



**DEPARTMENT OF THE ARMY**  
OFFICE OF THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT  
600 ARMY PENTAGON  
WASHINGTON, DC 20310-0600

Reply to Attention Of:  
ARMY BASE REALIGNMENT AND CLOSURE DIVISION

APR 18 2011

Mr. John Burchette  
U.S. Environmental Protection Agency, Region III  
(3HS11)  
1650 Arch Street  
Philadelphia, PA 19103-2029

**Re: April 2011 Final Tipton Airfield Parcel Five-Year Review;  
Fort George G. Meade, Maryland**

Dear Mr. Burchette:

Please find enclosed one original and three copies of the *April 2011 Final Tipton Airfield Parcel Five-Year Review; Fort George G. Meade, Maryland*, for your administrative files. Army responses to all regulatory and USFWS comments were approved and incorporated into the final document.

If you have any questions, please feel free to contact me at (703) 545-2474.

Sincerely,

Markus A. Craig  
Program Manager, Office of the Assistant Chief  
of Staff for Installation Management; Base  
Realignment and Closure Division

**Enclosure:** *April 2011 Final Tipton Airfield Parcel Five-Year Review; Fort George G. Meade, Maryland* – 1 original and 3 copies

**DISTRIBUTION:**

Elisabeth Green (Maryland Department of the Environment) – 1 copy  
Andrea Graham (US Army Corps of Engineers) – 1 copy  
Brad Knudsen – (US Fish and Wildlife Service) – 1 copy  
Steve Cardon (Fort Meade BRAC Environmental Office) – 2 copies

This page intentionally left blank

**SECOND FIVE-YEAR REVIEW REPORT  
FOR  
FORT GEORGE G. MEADE  
LEGACY BASE REALIGNMENT AND CLOSURE  
PROGRAM**

**Tipton Airfield Parcel**

**Submitted to:  
U.S. Army Corps of Engineers  
Baltimore District  
10 South Howard Street  
Baltimore, MD 21201**

**Prepared by:  
URS Group, Inc.  
200 Orchard Ridge Drive, Suite 101  
Gaithersburg, MD 20878**

**Delivery Order No. 0018  
Contract No. W912WJ-05-D-0005**

Prepared Under Direction Of:

Approved For Submission By:

---

Bill Eaton, Project Manager  
URS Group, Inc.

---

Andrea Graham, Project Manager  
USACE, Baltimore District

Approved By:

---

William J. O'Donnell, II  
Chief, Operational Army and Medical Branch Office of the Assistant Chief of  
Staff for Installation Management; BRAC Division (DAIM-ODB)

This page intentionally left blank

# CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1-1</b>
<b>2.0</b>	<b>SITE CHRONOLOGY.....</b>	<b>2-1</b>
<b>3.0</b>	<b>BACKGROUND .....</b>	<b>3-1</b>
3.1	Physical Characteristics .....	3-1
3.1.1	Inactive Landfill 1 (IAL1).....	3-1
3.1.2	Inactive Landfill 2 (IAL2).....	3-1
3.1.3	Inactive Landfill 3 (IAL3).....	3-4
3.1.4	Fire Training Area (FTA).....	3-4
3.1.5	Helicopter Hangar Area (HHA).....	3-4
3.1.6	Little Patuxent River .....	3-4
3.2	Land and Resource Use .....	3-4
3.3	History of Contamination .....	3-5
3.4	Tipton Airfield Parcel (TAP) Initial Response .....	3-8
3.5	Little Patuxent River Initial Response .....	3-8
3.6	Basis for Taking Action.....	3-9
<b>4.0</b>	<b>REMEDIAL ACTIONS .....</b>	<b>4-1</b>
4.1	Remedy Selection .....	4-1
4.2	Remedy Implementation.....	4-4
4.2.1	Little Patuxent River .....	4-6
4.3	System Operations/O&M.....	4-6
<b>5.0</b>	<b>PROGRESS SINCE LAST REVIEW.....</b>	<b>5-1</b>
5.1	Protectiveness Statement from Last Review.....	5-1
5.2	Status of Recommendations and Follow-up Actions from Last Review.....	5-1
<b>6.0</b>	<b>FIVE-YEAR REVIEW PROCESS .....</b>	<b>6-1</b>
6.1	Administrative Components .....	6-1
6.2	Community Notification and Involvement.....	6-1
6.3	Document Review.....	6-2
6.4	Data Review and Evaluation.....	6-3
6.4.1	Groundwater Data Analysis .....	6-5
6.4.2	Maximum Contaminant Level (MCL) Exceedances.....	6-5
6.4.3	Regional Screening Level (RSL) Exceedances.....	6-7
6.5	Site Inspection.....	6-7
6.5.1	Covers Over IAL1 and IAL3.....	6-9
6.5.2	Fence Surrounding IAL2.....	6-9
6.5.3	Monitoring Wells Associated with IAL1, IAL2, IAL3, HHA, and FTA..	6-9
6.5.4	Fence Limiting Access to the Little Patuxent River.....	6-10
6.5.5	MEC Warning Signs .....	6-10
6.5.6	PRR Fishing Ban.....	6-10
6.5.7	Tipton Airport Excavation Prohibition.....	6-11
6.6	Interviews.....	6-11
<b>7.0</b>	<b>TECHNICAL ASSESSMENT.....</b>	<b>7-1</b>
7.1	Question A .....	7-1

## CONTENTS (cont'd)

7.2	Question B .....	7-1
7.3	Question C .....	7-3
7.4	Technical Assessment Summary .....	7-3
<b>8.0</b>	<b>ISSUES.....</b>	<b>8-1</b>
<b>9.0</b>	<b>RECOMMENDATIONS AND FOLLOW-UP ACTIONS .....</b>	<b>9-1</b>
<b>10.0</b>	<b>PROTECTIVENESS STATEMENT .....</b>	<b>10-1</b>
<b>11.0</b>	<b>NEXT REVIEW.....</b>	<b>11-1</b>

### List of Appendices

Appendix A:	References
Appendix B:	Site Inspection Checklist and Evaluation Photographs
Appendix C:	Reference Doses and Slope Factor
Appendix D:	Public Notice
Appendix E:	Regulatory Response to Comments Table

### Figures

Figure 3-1:	General Location of Fort George G. Meade and Tipton Airfield Parcel .....	3-2
Figure 3-2:	Tipton Airfield Parcel Evaluation Areas.....	3-3
Figure 4-1:	TAP Monitoring Wells.....	4-5

### Tables

Table 3-1:	Brief Description and History of Contamination for the TAP Evaluation Areas .....	3-6
Table 4-1:	Summary of Affected Media and Selected Remedies for the TAP Evaluation Areas .....	4-2
Table 4-2:	Summary of the LUCs Implemented at the TAP .....	4-3
Table 4-3:	Monitoring Well Identification .....	4-4
Table 4-4:	Annual LTM Results for MEC at Little Patuxent River .....	4-7
Table 4-5:	Long-Term Groundwater Monitoring Costs for the TAP .....	4-9
Table 4-6:	Long-Term Monitoring Costs for Annual Little Patuxent River MEC Sweeps and Landfill Inspections.....	4-9
Table 5-1:	Status of the First Five-Year Review Report Recommendations.....	5-1
Table 6-1:	Stakeholder Points of Contact .....	6-1
Table 6-2:	Evaluation of Response Actions at the TAP .....	6-4
Table 6-3:	Organics that have Historically Exceeded Screening Criteria at the TAP .....	6-6
Table 6-4:	Inorganics that have Historically Exceeded Screening Criteria at the TAP.....	6-8
Table 7-1:	IAL Risk Assessment Review .....	7-2
Table 7-2:	FTA Risk Assessment Review .....	7-2
Table 7-3:	HHA Risk Assessment Review .....	7-3
Table 8-1:	Issues Identified at the TAP .....	8-1
Table 9-1:	Recommendations and Follow-Up Actions for the TAP .....	9-2
Table 9-2:	2011 Proposed Sampling and Analysis Plan.....	9-4

## LIST OF ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
BRACD	Base Realignment and Closure Division (now DAIM-ODB)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COPC	Chemical of Potential Concern
DCE	Dichloroethene
DOD	Department of Defense
DOI	Department of the Interior
DAIM-ODB	Department of the Army, Installation Management, Operations Directorate/Base Realignment and Closure Division
EOD	Explosive Ordnance Disposal
ESD	Explanation of Significant Difference
FGGM	Fort George G. Meade
FS	Feasibility Study
FTA	Fire Training Area
HHA	Helicopter Hangar Area
HI	Hazard Index
IAL1	Inactive Landfill 1
IAL2	Inactive Landfill 2
IAL3	Inactive Landfill 3
LTGM	Long-Term Groundwater Monitoring
LTM	Long-Term Monitoring
LUCIP	Land Use Control Implementation Plan
LUCs	Land Use Controls
µg/L	microgram per liter
MCL	Maximum Contaminant Level
MCLGs	Maximum Contaminant Level Goals
MDE	Maryland Department of the Environment
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
MW	Monitoring Well
MW	Molecular weight
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NPL	National Priority List
NTCOE	Non-Time Critical Ordnance and Explosives
OE	Ordnance and Explosives
PAH	Polycyclic Aromatic Hydrocarbons

## **LIST OF ACRONYMS AND ABBREVIATIONS (cont'd)**

PFOA	perfluorooctanoic acid
PFOS	perfluorooctyl sulfonates
PRG	Preliminary Remediation Goal
PRR	Patuxent Research Refuge
PRR-NT	Patuxent Research Refuge-North Tract
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
SI	Site Inspection
SL	Screening Level
SVOC	Semi-volatile organic compound
TAP	Tipton Airfield Parcel
URS	URS Group, Inc.
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center (now U.S. Army Environmental Command)
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded ordnance
VOC	Volatile organic compound
WP	White phosphorous

## Five-Year Review Summary Form

<b>SITE IDENTIFICATION</b>		
<b>Site name (from WasteLAN):</b> Tipton Airfield Area Operable Unit 01 and Tipton Airfield Parcel (TAP) Operable Unit 02		
<b>EPA ID (from WasteLAN):</b> MD9210020567		
<b>Region:</b> 3	<b>State:</b> MD	<b>City/County:</b> Odenton/Anne Arundel County
<b>SITE STATUS</b>		
<b>National Priority List (NPL) status:</b> <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
<b>Multiple OUs?*</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<b>Construction completion date:</b> ___ / ___ / _____	
<b>Has site been put into reuse?</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency U.S. Army		
<b>Author name:</b> Bill Eaton		
<b>Author title:</b> Project Manager	<b>Author affiliation:</b> URS Group, Inc.	
<b>Review period:**</b> 06 / 01 / 2008 to 09 / 30 / 2011		
<b>Date(s) of site inspection:</b> 06 / 24 / 2008		
<b>Type of review:</b>		
<input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input checked="" type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
<b>Triggering action:</b>		
<input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
<b>Triggering action date (from WasteLAN):</b> 03 / 01 / 2005		
<b>Due date (five years after triggering action date):</b> 03 / 01 / 2010		

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

### Issues:

- 1 Remove the young trees and repair ruts in the soil safety cover at the Inactive Landfill 1 (IAL1).
- 2 Approximately 60 percent of the Inactive Landfill 2 (IAL2) perimeter fence is overgrown with heavy vegetation. Sections of IAL2 fence may require repairs to ensure integrity of fence as a munitions and explosives of concern (MEC) land use control (LUC).
- 3 S settlement ridges were identified at the Inactive Landfill 3 (IAL3).
- 4 Some fence segments located between the ball fields and the Little Patuxent River have fallen down.
- 5 U.S. Environmental Protection Agency (USEPA) requested more data documenting the natural attenuation of the groundwater contaminants at the Tipton Airfield Parcel (TAP). USEPA also asked that groundwater samples be collected and analyzed for perfluorooctanoic acid (PFOA) and perfluorooctyl sulfonates (PFOS) at the former Fire Training Area (FTA).
- 6 USEPA requested that the groundwater and MEC Land Use Controls (LUCs) identified in 1998 Army Decision Documents be incorporated into the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Record of Decisions (RODs).
- 7 Several incidents have been reported where the public has come into contact with potential MEC items:  
Evidence of fishing at the Little Patuxent River is seen in the vicinity where MEC and material potentially presenting an explosive hazard (MPPEH) occur.  
A citizen attempted to collect a potential MEC item from the Little Patuxent River.  
A Tipton Airport contractor engaged in unauthorized excavation and encountered a buried rocket.

### Recommendations:

- 1 Use fill to repair the ruts and implement a grubbing program in fiscal year 2012 to remove vegetation that might disturb the soil safety cover at the IAL1; perform inspection in fall/winter when vegetation is less dense to verify that the integrity of the soil cover remains intact.
- 2 Implement a contract in fiscal year 2011 to clear the IAL2 fence line. Once it is cleared, conduct the necessary fence line repair work.
- 3 Re-grade the swales and level the surface of IAL3's cover to remove settlement ridges.
- 4 Complete the MEC sweep of the ball fields (which is not part of the TAP); this effort will address the fallen fence segments (See issue no. 4).
- 5 The Army plans to make the following changes to the Long-Term Groundwater Monitoring (LTGM) program at the TAP: revise the LTGM work plan to address all the Base Realignment and Closure (BRAC) sites; 2) develop Fort George G. Meade-specific (FGGM) groundwater background levels; 3) change the LTGM sampling at the TAP from biennial to annual; 4) add volatile organic compound (VOC) breakdown daughter products to the TAP LTGM; and 5) repair/maintain the well casings and pads at the TAP.
- 6 Submit an Explanation of Significant Difference (ESD) to change the TAP selected remedy from "no further action (NFA) with groundwater monitoring" to "LUCs with groundwater monitoring" and present the groundwater and MEC LUCs. Also, submit a Land Use Control Implementation Plan (LUCIP) that will address notice of planned construction and construction support where necessary, describe the appropriate disposal procedures of any discovered ordnance, and define the institutional and engineering controls (signage, fencing, education, and notice requirements) to ensure the continued protectiveness of previous and future MEC removal actions at the TAP.
- 7 The following measures are recommended to address potential MEC exposure to the public:  
Conduct a MEC clearance between river bends A and B of the Little Patuxent River to the depth of detection using a Schonstedt magnetometer or similar instrument.  
Place signs in the area of concern along the river bend warning fishermen and citizens that their presence is unauthorized and that MEC is present and should not be handled.  
Reinforce educational outreach programs that warn the public of the potential MEC and MPPEH hazards at the TAP, Little Patuxent River, and ball fields.

### Protectiveness Statement(s):

The remedy at the TAP currently protects human health and the environment because the LUCs protect the public from exposure to contaminated groundwater and MEC; the LTGM program documents that the detected groundwater contaminants are naturally attenuating and are not migrating off property. However, in order for the remedy to be protective in the long term the following actions need to be taken to ensure long-term protectiveness: submit an ESD to change the remedy from "NFA with groundwater monitoring" to "LUCs with groundwater monitoring" and submit a LUCIP to better enforce and maintain the LUCs at the TAP.

## 1.0 INTRODUCTION

This five-year review evaluates the no further action (NFA) with groundwater monitoring remedy for the Tipton Airfield Parcel (TAP) located in Anne Arundel County within the township of Laurel, Maryland. The TAP is located on property formerly part of Fort George G. Meade (FGGM). The TAP was released under the Base Realignment and Closure Act (BRAC) of 1988 (Public Law 100-526, 102 Stat. 2623) to Anne Arundel County for use as a small municipal airfield for light fixed wing and rotary wing aircraft.

On January 10, 2011, the Army submitted a Draft Explanation of Significant Difference (ESD) to stakeholders that would change the remedy from “NFA with groundwater monitoring” to “Land Use Controls (LUCs) with groundwater monitoring” [URS Group, Inc., (URS), 2011a]. However, the ESD is not yet approved by the U.S. Environmental Protection Agency (USEPA) and the Maryland Department of the Environment (MDE). Therefore, this five-year review will focus on the effectiveness of the original remedy selected for the TAP in the December 30, 1998 Record of Decision (ROD) and the July 20, 1999 ROD.

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

The United States Army (Army) is the lead Agency for this five-year review of the remedial actions implemented at the TAP. The review was conducted from June 2008 through September 2010. This report documents the results of this review. This is the second five-year review for the TAP; the first five-year review was completed in March 2005 and is the triggering action for this statutory review. The five-year review is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

The Agency is preparing this five-year review pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

*If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

This page intentionally left blank

## 2.0 SITE CHRONOLOGY

### Chronology of Site Events

Site Investigation/Remediation Events	Date
<b><u>TAP Evaluation Areas</u></b>	<b><u>Periods of Operation</u></b>
Inactive Landfill 1 (unlined sanitary landfill)	1950 to 1964
Inactive Landfill 2 (soil borrow area and unlined rubble disposal area)	1938 to 1986
Inactive Landfill 3 (soil borrow area and sanitary and leaf-dump landfill)	Late 1940s to 1963
Fire Training Area (fire training area)	1979 to 1998
Helicopter Hangar Area (helicopter maintenance)	Early 1980s to 1996
The TAP Evaluation Areas are identified in the <b>Enhanced Preliminary Assessment Report</b> .	October 1989
<b>Site Inspection (SI) Study</b> addressed all 5 Evaluation Areas at the TAP.	October 1992
<b>SI Study Addendum</b> - Fire Training Area, Helicopter Hangar Area, and Inactive Landfill 2 of the TAP were addressed.	1994
<b>Construction Specifications, Fire Training Area Demolition, Landfill Capping Projects</b>	January 26, 1996
<b>Final Remedial Investigation/Feasibility Study (RI/FS) Report</b> for Inactive Landfills 1, 2, and 3 and the Clean Fill Dump site was submitted.	August 1998
<b>Final RI/FS Report</b> for Helicopter Hangar Area and Fire Training Area was submitted.	October 1998
<b>Fire Training Area Removal Action Report</b> was submitted.	October 28, 1998
<b>Final Proposed Plan</b> for the Helicopter Hangar Area, Fire Training Area, and Inactive Landfill 3 was issued.	November 1, 1998
<b>ROD</b> for Helicopter Hangar Area, Fire Training Area, and Inactive Landfill 3 was issued.	December 1998
<b>Helicopter Hangar Area Removal Action Report</b> was submitted.	19 March 1999
<b>Proposed Plan</b> for the Tipton Army Airfield, Inactive Landfill 1, and Inactive Landfill 2 was issued.	April 1999
<b>ROD</b> for the Inactive Landfill 1 and Inactive Landfill 2 was issued.	July 1999
<b>Inactive Landfill 1 and Inactive Landfill 2 Maintenance Inspection Report</b> was submitted.	April 2002
First <b>5-Year Review Report</b> was submitted.	March 2005
<b>2006 Inactive Landfill 1, Inactive Landfill 2, and Inactive Landfill 3 Annual Maintenance Inspection Report</b>	May 2007
<b>2007 Inactive Landfill 1 and Inactive Landfill 2 Annual Maintenance Inspection Report</b>	February 2009
Second <b>5-Year Review Report (Draft)</b> was submitted	April 2009
<b>2009 Inactive Landfill 1 and Inactive Landfill 2 Annual Maintenance Inspection Report</b>	February 17, 2010
<b>2008 Inactive Landfill 1 and Inactive Landfill 2 Annual Maintenance Inspection Report</b>	April 23, 2010
2011 Draft <b>Explanation of Significant Difference (ESD)</b> was submitted to stakeholders.	January 10, 2011
2010 <b>Final Inactive Landfill 1, Inactive Landfill 2, and Inactive Landfill 3 Annual Maintenance Inspection Report</b>	April 8, 2011
<b>Land Use Events</b>	<b>Date</b>
<b>Defense Authorization Amendments and Base Realignment and Closure Act (BRAC) of 1988</b> mandated the closure of 9,000 acres of the FGGM's original 13,670 acres.	1988

<b>Land Use Events</b>	<b>Date</b>
<b>Maryland Department of Natural Resources evaluation of surplus property</b> delineated the natural features and land uses of the 9,000 acres BRAC parcel.	January 1990
<b>1991 Military Construction Appropriations Act</b> directed the transfer of 7,600 acres of the 9,000 acres (BRAC parcel) to the Department of the Interior (DOI) for inclusion in the Patuxent Research Refuge (PRR).	October 16, 1991
<b>DOI 1992 Transfer Assembly</b> , 498.2 acres transferred to DOI.	November 17, 1992
<b>Decision Document, Safety Precautions to be Taken at Tipton Airfield</b> documents the approval of the proposed safety actions taken by the Army for the Inactive Landfills 1, 2, and 3.	July 9, 1998
FGGM was formally added to the EPA's <b>Final National Priorities List (NPL)</b>	July 28, 1998
<b>Decision Document Addendum, Safety Precautions to be Taken at Tipton Airfield</b> further clarifies the institutional controls including the prohibition of the use of groundwater at the TAP that were originally part of the Transfer Assembly documents.	November 6, 1998
<b>EPA</b> submitted a <b>Notice of Intent</b> to delete Tipton Army Airfield from the NPL and Request for Comments.	1 September 1999
<b>Finding of Suitability to Transfer</b> documented the environmental conditions of the TAP for the land transfer to Anne Arundel County, MD.	October 1999
State of Maryland – <b>Quitclaim Deed</b> for Surplus Airfield Property	July 2001
<b>Groundwater Events</b>	<b>Date</b>
<b>Long-Term Groundwater Monitoring (LTGM) Plan</b>	June 2001
<b>Biennial LTGM Report</b> , Summer 2001 Sampling Event	December 2002
<b>Biennial LTGM Report</b> , Summer 2003 Sampling Event	January 2004
<b>Biennial LTGM Report</b> , Summer 2005 Sampling Event	September 2006
<b>Biennial LTGM Report</b> , August 2007 Sampling Event	September 2008
<b>Biennial LTGM Report</b> , June 2009 Sampling Event	June 29, 2010
<b>Munitions and Explosives of Concern (MEC) Events</b>	<b>Date</b>
<b>FGGM Ordnance Survey (1,400-Acre Parcel)</b>	June 1994
<b>FGGM Ordnance Survey (7,600 Acre Parcel)</b>	December 1995
An <b>Ordnance and Explosives (OE) removal action</b> - Tipton Airfield, Helicopter Hangar Area, and Fire Training Area.	1995
<b>FGGM BRAC Parcel, Unexploded Ordnance (UXO) Survey and Data Analysis</b>	June 1997
<b>A 3-foot thick earthen MEC Safety Cover</b> was installed at the Inactive Landfill 1.	August 1998 – October 1999
<b>Annual Non-Time Critical OE (NTCOE) Removal Action Report</b> for the Little Patuxent River and Tipton Airfield, Inactive Landfill 3, Sweep 2001	January 2002
<b>Annual NTCOE Removal Action Long-Term Monitoring (LTM) Report</b> , 2002 Little Patuxent River Sweep	August 2002
<b>Annual NTCOE Removal Action LTM Report</b> , 2003 Little Patuxent River Sweep	December 2003
<b>Annual NTCOE Removal Action LTM Report</b> , 2004 Little Patuxent River Sweep	2004
<b>Annual NTCOE Removal Action LTM Report</b> , 2005 Little Patuxent River Sweep	2005
U.S. Army Corp of Engineers (USACE) performed an <b>Ordnance Sweep</b> at the Inactive Landfill 3	March 30, 2006
<b>Annual NTCOE Removal Action LTM Report</b> , 2006 Little Patuxent River Sweep	12 October 2007
<b>Annual NTCOE Removal Action LTM Report</b> , 2007 Little Patuxent River Sweep	February 2009
<b>Annual NTCOE Removal Action LTM Report</b> , 2008 Little Patuxent River Sweep	January 2010
<b>Annual NTCOE Removal Action LTM Report</b> , 2009 Little Patuxent River Sweep	February 2010
<b>Annual NTCOE Removal Action LTM Report</b> , 2010 Little Patuxent River Sweep	February 2011

## **3.0 BACKGROUND**

### **3.1 PHYSICAL CHARACTERISTICS**

FGGM formerly occupied 13,596 acres of land in the northwest corner of Anne Arundel County, approximately halfway between Washington, D.C., and Baltimore, Maryland. Figure 3-1 illustrates the regional location of FGGM with respect to the State of Maryland and the Baltimore-Washington metropolitan area. It also shows the BRAC parcel [also known as the Patuxent Research Refuge-North Tract (PRR-NT)].

