi-annual soil gas monitoring event including in-situ sampling for methane;
- Collection of one annual indoor air sample from within the crawl space at Manor View Elementary for analysis of TCE and its daughter products (i.e., 1,1-dichloroethene [DCE], cis-1,2-DCE, trans-1,2-DCE, and VC);
- Completion of the annual site inspections and maintenance of the soil cover; and
- Implementation of land use controls (LUCs).

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

### 4. Demonstration of Completion

The following sections discuss implementation of the selected remedy at FGGM 93 conducted in accordance with the RD (U.S. Army, 2015) and include a summary of remedy implementation (i.e. components of the long term monitoring (LTM) program, LUC implementation, and the annual site inspection) and presentation of the August 2014 analytical results. A photographic log is presented in **Appendix A**.

#### 4.1 Long Term Monitoring

The following sections discuss the LTM activities conducted in accordance with the monitoring program developed in the RD (U.S. Army, 2015). A summary of LTM program is provided in **Table 1**.

##### 4.1.1 Groundwater Sampling

A semi-annual groundwater sampling event was conducted on August 19 – 21, 2014. Samples were collected from ten monitoring wells (monitoring well [MW]-01, MW-02, MW-03, MW-04, MW-05, MW-06, MW-07, MW-09, MW-10, and MW-11) using low flow methodology. Monitoring well locations are provided on **Figure 5**. Groundwater samples were submitted to Shealy Environmental Services located in West Columbia, South Carolina and analyzed for volatile organic compounds, total metals, and biogeochemical parameters (i.e., pH, alkalinity, hardness, chloride, specific conductance, nitrate, chemical oxygen demand, turbidity, ammonia, sulfate, and total dissolved solids). Prior to conducting groundwater sampling, each monitoring well was gauged with an electronic water level meter and depth to water and total sounded depth measurements were recorded.

##### 4.1.2 In-Situ Soil Gas Monitoring

A semi-annual in-situ soil gas monitoring event was conducted on August 8, 2014. Landfill gas measurements (i.e., methane, carbon dioxide, and oxygen) were collected in-situ using a Landtec GEM™ 2000 landfill gas monitor and in accordance with the standard operating procedure (SOP) provided in the RD (U.S. Army, 2015) from 17 monitoring points (VMP-1, VMP-4, VMP-11, VMP-26, VMP-27, VMP-29 through VMP-33, VMP-36, MP-A, VE-C, VE-F, SG-82S, SG-82M, and SG-82D). Soil gas monitoring locations are presented on **Figure 6**. Prior to conducting monitoring activities, the landfill gas monitor was calibrated in accordance with manufacturer specifications. Two landfill gas readings were collected at each monitoring point: (1) an initial reading

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

collected from the monitoring point head space and (2) a final reading following a three-volume purge of the monitoring point. Following documentation of the initial reading, a three-volume purge was conducted at each monitoring point to displace stagnant air within the headspace and to capture a representative sample of the soil vapor from the screened interval. Flow rates and purge times were recorded following the three-volume purge at each monitoring point.

### 4.1.3 Indoor Air Sampling

The annual indoor air sampling event was conducted on August 20 – 21, 2014. A time integrated sample was collected from the indoor sampling location MV-13, located in the crawl space at the Manor View Elementary School, presented on **Figure 7**. The sample was collected using a 6L Summa® canister with flow controller pre-set by ALS Laboratories located in Simi Valley, California. Prior to collecting the sample, materials and chemicals housed in the storage room above the crawl space were documented and photographed. Safety Data Sheets were obtained for the chemicals within the storage room and are provided in **Appendix B**. Indoor air sampling was conducted in accordance with the SOP presented in the RD (U.S. Army, 2015). The Summa® canister was lowered in to the crawl space using a rope and the crawl space entry hatch was closed. The flow controller of the Summa® canister regulated passive sampling for a 24 hour period. Following the 24 hour sample period, the Summa® was retrieved and submitted to ALS Laboratories for analysis of TCE and its daughter products via USEPA method TO-15.

## 4.2 Land Use Control Implementation

As discussed in the RD (U.S. Army, 2015), a number of the institutional controls (ICs) specified in the ROD (U.S. Army, 2014a) to achieve RAOs are already in place as elements of required procedures at FGGM (i.e. regulation of intrusive activities through the FGGM Dig Permit requirements; Master Plan Regulations including the prohibition of residential land use and groundwater use at the Site; and the documentation of the Site boundaries in the FGGM Geographic Information System Database). The remaining ICs were implemented through completion of the annual site inspection which was conducted during multiple mobilizations in August and October 2014 to ensure the placement and functionality of the methane monitors in the Manor View Elementary School and the adjacent housing units; confirm that the occupancy of the crawl space at Manor View Elementary has not changed; and identify any building construction planned within the Site boundaries. Site boundaries are presented in **Figure 8**.

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

Engineering controls identified in the ROD (US Army, 2014a) to be implemented at the Site include the following:

- Installation of signs prohibiting unauthorized intrusive activities at the Site;
- Installation of warning signs at various conspicuous locations at the Site including common entrances and exits informing Site visitors of environmental concerns at the Site; and
- Retention of the fence bisecting the Site into eastern and western parcels.

The fence currently in place at the Site bisects the Site into eastern and western parcels and satisfies the LUC as defined above. As of August 2014, no modifications to this fence had been made and the north-south oriented portion delineating the school yard remained in place. Additionally, five LUC signs were installed on October 2, 2014 utilizing steel u-channel posts at the locations depicted on **Figure 8**.

### 4.3 Annual Site Inspection

As outlined in the RD (U.S. Army, 2015), annual inspections are conducted on an annual basis to confirm the continued compliance with all of the LUC objectives, and to ensure that the integrity and continued effectiveness of the existing soil cover is maintained. Specifically, the annual inspection included an evaluation of the existing soil cover, land use, and the integrity of on-Site monitoring locations (i.e., monitoring wells and soil gas monitoring points); operational testing of the methane monitors and soil vapor extraction system; and identification of planned construction. The inspection was conducted during multiple mobilizations and in tandem with LTM activities in August through October 2014. Completed inspection forms are provided in **Appendix C**.

### 4.4 Analytical Results

This section presents the results of the August 2014 annual indoor air and semi-annual groundwater and soil gas monitoring events. Field forms are provided in **Appendix D**. Laboratory analytical reports are included in **Appendix E**.

#### 4.4.1 Groundwater Analytical Results

Depth to groundwater measurements were collected from the monitoring wells on August 18 and 19, 2014. Groundwater elevations ranged from 161.01 ft above mean

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

sea level (amsl) at MW-05 to 168.74 ft amsl at MW-01. Based on historic and current groundwater elevation data, groundwater flows generally towards the southeast. Depth to groundwater measurements and corresponding groundwater elevations are provided in **Table 2**. A groundwater contour map is provided on **Figure 9**.

Groundwater analytical results for Site COCs are provided in **Table 3** and also on **Figure 10** (metals) and **Figure 11** (volatile organic compounds). A summary of the COC concentrations observed during the August 2014 sampling event is discussed below:

- Arsenic was not detected above the Remedial Goal (RG) established in the ROD (U.S. Army, 2014a) of 10 micrograms per liter ( $\mu\text{g/L}$ ) in any of the ten monitoring wells sampled. The maximum concentration of arsenic was an estimated 2.3  $\mu\text{g/L}$  at MW-04.
- Cadmium was not detected above the RG of 5  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of cadmium was 1.3  $\mu\text{g/L}$  at MW-04.
- Chromium was not detected above the RG of 100  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of chromium was an estimated 3.6  $\mu\text{g/L}$  at MW-04.
- Cobalt was detected above the RG of 5  $\mu\text{g/L}$  in six of the ten monitoring wells sampled. The maximum concentration of cobalt was 20  $\mu\text{g/L}$  at MW-01 and MW-04.
- Lead was not detected above the RG of 15  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of lead was an estimated 0.80  $\mu\text{g/L}$  at MW-03.
- Selenium was not detected above the RG of 50  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of selenium was 2.3  $\mu\text{g/L}$  at MW-11.
- Thallium was not detected above the RG of 0.5  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of thallium was an estimated concentration of 0.28  $\mu\text{g/L}$  at MW-01.
- TCE was not detected above the RG of 5  $\mu\text{g/L}$  in any of the ten monitoring wells sampled. The maximum concentration of TCE was 2.7  $\mu\text{g/L}$  at MW-05.

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

- VC was not detected above the RG of 2 µg/L in any of the ten monitoring wells sampled. The maximum concentration of VC was 0.97 µg/L at MW-09.

In general, the analytical results presented above were consistent or less than the results observed during the previous round of sampling conducted in April 2012. Historical groundwater data is presented in the Final FS (ARCADIS, 2014a).

### 4.4.2 In-Situ Soil Gas Monitoring

The August 2014 monitoring event was conducted in accordance with the LTM program established in the ROD and as a component of the selected remedy (U.S. Army, 2014a). During development of the RD, the monitoring network was reduced to include monitoring locations with detectable concentrations of methane following completion of the NTCRA (17 total locations). Methane was detected above the LEL of 5% at VMP-26 at a concentration of 9.1%. Final methane concentrations were detected below the LEL at ten locations. The remaining six locations did not exhibit any methane concentrations above the landfill gas monitor's detection limits (i.e., 0 %). Final methane results collected following completion of purging activities are presented in **Table 4** and on **Figure 12**. A summary of the three volume purge including total purge times, flow rates, and total purge volumes is provided in **Table 5**. A comprehensive historical review of the in-situ soil gas monitoring including results conducted in 2014 is presented in the 2014 Annual Soil Gas Monitoring Report (ARCADIS, 2014b).

### 4.4.3 Indoor Air Analytical Results

Analytical results of the indoor air sample collected in the crawl space at the Manor View Elementary School on August 21, 2014 are presented in **Table 6**. The crawl space sample location (MV-13) and 2014 analytical results are presented on **Figure 13**. TCE was detected above the RG of 1 microgram per cubic meter (µg/m<sup>3</sup>) at a concentration of 4.1 µg/m<sup>3</sup>. Tetrachloroethene was also detected above laboratory reporting limits at an estimated concentration of 0.61 µg/m<sup>3</sup>. 1, 1-DCE, cis-1,2-DCE, trans-1,2-DCE, and VC were not detected above the laboratory reporting limits. Analytical results are consistent with the results from the previous round of sampling conducted during the RI in February 2005 (3.5 µg/m<sup>3</sup>).

To confirm that TCE concentrations detected in the crawl space are not migrating towards areas of the school occupied by students and teachers, two additional indoor air samples will be collected from within the utility closet above the crawl space and in

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

the cafetorium in 2015 and analyzed for TCE and its daughter products. The proposed sample locations are depicted on **Figure 13**; however, the final sample locations are subject to approval from Manor View Elementary School representatives. All indoor air sampling activities will be conducted in accordance with the sampling procedures presented in the RD (U.S. Army, 2015).

### 4.5 Annual Inspection Findings

Completed inspection forms documenting completion of the annual site inspection are provided in **Appendix C**. A summary of the inspection findings is presented below:

- **Existing Soil Cover:** The existing soil cover was inspected on August 21, 2014 and was observed in good condition. No signs of settling, subsidence, or erosion were noted and no waste material was exposed at the ground surface. An annual mowing event was conducted in June 2014 and included mowing of the western portion of the Site and vegetation clearing along the capped passive gas collection trench. Browning grass was identified in the northwest corner. No significant vegetation growth requiring an additional mowing event was observed during the annual inspection.
- **Soil Vapor Extraction System:** The soil vapor extraction system was started October 2, 2014. The system was shut down immediately following the completion of the operational testing. No operational issues were noted.
- **Monitoring Locations:** As part of the annual inspection all of the monitoring locations (i.e., monitoring wells and soil gas monitoring points) were evaluated with respect to integrity of construction and security. During the inspection, MW-08 was observed outside of its manhole vault and it is assumed that it likely shifted due to settling following completion of the NTCRA in 2012 (Refer to Photo 1 of **Appendix A**). Thus, as proposed in the RD (U.S. Army, 2015) MW-8 was abandoned on October 3, 2014 by a driller licensed in the State of Maryland. The well abandonment report is provided in **Appendix F**.
- **Fence:** In general, the fence was observed in good condition and was locked upon arrival to the Site. Small animal passages were noted at multiple locations along the fence line. Additionally, vegetation overgrowth along the access road has collapsed a 10 ft section of fencing extending past the southwest corner of the school yard along the east side of the access road. This fence collapse does not allow access to the western portion of the Site and continues to delineate the land

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

use associated with the Manor View Elementary School play yard and the western portion of the Site (Refer to Photo 2 of **Appendix A**).

