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US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, U.S. ARMY GARRISON FORT MEADE
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FORT GEORGE G. MEADE, MARYLAND 20755-5000

May 9, 2023

Environmental Division

Mr. Robert Stroud
NPL/BRAC/Federal Facilities Branch
U.S. Environmental Protection Agency
701 Mapes Road
Fort Meade, Maryland 20755

Dear Mr. Stroud:

Enclosed please find the *Final Proposed Remedial Action Plan, Former Trap and Skeet Range, Operable Unit 1 (OU-1, FGGM-83),* (Report) at Fort George G. Meade. This Report incorporates comments received from the Maryland Department of the Environment (MDE) dated October 4, 2022 and March 28, 2023, and U.S Environmental Protection Agency (USEPA) dated October 28, 2022.

Copies of the Report have been furnished to Elisabeth Green (Maryland Department of the Environment), Fran Coulters (U.S. Army Environmental Command), Shelly Morris (U.S. Army Corps of Engineers), Jeff Leach (U.S. Army Public Health Center), Craig Mah (Fort George G. Meade Staff Judge Advocate), and the Fort George G. Meade Restoration Advisory Board. Comments may be submitted during the 30-day public comment period (May 18 to June 17, 2023). Public comments must be postmarked by June 17, 2023, and sent to Mr. Shaun Herron, U.S. Army Garrison Public Affairs Office, 4409 Llewellyn Avenue, Fort Meade, MD, 20755, or, Fort George G. Meade, Attention: AMIM-MEPE (Erin Geiger), 4216 Roberts Ave., Suite 5115, Fort Meade, Maryland 20755.

If you have any questions please contact me at erin.l.geiger2.civ@army.mil.

Sincerely,

Erin Geiger
Program Manager, Installation Restoration Program
Directorate of Public Works Environmental Division
Fort George G. Meade

Enclosure

FINAL PROPOSED REMEDIAL ACTION PLAN
FORMER TRAP AND SKEET RANGE (FGGM-83, OU1)
FORT GEORGE G. MEADE, MARYLAND
May 2023

INTRODUCTION AND PURPOSE

This ***Proposed Remedial Action Plan (PRAP)*** is intended to provide information necessary to facilitate public involvement in the remedy selection process at the Former Trap and Skeet Range (FGGM-83, OU1) at Fort George G. Meade (FGGM), Maryland. This PRAP presents a summary of the ***Remedial Investigation (RI)*** findings and the remedial alternatives evaluated in the ***Feasibility Study (FS)***. The RI, FS, and PRAP were prepared in accordance with the provisions of the ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)*** as amended and the ***National Oil and Hazardous Substances Pollution Contingency Plan (NCP)*** and were reviewed by the United States (U.S.) Environmental Protection Agency (USEPA) and the Maryland Department of the Environment (MDE). Figure and table references are bolded throughout this document. In addition, bolded and italicized terms are defined in the "Glossary of Terms" section.

The public is encouraged to comment on the preferred remedial alternative presented in this PRAP as well as the other remedial alternatives considered in the FS. Information about how to submit comments may be found in the "Community Participation" section of this PRAP. The U.S. Army (the ***lead agency***) will finalize and present the selected remedial alternative for the Former Trap and Skeet Range in a ***Record of Decision (ROD)***. The final selection, however, will not take place until after the public comment period for this PRAP has ended. All significant comments will be considered and responded to in the ***Responsiveness Summary*** section of the ROD. Pertinent information regarding the public meeting and comment period, and the remedial alternatives considered, are provided in the adjacent text boxes.

Based on investigation activities conducted including the quantitative ***Baseline Human Health Risk Assessment (BHHRA)*** and ***Screening Level Ecological Risk Assessment (SLERA)*** presented in the RI (KEMRON Environmental Services, Inc. [KEMRON] 2013), lead in soil and sediment was determined to be a contaminant of concern (COC) identified at the range, and therefore a potential unacceptable risk to human health posed from surface soil and sediment under future unrestricted land use scenarios. The SLERA evaluated potential risks to environmental receptors associated with the range. Lead and lead shot in soils posed unacceptable risk to ***receptors*** in soils east of the pond and in sediments from the creek east of the pond. The preferred remedial alternative to address these contaminants as presented in the FS (Aptim Federal Services, LLC [Aptim] 2019) is presented in this PRAP.

Relevant documents used in the preparation of this PRAP are listed in the "References" section found at the end of this document.

Important Dates and Locations

Public Comment Period: May 18, 2023 to June 17, 2023

The U.S. Army will accept written comments on the PRAP during the public comment period.

Public Meeting: May 18, 2023 at 7:00 p.m. via Teams

The U.S. Army will hold a public meeting to explain the PRAP. Verbal and written comments will also be accepted at the meeting. The meeting will be held virtually. Invitation to the virtual meeting can be requested by contacting Katrina Harris at kharris@bridgeconsultingcorp.com.

The Administrative Record containing information used in selecting the Preferred Alternative is available for public review at the following location:

Anne Arundel County Public Library
Odenton Regional Library
1325 Annapolis Road
Odenton, MD 21113

Additional information is maintained at the following location:

Fort Meade Environmental Division Office
4216 Roberts Avenue, Second Floor
Fort Meade, MD 20755

Remedial Alternatives

- **Alternative 1** – No Action
- **Alternative 2** – Protective Cover and Land Use Controls (LUCs)
- **Alternative 3** – Soil Removal, Resource Conservation and Recovery Act (RCRA) Subtitle D Disposal, and LUCs

SITE CHARACTERISTICS

FGGM is located approximately midway between Washington, D.C. and Baltimore, Maryland, in Anne Arundel County, Maryland, as illustrated on the regional map, **Figure 1**. The Former Trap and Skeet Range is located an approximated 1,400 feet (ft) east-northeast of the intersection of 20th Street and Annapolis Road (Maryland Route 175) (**Figure 2**).

The former range currently consists of a concrete block storage shed, a gravel access road, grass covered areas, a man-made retention pond, and a sand berm downrange of the former firing point. The range is currently an undeveloped parcel of land. The pond (approximately 1 acre in extent and approximately 10 ft in depth) continues to function as a stormwater retention pond. The berm and the areas beyond are wooded (**Figure 3**). The range, including the firing fan, is approximately 66 acres in extent (**Figure 4**).

The range is bounded to the north and south by undeveloped, wooded FGGM land; to the east by undeveloped, wooded FGGM land, beyond which are single family residences and an elementary school; and to the west by active FGGM facilities and housing. The elementary school is located approximately 800 ft east of the pond.

SITE BACKGROUND

The USEPA placed FGGM on the National Priorities List on July 22, 1998, after an evaluation of contamination due to past practices of storage and disposal of hazardous substances. A Federal Facility Agreement was signed by the U.S. Army, USEPA, Department of the Interior, and Architect of the Capitol in June 2009 defining the mechanisms and roles of each in the restoration of the installation.

FGGM operated the Former Trap and Skeet Range from the mid-1970s through 1994. There has been no activity, range or other military, that has occurred at the site since the range was closed. The range consisted of a firing line, skeet houses, and a manmade pond constructed in the 1970s (**Figure 3**). A 15 ft tall sand berm was constructed from excavated pond fill to limit the number of clay targets that entered the wooded area east and south of the pond (Versar, Inc. [Versar] 2002). The firing line was located approximately 150 ft northwest of the pond. A trap house was located between the firing line and the pond. The range was closed in 1994 and has not been used since that time. A small concrete-block storage shed remains on-site. Two former buildings (Buildings 2046 and 2047) were demolished in 2001 (**Figure 4**).

Trap and skeet activities involved the projection of clay targets downrange in the direction of the pond and berm. Clay targets were thrown into the air from skeet houses located on both ends of the firing line. The trajectories of the clay targets were diagonal over the clear area between the firing line and the pond (skeet) or toward and over the pond (trap). The vast majority of clay target fragments fell between the firing line and the pond, into the pond, or on the western face of the berm. There were several investigations conducted prior to the RI. Early investigations, including the Environmental Baseline Survey in 1998 and the Comprehensive Site Assessment conducted between 1999 and 2000, indicated the principal COCs at the Former Trap and Skeet Range included lead, resulting from lead shot, and ***polycyclic aromatic hydrocarbons (PAHs)*** resulting from clay targets/pigeons. Because lead shot contained traces of antimony and arsenic as hardening agents and shell casings contained brass (an alloy of copper and zinc), the target constituent list evaluated during the investigations was expanded to include these four metals. The investigations included:

- 1998 – Environmental Baseline Survey, by FGGM Environmental Management Office
- 1999 – Comprehensive Site Assessment by Versar
- 2000 – Corrective Action Plan by Versar (Versar 2000)
- 2005 – Draft Data Report by Versar (Versar 2005)

These investigations collected soil, sediment, surface water, and groundwater samples to characterize the nature and extent of contamination at the Former Trap and Skeet Range. These investigations included the following fieldwork components:

- Initial investigations prior to the 2005 Draft Data Report (Versar 2005) included 44 soil sample locations (plus 2 background and 3 off-site), 10 sediment sampling locations, 6 surface water locations, and 3 groundwater monitoring well locations (plus 1 background well). All samples were analyzed for lead and PAHs.
- The Draft Data Report (Versar 2005) documented the establishment of a sampling grid 360° around the firing point with a radius of 300 ft plus an additional 675 ft between 60° and 192° (60° plus on either side of principle firing direction). Soil samples were collected from 0 to 6 inches below the ground surface (bgs) across the site and from 6 to18 inches within 375 ft of the firing points and 6 to 12 inches beyond 375 ft. A total of 95 locations were sampled (**Figure 5**).
- Eleven sediment locations were sampled for lead shot, lead, and PAHs. Two samples were collected from the stream entering the pond, four at the base of the pond, and four from intermittent streams leaving the pond (**Figure 5**).
- Seven surface water locations were sampled, two in a feeder stream upgradient of the pond, four from the pond, and one in a stream downgradient of the pond (**Figure 5**).
- Seven groundwater monitoring wells were installed (**Figure 5**) and drilled to approximately 5 ft below the water table.

Versar conducted a field investigation of the Former Trap and Skeet Range in August 2004 (Versar 2005). The sample locations were assigned using a polar coordinate system to reflect the firing line as the likely origin of shot and clay targets. The firing line faced approximately 126° clock-wise of true north. The majority of clay targets and shot would have fallen within an arc between 66° and 186°. The sampling grid encompassed a 360° circle about the firing line with a radius of 300 ft and extended to a 675 ft radius between 60° and 192° (**Figure 5**).

The area of investigation by Versar (2005) was selected not only based on the direction in which shot and clay targets were launched, but also the distances these projectiles would have traveled. Lead shot is reported to travel up to 675 ft from the firing line with a region of maximum density between a 375 and a 600 ft radius (National Shooting Sports Foundation 1997). Similarly, the flight distance of clay targets is limited by the target launchers stored in the trap houses. According to the North American Skeet Shooting Association (NSSA) Rule Book (NSSA 2003), launchers are calibrated to cause clay targets to travel approximately 180 ft. Because wind and shot may cause clay targets to travel greater distances, it is possible that some targets could have traveled a distance of 375 ft. It is likely that the vast majority of lead shot and total lead are contained in the upper 10 centimeters (approximately 4 inches) of soil (Chen et al. 2000; Craig et al. 2002). Results from previous work on the range indicated that PAH concentrations extended below 1 ft in limited areas around the firing line. Therefore, historical sampling intervals included 0 to 6 inches across the site and a second interval of 6 to 18 inches within 375 ft and 6 to 12 inches beyond 375 ft. Within 375 ft, all of the surface and shallow subsurface samples were analyzed for PAHs. Outside of 375 ft, only a random population of surface soils were sampled for PAHs.

In order to fill in some data gaps regarding the nature and extent of site-related contamination and quantify the risks posed by contamination at the Former Trap and Skeet Range, an RI was initiated in July 2010 and included the following fieldwork components:

- Collection of eight additional sediment samples, from 0 to 0.5 ft below the sediment surface, analyzed for total antimony, arsenic, copper, lead, zinc, lead shot, PAHs, and acid volatile sulfides/simultaneously extracted metals.
- Collection of field measurements in the pond co-located with the sediment investigation.

A detailed summary of the field activities and results is provided in the RI (KEMRON 2013). RI sample locations are shown on **Figure 5**.

NATURE AND EXTENT OF CONTAMINATION

The following sections summarize the distribution of the analytical data for soil, sediment, and surface water samples collected between 1998 and 2010 (the RI data set). Soil sample locations are shown on **Figure 5**, and sediment and surface water samples are shown on **Figures 5 and 6**. No surface water or groundwater impacts were determined based upon the findings of the RI.

