



Environmental Remediation Services

Draft Focused FS

FGGM – 83/OU-1 – Former Skeet Range



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Presentation Agenda



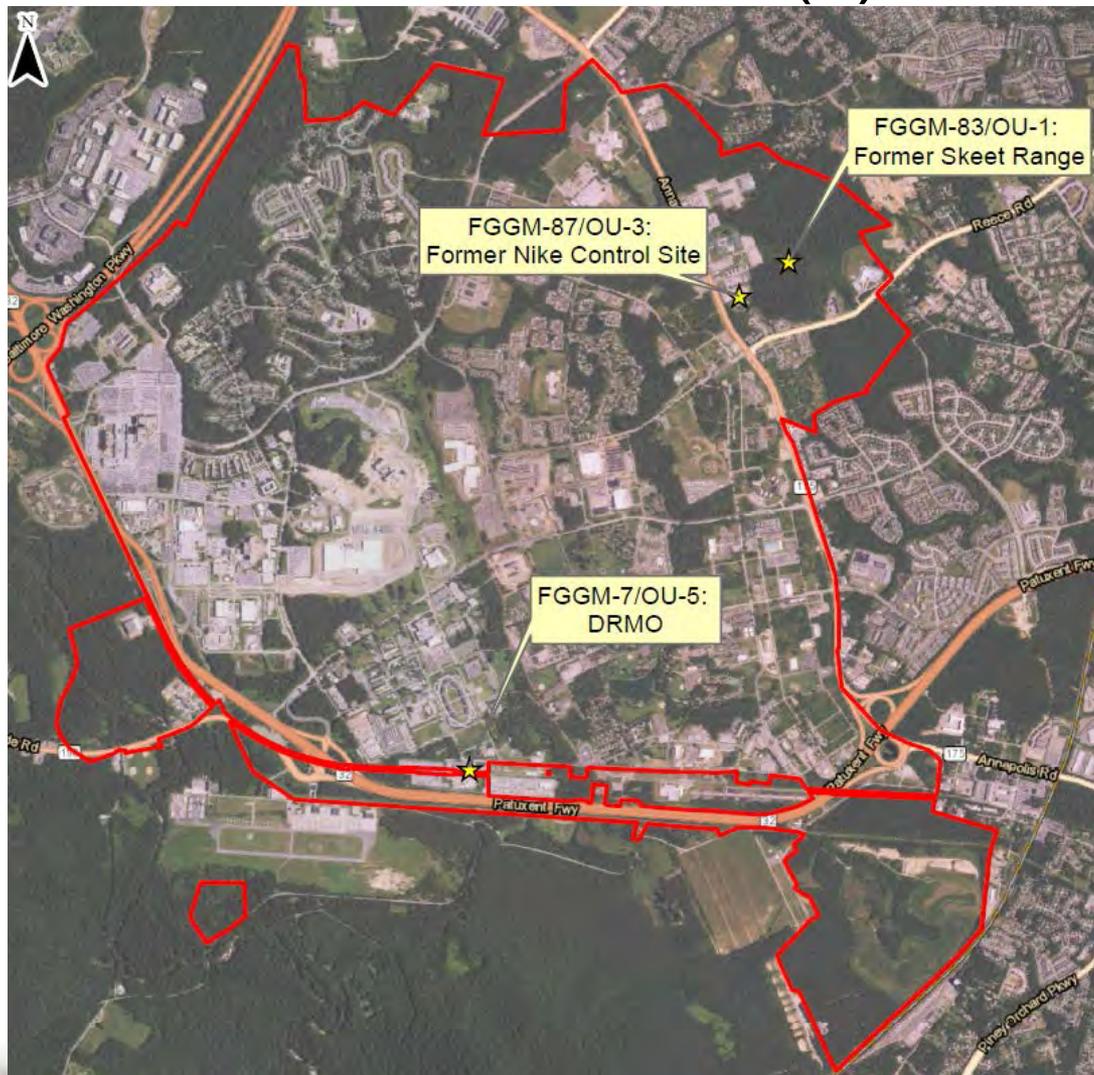
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- **OU-1/FGGM-83, Former Trap & Skeet Range**
 - **Focused Feasibility Study (FFS)**
- **OU-3/FGGM-87, Former Nike Site**
 - Baseline Groundwater Sampling
 - Data Gap Investigation Work Plan
- **OU-5/FGGM-7, Former DRMO**
 - Baseline Groundwater Sampling
 - Data Gap Investigation Work Plan