- **Methane Monitors:** One methane monitor (Kidde Nighthawk™ AC Plug-in Operated Carbon Monoxide and Explosive Gas Alarm with Digital Display, Model No. KN-COEG-3) is located in each of the housing units in the room nearest to the western portion of the Site (20 total). ARCADIS inspected and tested each methane monitor on August 8, 2014 with representatives from the U.S Army Environmental Division and the Corvias Group. In general, the methane monitors were mounted to the wall in the living room of each housing unit. Methane monitors were observed in disrepair with four of the monitors unaccounted for and multiple units identified without power. Almost all of the monitors were exhibiting a low battery warning. Following battery replacement, the monitors were able to be tested and were assumed to be operational. However, upon further inspection, it was noted that pursuant to the manufacturer's specifications, the monitors should be replaced every seven years following initial system startup. Representatives of the Corvias Group indicated that the monitors were likely installed prior to evacuation of the housing units in 2005. Thus, it is recommended that each of the methane monitors be replaced. ARCADIS provided replacement monitors to the Army on November 7, 2014. Replacement monitors will be installed in the housing units and in the crawl space at the Manor View Elementary School. Installation will be conducted by the Corvias Group with support from the Army. One methane monitor (S-Tech Natural Gas [Methane] Detector, Model No. STCH-1000LC) is located in the crawl space at the Manor View Elementary School and was identified in an operational state. This methane monitor was a different make and model than the units identified in the housing units.
- **Land Use:** No changes in land use were observed at the Site including the crawl space of the Manor View Elementary School.
- **LUC Signage:** Five LUC signs were installed on October 2, 2014 utilizing U-steel channel posts. The signs were installed 3 to 4 ft below ground surface and stand approximately 7 ft above the ground surface. The signs were installed at the locations depicted on **Figure 8** and are depicted on Photos 3 through 7 of **Appendix A**. Following installation, the signs were inspected to document sign locations and conditions.
- **Construction Activities:** No construction activities were identified on or near the Site.

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

**4.6 Deviations from the Remedial Design**

No significant deviations from the RD (U.S. Army, 2015) were encountered during implementation of the selected remedy.

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

**5. Ongoing Activities**

The following table summarizes ongoing activities at FGGM 93:

<b>Ongoing Site Activities</b>
<b>Annual Activities:</b>
Site inspection including an evaluation of the following: <ul style="list-style-type: none"><li>• Soil cover integrity;</li><li>• Land use including implementation of LUCs;</li><li>• Site monitoring locations;</li><li>• Methane monitors located in the housing units adjacent to the western portion of the Site and in the crawl space beneath the Manor View Elementary School; and</li><li>• Operational testing of the soil vapor extraction system.</li></ul>
Mowing and maintenance of the existing soil cover
Indoor air sampling in the crawl space beneath the Manor View Elementary School
<b>Semi-Annual Activities</b>
Groundwater sampling
Soil gas monitoring
<b>Other Activities</b>
CERCLA 5-year reviews

## Remedial Action Completion Report

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

### 6. Community Relations

In accordance with the NCP, public participation is required to promote active communication between the communities affected by activities conducted at the Site. This public participation requirement of the NCP has been fulfilled by the U.S. Army in the following manner:

- **Fact Sheets:** A fact sheet was prepared and provided to the public in March 2014 during development of the PP. This fact sheet summarized the site history, current site conditions, and the proposed remedial action. In addition, the fact sheet informed the community of pertinent contact information and the locations of the information repository available for public review. A copy of the fact sheet is provided as **Appendix G**.
- **Restoration Advisory Board (RAB) Meetings:** The Site has been discussed regularly at RAB meetings including briefings on in-situ soil gas monitoring results and updates throughout the duration of the NTCRA. Bi-monthly RAB meetings provide an opportunity for community members (including elected RAB members) and representatives of government agencies to meet and exchange information about FGGM's environmental program.
- **Public Comment Period:** A public notice was published in the Capital Gazette (a local newspaper) on March 16, 2014, and in SoundOff (weekly FGGM newspaper) on March 13, 2014, announcing the availability of the PP for public review and comment during the public comment period from March 20 to April 19, 2014. Additionally, a public meeting was held on March 27, 2014, to provide an opportunity for the public to comment on the proposed remedial actions documented in the PP.
- **Information Repositories:** The Administrative Record for the Site including documents pertaining to FGGM 93 (i.e., FS, PP, ROD) is located at two information repositories established by FGGM. The repositories are accessible in accordance with the American Disabilities Act, have copy facilities, and are available to the community during normal business hours. Information repositories are maintained at the following locations: Anne Arundel County Public Library – Odenton Regional Library (1325 Annapolis Road, Odenton, Maryland 21113) and the Fort Meade Environmental Division office (2460 85<sup>th</sup> Medical Battalion Avenue and Wilson Street, Fort Meade, Maryland). Additionally, electronic copies of pertinent Site documents are provided on the FGGM Environmental Management

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

System website available at the following path:

<http://www.ftmeade.army.mil/environment/> (Select Clean-up Program from the menu on the left hand side of the webpage).

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

**7. Certification Statement**

This Remedial Action Completion Report memorializes the completion of the remedial action and achievement of the RAOs at FGGM 93, Manor View Dump Site, FGGM, Maryland. All components of the remedial action were implemented pursuant to CERCLA, and as documented in the ROD (U.S. Army, 2014a).



Brian P. Foley  
Colonel, Signal Corps, Commanding

24 Sept 15

Date



Paul Leonard, Office Director  
Office of Federal Facility Remediation and Site Assessment  
United States Environmental Protection Agency, Region III

December 9, 2015

Date

**Remedial Action  
Completion Report**

FGGM 93, Manor View Dump  
Site  
Fort George G. Meade,  
Maryland

**8. References**

ARCADIS U.S., Inc. (ARCADIS). 2012. Final Non-Time Critical Removal Action Work Plan for FGGM 93, Manor View Dump Site. February 2012.

ARCADIS. 2013. Final Interim Removal Action Report, Manor View Dump Site. March 2013.

ARCADIS. 2014a. Final Feasibility Study, Revision 01, FGGM 93 Manor View Dump Site, Fort George G. Meade. Maryland. Final, Revision 1. March 2014.

ARCADIS. 2014b. Final Remedial Investigation Report Final Addendum, FGGM 93 Manor View Dump Site, Fort George G. Meade. Maryland. Final. March 2014.

ARCADIS. 2014c. Internal Draft 2014 Annual Soil Gas Monitoring Report, FGGM 93 Manor View Dump Site, Fort George G. Meade. Maryland. Internal Draft. September 2014.

United States Army (U.S. Army). 2014a. Final Record of Decision, FGGM 93 Manor View Dump Site, Fort George G. Meade, Maryland. Final. September 2014.

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U.S. Army. 2015. Revised Final Remedial Design, FGGM 93 Manor View Dump Site, Fort George G. Meade. Maryland. Final. August 2015.

URS. 2008. Remedial Investigation Report, Manor View Dump Site, Fort George G. Meade Maryland. Prepared by URS and the Army Corps of Engineers for Fort George G. Meade ANME-PWE, Environmental Division. November.

## Tables

**Table 1**  
**Long-term Monitoring Program Summary**  
 FGGM 93 Manor View Dump Site  
 Fort George G. Meade, Maryland

Category	Analytical Parameters	Sampling Frequency	Monitoring Wells	Sampling Method
Groundwater	40 CFR 258, Appendix I Parameters (Volatile Organic Compounds, Total Metals, and Water Quality Parameters <sup>2</sup> )	Semi-annually	MW-1	Low Flow Sampling
			MW-2	
			MW-3	
			MW-4	
			MW-5	
			MW-6	
			MW-7	
			MW-9	
			MW-10	
			MW-11	
Soil Gas	Landfill Gases (Methane, Carbon Dioxide, and Oxygen)	Semi-annually, concurrent with groundwater monitoring schedule.	VMP-1	In-Situ Monitoring
			VMP-4	
			VMP-11	
			VMP-26	
			VMP-27	
			VMP-29	
			VMP-30	
			VMP-31	
			VMP-32	
			VMP-33	
			VMP-36	
			MP-A	
			VE-F	
VE-C				
SG-82 (S,M,D)				
Indoor Air	Trichloroethene and its daughter products	Annually, concurrent with groundwater monitoring schedule.	MV-13, Manor View Elementary Crawl Space	SUMMA® Canister

**Notes:**

1. The groundwater monitoring program may be modified over time based on monitoring results, upon concurrence from the Maryland Department of the Environment and the United States Environmental Protection Agency.
2. Water quality parameters include pH, alkalinity, hardness, chloride, specific conductance, nitrate, chemical oxygen demand, turbidity, ammonia, sulfate, and total dissolved solids.
3. MW-8 was removed from the monitoring program following well abandonment on October 3, 2014. Abandonment was deemed necessary as the well had shifted outside of its manhole following excavation and backfilling activities conducted during implementation of the Non-Time Critical Removal Action.

**Table 2**  
**Well Construction Details and Groundwater Elevations**  
 FGGM 93 Manor View Dump Site  
 Fort George G. Meade, Maryland

Well ID	Well Material	Well Diameter (inches)	Ground Surface Elevation	Top of Casing Elevation (ft msl)	Measured Total Depth (ft bmp)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Screen Length (ft bgs)	Depth to Water (ft bmp) <sup>1</sup>	Groundwater Elevation (ft msl)
MW-1	PVC	2	NA	212.71	49.68	40	50	10	43.97	168.74
MW-2	PVC	2	NA	208.58	53.58	44	54	10	40.81	167.77
MW-3	PVC	2	NA	210.68	49.89	40	50	10	44.74	165.94
MW-4	PVC	2	NA	209.41	49.67	40	50	10	45.55	163.86
MW-5	PVC	2	NA	202.94	52.14	42	52	10	41.93	161.01
MW-6	PVC	2	NA	199.50	47.83	38	48	10	37.75	161.75
MW-7	PVC	2	NA	216.16	54.79	45	55	10	47.91	168.25
MW-8	PVC	2	NA	213.18	54.45	45	55	10	NM	NM
MW-9	PVC	2	NA	206.57	50.17	40	50	10	40.01	166.56
MW-10	PVC	2	NA	187.78	35.51	25	35	10	23.59	164.19
MW-11	PVC	2	NA	188.15	39.50	30	40	10	25.61	162.54

Notes:

1. Depth to groundwater measurements were collected at each monitoring well on August 18, 2014 with the exception of MW-10 which was gauged on August 19, 2014.

ft bgs - feet below ground surface

ft bmp - feet below measuring point

ft msl - feet above mean sea level

NM - not measured



**Table 4**  
**Soil Gas Monitoring Results**  
 FGGM 93 Manor View Dump Site  
 Fort George G. Meade, Maryland

Monitoring Point	Methane (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)
VMP - 1	0.0	2.3	19.1
VMP - 4	0.0	3.0	17.8
VMP - 11	0.3	3.0	17.9
VMP - 26	9.1	21.9	0.2
VMP - 27	3.9	25.8	0.0
VMP - 29	0.7	0.2	19.9
VMP - 30	0	0.2	20
VMP - 31	0.0	0.3	20
VMP - 32	1.3	19.6	0.3
VMP - 33	1.4	20.7	0.3
VMP - 36	4.1	20.7	0.3
MP-A	0.0	0.0	20.6
VE-C	0.0	2.0	18.8
VE-F	0.8	5.6	15.0
SG-82S	1.7	20.1	0.1
SG-82M	2.7	20.4	0.1
SG-82D	0.1	14.5	1.0

**Note:**

1. Sample results presented above were collected on August 8, 2014.
2. The August 2014 sampling event was conducted in accordance with the long-term monitoring program presented in the Remedial Design; thus, a subset of the sample locations were monitored.
3. Results presented above represent landfill gas concentrations measured following completion of three-volume purge activities.