Soil

Soil samples were collected from soil borings at the Former Trap and Skeet Range (**Figure 5**). Soil samples were analyzed for lead, lead shot, antimony, arsenic, copper, zinc, and PAHs. For evaluation purposes, the following soil intervals were defined in the RI:

- Surface Soils – defined as soils from 0 to 0.5 ft below ground surface (bgs).
- Subsurface Soils – defined as soils deeper than 0.5 ft bgs.

Metals – Detectable concentrations of total lead (results that were higher than the analytical laboratory's detection limit) were observed in all soil samples. Detectable lead concentrations in surface soil samples ranged from 8.3 milligrams per kilogram (mg/kg) to 22,800 mg/kg. The highest lead concentration was detected from sample location SB-C8, located approximately 350 ft from the firing line and 150° from true north (14° off from the principle firing direction) (**Figure 5**). Elevated lead levels of concern spanned an approximate 120° arc extending approximately 630 ft southeast of the firing point. Lead concentrations in subsurface soil samples (0.5 to 1.5 ft bgs) ranged from 2.7 mg/kg to 625 mg/kg. Forty of the lead detections in surface soil and one in subsurface soil exceeded the USEPA ***Regional Screening Level (RSL)*** of 400 mg/kg for residential soil (**Figure 5**).

The amount of lead shot counted from the sample locations ranged from zero to 4,800 counts/square foot (ft^2) at location SB-D6, approximately 420 ft from the firing line and 128° clockwise of true north. This azimuth is close to the principle firing direction (126°) and within the anticipated maximum shot-fall zone between 300 and 525 ft from the firing line. The density of lead shot decreases outward from SB-D6 in a fan-like pattern (**Figures 5 and 7**).

Detectable concentrations of antimony in surface soil samples ranged from 0.78 mg/kg to 457 mg/kg. The highest antimony concentration was found approximately 350 ft downrange from the firing line. All subsurface soil samples were reported as being below the ***laboratory detection limit***.

Detectable concentrations of arsenic in surface soil samples ranged from 1 mg/kg to 50.5 mg/kg. The highest arsenic concentration was found approximately 350 ft downrange from the firing line. Detectable concentrations in subsurface soils ranged from 1.3 mg/kg to 21.6 mg/kg.

Detectable concentrations of copper in surface soil samples ranged from 5.1 mg/kg to 42.2 mg/kg. The highest concentration of copper was found near the

former firing line. Detectable concentrations in subsurface soil ranged from 4 mg/kg to 25.3 mg/kg.

Detectable concentrations of zinc in surface soil samples ranged from 6.3 mg/kg to 227 mg/kg. The highest concentration of zinc was found in a surface soil sample located near the former firing line. Detectable concentrations in subsurface soils ranged from 2.7 mg/kg to 48.1 mg/kg.

PAHs – Sixty-two surface soil samples and 49 subsurface soil samples were collected from the range and analyzed for PAHs. PAHs were detected in both surface and subsurface soils within 375 ft of the firing point. Outside of 375 ft, only trace concentrations of PAHs were found. PAH impacts to soil are generally confined to the area southeast of the firing point and northwest of the pond. ***Benzo(a)pyrene*** (an indicator PAH) was detected in 28 of 62 surface soil samples ranging from 19.6 micrograms per kilogram (µg/kg) to 42,600 µg/kg. Benzo(a)pyrene was detected in 14 of 49 subsurface soil samples ranging from 19.9 µg/kg to 21,100 µg/kg. The highest concentrations were detected in the samples collected from locations in front of the firing line.

Sediment

Sediment samples were collected from 18 locations (co-located with surface water sampling locations) at depths of 0 to 0.5 ft bgs to characterize site conditions and assess ecological risk for the Former Trap and Skeet Range. Sediment samples were analyzed for lead, lead shot, antimony, arsenic, copper, zinc, and PAHs (**Figure 7**).

Metals – Sediment sampling determined that lead concentrations ranged from 23.5 mg/kg to 2,550 mg/kg. The highest concentration observed from the pond was 159 mg/kg.

Lead shot in the pond was only observed in one pond sediment sample at 340 counts/ft^2. Two streambed sediment samples contained lead shot at 430 counts/ft^2 and 1,600 counts/ft^2 (**Figure 7**).

Antimony concentrations in sediment ranged from 0.98 mg/kg to 11.7 mg/kg. Detectable concentrations of arsenic in sediment samples ranged from 1.2 mg/kg to 15 mg/kg and copper concentrations in sediment samples ranged from 7.1 mg/kg to 20.1 mg/kg. Detectable concentrations of zinc in sediment samples ranged from 11.2 mg/kg to 129 mg/kg.

PAHs – Detectable concentrations of PAHs were observed in one pond sediment sample and one streambed sediment sample west of the pond. The remaining sediment samples in streams east and west of the pond were estimated concentrations detected at low levels. None of the detectable concentrations exceeded the USEPA RSL for residential soils.

A supplemental RI investigation (KEMRON 2013) included collection of an additional eight sediment samples from within the pond to fill data gaps in the RI data set and support an ecological risk assessment. The metals and PAH results were screened against the USEPA Region 3 ***Biological Technical Assistance Group Screening Benchmarks*** (USEPA 2006). Sediment sample results for metals indicated exceedance of benchmarks for antimony, copper, lead, and zinc in one or more samples. Antimony exceeded the benchmark (2 mg/kg) in three of eight sediment samples with detections ranging from 0.863 mg/kg to 5.94 mg/kg. Copper exceeded the benchmark (31.6 mg/kg) in four of eight samples with detections ranging from 5.09 mg/kg to 54.1 mg/kg. Lead exceeded the benchmark (35.8 mg/kg) in all eight sediment samples with detections ranging from 38.1 mg/kg to 524 mg/kg. Zinc exceeded the benchmark (121 mg/kg) in six of eight sediment samples with detections ranging from 20.6 mg/kg to 512 mg/kg. Seven of eight sediment samples exceeded individual benchmarks for PAHs.

Surface Water

A total of seven surface water samples (including one duplicate) were collected and submitted for analysis of PAHs and total and dissolved antimony, arsenic, copper, lead, and zinc. The original sampling plan included sample collection from 10 surface water locations, however locations SW-7, SW-9, and SW-10, located downstream of the pond, were dry at the time of sample collection and were not revisited (**Figure 6**). There were no detections of antimony or arsenic in any of the surface water samples. The surface water samples had detectable concentrations of total lead ranging from 3.2 micrograms per liter (µg/L) to 12.4 µg/L. Copper was detected in all samples at concentrations between 4.1 µg/L and 6.8 µg/L. Copper was also detected in the dissolved phase between 3.2 µg/L and 6.9 µg/L. Total lead was detected in the surface water samples at concentrations between 3.6 µg/L and 12.4 µg/L. Concentrations of dissolved lead were detected in samples and ranged from 3 µg/L to 4.5 µg/L. Concentrations of total zinc ranged from 7.7 µg/L to 31.3 µg/L and for dissolved zinc 6 µg/L to 89 µg/L. None of the surface water concentrations of copper, lead, or zinc exceeded any human health-based surface water criteria.

SUMMARY OF THE SITE RISKS

As presented in the RI (KEMRON 2013), baseline risk assessments were conducted to determine the current and future effects of contaminants on human health and the environment in accordance with 40 Code of Federal Regulations (CFR) § 300.430(d)(4) and USEPA guidance.

The baseline risk assessments provide an estimated level of risk contaminants pose to human health and the environment if no action were taken to address on-site contamination.

Two separate risk assessments were performed as part of the baseline risk assessment — a BHHRA and a SLERA. Both risk assessments were conducted in

accordance with guidance developed by the USEPA, supplemented as necessary with related guidance developed by the MDE.

The results of the BHHRA and the SLERA indicate that there may be unacceptable risks to human health under a residential scenario and to the environment posed by lead and lead shot in soil and sediment east of the pond. The conclusions of the BHHRA were that there is no unacceptable risk to human health or the environment associated with potential exposures to contaminants in groundwater, soil, sediment, and surface water at the Former Trap and Skeet Range under commercial or industrial use (KEMRON 2013). Although the current land use at the Former Trap and Skeet Range is not anticipated to change, lead and lead shot remain in place at the range, prohibiting unrestricted future land use. The findings of the BHHRA concluded that the range should be restricted from future residential use unless or until such time that the pathways for potential risk to potential residential receptors is sufficiently mitigated by means other than a land use restriction. The SLERA identified potential receptors at the ecological exposure areas that include a variety of ***terrestrial, benthic***, and ***aquatic organisms***. Based on an evaluation of the site-specific data, no further ecological evaluation was warranted for pond sediment, surface water, or creeks south of the pond. It recommended that the soils of the range impacted by lead be further evaluated to develop and evaluate options for remedial action (KEMRON 2013). Summaries of these two risk assessments are discussed separately in the following subsections.

Baseline Human Health Risk Assessment

The BHHRA was completed in accordance with USEPA guidance (USEPA 2001) to evaluate the potential cancer risks and non-cancer hazards to human health posed by contaminants present at the Former Trap and Skeet Range. The BHHRA is provided in its entirety as Appendix B in the RI report (KEMRON 2013).

In accordance with federal regulations, cancer risk within the benchmark range of 0.000001 to 0.0001 (commonly written as $1x10^{-6}$ to $1x10^{-4}$ or in scientific notation as 1E-06 to 1E-04) may be considered acceptable. ***Risk levels*** that are less than one excess cancer in one million people (1E-06) are generally considered acceptable, while risks greater than one excess cancer in ten thousand people (1E-04) are generally considered significant. Therefore, a cumulative site risk level of 1E-04 is generally used as the remediation "trigger" for a site (USEPA 2001). Non-cancer hazard drivers are chemicals that contribute significantly to a total receptor target organ hazard index (HI) that exceeds 1.

Table 1 (below) presents a summary of the cancer risks and non-cancer hazards calculated for each receptor group evaluated at the Former Trap and Skeet Range for incidental exposure to metals and PAHs in soil and sediment. All risk estimates for current and future exposure scenarios at the Former Trap and Skeet Range are below the upper limit of USEPA's acceptable cancer risk range (1E-04).

The risks in **Table 1** do not include the pathway exposure additive risk for lead. Lead was assessed with the arithmetic mean lead soil concentration input into blood-level modeling procedures including the Integrated Exposure-Uptake Biokenetic Model, the Adult Lead Model, and the All-Ages Lead Model. The mean concentrations found in sediments southeast of the pond (666 mg/kg), soil within 375 ft of the firing point (495 mg/kg), and soil outside 375 ft of the firing point (473 mg/kg) were applied to these models. These concentrations were below the USEPA Region 3 industrial lead soil screening level of 800 mg/kg, and the 750 mg/kg concentration of concern using the Adult Lead Model for the maximally exposed receptor (commercial indoor worker), under the intended future land use scenario. However, these mean lead concentrations were above the residential soil screening level of 400 mg/kg. The HHRA recommended land use restrictions be implemented which would require a re-evaluation of risk from exposure to lead if the site were to be designated for residential land use.

Table 1. Summary of Cancer Risks and Non-Cancer Hazards for the Former Trap and Skeet Range

Receptor Group	Quantitative Risk Estimates	
	Cancer Risk	Non-Cancer Hazard Index
Current Receptors		
Trespasser (adolescent) – Soil and Sediment Exposure	4E-05	0.75
Future Receptors		
Trespasser (adolescent) – Soil and Sediment Exposure	4E-05	0.75
Commercial/Industrial Worker – Soil and Sediment Exposure	2E-05	0.73
Construction Worker – Soil and Sediment Exposure	4E-05	1.0

Note:
For current and future trespasser, HIs provided in the table are for the child, which are more conservative than the HIs for adults.

Screening Level Ecological Risk Assessment

A SLERA was conducted to identify and evaluate potential risks to environmental receptors associated with the Former Trap and Skeet Range. The SLERA was prepared in accordance with the technical guide provided by the *Ecological Risk Assessment Guidance for Superfund* (USEPA 1997), the *Guidelines for Ecological*

Risk Assessment (USEPA 1998), USEPA Region 3 ecological risk assessment guidance website (http://www.epa.gov/region3/superfund/ecology/index.html), and Intermittent "ECO Updates Bulletins" of USEPA. The complete SLERA is included as Appendix G of the RI report (KEMRON 2013).