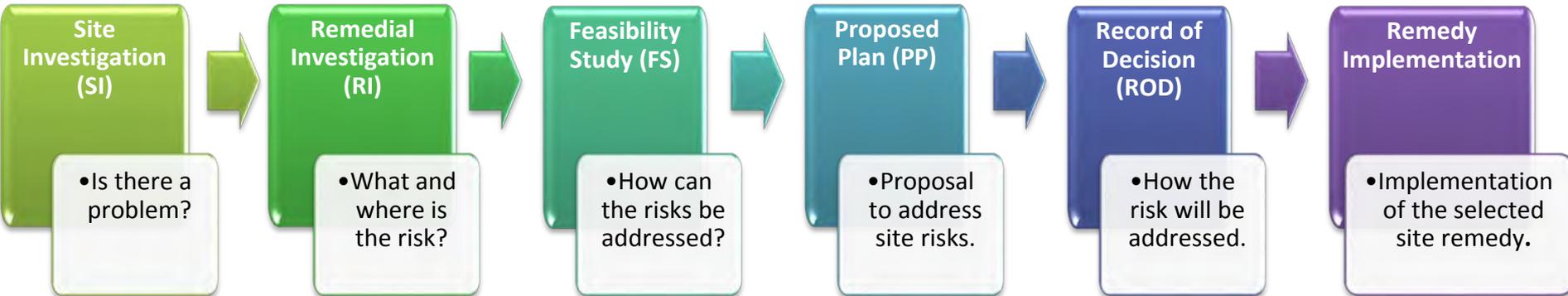


Site Location(s)





CERCLA Process



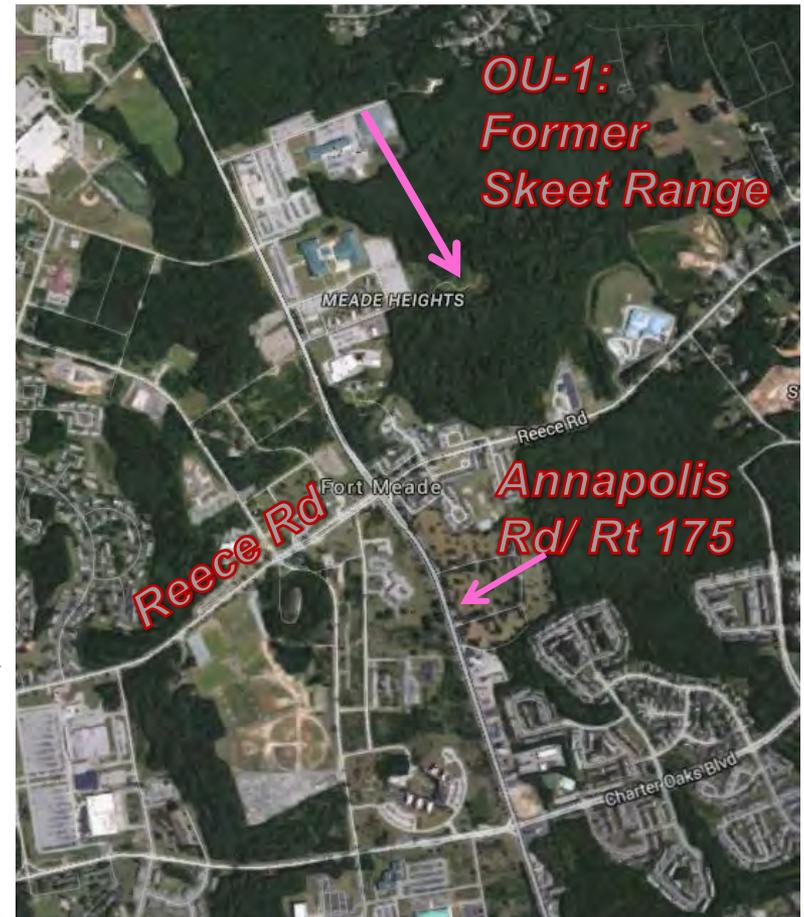


FGGM-83/OU-1, Former Trap & Skeet Range



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- Former trap and skeet range used from 1975 to 1994
- RI field work was conducted in 2010, and the RI Report was finalized in 2013
- The RI evaluated all media on site, polycyclic aromatic hydrocarbons (PAHs) (in soil and sediment) and total lead (in soil) were detected at concentrations exceeding regulatory criteria. Groundwater had no COPCs.



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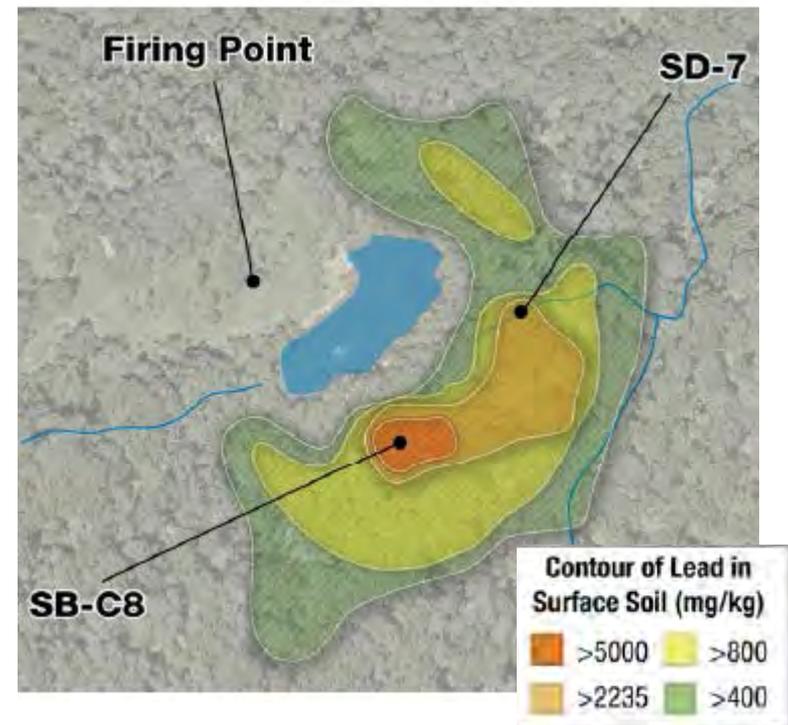


