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

July 18, 2014

Environmental Division

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

Dear Mr. Burchette:

Enclosed please find the July 2014 *Final Proposed Plan FGGM-74, Architect of the Capitol* (Plan). The Plan has been revised based on comments received from the United States Environmental Protection Agency (USEPA) on June 19, 2014, and the Architect of the Capitol (AOC) on March 31, 2014. The Maryland Department of the Environment (MDE) approved the Draft Final Plan on April 3, 2014, and the USEPA approved the Final (submitted via email) on July 17, 2014. Copies of the Plan have been furnished to Mick Butler (Fort George G. Meade), Francis Coulters (U.S. Army Environmental Command), Sherry Deskins (AOC), Elisabeth Green (MDE), and the Fort Meade Restoration Advisory Board.

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

Sincerely,

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

Enclosure

ARCADIS

Imagine the result

FINAL Proposed Plan

FGGM-74, Architect of the Capitol
Fort George G. Meade, Maryland

July 2014

FINAL PROPOSED PLAN FOR THE ARCHITECT OF THE CAPITOL (FGGM-74) FORT GEORGE G. MEADE, MARYLAND

July 2014

INTRODUCTION AND PURPOSE

This Proposed Plan (PP) provides information necessary to allow the public to participate with the United States (U.S.) Department of the Army (Army) and U.S. Environmental Protection Agency (USEPA), in selecting the appropriate Remedial Alternative (RA) for the Architect of the Capitol (AOC) (FGGM-74) at Fort George G. Meade (FGGM), Maryland. FGGM-74 ("the Site") is located on the southeastern corridor of FGGM and is bound by Rock Avenue to the north, Route 32 to the south, Pepper Road to the east, and Remount Road to the west. **Figure 1** illustrates the location of the Site. Throughout this document figure and table references are bolded. In addition, bolded terms are defined in the Glossary Section.

This PP summarizes information found in detail in the ***Remedial Investigation*** (RI), Supplemental RI and the ***Focused Feasibility Study*** (FFS) as well as other reports that are available for review as part of the ***Administrative Record*** file for this Site. This PP describes the Preferred RA for addressing soil and groundwater at the Site and outlines all RAs identified during the FFS (ARCADIS U.S., Inc. [ARCADIS], 2014).

The Army and USEPA will present the selected RA for the Site in a ***Record of Decision*** (ROD). The public is encouraged to comment on the Preferred RA presented in this PP as well as the other RAs considered. Information about how to submit comments may be found in the "Community Participation" section of this PP.

The Army at FGGM and USEPA jointly issue this PP, with support from the Maryland Department of the Environment (MDE), in order to fulfill the public participation requirements under Section 117(a) of the ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980*** (CERCLA) and the ***National Oil and Hazardous Substances Pollution Contingency Plan*** (NCP), Section 300.430(f)(2). The Army and AOC at FGGM, USEPA, and MDE encourage the public to review all of the documents relevant to activities conducted at the Site in order to provide comment on an appropriate RA for the Site. Pertinent information regarding the public meeting and comment period is provided in this PP.

IMPORTANT DATES AND LOCATIONS

Public Meeting: August 7, 2014 at 7:00 pm
The Army will hold a public meeting to explain the PP and all Response Actions presented in the FFS. Oral and written comments will also be accepted at the meeting. The meeting will be held at Courtyard BWI Business District, 2700 Hercules Road, Annapolis Junction, Maryland 20701-1030.

Public Comment Period:
July 24, 2014– August 22, 2014
The Army will accept written comments on the PP during the public comment period.

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

Anne Arundel County Public Library
West County Area Branch
1325 Annapolis Rd.
Odenton, Maryland 21113

Additional information is maintained at the following locations:

Fort Meade Environmental Division Office
4215 Roberts Avenue, Room 320
Fort Meade, Maryland 20755

REMEDIAL ALTERNATIVES

Soil Remedial Alternatives

Remedial Alternative SL-1: No Action

Remedial Alternative SL-2: Land Use Controls

Remedial Alternative SL-3: Lead Hot Spot Excavation with Off-Site Disposal.

Groundwater Remedial Alternatives

Remedial Alternative GW-1: No Action.

Remedial Alternative GW-2: Land Use Controls with Long-Term Monitoring of Groundwater.

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

Based on the RI and FFS, the Army's Preferred RA is:

- Alternative SL-3 – Lead Hot Spot Removal with Off-site Disposal.
- Alternative GW-2 – Land Use Controls (LUCs) and Long-term Monitoring (LTM) of Groundwater.

This RA addresses both soil and groundwater contamination at the Site.

The results of a ***Human Health Risk Assessment*** (HHRA), performed as part of the RI, indicated that lead concentrations in soil at two hot spot areas at depths of 7 and 10 feet below ground surface (ft bgs) present an unacceptable risk to the future commercial worker and hypothetical resident under a hypothetical regrading or excavation scenario. The results of the HHRA also indicate that inorganics (metals) present in shallow groundwater present an unacceptable risk under future commercial worker and hypothetical resident scenarios if shallow groundwater is used for potable purposes. The primary (non-residential) future receptors at risk are:

- Future commercial workers who may be exposed to subsurface soil lead hot spots due to excavation or grading activities; and,
- Use of shallow groundwater as a source of drinking water.