The TAP is located east of State Route 198 and south of Highway 32. To the west is the Baltimore-Washington Parkway, and the Little Patuxent River is to the south. An Amtrak railroad right-of-way and State Route 175 form the southeast and northeast site boundaries, respectively. The TAP occupies approximately 346 acres. Several areas were identified that required environmental investigation (Evaluation Areas): Inactive Landfill 1 (IAL1), Inactive Landfill 2 (IAL2), Inactive Landfill 3 (IAL3), Fire Training Area (FTA), and Helicopter Hangar Area (HHA). Figure 3-2 illustrates the Evaluation Areas within the TAP. The Evaluation Areas are described further below.

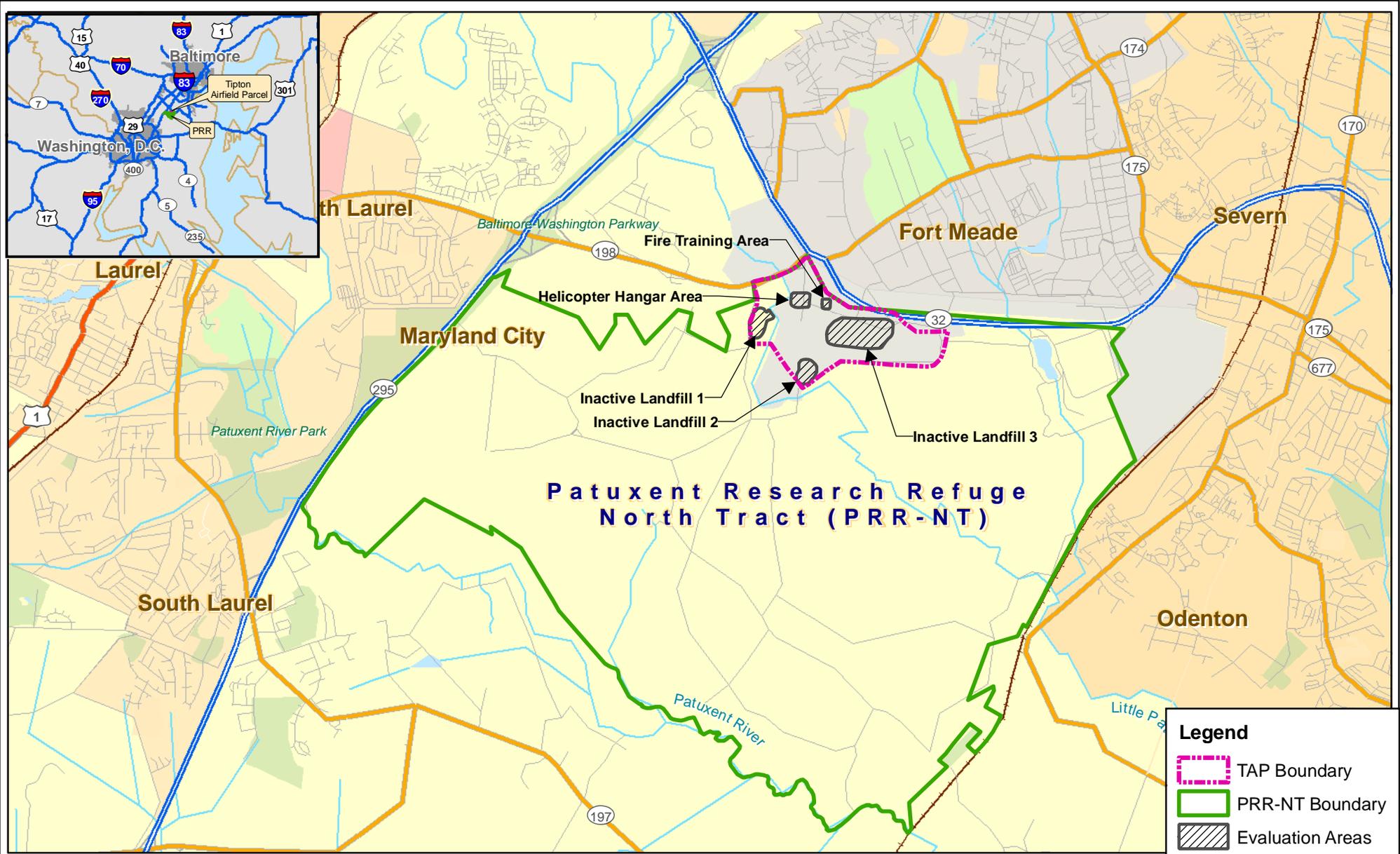
Figure 3-2 also shows Little Patuxent River that runs through the TAP. The Army currently conducts annual MEC sweeps along the river. The TAP and the Little Patuxent River are located within the fans of two former military ranges and are considered artillery impact areas. The MEC investigations for the Little Patuxent River are summarized in this five-year review.

#### ***3.1.1 Inactive Landfill 1 (IAL1)***

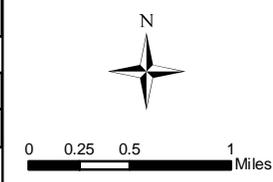
The IAL1 covers approximately 8 acres and is located in the north-central portion of the BRAC parcel between the Little Patuxent River and Bald Eagle Drive. The IAL1 is considered part of the TAP, although it is physically separated from the airfield by the Little Patuxent River. A small concrete blockhouse, formerly used as a communications building, is present on the northwest corner of the area. The September 2010 landfill maintenance inspection (URS, 2011b) indicates that heavy vegetation is apparent across the entire soil safety cover, though no evidence was found that the soil cover was compromised. Young trees and woody shrubs are also becoming established on the cover, particularly around the perimeter of the landfill.

#### ***3.1.2 Inactive Landfill 2 (IAL2)***

The IAL2 is located within the BRAC parcel on approximately 10 acres of land north of the former New Tank Road (now Wildlife Loop), approximately 450 feet north and east of the Little Patuxent River. The IAL2 was part of the Tipton Army Airfield but was excised from the legal description of the BRAC property and was retained by the Army. An estimated 3,500-foot-long perimeter fence encloses the 20-acre area, including the 10-acre landfill. The Tipton Airfield and the PRR border the landfill. The approximate extent of IAL2 is indicated on Figure 3-2. No buildings or structures are present at IAL2. The September 2010 landfill maintenance inspection (URS, 2011b) reported several trees that have fallen on the fence causing minor to moderate damage. Most of the landfill and the fence line are covered with heavy vegetation.



CLIENT	USACE, Baltimore District		
PROJ	Tipton Airfield Parcel		
SOURCE	ESRI Street Maps 9.2	GIS:	JK 04/01/2011
SCALE	1:60,000	CHECKED:	GW 04/01/2011
FILE	G:\Projects\Fort_Meade\Tipton_Inactive_Landfills\Projects\TiptonLTM-InsetandFigure1-1_2011.mxd		
	PROJ MGR:	GW	04/01/2011

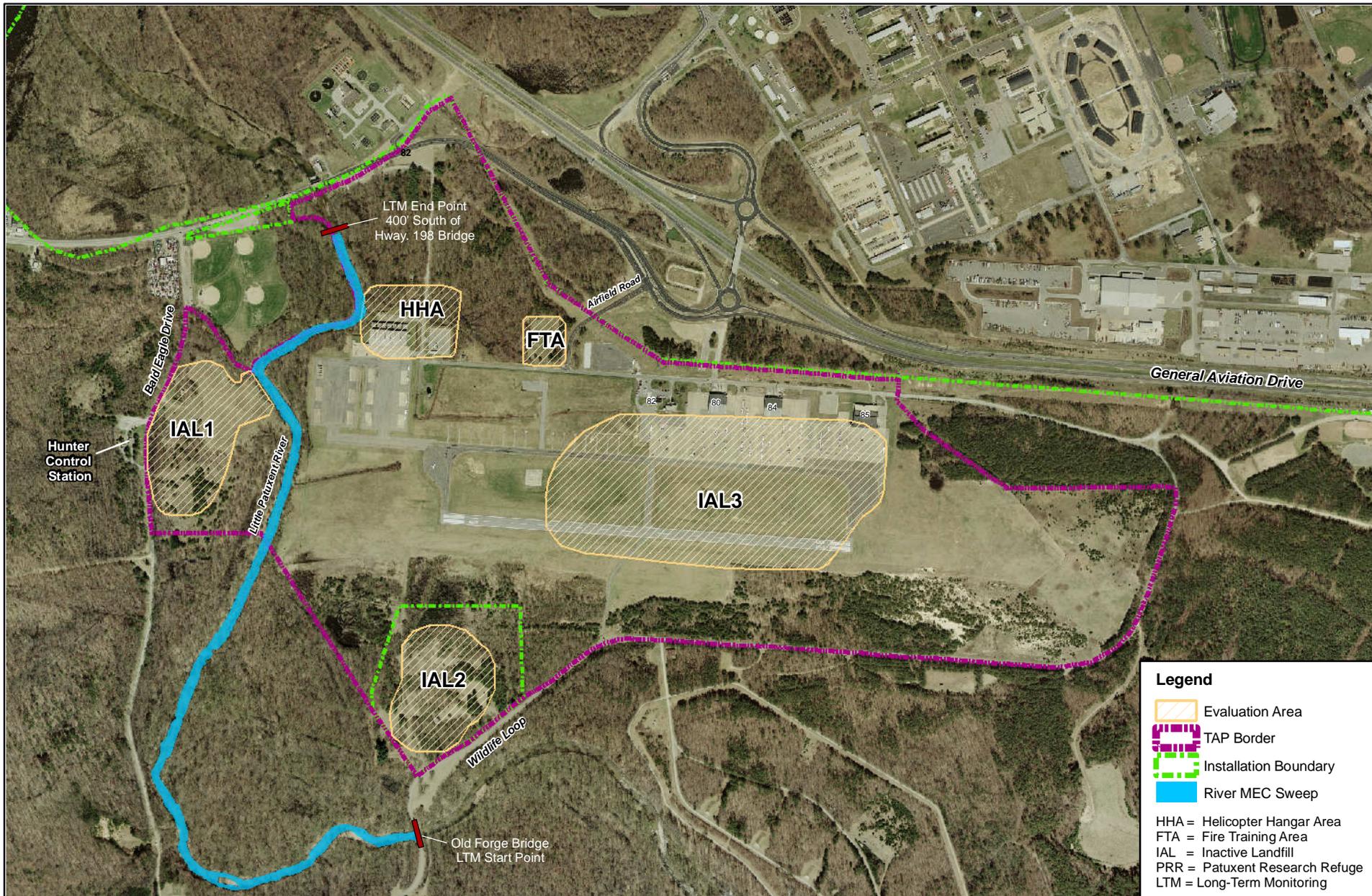


**URS**  
 200 Orchard Ridge Drive  
 Gaithersburg, MD 20878

Figure 3-1  
 General Location of Fort George G. Meade  
 and Tipton Airfield Parcel

**Legend**

- TAP Boundary
- PRR-NT Boundary
- Evaluation Areas

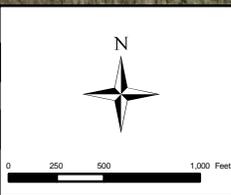


**Legend**

- Evaluation Area
- TAP Border
- Installation Boundary
- River MEC Sweep

HHA = Helicopter Hangar Area  
 FTA = Fire Training Area  
 IAL = Inactive Landfill  
 PRR = Patuxent Research Refuge  
 LTM = Long-Term Monitoring

USACE, Baltimore District			
PROJ	Tipton Airfield Parcel		
SOURCE	ESRI MrSid Aerial, c.2003.	GIS:	JK 04/02/2011
SCALE	1:12,000	CHECKED:	GW 04/02/2011
FILE	G:\Projects\Fort_Meade\Tipton\Projects TiptonMonitoringWells_Fig3-2_2011.mxd	PROJ MGR:	GW 04/02/2011



**URS**  
 200 Orchard Ridge Drive  
 Gaithersburg, MD 20878

Figure 3-2  
 Fort George C. Meade  
 Tipton Airfield Parcel Evaluation Areas

### **3.1.3 Inactive Landfill 3 (IAL3)**

The IAL3 covers approximately 78 acres and is within the eastern portion of the airplane runway area. The approximate extent of IAL3 is indicated on Figure 3-2. The airfield consists of four hangars, an operations building, a fire station, taxiways and runway, and a helicopter training area. A storm water management system exists under the airfield. The September 2010 landfill maintenance inspection (URS, 2011b) reported surface settlement throughout the grassy area between the runway and the taxi-way. Airfield staff indicated having difficulty mowing grass as a result of the settlement ridges.

### **3.1.4 Fire Training Area (FTA)**

The FTA is located north of Airfield Road and is about 800 feet east of the HHA (see Figure 3-2). The FTA covers approximately 2 acres. The northern half of the FTA is fenced off, enclosing the fire training pit and adjacent training areas. The FTA is flat and sparsely vegetated with grass.

### **3.1.5 Helicopter Hangar Area (HHA)**

The HHA includes Building 90 (the Helicopter Hangar) and adjacent areas located at the northwest corner of the airfield. The approximate extent of the HHA is indicated in Figure 3-2. The HHA is roughly bounded by the Little Patuxent River to the west, an unnamed tributary of the Little Patuxent River to the north, Patuxent Freeway to the east, and the helicopter parking area to the south. The HHA is located approximately 800 feet west of the FTA and covers approximately 5 acres. The HHA is surrounded by a chain-link fence that secures the site from both the river and Patuxent Freeway.

### **3.1.6 Little Patuxent River**

The Little Patuxent River is located near the western border of the TAP and flows from the northwest to the southeast. State-listed endangered species are present in this area. A nature trail parallels certain sections of the river. The Refuge has maintained diverse habitats in this river bottomland. Wetlands and marsh areas are present along the river and the tributary streams. The Refuge does not allow swimming, boating, fishing, or other recreational use of the river. The Army has constructed a fence along the river to discourage access to the river; signs that warn about potential MEC exposure are posted along the river. The Refuge management maintains some of the former military roads for access, but other roads were allowed to return to natural conditions.

## **3.2 LAND AND RESOURCE USE**

The TAP, formerly known as Tipton Army Airfield, is located in the north-central portion of the BRAC parcel. The land use for the TAP as an airfield for light fixed wing and rotary wing aircraft is not likely to change in the future. The *2009 Anne Arundel County General Development Plan* that was approved on October 19, 2009 by the County Council under Bill No. 64-09 states that over one hundred aircraft are based at the TAP; the airport handles approximately 150 aircraft arrival/departures daily. In the future, the county hopes to extend the length of the 3,000-foot runway to 4,000 feet and increase the amount of hangar space to accommodate larger turboprop aircraft. The county hopes to improve the accessibility to the airport (Anne Arundel County, 2009).

Even though Anne Arundel County currently owns the TAP property, the Army still remains responsible for any and all decontamination, cleanup, and remediation action that may be required. However, this only applies to contamination that occurred before the transfer of the property from the Army to Anne Arundel County. The Army has authority and control over the management of the property with respect to conducting cleanup and remediation activities relating to the environmental restoration of the property. For example, FGGM BRAC program representatives toured the IAL3 with the Tipton Airfield Director after reviewing the results of the September 2010 landfill inspection report (URS, 2010). The Army agreed with the report's recommendation to fill and re-grade the swales of the landfill surface so that water infiltration into the landfill is reduced.

### 3.3 HISTORY OF CONTAMINATION

Table 3-1 provides a brief history of the chemical and MEC contamination for each of the TAP Evaluation Areas. In October 1989, the TAP Evaluation Areas were identified in the Enhanced Preliminary Assessment Report [U.S. Army Environmental Center (USAEC), 1989]. A Site Inspection (SI) Study was conducted in October 1992 that addressed all five Evaluation Areas (USAEC, 1992). To address data gaps identified in the SI Study, an SI Study Addendum was conducted in 1994 (USAEC, 1994).

**Chemical Contamination:** Two RI/FS reports and risk assessments were completed by ICF Kaiser for the TAP. The August 1998 RI/FS addressed the three IALs [ICF Kaiser Engineers, Inc. (Kaiser), 1998a] and the October 1998 RI/FS addressed the HHA and the FTA (Kaiser, 1998b). The human health risk assessment findings indicate that contaminants detected in the soils, surface water, and sediment media do not pose an unacceptable risk to human health and the environment. The human health cancer risk and non-cancer hazards calculated under the current and reasonably anticipated future land use scenarios (i.e., excavation/site worker and trespasser) for the soils, surface water, and sediment media were within the USEPA's acceptable cancer risk range and below the hazard index (HI) of 1, respectively.

The RI/FS report also documented the ecological risk assessment which evaluated surface soil, sediments, and surface water exposure to terrestrial and aquatic receptors. The use of the site as the approach area for the airfield discourages ecological receptors. The management of the TAP as an airfield prevents the growth of a diverse plant community, thus reducing the natural habitat for terrestrial receptors. Therefore, NFA was deemed appropriate for the soils, surface water, and sediment media to protect human health and the environment.

The Final RI/FS groundwater results indicated that only scattered detections of contaminants were found; the distribution and concentrations did not constitute an identifiable area of contamination or plume at the TAP (Kaiser, 1998a and 1998b). In addition, contaminants were not leaching from soil into groundwater. The risk assessments assumed that the current industrial (non-residential) land use scenario would continue and that the land use restrictions established in the Transfer Assembly documents would eliminate exposure to the contaminated groundwater. However, a supplemental human health risk assessment was conducted in both reports for informational purposes only. Incidental ingestion of groundwater for a future site worker was evaluated and the results produced cancer risk estimates within USEPA's acceptable cancer risk range and HIs greater than 1. The non-cancer HI results were attributed to inorganics. In the RI/FS report, the residential scenario was not evaluated for exposure to groundwater.

**Table 3-1: Brief Description and History of Contamination for the TAP Evaluation Areas**

Evaluation Areas	Brief History of Contamination	
	Chemical	MEC
IAL1 (FGGM 10)	IAL1 was an unlined sanitary landfill from approximately 1950 to 1964; however, the types of material disposed of at IAL1 is unknown. Site investigations include the 1992 Site Inspection (SI) Study (USAEC, 1992) and the August 1998 RI/FS (Kaiser, 1998a).	Historic cantonment maps indicate that the TAP is a potential artillery impact area because of the location of two former military ranges intersecting the property. A 1995-1997 MEC sweep and removal action was conducted over the entire TAP to remove all ordnance and related scrap to a depth of 4 feet (USACE, 1995 and FGGM, 1997). No intrusive work was conducted at the landfills or within a 25 foot buffer for safety reasons. Paved areas, buildings, and areas beneath water were not included in the sweep.
IAL2 (FGGM 31)	IAL2 was initially operated as a soil borrows area (1938 to 1942) and then used as an unlined rubble disposal area until 1986. Site investigations include the 1992 SI Study (USAEC, 1992) and 1994 SI Study Addendum (addressing data gaps in the previous SI Study) (USAEC, 1994), and the August 1998 RI/FS (Kaiser, 1998a).	See IAL1 MEC description above. IAL2 could not be cleared of suspected MEC because it contains large amounts of rubble debris and is partially composed of wetlands with a shallow water table. The IAL2 was not included in the TAP BRAC land transfer to Anne Arundel County.
IAL3 (FGGM 31)	IAL3 was initially used as a sand borrows area. It was used as a sanitary and “leaf-dump” landfill in the late 1940s and 1950s. The airfield was constructed over IAL3 in 1963. Much of the IAL3 was excavated and disposed off-post. Materials were removed from beneath all the runway construction areas however landfilled materials are still present in areas next to the runways. Site investigations include the 1992 SI Study (USAEC, 1992) and the August 1998 RI/FS (Kaiser, 1998a).	See IAL1 MEC description above. In 1998, a MEC sweep was conducted in and around the IAL3. A long-term monitoring plan was developed for the IAL3 that provided a sweep schedule (years 3, 7, and then every 5 years) to ensure that no MEC items have migrated to the surface through frost action. Subsequent MEC sweeps were conducted in 2001 (USA Environmental, Inc., 2002) and 2006 (USACE, 2007) per the sweep schedule described in the July 1998 Decision Document (FGGM, 1998b).
FTA (FGGM 32)	FTA was constructed around 1979 for training purposes by the Fort Meade Fire Department. Fires were typically set using gasoline or aviation fuel inside the fire training pit or in portable burn pans. Site investigations include the 1992 SI Study (USAEC, 1992), 1994 SI Study Addendum (USAEC, 1994), and the October 1998 RI/FS (Kaiser, 1998b). The October 1998 FTA Removal Action Report documented the removal of the fire pit and the oil-water separators from the site (Radian, 1998).	A 1995-1997 MEC sweep and removal action was conducted over the entire TAP to remove all ordnance and related scrap to a depth of 4 feet (USACE, 1995 and FGGM, 1997). Paved areas, buildings, and areas beneath water were not included in the sweep.
HHA (FGGM 80)	HHA was used for helicopter maintenance, starting in the early 1980s until it was cleared and taken out of service in early 1996. Fuels, hydraulic and lubricating oils, detergents, and solvents were used there. Site investigations include the 1992 SI Study (USAEC, 1992), 1994 SI Study Addendum (USAEC, 1994), and the October 1998 RI/FS (Kaiser, 1998b). The 1999 HHA Removal Action Report documented the removal of the oil/water separators, gasoline evaporation pits, acid pits, and piping related to the hangar area from the site (Radian, 1999).	A 1995-1997 MEC sweep and removal action was conducted over the entire TAP to remove all ordnance and related scrap to a depth of 4 feet (USACE, 1995 and FGGM, 1997). Paved areas, buildings, and areas beneath water were not included in the sweep.

**Notes:**

IAL = inactive landfill; FGGM = Fort George G. Meade; FTA = fire training area; HHA = helicopter hangar area; MEC = munitions and explosives of concern; BRAC = Base Realignment and Closure; TAP = Tipton Airfield Parcel

**MEC Contamination:** Use of the TAP as a military range has been documented as far back as the early 1920s. In Special Military Maps from 1923, the area later designated as Tipton Airfield was identified as an artillery impact area. A 1941 Cantonment Map shows that two ranges were located within the future Tipton airfield.