Remedial Investigation



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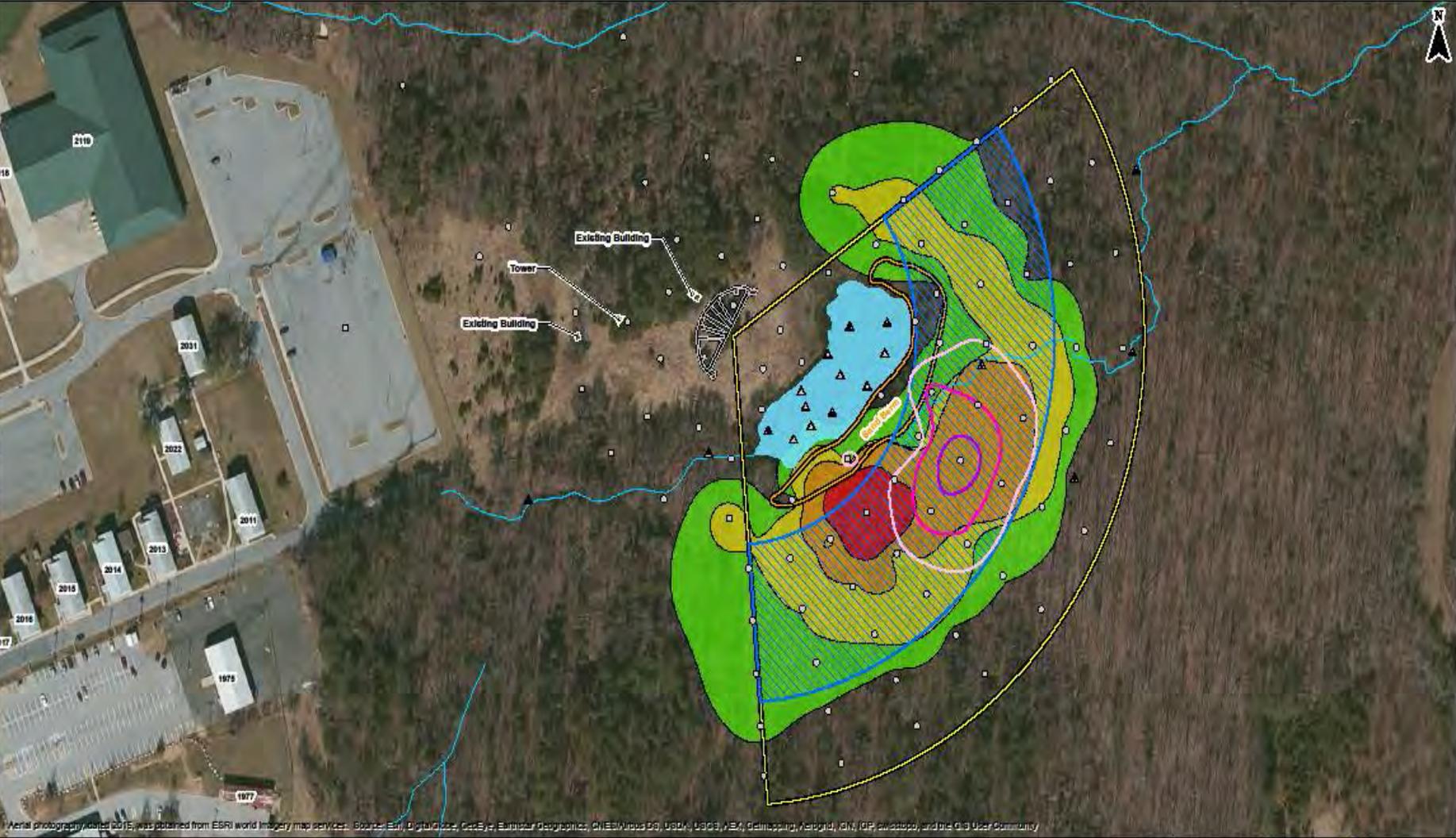
- No unacceptable risk to human health exists due to lead in soil based on the reasonably anticipated future land use of military/industrial.
- No unacceptable risk to human health for current or future receptors exists due to PAHs in soil or sediment.
- The screening-level ecological risk assessment concluded there is potential for adverse ecological effects from lead and lead shot, and an evaluation of the need for additional study and/or alternatives is warranted.