For lead in soil, there is no unacceptable risk from exposure to surface soils under a current (commercial worker) scenario. Additionally, for the commercial worker scenario, shallow water is not used for potable purposes so there is no risk from groundwater under current use conditions.

The Preferred RA presented in this PP is protective of human health and the environment, meets the CERCLA threshold criteria, and provides the best combination of balancing criteria when evaluated against the CERCLA requirements.

SITE BACKGROUND

FGGM is located approximately midway between Washington, D.C. and Baltimore, Maryland in Anne Arundel County, Maryland, as illustrated on the regional map in **Figure 2**. FGGM became an Army installation in 1917 and encompasses 9,349 acres. The installation was originally named Camp Meade but changed to Fort George G. Meade on March 5, 1929. During World War I (WWI), over 100,000 soldiers passed through FGGM. The 79th, 92nd, and 11th Infantry Divisions trained at the installation, and an Ordnance Supply School was established in 1918. When the war ended, FGGM served as a demobilization center for returning troops. FGGM became a permanent Army installation after WWI.

By 1940, there were 251 permanent and 218 temporary buildings and over 2,100 enlisted soldiers on post. By December 1941, the total land acquired by FGGM had grown to approximately 13,800 acres. After World War II, the National Security Agency (NSA) relocated to FGGM, and Tipton Airfield was constructed in 1960. In 1988, FGGM was realigned under the first round of Base Realignment and Closure (BRAC). The BRAC program authorized 9,000 acres to be divested from FGGM. The Army retained 900 acres of the BRAC parcel which included Tipton Airfield, which would later be transferred to Anne Arundel County in 1999. Following the 1988 BRAC realignment, the installation covered 5,142 acres.

The USEPA placed FGGM on the ***National Priority List (NPL)*** on July 22, 1998, after an evaluation of contamination due to past storage and disposal of hazardous substances. The Federal Facility Agreement (FFA) was signed by the Army, USEPA, the AOC, and the Department of the Interior, and the remedial work is continuing under CERCLA and the NCP as well as the ***Defense Environmental Restoration Program*** (DERP) and the Installation Restoration Program.

The current installation boundaries encompass the area previously referred to as the cantonment area, which is used for administrative, recreational, and housing facilities. FGGM contains approximately 65.5 miles of paved roads, 3.3 miles of secondary roads, and about 1,300 buildings. Major tenants at Fort Meade include the NSA, the Defense Information School, the U.S. Army Intelligence and Security Command, the Naval Security Group, the 70th Intelligence Wing (Air Force), and USEPA. The 93-acre AOC parcel located on the southeastern corridor of FGGM was transferred to the AOC from the Army effective September 30, 1994.

Architect of the Capitol (FGGM-74) History

Based on historical field reconnaissance and review of historical aerial photographs, the property was used historically for a variety of purposes, including: warehouses and storage for the Former Defense Reutilization and Marketing Office, Transportation Motor Pool Facility, electrical substation, tractor trailer storage, and additional warehouse storage buildings. Other areas identified on the property include a suspected fill area, a compost area, a gravel fill area, a former railroad bed, and Commissary Warehouse Area (**Figure 3**).

Current and Future Use

The Site is presently owned by the AOC and is used to accommodate long-term storage and service needs of the Library of Congress and other Legislative Branch agencies. The area consists of undeveloped land, warehouse, and archive facilities, roads and vehicle parking areas and underground storage tanks associated with an existing motor pool managed by the Army on the extreme western portion of the AOC property. No redevelopment or future land use for other purposes is presently planned.

Historical Investigations

Multiple phases of environmental investigations and sampling have been conducted at the Site dating back to the late 1980s. The previously collected data is summarized in the Final Remedial Investigation Package for the Architect of the Capitol (ARCADIS, 2013a). Historical investigations and actions include tank removals and remediation (1988-2000), a soil vapor study (1990), Phase 1 environmental site assessment (early 1990s), and multiple rounds of remedial investigation sampling (2000-2011).

SITE CHARACTERISTICS

Architect of the Capitol (FGGM-74) Description

The 93-acre Site is located on the southeastern corridor of FGGM and is bound by Rock Avenue to the north, Route 32 to the south, Pepper Road to the east, and Remount Road to the west. The Site is bisected by the Rogue Harbor Branch which is a tributary to the Little Patuxent River. The local topography is relatively flat and surface water drainage is controlled and directed by storm water drains at the AOC parcel and the Rogue Harbor Branch.

Extent of Contamination in Soil

During the 2000/2001 and 2004/2005 RI analytical results for soil samples collected at the Site were screened using USEPA industrial soil Regional Screening Levels (RSLs), residential soil RSLs, the maximum background surface soil metal concentrations (Malcolm Pirnie, 2001), and the residential risk based concentration (RBC) for lead, when applicable. Only one location, designated at DPT/GW-29, was found to have elevated lead concentrations above the residential RBC of 400 milligrams per kilogram (mg/kg). DPT/GW-29 is located adjacent to the Trailer Storage Area and the lead concentration was 3,350 mg/kg at 6-8 ft bgs.

The 2010/2011 follow-up investigation was conducted to delineate this lead hot spot. Lead concentrations in soil samples were compared to 418 mg/kg which is the site-wide exposure point concentration (EPC) for residential exposures and was derived using the USEPA Integrated Exposure and Uptake Biokinetic (IEUBK) model.