A MEC risk assessment for TAP was performed in conjunction with the *Explosives Safety Submission for Ordnance and Explosives Removal and Property Release, Tipton Airfield, Fort Meade, Maryland* (USACE, 1995). The TAP area was assigned an overall Risk Assessment Code of 1 (which indicates highest priority for response) and was recommended for additional MEC clearance. The July 1999 ROD (FGGM, 1999) provided the following list of actions and safety precautions taken by the Army at the TAP to address MEC:

Ordnance Survey (1994): The Army commissioned an ordnance survey covering all areas of the airfield to assess the extent of ordnance remaining at the site and surrounding areas. During this survey, ordnance was searched for to a depth of 6 inches below the surface, and 10% of the remaining area was surveyed for ordnance to a depth of 5 feet. During this action, a total of 1,400 ordnance items were recovered from the site and surrounding areas.

Ordnance Clearance (1995-1997): The Army searched for ordnance from all accessible areas to a 4 foot depth. The inactive landfill areas, wetlands, and all paved surfaces were excluded. During this action, 1,548 ordnance items were recovered, rendered safe, and disposed. In addition, more than 33 tons of scrap consisting of concrete, metal, and miscellaneous debris was recovered incidental to the ordnance removal. Much of this material was recycled at local facilities.

Miscellaneous Debris Removal (Summer 1998): Several items that were identified during the ordnance removal projects were recovered for disposal. Items removed included several 55-gallon drums and an old vehicle-mounted storage tank.

Ordnance Removal, Airfield Drainage Swale (1998): The Army conducted an ordnance removal from a drainage swale located on the airfield where 420 additional items were recovered from areas previously inaccessible due to standing water. This was the last ordnance removal action at all known areas on the airfield which had been identified as containing potential MEC.

Ordnance Safety Measures, Inactive Landfill 3 (1998): The Army performed ordnance survey work in and around the IAL3. A long-term monitoring plan was developed for the IAL3 that provided a sweep schedule (years 3, 7, and then every 5 years) to ensure that no ordnance items have migrated to the surface through frost action.

Ordnance Safety Measures, Building Debris Site (1998): The Army conducted additional ordnance safety measures at a 2.5-acre area designated as the Building Debris Site. This site was made a priority for reuse because it was centrally located. Ordnance clearance and construction of a vehicle parking lot was completed at the site.

Ordnance Safety Measures, Inactive Landfill 2 (1998): The IAL2 could not be cleared of suspected ordnance because the area contains large amounts of rubble debris and is partially composed of wetlands with a shallow water table. The selected remedy was installing a seven-foot high chain link fence with three-strand barbed wire around the

landfill. The fence ties into an existing fence along Wildlife Loop Road. The IAL2 was not included in the TAP BRAC transfer to Anne Arundel County.

Ordnance Safety Measures, Inactive Landfill 1 (1998-1999): An ordnance clearance to a 4-foot depth and the construction of a safety cover was performed at the IAL1. During this action, 54 ordnance items were recovered, rendered safe and disposed. In addition, more than 760 tons of scrap (concrete, metal, and miscellaneous debris) were recovered incidental to the ordnance removal, and recycled at local facilities. The area of the IAL1 not cleared of suspected MEC is approximately 5.5 acres; and a 3-foot thick safety cover was constructed.

### **3.4 TIPTON AIRFIELD PARCEL (TAP) INITIAL RESPONSE**

The environmental remediation at the TAP is managed under CERCLA because its usage had been associated with FGGM. FGGM was listed by the USEPA as a Superfund site and was proposed for the NPL on April 1, 1997, and finalized on the NPL on July 28, 1998. However, the USEPA announced on November 12, 1999 in the Federal Register that the Tipton Army Airfield portion of FGGM was deleted from the NPL list.

From August 2007 to June 2010, the environmental remediation was managed under a Resource Conservation and Recovery Act (RCRA) Section 7003 unilateral order. The Army, DOI and USFWS, USEPA Region 3, and the U.S. Architect of the Capitol signed a Federal Facility Agreement (FFA) in 2009. As of October 6, 2009, the FFA drives the comprehensive cleanup of the BRAC sites. The Army, as the lead agency is responsible for the remedy selection and cleanup of the TAP; the Army will implement and incur all costs associated with the agreed upon response action(s).

After reviewing the results of the 1998 RI/FS reports (Kaiser, 1998a and 119b), the Army issued two RODs for the TAP. The December 30, 1998 ROD addressed the IAL3, HHA, and FTA Evaluation Areas (FGGM, 1998a), and the July 20, 1999 ROD addressed the IAL1 and IAL2 Evaluation Areas (FGGM, 1999). The RODs state that the selected remedy for the TAP is NFA with groundwater monitoring.

### **3.5 LITTLE PATUXENT RIVER INITIAL RESPONSE**

At the Little Patuxent River, no MEC clearance could be conducted in the river according to the *Explosives Safety Submission for Ordnance and Explosives Removal and Property Release Tipton Airfield, Fort Meade, Maryland* (USACE, 1996). Therefore, the river and adjacent property was retained by the Department of Defense (DOD). A fence was constructed along the river to discourage access. Signs were posted warning of MEC.

The Explosives Safety Submission was changed as documented in the *Amendment to Explosives Safety Submission for Tipton Army Airfield, Fort Meade, Maryland* (FGGM, 1997). The Amendment states that the presence of potential state-listed threatened species precludes dredging of the river. However, the presence of ordnance in the river is a safety hazard. The banks along the river were cleared of MEC to a depth of 4 feet or the water table (whichever was less) and the surface of the river bed was also cleared.

MEC sweeps are conducted every year along the Little Patuxent River and riverbanks (approximately 8 acres) from the Old Forge Bridge to a point 400 feet south of Maryland Highway 198 (see Figure 3-2). This section of the Little Patuxent River is located near the

northwest corner of the TAP between the IAL1 and the HHA. From 2002 to 2010, MEC items that were recovered during the sweep have been documented in the annual LTM reports (See Section 2.0); these reports have been submitted to the Army, USEPA, and MDE.

### 3.6 BASIS FOR TAKING ACTION

The December 30, 1998 and July 20, 1999 RODs proposed long-term groundwater monitoring (LTGM) for the TAP (FGGM, 1998a and 1999). The RODs indicate that sporadic detections of groundwater contaminants are present above drinking water Maximum Contaminant Levels (MCLs), non-zero Maximum Contaminant Level Goals (MCLGs), and/or USEPA risk-based screening levels for tap water. The contaminants were detected at concentrations that would be associated with unacceptable risks if the groundwater was used for potable purposes. The contaminants are mainly metals (inorganics), which could be naturally occurring, but the organic contaminants are not expected to be naturally occurring. Because of these findings, every two years after the date of the 1999 ROD, groundwater is sampled from some of the currently existing wells. In addition, inspections are conducted to ensure compliance with the LUCs that prohibit usage of the groundwater for anything other than environmental studies.

FGGM aquifer-specific background concentrations were derived for inorganics in the RI/FS reports (Kaiser, 1998a and 1998b); however, stakeholders have not approved the background data for screening purposes. At this time, it is unknown if the detected inorganics in groundwater at the TAP are site-related or could be attributed to background.

The contaminants detected in the groundwater at the TAP include three volatile organic compounds (VOCs) benzene, carbon tetrachloride, and 1,1,2,2-tetrachloroethane (1122TCA); a semi-volatile organic compound (SVOC) bis(2-ethylhexyl)phthalate; a polycyclic aromatic hydrocarbon (PAH) naphthalene; and three metals (arsenic, iron, and manganese). The RI/FS reports also identified acetophenone and explosives as chemicals of potential concern (COPCs) in groundwater. The 2003 LTGM report and the first five-year review report recommended removing these contaminants from the LTGM program; the USEPA and MDE approved their removal (USACE, 2004 and URS, 2005). Also, the USEPA and MDE approved the removal of bis(2-ethylhexyl)phthalate from the LTGM program with the 2009 LTGM report (URS, 2010c). The contaminants detected in the groundwater and the areas with suspected subsurface MEC are as follows:

**IAL1**

MEC, arsenic, iron, and manganese.

**IAL2**

MEC, arsenic, iron, and manganese.

**IAL3**

MEC, benzene, 1122TCA, naphthalene, and arsenic.

**FTA**

Benzene, carbon tetrachloride, arsenic, iron, and manganese.

**HHA**

Arsenic, iron, and manganese.

**Little Patuxent River**

MEC

This page intentionally left blank

## 4.0 REMEDIAL ACTIONS

### 4.1 REMEDY SELECTION

Table 4-1 summarizes the selected remedies for each Evaluation Area and its affected media. Table 4-2 summarizes the LUCs that have been implemented and maintained at the TAP.

The selected remedy of “NFA” represents a final remedial action determination with regard to the soils for the IAL3, HHA and FTA Evaluation Areas and the soils, sediment and surface water for the Inactive Landfills 1 and 2 Evaluation Areas. The RODs state that under the NFA alternative, no remedial action will be taken based upon both the current level of risk posed by contamination in these media and the protectiveness provided by prior removal actions.

In the 1998 ROD, an interim remedial action determination for groundwater was made, meaning that the TAP groundwater contamination would be addressed under a separate base-wide groundwater remedial action evaluation (FGGM, 1998a). However, the 1999 ROD groundwater remedial action determination superseded the 1998 ROD. The 1999 ROD presented the following remedial measures to address groundwater and MEC exposure at the TAP (FGGM, 1999):

- Every two years after the date of the 1999 ROD, the groundwater at the TAP will be sampled from certain wells. These monitoring results will be provided to the Army, the USEPA, and the MDE.
- The TAP will be inspected to assure compliance with the LUCs that address MEC and groundwater contamination as outlined in the July and November 1998 Army Decision Documents (FGGM, 1998b and 1998c).
- A review every 5 years will be conducted to evaluate the frequency and need for continued MEC sweeps and groundwater monitoring. This is to ensure that the remedy continues to provide adequate protection for human health and the environment.

Although contaminants were detected in groundwater at concentrations that exceeded MCLs, non-zero MCLGs, and/or risk-based screening levels that are protective of tap water, these detections were sporadic and did not constitute an identifiable area of contamination or plume. Therefore, a groundwater cleanup remedy was not implemented. To protect hypothetical residential users from potential risks associated with consumption of groundwater containing contaminants at levels that would present an unacceptable risk, the Army established LUCs (see Table 4-2) and implemented the LTGM program that tracks groundwater contaminants and determines whether the levels are decreasing or whether any changes in the groundwater remedy is needed.

The Army submitted a Draft ESD (URS, 2011a) in January 2011 to add the existing LUCs implemented under the 1998 Decision Documents to the CERCLA RODs. The Army and stakeholders have determined that the selected remedy for the TAP should be changed from “NFA with groundwater monitoring” to “LUCs with groundwater monitoring.” The Army will submit a subsequent Land Use Control Implementation Plan (LUCIP) to address notice(s) of planned construction and construction support where necessary, appropriate disposal of any discovered ordnance, and institutional and engineering controls (signage, fencing, education, and notice requirements) to ensure the continued protectiveness of previous and future MEC removal

**Table 4-1: Summary of Affected Media and Selected Remedies for the TAP Evaluation Areas**

Evaluation Areas (Army Site No)	Affected Media and Selected Remedy				
	Soils	Surface Water	Sediment	Subsurface MEC	Groundwater
IAL1 (FGGM 10)	NFA <sup>(1)</sup>	NFA <sup>(1)</sup>	NFA <sup>(1)</sup>	Between August 1998 and October 1999, a MEC clearance to a 4-foot depth and the construction of a 3-foot thick earthen MEC safety cover was conducted at the IAL1. IAL1 is monitored to ensure that the cover is not compromised by erosion. Also, LUCs were implemented. <sup>(3)</sup>	LTGM & LUCs <sup>(1,4)</sup>
IAL2 (FGGM 31)	NFA <sup>(1)</sup>	NFA <sup>(1)</sup>	NFA <sup>(1)</sup>	A 3,500 feet long, seven-foot high chain link fence with three-strand barbed wire was installed; it encloses approximately 20 acres, including the 10-acre landfill. The fence ties into an existing fence along Wildlife Loop Road. The fence is to be inspected periodically and any damage repaired. LUCs were implemented. <sup>(3)</sup>	LTGM & LUCs <sup>(1,4)</sup>
IAL3 (FGGM 31)	NFA <sup>(2)</sup>	n/a	n/a	Periodic MEC sweeps are to be conducted every 5 years at IAL3; the next MEC sweep is scheduled for fiscal year 2011. Also, LUCs were implemented. <sup>(3)</sup>	LTGM & LUCs <sup>(1,4)</sup>
FTA (FGGM 32)	NFA <sup>(2)</sup>	n/a	n/a	n/a	LTGM & LUCs <sup>(1,4)</sup>
HHA (FGGM 80)	NFA <sup>(2)</sup>	n/a	n/a	n/a	LTGM & LUCs <sup>(1,4)</sup>

**Notes:**

IAL = inactive landfill; FGGM = Fort George G. Meade; FTA = fire training area; HHA = helicopter hangar area; MEC = munitions and explosives of concern; NFA = no further action; n/a = not applicable; LTM = long-term groundwater monitoring; LUCs = land use controls

**Sources:**

(1) FGGM, 1999. *Final Record of Decision, Tipton Airfield Parcel (TAP) Operable Unit, Fort George G. Meade, Fort Meade, Maryland*, July 1999. EPA/ROD/R03-99/006.

(2) FGGM, 1998a. *Final Record of Decision, Tipton Airfield Area Operable Unit, Fort George G. Meade, Fort Meade, Maryland*, December 1998. EPA/ROD/R03-99/005.

(3) FGGM, 1998b. *Safety Precautions to be Taken at Tipton Airfield, Fort George G. Meade, Maryland*, Decision Document, 9 July 1998.

(4) FGGM, 1998c. *Safety Precautions to be Taken at Tipton Airfield, Fort George G. Meade, Maryland*, Decision Document Addendum, 6 November 1998.

**Table 4-2: Summary of the LUCs Implemented at the TAP**

LUCs Description	LUC Source
<b>GROUNDWATER</b>	
Prohibit drilling of wells at the TAP.	Decision Document Addendum, <i>Safety Precautions to be taken at Tipton Airfield, Fort George G. Meade, Maryland.</i> Dated 6 November 1998 (FGGM, 1998c).
The restriction on drilling without prior written approval from the Army is modified to prohibit the use of groundwater at the TAP for any potable or nonpotable purposes except for environmental studies.	
Prohibit residential use of the property without evaluation of residential exposure risks.	
<b>MEC</b>	
Prohibit any surface or subsurface excavations, digging, or other disturbances of soil, or beyond paved surface, without written approval of the Army.	Decision Document, <i>Safety Precautions to be taken at Tipton Airfield, Fort George G. Meade, Maryland.</i> Dated 9 July 1998 (FGGM, 1998b).
The Army's approval is also required for activities in the first four feet, where there was previous clearance of ordnance items.	
The exception to the above LUCs is the emergency repair of existing utilities.	
The Army will retain the IAL2 property and maintain site security. The fence will be inspected periodically and any damage will be repaired.	
Surface sweeps for MEC will be performed at the IAL 3 every 5 years to remove any potential MEC that might migrate to the surface. Next sweep at the IAL3 is scheduled for 2011. The Army will periodically review the need to continue surface sweeps.	

actions at the TAP. In addition, the LUCs remedy prohibits the use of groundwater at the TAP for any potable or non-potable purposes based upon the human health risk assessment results and the November 1998 Decision Document Addendum (FGGM, 1998c).

#### 4.2 REMEDY IMPLEMENTATION

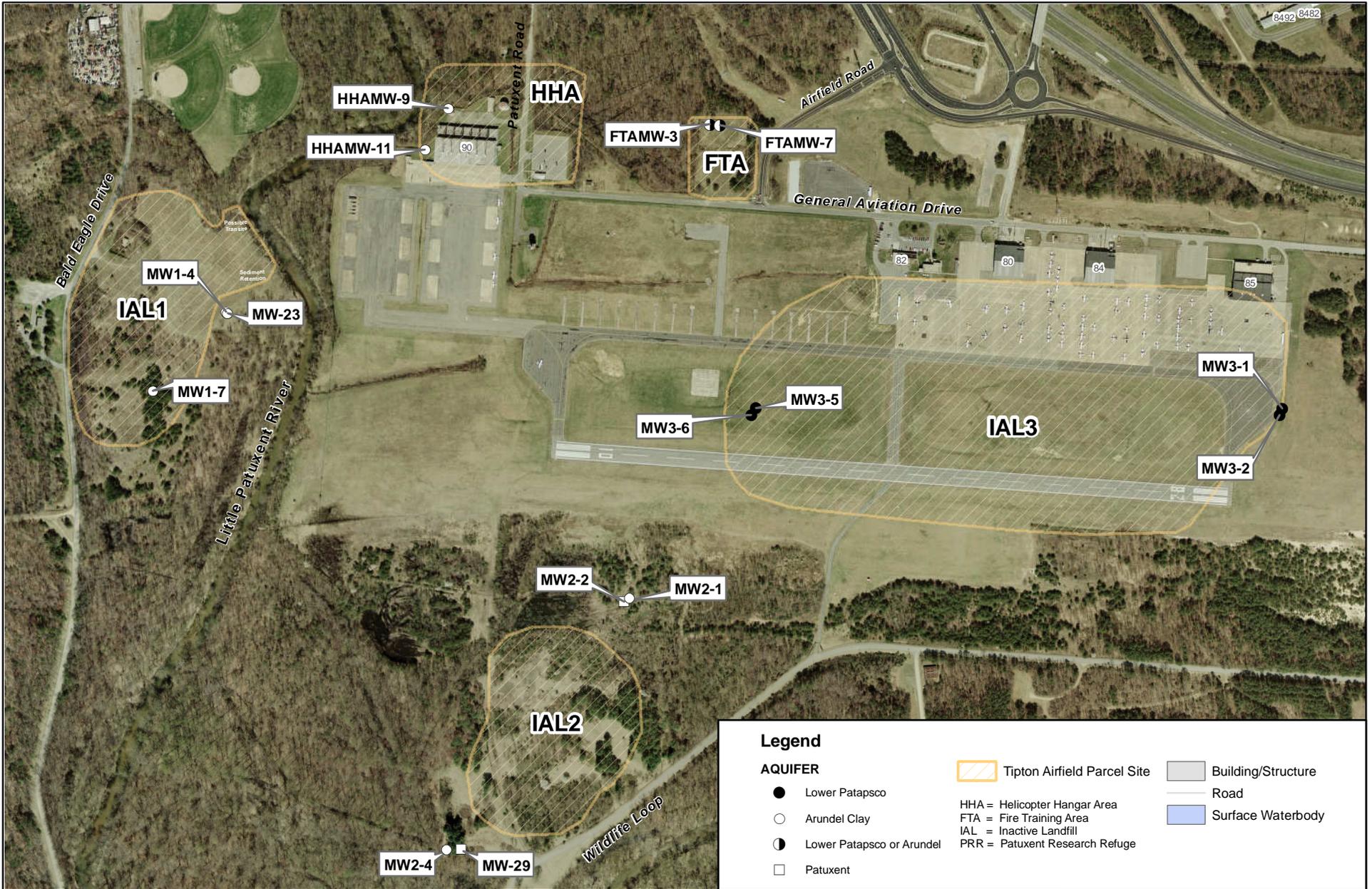
The Fort Meade Environmental Partnership, which includes the Army, USEPA Region III, and MDE selected 15 wells for biennial groundwater monitoring (once every 2 years) at the TAP. The *Long-Term Groundwater Monitoring Plan for Tipton Airfield Parcel* (USACE, 2001) includes sampling one well in the Patuxent Formation, eight wells in porous zones in the Arundel Clay, two wells that are either in permeable zones of the Arundel Clay or in the Lower Patapsco Formation (water table aquifer), and four wells in the Lower Patapsco Formation. Monitoring well identification numbers and the sites that they are associated with are listed in Table 4-3 and presented in Figure 4-1. The well/aquifer classifications have been updated in response to comments received in previous LTGM reports.

The following groundwater contaminants are sampled for in the LTGM program: VOCs (benzene, 1122TCA, and carbon tetrachloride), metals (arsenic, iron, and manganese), and PAH (naphthalene). With USEPA and MDE’s approval, acetophenone, explosives, and bis(2-ethylhexyl)phthalate were removed from the LTGM program (URS, 2005 and 2010c). The LTGM results are compared to MCLs, non-zero MCLGs, and USEPA Region 3 Regional Screening Levels (RSLs). A review like this one will occur every five years to evaluate the frequency and need for continued LTGM. This is to ensure that the remedy continues to provide adequate protection of human health and the environment.

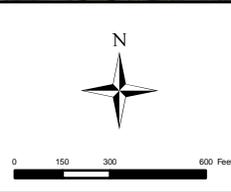
**Table 4-3: Monitoring Well Identification**

Well Identification Number	Well Location
<i>Patuxent Formation</i>	
MW2-2	IAL2
<i>Arundel Clay</i>	
MW1-4	IAL1
MW1-7	IAL1
MW-23	IAL1
MW2-1	IAL2
MW2-4	IAL2
MW-29	IAL2
HHAMW-9	HHA
HHAMW-11	HHA
<i>Lower Patapsco/Arundel Clay</i>	
FTAMW-3	FTA
FTAMW-7	FTA
<i>Lower Patapsco Formation</i>	
MW3-1	IAL3
MW3-2	IAL3
MW3-5	IAL3
MW3-6	IAL3

The Army has conducted periodic landfill inspections to ensure that the 3-foot thick earthen MEC cover at IAL1 has not been compromised by erosion and to ensure that the perimeter fence at IAL2 remains intact and in good condition. In 2006, MEC surface sweeps using a schonstedt



USACE, Baltimore District			
PROJ	Tipton Airfield		
SOURCE	ESRI MrSid Aerial, c.2003.	GIS:	JK 04/01/2011
SCALE	1:7,200	CHECKED:	GW 04/01/2011
FILE	G:\Projects\Fort_Meade\Tipton_Inactive_Landfills\Projects\TiptonMonitoringWells_Fig4_2011.mxd	PROJ MGR:	GW 04/01/2011



**URS**  
 200 Orchard Ridge Drive  
 Gaithersburg, MD 20878

Figure 4-1  
 TAP Monitoring Wells

magnetometer were conducted over the entire IAL3 that was not covered by the airfield tarmac. No MEC was observed during the sweep (USACE, 2007).

#### **4.2.1 Little Patuxent River**

According to the *Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action for Little Patuxent River & Tipton Airfield, Landfill 3* (USA Environmental, Inc., 2002), a surface clearance of the riverbed and west riverbank was conducted during March 2001. The clearance was conducted from approximately 400 feet south of the bridge on Maryland Route 198 downstream to the Old Forge Bridge. The total clearance area length was about 1 mile. No ordnance related items were found on the riverbank; however, 248 practice rockets were found in the riverbed.