Potential ecological receptors at the ecological exposure areas include a variety of terrestrial, benthic, and aquatic plants and animals. No rare or endangered species exist within the range. No proposed nature preserves, scenic rivers, unique ecological sites, geologic features, animal concentrations, or state parks, forest or wildlife areas occur in the vicinity of the range. No federal wilderness areas, wildlife refuges, or designated critical habitat occur within the vicinity of the range. Wetlands are present within the site and its vicinity because of the low-lying topographic areas. Exposure pathways considered in the SLERA included surface soil, surface water, and sediment from streams and the pond (KEMRON 2013).

Potential adverse ecological effects to terrestrial plants, terrestrial invertebrates, benthic invertebrates, and aquatic receptors were evaluated based on comparisons to literature-derived screening values. Lead and lead shot were the primary drivers for ecological risk at the range. PAHs were determined unlikely to affect the ecological receptors given the constituents non-***bioavailability*** in the clay skeet targets. Potential for ecological exposure to lead and lead in surface soil exists for terrestrial plants, terrestrial invertebrates, terrestrial mammals, and avian species. Hazards for lead in soil were identified for the robin, shrew, and vole. Based on the ecological risk assessment findings, the potential for significant ecological risk exists for the range soils and creek sediment east of the pond (KEMRON 2013).

SCOPE AND ROLE OF THE RESPONSE ACTION

The findings of the RI indicated that a potential unacceptable risk to future human receptors exists if the site use remains unrestricted. The SLERA concluded there is potential for adverse ecological effects from lead and lead shot in site soils and creek sediment east of the manmade retention pond. A response action is necessary to prevent direct contact by current ecological and future human and ecological receptors with soil and sediment contaminated with lead and lead shot.

This PRAP provides a summary of the remedial alternatives developed to address contamination in surface soil and sediment and proposes Alternative 3 as described below as the preferred remedial alternative:

- Soil Removal, RCRA Subtitle D Disposal, and LUCs
- The objectives are developed based on the criteria outlined in 40 CFR § 300.430(e)(2) of the NCP and Section 121(d)(2) of CERCLA.

Details of the Alternative 3 are included in the "Summary of Remedial Alternatives" section of this PRAP.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund BHHRA is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases under current and future land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the COCs at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a reasonable maximal exposure scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards.

The likelihood of an individual developing cancer is expressed as a probability. For example, a 1E-04 cancer risk means a one-in-ten-thousand excess cancer risk; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. The NCP defines the acceptable exposure for an individual as a lifetime excess cancer risk in the range of 1E-04 to 1E-06 (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk).

For non-cancer health effects, an HI is calculated. An HI represents the sum of the hazard quotients (HQs) that impact the same target organs. An HQ is calculated by taking the ratio of the individual exposure level for a site-related contaminant as compared to its corresponding reference dose. The reference dose is the dose at which no adverse health effects are anticipated to occur. Therefore, an HQ of one or less indicates that no adverse non-cancer effects are anticipated and, when the HQs for COCs impacting the same target organ are summed, an HI of one or less also indicates that no adverse non-cancer effects are anticipated to occur.

REMEDIAL ACTION OBJECTIVES

This section presents the required scope of the remedial action and Remedial Action Objectives (RAOs). Lead and lead shot were the COCs identified for soil and sediment at the Former Trap and Skeet Range.

Remedial Action Objectives

RAOs are based on human health and environmental factors, which are considered in the formulation and development of remedial alternatives. Such objectives are developed based on the criteria outlined in 40 CFR § 300.430(e)(2) of the NCP and Section 121(d)(2) of CERCLA.

The following RAOs for the site have been developed based on the criteria mentioned above with the objective to protect human health and the environment:

- Eliminate or minimize the potential for human exposure for the potential residential receptor at unacceptable levels by direct contact or ingestion threat associated with lead in soil.
- Eliminate or minimize the potential for exposure to wildlife receptors from direct contact or ingestion threat associated with mean lead concentrations in surface soil (0 to 0.5 ft bgs) and sediment in the intermittent stream east of the pond above a not to exceed (NTE) concentration of 800 mg/kg with 95 percent confidence (i.e., using the expected residual site-wide lead 95 percent upper confidence limit [UCL] associated with an ecological RAO [Eco-RAO] of 800 mg/kg).
- Eliminate or minimize the potential for exposure to wildlife receptors to lead shot in surface soil (0 to 0.5 ft bgs) and sediment in the creek east of the pond above a preliminary remediation goal (PRG) for lead shot of above 1,000 counts/ft^2.

The preferred remedial alternative presented in this PRAP would achieve the RAOs and will serve as the final remedy for the Former Trap and Skeet Range while meeting completion requirements under CERCLA. However, selection of the final action will not occur until consideration of all public comments generated during the public comment period associated with this PRAP.

Basis for the Establishment of Remedial Action Objectives

A statutory goal of the ***Defense Environmental Restoration Program*** is for the Department of Defense to take appropriate actions to investigate and, where necessary, address releases of pollutants that create a risk to the public health or welfare and/or to the environment. The U.S. Army, thus, is required to select remedies that attain a degree of cleanup that assures protection of human health and the environment.

It is the U.S. Army's current judgment that the preferred remedial alternative identified in this PRAP will mitigate hazards associated with surface soil and sediment contamination and continue to provide protection to human health and the environment.

SUMMARY OF REMEDIAL ALTERNATIVES

Alternatives to address human health and environmental impacts posed by contamination at the Former Trap and Skeet Range were developed and evaluated in the FS (Aptim 2019) and included the following:

- **Alternative 1** – No Action
- **Alternative 2** – Protective Cover and LUCs
- **Alternative 3** – Soil Removal, RCRA Subtitle D Disposal, and LUCs

The alternatives are described below with their respective estimated ***Capital Costs***, estimated cost for ***Operation and Maintenance (O&M)*** activities, and an estimate of the ***Present Worth Costs***. Costs were prepared in accordance with the USEPA's Guide to Developing and Documenting Cost Estimates During the Feasibility Study (USEPA 2000).

Development of alternatives is completed with consideration of CERCLA Section 121(b), which shows a clear preference for remedies that are permanent, cost-effective, and involve the treatment of hazardous substances to reduce their volume, toxicity, or mobility. Section 121(b) also states a preference against off-site transport and disposal of hazardous substances without such treatment. When hazardous substances are left on-site at levels which will not allow unlimited use and unrestricted exposure, Section 121(c) requires that the lead agency review the protectiveness of the remedy every 5 years.

Alternative 1: No Action

Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $0

Under Alternative 1, no remedial action of any kind would be implemented. This alternative would not address direct contact with lead in soil or sediment by current and future human and environmental receptors. However, according to the NCP, the No Action alternative must be evaluated to establish a baseline for comparison of the remaining alternatives, even though this alternative would not be a viable option for the range. See 40 CFR § 300.430(e)(6).

Alternative 2: Protective Cover and LUCs

Estimated Capital Cost: $771,009
Estimated O&M Cost Over 30 Years: $1,165,467
Estimated Present Worth Cost: $1,936,476

Alternative 2 includes the following components to achieve RAOs:

- Installation of a protective soil cover
- Implementation of LUCs.

Alternative 2 was developed with the overall goal of protecting human health and the environment and achieving RAOs in a cost-effective manner.

Installation of a Protective Soil Cover

Under Alternative 2, a protective cover would be placed over the lead contaminated soil. The protective cover would include a minimum 1-ft thick, clean fill cover over a select portion of the site with lead concentrations at a NTE

concentration of 800 mg/kg and lead shot above 1,000 counts/ft^2. Placement of the protective cover would eliminate the direct exposure of potential ecological receptors to the existing site hazards. This alternative would require removal of most trees and all scrub/shrub vegetation within the contaminated area, approximately 3.9 acres, plus adequate clearing to allow for heavy construction equipment and to provide access to the site. Road construction would be required to permit earthmoving equipment and haul trucks to safely access the area. Additional soil sampling would be performed to further delineate the contaminant boundaries and refine the area requiring the protective cover. Stream remediation would be required for the impacted streams east of the pond where sediment would be removed from the contaminated areas and approximately 50 linear ft of streams would be restored and stabilized. The protective cover is estimated to be 3.9 acres in extent and require approximately 6,300 cubic yards of clean soil. The restored area would be graded to promote sheet flow runoff along the cover to minimize erosion. Upon completion of the protective cover, the site would be restored by revegetating the cover. The area would be seeded with an appropriate seed mix and trees would be replanted in accordance with the FGGM tree policy. Activities would be performed in a manner to minimize impacts to the environment and limit habitat destruction during execution of the remedial alternative. The estimated duration for execution and completion of remedial activities for Alternative 2 is 1 to 2 years.

Land Use Controls

At the Former Trap and Skeet Range, ***land use controls (LUCs)*** would be implemented to restrict further development of the area to ensure the future use is compatible with the potential hazard. The restrictions would be implemented by FGGM through the Master Planning process. Routine site inspections would be performed to ensure the ongoing effectiveness over the cover by periodically assessing conditions at the site.

Alternative 2 would result in waste remaining at the site above levels that allow for unlimited use and unrestricted exposure. Alternative 2 would require regular 5-year reviews to ensure that on-site contaminants remain stable and undisturbed.

Alternative 3: Soil Removal, RCRA Subtitle D Disposal, and LUCs

Estimated Capital Cost: $1,432,162
Estimated O&M Cost Over 30 Years: $444,301
Estimated Present Worth Cost: $1,876,463

Alternative 3 consists of removal and off-site disposal of lead contaminated soil and sediment from the Former Trap and Skeet Range. As part of Alternative 3, LUCs would be implemented consistent with the description for Alternative 2.

Soil Removal and RCRA Subtitle D Disposal

Under Alternative 3, lead contaminated soil and sediment would be removed and disposed in a RCRA permitted facility. This alternative includes the removal of lead contaminated surface soil (0 to 0.5 ft bgs) and sediment at a NTE concentration of 800 mg/kg and lead shot above 1,000 counts/ft^2 (**Figure 8**). As in Alternative 2, Alternative 3 would require vegetation removal, road construction, and additional sampling to refine the contaminant boundaries. Sampling would be accomplished by establishing 50 by 50 ft grids over the contaminated soil surface (**Figure 8**). Alternative 3 would remove an estimated 6,300 cubic yards of lead impacted soil and sediment. Soil and sediments would be treated as needed to reduce ***Toxicity Characteristic Leaching Procedure (TCLP)*** concentrations to below 5 milligrams per liter (mg/L) for off-site disposal in a RCRA Subtitle D landfill as a nonhazardous waste. Prior to the treatment/soil stabilization effort, a treatability study would be performed on representative samples of contaminated soil to determine the design of the preferred stabilization agent and the soil to stabilization agent ratio to be used. Soil stabilization would be performed on soil and sediment that fail the TCLP. Stabilized soils with TCLP values below 5 mg/L for lead would be loaded for off-site transport and disposal at a RCRA Subtitle D (nonhazardous) landfill. Site restoration would include grading to match the existing grade once excavation was complete. Stream restoration would be performed by backfilling the approximately 50 linear ft of stream length to match the existing channel geometry. Restoration, revegetation, and habitat preservation would occur similar to that described in Alternative 2. The estimated duration for execution and completion of remedial activities for Alternative 3 is 1 to 2 years.

Alternative 3 would result in waste remaining at the site above levels that allow for unlimited use and unrestricted exposure. Alternative 3 would require regular 5-year reviews to ensure that on-site contaminants remain stable and undisturbed.

EVALUATION OF REMEDIAL ALTERNATIVES

The NCP requires the evaluation of remedial alternatives both individually and against one another using the nine evaluation criteria listed below to select a remedy (40 CFR § 300.430(e)(9)).

Threshold Criteria – Must be met for the alternative to be eligible for selection as a remedial option.

- Overall Protection of Human Health and the Environment – Determines whether an alternative adequately eliminates, reduces, or controls threats to human health and the environment through treatment, engineering controls, or LUCs.
- Compliance with ***Applicable or Relevant and Appropriate Requirements (ARARs)*** – Evaluates

whether the alternative meets the requirements set forth in federal and state environmental or facility siting statutes and regulations, or whether a waiver is justified. Identification of ARARs is dependent upon site risks and the hazardous substances present at the site, site characteristics, the site location, and the actions selected to remediate the site. Thus, requirements may be chemical-, location-, or action-specific.

Primary Balancing Criteria – Used to weigh major trade-offs among alternatives.

- Long-Term Effectiveness and Permanence – Considers the ability of an alternative to maintain the protection of human health and the environment over time.
- Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment – Evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
- Short-Term Effectiveness – Considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
- Implementability – Considers the technical and administrative feasibility of implementing the alternative, such as the relative availability of goods and services.
- Cost – Includes estimated capital and annual O&M costs as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of –30% to +50%.