CO<sub>2</sub> - Carbon dioxide

MP - Monitoring Point

O<sub>2</sub> - Oxygen

SG - Soil Gas Monitoring Point

VMP - Vapor Monitoring Point

VE - Vapor Extraction Point

**Table 5**  
 Three Volume Purge Summary - August 2014  
 FGGM 93 Manor View Dump Site  
 Fort George G. Meade, Maryland

	Start Time	Stop Time	Vacuum (inches of water)	Flow (L/m)	Purge Duration (minutes)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Total Purge Time (minutes)	Approximate Volume Purged (ft <sup>3</sup> )
<b>VMP-26</b>										
FINAL	1009		0.4	0.4	0.5	9.1	21.9	0.2	0.5	0.007
<b>VMP-27</b>										
FINAL	1014		0.2	0.4	0.5	3.9	25.8	0	0.5	0.007
<b>VMP-29</b>										
FINAL	0959		0	0.4	0.5	0.7	0.2	19.9	0.5	0.007
<b>VMP-32</b>										
FINAL	1037		0	0.4	0.5	1.3	19.6	0.3	0.5	0.007
<b>VMP-33</b>										
FINAL	1005		1.7	0.4	0.5	1.4	20.7	0.3	0.5	0.007
<b>VMP-36</b>										
FINAL	1002		0	0.4	0.5	4.1	28	0	0.5	0.007
<b>VMP-4</b>										
INITIAL	1046		0	0.4	0.5	0.1	3.4	17.9	1.5	1.057
FINAL	1047	1048		30	1	0.0	3	17.8		
<b>VMP-11</b>										
INITIAL	0928		0	0.4	0.5	0.0	4.3	16.7	1.5	0.357
FINAL	0929	0930		10	1	0.3	3	17.9		
<b>VE-F</b>										
INITIAL	0932		0	0.4	0.5	0.0	0.4	20.4	4.5	4.207
FINAL	0933	0934		30	4	0.8	5.6	15		
<b>SG-82S</b>										
INITIAL	1019		0	0.4	0.5	6.8	25.4	0.1	1	0.182
FINAL	1021	1022		10	0.5	1.7	20.1	0.1		
<b>SG-82M</b>										
INITIAL	1019		0	0.4	0.5	2.6	19.6	0	1	0.182
FINAL	1022	1022		10	0.5	2.7	20.4	0.1		
<b>SG-82D</b>										
INITIAL	1020		0	0.4	0.5	3.7	21.3	0	1	0.182
FINAL	1023	1023		10	0.5	0.1	14.5	1		

**Notes:**

- Monitoring locations with no measurable methane were omitted from this summary table.
- Initial methane concentrations are not recorded for monitoring locations constructed of 0.25-inch diameter polyethylene tubing because methane concentrations fluctuate too quickly during purging with Landtec GEM™ 2000 due to the small volume associated with the construction of the monitoring point .

% - percent

ft<sup>3</sup> - cubic feet

L/m - liters per minute

**Table 6**  
**Indoor Air Monitoring Results**  
 FGGM 93 Manor View Dump Site  
 Fort George G. Meade, Maryland

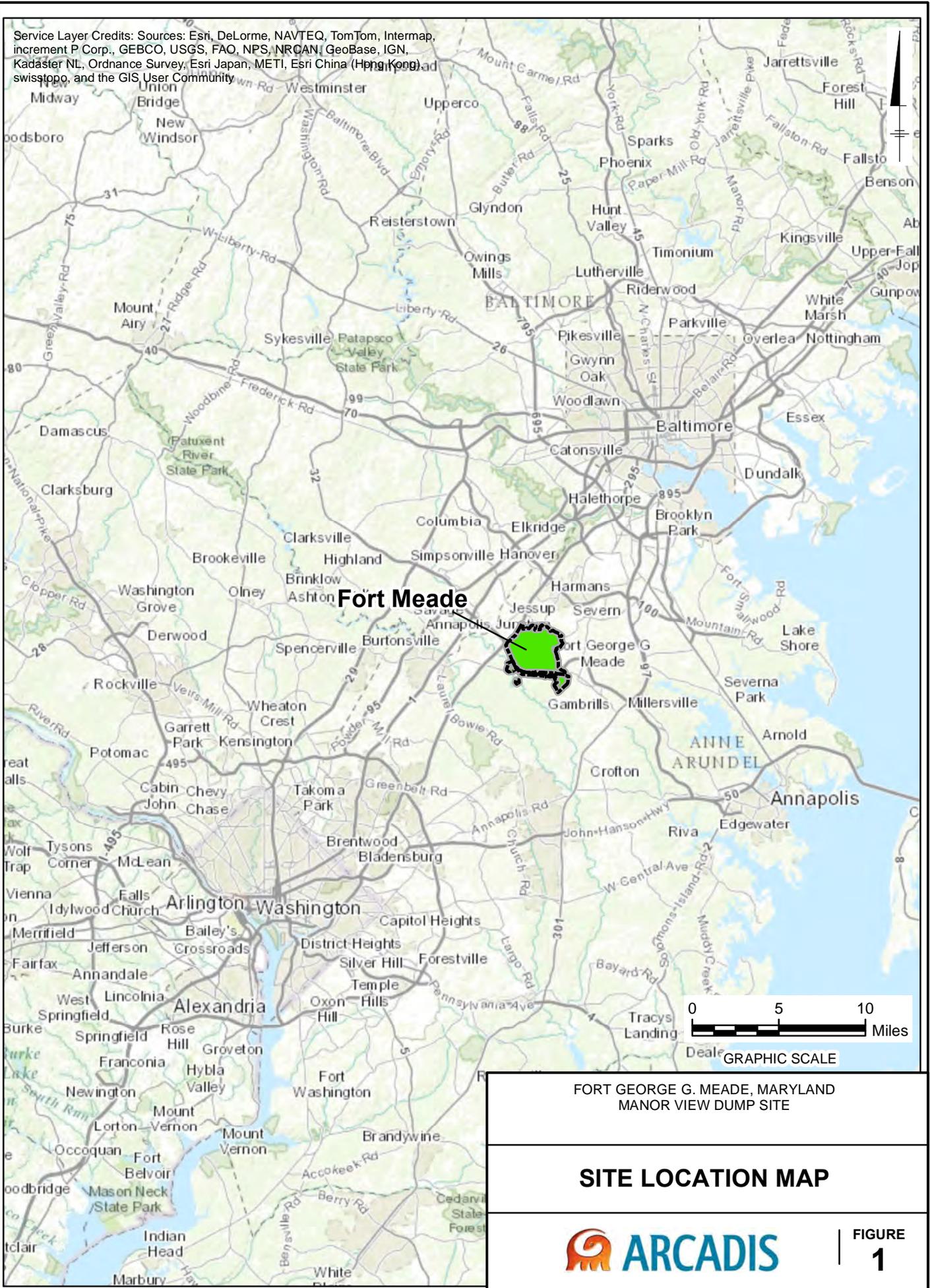
Site Specific Volatile Organic Compound Analyte List	Location ID:		FM93MV13
	Sample ID:		FGGM93-MV13 (082114)
	Date:		8/21/2014
	Remedial Goal <sup>1</sup>	Units	
1,1-Dichloroethene	--	µg/m <sup>3</sup>	<0.72 U
cis-1,2-Dichloroethene	--	µg/m <sup>3</sup>	<0.72 U
Tetrachloroethene	---	µg/m <sup>3</sup>	<b>0.61 J</b>
trans-1,2-Dichloroethene	---	µg/m <sup>3</sup>	<0.72 U
Trichloroethene	1	µg/m <sup>3</sup>	<b>4.1</b>
Vinyl Chloride	---	µg/m <sup>3</sup>	<0.72 U

**Notes:**

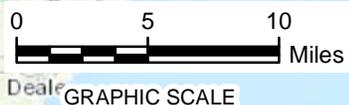
1. Remedial Goals presented were established in the Record of Decision (U.S. Army, 2014).
  2. Values exceeding the remedial goal are boldfaced and shaded. Detected values are bolded.
- µg/m<sup>3</sup> - micrograms per cubic meter  
 J - Indicates an estimated result. Result is less than laboratory reporting limits.  
 U - Indicates that the analyte was analyzed but not detected above the detection limit.

## Figures

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, and the GIS User Community



**Fört Meade**



FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

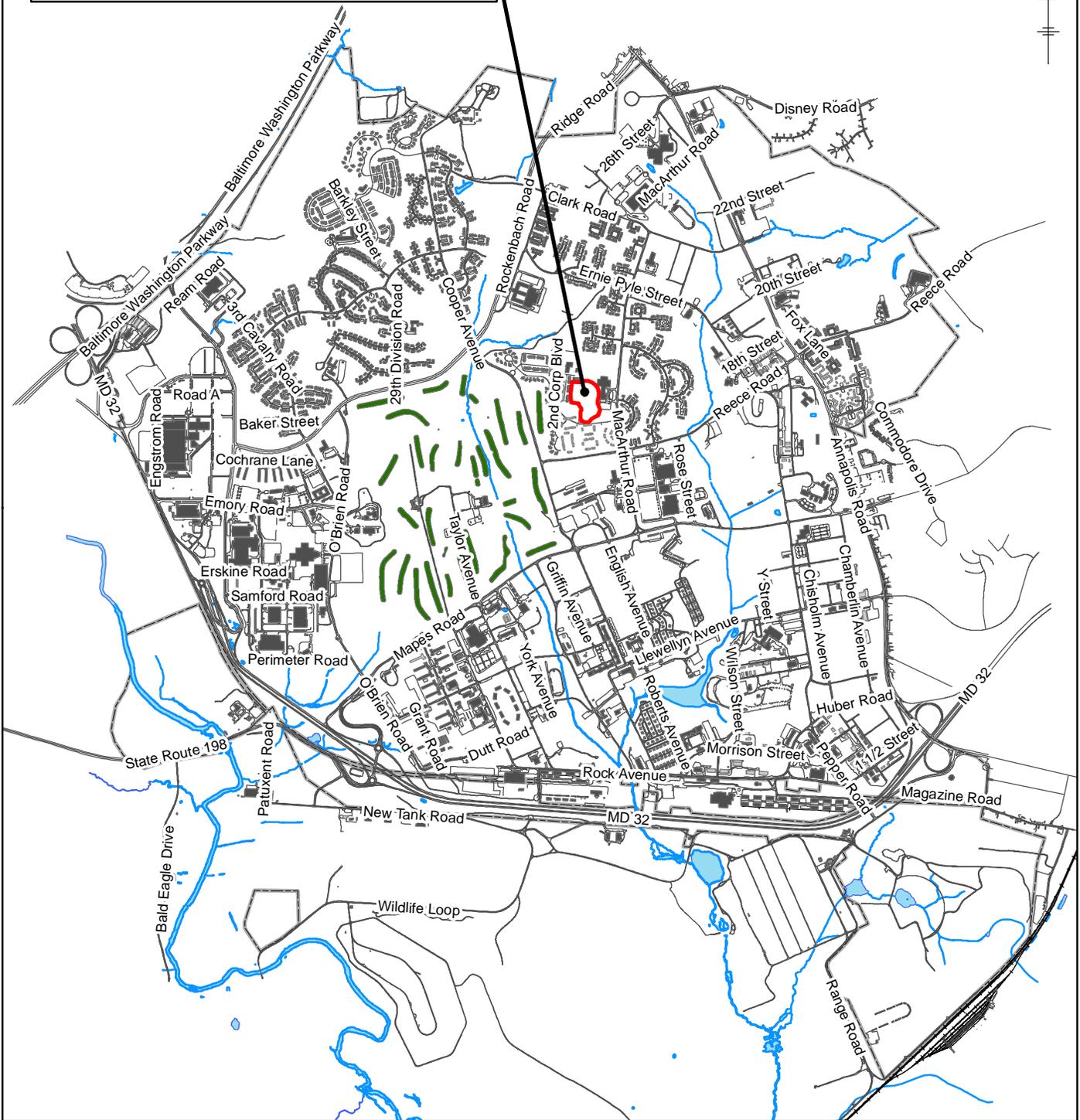
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FIGURE  
**1**

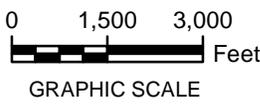
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# MANOR VIEW DUMP SITE



**LEGEND:**

 MANOR VIEW SITE BOUNDARY



FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

## MANOR VIEW DUMP SITE SITE LOCATION MAP



FIGURE  
2

CITY: MPLS DIV/GROUP: IM DB: MG LD: A. DUGGINS  
FORT MEADE  
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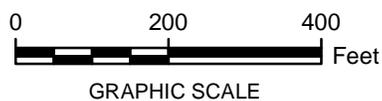
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 SITE BOUNDARY