Surface Soil

Between the two rounds of soil sampling completed to delineate the lead hot spot, 31 surface soil samples were collected. Lead detections observed in surface soil ranged from 3.2 mg/kg to 120 mg/kg and the site-wide EPC for surface soil was calculated to be 15 mg/kg in the 60 x 68 ft exposure area and 66 mg/kg in the 37 x 43 ft exposure area. The surface soil EPCs are well below the 418 mg/kg residential EPC.

Subsurface Soil

Table 1 presents a summary of subsurface soil results from the 2010/2011 sampling events. Elevated concentrations of lead in subsurface soil observed during the two rounds of sampling (2010/2011) are presented on **Figures 4** and **5**. Exceedances were limited to 7 and 10 ft bgs.

At 7 ft bgs, two elevated lead detections were observed at AOC GP01 (6,800 mg/kg) and AOC GP06 (5,200 mg/kg). At 10 ft bgs, four elevated lead detections were observed, AOC GP09 (3,300 mg/kg), AOC GP10 (5,600 mg/kg), AOC GP21 (1,500 mg/kg), and AOC GP27 (1,200 mg/kg).

These locations are within approximately 30 ft of the DPT/GW-29 hot spot identified during the 2000/2001 and 2004/2005 sampling events, as seen on **Figures 4** and **5**.

Table 1: 2010/2011 RI Subsurface Lead Results Summary

Analyte	Range of Concentrations (mg/kg)		Frequency of Detection	Calculated EPC – Total Soil (0 – 14 ft bgs) (mg/kg)		Soil Residential EPC[1] (mg/kg)
	Minimum	Maximum		60 x 68 ft Exposure Area	37 x 43 ft Exposure Area	
Lead	0.22	6,800	91/105	217	405	418

Notes;
[1] – Lead EPC for Residential Soil (418 mg/kg) was derived using USEPA IEUBK Model (win 32 Version 1.1 Build 11) assuming Geometric Standard Deviation of 1.6 in baseline blood levels, and a 5 percent probability of exceeding the 10 micrograms per deciliter (µg/dL) blood lead threshold.

mg/kg – milligram per kilogram

Extent of Contamination in Groundwater

Groundwater data were compared against the USEPA tap water RSLs (USPEPA, 2012) adjusted to a hazard limit of 0.1 and USEPA Maximum Contaminant Level (MCL) (for analytes with a MCL standard). A comprehensive summary of the detected inorganic (metal) constituents within groundwater is presented in the FFS.

Table 2 presents metals that exceeded USEPA RSLs protective of drinking water exposures (USEPA, 2012) adjusted to a hazard limit of 0.1. **Figure 3** depicts the groundwater sampling locations and the analytical results in exceedance of RSLs and MCLs.

Metals Results

Over the course of the sampling program (2000/2001 and 2004/2005) five metals exceeded the USEPA RSLs (aluminum [total], arsenic [total and dissolved], chromium [total], cobalt [total and dissolved], iron [total]). Of those five metals, three (arsenic [total and dissolved], chromium [total], and iron [total]) have documented USEPA MCLs and a subset of the locations in exceedance of USEPA RSLs were also found to be in exceedance of their respective USEPA MCL.

Information presented in previous reports documenting investigations conducted at the Site, including the RI (Malcolm Pirnie, 2008) and a Technical Memorandum (Malcolm Pirnie, 2007), have concluded there is no discernible plume of metals contamination or identifiable source(s) of inorganics in groundwater at the Site.

Table 2: Groundwater Regional Screening Level Exceedances

Analyte	Range of Concentrations (µg/L)		Frequency of Detection	Tapwater RSL		USEPA MCL		Upgradient Background Concentrations	
	Minimum	Maximum		RSL[1] (µg/L)	Number of Exceedances	MCL (µg/L)	Number of Exceedances	Mean Concentration[3]	Number of Exceedances
Metals									
Aluminum (total)	39.9	37,200	15/28	3,700	15	NS	NA	21,340	4
Arsenic (total)	0.59	25.5	17/27	0.045	17	10	10	19	8
Chromium[2] (total)	5.1	235	25/28	0.043	24	100	4	143	2
Cobalt (total)	0.96	127	25/28	1.1	25	NS	NA	8.0	13
Iron (total)	480	173,000	18/28	2,600	18	NS	NA	62,800	6
Arsenic (dissolved)	1.9	25.5	10/40	0.045	10	10	3	3.5	10
Chromium[2] (dissolved)	3.5	51.3	20/40	0.043	20	100	0	28	1
Cobalt (dissolved)	0.76	127	34/40	1.1	34	NS	NA	3.4	25

Notes:
[1] USEPA Regional Screening Levels (RSLs) for tap water (USEPA, 2011, May) used as Screening Criteria. RSLs based on noncancer endpoints ("n") were adjusted downward to reflect a Hazard Quotient limit of 0.1 for use as Screening Criteria for all compounds.
[2] Evaluated as hexavalent chromium.
[3] Architect of the Capitol Background Evaluation of Groundwater Conditions (Appendix G to the Supplemental RI/Revised HHRA [ARCADIS, 2013b]).
µg/L – micrograms per liter
MCL – Maximum Contaminant Level
RSL – Regional Screening Level
NA – Not Applicable.
NS – No Standard