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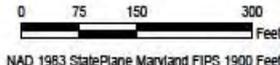
Created by JCP Date: 8/23/2016 File Path: G:\P_Meade\GIS Documents\Project Meade\SRMA_UFGGM_83\FGGM_83_VL_Meade_Fig1-4_FGGM83_Lead_Areas_OU1_FS.mxd

Project Number: 800518



Aerial photography, dated 2015, was obtained from ESRI world Imagery map services. Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, Swisstopo, and the GIS User Community

◇ Soil Sample Location (2004)	Sand Berm	Lead Shot Count in Surface Soil/Sediment (Shots/Sq. Ft.)
▲ Sediment Sample Location (2010)	Anticipated Maximum Shotfall Zone	1,000-2,000
▲ Surface Water/Sediment Sample Location (2004)	Lead in Surface Soil/Sediment (mg/kg)	2,000-3,000
Water Feature	400-800	> 3,000
Former Firing Line	800-2,000	
Former Firing Fan	2,000-5,000	
Water Body	> 5,000	



**OU-1/FGGM-83
FORMER TRAP & SKEET RANGE
LEAD IN SURFACE SOIL/SEDIMENT
FEASIBILITY STUDY
FORT MEADE, MARYLAND**



CBI Federal Services LLC
4695 Millennium Drive, Suite 520
Belcamp, Maryland 21017

FIG NO.
1-4



Feasibility Study



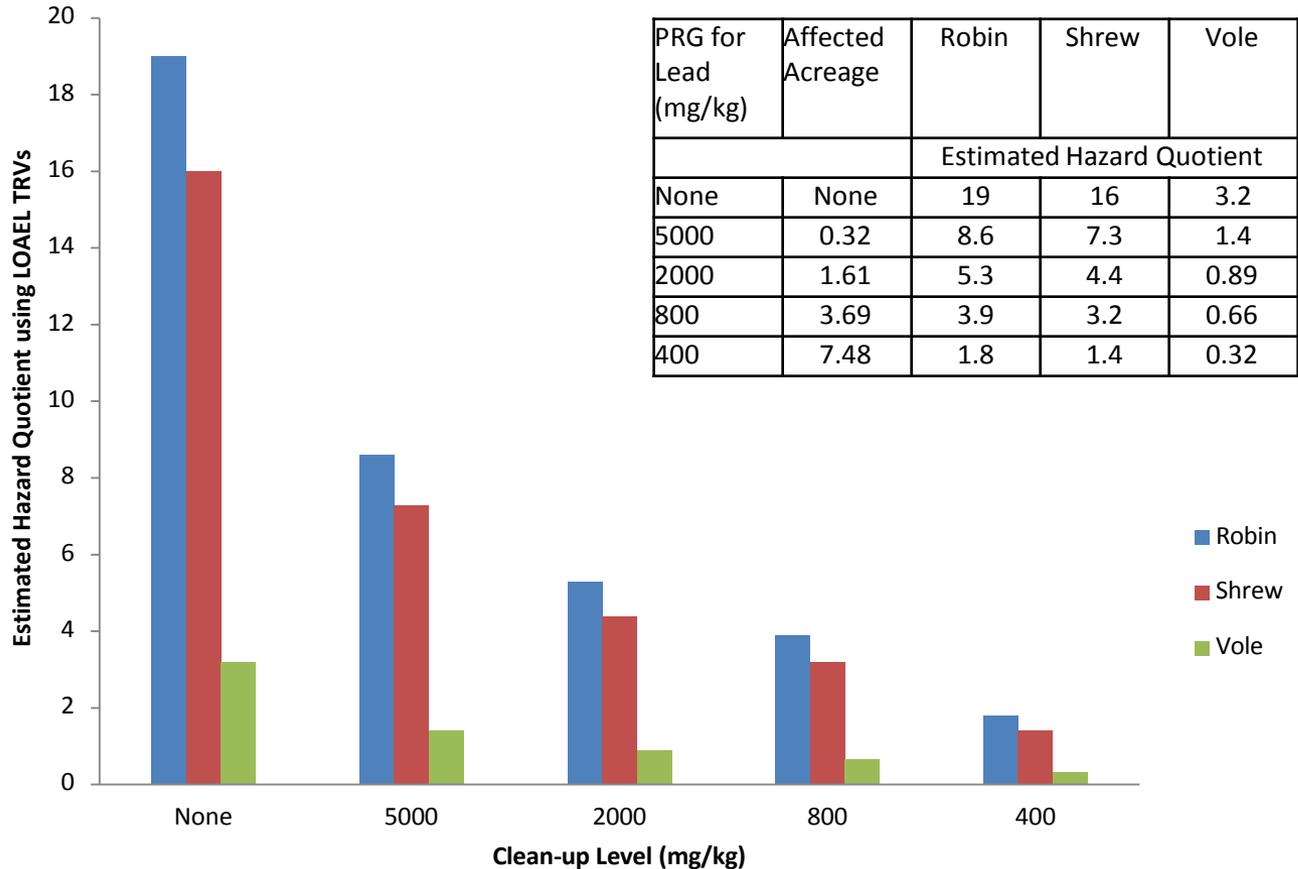
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- Draft Focused FS
 - submitted August 26, 2016
 - currently under stakeholder review
- Development of Ecological PRGs
 - Tradeoff exists between protecting existing habitat from remediation impacts (i.e., habitat destruction) vs. addressing elevated lead concentrations in soil
 - Four lead PRGs were evaluated: 5,000 mg/kg, 2,000 mg/kg, 800 mg/kg, and 400 mg/kg.
 - These four PRGs (plus current conditions) used to calculate average residual lead concentration in soil and lead hazards for ecological receptors (i.e., short-tailed shrew, American robin, and meadow vole).