In addition to the *Site Specific Final Report* (USA Environmental, Inc., 2002), nine reports have been written, each summarizing the results of an annual Little Patuxent River sweep for MEC, material potentially presenting an explosive hazard (MPPEH), and munitions debris (USA Environmental, Inc., 2004a, 2004b, 2005a, 2005b, 2007, 2008, 2010a, 2010b, and 2011).

The majority of the munitions debris items removed from the Little Patuxent River are recovered at the bend of the river near the ball field. No rockets have been found between the Old Forge Bridge and the river bend since the first MEC removal action. Each LTM effort, new items appear due to erosional forces present during high energy or high water conditions. Without knowing the amount of items in the riverbed or banks, there is no way to determine the exact duration of LTM. Table 4-4 summarizes the findings of the annual LTM efforts.

The most recent sweep conducted during the week of August 23, 2010 recovered 74 munitions debris items associated with 2.36-inch rockets. Since the annual sweeps began, a total of 639 practice rockets have been recovered (USA Environmental, Inc., 2011). No indications of any live high explosive rounds have been found.

The majority of recovered rockets have been expended practice rockets. The LTM efforts have recovered MEC items. During the 2005 LTM effort, two of the rockets had live rocket motors containing propellant. Two 2.36-inch M10A1 rockets containing White Phosphorous (WP) were recovered during the 2008 LTM effort. No MEC items were recovered during the 2009 and 2010 annual sweeps.

### **4.3 SYSTEM OPERATIONS/O&M**

The following long-term monitoring and inspection activities for the TAP are being completed as specified in the 1998 and 1999 RODs (FGGM, 1998a and 1999):

- The soil safety cover of IAL1 is monitored to ensure that it has not been compromised by erosion.
- The perimeter fence of IAL2 is inspected periodically to ensure that it remains in good condition.
- A MEC sweep of IAL3 is conducted every five years to remove any MEC that has surfaced from frost action.
- LTGM sampling is conducted biennially.

**Table 4-4: Annual LTM Results for MEC at Little Patuxent River**

Year	LTM Report	Removal Actions	MEC or MPPEH Present?
August 2002	<i>Final Addendum 1, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action for Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2004a)</i>	Six practice rockets were removed and determined to be inert/practice or munitions debris.	No
December 2003	<i>Addendum 2, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2004b)</i>	Eight practice rockets were removed and determined to be inert/practice or munitions debris.	No
2004	<i>Addendum 3, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2005a)</i>	Removal of practice rockets	No
2005	<i>Addendum 4, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2005b)</i>	Eighty (80) practice rockets were removed and determined to be inert/practice or munitions debris. Two of the rockets encountered had live rocket motors containing propellant.	Yes
28-29 August 2006	<i>Addendum 5, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River, Final (USA Environmental, Inc., 2007)</i>	Six M7 Series 2.36-inch rockets and one M9 Rifle Grenade were detected, recovered, and disposed of by detonation. In addition, 12 munition debris components associated with the M7 Series 2.36-inch rocket were located. All rockets covered to date were inert/practice or munitions debris. Also, a M80 Practice Land Mine was encountered on the riverbank; however, it was verified as munitions debris (wax-filled) by the Fort Belvoir Explosive Ordnance Disposal (EOD) unit.	No
4 September 2007	<i>Addendum 6, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2008)</i>	Of the 41 munitions debris items associated with 2.36-inch rockets recovered, 26 were identified as practice and 15 were initially suspected of MEC/MPPEH, removed remotely, x-rayed, and found to be practice rounds, so that all 41 items were ultimately identified as practice rounds.	No

**Table 4-4: Annual LTM Results for MEC at Little Patuxent River (cont'd)**

Year	LTM Report	Removal Actions	MEC or MPPEH Present?
11 August 2008	<i>Fort George G. Meade, Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2008 Little Patuxent River Sweep. January 2010 (USA Environmental, Inc., 2010a).</i>	Two MEC (M10A1 2.36-inch rockets filled with White Phosphorous) and 65 munitions debris items associated with 2.36-inch practice rockets were recovered from LPR.	Yes
17 August 2009	<i>Fort George G. Meade, Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2009 Little Patuxent River Sweep. February 2010 (USA Environmental, Inc., 2010b).</i>	The MEC Team recovered 101 items, consisting of 97 2.36-inch rockets and 4 expended rocket motors. No MEC items were recovered during the search.	No
24 August 2010	<i>Fort George G. Meade, Legacy Base Realignment and Closure Program. Long-Term Monitoring Report, 2010 Little Patuxent River Sweep. February 2011 (USA Environmental, Inc., 2011).</i>	The MEC team recovered 74 2.36-inch practice rockets. No MEC items were recovered during the search.	No

The LTGM monitoring wells are inspected for general condition and structural integrity prior to each LTGM sampling round. This inspection includes the following steps: 1) inspection of outer protective casing or flush-mount cover, well caps and locks, and concrete pad; and 2) inspection of inner cap and riser pipe.

The following items will be visually inspected each time:

- Outer protective casing or flush-mount cover to assess its structural integrity.
- Well caps and locks to ensure that both are in place and functioning properly.
- Concrete pad for the presence of cracks and settlement.
- The inner cap and riser pipe to ensure that these items are intact and functioning properly.

The landfill maintenance inspections, and LTGM program, and MEC sweeps for IAL3 are analyzed as part of the five-year review process to determine if these programs are operating efficiently and cost effectively, and evaluate the frequency and need for continued monitoring. The MEC sweeps for the Little Patuxent River are also addressed in this review even though the 1998 and 1999 RODs (FGGM, 1998a and 1999) do not list this activity as part of the remedy for the TAP. The biennial monitoring costs for the LTGM program are shown in Table 4-5. The annual costs for the Little Patuxent River MEC Sweeps and landfill inspections for the current five-year review cycle are presented in Table 4-6.

**Table 4-5: Long-Term Groundwater Monitoring Costs for the TAP**

<b>LTGM Dates</b>	<b>Total Cost Rounded to Nearest \$1,000</b>
June 2002	\$25,000
June 2004	\$25,000
August 2007	\$34,000
June 2009	\$39,000

**Notes:** The costs shown for the LTGM program do not include Army supervision and administrative costs.

**Table 4-6: Long-Term Monitoring Costs for Annual Little Patuxent River MEC Sweeps and Landfill Inspections**

<b>LTM Years</b>	<b>Total Cost Rounded to Nearest \$1,000</b>	
	<b>Little Patuxent River MEC Sweeps <sup>(a)</sup></b>	<b>IAL1 and IAL2 Inspections <sup>(a)</sup></b>
2005	\$25,000	\$6,000
2006	\$36,000	\$8,000
2007	\$36,000	\$8,000
2008	\$45,000	\$8,000
2009	\$53,000	\$6,000
2010	\$56,000	\$18,000 (b)

- (a) The costs shown for the LTM program do not include Army supervision and administrative costs.
- (b) The cost includes a visual inspection of IAL3 in preparation for fiscal year 2011 MEC Sweep.

This page intentionally left blank

## 5.0 PROGRESS SINCE LAST REVIEW

### 5.1 PROTECTIVENESS STATEMENT FROM LAST REVIEW

The findings of the first five-year review report for the TAP (URS, 2005) indicated that the selected remedy of NFA with groundwater monitoring in accordance with the 1998 and 1999 RODs was protective of human health and the environment (FGGM, 1998a and 1999).

### 5.2 STATUS OF RECOMMENDATIONS AND FOLLOW-UP ACTIONS FROM LAST REVIEW

The first five-year review report for the TAP identified no immediate issues impacting the protectiveness of the remedy and recommended to continue the five-year review process (URS, 2005).

The recommendations of the first five-year review report (2005) and any follow-up actions are summarized in Table 5-1.

**Table 5-1: Status of the First Five-Year Review Report Recommendations**

Recommendations	Status of Recommendations
Prepare brief inspection reports to document the fence line structural stability and response actions.	<b>Implemented.</b> The 1998 Decision Documents suggested periodic inspections. The Army now conducts the inspections annually and presents the results in a brief formal report.
Clear vegetation from the TAP fence along the southern border.	<b>NOT Implemented.</b> No vegetation removal actions were conducted from 2005 to present day. The Army plans to coordinate with USFWS to begin a grubbing program in fiscal year 2012 to clear fence lines and maintain landfill covers at the TAP.
Provide a “Tipton Airport Unexploded Munitions Notification” or something similar to all employees of the airfield as well as pilots for their review and signature.	<b>NOT Implemented.</b> The Army will provide copies of the IAL3 MEC sweep reports to Tipton airport personnel. The 2001 and 2006 MEC sweeps reported no MEC at the airfield (USA Environmental, Inc., 2002 and USACE, 2007).
Reduce the annual MEC sweeps at Little Patuxent River to visual sweeps once every two years.	<b>NOT implemented.</b> Annual MEC sweeps are still conducted at the Little Patuxent River.
Continue the LTGM monitoring on the current biennial schedule.	<b>Implemented.</b> However, the Army has plans to change the LTGM schedule from biennial to annual, starting with fiscal year 2011.
Improve the laboratory analytical sensitivity to obtain a reporting limit of approximately 5 microgram per liter (µg/L) for arsenic (i.e., half the MCL of 10 µg/L).	<b>Implemented.</b> Lower laboratory limit for arsenic was implemented for post-2005 LTM events.
Remove acetophenone and explosives from the LTGM sampling program based on previous recommendations made in the 2003 LTGM report (USACE, 2004).	<b>Implemented.</b> Acetophenone and explosives were removed from the LTGM sampling program in 2005.
Identify quantitative preliminary remediation goals (PRGs) that are technically feasible and protective of human health.	<b>NOT implemented.</b> The Army plans to update the LTGM Work Plan in fiscal year 2011.

This page intentionally left blank

## 6.0 FIVE-YEAR REVIEW PROCESS

### 6.1 ADMINISTRATIVE COMPONENTS

The objective of stakeholder notification and involvement is to ensure that people and organizations impacted by the five-year review are given the opportunity to participate in the planning and decision making process. Stakeholders in the TAP five-year review include representatives of the DOD, FGGM, USEPA, MDE, PRR, and the surrounding community. Table 6-1 presents key stakeholder point of contact information.

**Table 6-1: Stakeholder Points of Contact**

Name/E-Mail	Title	Organization	Phone
Ms. Andrea Graham <a href="mailto:andrea.a.graham@usace.army.mil">andrea.a.graham@usace.army.mil</a>	Baltimore District USACE Project Manager	USACE	443-986-3444
Steve Cardon <a href="mailto:steve.cardon@us.army.mil">steve.cardon@us.army.mil</a>	Ft. Meade BRAC Environmental Coordinator	Department of the Army	301-677-9178
Michael Wassel <a href="mailto:michael@tiptonairport.org">michael@tiptonairport.org</a>	Tipton Airport Manager	Tipton Airfield	410-222-6815
John Burchette <a href="mailto:burchette.john@epamail.epa.gov">burchette.john@epamail.epa.gov</a>	Federal Remedial Project Manager	USEPA	215-814-3378
Dr. Elisabeth Green <a href="mailto:egreen@mde.state.md.us">egreen@mde.state.md.us</a>	Remedial Project Manager	MDE	410-537-3346
Brad Knudson <a href="mailto:brad_knudson@fws.gov">brad_knudson@fws.gov</a>	Refuge Manager and Project Leader	PRR	301-497-5582

A Restoration Advisory Board (RAB) meeting was held on 11 September 2008 at the Fort Meade Directorate of Information Management (DOIM) conference room. During the meeting, a presentation was given describing the recurring review being conducted at TAP to include methodology, scheduling, participants, and goals. Comments and discussion with RAB members included topics such as the scheduling of ordnance sweeps at the Little Patuxent River, five-year review termination decisions, and assessment of groundwater sampling results.

### 6.2 COMMUNITY NOTIFICATION AND INVOLVEMENT

After the 2011 Draft Final Five-Year Review Report for TAP is approved by the USEPA and MDE, a notice will be placed in the Maryland Gazette, Crofton-West County, and Bowie Blade newspapers to solicit comments from the public and will be documented in Appendix D. The public comment period will be in effect for 30 days. Public meetings will be held after it is identified that enough public interest exists to warrant such a meeting. An additional 30-day extension will be provided if requested by interested stakeholders. A copy of the 2011 Draft Final Five-Year Review Report for TAP will be included in the Administrative Record which is available for public review.

The Administrative Record is available for public review at the following two locations:

1) Provinces Public Library  
2624 Annapolis Road  
Severn, MD 21144

**Phone:** (410) 222-6280

**Hours:** Mon, Tue, and Thu: 1:00 to 9:00 pm;  
Wed and Sat: 9:00 am to 5:00 pm; and  
Fri: 1:00 pm to 5:00 pm

2) Environmental Management Office  
Attn: ANME-PWE  
Fort Meade, MD 20755

**Phone:** (301) 677-9648

**Hours:** 7:30 am to 4 pm (Mon - Fri)

Any questions or requests for more information about the TAP and this review may be addressed to:

Department of the Army  
Markus Craig  
Office of the Assistant Chief of Staff for  
Installation Management; BRAC Division  
NC3-Taylor Building; 5064-A  
2530 Crystal Drive  
Arlington, VA 22202  
Phone: (703) 545-2474

John Burchette  
NPL/BRAC/Federal Facilities Branch  
USEPA Region III  
1650 Arch Street  
Philadelphia, PA 19103-2029  
Phone: (215) 814-3378

Kurt Scarbro  
Project Manager, Federal Facilities Division  
Maryland Department of the Environment  
1800 Washington Boulevard  
Baltimore, MD 21230-1719  
Phone: (410) 537-3045

Andrea Graham  
Program Manager, USACE  
Environmental and Munitions Design Center  
10 South Howard Street  
Baltimore, MD 21201  
Phone: 443-986-3444

### **6.3 DOCUMENT REVIEW**

The following post-2005 LTGM reports, landfill inspections, and MEC sweeps were reviewed to evaluate the condition of TAP property and the effectiveness of the LUCs and groundwater monitoring:

#### **LTGM Reports**

*Draft Final Long-Term Biannual Groundwater Monitoring Results, Tipton Airfield Parcel Operable Unit, Summer 2005 Sampling Event, Fort George G. Meade, Anne Arundel County, Maryland (USACE, 2006)*

*Fort George G. Meade Legacy Base Realignment and Closure Program Long-Term Biennial Groundwater Monitoring Results, Tipton Airfield Parcel, Anne Arundel County, Maryland, August 2007 Sampling Event (URS, 2008)*

*Final Long Term Monitoring Report, Tipton Airfield Parcel, Operable Unit, Anne Arundel County, Maryland, June 2009 Sampling Event (URS, 2010b)*

### **Landfill Inspection Reports**

*Maintenance Inspection Report Inactive Landfills 1, 2, &3 [2006], Fort George G. Meade, Laurel, Maryland, May 2007 (USACE, 2007)*

*Fort George G. Meade Legacy Base Realignment and Closure Program, Long-term Monitoring Report (CERCLA)/Corrective Measures Implementation (RCRA), Inactive Landfills 1 & 2; 2007 Inspection Report, Tipton Airfield Parcel, Anne Arundel County, Maryland. Prepared for U.S. Army Corps of Engineers, Baltimore District, February 2009 (URS, 2009)*

*Final 2008 Maintenance Inspection Report, Inactive Landfills 1 & 2, Tipton Airfield Parcel, Fort George G. Meade, Laurel, Maryland. Prepared for U.S. Army Corps of Engineers, Baltimore District, April 23, 2010 (URS, 2010a)*

*Final Inactive Landfills 1 & 2, 2009 Annual Maintenance Inspection Report, Anne Arundel County, MD. Prepared for U.S. Army Corps of Engineers, Baltimore District, February 2010 (URS, 2010b)*

*Final 2010 Maintenance Inspection Report, Inactive Landfills 1, 2, and 3, Tipton Airfield Parcel, Fort George G. Meade, Laurel, Maryland. Prepared for U.S. Army Corps of Engineers, Baltimore District (URS, 2011b)*

### **Little Patuxent River Sweep Reports**

*Final Addendum 5, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental Inc., 2007)*

*Draft Final Addendum 6, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action Long Term Monitoring, Little Patuxent River (USA Environmental, Inc., 2008)*

*Fort George G. Meade, Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2008 Little Patuxent River Sweep. January 2010, (USA Environmental Inc., 2010a)*

*Fort George G. Meade, Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2009 Little Patuxent River Sweep. February 2010, (USA Environmental Inc., 2010b)*

*Fort George G. Meade, Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2010 Little Patuxent River Sweep. February 2011. (USA Environmental Inc., 2011)*

The reports listed above encompass the investigations performed at the TAP since the previous five-year review report (URS, 2005); the data from these documents were incorporated into this report.

## **6.4 DATA REVIEW AND EVALUATION**

Table 6-2 summarizes the data review findings for the response actions implemented at the TAP Evaluation Areas and the Little Patuxent River. The landfill soil covers, groundwater LUCs, MEC sweeps (Little Patuxent River and IAL3), and LTGM program are generally functioning as

**Table 6-2: Evaluation of Response Actions at the TAP**

Site	Response Actions	Issues	Recommendations
IAL1	MEC Safety Soil Cover	Dense vegetation of annual plants on the cover is showing succession to woody shrubs and trees which could compromise cover.	Soil safety cover appears to be intact. However, the 2010 landfill inspection report recommends scheduling an inspection in the fall or winter when vegetation is low to verify cover's condition. Army will coordinate with USFWS to implement a grubbing program in fiscal year 2012.
	Inspections	No issues.	Continue inspections.
IAL2	Perimeter fence	Approximately 60 percent of the fence line is overgrown. Sections of the fence may require repairs and/or replacement to ensure integrity of the fence as a MEC LUC.	The Army has contracted to remove the vegetation along the perimeter of the fence and conduct fence repairs, as needed, in fiscal year 2011.
	Inspections	No issues.	Continue inspections.
IAL3	MEC Sweeps (every 5 years)	No issues.	Continue sweeps.
	Inspections	The 2010 landfill inspection report noted settlement ridges between the runway and taxi-ways; airport staff report that these conditions make it difficult to mow. FGGM BRAC program representatives toured the landfill with the Tipton Airfield Director.	The Army plans to fill and re-grade the swales of the landfill surface so that water infiltration into the landfill is reduced and the grade is leveled.
FTA	LTGM	(See Entire TAP LTGM below)	(See Entire TAP LTGM below)
HHA	LTGM	(See Entire TAP LTGM below)	(See Entire TAP LTGM below)
Entire TAP	LTGM	USEPA provided feedback on the LTGM program in 2009 LTGM report.  The 2009 well inspection identified 7 wells that require re-painting and stenciling. Heavy vegetation surrounding the IAL2 wells need to be cut back to allow better access. A broken cap at MW3-1 and a cracked concrete pad at MW3-5 were identified.	Continue LTGM program, but incorporate USEPA feedback regarding the 2009 LTGM report. The Army plans to do the following: 1) update the LTGM program by generating a revised LTGM Work Plan; 2) develop FGGM-specific groundwater background levels; 3) conduct annual LTGM sampling at the TAP rather than biennial; 4) drop bis(2-ethylhexyl)phthalate and add VOC breakdown daughter products [cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride]; and 5) repair and maintain well casings and pads.
	Groundwater LUCs	USEPA requested that the LUCs be incorporated into the CERCLA RODs.	Implement the ESD to incorporate groundwater LUCs into 1998 and 1999 RODs.
	MEC LUCs	USEPA requested that the LUCs be incorporated into the CERCLA RODs. Several incidences have been reported where the public has come into contact with potential MEC items (see text).	Implement the ESD to incorporate MEC LUCs into 1998 and 1999 RODs.
Little Patuxent River	Annual MEC Sweeps	The 2005 and 2008 MEC sweeps recovered MEC items from the river indicating that the potential for MEC hazards exists for the public, airport staff, and PRR personnel.	The subsequent MEC sweep reports recommend that USFWS identify the river as off limits to fisherman wading in the river. The 2010 MEC sweep report recommends that a MEC removal be conducted down to the depth of detection using the Schonstedt magnetometer between river bends A and B. Also, see MEC LUCs recommendation above.

intended. The data review identified some incidents where the MEC LUCs were not followed, resulting in potential MEC exposure to the public, Tipton Airport staff, and PRR personnel. The data evaluation identified the following incidents:

- PRR staff has stated during interviews that fishermen might be wading in areas of the Little Patuxent River where potential MEC items may occur.
- PRR staff also mentioned an incident where a citizen (boy) attempted to collect a potential MEC item from the Little Patuxent River. This incident resulted in a response from the Fort Meade EOD unit, which removed the item.
- Airport staff stated that a Tipton Airport contractor engaged in unauthorized excavation and encountered a buried rocket.

The Little Patuxent River banks can be accessed from either the USFWS property (PRR-NT and/or the ball fields located to the northwest of the TAP) and from MD Route 198 (state easement) property. Current USFWS policy prohibits any excavations in the riverbed or banks of the river, so any buried items will have to remain until weather uncovers them. Also, the USFWS currently provides educational outreach to the PRR-NT and ball field visitors. The Army plans to post additional signage at key locations informing potential trespassers of the potential presence of MEC and the appropriate response action, if encountered.

#### **6.4.1 Groundwater Data Analysis**

The objective of the groundwater data analysis is to review the data from the selected remedy and ensure that this remedy is meeting the objectives established in the RODs and to determine whether the response actions remain protective of human health and the environment.

The 1998 and 1999 RODs did not establish quantitative PRGs or clean up goals. The LTGM reports compared sampling data results to MCLs (USEPA, 2009), RSLs (USEPA, 2010), and FGGM aquifer-specific background concentrations for screening level purposes. As noted earlier in this review, the stakeholders have not approved the FGGM aquifer-specific background levels and therefore these levels were not used in this analysis. It is unknown if the detected inorganics in the groundwater at the TAP are site-related or could be attributed to background. Tables 6-3 and 6-4 present the historical screening results.

During the June/July 2005 sampling, the wells were not purged of one well volume prior to sampling. It appeared that the deviation from the sampling protocol resulted in elevated levels of particulate material being present in the groundwater samples (USACE, 2006). Because the inorganic data was determined to be suspect, the decision was made to disregard the June/July 2005 inorganic results and to resample all of the wells for inorganics utilizing the sampling procedures provided in the approved LTGM work plan (USACE, 2001).

The four wells associated with IAL2 (IALMW2-1, 2-2, 2-4, and 29) were not sampled during the 2007 LTGM event because the IAL2 had not been formally included in the BRAC transfer; as a result, funds were not made available for it during the 2007 LTGM effort.