Modifying Criteria – May be considered to the extent that information is available prior to the start of the public comment period, but can be fully considered only after public comment is received on this PRAP.

- State/Support Agency Acceptance – Considers whether the state agrees with the U.S. Army's analysis and recommendations, as described in the RI, FS, and PRAP.
- Community Acceptance – Considers whether the local community agrees with the U.S. Army's analysis and the ***Preferred Alternative***. Comments received on the PRAP are an important indicator of community acceptance.

Comparative Analysis of Alternatives

This section summarizes the comparative analysis of alternatives for the Former Trap and Skeet Range that were presented in the FS (Aptim 2019). A chart summarizing this comparative analysis is included as **Table 2** (on subsequent pages).

Overall Protection of Human Health and the Environment

Alternative 1 takes no action and is therefore not protective of human health and the environment. Alternative 2 reduces the risk of encountering COCs by ecological receptors through placement of a protective cover but does not reduce the volume or mobility of the lead-impacted soil. Alternative 3 provides the greatest overall protection by removing lead-contaminated soil above a NTE concentration of 800 mg/kg and lead shot exceeding 1,000 counts/ft^2 from the range and protecting human health through LUCs.

Compliance with Applicable or Relevant and Appropriate Requirements

All alternatives meet ARARs, except Alternative 1. Charts summarizing ARARs for the alternatives are included as **Tables 3 and 4**.

Long-Term Effectiveness and Permanence

The most effective and permanent alternative is Alternative 3, since lead-contaminated soil and lead shot are removed from the site above levels that pose an ecological risk. Alternative 2 would also be effective by reducing direct exposure of ecological receptors to site COCs, however, it would require ongoing maintenance to ensure long term integrity of the cover. Additionally, the volume of contaminants would not be reduced and would remain at the site. Therefore, Alternative 2 is less permanent than Alternative 3.

The reasonably anticipated land use for the Former Trap and Skeet Range is troop and professional/institutional, and the site is not anticipated to be transferred out of FGGM control. Residential land use is not likely. Alternative 2 and Alternative 3 would be effective at preventing unacceptable risk of residential exposure, providing better effectiveness than Alternative 1, No Action.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 3 provides the greatest reduction of toxicity, mobility, and volume by removing lead from the site and stabilization to make it less mobile. Alternative 1 and Alternative 2 do not provide any reduction of toxicity, mobility, or volume.

Short-Term Effectiveness

Alternative 2 and Alternative 3 require vegetation clearance and temporary impacts to wildlife habitat. The short-term effects on the environment would be minimized by performing sampling to confirm the footprint of contamination. The length of time to complete the remedy under any of the alternatives is low (within one to two years).

Implementability

All alternatives are technically feasible.

Cost

The progression of capital costs from the least expensive to most expensive alternative is:

- Alternative 1: $0
- Alternative 2: $771,009
- Alternative 3: $1,432,162

O&M costs are an important consideration when comparing costs. Alternative 2 requires the greatest ongoing O&M cost. The estimated O&M cost over 30-years for each alternative is:

- Alternative 1: $0
- Alternative 2: $1,165,467
- Alternative 3: $444,301

While the capital costs of Alternative 2 are less than the capital costs of Alternative 3, Alternative 2 would require ongoing O&M of the protective cover, which over the 30-year evaluation period makes the total cost for Alternative 2 higher than Alternative 3.

State/Support Agency Acceptance

Approval of the preferred remedial alternative presented in this PRAP is expected. Regulatory approval will be further evaluated in the ROD following the public comment period.

The actions implemented under the chosen remedial alternative will comply with substantive provisions of State of Maryland permitting requirements.

Community Acceptance

The U.S. Army has approved the release of this PRAP to the public. Community acceptance of the preferred remedial alternative will be evaluated at the conclusion of the public comment period. Community acceptance will be addressed in the Responsiveness Summary prepared for the ROD.

Table 2
Comparative Analysis Summary for the Former Trap and Skeet Range

	Alternative 1	Alternative 2	Alternative 3
	Description	**Description**	**Description**
Threshold Criteria			
Overall Protection of Human Health and the Environment	• Not protective, does not mitigate potentially remaining lead hazards.	• Protective of human health by placement of a 1-foot-thick protective soil cover and LUCs to prevent contact with COCs. • Protective of ecological receptors by meeting the Eco-RAO of 800 mg/kg for lead. • Level of tree and scrub/shrub vegetation removal is minimized to approximately 3.9 acres. Re-vegetation efforts will commence at the conclusion of the excavation in accordance with the FGGM Tree Policy.	• Protective of human health by removal of lead-contaminated soil and LUCs to prevent contact with COCs. • Protective of ecological receptors by meeting the Eco-RAO of 800 mg/kg for lead. • Level of tree and scrub/shrub vegetation removal is minimized to approximately 3.9 acres. Re-vegetation efforts will commence at the conclusion of the excavation in accordance with the FGGM Tree Policy.
Compliance with ARARs	• No action performed, so there are no ARARs.	• Complies with ARARs (Tables 3 and 4).	• Complies with ARARs (Tables 3 and 4).
Balancing Criteria			
Long-Term Effectiveness and Permanence	• Not effective or permanent now or in the future.	• LUCs would be maintained by the government so the long-term effectiveness is considered good. • Does not remove COCs, so the permanence is lower than removal alternatives.	• LUCs would be maintained by the government so the long-term effectiveness is considered good. • Removing elevated levels of lead in soil provides an effective and permanent resolution for COC hazards to human health and the environment.
Reduction of TMV through Treatment	• No change in TMV since no-actions are implemented.	• No change in TMV since no COCs are actually removed.	• TMV of lead is reduced by reducing the volume of lead on-site, and treating to reduce its mobility, and disposal in the RCRA Subtitle D landfill.
Short-Term Effectiveness	• No short-term increased risks to workers or public since no activities are conducted.	• Limited short-term impacts to the community or facility. • Limited short-term impacts to workers. • Limited short-term impacts to the environment. • Estimated time for completion is 1 to 2 years.	• Limited short-term impacts to the community or facility. • Limited short-term impacts to workers. • Limited short-term impacts to the environment. • Estimated time for completion is 1 to 2 years.
Implementability	• No actions to implement.	• This alternative is feasible to implement.	• This alternative uses proven technologies and is feasible to implement.
Cost	• No costs associated with this alternative.	• Capital: $771,009 • O&M: $1,165,467 • Present Worth: $1,936,476	• Capital: $1,432,162 • O&M: $444,301 • Present Worth: $1,876,463
Modifying Criteria			
State Acceptance	To be determined.	To be determined.	To be determined.
Community Acceptance	To be determined.	To be determined.	To be determined.

Notes:

ARAR Applicable or Relevant and Appropriate Requirement
COC Contaminant of Concern
Eco-RAO Ecologically-Based Remedial Action Objective
FGGM Fort George G. Meade
LUC Land Use Control
mg/kg Milligram per Kilogram
O&M Operation and Maintenance
RCRA Resource Conservation and Recovery Act
TMV Toxicity, Mobility, and Volume

Table 3
Summary of Potential Location-Specific ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate
Clean Water Act 33 U.S.C. Sec. 1344	40 CFR § 230.10 Restrictions on Discharge	No discharge of dredged or fill material shall be allowed if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.	**Applicable:** Requirement is applicable to Alternatives 2 and 3 since those remedies will occur along the intermittent stream at the Former Trap and Skeet Range and in areas adjacent to the stream. The activities will be performed in a manner to minimize impacts to the intermittent stream by conducting work during the dry seasons.
Wetlands Mitigation-Compensation Policy and Supplemental Guidelines	COMAR 26.23.04.03	Provides mitigation standards for an action which may impact nontidal wetlands including measures to minimize wetlands loss or disturbance, demonstration of the need for the project, and guidelines for consideration of compensation plan if required.	**Relevant and Appropriate:** Substantive requirements (permit not required) are relevant and appropriate to Alternatives 2 and 3 since those remedies would have impacts on wetlands. A portion of the footprint of impacted soils/sediments includes a section of the intermittent stream approximately 50 feet long. No net loss is anticipated.

Notes:

ARAR Applicable or Relevant and Appropriate Requirement
CFR Code of Federal Regulations
COMAR Code of Maryland Regulations
U.S.C. United States Code

Table 4
Summary of Potential Action-Specific ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate
Maryland Erosion and Sediment Control	COMAR 26.17.01.11 (Standards and Specifications)	Requires preparation of an erosion and sediment control plan for activities involving land clearing, grading, and other earth disturbances greater than 5,000 square feet. The remedial action would implement the erosion and sediment control criteria in relation to site activities. Applies to all earth-moving components of the remedy.	**Relevant and Appropriate:** Substantive requirements (permit not required) for an Erosion and Sediment Control Program are relevant and appropriate to Alternatives 2 and 3 since those remedies require excavation and/or clearing activities resulting in a disturbance of equal to or greater than 5,000 square feet. The remediation foot print for the alternatives is approximately 3.9 acres (169,884 square feet).
Maryland Stormwater Management	COMAR 26.17.02.02 B (Environmental Site Design Planning Techniques and Practices); (Stormwater Management Plans)	The primary goal of the state and local stormwater management programs is to maintain after development, as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding. The remedial action would implement stormwater management controls in relation to site activities.	**Relevant and Appropriate:** Substantive requirements (permit not required) for a Storm Water Management Plan are relevant and appropriate to Alternatives 2 and 3 since those remedies disturb an area greater than 5,000 square feet. The remediation foot print for the alternatives is approximately 3.9 acres (169,884 square feet).
Maryland Construction in Non-Tidal Wetlands and Waterways	COMAR 26.17.04.02 (Definitions) COMAR 26.17.04.04 (Permit Applications--General Requirements) COMAR 26.17.04.08 (Temporary Construction in a Stream Channel or Floodplain)	Governs construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction or any change of the course, current, or cross section of a stream or body of water within the State including any changes to the 100-year frequency floodplain of free-flowing waters.	**Relevant and Appropriate:** Substantive requirements (permit not required) are relevant and appropriate actions to Alternatives 2 and 3 since those remedies would have impacts on a stream. A portion of the footprint of impacted soils/sediments includes a section of the intermittent stream approximately 50 feet long. No net loss is anticipated.
RCRA	40 CFR § 261.24 40 CFR Part 136, App C	Specific requirements for identifying hazardous wastes. Establishes analytical requirements for testing and evaluating solid, hazardous, and water wastes.	**Applicable:** Any soils excavated and disposed of off-site will require TCLP analysis and hazardous waste characterization testing prior to disposal. It is unlikely that the soils will fail TCLP analysis and require treatment prior to off-site disposal or be handled as hazardous. Note some portions of the Maryland regulations for the definition of a hazardous waste are more stringent than Federal regulations, however, State regulations for TCLP are the same as Federal requirements.
RCRA	COMAR 26.13.03.02 through .06	Standards applicable to generators of hazardous waste, including satellite accumulation procedures and storage time allowed before disposal off-site is required. Applies to hazardous waste stored on-site before shipment, including all excavated materials that are determined to be hazardous waste. Any waste media that are actively managed or shipped off-site must be tested to determine if they are RCRA characteristic wastes. Includes investigation-derived wastes.	**Applicable** for on-site management and storage of soil classified as hazardous. Maryland has stricter volume requirements than Federal regulations.
RCRA	40 CFR §§ 268.40-.49	Establishes restrictions on land disposal of untreated hazardous wastes and provides treatment standards for hazardous wastes that are to be land disposed. These treatment standards are to a great extent concentration-based. However, certain wastes are required to be treated by a specified technology prior to land disposal.	**Applicable** if hazardous waste is disposed of on-site or transported off-site to a landfill.
RCRA	COMAR 26.13.05.02 through 0.5, .12, and 16.1	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Establishes for management of hazardous waste including general facility standards for waste analysis, facility inspection requirements, site selection criteria for location of a facility, preparedness and prevention, contingency planning, manifesting, record keeping and reporting. Also provides requirements for waste piles and miscellaneous units.	**Applicable:** Substantive requirements are applicable if soil is classified as hazardous and is stored and/or treated on-site or transported off-site for disposal.