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Figure 2-1 Tradeoff Between Cleanup Level and Acreage: Cleanup Level versus Hazard Quotient Using 95% UCLs



Hazard quotients were estimated using the recommended 95% upper confidence limit (UCL) on the mean from USEPA's ProUCL software (v5.0). Toxicity reference values (TRVs) based on lowest observed adverse effect level (LOAEL), for common wildlife, to estimate population level effects. TRVs from EPA EcoSSL Lead Document.

Estimated residual statistics assume "removed" samples are replaced with Site-specific average background concentration of 32 mg/kg.



Selection of Eco-PRGs



- PRG of 2,000 mg/kg considered to provide overall reduction in HQs to ecological receptors. As HQs are reduced, the predicted likelihood and/or severity of wildlife impacts are also reduced.
- A removal of soil impacted by concentrations of lead greater than 2,000 mg/kg will reduce HQs for the American robin, short-tailed shrew, and meadow vole by approximately 72 percent.
- Habitat destruction related to implementation of PRG of 2000 mg/kg would be limited to 1.6 acres, that is less than the 3.7 and 7.5 acres associated with PRGs of 800 and 400 mg/kg (Figure 2-1).



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Remedial Action Objectives



- Eliminate/minimize human exposure for potential residential receptor at unacceptable levels by direct contact or ingestion associated with lead in soil
- Eliminate/minimize potential for exposure to wildlife receptors from direct contact or ingestion associated with mean lead concentrations in surface soil and sediment in the intermittent stream east of the pond above 400 ppm with 95% confidence
 - Note: PRG of 2000 mg/kg results in estimated residual concentration of 476 mg/kg (95% UCL on mean)



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Remedial Action Objectives, cont.



- Eliminate/minimize potential for exposure to wildlife receptors to lead shot in surface soil and sediment in the creek east of the pond above a PRG for lead shot of 1,000 counts/sq ft
- Minimize impacts to the environment and limit habitat destruction during execution of the selected action



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Alternatives to address RAOs



- **Alternative 1** – No Action (required by CERCLA)
- **Alternative 2** – Protective Cover and Institutional Controls (ICs)
 - Placement of 1 foot protective cover over areas of the site with lead-contaminated soil
 - Placement of cover would prevent direct exposure of ecological receptors to site hazards
 - ICs would consist of land use restrictions since lead and lead shot would remain on site
- **Alternative 3** – Soil Removal, Off-Site Disposal, and ICs
 - Soil treated to non-hazardous land disposal standards
 - Soil disposed of in an off-installation RCRA Subtitle D landfill
 - ICs also needed as lead and lead shot will remain on site



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Remedial Alternative Evaluation



- **Alternative 1 - No Action**
 - Not protective,
 - Does not meet applicable regulations,
 - No long-term effectiveness or permanence,
 - No reduction in toxicity or mobility,
 - Readily implemented, and
 - No cost.



Remedial Alternative Evaluation



- **Alternative 2 – Protective Cover and ICs**
 - Protective of human health by placement of a 1-foot thick protective soil cover and institutional controls to prevent contact with COCs,
 - Protective of ecological receptors by meeting the Eco-RAO of 2,000 mg/kg for lead, and
 - Level of tree and scrub/shrub vegetation removal is minimized to approximately 1.4 acres.





Remedial Alternative Evaluation



- **Alternative 3 - Soil Removal, Off-Site Disposal, and ICs**

- Protective of human health by removing lead in soil that poses unacceptable risk to potential human receptors,
- Protective of ecological receptors by meeting the Eco-RAO of 1000 mg/kg for lead,
- Level of tree and scrub/shrub vegetation removal is minimized to approximately 1.4 acres. Revegetation efforts will commence at the conclusion of the excavation in accordance with the FGGM Tree Policy, and
- Hazards from COCs adequately mitigated with ICs.



Recommended Alternative



- Alternative 3 (Soil Removal, Off-Site Disposal, and ICs)
 - provides greater protectiveness, effectiveness, and permanence, by reducing volume and mobility of site contamination at lower overall cost
 - The NCP statutory preference for reduction of toxicity, mobility, or volume is best achieved with Alternative 3
- To be presented in Proposed Plan



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Proposed Path Forward



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- Proposed Path Forward:
 - Finalize FFS
 - Prepare PP and ROD to present Preferred Alternative to stakeholders and to document selected remedy
 - Implement remedy
- Schedule:
 - FFS
 - Draft comments due October 25, 2016
 - Final FFS – January 2017
 - PP/ROD – Spring 2017
 - Achieve RC – October 2018



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Presentation Agenda



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 - **Baseline Groundwater Sampling**
 - **Data Gap Investigation Work Plan**
- OU-5/FGGM-7, Former DRMO
 - Baseline Groundwater Sampling
 - Data Gap Investigation Work Plan