#### **6.4.2 Maximum Contaminant Level (MCL) Exceedances**

In the 2005 through 2009 LTGM sampling events, no organics were detected above MCLs. In previous LTGM events, benzene and bis(2-ethylhexyl)phthalate were detected slightly above

**Table 6-3: Organics that have Historically Exceeded Screening Criteria at the TAP**

Groundwater COPC <sup>(a)</sup>	Results (µg/L)						Screening Criteria (µg/L)	
	RI/FS, 1998	LTGM, 2001	LTGM, 2003	LTGM, 2005	LTGM, 2007	LTGM, 2009	MCL	RSL <sup>(c)</sup>
<b>Inactive Landfill No. 1</b>								
<i>TCL SVOCs</i>								
Bis(2-ethylhexyl)phthalate	<b>7.1 - 35</b>	<b>6.3 <sup>(b)</sup></b>	bdl	bdl	Bdl	Bdl	6	4.8 c
<b>Inactive Landfill No. 3</b>								
<i>TCL VOCs</i>								
Benzene	<b>8.7</b>	<b>9.4</b>	<b>5.4</b>	<b>0.58 J</b>	<b>3.2</b>	<b>2.6</b>	5	0.41 c
1,1,2,2,-Tetrachloroethane	<b>3.5</b>	<b>2.5</b>	<b>1.9</b>	bdl	<b>1.1</b>	<b>0.82</b>	--	0.067 c
<b>Fire Training Area</b>								
<i>TCL VOCs</i>								
Benzene	<b>16</b>	<b>2.2 – 12.8</b>	<b>0.91</b>	<b>0.5 J</b>	<b>0.67 J</b>	Bdl	5	0.41 c
Carbon tetrachloride	<b>0.95</b>	<b>2.4 – 3.2</b>	<b>0.66</b>	bdl	0.37 J	Bdl	5	0.44 c
<i>TCL PAHs</i>								
Naphthalene	<b>24 J</b>	<b>10</b>	bdl	<b>0.61</b>	<b>TR 0.35 J</b>	<b>0.66 J,s</b>	--	0.14 c

**Notes:**

MCL Exceedance:

RSL Exceedance: **Red value**

bdl: Below detection limit

c : Cancer

LTGM: Long-term groundwater monitoring

MCL: Maximum Contaminant Level

PAH: Polycyclic aromatic hydrocarbon

RI/FS: Remedial Investigation/Feasibility Study

RSL: Regional Screening Level (dated November 2010)

SVOC: Semi-volatile organic compound

TCL: Target compound list

VOC: Volatile organic compound

J: Estimated result reported

TR: Trace

s: Surrogate failure

<sup>(a)</sup> Organics were not detected at the Inactive Landfill No. 2 and Helicopter Hangar Area Evaluation Areas.

<sup>(b)</sup> The concentration, in context of laboratory error, is not much different from a result of 6 µg/L (the MCL) and is very close to the analytical reporting limit of 5 µg/L.

<sup>(c)</sup> The cancer RSL (indicated with “c”) is protective of a target cancer risk of 1×10<sup>-6</sup>.

MCLs (see Table 6-3), but the detected concentrations of benzene have dropped below the MCL and bis(2-ethylhexyl)phthalate have dropped below its detection limit. In the Final 2009 LTGM report, USEPA and MDE approved the Army's recommendation to remove bis(2-ethylhexyl)phthalate as a groundwater COPC in the TAP LTGM program.

As shown in Table 6-4, during the 2009 sampling round arsenic was below the detection limit at all the Evaluation Areas. During the 2005/06 round of sampling, arsenic was detected above its MCL of 10 µg/L at the IAL2. Arsenic was also detected above the MCL in 2007 at the HHA.

#### **6.4.3 Regional Screening Level (RSL) Exceedances**

Benzene was detected above the RSL in the 2005, 2007, and 2009 sampling events for the IAL3. In the 2007 and 2009 sampling events, 1122TCA was detected above the RSL, but not for the 2005 sampling event where it was below the detection limit. The RSL (0.067 µg/L) for 1122TCA is analytically unattainable and therefore should not be used as a cleanup goal; in addition, no MCL exists for this groundwater COPC.

Benzene was detected above the RSL in the 2005 and 2007 sampling events for the FTA. It was below the detection limit in the 2009 round. In the 2007 sampling event, carbon tetrachloride was detected above the RSL, but not for the 2005 and 2009 sampling events where it was below the detection limit.

Table 6-4 presents the RSL exceedances for the inorganics. Arsenic, iron, and manganese were detected at concentrations exceeding RSLs in one or more wells during the 2005/06, 2007, and 2009 sampling events. Arsenic was detected above RSLs in all the Evaluation Areas at the TAP during the 2007 round, however during the 2009 round it was below the detection limit. For IAL3 and FTA, arsenic was detected for the first time in the 2007 sampling event; the detections were above the RSL, but not the MCL. Except for manganese during the 2003 LTGM event, both iron and manganese were detected above RSLs for all the LTGM events.

### **6.5 SITE INSPECTION**

Multiple site inspections have occurred during the preparation of this five-year review: June 2008, November 2008, and September 2010 (URS, 2011b). The 2008 site evaluations consisted of a visual evaluation of portions of the Little Patuxent River and IALs 1 and 2. The September 2010 site inspection addressed all three landfills. Table 6-2 summarizes the inspection results. Photographic documentation of the inspections is contained in Appendix B.

During the June site visit, weather conditions included a temperature in the low 80s with calm winds. The skies were mostly clear. Swampy areas near the IAL2 were not accessible. During the November 2008 and September 2010 site visits, the weather was unseasonably warm with temperatures in the low 70s, calm winds, and clear skies. Evaluation of the TAP reveals that physical and programmatic elements of the response actions are in place and generally functioning as intended. The elements are identified below and individually discussed:

**Table 6-4: Inorganics that have Historically Exceeded Screening Criteria at the TAP**

Groundwater COPC	Results (µg/L)						Screening Criteria (µg/L)	
	RI/FS, 1998	LTGM, 2001	LTGM, 2003	LTGM, 2005/06 <sup>(a)</sup>	LTGM, 2007	LTGM, 2009	MCL	RSL <sup>(b)</sup>
<b>Inactive Landfill No. 1</b>								
Arsenic	10.7	bdl	bdl	7	8.3	bdl	10	0.045 c
Iron	72,000	40,300	43,000	42,000	47,000 D	47,700	--	2,600 n
Manganese	4,300	2,960	2,890	3,090	2,400 D	2,970	--	88 n
<b>Inactive Landfill No. 2</b>								
Arsenic	36.9	bdl	13.6	13	NS	bdl	10	0.045 c
Iron	50,000	47,700	42,400	54,500	NS	50,600	--	2,600 n
Manganese	1,600	1,080	772	1,820	NS	1,520	--	88 n
<b>Inactive Landfill No. 3</b>								
Arsenic	6.72	bdl	bdl	bdl	5.3	bdl	10	0.045 c
Iron	11,000	4,060	3,730	6,300	14,000 D	4,830	--	2,600 n
Manganese	436	102	79.5	97	94	125	--	88 n
<b>Fire Training Area</b>								
Arsenic	bdl	bdl	bdl	bdl	1	bdl	10	0.045 c
Iron	22,400	33,600	11,800	15,200	10,000 D	3,710	--	2,600 n
Manganese	4,620	2,010	890	1,040	1,700 D	1,510	--	88 n
<b>Helicopter Hangar Area</b>								
Arsenic	16.2 K	bdl	bdl	4 J	19	bdl	10	0.045 c
Iron	17,000	34,100	31,900	27,000	61,000 D	31,900	--	2,600 n
Manganese	957	2,640	1,860	857	1,300	2,160	--	88 n

**Notes:**

MCL Exceedance:

RSL Exceedance: **Red value**

bdl: Below detection limit

c : Cancer

n: Non-cancer

D: Diluted result reported.

K: Analyte is present. Reported value may be biased high.

<sup>(a)</sup> The inorganic data collected in June/July 2005 were suspect because of elevated levels of particulate material from wells not purged of one well Volume prior to sampling. The June/July 2005 inorganic sample results were discarded and replaced with January 2006 inorganic sample data Where LTGM purging procedures were followed.

<sup>(b)</sup> The cancer RSL is protective of a target cancer risk of  $1 \times 10^{-6}$ . The non-cancer RSL is protective of a target non-cancer hazard quotient of 0.1.

LTGM: Long-term groundwater monitoring

RI/FS: Remedial Investigation/Feasibility Study

RSL: Regional Screening Level (dated November 2010)

MCL: Maximum Contaminant Level

NS: Not sampled.

- Soil covers over IAL1 and IAL3
- Fence surrounding IAL2
- Monitoring wells associated with IAL1, IAL2, IAL3, HHA, and FTA
- Fence limiting access to the Little Patuxent River
- Signage proximate to the LPR warning of the presence of potential UXO, disallowance of metal detector usage, and contact information to report suspect items
- PRR mandated fishing ban along the segment of the LPR where the annual river sweep is conducted
- Tipton Airport policy prohibiting excavation without MEC avoidance support

### **6.5.1 Covers Over IAL1 and IAL3**

The covers on these landfills are functioning as intended. They continue to serve as effective barriers minimizing potential contact with potential underlying MEC or other materials.

The natural soil cover at IAL1 is generally intact and vegetated in a manner that minimizes erosion potential. Exceptions are minor erosion ruts/gullies along the edge of the cap at some locations, none of which have exposed any landfill contents. As noted in Table 6-2, the 2010 landfill inspection maintenance report (URS, 2011b) recommends scheduling an inspection during the fall or winter to verify that the cover is still intact when vegetation is less dense.

The cap at IAL3 consists of the operational portion of the airport (runway, taxi-ways, and medial grassy areas) as well as grassy areas in between these features. The 2010 landfill maintenance inspection report (URS, 2011b) noted settlement ridges between the runways and taxi-ways (See Appendix B).

### **6.5.2 Fence Surrounding IAL2**

The fence surrounding IAL2 is intact and is functioning as intended, despite the fact that it has become heavily overgrown with vegetation in places. Signs warning of MEC are intact and visible on the fence. In the future the vegetation may compromise the structural integrity of the fence and obscure the signage. The fence itself is less visible now due to vegetation than it was when it was constructed. A portion of the fence is consistently submerged in water associated with a wetland area (northern fence boundary). The submerged fence portions are subject to accelerated corrosion, which bears continued monitoring during the annual inspections. Downed trees on the fence line were reported along the western perimeter (See Appendix B).

### **6.5.3 Monitoring Wells Associated with IAL1, IAL2, IAL3, HHA, and FTA**

All monitoring wells are intact and facilitate groundwater monitoring as intended. No new wells have been observed that would otherwise suggest unauthorized use of groundwater. Similarly, no new commercial or residential construction has been observed near the TAP that would otherwise raise the possibility of off-site groundwater use.

Monitoring well inspections are conducted as part of the LTGM program. The 2009 LTGM sampling effort (URS, 2010c) identified at least seven wells where the protective casings need to be repainted and stenciled with well identification information. Heavy vegetation surrounding

the IAL2 wells need to be cut back to allow better access to the monitoring wells. The well inspections also reported a broken cap at MW3-1 and a cracked concrete pad at MW3-5.

#### **6.5.4 Fence Limiting Access to the Little Patuxent River**

Fencing along a portion of the Little Patuxent River continues to impede access to the segment of the Little Patuxent River where MEC and MPPEH have been confirmed. Access to this segment of the Little Patuxent River from the east is controlled by the presence of the Tipton Airport, which the public cannot access except for airport operations purposes. Access to this segment of the Little Patuxent River from the west is controlled by 1) fencing associated with nearby recreational ball fields, and 2) the fenced Patuxent Research Refuge property to which access and activities (see Section 6.5.6) are controlled.

Although the fencing impedes access to the Little Patuxent River, access is not entirely eliminated. At some locations, short segments of the fence have fallen due to vegetative growth (and possible water movement during historical Little Patuxent River flooding). Evidence of access includes discarded fishing gear along the river. An incident reported by several PRR employees involving a citizen attempting to collect a potential MEC item from the Little Patuxent River. According to the employees, this incident occurred sometime in 2007 and it resulted in a response from the Fort Meade EOD unit, which removed the item.

#### **6.5.5 MEC Warning Signs**

Signage is posted along the Patuxent River and the access areas adjacent to Route 198.

Signage associated with ball field fencing (ball field back stops) is present and generally functioning as intended. Although the ball field property is not included within the TAP, its location immediately adjacent to the TAP and associated Little Patuxent River render the ball field signage useful for the purpose of warning of possible MEC in the area. The signage warns of the potential presence of MEC, disallows use of metal detectors, and provides contact information to report suspect items.

Although the signage is generally functioning as intended, it is possible that individuals may not see or possibly read (e.g., young children) the MEC warning signs, depending on how they access the Little Patuxent River.

#### **6.5.6 PRR Fishing Ban**

The fishing ban is effectively communicated to individuals who visit the PRR-NT. During the 2008 site inspections, URS visited the PRR-NT and noted the public education procedures. Visitors are advised that MEC may be present at PRR-NT, that it should not be handled, and that no fishing is allowed along the portion of the Little Patuxent River where MEC is suspected.

However, as prior discussed in 4.5.4, within the past 5 years fishing gear has been observed along the Little Patuxent River where MEC and MPPEH are confirmed. Thus, there is evidence that the fishing ban may occasionally be violated. Depending on the nature of the fishing tackle used during fishing and the exact location where violators choose to fish, snagging fish hooks on MEC and MPPEH is a remote possibility.

### **6.5.7 Tipton Airport Excavation Prohibition**

Interview of the Tipton Airport manager confirms that the prohibition against excavation anywhere at the airport without MEC avoidance support is generally effective. In the past 5 years there has been only one incident of a contractor violating this prohibition and encountering a buried rocket.

## **6.6 INTERVIEWS**

Mr. Michael Wassel, the airport manager, was interviewed by Bill Eaton via telephone on October 24, 2008. Mr. Wassel was asked a series of questions about the status and effectiveness of the response action at TAP, including any occurrences of airport users coming into contact with MPPEH. Mr. Wassel explained that one MPPEH item was found on the property a few years ago by a contractor who was excavating near a telephone pole south of the Fire House. The Fort Meade EOD was contacted, visited the site, and removed a rocket buried at a depth of several feet. Otherwise, no MEC has been discovered at the surface during the past 5 years. Mr. Wassel stated that the contractor was reminded that no excavation is to occur at the airport without MEC avoidance support.

On November 3, 2008, URS' Fred Moose and Bill Eaton interviewed several Patuxent Research Refuge Staff: Dionne Briggs (Refuge Operations Specialist), Lisa Goncalves (Education Team), Amanda Hardaswick (Law Enforcement Officer), Brad Knudsen (Project Leader / Refuge Manager), Nancy Morrissey (Deputy Refuge Manager), and Holliday Obrecht III (Refuge Biologist). The portion of the interview focused on the Little Patuxent River annual sweep segment revealed the following information.

During the 2008 annual river sweep conducted during the week of August 11, two WP- filled rockets were recovered from the Little Patuxent River. Their smoking upon removal from the river was evidence that they were WP-filled. The EOD Technical Support Unit from Fort Belvoir was contacted. The EOD Technical Support removed the rockets to the closest safe area at PRR-NT (old Range 10) and performed on-site disposal of these two MEC items. This incident is also reported in the 2008 Little Patuxent River Annual Sweep Report (USA Environmental, Inc., 2008b). This report indicates that the two MEC items fired are M10A1 2.36-inch rockets.

This page intentionally left blank

## 7.0 TECHNICAL ASSESSMENT

### 7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

Yes. The TAP response actions (soil covers, LUCs such as deed restrictions and physical controls, MEC sweeps, and groundwater monitoring) are generally functioning as intended.

The effective implementation of LUCs has prevented exposure to or ingestion of contaminated groundwater. As described in Section 6.4, the data review identified several incidents where the MEC LUCs were not followed, resulting in potential MEC exposure to the public, Tipton Airport staff, and PRR personnel.

### 7.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOS) USED AT THE TIME OF THE REMEDY SELECTION STILL VALID?

No. The exposure assumptions used in the 1998 human health risk assessments require updating to incorporate the *Risk Assessment Guidance for Superfund* Parts E and F (addressing dermal and inhalation exposure, respectively) that were released after the submittal of the 1998 RI/FS reports. However, these USEPA guidance documents do not impact the ingestion of groundwater pathway that was evaluated for the industrial worker scenario. This scenario was evaluated in the 1998 risk assessments for informational purposes only because the LUCs prohibit the use of groundwater at the TAP for any use other than environmental studies. If a hypothetical residential scenario were evaluated at the TAP, then the dermal and inhalation exposure pathways (e.g., showering/bathing scenario) would likely be considered.

The three IALs were grouped together and the risk assessment analyzed the groundwater data for each individual aquifer (Table 7-1). A separate risk assessment was conducted for the HHA and the FTA and the groundwater for each was evaluated separately (Tables 7-2 and 7-3). For the HHA and FTA, all groundwater data was obtained from the same aquifer. Toxicity values and risk-based screening levels were reviewed to determine whether any changes in the values are of sufficient magnitude that would warrant re-evaluation of site risks or the selected remedy. The changes in these values and their qualitative effects on risks are summarized in Tables 7-1 through 7-3. For reference, the original and current toxicity data for the groundwater COPCs identified in the LTGM are tabulated in Table C-1 of Appendix C.

The 1998 and 1999 RODs did not provide RAOs for the TAP because the selected remedy was NFA. In the 2011 Draft ESD, the Army proposed the following RAOs for the TAP. They are as follows:

- To clean up the groundwater above numerical PRGs defined as MCLs and non-zero MCLGs, and to meet site-specific, risk-based remedial goals as defined by stakeholders;
- To prevent groundwater migration of contaminants beyond the LTM monitoring network; and
- To mitigate risks associated with the disturbance of buried MEC at the TAP.

**Table 7-1: IAL Risk Assessment Review**

<b>Change</b>	<b>Effect</b>
<b>Lower Patapsco Aquifer</b>	
RSLs increased for chlordane, 1,1-dichloroethene, barium, beryllium, chromium, iron, and manganese. RSLs decreased for 2-methylnaphthalene, naphthalene, chromium VI, cobalt, thallium, and vanadium.	Naphthalene and cobalt would be included in the risk assessment; therefore slightly increasing the overall risks and/or hazards. Chlordane, 1,1-dichloroethene, beryllium, and chromium would be eliminated from the risk assessment; the overall risks and/or hazards of the risk assessment would slightly decrease.
Oral reference dose for vanadium decreased.	A slight increase in overall hazard.
Oral reference dose for iron increased.	A slight decrease in overall hazard.
<b>Arundel Clay Aquifer</b>	
RSLs decreased for naphthalene, 4-nitrotoluene, and vanadium.	Naphthalene would be included in the risk assessment, slightly increasing overall risks and/or hazards.
RSLs increased for benzene, chloroform, 1,1,2,2-tetrachloroethane, 2-amino-4,6-dinitrotoluene, manganese, and iron.	These chemicals are already identified as groundwater COPCs in the risk assessment. Toxicity data changes for these chemicals and others impact the overall risks and/or hazards; toxicity changes are addressed below.
Oral reference doses are now available for naphthalene, 4-nitrotoluene, and 1,1,2,2-tetrachloroethane. Slope factor is now available for 4-nitrotoluene.	A slight increase in overall hazard. Slight increase in risk (4-nitrotoluene).
Oral reference dose and slope factor increased for benzene.	A slight decrease in overall hazard. A slight increase in overall cancer risk.
Oral reference doses increased for 4-amino-2,6-dinitrotoluene and iron	A slight decrease in overall hazard.
Oral reference dose decreased for vanadium.	A slight increase in overall hazard.
<b>Patuxent Aquifer</b>	
RSLs decreased for phenol, vanadium, and chromium.	Chromium is still carried forward as a groundwater COPC in the risk assessment. Phenol and vanadium are still eliminated as groundwater COPCs.
Oral reference dose is now available for phenol.	A slight increase in overall hazard.
Oral reference doses increased for chromium and iron.	A slight decrease in overall hazard.

**Table 7-2: FTA Risk Assessment Review**

<b>Change</b>	<b>Effect</b>
RSLs decreased for ethylbenzene, 2-methylnaphthalene, naphthalene, m&p-xylenes, o-xylene, cobalt, and vanadium.	Ethylbenzene, 2-methylnaphthalene, naphthalene, and cobalt would be included in the risk assessment, slightly increasing overall hazards and/or risks.
Oral reference doses are available for naphthalene and 2-methylnaphthalene.	A slight increase in overall hazard.

**Table 7-3: HHA Risk Assessment Review**

<b>Change</b>	<b>Effect</b>
RSLs decreased for cobalt, naphthalene, and vanadium.	These chemicals would be included in the risk assessment, slightly increasing overall risks and/or hazards.
RSLs increased for barium, iron, and manganese.	Groundwater COPCs selection did not change as a result of the increased SLs. Iron and manganese are still carried forward as groundwater COPCs.
Oral reference dose and slope factor increased for benzene.	A slight decrease in overall hazard; slight increase in cancer risk.
Oral reference dose for vanadium decreased.	A slight increase in overall hazard.
Oral reference dose for iron increased.	A slight decrease in overall hazard.

The Army is preparing a separate Proposed Plan and ROD to address potential MEC exposure for the 7,600-acre PRR-NT parcel. These documents will define the remedial actions and LUCs necessary to protect human health and the environment from MEC exposure in the future at the TAP.

**7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?**

No. No new information was identified that would lead to the conclusion that the current response actions are considered no longer protective. The Army plans to reinforce the groundwater and MEC LUCs with the submittal of the ESD and LUCIP. The LTGM program will be revised in fiscal year 2011 to better document the natural attenuation of the groundwater contaminants detected at the TAP; these changes do not alter the purpose of the LTGM program.

**7.4 TECHNICAL ASSESSMENT SUMMARY**

The data review, the site inspection, and the interviews indicate that the remedy is functioning as intended. No changes in the physical conditions of the TAP have occurred that would affect the protectiveness of the remedy. No new information calls into question the protectiveness of the remedy.

This page intentionally left blank

## 8.0 ISSUES

**Table 8-1: Issues Identified at the TAP**

Issue	Affects Protectiveness? (Y/N)	
	Current	Future
The soil cover at the IAL1 needs maintenance work to remove the young trees and repair ruts in the cover.	N	Y
Approximately 60 percent of the IAL2 perimeter fence is overgrown with heavy vegetation. Sections of IAL2 fence require repairs to ensure integrity of the fence as a MEC LUC.	N	Y
Settlement ridges were identified at the IAL3.	N	N
Some fence segments located between the ball fields and the Little Patuxent River have fallen down.	Y	Y
USEPA requested more data documenting the natural attenuation of the groundwater contaminants at the TAP. USEPA also asked that groundwater samples be collected and analyzed for PFOA and PFOS at the FTA	N	N
USEPA requested that the groundwater and MEC LUCs identified in 1998 Army Decision Documents be incorporated into the CERCLA RODs.	N	Y
Several incidents have been reported where the public has come into contact with potential MEC items: <ol style="list-style-type: none"> <li>1) Evidence of fishing at the Little Patuxent River is seen in the vicinity where MEC and MPPEH occur.</li> <li>2) A citizen attempted to collect a potential MEC item from the Little Patuxent River.</li> <li>3) A Tipton Airport contractor engaged in unauthorized excavation and encountered a buried rocket.</li> </ol>	Y	Y

This page intentionally left blank

## **9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS**

Table 9-1 presents recommendations and follow-up actions to ensure the protectiveness of the selected remedy for the TAP. Table 9-2 highlights the current sampling and analysis plan with proposed changes for the future sampling event. The regulatory feedback on this five-year review process is presented in Appendix E.