Table 4
Summary of Potential Action-Specific ARARs (Continued)

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate
RCRA	COMAR 26.13.07.02-5, and .02-9	Provides the Permit Requirements for Controlled Hazardous Substance Facilities. Requirements include data needs such as location requirements, waste characteristics, treatment process, security requirements, and contingency planning.	**Applicable:** Substantive requirements (permit not required) are applicable if soil is classified as hazardous and is treated on-site.
Clean Air Act National Ambient Air Quality Standards Particulates	40 CFR §§ 50.6 and 50.7	Establishes maximum concentrations for particulates and fugitive dust emissions.	**Applicable** for on-site activities which would generate particulate matter and fugitive dust emissions from construction vehicles and equipment.
Control of Fugitive Particulate Matter	COMAR 26.11.06.03	Applies to emission of particulates (dust) generated during excavation or other remedial construction activities. Provides requirements for the control of dust emissions for construction and other activities.	**Applicable** for on-site activities which would generate particulate matter and fugitive dust emissions from construction vehicles and equipment. Note federal environmental regulations do not provide specific requirements for dust control.

Notes:

ARAR Applicable or Relevant and Appropriate Requirement
CFR Code of Federal Regulations
COMAR Code of Maryland Regulations
RCRA Resource Conservation and Recovery Act
TCLP Toxicity Characteristic Leaching Procedure

SUMMARY OF THE PREFERRED ALTERNATIVE FOR THE FORMER TRAP AND SKEET RANGE

The Preferred Alternative for the Former Trap and Skeet Range is:

Alternative 3: Soil Removal, RCRA Subtitle D Disposal, and LUCs

Based on the results of the comparative analysis and detailed evaluation presented in the RI (KEMRON 2013) and FS (Aptim 2019), the U.S. Army proposes that Alternative 3 be implemented as the Preferred Alternative to control exposure to lead and lead shot at the Former Trap and Skeet Range. The proposed Preferred Alternative for the Former Trap and Skeet Range would meet the RAOs and satisfy the evaluation criteria, as described in the "Evaluation of Remedial Alternatives" section of this PRAP.

Based on the information currently available, the U.S. Army believes the Preferred Alternative meets the threshold and primary balancing criteria, and is expected to satisfy applicable modifying criteria. The U.S. Army expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA 121(b), to the extent practicable: 1) to be protective of human health and the environment, 2) to comply with ARARs, 3) to be cost-effective, and 4) to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

It is the U.S. Army's current judgement that the Preferred Alternative identified in this PRAP, or one of the other active measures considered in the PRAP, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. It should be noted that the Preferred Alternative can be changed in light of new information or in response to public comments as described below.

COMMUNITY PARTICIPATION

Public participation is an important component of remedy selection. The U.S. Army, USEPA, and MDE are soliciting input from the community on the preferred remedial alternative. The comment period extends from May 18, 2023 to June 17, 2023 (30 days). This period includes a public meeting where the U.S. Army will present the PRAP as agreed to by the USEPA and MDE. The U.S. Army will accept both verbal and written comments at this meeting and written comments following the meeting through June 17, 2023.

The ***Restoration Advisory Board (RAB)*** is a critical component of the FGGM Installation Restoration Program to keep the public informed about the environmental cleanup activities and involved in decision-making. The RAB gives community members, particularly those who may be affected by the cleanup activities, and government representatives a chance to exchange information and participate in meaningful dialogue. The site has previously been discussed with the RAB.

Public Comment Period

The U.S. Army is providing a 30-day comment period from May 18, 2023 to June 17, 2023, to provide an opportunity for public involvement in the decision-making process for the proposed action. If any significant new information or public comments are received during the public comment period, the U.S. Army, in consultation with the regulatory agencies, may modify the recommended action outlined in this PRAP. During the public comment period, the public is encouraged to review reports and other documents pertinent to FGGM and the CERCLA process at the Former Trap and Skeet Range. This information is available at the Anne Arundel County Library located at 1325 Annapolis Road in Odenton, Maryland and the Fort Meade Environmental Division Office, located at 4216 Roberts Avenue, Second Floor, at FGGM. To obtain further information, the representatives identified in the boxes below may be contacted.

Written Comments

If the public would like to comment in writing on the PRAP or other relevant issues, comments should be delivered to the U.S. Army at the public meeting or mailed (postmarked no later than June 17, 2023) to Mr. Shaun Herron, Mr. Robert Stroud, or Ms. Elisabeth Green at the addresses provided below.

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Public Meeting

The U.S. Army will hold a public meeting to accept comments on this PRAP on **May 18, 2023 at 7:00 p.m. via a virtual Teams meeting. Invitation requests to the virtual meeting can be made to Katrina Harris at kharris@bridgeconsultingcorp.com**. This meeting will provide an opportunity for the public to comment on the proposed action. Comments made at the meeting will be transcribed. A copy of the transcript will be included in the ROD Responsiveness Summary and will be added to the FGGM ***Administrative Record*** file and information repositories.

U.S. Army's Review of Public's Comments

The U.S. Army will review the public's comments as part of the process in reaching a final decision on the action to be taken. The U.S. Army's final choice of action will be issued in the ROD. A Responsiveness Summary, documenting and responding to written and verbal comments received from the public will be issued with the ROD. Once community response and input are received and the U.S. Army and USEPA sign the ROD, it will become part of the Administrative Record.

ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per Liter
µg/kg	Microgram per Kilogram
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
BHHRA	Baseline Human Health Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COMAR	Code of Maryland Regulations
Eco-RAO	Ecologically-Based Remedial Action Objective
FGGM	Fort George G. Meade
FS	Feasibility Study
ft	Foot
ft^2	Square Foot
HI	Hazard Index
HQ	Hazard Quotient
LUC	Land Use Control
MDE	Maryland Department of the Environment
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NSSA	North American Skeet Shooting Association
NTE	Not to Exceed
O&M	Operation and Maintenance
PAH	Polycyclic Aromatic Hydrocarbon
PRAP	Proposed Remedial Action Plan
PRG	Preliminary Remediation Goal
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
SLERA	Screening Level Ecological Risk Assessment
TCLP	Toxicity Characteristic Leaching Procedure
UCL	Upper Confidence Limit
U.S.	United States
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency

GLOSSARY OF TERMS

Administrative Record: A collection of documents (including plans, correspondence, and reports) generated during site investigation and remedial activities. The Administrative Record contains the basis for the lead agency's selection of response actions and is required to be made available for public review.

Applicable or Relevant and Appropriate Requirement (ARAR): Those federal and state requirements that a selected remedy will attain. These requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address circumstances at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

Aquatic Organism: Plant or animal of any species or hybrid thereof, and includes gametes, seeds, egg, sperm, larvae, juvenile, and adult stages, any one of which is required to be in water during that stage of its life.

Baseline Human Health Risk Assessment (BHHRA): The 1990 National Contingency Plan (NCP) requires a site-specific baseline risk assessment to be conducted, as appropriate, as part of the remedial investigation (RI). The baseline risk assessment characterizes the current and potential threats to human health and the environment that may be posed by contaminants migrating to groundwater or surface water, releasing to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain. The primary purpose of the baseline risk assessment is to provide risk managers with an understanding of the actual and potential risks to human health and the environment posed by the site and any uncertainties associated with the assessment.

Benthic Organism*:* Plant or animal whose habitat is located at the lowest level of a body of water such as a lake, river, or ocean.

Benzo(a)pyrene: A polycyclic aromatic hydrocarbon (PAH) and the result of incomplete combustion of organic matter at temperatures between 300 °C (572 °F) and 600 °C (1,112 °F). The ubiquitous compound can be found in coal tar, tobacco smoke and many foods, especially grilled meats. Benzo(a)pyrene is commonly used as an indicator species for PAH contamination because it is particularly carcinogenic.

Bioavailability: The degree and rate at which a substance (such as a contaminant) is absorbed into a living system or is made available at the site of physiological activity.

Biological Technical Assistance Group Screening Benchmarks: These values were developed to facilitate consistency in screening level ecological risk assessments throughout USEPA Region 3. Benchmark values have been established for compounds that are considered bioaccumulative. Values are provided for freshwater and marine sediments. For additional information please refer to the following website: https://www.epa.gov/risk/biological-technical-assistance-group-btag-screening-values.

Capital Costs: This includes costs associated with construction, treatment equipment, site preparation, services, transportation, disposal, health and safety, installation and start-up, administration, legal support, engineering, and design associated with response actions.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA): This federal law was passed in 1980 and is commonly referred to as the Superfund Program. It provides for liability, compensation, cleanup, and emergency response regarding the cleanup of inactive hazardous waste disposal sites that endanger public health and safety or the environment. CERCLA becomes applicable to sites through a process where the USEPA calculates a Hazard Ranking Score (HRS) and then proposes that sites with a high enough HRS be placed on the National Priorities List.

Defense Environmental Restoration Program: Addresses the cleanup of Department of Defense hazardous waste sites consistent with the requirements of CERCLA. The three main objectives of the Defense Environmental Restoration Program are: 1) the identification, research and development, and cleanup of contamination from hazardous substances, pollutants, and contaminants; 2) the correction of other environmental damage that creates an imminent and substantial endangerment to public health or the environment; and 3) the demolition and removal of unsafe buildings and structures at sites formerly used by or under the jurisdiction of the Secretary of Defense.

Feasibility Study (FS): The FS documents the development, screening, and detailed evaluation of alternative remedial actions.

Laboratory Detection Limit: Is the lowest concentration at which an analyte can be detected in a sample that does not cause matrix interferences during sample analysis.

Land Use Control (LUC): LUCs are implemented to help minimize the potential for exposure to contamination and/or protect the integrity of a cleanup action. LUCs may consist of non-engineered measures, such as administrative and legal controls, or engineered measures, such as physical barriers (e.g., fences, signage)

Lead Agency: The lead agency for remedial actions and removal actions other than emergencies provides the on-scene coordinator/remedial project manager to plan and implement response actions under the NCP (40 CFR § 300.5).

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): These regulations were developed by the USEPA with public input, and they provide the rules for implementing CERCLA. They give the federal government the authority to respond to the problems of abandoned or uncontrolled hazardous waste disposal sites as well as to certain incidents involving hazardous wastes (e.g., spills). The NCP specifies a framework of sequential steps for performing investigation and remediation/cleanup of an environmental site, including RI, FS, PRAP, Record of Decision/Decision Document, Remedial Design, Remedial Action. Environmental restoration/cleanup at FGGM is required to be conducted consistent with this framework.

Operation and Maintenance (O&M): Annual post-construction cost necessary to ensure the continued effectiveness of a response action.

Polycyclic Aromatic Hydrocarbon (PAH): A group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot. Some PAHs are manufactured and usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

Preferred Alternative: The alternative identified tentatively on the basis of the analysis presented in the RI and FS report and ongoing discussions between the lead and support agencies and the affected community.

Present Worth Costs: Used to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year. This allows the cost of the response actions to be compared on the basis of a single figure representing the amount of money that would be sufficient to cover capital and O&M costs associated with each response action over its planned life.

Proposed Remedial Action Plan (PRAP): The PRAP is a document used to facilitate public involvement in the remedy selection process. The document presents the lead agency's preliminary recommendation concerning how best to address contamination at the site, presents alternatives that were evaluated, and explains the reasons the lead agency proposes the Preferred Alternative.

Receptor: A population, community, or ecosystem that is exposed to a contaminant or other stressor.

Record of Decision (ROD): This legal record signed by the U.S. Army and USEPA that provides the cleanup action or remedy selected for a site, the basis for selecting that remedy, public comments, the lead agency's responses to comments, and the estimated cost of the remedy.

Regional Screening Level (RSL): Calculated safe exposure standards for contaminants in soil, water, and air that are based on standardized exposure scenarios (e.g., residential, industrial). RSLs are updated semi-annually by the USEPA and published on the internet. They are designed to be safe-sided so that if the concentrations of contaminants at a site do not exceed the RSLs, then the site generally needs no further environmental investigation or action. A site could have concentrations greater than the RSLs and still not require environmental cleanup because the estimated risks for the site are in the CERCLA allowable range.

Remedial Investigation (RI): An investigation under CERCLA that involves sampling environmental media, such as air, soil, and water, to determine the nature and extent of contamination and human health and the environmental risks that result from the contamination.

Responsiveness Summary: A part of the ROD in which the U.S. Army documents and responds to written and oral comments received during the public comment period regarding the alternatives presented in the PRAP.

Restoration Advisory Board (RAB): The board provides a forum for exchange of information and partnership among citizens, the military installation, USEPA, and MDE. The RAB offers an opportunity for community members to provide input to the cleanup process.

Risk Levels: Risk levels define the probability of health risks to humans and ecological receptors from chemical contaminants and other stressors that may be present in the environment.

Screening Level Ecological Risk Assessment (SLERA): The 1990 National Contingency Plan (NCP) requires a site-specific screening level ecological risk assessment to be conducted, as appropriate, as part of the remedial investigation (RI). The SLERA is used to evaluate potential hazards to the environment that are attributable to chemical releases from site-related activities.