This determination is supported by a background evaluation presented in the Supplemental RI (ARCADIS, 2013b). The background evaluation compared detected levels of inorganics in groundwater at the Site to upgradient groundwater reference wells NW-5, NW-6, and NW-7, located on the north side of Rock Avenue (**Figure 3**). Based on the conclusions of this evaluation, the concentrations of the majority of the inorganics in the Site groundwater are at levels comparable to upgradient groundwater, including aluminum, antimony, barium, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, mercury, nickel, selenium, thallium and vanadium. Because the background evaluation concluded that these inorganics are comparable to the concentrations in upgradient reference wells, no actions are warranted based on these contaminants of concern (COCs). However, the initial background evaluation for arsenic and cobalt was less conclusive regarding whether the concentrations of these inorganics are attributable to background. The on-site concentrations for both total and dissolved arsenic and cobalt are higher than upgradient background samples. Because of this uncertainty and because the concentration of arsenic in groundwater exceeds the MCL and the concentration of cobalt exceeds the RSL, arsenic and cobalt were not rejected as COCs, and remedial alternatives to address inorganics were evaluated in the FFS (ARCADIS, 2014).

While cobalt is used at low concentrations in numerous industrial applications, no such anthropogenic sources of cobalt have been identified during historical site investigation activities. It is possible that small, discrete and spatially limited sources of cobalt are present in the subsurface that could be contributing to groundwater concentrations above the RSL. However, considering there is no definable cobalt groundwater plume and only sporadic and isolated concentrations above criteria have been observed, there is no evidence to suggest a large-scale cobalt source is present at the Site, either in soil or groundwater, which would require treatment. It is also possible that the sporadic cobalt detections are related to naturally-occurring non-anthropogenic cobalt present in the formation.

The sporadic cobalt concentrations in the AOC and Operable Unit 4 (OU-4)/Lower Patapsco Aquifer (LPA) Study Area support the hypothesis that concentrations above criteria are due to slight changes in geochemical conditions which mobilize cobalt from naturally occurring soil minerals or, possibly, small, discrete, and spatially limited, anthropogenic cobalt sources. It is noted that the highest cobalt detection (127 micrograms per liter [µg/L] at NW-14) is located on the eastern side of the AOC property and falls within the volatile organic compound (VOC) plume originating in the upgradient OU-4 area and migrating south/southeast across the AOC parcel within the LPA. Geochemical conditions in the AOC and OU-4/LPA Study Area are highly spatially variable but there is evidence of incomplete reductive dechlorination and nitrate and sulfate reduction to indicate the presence of reducing conditions. Elevated concentrations of dissolved iron are also present at some monitoring locations, which supports the conclusion that conditions are suitable for the mobilization of metals, including cobalt. In addition, pH concentrations at the Site are variable and have the potential to influence metal speciation, solubility and

mobility, particularly at pH values of less than 5, or greater than 9, as observed at some monitoring locations.

While there are no specific identifiable sources or discernible plumes on the AOC parcel, alternatives to address the on-site concentrations of inorganics are presented in this PP as detected concentrations drive an unacceptable risk if shallow groundwater were to be used as a drinking water source in the future, as determined during the HHRA.

SCOPE AND ROLE OF THE RESPONSE ACTION

This response action represents the overall strategy for remediation at the AOC. The Site is one of many sites at FGGM that are in the CERCLA process. The Site Management Plan (URS, 2013) provides details on other sites at FGGM that will be addressed in separate response actions. The anticipated schedule for each of those sites is also provided in the Site Management Plan.

Based on historical investigations, unacceptable risks were determined for future use scenarios due to exposure to contaminants in soil and groundwater at the Site. These risks must be eliminated or controlled. This PP provides a summary of the RAs considered for soil and groundwater contamination at the Site and presents the Preferred RA (Alternative SL-3 – Lead Hot Spot Removal with Off-Site Disposal and Alternative GW-2 – LUCs and LTM of Groundwater).

SUMMARY OF THE SITE RISKS

As presented in the RI Report (Malcolm Pirnie, 2008) and the Technical Memorandum (Malcolm Pirnie, 2007), an HHRA was completed to identify contaminants of potential concern (COPCs) at the Site to be quantitatively evaluated as part of a hazard evaluation.

A Supplemental RI including a Revised HHRA (ARCADIS, 2013b) was completed to fill data gaps identified during the RI and update risks associated with the lead hot spot in subsurface soil and the presence of inorganics in groundwater. The Revised HHRA was completed in accordance with 40 Code of Federal Regulations (CFR) 300.430(d)(4) and USEPA guidance (USEPA, 1991).

Lead was identified as a COPC for soil during the 2010/2011 Supplemental RI based on the localized hotspot area of elevated lead concentrations. No other analyte was identified in exceedance of screening levels during the initial RI, and no others are considered COPCs.

Constituents were identified as COPCs for groundwater when the maximum concentration exceeded the USEPA's RSLs for tap water, which are protective of potable uses of groundwater (USEPA, 2011). RSLs based on non-cancer endpoints were divided by 10 to adjust from a target hazard quotient of 1 to 0.1 for identification of COPCs. Details of the HHRA methodology are presented in the Supplemental RI (ARCADIS, 2013b).

Human Health Risk Assessment

The Revised HHRA included in the Supplemental RI (ARCADIS, 2013b) identified potential risks associated with exposure to COPCs in soil and groundwater. Evaluated populations include:

Current receptors:

- Commercial outdoor worker at the AOC property (exposure to surface soils only)

Future receptors:

- Commercial worker at the AOC property (exposure to soil and groundwater)
- Construction/utility worker at the AOC property (exposure to subsurface soil)
- Hypothetical resident (adult and child) (exposure to groundwater and subsurface soil).