**Table 9-1: Recommendations and Follow-Up Actions for the TAP**

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
The soil cover at the IAL1 needs maintenance work to remove the young trees and repair ruts in the cover.	Implement a grubbing program in fiscal year 2012 to remove vegetation that might disturb the soil safety cover at the IAL1; perform inspection in fall/winter when vegetation is less dense to verify that the integrity of the soil cover remains intact.	Army	USEPA/MDE In cooperation with USFWS	Fiscal Year 2012	N	Y
Approximately 60 percent of the IAL2 perimeter fence is overgrown with heavy vegetation. Sections of IAL2 fence may require repairs to ensure integrity of fence as a MEC LUC.	The Army has contracted to remove the vegetation along the perimeter of the fence and conduct fence repairs, as needed, in fiscal year 2011.	Army	USEPA/MDE In cooperation with USFWS	Fiscal Year 2011	N	Y
Settlement ridges were identified at the IAL3.	Re-grade the swales and level the surface of IAL3's cover to remove settlement ridges.	Army	USEPA/MDE In cooperation with Tipton Airport	Fiscal Year 2011	N	N
Some fence segments located between the ball fields and the Little Patuxent River have fallen down.	The fallen fence segments will address in fiscal year 2012.	Army	USEPA/MDE	Fiscal Year 2012	Y	Y
USEPA requested more data documenting the natural attenuation of the groundwater contaminants at the TAP. USEPA also asked that groundwater samples be collected and analyzed for PFOA and PFOS at the FTA	Revise the LTGM work plan. Derive FGGM-specific groundwater background levels. Change the LTGM sampling from biennial to annual. Add VOC breakdown daughter products to the LTGM. Collect samples for PFOA and PFOS at the FTA. Repair/maintain the well casings and pads at the TAP.	Army	USEPA/MDE	Fiscal Year 2011	N	N
USEPA requested that the groundwater and MEC LUCs identified in 1998 Army Decision Documents be incorporated into the CERCLA RODs.	Submit an ESD to change the TAP selected remedy from "NFA with groundwater monitoring" to "LUCs with groundwater monitoring" and present the groundwater and MEC LUCs. Also, submit a LUCIP to ensure the continued protectiveness of the LUCs implemented at the TAP.	Army	USEPA/MDE	Fiscal Year 20112	N	Y

**Table 9 1: Recommendations and Follow-Up Actions for the TAP (cont'd)**

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
<p>Several incidents have been reported where the public has come into contact with potential MEC items:</p> <p>1) Evidence of fishing at the Little Patuxent River is seen in the vicinity where MEC and MPPEH occur.</p> <p>2) A citizen attempted to collect a potential MEC item from the Little Patuxent River.</p> <p>3) A Tipton Airport contractor engaged in unauthorized excavation and encountered a buried rocket.</p>	<p>Conduct a MEC clearance between river bends A and B of the Little Patuxent River to the depth of detection using a Schonstedt magnetometer or similar instrument.</p> <p>Place more signs in the area of concern along the riverbend warning fishermen and citizens that their presence is unauthorized and that MEC is present and should not be handled.</p> <p>Reinforce educational outreach programs that warn the public of the potential MEC and MPPEH hazards at the TAP, Little Patuxent River, and ball fields.</p>	Army	USEPA/MDE In coordination with USFWS.	USEPA and MDE approved decision (June 2010)	Y	Y

**Table 9-2: 2011 Proposed Sampling and Analysis Plan**

Well	Evaluation Area	VOCs					C8		Energetic	PAHs	TAL Metals		
		Benzene	1122TCA	Carbon Tetrachloride	Cis-1,2-DCE	Vinyl chloride	PFOA	PFOS	Perchlorate	Naphthalene	Iron	Manganese	Arsenic
<b>Patuxent Formation</b>													
MW2-2	IAL2										X	X	X
<b>Arundel Clay</b>													
MW1-4	IAL1										X	X	X
MW-23	IAL1										X	X	X
MW1-7	IAL1										X	X	X
MW2-1	IAL2	X	X	X							X	X	X
MW2-4	IAL2										X	X	X
MW-29	IAL2										X	X	X
HHAMW-9	HHA	X	X	X	X	X					X	X	X
HHAMW-11	HHA	X	X	X	X	X					X	X	X
<b>Lower Patapsco Formation or Arundel Clay Unit</b>													
FTAMW-3	FTA	X	X	X	X	X	X	X			X	X	X
FTAMW-7	FTA	X	X	X	X	X	X	X			X	X	X
<b>Lower Patapsco Formation</b>													
MW3-1	IAL3	X	X	X	X	X							
MW3-2	IAL3	X	X	X	X	X							
MW3-5	IAL3								X				
MW3-6	IAL3								X				

**NOTES:**

- DCE = Dichloroethene
- PFOA = perfluorooctanoic acid
- PFOS = perfluorooctyl sulfonates
- 1122TCA = 1,1,2,2-Tetrachloroethane

X	= Analysis proposed for one-time 2011 sampling event only
X	= Analysis will be conducted as part of LTGM program.

## **10.0 PROTECTIVENESS STATEMENT**

The remedy at the TAP currently protects human health and the environment because the LUCs protect the public from exposure to contaminated groundwater and MEC; the LTGM program ensures that the detected groundwater contaminants are naturally attenuating and are not migrating off property. However, in order for the remedy to be protective in the long term the following actions need to be taken to ensure long-term protectiveness:

- Submit an ESD to modify the remedy from “NFA with groundwater monitoring” to “LUCs with groundwater monitoring” and incorporate MEC and groundwater LUCs that were documented in the 1998 Army Decision Documents.
- Submit a LUCIP to better enforce and document the protectiveness of the LUCs at the TAP.

This page intentionally left blank

## **11.0 NEXT REVIEW**

The next five-year review will take place in 2015 with no changes to the scope of the review.

This page intentionally left blank

**Appendix A**  
**References**

This page intentionally left blank

## APPENDIX A: REFERENCES

- Anne Arundel County, 2009. *2009 Anne Arundel County General Development Plan*. April.  
<http://www.aacounty.org/PlanZone/LongRange/GDP.cfm>.
- Fort George G. Meade (FGGM), 1999. *Final Record of Decision Tipton Airfield Parcel Operable Unit*, July 20, 1999.
- FGGM, 1998a. *Final Record of Decision Tipton Airfield Parcel Operable Unit*, December 30, 1998.
- FGGM, 1998b. *Decision Document, Safety Precautions to be taken at Tipton Airfield, Fort George G. Meade, Maryland*. July 1998.
- FGGM, 1998c. *Decision Document Addendum, Safety Precautions to be taken at Tipton Airfield, Fort George G. Meade, Maryland*, November 1998.
- FGGM, 1997. *Amendment to Explosives Safety Submission for Tipton Army Airfield, Fort Meade, Maryland*.
- ICF Kaiser Engineers, Inc. (Kaiser), 1998a. *Remedial Investigation Report for Inactive Landfills 1, 2, 3 and Clean Fill Dump*. August 1998.
- Kaiser, 1998b. *Helicopter Hangar Area and Fire Training Area, Remedial Investigation Report*, October 1998.
- Radian International (Radian), 1998. *Fire Training Area Removal Action Report*. Prepared for U.S. Army Corps of Engineers, Baltimore District. October 26.
- Radian, 1999. *Final Helicopter Hangar Area Removal Action Report*. Prepared for U.S. Army Corps of Engineers, Baltimore District. March 23.
- State of Maryland, 2001. *Quitclaim Deed for Surplus Airport Property*, July 2001.
- URS Group, Inc. (URS), 2011a. *Explanation of Significant Difference Report, Tipton Airfield Parcel, Anne Arundel County, MD*. Prepared for U.S. Army Corps of Engineers, Baltimore District, January 10, 2011.
- URS, 2011b. *Final 2010 Maintenance Inspection Report, Inactive Landfills 1, 2, and 3, Tipton Airfield Parcel, Fort George G. Meade, Laurel, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District, April 8, 2011.
- URS, 2010a. *Final Inactive Landfills 1 & 2, 2009 Annual Maintenance Inspection Report, Anne Arundel County, MD*. Prepared for U.S. Army Corps of Engineers, Baltimore District, February 2010.

- URS, 2010b. *Final 2008 Maintenance Inspection Report, Inactive Landfills 1 & 2, Tipton Airfield Parcel, Fort George G. Meade, Laurel, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District, April 23, 2010.
- URS, 2010c. *Final Long Term Monitoring Report, Tipton Airfield Parcel, Operable Unit, Anne Arundel County, Maryland, June 2009 Sampling Event*. June 29, 2010.
- URS, 2009. *Fort George G. Meade Legacy Base Realignment and Closure Program, Long-term Monitoring Report (CERCLA)/Corrective Measures Implementation (RCRA), Inactive Landfills 1 & 2; 2007 Inspection Report, Tipton Airfield Parcel, Anne Arundel County, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District, February 2009.
- URS, 2008. *Fort George G. Meade Legacy Base Realignment and Closure Program, Long-Term Biennial Groundwater Monitoring Results, Tipton Airfield Parcel, Anne Arundel County, Maryland, August 2007 Sampling Event*. September 2008.
- URS, 2005. *Revised Final Recurring Review Report, Tipton Airfield Parcel*. Prepared for U.S. Army Corps of Engineers, Baltimore District. March 2005.
- U.S. Army Corps of Engineers (USACE), 2007. *Maintenance Inspection Report, Inactive Landfills 1, 2, & 3. Fort George G. Meade, Laurel, Maryland*. Draft. May.
- USACE, 2006. *Draft Final Long-Term Biannual Groundwater Monitoring Results Tipton Airfield Parcel Operable Unit Summer 2005 Sampling Event, Fort George G. Mead Anne Arundel County, Maryland*, September 2006.
- USACE, 2004. *Fort George G. Meade Long-Term Groundwater Monitoring Results Tipton Airfield Parcel (TAP) Operable Unit (OU) Summer 2003 Sampling Event, Draft Final Document*, January 2004.
- USACE, 2002a. *Ordnance and Explosives Reference Guide for Department of Army Base Realignment and Closure Act Sites*. June 2002.
- USACE, 2002b. *Fort George G. Meade Long-Term Biannual Groundwater Monitoring Results Tipton Airfield Parcel (TAP) Operable Unit (OU) Summer 2001 Sampling Event*. December 2002.
- USACE, 2001. *Fort George G. Meade Long-Term Groundwater Monitoring Plan for Tipton Airfield Parcel (TAP) Operable Unit (OU), Final Document*, June 2001.
- USACE, 1999. *Finding of Suitability to Transfer, Tipton Airfield Anne Arundel County, Maryland*.
- USACE, 1995. *Explosive Safety Submission for Ordnance and Explosives Removal and Property Release Tipton Airfield, Fort Meade*. June 1995.

- U.S. Army Environmental Center (USAEC), 1994. *Fort George G. Meade Base Closure Parcel Site Inspection Study Addendum*.
- USAEC, 1992. *Fort George G. Meade Base Closure Parcel Site Inspection Study, Vols. I and II. Final*. EA Engineering, Science, and Technology, Inc. Sparks, MD 21152.
- USAEC, 1989. *Enhanced Preliminary Assessment Report: Fort George G. Meade, Maryland. Final*. Environmental Research Division, Argonne, IL. October 1989.
- USA Environmental, Inc., 2011. *Fort George G. Meade Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2010 Little Patuxent River Sweep*. Final, February.
- USA Environmental, Inc., 2010b. *Fort George G. Meade Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2009 Little Patuxent River Sweep*. Final, February.
- USA Environmental, Inc., 2010a. *Fort George G. Meade Legacy Base Realignment and Closure Program, Long-Term Monitoring Report, 2008 Little Patuxent River Sweep*. Final, January.
- USA Environmental, Inc., 2008. *Addendum No. 6, Site Specific Final Report, Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action, Long Term Monitoring, Little Patuxent River, Fort George G. Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District. Contract No: W912WJ-05-D-0005, Delivery Order No: DA07. Draft Final. 8 April 2008.
- USA Environmental, Inc., 2007. *Addendum No. 5, Site Specific Final Report, Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action, Long Term Monitoring, Little Patuxent River, Fort George G. Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District. Contract No: W912WJ-05-D-0005, Delivery Order No: DA07. Final. 12 October 2007.
- USA Environmental, Inc., 2005a. *Addendum No. 3, Site Specific Final Report, Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action, Long Term Monitoring, Little Patuxent River, Fort George G. Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District.
- USA Environmental, Inc., 2005b. *Addendum No. 4, Site Specific Final Report, Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action, Long Term Monitoring, Little Patuxent River, Fort George G. Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District..

- USA Environmental Inc., 2004a. *Final Addendum 1, Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action for Long-Term Monitoring, Little Patuxent River.*
- USA Environmental, Inc., 2004b. *Addendum No. 2, Site Specific Final Report, Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action, Long Term Monitoring, Little Patuxent River, Fort George G. Meade, Maryland.* Prepared for U.S. Army Corps of Engineers, Baltimore District.
- USA Environmental, Inc., 2002. *Site Specific Final Report for the Non-Time Critical Ordnance and Explosives (OE) Removal Action for Little Patuxent River and Tipton Airfield, Landfill 3.* January 2002.
- U.S. Environmental Protection Agency (USEPA), 2010. Regional Screening Levels for Chemical Contaminants at Superfund Sites Table dated November, 2010.  
<http://www.epa.gov/reg3hwmd/risk/human/index.htm>
- USEPA, 2009. *National Primary Drinking Water Standards*, EPA 816-F-09-004,  
[www.water.epa.gov/drink/contaminants/index.cfm](http://www.water.epa.gov/drink/contaminants/index.cfm). May.
- USEPA, 2001. *Comprehensive Five-Year Review Guidance*. EPA 540-R-01-007, June 2001.  
<http://www.epa.gov/superfund/accomp/5year/index.htm>.

**Appendix B**  
**Site Inspection Checklist and**  
**Evaluation Photographs**

This page intentionally left blank

## **Site Inspection Checklist**

This page intentionally left blank

## Site Inspection Checklist

I. SITE INFORMATION			
Site name: Tipton Airfield Parcel	Date of inspection: June and November, 2008 and September 22-23, 2010		
Location and Region: Patuxent Research Refuge – North Tract, EPA Region 3	EPA ID: MD9210020567		
Agency, office, or company leading the five-year review:	Weather/temperature: Calm winds and clear skies, low 70s.		
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment  <input checked="" type="checkbox"/> Other: <u>Groundwater monitoring, MEC Sweeps</u> </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input type="checkbox"/> Vertical barrier walls           </td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other: <u>Groundwater monitoring, MEC Sweeps</u>	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls
<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other: <u>Groundwater monitoring, MEC Sweeps</u>	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls		
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached (Figure 3-2 of main report)			
II. INTERVIEWS (Check all that apply) SEE SECTION 6.6 OF MAIN REPORT			
<b>1. O&amp;M Site Manager :</b> _____                      _____                      _____ <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone    Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			
<b>2. O&amp;M staff</b> _____                      _____                      _____ <div style="display: flex; justify-content: space-around; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_ Phone no. \_\_\_\_\_  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_ Phone no. \_\_\_\_\_  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_ Phone no. \_\_\_\_\_  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_ Phone no. \_\_\_\_\_  
Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews** (optional)  Report attached.


<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____ _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____ _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____ _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____ _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____ _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____ _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A



<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and enforcement</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> N/A	
	Site conditions imply ICs not being fully enforced	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> N/A	
	Type of monitoring ( <i>e.g.</i> , self-reporting, drive by) <u>Site inspections</u>		
	Frequency <u>Annual (landfill inspections, MEC Sweeps at Little Patuxent River); biennial (groundwater)</u>		
	Responsible party/agency <u>U.S.Army (or designee)</u>		
	Contact <u>Steve Cardon</u>	<u>Ft Meade BRAC Coordinator</u>	<u>9/20/10</u>
	Name	Title	Date
			<u>301-677-9178</u>
			Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> N/A	
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Violations have been reported	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
		<input type="checkbox"/> N/A	
	Other problems or suggestions: <input type="checkbox"/> Report attached		
	<u>Several incidents reported regarding MEC exposure to public (i.e., LUC measures not being followed). Army plans to take extra measures to reinforce LUCs associated with prohibiting MEC exposure. See main report, Section 9.0</u>		
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate
	Remarks _____		<input type="checkbox"/> N/A
	_____		
	_____		
<b>D. General</b>			
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks _____		
	_____		
2.	<b>Land use changes on site</b>	<input checked="" type="checkbox"/> N/A	
	Remarks _____		
	_____		
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A	
	Remarks _____		
	_____		
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b>			
	<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A	
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate
	Remarks _____		<input type="checkbox"/> N/A
	_____		

<b>B. Other Site Conditions</b>		
Remarks <u>None.</u>		
_____		
_____		
_____		
_____		
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Landfill Surface</b>		
1.	<b>Settlement</b> (Low spots) <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent _____                      Depth _____ Remarks <u>IAL3 shows settlement ridges (see Appendix B for pictures).</u>	
2.	<b>Cracks</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident Lengths _____                      Widths _____                      Depths _____ Remarks _____ _____	
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident Areal extent _____                      Depth _____ Remarks <u>IAL1 and IAL2 are mostly covered with vegetation. IAL3 is either covered with runways/taxi-ways or maintained grassy areas. Ruts are visible in the soil safety cover at the IAL1 (See photos in Appendix B).</u>	
4.	<b>Holes</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Holes not evident Areal extent _____                      Depth _____ Remarks _____ _____	
5.	<b>Vegetative Cover</b> <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input checked="" type="checkbox"/> No signs of stress <input checked="" type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks <u>Vegetation is apparent across the entire soil safety cover of IAL1 though there is no evidence that the cover has been compromised. Young trees and woody shrubs are becoming established on the cover of IAL1, particularly around the perimeter (See Appendix B for photos). Approximately 60 percent of IAL2 fence line is covered with heavy vegetation. Several trees have fallen on the fence causing minor to moderate damage.</u>	
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> <input type="checkbox"/> N/A Remarks <u>Runways and taxi-ways of the Tipton Airport cover portions of the IAL3. The other portions are mowed grassy areas</u>	
7.	<b>Bulges</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident Areal extent _____                      Height _____ Remarks _____ _____	

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____	<input checked="" type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	<b>Flows Bypass Bench</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
2.	<b>Bench Breached</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
3.	<b>Bench Overtopped</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A or okay
<b>C. Letdown Channels</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	<b>Settlement</b> Areal extent _____    Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of settlement
2.	<b>Material Degradation</b> Material type _____    Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of degradation
3.	<b>Erosion</b> Areal extent _____    Depth _____ Remarks: <u>Traverses are visible along the edges at IAL1 where steeper slopes are located, suggesting the IAL1 is susceptible to erosion. The rip rap installed at strategic locations appear to be functioning as designed to protect the cover</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	<b>Obstructions</b>	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	Size _____
	Remarks _____		
<hr/>			
6.	<b>Excessive Vegetative Growth</b>	Type <u>Lespedeza, vines, wild rose, and black locust</u>	
	<input type="checkbox"/> No evidence of excessive growth	<input checked="" type="checkbox"/> Vegetation in channels does not obstruct flow	
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<hr/>			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks _____		
<hr/>			
3.	<b>Monitoring Wells</b> (within surface area of landfill)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input checked="" type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
4.	<b>Leachate Extraction Wells</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed
	<input checked="" type="checkbox"/> N/A		
	Remarks _____		
<hr/>			

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> ( <i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Deformations</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident Horizontal displacement _____                      Vertical displacement _____ Rotational displacement _____ Remarks _____ _____	
2.	<b>Degradation</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident Remarks _____ _____	
<b>I. Perimeter Ditches/Off-Site Discharge</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Siltation</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Siltation not evident Areal extent _____                      Depth _____ Remarks _____ _____	
2.	<b>Vegetative Growth</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Vegetation does not impede flow Areal extent _____                      Type _____ Remarks _____ _____	
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident Areal extent _____                      Depth _____ Remarks _____ _____	
4.	<b>Discharge Structure</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Settlement</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent _____                      Depth _____ Remarks _____ _____	
2.	<b>Performance Monitoring</b> Type of monitoring _____ <input type="checkbox"/> Performance not monitored Frequency _____ <input type="checkbox"/> Evidence of breaching Head differential _____ Remarks _____ _____	

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive ( <i>e.g.</i> , chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4.	<b>Discharge Structure and Appurtenances</b> <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5.	<b>Treatment Building(s)</b> <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition ( <i>esp.</i> roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____		
<b>D. Monitoring Data</b>			
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining		

<b>D. Monitored Natural Attenuation NOTE: Remedy is monitoring only, not MNA</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)	<input type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning
		<input checked="" type="checkbox"/> All required wells located	<input checked="" type="checkbox"/> Needs Maintenance
		<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
			<input type="checkbox"/> N/A
Remarks: <u>See Section 6.5.3 of main report. Heavy vegetation surrounds IAL2 wells (access is difficult). Broken cap at MW3-1 and a cracked concrete pad at MW3-5 are reported at IAL3. Multiple wells require repainting and re-stenciling</u>			
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. SEE LAST PAGE OF SITE INSPECTION LIST.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). <u>The TAP remedy is functioning as intended and is protective for the short-term. The LTGM is effectively monitoring groundwater contaminants; no plume is evident at the TAP and no contamination is migrating off property. The groundwater is used for environmental studies only; all other uses are prohibited through LUCs. The inspections of all three landfills and MEC sweeps of IAL3 are being conducted regularly and are satisfying the monitoring requirements of the remedy.</u>			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>the following changes will be made regarding issues identified at the TAP: 1) an ESD and LUCIP will be submitted to change the remedy from "NFA with groundwater monitoring" to "LUCs with groundwater monitoring;" 2) Ft Meade does not have an acceptable background data set and screening levels for metals in groundwater; 3) LTGM program sampling will be changed from biennial to annual; and 4) VOC daughter breakdown products will be added to the LTGM program to better measure the natural attenuation processes at the site.</u>			

<p><b>C. Early Indicators of Potential Remedy Problems</b></p>
<p>Describe issues and observations such as unexpected changes in the cost or scope of O&amp;M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.</p> <ol style="list-style-type: none"> <li>1) <u>IAL1 and IAL2 require vegetation clearing to protect safety soil cover at IAL1 and to maintain fence line at IAL2.</u></li> <li>2) <u>Vegetation clearing is also required to gain better access to IAL2 monitoring wells.</u></li> <li>3) <u>Re-grade the swales identified at the IAL3.</u></li> <li>4) <u>Fence line repair work is needed between ballfields and Little Patuxent River (separate from TAP).</u></li> <li>5) <u>More MEC Warning Signs are needed along Little Patuxent River where potential MEC exposure exists.</u></li> <li>6) <u>Conduct additional MEC evaluation of the ball fields (separate from TAP).</u></li> </ol>
<p><b>D. Opportunities for Optimization</b></p>
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>The Army plans to submit an ESD and LUCIP for the TAP to incorporate the groundwater and MEC LUCs into the CERCLA RODs. These documents will improve the LUC implementation and maintenance at the TAP. Also, the Army plans to make some changes to the LTGM program. They are:</u></p> <ol style="list-style-type: none"> <li>1) <u>Revise the LTGM work plan.</u></li> <li>2) <u>Derive FGGM-specific groundwater background levels.</u></li> <li>3) <u>Change the LTGM sampling from biennial to annual.</u></li> <li>4) <u>Add VOC breakdown daughter products to the TAP LTGM.</u></li> <li>5) <u>Repair/maintain the well casings and pads at the TAP</u></li> </ol> <p><u>These changes do not alter the primary purpose of the LTGM program, but will improve the monitoring of the natural attenuation of groundwater contaminants at the site and maintain the monitoring well network.</u></p>

<p><b>X. OTHER REMEDIES</b></p>
<p><b>MEC Sweeps for IAL3</b></p>
<p>Two MEC Sweeps were conducted at the IAL3 as part of the remedy for the TAP. No MEC items were recovered during the sweeps. The Army plans to continue the sweeps every 5 years to monitor MEC and MPPEH that might surface at the landfill due to frost action.</p>
<p><b>MEC Sweeps for Little Patuxent River</b></p>
<p>The results of the MEC sweeps are reported in this five- year review. The sweeps have successfully recovered munition debris and MEC items from the river therefore the Army plans to continue the annual sweeps.</p>

This page intentionally left blank

**2010 Photo Documentation of Inactive Landfill No. 1**

This page intentionally left blank



# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P1	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** East

**Description:**  
From entrance to IAL 1 on Bald Eagle Drive, looking towards the Little Patuxent River.

Photo by: URS



<b>Photo No.</b> P2	<b>Date:</b>
------------------------	--------------

**Direction Photo Taken:** North/Northeast

**Description:**  
View to the North from the entrance to IAL 1 on Bald Eagle Drive

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P3	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> East/Southeast	

**Description:**  
View to the east/southeast from the northwest corner of IAL 1. Safety cover along northwest tree line is intact.