Terrestrial Organism: Plant or animal whose habitats are on land. This excludes all sea organisms and some birds.

Toxicity Characteristic Leaching Procedure (TCLP): A laboratory procedure that is designed to determine the mobility of both organic and inorganic analytes present in liquid, solid, and multi-phase wastes. The intent of this leachate procedure is to simulate the conditions that may be present in a landfill where water may pass through the land-filled waste and travel into the groundwater carrying the soluble materials with it.

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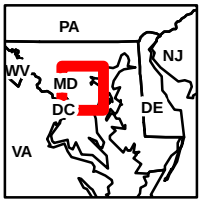
Fort George G. Meade Boundary



0 2.5 5 10 Miles

Source: Aptim 2019

NAD 1983 StatePlane Maryland FIPS 1900 Feet

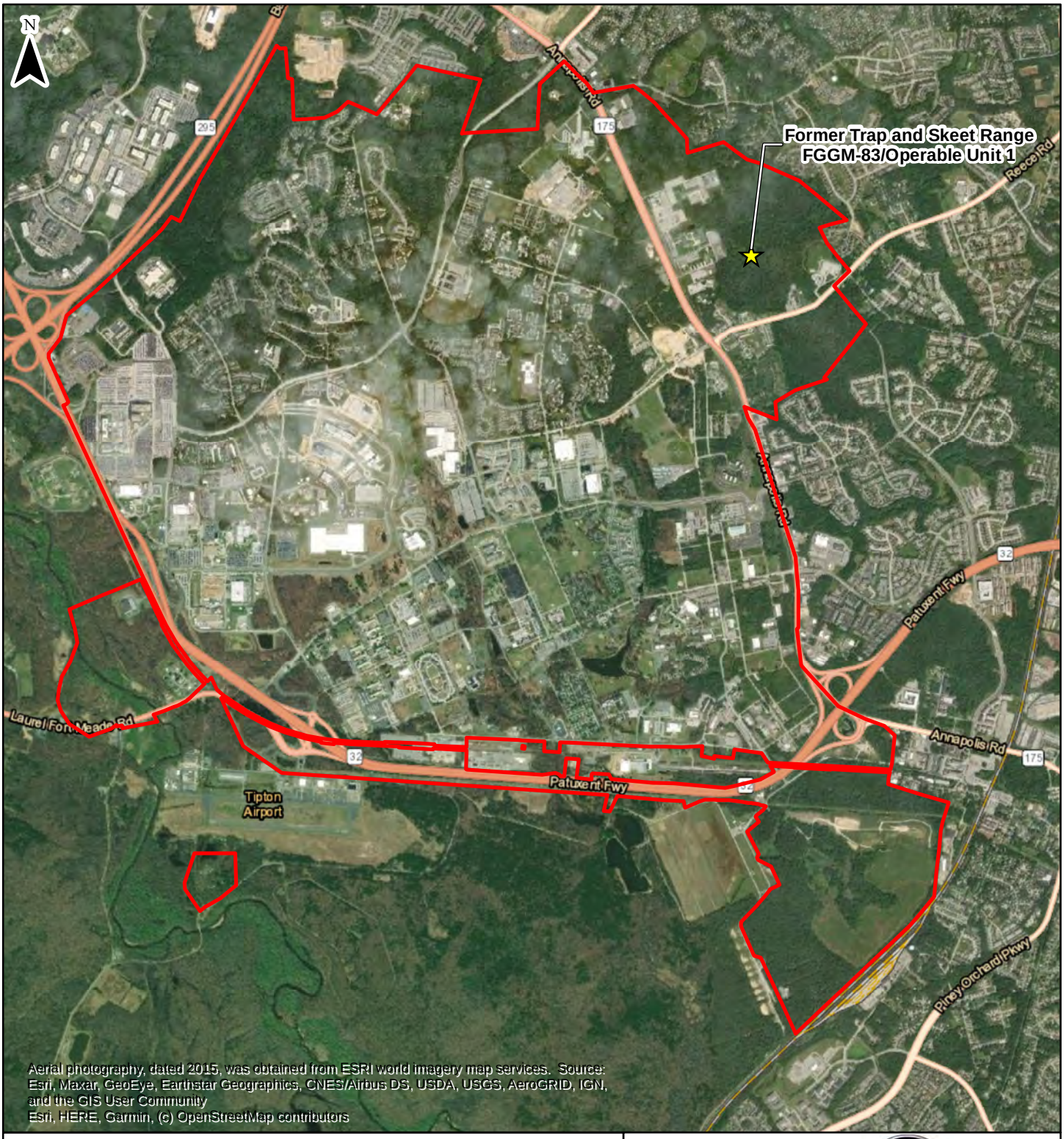
Regional Map
Former Trap and Skeet Range
Fort George G. Meade, Maryland

SERES ARCADIS a joint venture

FIGURE 1

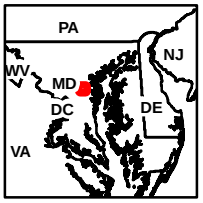
Created by: MJH Date: 2/24/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig1\Ft_Meade_Fig1.R2.mxd

Project Number: JV2117



Site Location

Fort George G. Meade Boundary



0 1,500 3,000 6,000 Feet

Source: Aptim 2019

NAD 1983 StatePlane Maryland FIPS 1900 Feet

Site Location Map
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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FIGURE 2

Created by: MJH Date: 2/24/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 2\Ft_Meade_Fig2.R2.mxd

Project Number: JV2117

Former Firing Line
Sand Berm
Former Building

Notes:
1) Wetland source = National Wetlands Inventory, U.S. Fish & Wildlife Service.
2) Topography source = FGGM GIS.
3) Former building locations are approximate.
4) 2010 aerial = ArcGIS Image Service Ortho/Color_2010

Source: Aptim 2019

0 100 200 400 Feet

NAD 1983 StatePlane Maryland FIPS 1900 Feet

Aerial Photo, 2010
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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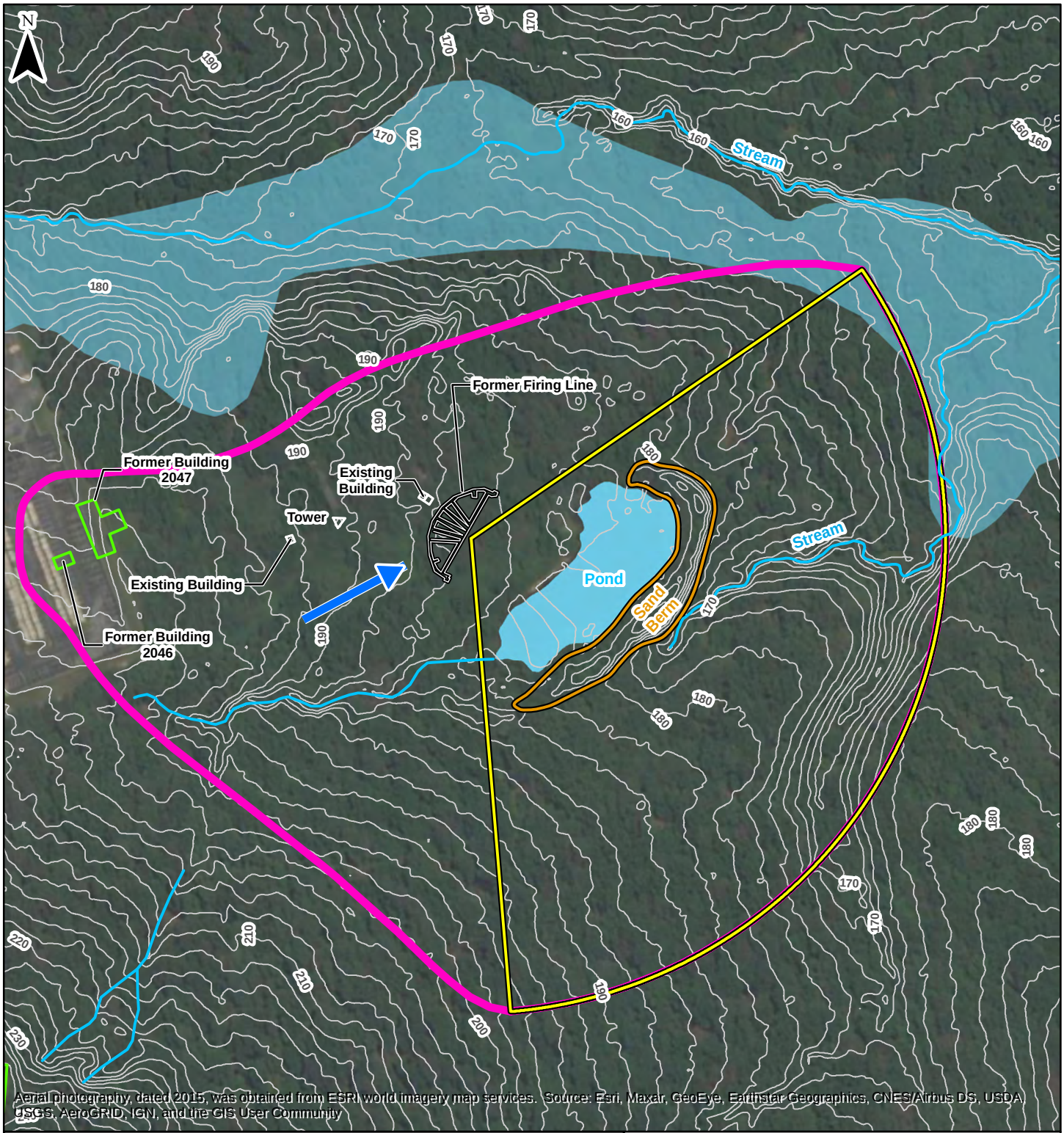
FIGURE 3

Created by: MJH Date: 2/24/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 3 (old Fig 4)\Ft_Meade_Fig3.mxd

Project Number: JV2117



Groundwater Flow Direction
Ground Surface Contour (2-Foot Interval)
Water Feature
Former Firing Line
Former Firing Fan
Sand Berm
Site Boundary
Former Building
Wetland
Water Body

Source: Aptim 2019

Notes:
1) Wetland source = National Wetlands Inventory, U.S. Fish & Wildlife Service.
2) Topography source = FGGM GIS.
3) Former building locations are approximate.

0 100 200 400 Feet

NAD 1983 StatePlane Maryland FIPS 1900 Feet

Site Features
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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FIGURE 4

Created by: MJH Date: 2/24/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 4 (old Fig 3)\Ft_Meade_Fig4.R1.mxd

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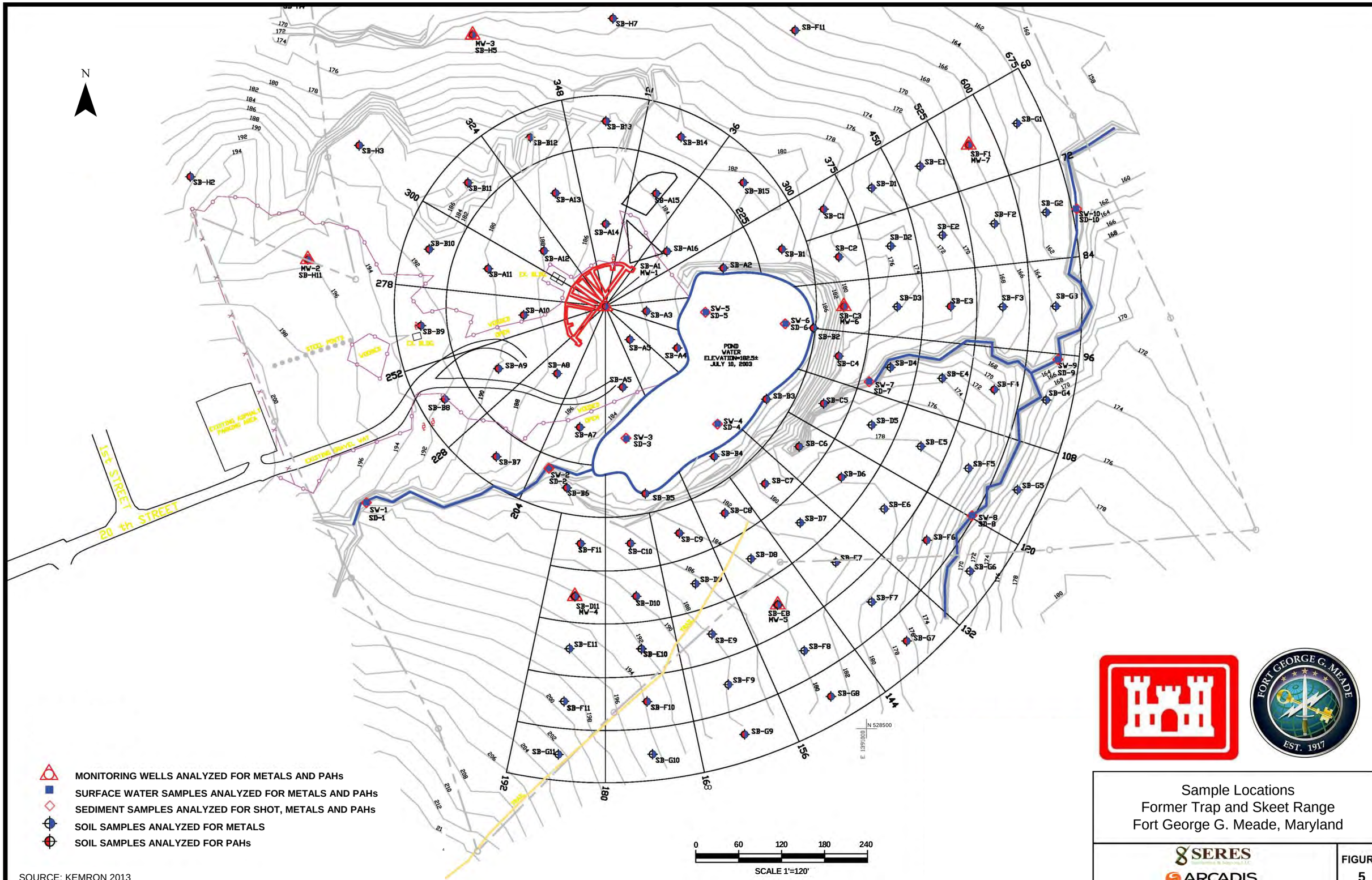