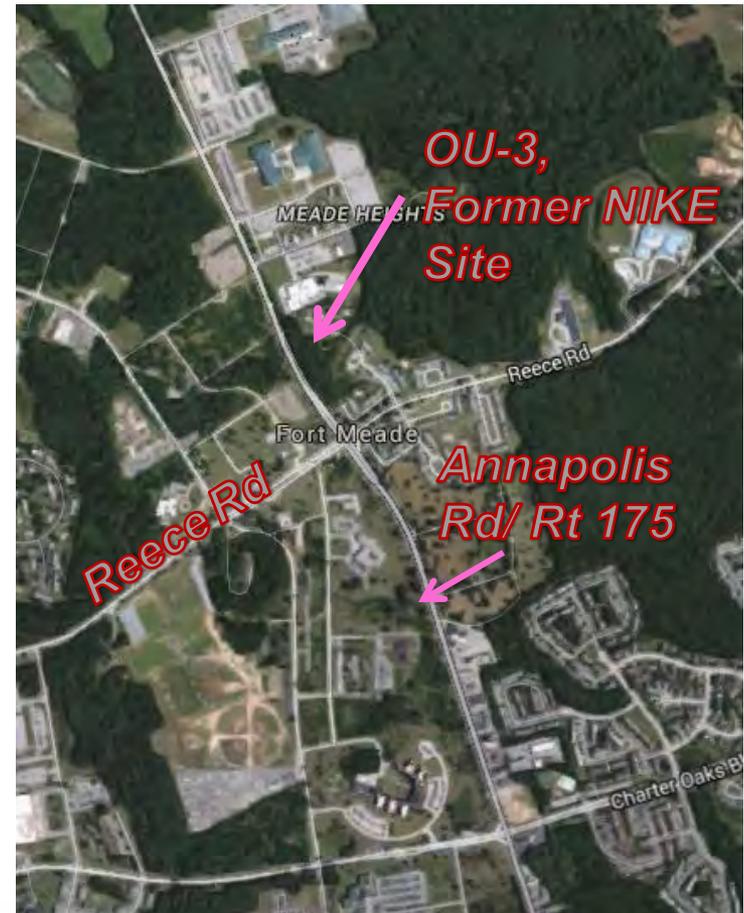


Background



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- Ft. Meade's Nike missile program utilized the buildings at OU-3 from 1955 to 1972
- The most recent field work was conducted in 2010, RI will be finalized
- Soil, groundwater, surface water, and sediment have all been evaluated at FGGM-87, and risk assessments have been performed



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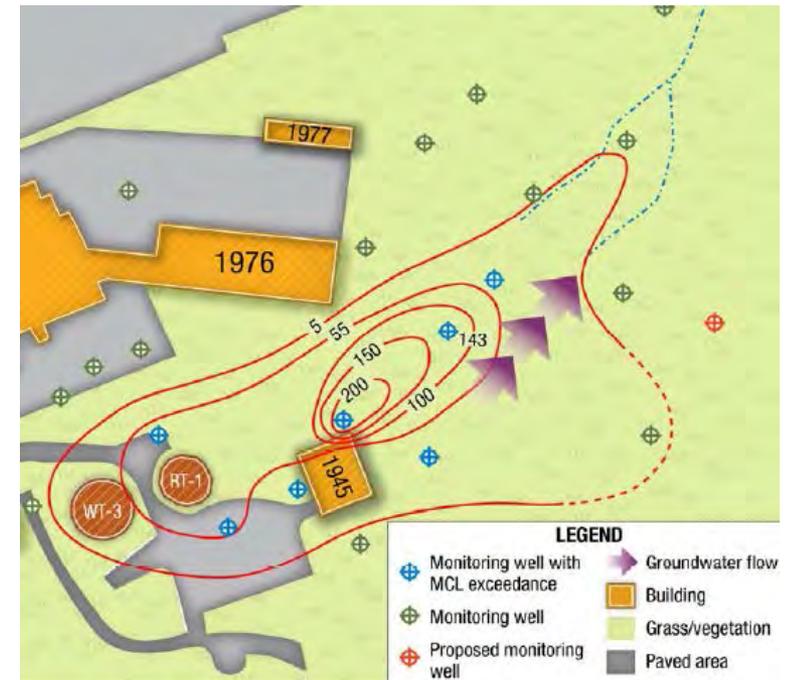


RI Findings



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- Groundwater COCs include arsenic, cobalt, TCE, and bis (2-Ethylhexyl) phthalate (BEHP).
- In 2009, the shallow TCE plume was mapped as approximately being 200 feet wide, 750 feet long, and 10 ft. thick (saturated zone from 15-25' bgs) with a maximum TCE concentration of 244 $\mu\text{g/L}$.