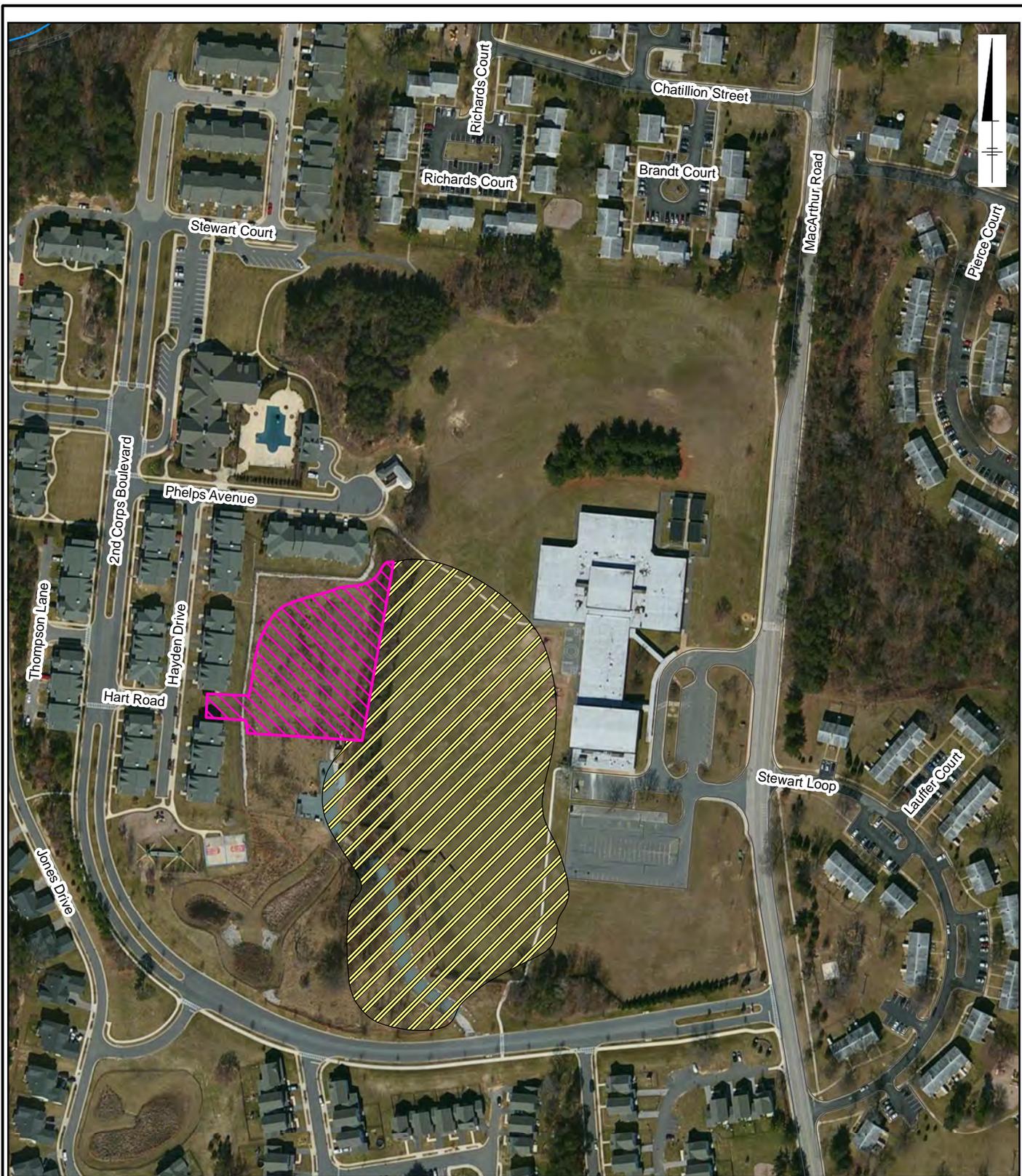


FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

**MANOR VIEW DUMP SITE  
SITE MAP**



FIGURE  
**3**



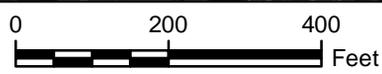
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**LEGEND:**

-  DEBRIS/FILL FOOTPRINT
-  METHANE GENERATING WASTE FOOTPRINT  
REMOVED DURING THE 2012 NON-TIME CRITICAL  
REMOVAL ACTION (LOCATION IS APPROXIMATE)

**NOTE:**

IMAGERY ACCESSED THROUGH BING MAPS AERIAL VIA ARCGIS  
 ONLINE LAYER PACKAGES BY ESRI (12/1/2010) (C)  
 2010 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS  
 ACCESSED ON 6/13/2013 THROUGH ARCGIS 10.



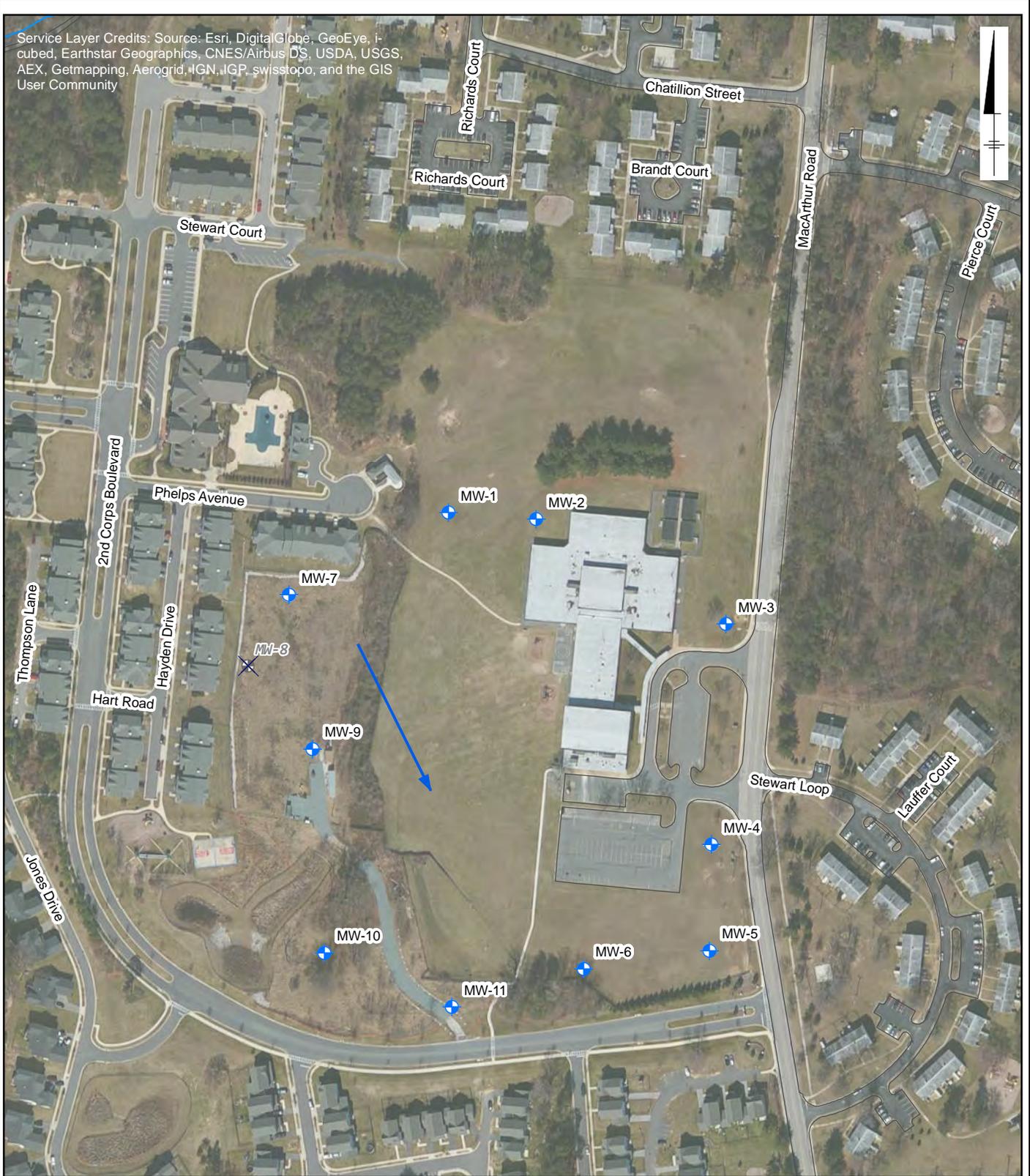
FORT GEORGE G. MEADE, MARYLAND  
 MANOR VIEW DUMP SITE

**DEBRIS/FILL FOOTPRINT**



FIGURE  
**4**

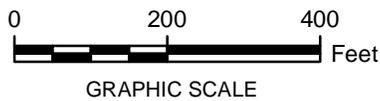
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**LEGEND**

-  MONITORING WELL
-  DAMAGED, WELL ABANDONED  
OCTOBER 2014
-  GROUNDWATER FLOW DIRECTION



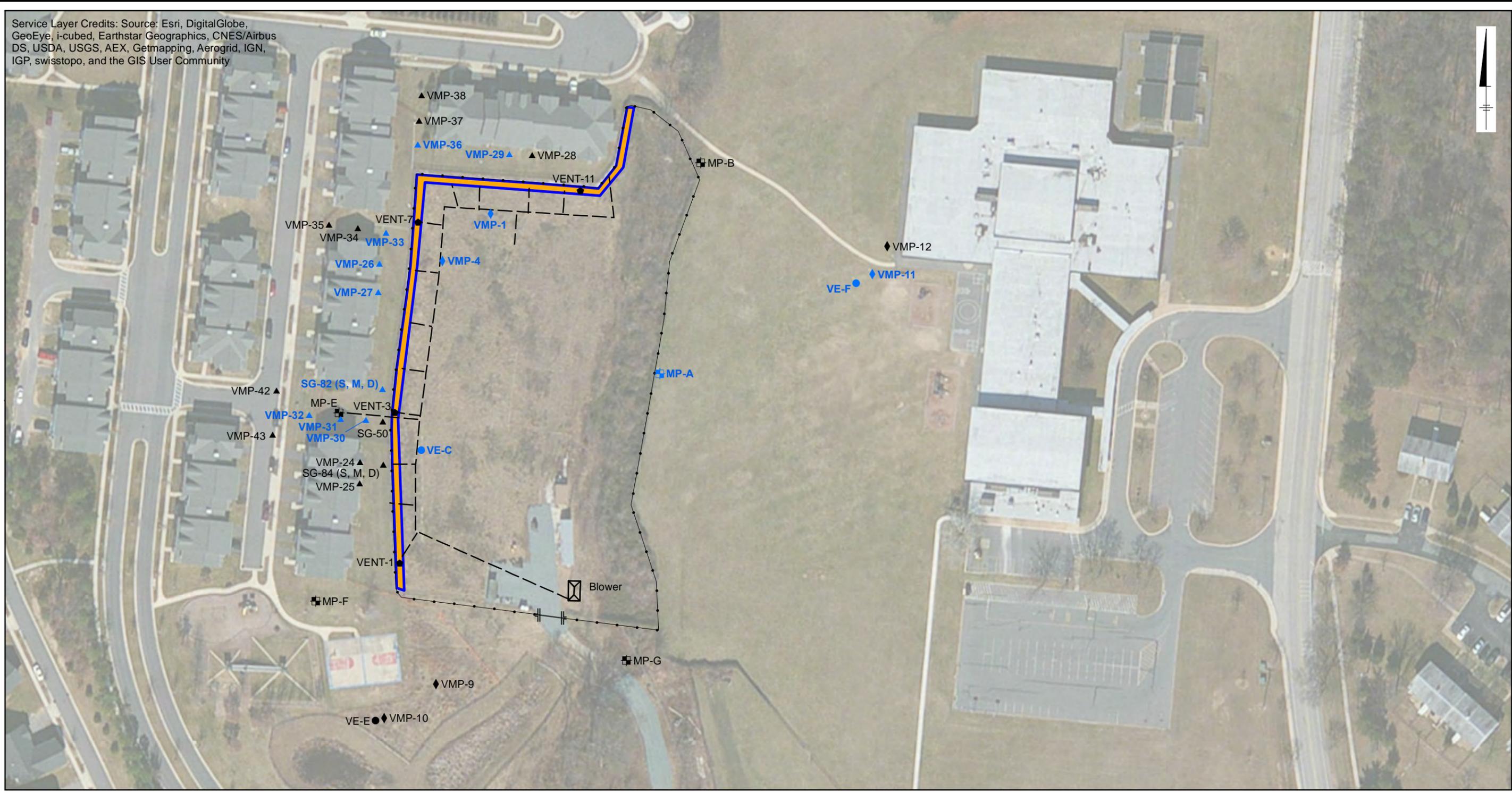
FORT GEORGE G. MEADE, MARYLAND  
 MANOR VIEW DUMP SITE

**MONITORING WELL LOCATIONS**



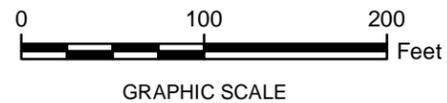
**FIGURE  
 5**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**LEGEND:**

- Monitoring Point
- Trench Well
- ◆ Deep Vapor Monitoring Point
- ▲ Shallow Vapor Monitoring Point
- Former Vapor Extraction Well
- Perimeter Fence
- || Gate
- - - Subsurface Piping Network Associated with the Dormant Soil Vapor Extraction System (February 2012 - Present)
- ▭ Capped Passive Gas Collection Trench



FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

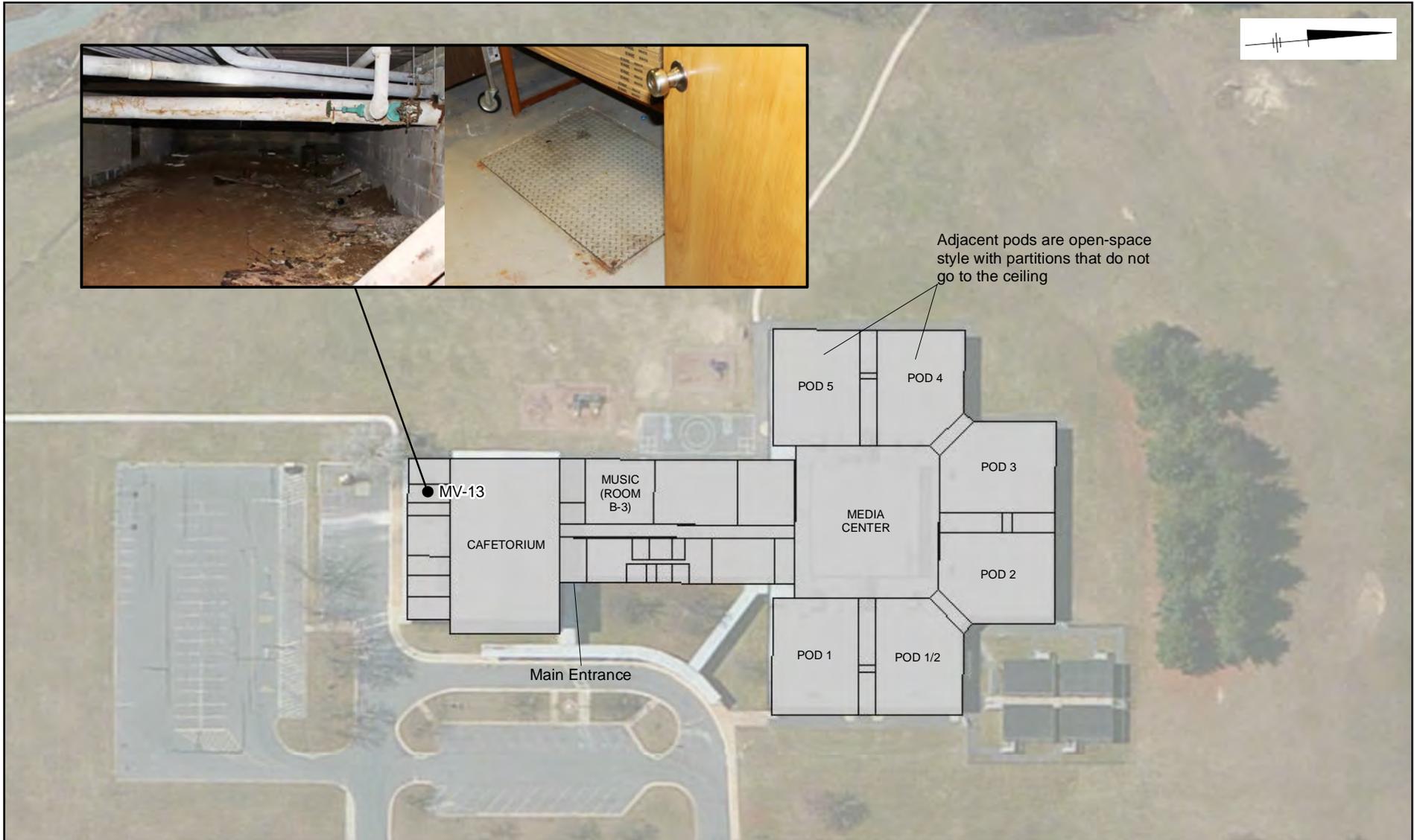
**SOIL GAS MONITORING LOCATIONS**



FIGURE  
**6**

Notes:  
1. The soil vapor extraction system was shutdown on August 17, 2012. The system has remained off but in an operational status.  
2. Monitoring locations included in the long-term monitoring program are displayed as a blue symbol with blue labels.

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FORT MEADE  
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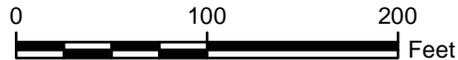


LEGEND:

- Indoor Air Sample

NOTE:

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



GRAPHIC SCALE

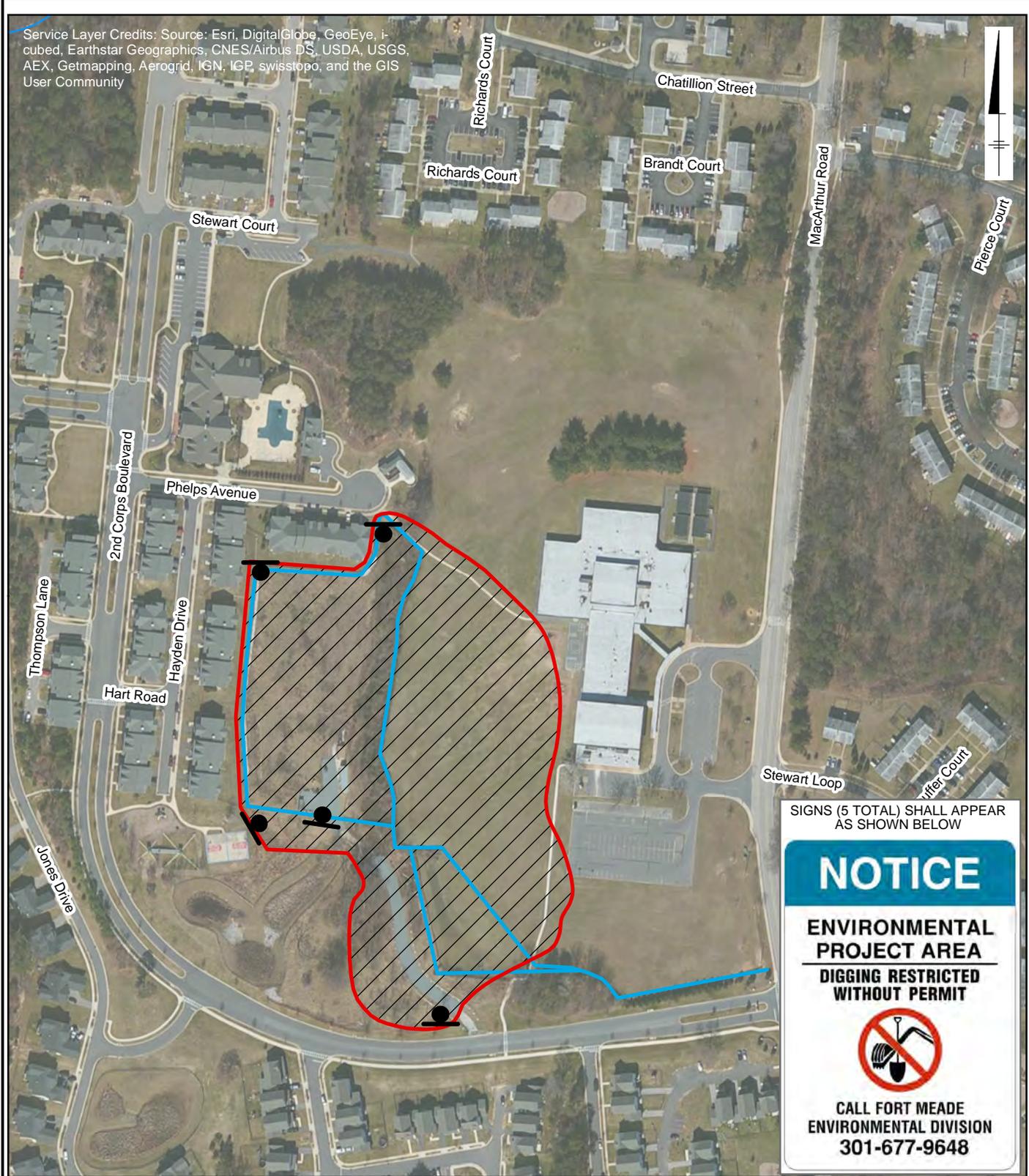
FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

**INDOOR AIR SAMPLE LOCATIONS  
SITE SCHOOL**



FIGURE  
**7**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



SIGNS (5 TOTAL) SHALL APPEAR AS SHOWN BELOW

**NOTICE**

**ENVIRONMENTAL PROJECT AREA**

**DIGGING RESTRICTED WITHOUT PERMIT**

**CALL FORT MEADE ENVIRONMENTAL DIVISION 301-677-9648**

CITY: MPLS\_DIV\GROUP: IM\_DB: MG\_LD: HA  
 FORT MEADE  
 Path: Z:\GIS\PROJECTS\_ENV\Fort\_Meade\ArcMap\Manor\_View\Remedial Design for FCGM 9307\_LandUse\_2014\_0813.mxd

**LEGEND:**

- SIGN LOCATIONS
- CURRENT ENGINEERING CONTROL / FENCE
- SITE BOUNDARY
- EXTENT OF LAND USE CONTROLS

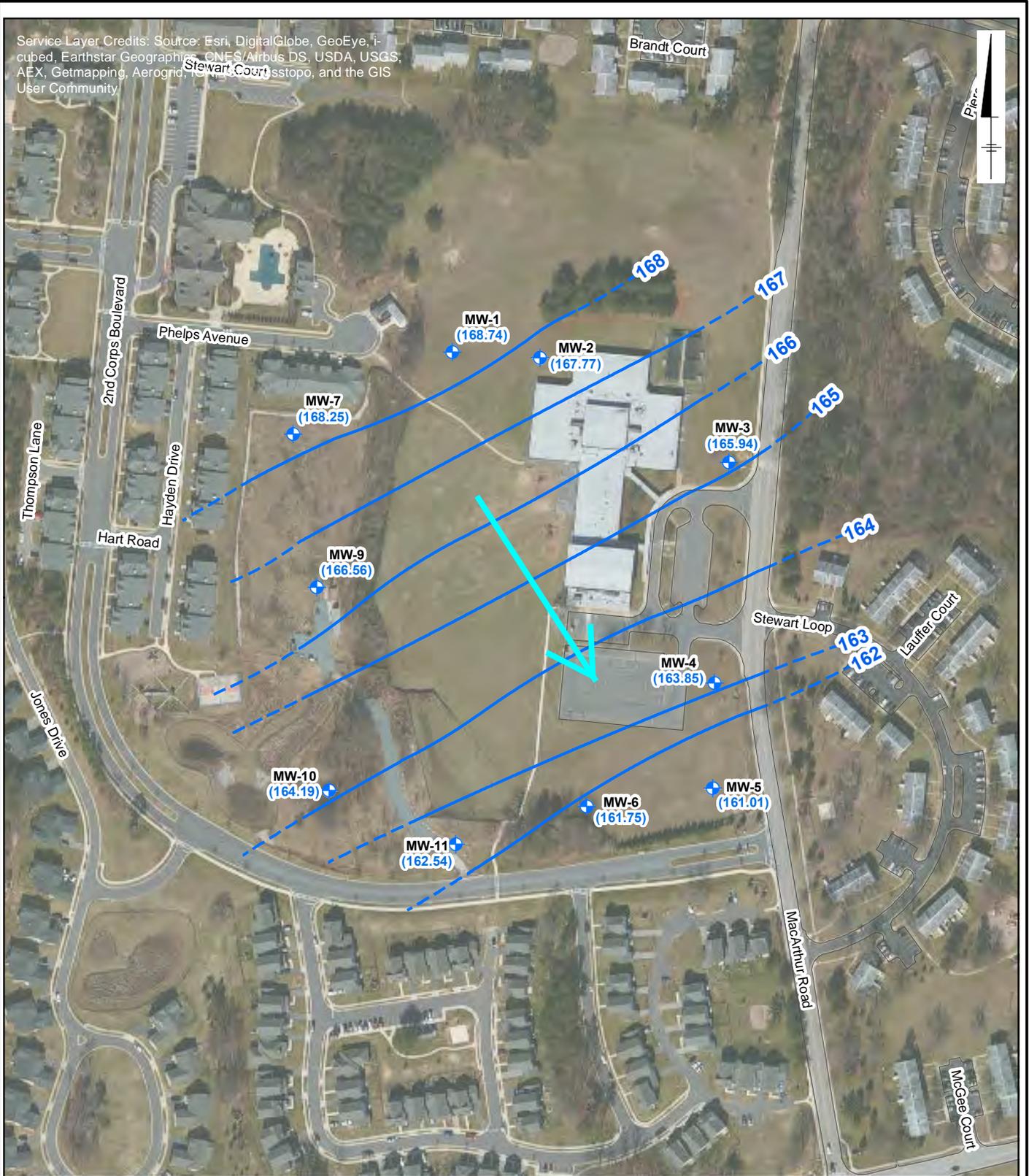
0 200 400 Feet  
 GRAPHIC SCALE

FORT GEORGE G. MEADE, MARYLAND  
 MANOR VIEW DUMP SITE

**EXTENT OF LAND USE CONTROLS**

**FIGURE 8**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, Swisstopo, and the GIS User Community



**LEGEND**

- Monitoring Well
- (166.50)** Groundwater Elevation (Feet Above Mean Sea Level)
- Groundwater Elevation Contour Line (Dashed Where Inferred)
- Groundwater Flow Direction



FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

**GROUNDWATER CONTOURS  
AUGUST 2014**

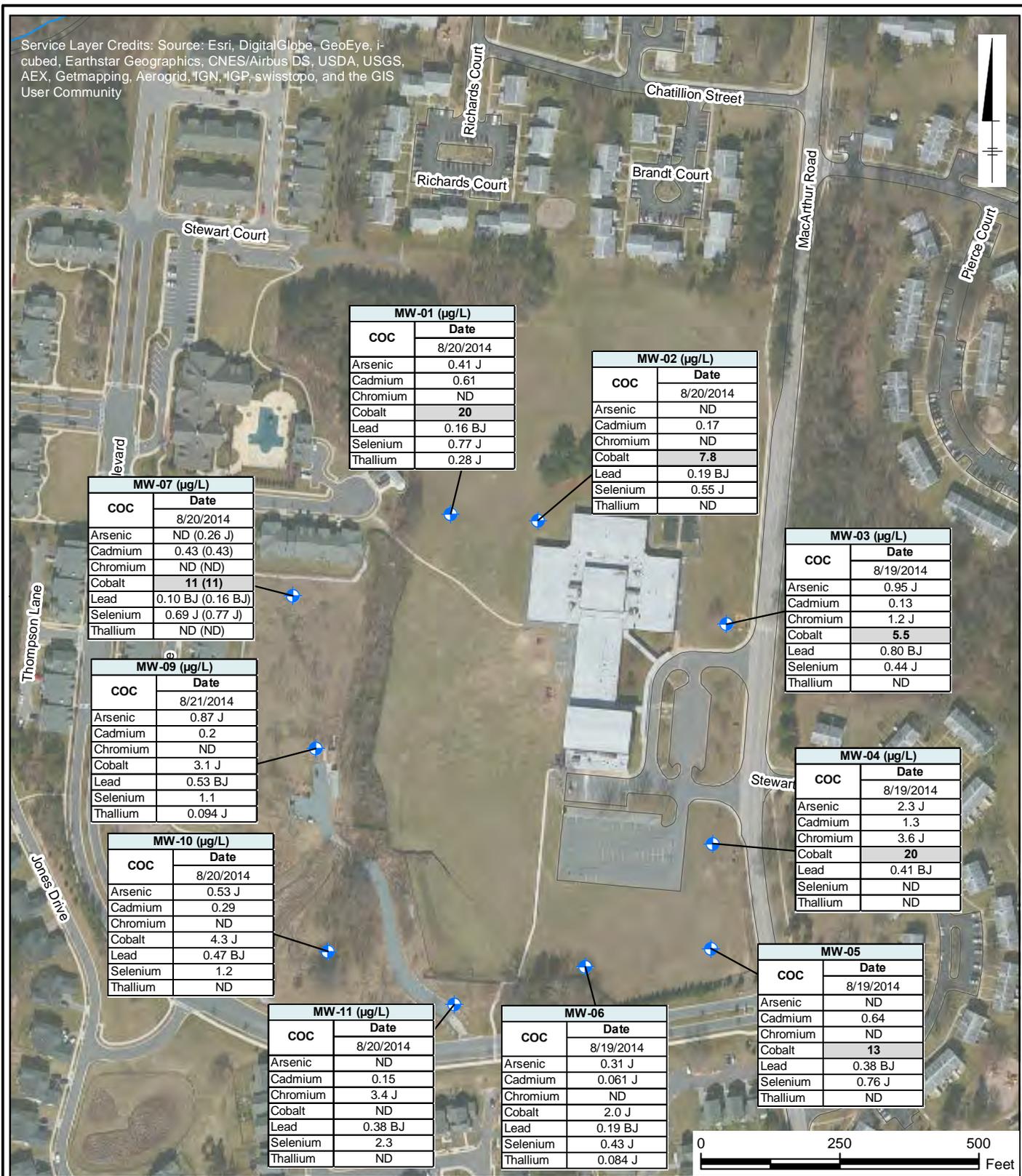
**Notes:**

1. Depth to groundwater measurements were collected at each monitoring well on August 18, 2014 with the exception of MW-10 which was gauged on August 19, 2014.
2. Depth to groundwater was measured relative to the top of casing of each well.



**FIGURE  
9**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



MW-01 (µg/L)	
COC	Date
	8/20/2014
Arsenic	0.41 J
Cadmium	0.61
Chromium	ND
Cobalt	<b>20</b>
Lead	0.16 BJ
Selenium	0.77 J
Thallium	0.28 J

MW-02 (µg/L)	
COC	Date
	8/20/2014
Arsenic	ND
Cadmium	0.17
Chromium	ND
Cobalt	<b>7.8</b>
Lead	0.19 BJ
Selenium	0.55 J
Thallium	ND

MW-07 (µg/L)	
COC	Date
	8/20/2014
Arsenic	ND (0.26 J)
Cadmium	0.43 (0.43)
Chromium	ND (ND)
Cobalt	<b>11 (11)</b>
Lead	0.10 BJ (0.16 BJ)
Selenium	0.69 J (0.77 J)
Thallium	ND (ND)

MW-03 (µg/L)	
COC	Date
	8/19/2014
Arsenic	0.95 J
Cadmium	0.13
Chromium	1.2 J
Cobalt	<b>5.5</b>
Lead	0.80 BJ
Selenium	0.44 J
Thallium	ND

MW-09 (µg/L)	
COC	Date
	8/21/2014
Arsenic	0.87 J
Cadmium	0.2
Chromium	ND
Cobalt	3.1 J
Lead	0.53 BJ
Selenium	1.1
Thallium	0.094 J

MW-04 (µg/L)	
COC	Date
	8/19/2014
Arsenic	2.3 J
Cadmium	1.3
Chromium	3.6 J
Cobalt	<b>20</b>
Lead	0.41 BJ
Selenium	ND
Thallium	ND

MW-10 (µg/L)	
COC	Date
	8/20/2014
Arsenic	0.53 J
Cadmium	0.29
Chromium	ND
Cobalt	4.3 J
Lead	0.47 BJ
Selenium	1.2
Thallium	ND

MW-05 (µg/L)	
COC	Date
	8/19/2014
Arsenic	ND
Cadmium	0.64
Chromium	ND
Cobalt	<b>13</b>
Lead	0.38 BJ
Selenium	0.76 J
Thallium	ND

MW-11 (µg/L)	
COC	Date
	8/20/2014
Arsenic	ND
Cadmium	0.15
Chromium	3.4 J
Cobalt	ND
Lead	0.38 BJ
Selenium	2.3
Thallium	ND

MW-06 (µg/L)	
COC	Date
	8/19/2014
Arsenic	0.31 J
Cadmium	0.061 J
Chromium	ND
Cobalt	2.0 J
Lead	0.19 BJ
Selenium	0.43 J
Thallium	0.084 J



**LEGEND**

- Monitoring Well
- µg/L micrograms per liter
- COC Constituent of Concern
- VOCs Volatile Organic Compounds
- B Analyte found in associate blank.
- J Indicates an estimated result. Result is less than laboratory reporting limits.
- ND The analyte was not detected above the detection limit

**RG Summary Table**

COC	RG (µg/L)
Arsenic	10
Cadmium	5
Chromium	100
Cobalt	5
Lead	15
Selenium	50
Thallium	0.5

FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

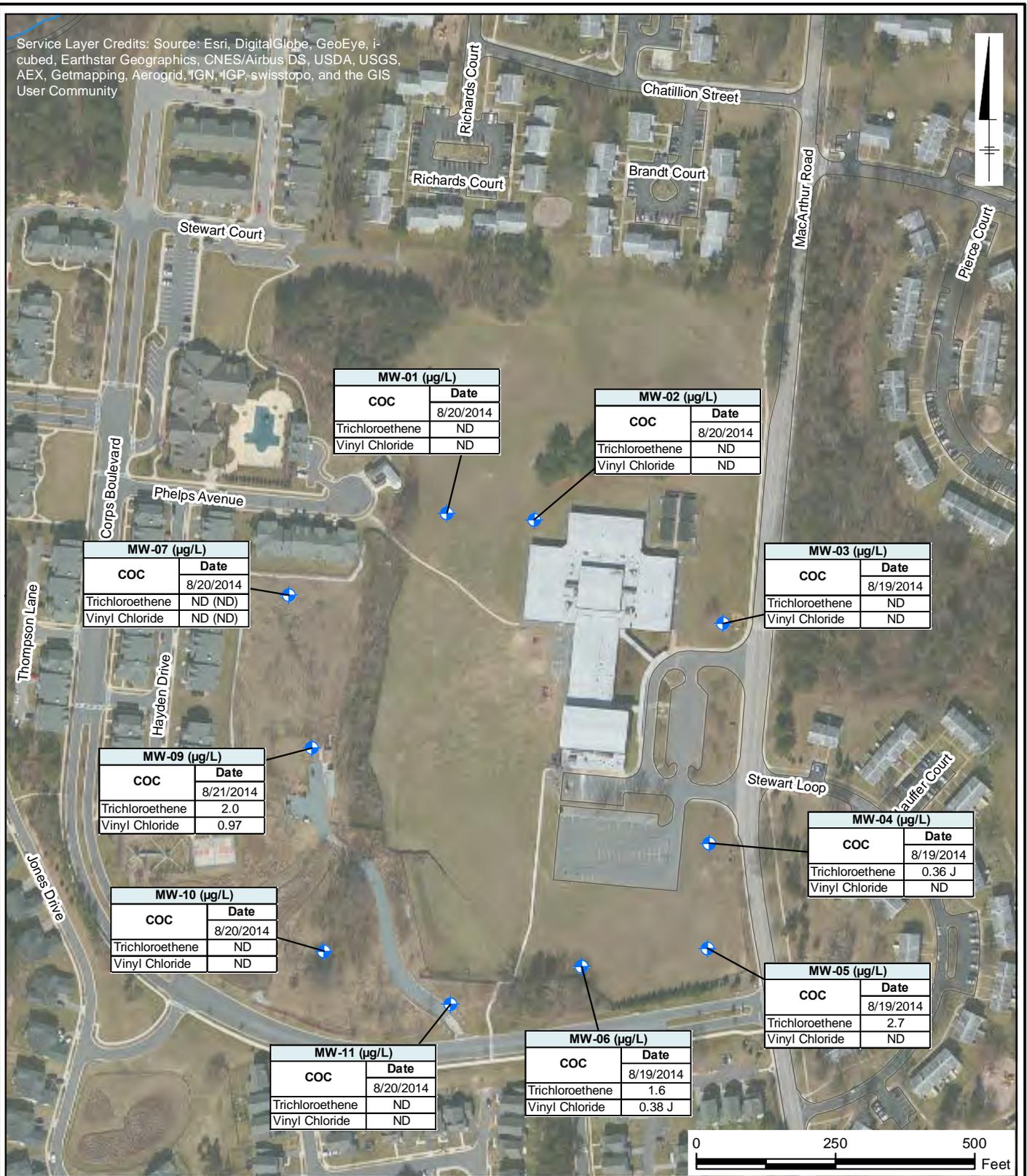
**GROUNDWATER ANALYTICAL  
RESULTS - METALS**



FIGURE  
**10**

Notes:  
1. Bolded and grey shaded values indicate concentrations above the Remedial Goal (RG).  
2. Duplicate sample results are provided in parenthesis adjacent to results presented for the parent sample.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**LEGEND**

- Monitoring Well
- $\mu\text{g/L}$  micrograms per liter
- COC Constituent of Concern
- VOCs Volatile Organic Compounds
- J Indicates an estimated result. Result is less than laboratory reporting limits.
- ND The analyte was not detected above the detection limit.