SOURCE: KEMRON 2013

FORT GEORGE G. MEADE EST. 1917

Sample Locations
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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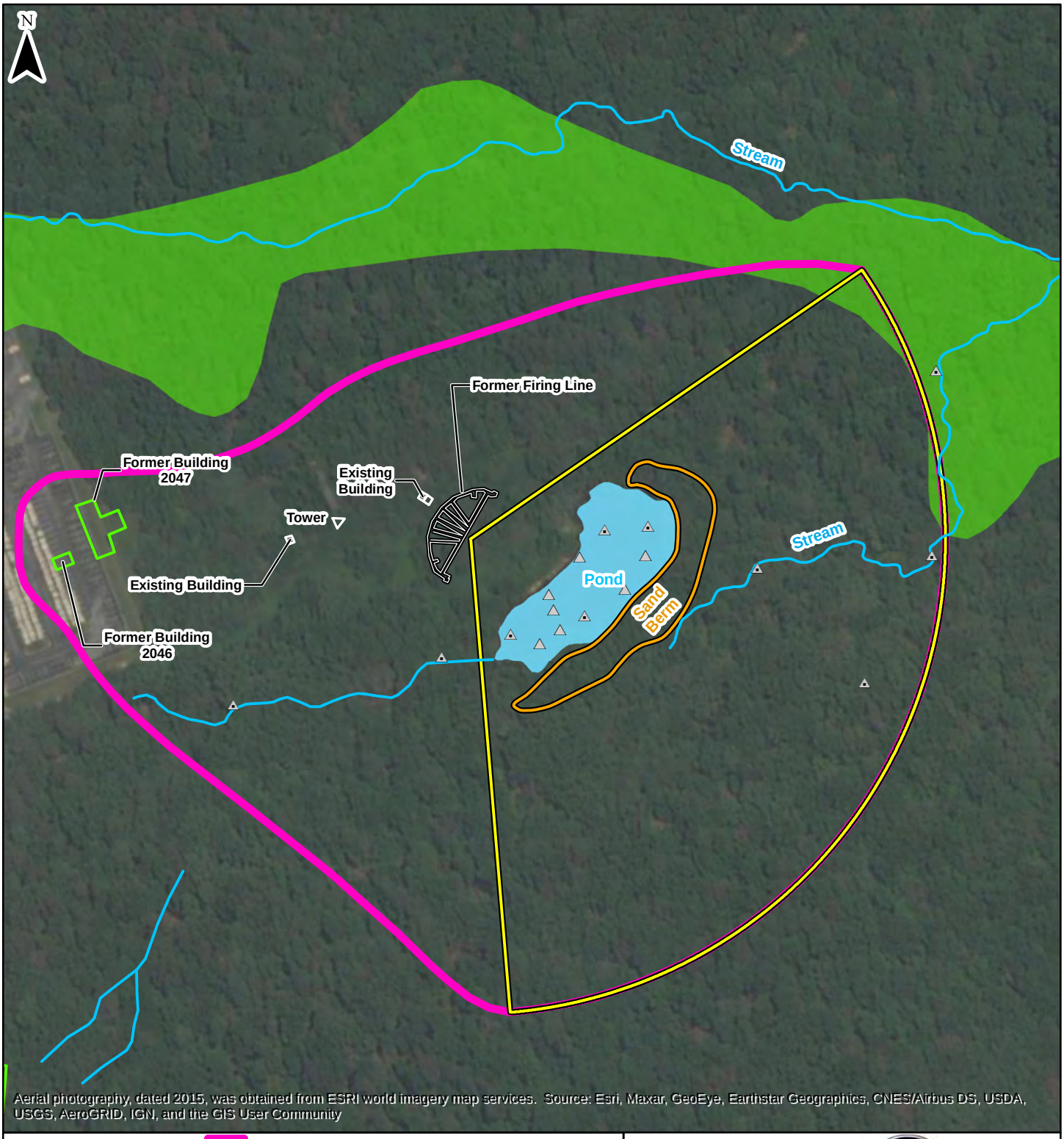
FIGURE
5



Aerial photography, dated 2015, was obtained from ESRI world imagery map services. Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sediment Sample Location (2010)

Surface Water/Sediment Sample Location (2004)

Site Boundary

Former Building

Wetland

Water Body

Water Feature

Former Firing Line

Former Firing Fan

Sand Berm

Source: Aptim 2019

Notes:
1) Wetland source = National Wetlands Inventory, U.S. Fish & Wildlife Service.
2) Topography source = FGGM GIS.
3) Former building locations are approximate.

0 100 200 400 Feet

NAD 1983 StatePlane Maryland FIPS 1900 Feet

Sediment and Surface Water Sample Locations
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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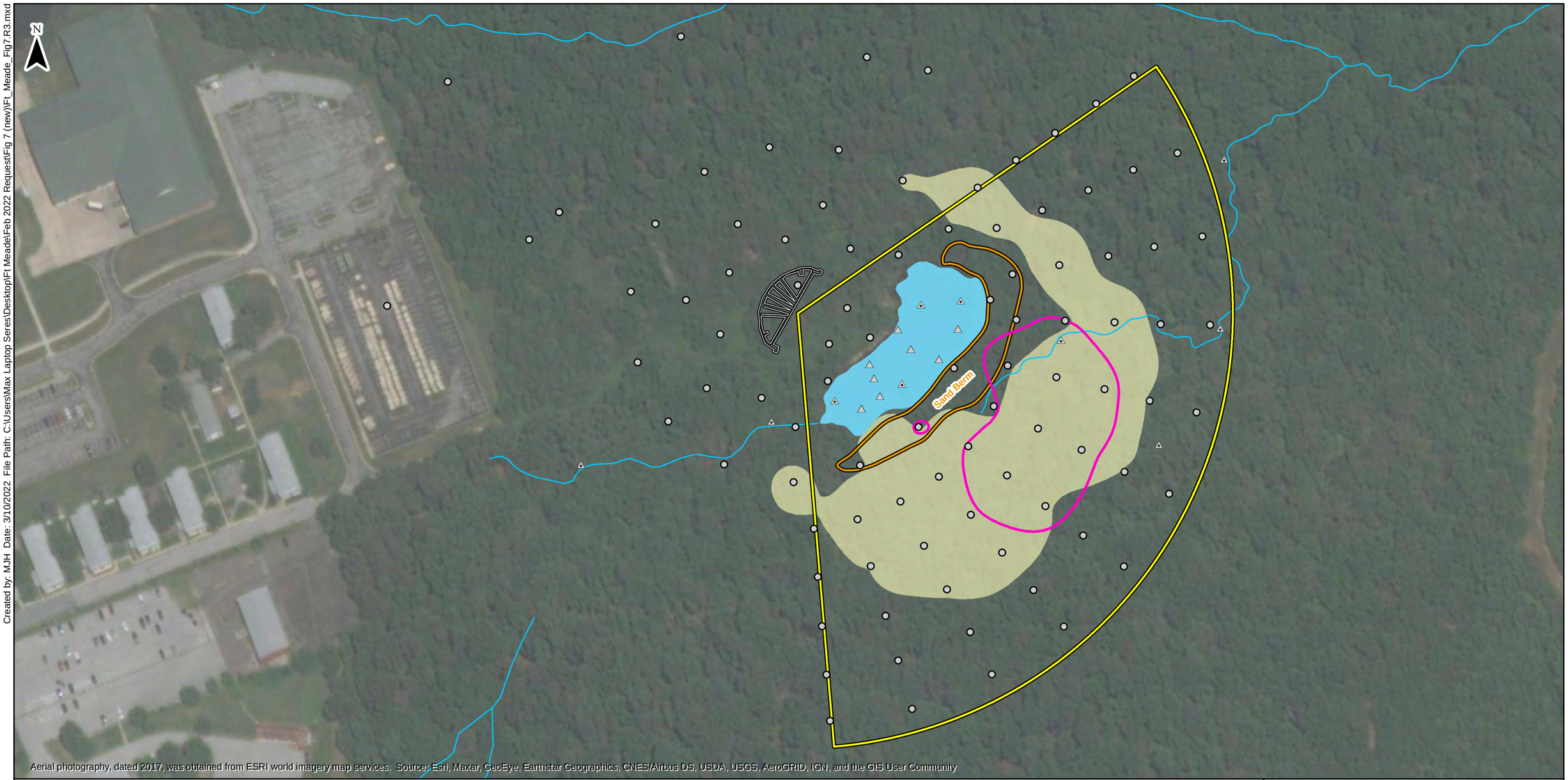
FIGURE 6

Created by: MJH Date: 2/24/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 6 (new)\Ft_Meade_Fig6.R1.mxd

Project Number: JV2117

Created by: MJH Date: 3/10/2022 File Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 7 (new)\Ft_Meade_Fig7.R3.mxd

Project Number: JV2117



Aerial photography, dated 2017, was obtained from ESRI world imagery map services. Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Soil Sample Location (2004)
- Sediment Sample Location (2010)
- Surface Water/Sediment Sample Location (2004)
- Water Feature
- Former Firing Line
- Former Firing Fan
- Water Body
- Sand Berm

Lead in Surface Soil/Sediment (mg/kg)

- > 800

Lead Shot Count in Surface Soil/Sediment (counts/ft²)

- > 1000

Notes:

>	Greater than
counts/ft²	Amount of lead shots counted per square foot
mg/kg	Milligram per kilogram