The following exposure pathways were quantitatively evaluated for future land-use scenarios:

- Ingestion of inorganics in groundwater used as drinking water by commercial workers and hypothetical residents (adult and child)
- Incidental dermal adsorption of inorganics in groundwater by construction/utility workers during trenching or excavation activities and hypothetical residents (adult and child)

Results of the HHRA

A summary of the HHRA results is presented on **Table 3**. The HHRA evaluation of the cancer risk and non-cancer hazard for the soil and groundwater media concluded the following:

- Potential hazards associated with lead concentrations in surface soil or combined surface and subsurface soil accounting for all samples across all depth intervals (0 – 14 ft) were evaluated using the USEPA's lead model (IEUBK model) and the predicted probabilities were found to be below the EPCs for all future receptors.
- Potential hazards associated with lead concentrations limited to subsurface soil at 7 ft and 10 ft bgs (i.e., lead hot spots) were evaluated using the USEPA's lead model (IEUBK model) and were found to present a level of concern for future commercial workers and hypothetical residents under a regrading or excavation activity where receptors are exposed to the two hot spot areas at depths of 7 and 10 ft bgs.
- Estimated reasonable maximum exposure (RME) cancer risk for future commercial workers exposed to dissolved concentrations of inorganics in groundwater is within the acceptable target risk range (1×10^{-4} to 1×10^{-6});

however, the non-cancer hazard estimate is greater than 1. The thyroid is the only target organ with a target organ-specific Hazard Index (HI) greater than 1. The compound within groundwater identified as the risk-driver for the future commercial worker is cobalt (dissolved).

- Estimated RME cancer risk for future commercial workers exposed to total concentrations of inorganics in groundwater are above the upper end of the target cancer risk range (1×10^{-4} to 1×10^{-6}) and the non-cancer hazard estimate is greater than 1. The thyroid is the only target organ with a target organ-specific HI greater than 1. The compounds within groundwater identified as risk-drivers for the future commercial worker is arsenic (total), chromium (total), and cobalt (total).
- Estimated RME cancer risk for construction/utility workers exposed to total and dissolved concentrations of inorganics in groundwater is below or at the lower limit of the acceptable target risk range (1×10^{-4} to 1×10^{-6}) and the non-cancer hazard estimate is less than 1.
- Estimated RME cancer risk for future hypothetical residents (adult and child) exposed to total and dissolved concentrations of inorganics in groundwater are above the upper end of the target cancer risk range (1×10^{-4}) and the non-cancer hazard estimate is greater than 1. The thyroid and vascular system/skin are the target organs with a target organ-specific HI greater than 1. The compounds within groundwater identified as risk-drivers for the future hypothetical resident (adult and child) are aluminum (total), arsenic (dissolved and total), chromium (dissolved and total), cobalt (dissolved and total), and iron (total).
- Potential hazards associated with lead concentrations in groundwater used as a drinking water source were evaluated using the USEPA's lead model (IEUBK model). Risk calculated for the future hypothetical resident (child 0 to 84 months) did not exceed the USEPA's target level (5 percent predicted probability of exceeding a blood lead level greater than 10 micrograms per deciliter ([µg/dL]). Because a hypothetical resident is considered more exposed relative to a commercial worker, blood lead concentrations associated with potential drinking water exposures by commercial workers are also expected to be below USEPA's target risk management threshold.

The HHRA assumed that future receptors could hypothetically use shallow groundwater for drinking purposes. The hypothetical drinking water pathway is a major contributor to the elevated cumulative cancer risks and non-cancer hazards calculated for the future commercial worker. However, the groundwater at the Site is not currently used as a source of drinking water.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment 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 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 contaminants of concern 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, and 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 maximum 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 10^{-4} 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. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For non-cancer health effects, a hazard index (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a threshold level (measured as an HI of less than 1) exists below which non-cancer health effects are not expected.

Screening Level Risk Assessment

A Screening Level Ecological Risk Assessment (SLERA) was also performed as part of the RI (Malcolm Pirnie,

2008). A SLERA is a conservative assessment that provides a high level of confidence in determining a low probability of adverse risk to potential ecological receptors that aids in determination if further ecological assessments are required. The SLERA indicated that no further evaluation was required and is not discussed further in this PP.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are based on human health and environmental factors, which are considered in the formulation and development of RAs. Such objectives are developed based on the criteria outlined in 40 CFR 300.430(e)(2) and CERCLA Sec. 121(b).

The RAOs for the Site have been developed in such a way that attainment of these goals will result in the protection of human health and meet ***Applicable or Relevant and Appropriate Requirements (ARARs)*** identified pursuant to 40 CFR 300.400(g). Potential ARARs for groundwater are chemical-specific and include the Safe Drinking Water Act National Primary Drinking Water Regulations at 40 CFR 141 through 146 which establishes USEPA MCLs for drinking water. There are no location- or action-specific ARARs for groundwater. For soils, potential ARARs are action-specific and include substantive provisions of the erosion and sediment control regulations under Code of Maryland Regulation (COMAR) 26.17.01.07 and 26.17.01.11, disposal of controlled hazardous substances regulations, COMAR 26.13.02.02, 26.13.02.03, 26.13.02.05A (1), and 26.13.03.01 through 26.13.03.06, and control of noise pollution regulations, COMAR 26.02.03.02 and 26.02.03.03. There are no chemical- or location-specific ARARs for soils.