**RG Summary Table**

COC	RG ( $\mu\text{g/L}$ )
Trichloroethene	5
Vinyl Chloride	2

FORT GEORGE G. MEADE, MARYLAND  
MANOR VIEW DUMP SITE

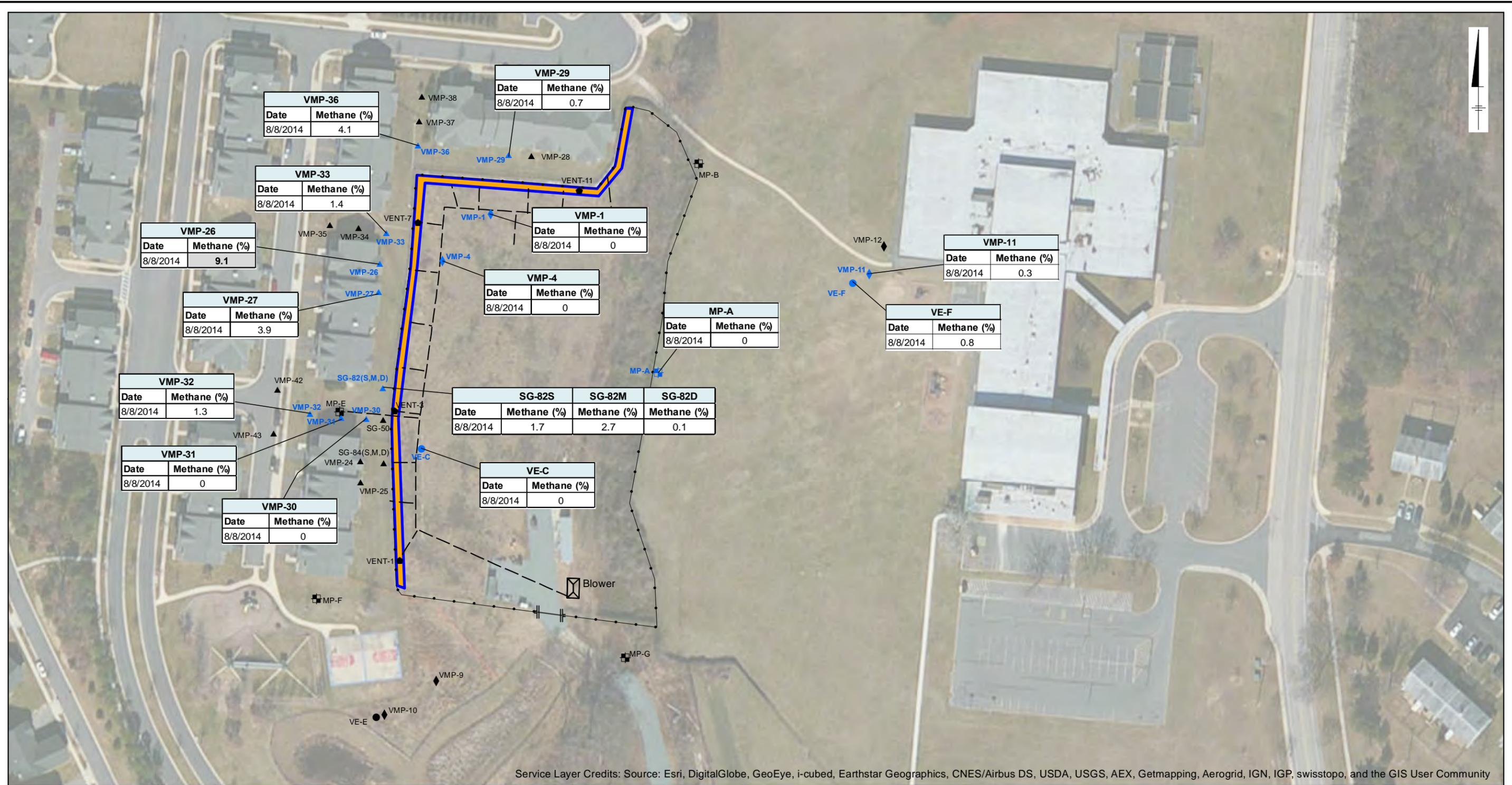
**GROUNDWATER ANALYTICAL  
RESULTS - VOCs**



FIGURE  
**11**

Notes:

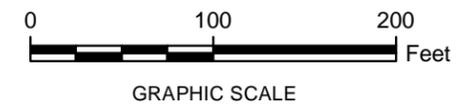
1. Duplicate sample results are provided in parenthesis adjacent to results presented for the parent sample.



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**LEGEND:**

- Monitoring Point
- Trench Well
- ◆ Deep Vapor Monitoring Point
- ▲ Shallow Vapor Monitoring Point
- Former Vapor Extraction Well
- Perimeter Fence
- || Gate
- - - Subsurface Piping Network Associated with the Dormant Soil Vapor Extraction System (2012 - Present)
- Capped Passive Gas Collection Trench



**Note:**

1. Monitoring locations included in the long-term monitoring program are displayed in blue.
2. Results exceeding the lower explosive limit for methane (5%) are boldfaced and grey shaded.
3. The August 2014 sampling event was conducted in accordance with the long-term monitoring program presented in the remedial design; thus, a subset of the sample locations were monitored.
4. NS - Not Sampled
5. S - Shallow; M- Mid-depth; D - Deep

FORT GEORGE G. MEADE, MARYLAND  
 MANOR VIEW DUMP SITE

**SOIL GAS MONITORING  
 RESULTS - AUGUST 2014**

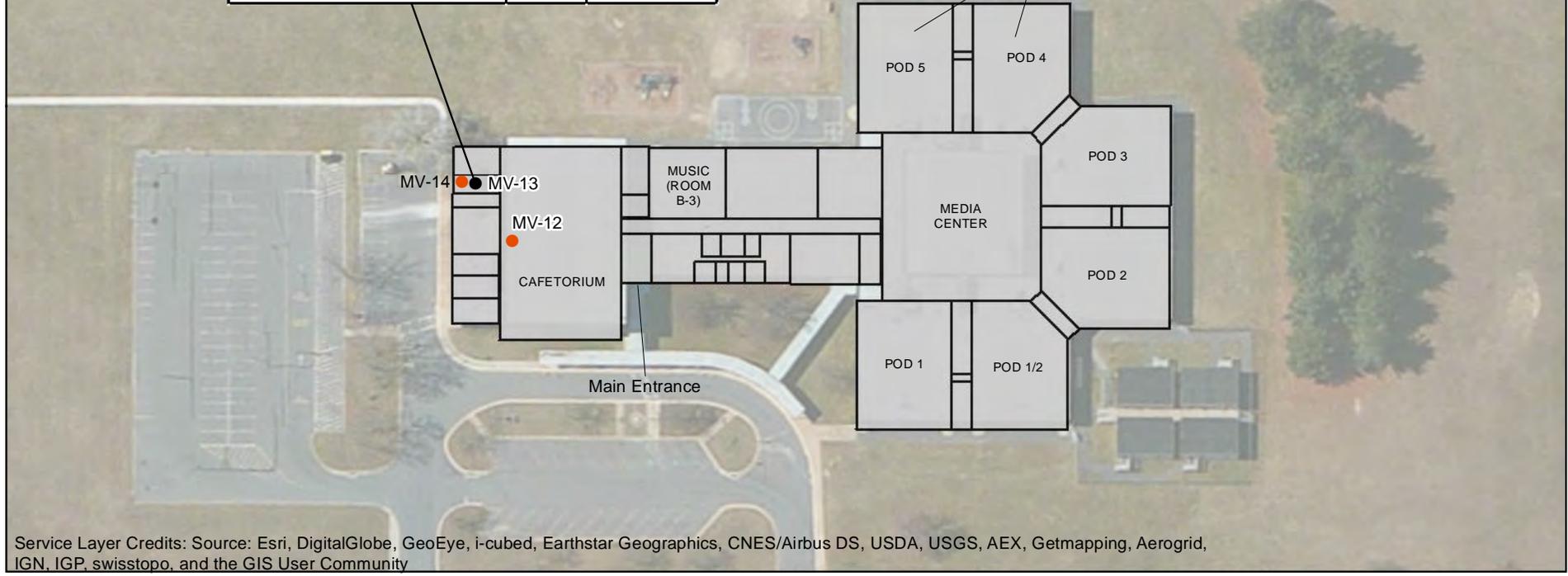


CITY: MPLS DIV/GROUP: IM DB: MG LD: HA  
 FORT MEADE  
 Path: Z:\GIS\PROJECTS\ENV\Fort\_Meade\ArcMap\Manor\_View\Remedial Design for FGGM 9313\_IndoorAirMonitoringResults\_2014\_1215.mxd



MV-13 ( $\mu\text{g}/\text{m}^3$ )		
Analyte	RG	Date
		8/20/2014
1,1-Dichloroethene	--	ND
cis-1,2-Dichloroethene	--	ND
Tetrachloroethene	--	<b>0.61 J</b>
trans-1,2-Dichloroethene	--	ND
Trichloroethene	1	<b>4.1</b>
Vinyl Chloride	--	ND

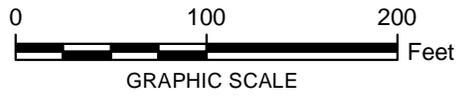
Adjacent pods are open-space style with partitions that do not go to the ceiling



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**LEGEND:**

- Indoor Air Sample
- Additional Indoor Air Monitoring Location To Be Sampled in 2015
- $\mu\text{g}/\text{m}^3$  micrograms per cubic meter
- J Indicates an estimated result. Result is less than laboratory reporting limits.
- ND The analyte was not detected above the detection limit.



Notes:  
 1. Bolded and grey shaded values indicate concentrations above the Remedial Goal (RG).  
 2. Monitoring locations presented hereon are subject to change pending approval from Manor View Elementary School officials at the time of sampling. MV-14 is located in the utility closet above the crawl space.

FORT GEORGE G. MEADE, MARYLAND  
 MANOR VIEW DUMP SITE

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**INDOOR AIR SAMPLE RESULTS**

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**FIGURE**  
**13**

## **Appendix A**

Photo Log

**Remedial Action  
Completion Report**  
FGGM 93 Manor View Dump Site  
Fort George G. Meade, Maryland



**Photo 1:** Damage at MW-8  
**Date:** August 18, 2014  
**Location Taken:** MW-8  
**Direction Facing:** Ground surface



**Photo 2:** Fence damage  
**Date:** August 21, 2014  
**Location Taken:** Southwest corner of Manor View Elementary School play yard. Damaged fence is not part of the fence enclosing the western portion of the Site; rather, damaged fence runs parallel to the site access road.  
**Direction Facing:** Northwest

**Remedial Action  
Completion Report**  
FGGM 93 Manor View Dump Site  
Fort George G. Meade, Maryland



**Photo 3:** Sign Location #1  
**Date:** October 2, 2014  
**Location Taken:** Site access road and 2<sup>nd</sup> Corp Blvd.  
**Direction Facing:** West



**Photo 4:** Sign Location # 2  
**Date:** October 3, 2014  
**Location Taken:** South gate entrance to the Site.  
**Direction Facing:** North

**Remedial Action  
Completion Report**  
FGGM 93 Manor View Dump Site  
Fort George G. Meade, Maryland



**Photo 5:** Sign Location #3  
**Date:** October 2, 2014  
**Location Taken:** Northwest corner of the Site  
**Direction Facing:** South



**Photo 6:** Sign Location #4  
**Date:** October 3, 2014  
**Location Taken:** Walking path from Phelps Drive to Manor View Elementary School play yard, north most fenced portion of Site  
**Direction Facing:** South

**Remedial Action  
Completion Report**  
FGGM 93 Manor View Dump Site  
Fort George G. Meade, Maryland



**Photo 7:** Sign Location # 5  
**Date:** October 3, 2014  
**Location Taken:** Southwest corner of the Site.  
**Direction Facing:** Northeast

## **Appendix B**

Safety Data Sheets for Chemicals  
Stored near the Manor View  
Elementary School Crawl Space

## **Appendix C**

Inspection Forms

## **Appendix D**

Field Forms

## **Appendix F**

Well Abandonment Form

## **Appendix G**

Fact Sheet



# FACT SHEET



## Fort George G. Meade, Maryland Manor View Dump Site

March 2014

### Overview

The U.S. Army at Fort George G. Meade has released a Proposed Plan for public comment on the final environmental response plan for the Manor View Dump Site (Site). This fact sheet summarizes the investigations performed by the Army, past actions, alternatives presented in the Proposed Plan, and the preferred alternative. This fact sheet also provides information on how you can submit your comments.



LEGEND:

0 200 400 Feet

DEBRIS/FILL FOOTPRINT GRAPHIC SCALE

METHANE GENERATING WASTE FOOTPRINT REMOVED DURING THE 2012 NON-TIME CRITICAL REMOVAL ACTION (LOCATION IS APPROXIMATE)

### Site History & Background

The Manor View Dump Site is an approximately 10-acre site near the intersection of MacArthur Road and 2nd Corps Boulevard in the central portion of Fort Meade (see map to left). The Site is surrounded by residential housing (Potomac Place) to the north along Phelps Avenue, to the west along Hayden Drive, and to the south along 2nd Corps Boulevard. Manor View Elementary School is to the east.