TCE Plume as mapped in 2009



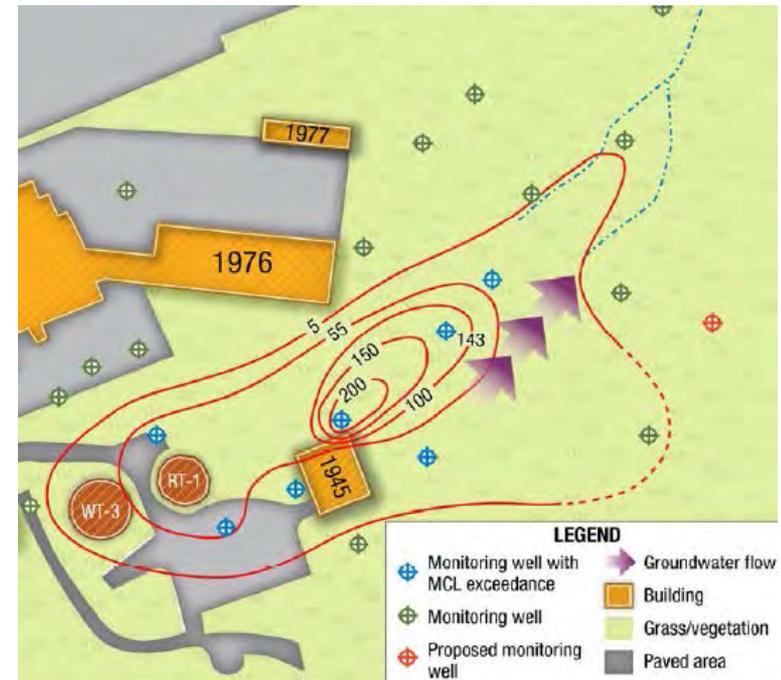
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Data Gaps Identified



- Delineate the current extent of the trichloroethene (TCE) plume and identify trends in concentrations,
- Conduct supplemental sampling for bis(2-Ethylhexyl)phthalate (BEHP) to identify if a release has occurred,
- Determine the need for additional investigation to assess the potential for risk due to vapor intrusion (VI) in buildings at OU-3;
- Confirm the continuity of the clay layer underlying the plume center; and
- Investigate the potential for OU-3 groundwater to impact groundwater at the Nevada Avenue study area.



TCE Plume as mapped in 2009



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Path Forward



- Combined Work Plan for Baseline GW Sampling
 - Finalize Sept 2016
 - Collect baseline round of groundwater samples (Sept/Oct 2016)
- Data Gap Investigation Work Plan
 - Finalize November 2016
 - Fill Data Gaps (early 2017)
- Finalize RI and prepare Feasibility Study to evaluate Remedial Alternatives (Fall 2017)
- Remedial Action Objective:
 - Reduce TCE mass
- Prepare PP and ROD to present Preferred Alternative to stakeholders and to document selected remedy
- Implement remedy



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Presentation Agenda



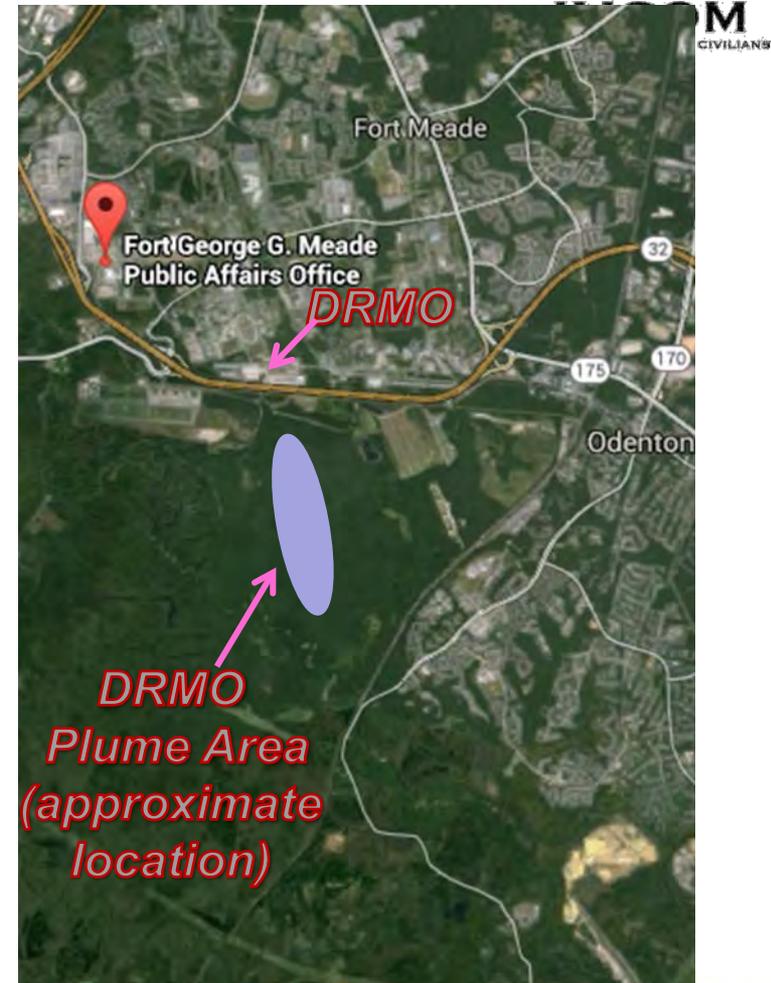
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 - **Data Gap Investigation Work Plan**



Background

- Source of contamination was buried drums at the Defense Reutilization and Marketing Office (DRMO) Site.
- Drums were discovered and removed from the site along with impacted soil in 1995.
- The resulting contamination is a long dispersed PCE groundwater plume that extends onto the Department of the Interior property.
- The PCE plume is within the Lower Patapsco Aquifer, which extends to a depth of approximately 225 feet.