The RAOs for the Site are:

- To prevent human exposure to soil that would cause unacceptable risk to human health.
- To prevent human exposure to groundwater that would cause unacceptable risk until contaminant concentrations in groundwater are reduced so the groundwater does not pose unacceptable risk and the aquifer's potential for beneficial use is restored.

Table 3: Summary of Site-Specific Cancer Risk/Non-Cancer Hazard Estimates

Scenario Timeframe and Receptor	Exposure Medium	Estimated Potential Cancer Risk	Estimated Potential Non-Cancer Risk	Exposure Point Concentrations
Current				
Commercial Outdoor Worker	Surface Soil - Lead 60 x 68 ft area 37 x 43 ft area	--	--	15 mg/kg 66 mg/kg
Future				
Commercial Worker	Tap Water (Groundwater) – Dissolved	7E-05	Total HI: **3** Thyroid Endpoint Specific HI: **2** Gastrointestinal Tract Endpoint Specific HI: 0.12	--
	Tap Water (Groundwater) – Total	**3E-04**	Total HI: **5** Thyroid Endpoint Specific HI: **2** Gastrointestinal Tract Endpoint Specific HI: 1	--
	Surface Soil - Lead 60 x 68 ft area 37 x 43 ft area	--	--	15 mg/kg 66 mg/kg
Construction / Utility Worker	Total Soil (0-14 ft bgs) – Lead 60 x 68 ft area 37 x 43 ft area	--	--	217 mg/kg 405 mg/kg
	Subsurface Soil (7 ft) - Lead	--	--	427 mg/kg[1]
	Subsurface Soil (10 ft) - Lead	--	--	425 mg/kg[2]
	Tap Water (Groundwater) – Dissolved	5E-08 / 3E-08	2E-04 / 1E-04	
	Tap Water (Groundwater) – Total	1E-06 / 5E-07	1E-03 / 1E-03	
Hypothetical Resident (adult and child) Chromium evaluated as a mutagen[3])	Tap Water (Groundwater) – Dissolved	**5E-04**	--	--
	Tap Water (Groundwater) – Total	**5E-03**	--	--

Scenario Timeframe and Receptor	Exposure Medium	Estimated Potential Cancer Risk	Estimated Potential Non-Cancer Risk	Exposure Point Concentrations
Hypothetical Resident (adult and child) Chromium evaluated as a carcinogen but not as a mutagen[3])	Tap Water (Groundwater) – Dissolved	**3E-04**	--	**--**
	Tap Water (Groundwater) – Total	**2E-03**	--	**--**
Hypothetical Resident (adult and child)	Tap Water (Groundwater) – Dissolved	--	Total HI: **17** Thyroid Endpoint Specific HI: **13** Vascular System; Skin Endpoint Specific HI: **2**	**--**
	Tap Water (Groundwater) – Total	--	Total HI: **31** Thyroid Endpoint Specific HI: **13** Vascular System; Skin Endpoint Specific HI: **7** Gastrointestinal Tract Endpoint Specific HI: **7** None Reported Endpoint Specific HI: **3** Central Nervous System Endpoint Specific HI: **2**	**--**
	Surface Soil - Lead 60 x 68 ft area 37 x 43 ft area	**--**	**--**	15 mg/kg 66 mg/kg
	Total Soil (0-14 ft bgs) – Lead 60 x 68 ft area 37 x 43 ft area	**--**	**--**	217 mg/kg 405 mg/kg
	Subsurface Soil (7 ft) - Lead	**--**	**--**	**427 mg/**kg
	Subsurface Soil (10 ft) - Lead	**--**	**--**	**425 mg/kg**

Notes

[1] The EPC exceeds residential PRG (418 mg/kg) as a result of the lead concentrations at AOCGP01 and AOCGP06, which are considered lead hotspots and are the primary contributors to elevated lead EPCs at 7ft bgs.

[2] The EPC exceeds the EPC residential PRG (418 mg/kg) as a result of the lead concentrations at AOCGP09 and AOCGP10, which are considered lead hotspots and are the primary contributors to elevated lead EPCs at 10 ft bgs.

[3] As requested by the USEPA (August 6, 2012), chromium (total) was evaluated as hexavalent chromium, using a Tier 3 oral Cancer Slope Factor. In addition, because it had been proposed that hexavalent chromium has a mutagenic mode of action, risk estimates to future residents

-- Not Relevant

Basis for the Establishment of Remedial Action Objectives

A statutory goal of the DERP is "the identification, investigation, research and development, and cleanup of contamination from hazardous substances or pollutants or contaminants" (10 United States Code § 2701(b)). The statute also establishes as a goal to correct other environmental damage that "creates an imminent and substantial endangerment to the public health or welfare or to the environment." The DERP must be carried out in accordance with CERCLA and the NCP. The Army and USEPA are required to select remedies that attain a degree of cleanup that assures protection of human health and the environment.

It is the Army's current judgment that the Preferred RA identified in this PP will provide protection to human health and the environment from actual or threatened releases of hazardous substances into the environment.

Identification of Contaminants of Concern and Site Cleanup Levels

Through the RI, it has been determined that a remedial action is necessary to address soil and groundwater contamination at the Site under future land use scenarios.