Photo by: URS



<b>Photo No.</b> P4	<b>Date:</b>
<b>Direction Photo Taken:</b> East/Southeast	

**Description:**  
Edge of safety cover / tree line along northwest corner of IAL 1. Some concrete debris visible in center of photograph.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P5	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> South	

**Description:**  
Edge of safety cover looking south along the northern perimeter of IAL 1. Cover appears to be resisting erosion and remains intact.

Photo by: URS



<b>Photo No.</b> P6	<b>Date:</b>
<b>Direction Photo Taken:</b> South	

**Description:**  
View south from northern perimeter of IAL 1. Safety cover is intact. Lespedeza is the dominant vegetation.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P7	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> Northwest	

**Description:**  
View to the northwest along northern perimeter of IAL 1. Safety cover is intact. Small trees are succeeding lespedeza in some areas.

Photo by: URS



<b>Photo No.</b> P8	<b>Date:</b>
<b>Direction Photo Taken:</b> East/Southeast	

**Description:**  
Edge of safety cover appears intact and resisting erosion. Little Patuxent River seen middle left.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District		<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
<b>Photo No.</b> P9	<b>Date:</b> 9-2010		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> View along northern tree line of IAL 1, towards Bald Eagle Drive. Soil Safety cover appears intact.  Photo by: URS			

<b>Photo No.</b> P10	<b>Date:</b>		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> View west from the eastern edge of the safety cover. Game trails from the Little Patuxent River lead towards the center of IAL 1.  Photo by: URS			



# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P11	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** West

**Description:**  
View west from eastern perimeter. MW1-4 and MW23 in foreground.

Photo by: URS



<b>Photo No.</b> P12	<b>Date:</b>
-------------------------	--------------

**Direction Photo Taken:** West

**Description:**  
View west of southern tree line. Safety cover appears intact. Some small trees and woody growth succeeding lespedeza in some areas.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 1	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P13	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> North/Northwest	

**Description:**  
View north/northwest towards entrance on Bald Eagle Drive. Small trees <4 inches have taken root. Vegetation is mix of lespedeza and grasses. Safety cover appears intact.

Photo by: URS



<b>Photo No.</b> P14	<b>Date:</b>
<b>Direction Photo Taken:</b> East/Northeast	

**Description:**  
View towards Little Patuxent River from Southwest perimeter of IAL 1. Safety cover appears intact. Small trees present. Lespedeza and grasses are the dominant vegetation.

Photo by: URS



[Page Intentionally Left Blank.]

**2010 Photo Documentation of Inactive Landfill No. 2**

[Page Intentionally Left Blank.]

<b>Client Name:</b> USACE-Baltimore District		<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
<b>Photo No.</b> P1	<b>Date:</b> 9-2010		
<b>Direction Photo Taken:</b> Northwest			
<b>Description:</b> Main gate: locks, chain, signage in tact. Light overgrowth.  Photo by: URS			

<b>Photo No.</b> P2	<b>Date:</b>		
<b>Direction Photo Taken:</b> Northeast			
<b>Description:</b> Fence line adjacent to main gate. Moderate overgrowth.  Photo by: URS			



# PHOTOGRAPHIC LOG

**Client Name:**  
USACE-Baltimore District

**Site Location:** FGGM Inactive Landfill No. 2

**Project No.**  
15302389.40000

**Photo No.**  
P3

**Date:**  
9-2010

**Direction Photo Taken:** Southeast

**Description:**  
Southwestern fence line.  
Light overgrowth.

Photo by: URS



**Photo No.**  
P4

**Date:**  
9-2010

**Direction Photo Taken:** North/Northwest

**Description:**  
Southwestern fence line. Moderate overgrowth.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P5	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** East

**Description:**  
Western fence line.  
Severe overgrowth.

Photo by: URS



<b>Photo No.</b> P6	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Western fence line.  
Downed tree on fence.  
Moderate damage.  
Moderate overgrowth.

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P7	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** North

**Description:**  
Western fence line.  
Downed branches on fence line.  
Moderate damage.  
Severe overgrowth.

Photo by: URS



<b>Photo No.</b> P8	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Western fence line.  
Light to moderate overgrowth.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P9	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** North

**Description:**  
Western fence line.  
Light to moderate overgrowth.

Photo by: URS



<b>Photo No.</b> P10	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Northwest gate, northwestern corner.  
Gate closed locks and chain in tact.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P11	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** East

**Description:**  
Northern fence line.  
Light overgrowth.

Photo by: URS



<b>Photo No.</b> P12	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** West

**Description:**  
Northern fence line.  
Moderate to severe rust damage- bottom 2 ft. of fence fabric.

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P13	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> South/Southwest	

**Description:**  
Northern fence line.  
Moderate to severe rust damage (bottom).  
Fence fabric detached from poles (top).

Photo by: URS



<b>Photo No.</b> P14	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> West	

**Description:**  
Northern fence line.  
Moderate to severe rust damage (bottom).  
Fence fabric detached from poles (top).

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P15	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> South	

**Description:**  
Northern fence line.  
North gate, open to allow wildlife (deer) passage.

Photo by: URS



<b>Photo No.</b> P16	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> South	

**Description:**  
Northern fence line.  
Downed tree on fence.  
Moderate damage.  
Moderate overgrowth.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P17	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** West

**Description:**  
Northeast corner.  
Light overgrowth.

Photo by: URS



<b>Photo No.</b> P18	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Northeast corner.  
Light overgrowth.

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P19	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:**  
South/Southwest

**Description:**  
Eastern fence line.  
Downed branches on fence line.  
Light to moderate damage.  
Moderate to severe overgrowth.

Photo by: URS



<b>Photo No.</b> P20	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Eastern fence line.  
Moderate overgrowth.

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P21	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Eastern fence line.  
Moderate overgrowth.  
Signage visible and in tact.

Photo by: URS



<b>Photo No.</b> P22	<b>Date:</b> 9-2010
-------------------------	------------------------

**Direction Photo Taken:** South

**Description:**  
Eastern fence line.  
Downed branches on fence line.  
Light to Moderate damage.  
Moderate to severe overgrowth.

Photo by: URS



**Client Name:**  
USACE-Baltimore District

**Site Location:** FGGM Inactive Landfill No. 2

**Project No.**  
15302389.40000

**Photo No.**  
P23

**Date:**  
9-2010

**Direction Photo Taken:** Southwest

**Description:**  
Southern fence line  
Moderate to severe  
overgrowth.  
Signage intact, partially  
visible.

Photo by: URS



**Photo No.**  
P24

**Date:**  
9-2010

**Direction Photo Taken:** Southwest

**Description:**  
Southern fence line.  
Light overgrowth.

Photo by: URS



<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 2	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P25	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> Southwest	

**Description:**  
Southern fence line.  
Light to moderate overgrowth.  
Signage intact and visible.

Photo by: URS



<b>Photo No.</b> P26	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> North/Northwest	

**Description:**  
Southern fence line.  
Severe overgrowth.  
Signage intact, barely visible.

Photo by: URS





# PHOTOGRAPHIC LOG

**Client Name:**  
USACE-Baltimore District

**Site Location:** FGGM Inactive Landfill No. 2

**Project No.**  
15302389.40000

**Photo No.**  
P27

**Date:**  
9-2010

**Direction Photo Taken:**  
North/Northwest

**Description:**  
Southern fence line.  
Light to moderate overgrowth.  
Signage intact, faded/bleached by sun.

Photo by: URS



**2010 Photo Documentation of Inactive Landfill No. 3**

This page intentionally left blank



# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 3	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P1	<b>Date:</b> 9-2010
------------------------	------------------------

**Direction Photo Taken:** East

**Description:**  
View east towards perimeter of IAL3.  
  
Photo by: URS



<b>Photo No.</b> P2	<b>Date:</b>
------------------------	--------------

**Direction Photo Taken:** East

**Description:**  
View east. Tipton airfield runway visible in upper right of photograph. Moderate ground settling apparent.  
  
Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 3	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P3	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> North	

**Description:**  
View north towards hangar and operations building. Settlement ridges apparent in center of photograph.

Photo by: URS



<b>Photo No.</b> P4	<b>Date:</b>
<b>Direction Photo Taken:</b> East	

**Description:**  
Settlement occurring around aviation windsock.

Photo by: URS





# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 3	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P5	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> East	

**Description:**  
Settlement occurring around aviation windsock.  
  
Photo by: URS



<b>Photo No.</b> P6	<b>Date:</b>
<b>Direction Photo Taken:</b> North	

**Description:**  
Settlement ridges  
  
Photo by: URS



<b>Client Name:</b> USACE-Baltimore District		<b>Site Location:</b> FGGM Inactive Landfill No. 3	<b>Project No.</b> 15302389.40000
<b>Photo No.</b> P7	<b>Date:</b> 9-2010		
<b>Direction Photo Taken:</b> Northwest			
<b>Description:</b> Settlement ridges are visible.  Photo by: URS			

<b>Photo No.</b> P8	<b>Date:</b>		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> Settling occurring around storm water drainage structure.  Photo by: URS			



# PHOTOGRAPHIC LOG

<b>Client Name:</b> USACE-Baltimore District	<b>Site Location:</b> FGGM Inactive Landfill No. 3	<b>Project No.</b> 15302389.40000
---	--	--------------------------------------

<b>Photo No.</b> P9	<b>Date:</b> 9-2010
<b>Direction Photo Taken:</b> Southwest	

**Description:**  
Settlement ridges are visible.

Photo by: URS



<b>Photo No.</b> P10	<b>Date:</b>
<b>Direction Photo Taken:</b> South	

**Description:**  
Settlement ridges are visible.

Photo by: URS



This page intentionally left blank

**Appendix C**  
**Reference Doses and Slope Factor**

This page intentionally left blank

**Table C-1: Original and Current Toxicity Data for Tipton Airfield Parcel (TAP) Groundwater COPCs**

Chemicals	RfDo-ORIGINAL		RfDo-CURRENT		CSFo-ORIGINAL		CSFo-CURRENT	
	mg/kg/d		mg/kg/d		1/mg/kg/d		1/mg/kg/d	
<b>Organic</b>								
Benzene	3.00E-03	E	4.00E-03	I	2.90E-02	I	5.50E-02	I
Carbon Tetrachloride	7.00E-04		4.00E-03	I	1.30E-01		7.00E-02	I
Chloroform	1.00E-02	I	1.00E-02	I	6.10E-03	I	3.10E-02	C
Dieldrin	5.00E-05		5.00E-05	I	1.60E+01		1.60E+01	I
4-amino-2,6-Dinitrotoluene	6.00E-05	E	2.00E-03	S	--	-	--	-
Ethylbenzene	1.00E-01	I	1.00E-01	I	--	I	1.10E-02	C
Bis(2-ethylhexyl) phthalate	2.00E-02	I	2.00E-02	I	1.40E-02	I	1.40E-02	I
2-Methylnaphthalene	2.00E-02	E	4.00E-03	I	--		--	
Naphthalene	--		2.00E-02	I	--		--	
4-Nitrotoluene (1)	--		4.00E-03	P	--		1.60E-02	P
Phenol	6.00E-01	I	3.00E-01	I	--		--	
RDX	3.00E-03	I	3.00E-03	I	1.10E-01	I	1.10E-01	I
1,1,2,2-Tetrachlorethane	--		2.00E-02	I	2.00E-01	I	2.00E-01	I
2,4,6-Trinitrotoluene	5.00E-04	I	5.00E-04	I	3.00E-02	I	3.00E-02	I
<b>Inorganic</b>								
Arsenic	3.00E-04	I	3.00E-04	I	1.50E+00	I	1.50E+00	I
Barium	7.00E-02	I	2.00E-01	I	--		--	
Beryllium	2.00E-03	I	2.00E-03	I	--		--	
Iron	3.00E-01	E	7.00E-01	P	--		--	
Lead (2)	--		--		--		--	
Manganese	2.40E-02	I	2.40E-02	I	--		--	
Vanadium	7.00E-03	H	5.00E-03	S	--		--	

**Notes:**

RfDo = Reference dose, oral; CSFo = cancer slope factor, oral

Toxicity data were reviewed only for those contaminants that exceeded the EPA Region III RBCs (dated 10/15/03).

Reference dose and slope factors are not listed for inhalation because that pathway was not evaluated in the risk assessment groundwater evaluation.

(1) Data is for p-Nitrotoluene

(2) USEPA has no consensus RfD or CSF selected for inorganic lead; lead is typically evaluated using blood-lead models.

References: I=IRIS, P=PPRTV, H=HEAST, E=EPA-NCEA provisional value, C=California EPA, S=See User's Guide for November 2010 table.

The user's guide describes methodology used for chemical-specific special cases. The methodology for applicable chemicals is summarized below:

The IRIS RfDo for 2,4-dinitrotoluene is used as a surrogate for 4-amino-2,6-dinitrotoluene. For vanadium, the IRIS RfDo for vanadium pentoxide was used by factoring out the molecular weight (MW) of the oxide ion. The two atoms of vanadium contribute 56% of the MW for vanadium pentoxide. The vanadium pentoxide RfDo of 9.00E-03 was multiplied by 56% to derive the vanadium RfDo of 5.00E-03 mg/kg-day.

This page intentionally left blank

## **Appendix D**

### **Public Notices**

[Pending Approval of Draft Final Five-Year  
Review Report by USEPA and MDE]

This page intentionally left blank

**Appendix E**  
**Regulatory Response to Comments Table**

This page intentionally left blank

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

Commenter / ORG	Comment Number	Comment Origin	Regulator Comment	Army Response
<b>Maryland Department of the Environment (MDE) Federal Facilities Division (FFD) Comments, Dated April 17, 2009</b>				
Kurt M. Scarbro, Remedial Project Manager, MDE FFD	1	Page 2-5, Table 2-1	The table indicates that monitoring well MW2-4 is screened in the Arundel Clay formation. Figure 2-1 indicates that MW2-4 is screened in the Patuxent formation. Please correct this discrepancy.	MW2-4 is screened in the Arundel Clay Formation. Figure 2-1 will be corrected.
Kurt M. Scarbro, Remedial Project Manager, MDE FFD	2	Page 2-8, §2.4.3, 3rd ¶	The paragraph references a report, USA Environmental, Inc., 2008b, which is listed as <i>Addendum 7, Site Specific Report Non-Time Critical Munitions and Explosives of Concern (MEC) Removal Action Long Term Monitoring, Little Patuxent River Fort George G. Meade, Maryland</i> , of 17 October 2008. The FFD has not yet received this draft report. Please forward the report for review and comments.	The reference refers to a Draft version of the <i>Little Patuxent River MEC Sweep 2008 Final Report</i> . The referenced text will be cross-checked with the final report (dated February 2010); the draft report reference will be replaced with the final report reference. Tracking records indicate that a copy of the final 2008 report was delivered to Elisabeth Green (MDE) on February 16, 2010.
Kurt M. Scarbro, Remedial Project Manager, MDE FFD	3	Page 3-1, §3.3, 2nd ¶	The location of the Restoration Advisory Board meeting on 11 September 2008 is incorrect. Please provide the correct location.	The location will be changed to the Fort Meade Directorate of Information Management (DOIM) conference room.
Kurt M. Scarbro, Remedial Project Manager, MDE FFD	4	Page 6-5, § 6.4	The FFD concurs with the recommendations made in this section on: a) Maintenance work on the soil cover at Inactive Landfill #1 b) Vegetation clearing, fence repair, and additional signage at the Tipton Airfield Parcel and along the Little Patuxent River (LPR). c) Annual unexploded ordnance sweeps along the LPR, and d) Biennial groundwater monitoring, removal of naphthalene and bis(2-ethylhexyl)phthalate from future monitoring, and aggressive purging of the monitoring wells, as described.	Comment noted.
<b>U.S. Environmental Protection Agency (EPA) Region III Comments, Dated April 20, 2010</b>				
John Burchette, EPA Remedial Project Manager (RPM)	1	General Comment	Please revise the document to follow EPA Guidance more closely in certain areas. Please refer to Appendix E in the link below:  <a href="http://www.epa.gov/superfund/accomp/5year/appendices_a-e.pdf">http://www.epa.gov/superfund/accomp/5year/appendices_a-e.pdf</a>  Please note that 5-Year Reviews are compared to the checklist found on page E-5. Please use this format in Five Year Review documents. Additionally, an example can be found at the following link: <a href="http://www.epa.gov/superfund/accomp/5year/appendices_f-g.pdf">http://www.epa.gov/superfund/accomp/5year/appendices_f-g.pdf</a>	The report will be converted into EPA CERCLA 5-Year Review guidance format.
John Burchette, EPA RPM	2		Please combine the multiple 5-Year Reviews into one basewide 5-Year Review. The actual start date trigger is 5 years after the initial Remedial Action Start date that left waste in place. Subsequent 5-Year Reviews would be due 5 years after the prior review.	The outstanding 5-Year Review Final Reports will not be consolidated since the drafts were submitted as stand-alone documents. Future 5-Year Reviews will be consolidated; however, the Army and EPA will need to agree on the trigger action date since the 5-Years Reviews are not conducted concurrently.
John Burchette, EPA RPM	1		Please use the sample language that is provided in the template (where applicable) (Appendix E).	Sample language will be added (where applicable).
John Burchette, EPA RPM	2		Please provide a title page with signature and date (see Appendix E page 9).	A title page with a signature and date will be added.
John Burchette, EPA RPM	3		Please provide a Five-Year Review Summary Form (see Appendix E page 17 and 18).	A Five-Year Summary Form will be added.
John Burchette, EPA RPM	4		Please Provide a Site Inspection Checklist.	A Site Inspection Checklist will be provided.
John Burchette, EPA RPM	5		In the introduction section, please briefly explain the trigger and action and date for the 5-Year Review.	The trigger and action and date will be provided in the Introduction.
John Burchette, EPA RPM	6		Please insert a Site Chronology section similar to that on page E-21 and 22 of the guidance.	A Site Chronology Section will be added.
John Burchette, EPA RPM	7		Please insert a section describing the progress since the last 5-Year Review.	A Section describing the progress made since the last 5-Year Review will be added.
John Burchette, EPA RPM	8		Please insert a 5-Year Review Process section. Please see pages E-6 and 7 of the guidance for additional details.	A 5-Year Review Process Section will be added.
John Burchette, EPA RPM	9		Please insert a technical assessment section found on page E-7 of the guidance. This should include answers to questions A, B and C.	A Technical Assessment Section will be added (including answers to questions A, B, and C).

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

<b>Commenter / ORG</b>	<b>Comment Number</b>	<b>Comment Origin</b>	<b>Regulator Comment</b>	<b>Army Response</b>
John Burchette, EPA RPM	10		Please insert a section titled "Protective Statement", as well as a brief discussion of the protectiveness of the remedy. Please see page F-28 of the 5-Year Review Guidance for an example.	A "Protective Statement" Section will be added that describes the protectiveness of the selected remedy for TAP.
John Burchette, EPA RPM	11		Please add a section titled "Next Review" and discuss the expected date of the next 5-Year Review.	A Section titled "Next Review" will be added; the next 5-Year Review date will be listed.
John Burchette, EPA RPM	12		Please add a section titled "Community Involvement" and briefly discuss (see page F-21 of the guidance).	A "Community Involvement" Section will be added.
John Burchette, EPA RPM	13		Page 1-2. The Army is the lead agency for the ROD 5-Year Review process.	The Army will be identified as the lead agency.
John Burchette, EPA RPM	14		Page 2-2. Due to the basewide groundwater issues, it is highly recommended that any of the office building development that occurs will include vapor barriers.	It is true that groundwater issues exist on Fort Meade that warrant vapor intrusion assessment prior to office building construction; however, the Tipton Airfield Parcel 2009 LTM groundwater results do not support EPA's recommendation. Those results show that VOC results (1,1,2,2-tetrachloroethane, benzene, and carbon tetrachloride) are non-detect in the Arundel Clay aquifer. Maximum detections of VOCs in the Lower Patapasco aquifer (96-106 ft bgs) for 1,1,2,2-tetrachloroethane (0.82 ug/L from MW3-2) and benzene (2.6 ug/L from MW3-2) were well below target groundwater concentrations of 30 ug/L and 14 ug/L from Table 2b of EPA's <i>OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater to Soils (Subsurface Vapor Intrusion Guidance)</i> (November 2002). The one detected SVOC result for naphthalene (0.66 J ug/L from FTAMW-7) is an estimated value and is also well below the target groundwater concentration of 150 ug/L (EPA, 2002).
John Burchette, EPA RPM	15		Please provide a brief explanation of the history of VOC contamination.	Text explaining the history of VOC contamination will be added.
John Burchette, EPA RPM	16		Please include a "Progress since Last Five-Year Review Section". In this section please include:	A "Progress since Last Five-Year Review" Section will be added that addresses the items identified in your comment.
			-The Protectiveness statements from The last review.	
			-Status of recommendations and follow-up actions from The last review.	
			-Results of implemented actions, including whether they achieved The intended effect.	
			-Status of any other prior issues.	
John Burchette, EPA RPM	17		Please include a "Five Year Review Process" Section. The checklist on page E-25 and E-26 of the guidance may be helpful.	A "Five Year Review Process" Section will be incorporated.
John Burchette, EPA RPM	18		EPA Suggest Naphthalene should be monitored until an agreed upon number of consecutive rounds are below the MCL.	Naphthalene will be carried forward in the LTM program for TAP.
John Burchette, EPA RPM	19	Page 1-1	Please update the discussion of the 7003 RCRA Order.	The 7003 RCRA Order discussion will be updated.
John Burchette, EPA RPM	20	Section 2.4.7 Fire Training Area.	For the removal actions at the end of this section, it is unclear whether the removal actions were performed under CERCLA and whether confirmation samples were taken, etc.	Removal action text will be revised to address these points.
John Burchette, EPA RPM	21	Section 4.5.5.	The Ball Fields need to be taken into special consideration since this is a high traffic area.	Please note that the Ball Fields are an area of concern (AOC) of Non-Time Critical Removal Action (NTCRA) 5-Year Review and are addressed in that document. The Ball Fields are only mentioned in the Tipton 5-Year Review because of the condition of the fencing that is located west of the Little Patuxent River.
John Burchette, EPA RPM	22		Prior to the ESD, EPA suggests a current round of groundwater sampling be completed as the data sets are incomplete (the limiting of samples in 2007 and the turbidity/metals issue in 2005).	The Army will provide results from the 2009 LTM sampling event which was conducted after the TAP Draft Final 5YR Report was submitted.
John Burchette, EPA RPM	23	Section 5.4	Generally it would be best to look at the median background level in this instance.	The median will be calculated and used for discussion purposes in the text.
John Burchette, EPA RPM	24		EPA agrees that it is acceptable to drop bis(2-ethylhexyl)phthalate from the LTM program. When looking at table 5-1, it appears that naphthalene was only sampled in 2001. At that time, it was nearly 2 orders of magnitude above the screening level. Therefore, EPA suggests naphthalene should be monitored until a trend is established.	Bis(2-ethylhexyl)phthalate will be dropped from the LTM program. Naphthalene will continue to be monitored.