In 2003, construction workers discovered buried wastes and fill material when moving soil during the construction of military housing. Fort Meade began environmental investigations at the Site to determine the nature and extent of buried waste. As a result of the investigations, methane was detected at the Site in 2004, and safety measures were implemented.

Fort Meade has not found any records describing the operation of the dump or identifying the nature of the waste placed in the dump. The Army conducted several environmental investigations to categorize the age, type, and location of waste within the former dump. The investigations found organic material buried in the western parcel of the Site in an area about one acre in size (pink striped area in figure at left). Some of the waste is from the 1940s. The rest of the Site (eastern parcel) contains construction debris. The decomposition of the organic material in the one-acre area was generating methane, and the Army's initial actions focused on the methane.

## Extensive Safety Measures Taken

The Army has taken extensive actions to ensure the safety of Potomac Place housing, Manor View Elementary School, and the surrounding community. First, the Army installed methane monitors within some of the military houses and Manor View Elementary School. Methane has not been detected at hazardous levels inside the homes or above normal background levels at the school. Second, the Army installed a temporary landfill gas migration control system to prevent the methane from moving beyond the Site boundary. The system consists of a vacuum blower which draws methane from the landfill and away from the residential properties. The methane was then safely discharged to the atmosphere at very low concentrations. To monitor the methane levels, the Army collected samples weekly from the system and from soil locations surrounding the Site. Third, when it was determined the control system was not capturing all the methane, the Army relocated military families in the houses nearest the Site, while it sought a more permanent solution.

## Developing a Permanent Solution

To address the source of the methane, the Army excavated the methane-generating waste at the site and disposed of it in an off-site landfill specifically designed to accept these wastes. The Army removed approximately 30,000 tons of waste, soil, and materials during the removal action in 2012. Air monitoring was conducted during the more than two-months of excavation activities, and no readings exceeded an action level.

The excavated area was backfilled and covered with 18 inches of clean imported fill and 6 inches of clean, imported topsoil. The remaining portion of the site containing the construction debris also has a soil cover ranging from two feet to eight feet in depth.

The Army has continued to sample and monitor for methane. Almost all locations now show no detection, while a few have continued to detect low-levels of residual methane. The Army will continue to sample and monitor.

## Methane Facts

Methane (also known as natural gas) is an odorless and colorless gas. Methane can form within landfills as a natural byproduct when organic waste biodegrades. Although methane is not toxic, methane from landfills can pose a safety hazard at certain concentrations in the atmosphere that make it potentially flammable or explosive in the presence of an ignition source. To be dangerous, the methane would have to be at a significant concentration and have contact with an ignition source. Methane may displace oxygen in an enclosed space and present an asphyxiation hazard.



*Photo of the site during the excavation of the approximately 30,000 tons of waste.*

## COMPREHENSIVE INVESTIGATIONS COMPLETED

While the Army took interim actions to protect the community from the methane detected at the Site, it also conducted the full environmental investigations required by law, specifically the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Army conducted a thorough Remedial Investigation of the Site to determine if any residual contamination was present, and if so, whether the contamination presented a risk to human health or the environment. It also developed a Feasibility Study to look at alternatives for addressing any identified risks.

The investigations found some sporadic detections of metals and solvents in the groundwater. However, drinking water is not impacted because drinking water at Fort Meade is supplied by a community water system which does not draw water from this area.

Trichloroethylene (TCE), a solvent, was detected in one sample collected in 2005 during indoor air sampling at the Manor View Elementary School in a crawl space and could present a risk if the crawl space was ever occupied on a full-time basis by a student or teacher in the future. TCE was not detected in 12 other samples of occupied spaces at the school, nor was it detected in five sub-slab samples collected from beneath occupied spaces.

The Army's Feasibility Study looked at alternatives for controlling these potential future risks and continuing to provide protection from the waste still buried at the Site. The removal of approximately 30,000 tons of soil and methane-generating waste substantially addressed the methane issue; however, inspections and long-term monitoring will continue to ensure the effectiveness of the action.

## RESPONSE ALTERNATIVES EXAMINED

The Army conducted a detailed analysis of various response alternatives and associated costs for the Site. The selected alternative will include a five-year review as required by CERCLA to ensure it continues to be effective.

**Alternative 1: No Action.** The law requires the Army evaluate taking no action to establish a baseline for comparison with other alternatives. **Cost: \$0.**

**Alternative 2: Maintenance of Existing Soil Cover, Land Use Controls, and Long-Term Monitoring.** The existing soil cover over the Site will be inspected and maintained. Land use controls include signage at the Site, fencing, prohibiting residential use of the Site, prohibiting groundwater use throughout the Site, prohibiting full-time occupancy of the crawl space at the Manor View Elementary School, and developing and enforcing provisions for the construction of buildings within 100 feet of the Site to prevent the possibility of vapor intrusion. The long-term monitoring would include soil gas monitoring for methane, groundwater sampling, indoor air sampling in the crawl space at the school, and site inspections. **Cost: \$241,000.**

**Alternative 3: Installation of a Low Permeability Cap, Land Use Controls, and Long-Term Monitoring.** A low permeability cap would be installed over the eastern parcel of the Site where buried construction debris remains (approximately nine acres). Land use controls and long-term monitoring would be similar to the activities discussed for Alternative 2. **Cost: \$6,566,105.**



*Photo of the site after the removal action*

## ALTERNATIVES EVALUATED AGAINST CRITERIA

As required by law, the Army evaluated the above alternatives against nine criteria. The criteria are:

1. Overall protection of human health and the environment
2. Compliance with applicable or relevant and appropriate requirements
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility, and volume
5. Short-term effectiveness
6. Implementability
7. Cost
8. State acceptance
9. Community acceptance

## PREFERRED ALTERNATIVE SELECTED

The Army's preferred alternative is **Alternative No. 2, Maintenance of Existing Soil Cover, Land Use Controls, and Long-Term Monitoring**. The existing soil cover prevents direct contact with the buried waste and sub-surface soil. The land use controls would mitigate other Site risks, and long-term monitoring would ensure the soil cover continues to be effective and provide ongoing groundwater data.

## OPPORTUNITIES FOR PUBLIC INPUT

The Army, in consultation with the U.S. Environmental Protection Agency and the Maryland Department of the Environment, can change the preferred alternative based on public comments. The Army encourages interested citizens to review and comment on the proposed action.

The Proposed Plan, can be viewed online, at [www.ftmeade.army.mil/environment](http://www.ftmeade.army.mil/environment); click on "Clean-up Program", and then "Program Sites."

The Proposed Plan, as well as the full Administrative Record, also can be viewed at:

### Fort Meade Environmental Division

4215 Roberts Avenue, Suite 320  
Fort Meade, MD 20755  
(301) 677-9559  
Hours: 8 a.m. to 4 p.m.  
(Monday—Friday)  
(photo I.D. required to gain access onto Fort Meade)

### Anne Arundel County Library West County Area Branch

1325 Annapolis Road  
Odenton, MD 21113  
(410) 222-6277  
Hours: 9 a.m. to 9 p.m. (Monday-Thursday)  
9 a.m. to 5 p.m. (Friday and Saturday)  
1 p.m. to 5 p.m. (Sunday)

The 30-day public comment period on the proposed action extends from March 20 to April 19, 2014. Written comments, postmarked by April 19, can be mailed to the address below (a comment form is enclosed for convenience) or sent by email to:

Ms. Mary Doyle  
U.S. Army Garrison Fort George G Meade  
Public Affairs Office  
4409 Llewellyn Avenue  
Fort Meade, MD 20755-7058  
[mary.l.doyle.civ@mail.mil](mailto:mary.l.doyle.civ@mail.mil)

Or

Mr. John Burchette  
Remedial Project Manager  
U.S. EPA  
1650 Arch Street  
Philadelphia, PA 19103-2029  
[burchette.john@epa.gov](mailto:burchette.john@epa.gov)

Or

Ms. Elisabeth Green, Ph.D.  
Maryland Department of the Environment  
Federal Facilities Division  
1800 Washington Blvd., Suite 625  
Baltimore, MD 21230-1719  
[elisabeth.green@maryland.gov](mailto:elisabeth.green@maryland.gov)

## **Appendix H**

Response to Comments

Response to Comments Table								
Draft Remedial Action Completion Report, FGM Manor View Dump Site								
November 2014								
Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification N = Comment noted, no action required or taken								
Comment No.	Commenter	Date of Comment	Page(s)	Section	Line(s)	Comment	Response Code	Response
1	EPA, JB	12/8/2014	10	Section 4.4.1	--	when discussing the Max groundwater results in the report such as selenium (in the section where they are listed), it looks like 2 of them list 'Arsenic' in their COC specific discussion when it should be selenium etc..	A	Agreed. Section 4.4.1 was revised accordingly.
2	EPA, JB	12/8/2014	--	General	--	since the crawl space still exceeds our remedial goal for Indoor Air, I really think we should collect some data in the next closest room to the crawl space to show we have data that the indoor air issue is not a larger problem than just the crawl space.	A	Agreed. Two additional sample locations (MV-12 and MV-14) will be sampled in 2015. The proposed locations are presented on <b>Figure 13</b> . Additional sampling may be scheduled pending 2015 analytical results.
3	EPA, JB	12/18/2014	--	Table 4	--	Note #2 is cut off.	A	Agreed. Table 4 was revised accordingly.
4	EPA, LR	12/18/2014	3	Section 1.2	--	Nov 9 – NTRCA should be NTCRA	A	Agreed, the table was revised accordingly.
5	EPA, LR	12/18/2014	13	Section 4.5	--	Monitoring locations – shifted due to settling....	A	Agreed, the text was revised accordingly.
6	EPA, LR	12/18/2014	2	Section 1.1	--	Page 2 says the housing units have not been reoccupied – makes me wonder why. Based on our conversation, might clarify by saying that they are in the process of being reoccupied.	A	Agreed, added additional text to clarify.
7	EPA, LR	12/18/2014	6	Section 3.0	--	Page 6 – called semi-annual but appears to be a 3 month window	N	Noted, revised text for clarity.
8	EPA, LR	12/18/2014	9	--	--	wondering and not necessarily for inclusion – how is the passive collection trench working? The write-up caused me to be left wondering	N	The passive gas collection trench was the first interim measure implemented to address methane concentrations in soil gas in August 2005. The trench was capped shortly thereafter with an impermeable cover during installation of the original soil vapor extraction system (SVE). Currently the existing SVE system ties in to the trench at 13 locations. A detailed write up describing the evolution of the soil vapor extraction system is provided in the 2014 Annual Soil Gas Monitoring Report.
9	EPA, LR	12/18/2014	--	--	--	Remarks made on the inspection report may differ from what is here – just want to make sure not repairing the fence and the eroded soil are non-issues – or at least speak to the issues since the inspection reports draw attention to the matters	N	No eroded soil was specifically noted in the inspection form. However, reference is made to multiple locations where animals have burrowed under the fence. These holes were identified along the perimeter of the western portion of the Site at the fence line. They are small in size and provide no access to the Site. Furthermore, as indicated in the fourth bullet of Section 4.5, the portion of the fence that was identified as partially collapsed is a separate entity from the fence that encompasses the western portion of the Site. It is important to note, that the ROD indicates that portions of the fence may be removed in the future; however, the north-south oriented portion of the fence will remain in place to delineate land use associated with the school play yard and the western portion of the Site. The integrity of the partially collapsed portion of the fence will continue to be monitored during future inspections and a determination will be made as to whether or not it continues to delineate land use.
10	EPA, LR	12/18/2014	11	Section 4.4.3	--	please add the date of when the sample was collected.	A	Agreed, added sample date to the appropriate Section.
11	EPA, LR	12/18/2014	13	Section 4.5	--	Existing soil cover was observed (add date). Soil vapor extraction system (add date of when it was shut down).	A	Agreed, added inspection data to the appropriate Section.
12	EPA, LR	12/18/2014	14	--	--	TCE detected in the crawl space – could a tarp be considered to prevent release of gases? You mentioned some planned next steps (sampling the room with the entry way to the crawl space) – might include to give greater assurance.	A	Additional indoor air samples will be collected to confirm TCE concentrations detected within the crawl space are not migrating to areas occupied by students and school staff (refer to Section 4.4.3 and Figure 13). Following receipt of analytical data, a determination as to whether or not mitigation measures are warranted will be made.
13	MDE	12/10/2014	11	Section 4.4.3	--	The indoor air monitoring for the unoccupied crawl space at Manor View Elementary School included a trichloroethene (TCE) detection above the remedial goal for this site. Please add additional monitoring point (s) in occupied areas of the building which are in close proximity to this exceedance to ensure that TCE vapors are not migrating into space occupied by students and teachers.	A	Agreed. See above for response to EPA Comment 2.