As part of the FFS for the Site (ARCADIS, 2014), the contaminants detected in soil and groundwater were screened to identify COPCs. Details of the screening process are presented in Sections 3 and 4 of the FFS (ARCADIS, 2014). COPCs are further evaluated through a HHRA to determine which COPCs are COCs. In summary, COCs are defined as contaminants that have the potential to affect ecological receptors adversely due to its concentration, distribution, and mode of toxicity.

Soil

Based on the results of the HHRA for the commercial worker (non-residential) land use scenario, lead was identified as the only COC in subsurface soils for AOC. Lead was identified as a COC based on IEUBK model exceedances for exposure at 7 and 10 ft bgs.

The lead preliminary remediation goal (PRG) is the residential EPC (418 mg/kg) and was derived using USEPA's IEUBK Model (win 32 Version 1.1 Build 11) assuming Geometric Standard Deviation of 1.6 in baseline blood lead levels, and a 5% probability of exceeding the 10 µg/dL blood-lead threshold. The PRG is protective of the future hypothetical resident and is therefore also protective of the future commercial worker. The PRG for lead in soil is shown on **Table 4**.

Table 4: Site Cleanup Levels for Soil

Compounds of Concern	PRG Hypothetical Future Resident
Lead	418 mg/kg

Groundwater

For groundwater, the site cleanup levels are USEPA MCLs where they exist, and RBCs in the absence of promulgated MCLs, in accordance with the requirements of CERCLA. For groundwater COCs without MCLs, the higher of the practical quantitation limit (PQL) and USEPA's tap water RSL was the selected site cleanup levels. For the Site, the COCs for groundwater are aluminum (total), arsenic (total and dissolved), chromium (total and dissolved), cobalt (total and dissolved), and iron (total). The site cleanup levels for these constituents are presented in **Table 5**.

Table 5: Site Cleanup Levels for Groundwater

Compounds of Concern	Site Cleanup Levels[1] (µg/L)
Aluminum (total)	16,000
Arsenic (total/dissolved)	10
Chromium[2] (total/dissolved)	100
Cobalt (total/dissolved)	6
Iron (total)	11,100

Notes:

[1]Represents the MCL where promulgated. If an MCL is not available, represents the higher of the RSL and the PQL.

[2] Chromium evaluated as hexavalent chromium

SUMMARY OF REMEDIAL ALTERNATIVES

RAs for soil and groundwater contamination at the Site were developed and evaluated in the FFS (ARCADIS, 2014). The types of remedial measures considered for soil and groundwater remediation during the evaluation presented in the FFS included:

- No Action
- Soil and groundwater LUCs
- Soil excavation with off-site disposal
- Groundwater LTM

The RAs 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*** for the RA.

Remedial Alternative SL-1: No Action

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

CERCLA and the NCP require that a No Action alternative be evaluated at every site to establish a baseline for the comparison of other RAs pursuant to 40 CFR 300.430(e)(9). Under this alternative, no remedial action would take place.

Remedial Alternative SL-2: LUCs

Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $82,186
Estimated Present Worth Cost: $82,186

Alternative SL-2 would involve the implementation of LUCs. Under Alternative SL-2, existing LUCs already in place at FGGM, specifically institutional controls (ICs), would be maintained and enhanced. As previously mentioned, these LUCs would restrict the Site to non-residential use only.

The four general categories of ICs evaluated or already in use at FGGM, which provide layers of protection, are: governmental controls, proprietary controls, enforcement and permitting, and informational devices, each of which would assist with the management and implementation of LUCs. Most of these measures are already in place as elements of required procedures at FGGM and/or the AOC parcel. These elements include requirements to obtain excavation permits from the FGGM Directorate of Public Works for any intrusive activity at FGGM; Master Plan Regulations to ensure that installation projects are sited to meet operational, safety, physical security, and environmental requirements; the FGGM Geographic Information System (GIS) Database where restricted areas are demarcated; and FGGM access restrictions. In addition, the AOC requires the use of Right of Entry (ROE) documentation and the application for excavation permits for activities which may disturb soils. These controls have been developed taking into consideration all possible land uses at AOC, including residential, administrative, and industrial operations, and outdoor recreation. All existing LUCs, together with any additional requirements, would be incorporated into the CERCLA remedy for the Site under this alternative.

The following LUCs are in place at the AOC parcel located within the FGGM fence line to the extent allowed under the FFA:

- **Master Plan Regulations, Army Regulation (AR) 210-20**: The Army issued Master Planning for Army Installations, AR 210-20, on 16 May 2005 updating an earlier regulation dated 13 July 1987. AR 210-20 "establishes the requirement for an Installation Master Plan and planning board and specifies procedures for developing, submitting for approval, updating, and implementing the Installation Master Plan." This regulation provides for comprehensive

planning at Army installations and not only allows, but requires incorporation of existing land-use and conditions into the Master Plan. The master plan regulations provide a framework for comprehensive planning through the use of component plans, which include, but are not limited to, the following:

- Natural Resources Plan
- Environmental Protection Plan
- Installation Layout Vicinity Plan
- Land-use Plan
- Future Development Plan

The overall objective is to provide each installation with a master plan through the integration of each component plan into the Installation Master Plan. The component plans form a series of narrative, tabular, and graphic plans. Their integration into an Installation Master Plan provides many benefits as outlined in AR 210-20. The Army and AOC will coordinate to ensure LUCs are consistently documented in both Army and/or AOC Master Planning efforts relevant to the AOC parcel.