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

<b>Commenter / ORG</b>	<b>Comment Number</b>	<b>Comment Origin</b>	<b>Regulator Comment</b>	<b>Army Response</b>
Elizabeth Lukens & Brian Nishitani, EPA Region III Office of Regional Counsel (ORC)	1	Executive Summary, p. v, 1st Paragraph, 1st sentence	A "recurring review" is not a CERCLA 5-Year Review. It relates more to UXO follow-up (under the MMRP Decision Document) than to the CERCLA ROD (June 1999) decision of NFA w/ monitoring. Second sentence: What were the "technical impracticability determinations" referenced? With respect to UXO?	The report will be re-formatted to meet CERCLA 5-Year Review Guidance. Any technical issues regarding UXO at Tipton will be addressed in the new Section 7: Technical Assessment.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	2	Executive Summary, p. v, 2nd Paragraph, 4th sentence	The ROD selected monitoring for groundwater, which is not considered a response action.	The text will be modified to state that the ROD selected remedy was NFA (with groundwater monitoring). The groundwater monitoring will be described as a passive remedy; this will be consistent with recent EPA comments received for the Clean Fill Dump 5-Year Review Report and the Ordnance Demolition Area (ODA) Revised Draft Proposed Plan.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	3	Executive Summary, p. v, 2nd Paragraph, 8th sentence	Were ICs restricting/prohibiting use of groundwater part of the UXO Decision Document?	Section 5 of the 9 July 1998 Decision Document Addendum prohibits the use of groundwater at Tipton for any potable or non-potable purposes except for conducting environmental studies. A restriction to prohibit residential use without evaluation of exposure risk was added.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	4	Executive Summary, p. v, 4th Paragraph, 2nd sentence	The ROD only says "NFA."	The OU 01 (12/30/98) and OU 02 (07/20/99) RODs do state that NFA is the selected remedy. The text will be revised to reflect this.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	5	Executive Summary, p. vi, 1st full sentence	LUCs were part of the UXO DD; groundwater monitoring is not considered an active remedy.	The text will be changed to state "passive remedy".
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	6	Executive Summary, p. vi, 1st full Paragraph, 1st & 2nd sentences	Perhaps what is meant is that the current protection is comparable to the level of protection present when the RODs were <i>implemented</i> .	Text will be changed to state "RODS were implemented" rather than "RODS selected the current responses."
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	7	Executive Summary, p. vi, 1st full Paragraph, numbered items 1-4	These four incidents underscore the need for the CERCLA ESD to strengthen the LUCs.	Comment noted.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	8	Executive Summary, p. vi, 2nd Paragraph	In addition to the recommended actions to strengthen the LUCs, perhaps renewed education regarding the risks and suspected locations of UXO for Tipton workers/contractors would be appropriate.	The ESD will strengthen existing UXO LUCs and provide that workers receive educational material regarding recognition and appropriate response action where suspected MEC is encountered.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	9	Executive Summary, p. vi, Paragraph 3, 5th sentence	Monitored Natural Attenuation (MNA) is not a selected remedy at the site. The effects of natural attenuation cannot be claimed as a remedy unless MNA is selected and monitoring is performed for the appropriate parameters to demonstrate NA.	This sentence will be revised to state "Overall, the NFA with biennial LTM remedy selected in the EPA-approved June 1999 TAP GW OU ROD remain protective of human health and the environment particularly considering the site location and land use controls prohibiting groundwater use. NOTE: The Army intends to initiate annual sampling in FY2011 of the TAP GW OU and include breakdown daughter products in subsequent annual sampling rounds.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	10	1.0 Introduction, p. 1-1, 1st Paragraph, 6th line, item 2)	This description of the remedy selected in the RODs is not accurate. All that the RODs selected was NFA (with monitoring); the ICs are only part of the UXO DD.)	The text will be modified to state the following: 1) the ROD's selected remedy was NFA (with groundwater monitoring); 2) the groundwater monitoring is considered a passive remedy; and 3) the <i>Decision Document Addendum, Safety Precautions to be taken at Tipton Airfield, Fort George G. Meade, Maryland</i> dated 06 November 1998 is the driver for implementing LUCs at the site. Also, see Lukens response to comment 3.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	11	1.0 Introduction, p. 1-1, 3rd Paragraph	Delete paragraph (as a result of FFA).	The paragraph will be replaced with the following: "For federal facility sites under the jurisdiction, custody, or control of the Department of Defense (DoD), Executive Order 12580 relieves EPA of this responsibility and delegates the responsibility to the DoD. The U.S. Army is the lead agency responsible for the five-year reviews at FGGM, working with EPA and the Maryland Department of the Environment (MDE) through the Federal Facility Agreement (FFA)."

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

<b>Commenter / ORG</b>	<b>Comment Number</b>	<b>Comment Origin</b>	<b>Regulator Comment</b>	<b>Army Response</b>
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	12	1.0 Introduction, p. 1-2, 1st Paragraph	This paragraph is not an accurate portrayal of what the RODs require. ICs are not required by the RODs.	"and ICs" will be deleted from the sentence.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	13	2.0 Site Description, p. 2-3, 2nd Paragraph	The risk assessment should have evaluated the residential groundwater use exposure route.	Section 5 of the 9 July 19 98 Decision Document Addendum prohibit any potable or non-potable purposes for groundwater under the current and future anticipated land use except for conducting environmental studies . The DD provides a restriction to prohibit residential use without evaluation of exposure risk. Contaminant levels are not increasing and there is no new exposure pathway, or new potential contaminant of concern, or an unanticipated toxic byproduct of the remedy.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	14	2.0 Site Description, p. 2-3, 3rd Paragraph	Hypothetical residential groundwater use needs to be evaluated.	No residential exposure is identified under the current and future anticipated land use. The DD provides a restriction to prohibit residential use without evaluation of exposure risk. Residential use without evaluation of residential exposure risks is prohibited, as is groundwater use for any potable or non-potable purposes except for environmental studies.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	15	2.0 Site Description, p. 2-3, 4th Paragraph	The statement that, "[b]ecause residential risks were not evaluated some action was necessary to ensure that there is no future potential for residential exposure to contamination in groundwater," was the basis for taking action in the 1998 and 1999 RODs is not correct. The RODs did not require deed restrictions. There are no remedial action objectives in the RODs because the RODs selected NFA.	The text will also be modified to state that " chemicals were detected at concentrations that would be associated with unacceptable risks if the groundwater was used for potable purposes. These chemicals were mainly metals, which could be naturally occurring, and organic chemicals, which are not expected to be naturally occurring, but were detected sporadically. Because of these findings, every two years after the date fo the ROD, groundwater is sampled from some of the currently existing wells. Additionally, inspections are conducted annually to ensure compliance with land use restrictions."
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	16	2.0 Site Description, p. 2-3, 5th Paragraph	Was the statement, "[b]ased on the RI data, there is no defined plume at TAP," a risk management decision?	The findings of the Final RI/FS (USACE, August 1998) summarized that scattered detections of a variety of chemical constituents were detected in soils, sediments, surface water, and groundwater at IAL1, IAL2, and IAL 3. Their distribution and concentrations did not constitute an identifiable area of contamination or plume.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	17	2.0 Site Description, p. 2-4, 2nd full Paragraph	(Brian has a star next to this paragraph, but no further comment. I'm guessing that the point was that "all evaluated receptors" did not include residential use.)	Groundwater at the TAP is not used as a source of water under the current or future anticipated land use scenarios and therefore, exposures to chemicals in groundwater at the TAP is not a complete pathway, and as a result were not quantitatively evaluated in the RI/FS.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	18	2.0 Site Description, p. 2-4, 3rd full Paragraph	(This paragraph appears to describe the 1998 and 1999 RODs as though they addressed the same area of the site. However, the RODs indicate that they address different areas: 2, 4, & 12 (1998) and 10 & 11 (1999).) The ROD(s) did not select an active remedy for groundwater. The ICs are included in the Decision Document, which is not a CERCLA document. The remedy selected in the ROD(s) is NFA with groundwater monitoring, which is not an action.	References to the term "remedial action" will be removed from the paragraph. The paragraph will be revised to state, "The December 1998 ROD included an NFA remedy for the Tipton Army Airfield (TAA) Operable Unit (OU) that included soils at AREES 2,4, & 12, and an interim NFA remedy for groundwater. The June 1999 ROD included an NFA remedy for the Tipton Airfield Parcel (TAP) OU, that included soils at AREES 10 & 11 and a final NFA remedy with LTM for groundwater that determined the NFA remedy is protective of human health and the environment. It should be noted that the groundwater NFA remedy with LTM is contradictory. Additionally, the June 1999 ROD states that inspections will take place that ensure compliance with ICs that were implemented through unilateral Decision Documents. Therefore, for the purposes of this review, the response action is considered an active remedy.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	19	2.0 Site Description, p. 2-5, 1st full Paragraph	(I think Brian's objection to the first and second sentences in this paragraph is that the ICs are not part of the CERCLA remedy.)	The 1st sentence in this paragraph will be deleted. The 2nd sentence will begin the paragraph and will be revised to state, " the ROD states that every 2 years, groundwater will be sampled from certain wells."
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	20	2.0 Site Description, p. 2-8, 1st Paragraph	What is meant by the statement, "the disposition of the river was changed from being retained by the Army to not being retained"? What happened to the ownership of the river?	The responsibility of annual river monitoring was transferred from the active Ft. George G. Meade to Army BRAC.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	21	2.0 Site Description, p. 2-9, 1st full Paragraph	Is the riverbank in question on USFWS property, or is access to the riverbank gained via USFWS property? Perhaps educational outreach would be beneficial, in addition to signs.	The Little Patuxent River banks can be accessed from either USFWS property (PRR-NT and/or ballfields), and from MD Route 198 (state easement) propoerty. The USFWS provides educational outreach to PRR-NT and ballfield visitors. The Army will post additional signage at key locations informing potential trespassers of the potential presence of MEC and the appropriate response action if encountered.

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

<b>Commenter / ORG</b>	<b>Comment Number</b>	<b>Comment Origin</b>	<b>Regulator Comment</b>	<b>Army Response</b>
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	22	2.0 Site Description, p. 2-15, 1st full Paragraph	Were surface sweeps performed as required by the Decision Document?	Yes. Annual UXO sweeps have been performed annually along the Little Patuxent River. The last surface sweep at IAL 3 was conducted in 2006 by the Corps of Engineers. No MEC items were discovered. The next IAL 3 surface sweep is scheduled for 2011.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	23	3.0 Stakeholder Notification and Involvement, p. 3-1, Table 3-1	Update EPA RPM contact information.	The EPA RPM text will be updated with John Burchette's contact information
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	24	3.0 Stakeholder Notification and Involvement, p. 3-2, first line	Change reference to RCRA Section 7003 unilateral order to reference to Federal Facility Agreement.	Information from this section will be incorporated into the new Section 6: Five-Year Review Process, subsection Community Notification and Involvement. It will be stated that the Army will be working with EPA and MDE in accordance with the FFA,
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	25	4.0 Site Visit, p. 4-1, 3rd Paragraph	There should be on-going/recurring educational training for contractors (and outreach for the public) regarding the presence of UXO at the site.	See Lukens response to comment 8.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	26	4.0 Site Visit, p. 4-4, 3rd Paragraph	Are there any recommendations regarding the response to future recurrences of citizens attempting to collect UXO?	Additional signage at the riverbank will be provided. Additionally, the Army will coordinate with the USFWS to promote its' UXO educational program outreach literature to ballplayers and spectators.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	27	5.0 Groundwater Data Analysis, p. 5-1, 1st Paragraph	Selected remedy in CERCLA ROD(s) does not include ICs.	Comment noted. See Army response to Lukens' comments 3 and 10.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	28	5.0 Groundwater Data Analysis, p. 5-1, 2nd Paragraph	(Brian objects to the statement that "[t]he groundwater objectives for the TAP LTGM are: 1) ensure that the <i>NFA with monitoring remedy</i> continues to provide adequate protection of human health and the environment; . . .")	Concur. The text will be revised to state: "1) ensure that the NFA remedy continues to provide adequate protection of human health and the environment...". NOTE: The Army will prepare an ESD that will revise the NFA remedy to "Long-Term Monitoring with ICs".
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	29	5.0 Groundwater Data Analysis, p. 5-2, 4th Paragraph	Why were IAL2 wells not sampled?	Groundwater monitoring wells located at IAL2 were not sampled in 2007 because of funding issues.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	30	6.0 Final Site Analysis, p. 6-1, Section 6.1	The response actions referenced were selected under the UXO Decision Document. (These need to be selected in a CERCLA document in order to be part of a CERCLA remedy.)	The UXO response actions and ICs selected in the July 1998 Decision Document will be memorialized in an ESD.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	31	6.0 Final Site Analysis, p. 6-1, Section 6.2.1	Same comments as for these same paragraphs as excerpted in the Executive Summary on p. vi.	Text will be modified here in accordance with Lukens response to comments 1 through 9.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	32	6.0 Final Site Analysis, p. 6-5, 1st full Paragraph	Is there a plan to implement maintenance work to remove the young trees and repair ruts in the soil cover for IAL1?	A scope of work (SOW) has been prepared and FY11 funds have been programmed to perform this task.
Elizabeth Lukens & Brian Nishitani, EPA Region III ORC	33	6.0 Final Site Analysis, p. 6-6, Section 6.4.4	Monitored Natural Attenuation has not been selected as a remedy at TAP. Therefore, it is not appropriate to state that "[b]iennial groundwater sampling and <i>natural attenuation</i> are proving to be effective remedies at TAP."	The last sentence in this paragraph will be revised to state, "Biennial groundwater sampling has proven that the NFA remedy continues to remain protective of human health and the environment.
<b>U.S. Environmental Protection Agency (EPA) Region III Comments, Dated August 13, 2010</b>				
EPA Headquarters	--	--	EPA Headquarters has reviewed the document and has no comments.	Comment noted.
EPA RPM	1	Response to Comment 14	Groundwater and VI will be continually evaluated and discussed as we progress through the Long Term Groundwater Monitoring at Tipton.	Comment noted.

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)**  
**Army Responses to Regulator Comments**

**Initial Comments**

Commenter / ORG	Comment Number	Comment Origin	Regulator Comment	Army Response
EPA RPM	2	General	As a heads up, once Betsy's comments are addressed, I will be sending a letter with language similar to this:	Comment noted.
			The five-year review process involved reviewing the protectiveness of the Tipton Airfield Parcel. It is suggested that an Explanation of Significant Difference be completed formally documenting Land Use Controls as a remedial action at the site.	
			EPA does concur that the Tipton Airfield Parcel is protective in the short-term. However, EPA has made a determination that the long-term protectiveness of the Tipton Airfield Parcel must be deferred until the Land Use Controls are formally captured within a CERCLA decision document. A Land Use Control Remedial Design should be submitted following the Explanation of Significant Difference document discussing the specifics of the Land Use Controls (i.e. what actions are limited and the extent of their limitation). Furthermore, as part of this five-year review, EPA has evaluated the basewide Government Performance and Results Act (GPRA) measures for this site and has determined their status is as follows:	
			<b>Environmental Indicators</b> 1. Human Health: There is insufficient data to determine the human exposure status of Fort George G. Meade (primarily due to the off-base groundwater contamination. Extent of the plume is unknown at this time). 2. Groundwater Migration: Groundwater Migration Not Under Control	
			<b>Sitewide Ready for Anticipated Use</b> The Site is not Site-Wide Ready for Anticipated Use but is expected to be on 6/30/2022. The requirement for this five-year review at Ft. George G. Meade was triggered by _____. The next five-year review will be due five years from the date of this concurrence letter.	
EPA ORC	1	Response to Comments 2, 5, 10, 18	It is my understanding that groundwater monitoring, unless it is specifically designed to support "monitored natural attenuation", is not considered to be a remedy. Therefore, a remedy selection of No Further Action (NFA) that includes long term groundwater monitoring (LTGM) is not incorrectly named as NFA. LTGM is not a "passive remedy". It is not a remedy at all. It is just a way of collecting data to justify NFA. In their responses to my comments #d 2, 5, 10, & 18, they make the statement that the remedy description will be revised to call the LTM a "passive remedy." They should not do this. The ROD remedy is NFA with LTM, which is not contradictory. When they prepare the ESD to add LUCs to the CERCLA remedy, then it will no longer be "NFA."	The language of the report will be corrected to state that the selected remedy is NFA with LTM, as suggested. The remedy will not be described as active or passive in the report.
EPA ORC	2	Response to Comment 9	In their response to my comment #9, they state that the LTM program will be modified to include breakdown daughter products [of the organic compounds].	Noted
EPA ORC	3	Response to Comments 13 and 14	Their responses to my comments #d 13 & 14 raise the question of why a residential risk assessment was not done at this site. My first reaction to their statements that the prohibition on groundwater use means that there is currently no exposure is to say that LUCs cannot be used as a remedy to address risks from exposure to contaminants in groundwater. The expectation is that groundwater will be cleaned up to its beneficial use. However, their answers to 15 & 16 indicate that there was no plume of contamination discovered. Therefore, the presumption is that it would not be appropriate to attempt a groundwater cleanup. If this is true, this presumption needs to be articulated upfront. They should say:	Response will be incorporated, as suggested.
			(1) Although contaminants were detected in groundwater at concentrations that exceeded the MCLs (or whatever risk-screening values were used) for those contaminants, these detections were sporadic and did not constitute an identifiable area of contamination or plume; (2) therefore, it would not be appropriate/expedient to attempt an active groundwater cleanup remedy; (3) however, to protect hypothetical residential users from potential risks associated with consumption of groundwater containing contaminants at levels that would present an unacceptable risk, LUCs were implemented in accordance with the UXO DD; and (4) the Army has implemented a LTM program to track groundwater contaminants to determine whether levels are decreasing or whether an active groundwater remedy is indicated. Finally, (5) the Army will develop an ESD to add the LUCs implemented under the UXO DD to the CERCLA ROD.	
EPA ORC	4	Response to Comment 22	Their response to my comment #22 should be incorporated into the text of the document so the reader isn't left wondering whether the requisite sweeps were, in fact, conducted.	Response will be incorporated, as suggested.
EPA ORC	5	Response to Comment 28	Their response to my comment #28 includes the statement that the ESD will revise the NFA remedy to "Long-Term Monitoring with ICs." It should really be the other way around, since ICs are the addition to the remedy, and LTM is not a remedial action (active or passive). ("ICs with LTM")	The text referring to the ESD will be modified to state ICs with LTM, as suggested. Discussion of "active" or "passive" remedy will be removed.

**Draft Final Integrated CERCLA 5-Year Review Report and RCRA CMI 5-Year Assessment Report for Tipton Airfield Parcel (April 2009)  
Army Responses to Regulator Comments**

**Initial Comments**

<b>Commenter / ORG</b>	<b>Comment Number</b>	<b>Comment Origin</b>	<b>Regulator Comment</b>	<b>Army Response</b>
EPA ORC	--	--	If you have any questions, please contact me at 215-814-3378.	Comment noted.
<b>U.S. Environmental Protection Agency (EPA) Region III Comments, Dated January 4, 2011</b>				
EPA ORC	1	Additional EPA Comments to Army Responses to Comments #s 2, 5, 10	Groundwater monitoring is not a "passive remedy" -- it's not a remedy of any sort. It's just monitoring to confirm that NFA is OK, right?	Comment noted. Discussion of "active" or "passive" remedy will be removed from the text.
EPA ORC	2	Additional EPA Response to Comment #11	What is "this responsibility"? Please explain/specify.	The revised text will read " From August 2007 to June 2010, environmental remediation was managed under a RCRA Section 7003 unilateral order. Effective October 6, 2009; BRAC sites are now governed by the Federal Facility Agreement.
EPA ORC	3	Additional EPA Comments to Army Responses to #s 13-16:	Be careful how you reference DD providing prohibition on groundwater use. It is not acceptable to use an LUC as the sole remedy for groundwater contamination. I believe that the situation here is that there is no defined plume of contamination, right? That needs to be made clear every time there's a reference to the prohibition on groundwater use (within reason, of course -- not clogging up the document).	The text will note that "Groundwater use at TAP is prohibited; however, distribution and concentrations of contaminants detected at the TAP do not constitute an identifiable area of contamination or plume."
EPA ORC	4	Additional EPA Comment to Army Response to Comment # 18:	The groundwater NFA remedy with LTM is NOT contradictory. LTM is not a remedy. LUCs are not an active remedy; they're a passive remedy. Maybe the easiest thing to do would be to remove all references to "active remedy" and "passive remedy" and just acknowledge that LTM is not a remedy and LUCs are a remedy.	Comment noted. Discussion of "active" or "passive" remedy will be removed from the text.
EPA ORC	5	Additional EPA Comment to Army Response to Comment #22:	I trust the text will be edited to reflect the response provided?	Yes. The text will be revised to state "Annual UXO sweeps have been performed annually along the Little Patuxent River. The last surface sweep at IAL 3 was conducted in 2006 by the Corps of Engineers. No MEC items were discovered. The next IAL 3 surface sweep is scheduled for 2011."
EPA ORC	6	Additional EPA Comment to Army Response to Comment #26:	Is additional signage adequate to protect users at the ballfield? I'm skeptical about this.	The Army intends to complete excavation of metallic anomalies at the Ball Fields in FY12; provided funding is available. In the interim, the Army will request funding in February 2011 to conduct a spring UXO sweep prior to use of the fields. The Army will also review the need for additional soil cover.
EPA ORC	7	Additional EPA Comment to Army Response to Comment #28:	When the ESD is issued, the remedy should be entitled "LUCs with LTM" (rather than the other way around), since the LUCs are the operative component of the remedy.	Commented noted. The ESD has been submitted for regulatory approval. The recommended ROD remedy modification is "LUCs with LTM".