0 75 150 300 Feet

Source: Aptim 2019

NAD 1983 StatePlane Maryland FIPS 1900 Feet

Lead in Surface Soil and Sediment
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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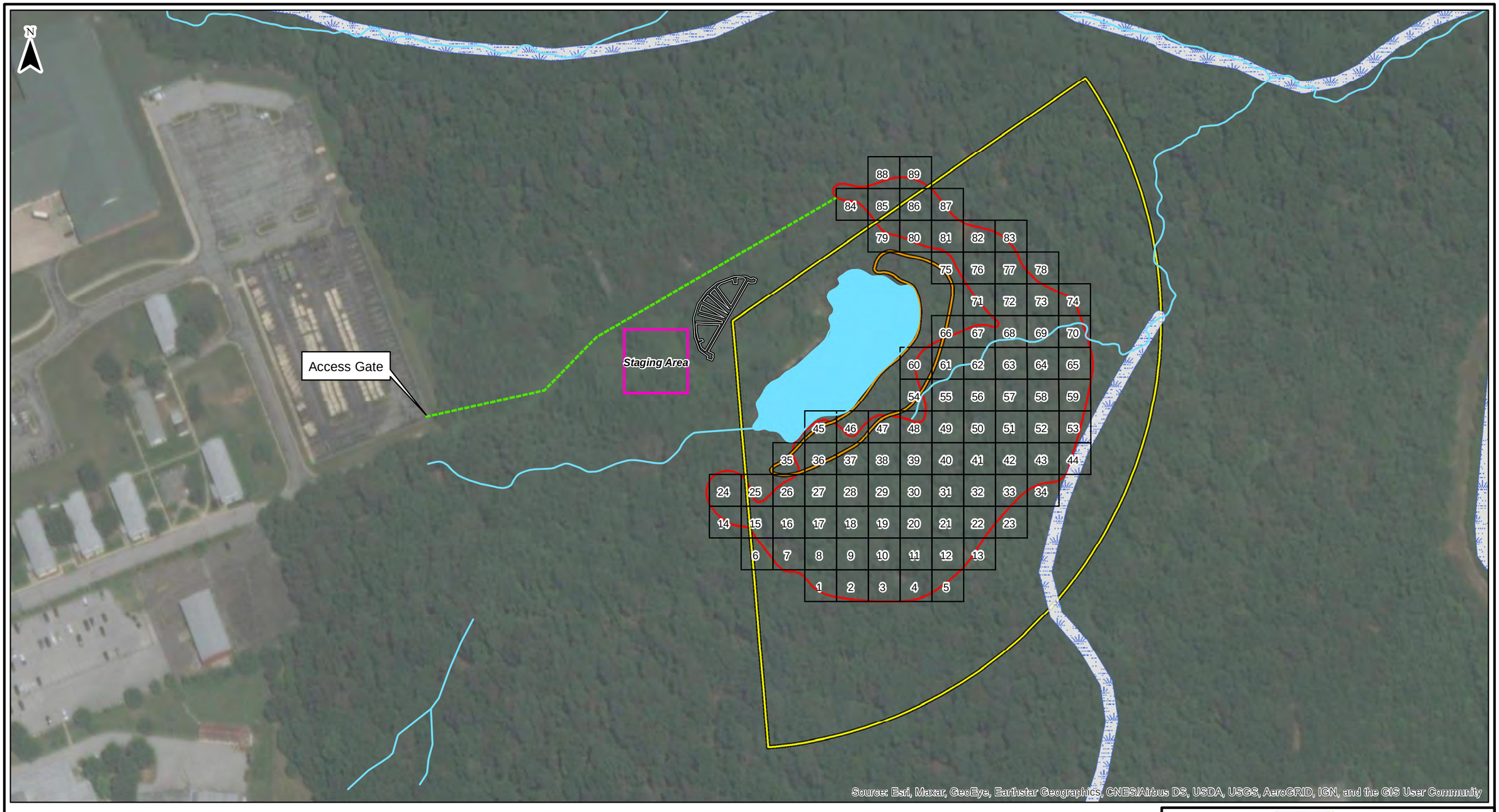
FIGURE 7



Water Feature
Former Firing Line
Proposed Access Road
Grid (50 feet x 50 feet)
Water Body
Former Firing Fan
Sand Berm
Wetlands
Staging Area
Approximate Extent of Removal Action
(> 800 mg/kg and/or > 1,000 counts/ft²)

0 150 300 Feet
GRAPHIC SCALE

Notes:
> Greater than
counts/ft² Amount of lead shots counted per square foot
mg/kg Milligram per kilogram

Proposed Surface Soil and Sediment Removal
Former Trap and Skeet Range
Fort George G. Meade, Maryland

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FIGURE
8

Path: C:\Users\Max Laptop Seres\Desktop\Ft Meade\Feb 2022 Request\Fig 8 (old Fig 9)\Ft_Meade_Fig8.R4.mxd

Comments on the
Draft Proposed Remedial Action Plan, Former Trap and Skeet Range (FGGM-83, OU1), Fort George G. Meade, Maryland, August 2022

Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification

Comment Number	Commenter	Page(s)	Section	Line(s)	Comment	Response Code	Response
1	Elizabeth Green, Ph.D.	General Comment			As of July 1, 2020, Code of Maryland Regulations 26.14.02.06E(2) allows the Maryland Department of the Environment (MDE) to establish a residential soil cleanup standard, predicated on a blood lead reference value (BLRV) of 5 micrograms per deciliter. MDE has therefore established 200 milligrams per kilogram as a residential soil cleanup standard. Since inclusion of this regulation in this Proposed Remedial Action Plan would not change the remedy selection or its protectiveness for potential residents, MDE's Federal Facilities Installation Restoration Program is not requesting this change. However, please note that this will be considered an applicable or relevant and appropriate requirement for future actions involving lead contamination in soil. A fact sheet on MDE's lead soil screening update can be found at https://mad.maryland.gov/programs/LAND/MarylandBrownfieldVCP/Documents/Lead%20Soil%20Standards%20Update%20FINAL.pdf	A	Comment noted.
2	Elizabeth Green, Ph.D.	6	Summary of Site Risks		This section should conclude with standard, required language from United States Environmental Protection Agency's (USEPA) guidance on Proposed Plans ("A Guide to Preparing Superfund Proposed Plan, Records of Decision, and Other Remedy Selection Decision Documents," USEPA, July 1999): "It is the lead agency's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment."	A	The following passage has been added to the beginning of the last paragraph of the "Summary of the Preferred Alternative for the Former Trap and Skeet Range" section: "It is the U.S. Army's current judgement that the Preferred Alternative identified in this PRAP, or one of the other active measures considered in the PRAP, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment."
3	Elizabeth Green, Ph.D.	7	Summary of Remedial Alternatives		Please include the estimated time for completion for Remedial Alternatives 2 and 3 in this section. The estimated time to completion is listed in Table 2, but it would be helpful to include this information in this section as well.	A	The following sentence has been placed at the end of each discussion of Alternatives 2 and 3 in the "Summary of Remedial Alternatives" section: "The estimated duration for execution and completion of remedial activities for Alternative [2 or 3] is 1 to 2 years."
4	Robert Stroud, RPM	1 & 7			Lead was not the only COC. Antimony (hot spot) and benzo[a]pyrene were also human health COCs for future unrestricted use.	D	Concentrations of PAHs and antimony are summarized in the "Soil" subsection to provide a general Nature and Extent discussion. This PRAP focuses on identifying a preferred remedial alternative to address unacceptable risks for ecological receptors attributed to lead and lead shot in soil. The HHRA concluded there are no unacceptable risks to human health based on the current and reasonably anticipated future land uses and LUCs would prohibit unrestricted use. Alternative 3 provides LUCs to prohibit future residential land use.

Comments on the

Draft Proposed Remedial Action Plan, Former Trap and Skeet Range (FGGM-83, OU1), Fort George G. Meade, Maryland, August 2022

Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification

Comment Number	Commenter	Page(s)	Section	Line(s)	Comment	Response Code	Response
5	Robert Stroud, RPM	5	Table 1		Table 1 omitted the potential residential receptors (which form the basis for needing to ensure the site will not have unrestricted use).	D	Table 1 presents the results of the Human Health Risk Assessment based on Youth and Adult Trespasser scenarios and the Adult Construction Worker scenario as reasonably anticipated based on future land use. The HHRA did not evaluate potential future residential land use scenarios. The HHRA calculated a cumulative risk based on all COPCs with the exception of lead. Lead was evaluated separately. The HHRA found that there was neither unacceptable cumulative risk, nor lead risk for reasonable anticipated future land use of troop and professional/institutional. Site-wide average concentrations of lead would exceed the residential RSL. It is known that concentrations of lead in soil, following the remedial action, will remain above levels suitable for unrestricted residential use and would require land-use restrictions through LUCs. Therefore, addition of the unrestricted human exposure to Table 1 would not be relevant to the preferred alternative for which it was designed.
6	Robert Stroud, RPM	5	Human Health Risk Assessment	Last paragraph	The document goes into detail about HIs and cancer risks, but then does not explain that lead's risks are evaluated neither by HI nor cancer risk, but by blood-lead modeling. A brief discussion of the changes in lead modeling and screening since 2013 should be included. Essentially, the most recent iteration of the Adult Lead model confirms that the proposed average PRG concentrations would be acceptable for industrial use even at 5 ug/dL; the most recent iteration of the IEUBK model reinforces that the soil concentrations would not be acceptable for residential use.	A	The last paragraph in the "Baseline Human Health Risk Assessment" has been modified to state: "The risks in Table 1 do not include the pathway exposure additive risk for lead. Lead was assessed with the arithmetic mean lead soil concentration input into blood-level modeling procedures including the Integrated Exposure-Uptake Biokenetic Model, the Adult Lead Model, and the All-Ages Lead Model. The mean concentrations found in sediments southeast of the pond (666 mg/kg), soil within 375 ft of the firing point (495 mg/kg), and soil outside 375 ft of the firing point (473 mg/kg) were applied to these models. These concentrations were below the USEPA Region 3 industrial lead soil screening level of 800 mg/kg, and the 750 mg/kg concentration of concern using the Adult Lead Model for the maximally exposed receptor (commercial indoor worker), under the intended future land use scenario. However, these mean lead concentrations were above the residential soil screening level of 400 mg/kg. The HHRA recommended land use restrictions be implemented which would require a re-evaluation of risk from exposure to lead if the site were to be designated for residential land use."
7	Robert Stroud, RPM	7	Alternative 2: Protective Cover and LUCs		The remedy discusses a protective cover of 1-ft thick of clean fill over the site to prevent direct exposure of potential ecological receptors. As BTAG considers the top 2-ft of soils as the exposure unit for ecological risk, it is unclear from this discussion on how a 1-ft cover will be protective. This needs to be discussed in the document or provided in a response. Along with the above, if this soil cover is to be used it needs to be noted that as part of the O&M would require monitoring of the thickness of the cap.	D	Comment noted. A protective cover of 1-ft was presented as part of Alternative 2 in the approved Feasibility Study. Alternative 2 would require routine inspections of the cap as an element of LUCs which would note the condition including changes in cap thickness. The Army notes that Alternative 2 is not the preferred remedial alternative being recommended in the OU1 PRAP.

Comments on the							
Draft Proposed Remedial Action Plan, Former Trap and Skeet Range (FGGM-83, OU1), Fort George G. Meade, Maryland, August 2022							
Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification							
Comment Number	**Commenter**	**Page(s)**	**Section**	**Line(s)**	**Comment**	**Response Code**	**Response**
8	Robert Stroud, RPM	8	Alternative 2 & 3		Both alternative 2 and 3 discuss stream remediation would be required. A sentence should be added providing the approximate stream length that needs to be remediated to help provide clarity of the work that is going to be completed.	A	The referenced stream remediation discussion under Alternative 2 has been modified to state: "Stream remediation would be required for the impacted streams east of the pond where sediment would be removed from the contaminated areas and approximately 50 linear ft of streams would be restored and stabilized." The referenced stream remediation discussion under Alternative 3 has been modified to state: "Stream restoration would be performed by backfilling the approximately 50 linear ft of stream length to match the existing channel geometry."

COMMENTS PROVIDED BY				
Date	Name	Department/ Organization	Email Address	Phone
10/04/2022	Elizabeth Green, Ph.D.	MDE	elisabeth.green@maryland.gov	410-537-3346
10/28/2022	Robert Stroud, RPM	USEPA	stroud.robert@epa.gov	410-305-2748

Comments on the
Draft Final Proposed Remedial Action Plan, Former Trap and Skeet Range (FGGM-83, OU1), Fort George G. Meade, Maryland, January 2023

Response Code: A = Agree with comment D = Disagree with comment C = Comment requires clarification

Comment Number	Commenter	Page(s)	Section	Line(s)	Comment	Response Code	Response
1	Elizabeth Green, Ph.D.	11	Table 4		The preferred alternative (Soil Removal, Resource Conservation and Recovery Act Subtitle D Disposal, and Land Use Controls) will include removal of lead-impacted sediment along approximately 50 feet an intermittent stream at the Former Trap and Skeet Range. The preferred alternative includes restoring and stabilizing the stream bed to the existing channel geometry once the removal is complete. Any work impacting the stream bed will need to meet the substantive requirements of the following Code of Maryland Regulations (COMAR): --COMAR 26.17.04.02 (Definitions) --COMAR 26.17.04.04 (Permit Applications--General Requirements) --COMAR 26.17.04.08 (Temporary Construction in a Stream Channel or Floodplain) Please Include these citations in Table 4 (Summary of Potential Action-Specific Applicable or Relevant and Appropriate Requirements) of the subject document.	A	These citations have been added to Table 4 (Summary of Potential Action-Specific Applicable or Relevant and Appropriate Requirements).

COMMENTS PROVIDED BY

Date	Name	Department/ Organization	Email Address	Phone
03/28/2023	Elizabeth Green, Ph.D.	MDE	elisabeth.green@maryland.gov	410-537-3346