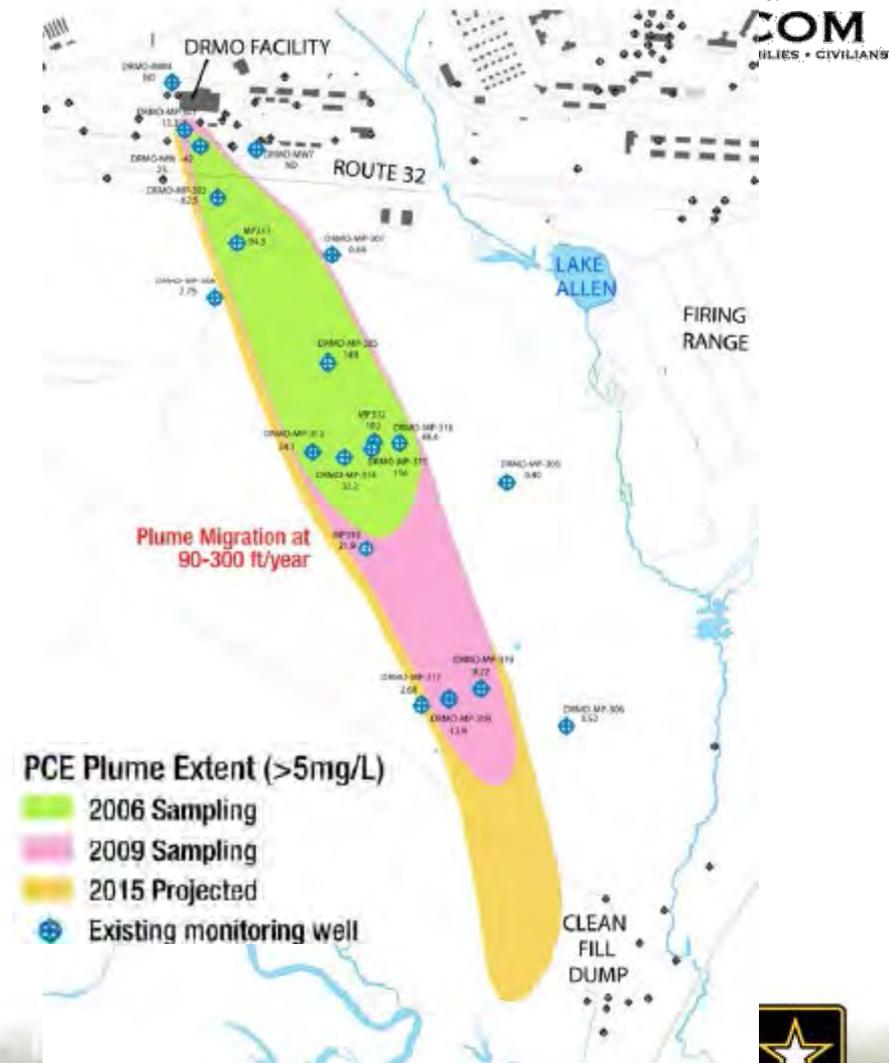
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RI Findings



- PCE concentrations in groundwater were as high as 156 $\mu\text{g/L}$ in 2009 (exceeding the MCL of 5 $\mu\text{g/L}$).
- Data Gaps include the following:
 - FGGM-7 has a hydraulic gradient of 90-300ft/year and comprehensive groundwater sampling has not been conducted since 2009
 - Current PCE concentrations
 - Current plume delineation- plume configuration changed drastically between the last two sampling events (2003 and 2009) with significant downgradient movement of the plume as well as the PCE center of mass
 - Sampling for additional parameters needed





Path Forward



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- Combined Work Plan for Baseline GW Sampling
 - Finalize Sept 2016
 - Collect baseline round of groundwater samples (Sept/Oct 2016)
- OU-5 Data Gap Investigation Work Plan
 - Finalize December 2016
 - Fill Data Gaps (early 2017)
- Finalize RI and prepare Feasibility Study to evaluate Remedial Alternatives (Fall 2017)
- Remedial Action Objectives:
 - Prevent down gradient migration of PCE
 - Remove PCE mass
- Prepare PP and ROD to present Preferred Alternative to stakeholders and to document selected remedy
- Implement remedy at OU-5/FGGM-7, DRMO & Plume



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Acronyms



- BEHP: Bis(2-ethylhexyl)phthalate
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act
- COC: Chemical of concern
- COPC: Chemical of potential concern
- DRMO: Defense Reutilization and Marketing Office
- FFS: Focused Feasibility Study
- FGGM: Fort George G. Meade
- FS: Feasibility Study
- HQ: Hazard quotient
- IC: Institutional control
- MCL: Maximum Contaminant Level
- $\mu\text{g/L}$: microgram per liter
- mg/kg : milligram per kilogram
- NCP: National Contingency Plan
- OU: Operable Unit
- PAH: Polycyclic aromatic hydrocarbon
- PCE: Tetrachloroethylene
- PP: Proposed Plan



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Acronyms Cont.



- PRG: Preliminary Remediation Goal
- RAO: Remedial Action Objective
- RC: Response complete
- RCRA: Resource Conservation and Recovery Act
- RI: Remedial Investigation
- ROD: Record of Decision
- sq ft: square feet
- TCE: Trichloroethylene
- UCL: Upper confidence limit (on the mean)



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Points of Contact



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