- **FGGM GIS Database:** FGGM maintains a comprehensive installation-wide GIS database. The database includes descriptions of existing land and environmental restrictions, locations of known contamination, and locations of munitions response areas / munitions response sites. This information will allow future end-users and tenants of FGGM to make rapid and accurate inquiries regarding sites within FGGM and will specify the LUCs in-place at specific locations. Existing wells, chemical contamination, building restrictions, munitions and explosives of concerns, and many other lines of inquiry will quickly be available to support the decision making process. The Army and AOC will coordinate to ensure LUCs are consistently documented in both Army and/or AOC GIS database efforts relevant to the AOC parcel.
- **FGGM Access Regulations**: Access regulations and controls are in place at FGGM, including identification checks and vehicle inspections. Trespassing and unauthorized activities on FGGM are illegal.
- **AOC Access Regulations**: Access regulations and controls are in place at the AOC, including obtaining valid ROEs to operate on the property. It is noted that the FGGM access regulations also help control access to the AOC parcel since AOC is only accessible through the FGGM visitor gate.

The FGGM FFA establishes responsibilities for both the Army and AOC with regard to LUCs selected in any CERCLA response decision documents. These responsibilities would be incorporated into the Remedial Design.

<u>Remedial Alternative SL-3:</u> Hot Spot Excavation with Off-Site Disposal

Estimated Capital Cost: $69,387
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $69,387

RA SL-3 would involve the combination of removal and disposal.

<u>Soil Excavation with Off-Site Disposal</u>

Under Alternative SL-3, lead concentrations in subsurface soil associated with sampling locations AOCGP01 and AOCGP06 at 7 ft bgs and in sampling locations AOCGP09 and AOCGP10 at 10 ft bgs are considered lead hotspots and would be excavated as these areas contribute to the high lead exposure point concentrations at each of these subsurface exposure areas. The lateral extent (as delineated in the Supplemental RI) of the lead hot spot excavation at 7 ft bgs and 10 ft bgs are displayed on **Figures 4 and 5**, respectively.

Overburden material (0 - 5 ft bgs) from each hot spot area would be staged onsite and used as fill material once the lead hot spot removal is complete. Additional clean soil imported from off-post, unless an approved on-post source is identified, would be transported to the Site for use as fill material to backfill the excavated areas. Upon completion of the backfill activities, the area would be graded and seeded with grass to minimize the potential for erosion.

<u>Remedial Alternative GW-1:</u> No Action

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

CERCLA and the NCP require that a No Action alternative be evaluated at every site to establish a baseline for the comparison of other RAs. Under this alternative, no remedial action would take place.

<u>Remedial Alternative GW-2:</u> LUCs and LTM of groundwater

Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $148,646
Estimated Present Worth Cost: $148,646

RA GW-2 would involve the combination of LUCs and LTM of groundwater.

<u>Land Use Controls</u>

Similar to Alternative SL-2, Alternative GW-2 would involve the implementation of LUCs. LUCs would restrict all shallow groundwater use within the Site. Existing LUCs already in place at FGGM and AOC, specifically ICs, would be maintained and enhanced. Examples of groundwater LUCs that could be implemented under this alterative include prohibition of drilling wells for potable use on the site, as well as a

permitting process that would trigger a review of possible drilling prohibitions. Annual inspections of the Site would be performed to establish that all LUCs are effective, to confirm that the land use of the Site has not changed, and to confirm through visual inspection that no unauthorized excavations were performed and that groundwater is not being used for potable purposes. The five-year review process and the annual land use certifications/inspections would be used to document that the remedy remains protective.

Long Term Monitoring

LTM would include groundwater monitoring for total and dissolved metals from select monitoring wells at the Site every year for five years and then every five years for a total of 30 years. Actual LTM frequency would be evaluated during the five-year review process and will depend on the annual monitoring results, as well as approval from USEPA, MDE, and AOC.

It should be noted that in the nearby OU-4/LPA Study Area, implementation of an Interim Removal Action Plan is currently underway at Building 2250 (air sparge/soil vapor extraction) and Building 2286/Former Building 2276 (in-situ chemical oxidation injections) to address VOC source contamination in the LPA. The two source area removal actions are located upgradient of the eastern portion of the AOC parcel (including the high cobalt detection at NW-14). Additionally, downgradient of NW-14, a hydraulic containment system was installed in 2014 as part of the Interim Removal Action Plan to capture and remediate the VOC plume migrating south/southeast from OU-4. During operation, the VOC source area removal actions may affect downgradient geochemical conditions in the LPA, resulting in the continued mobilization of metals species (such as iron, manganese, copper, nickel, arsenic and cobalt), influencing groundwater conditions in the AOC to ultimately reduce metals concentration in the groundwater.

In situations, like the AOC and OU-4/LPA Study Area, where ambient groundwater is naturally reducing, or mildly reducing, these metals once mobilized can persist outside of the treatment area and elevated concentrations can be detected down-gradient, even when VOC concentrations are below detection or strongly reducing conditions are no longer present.

The remedial timeframe for the OU-4 source area remediation, specifically at Building 2286/Former Building 2276, is approximately 20 years. It is anticipated that successful remediation of the VOC plume in the source area and within the plume will affect geochemical conditions within the LPA. Concentrations of metals will decline via physical attenuation mechanisms along the flow path, or when the geochemical conditions are more conducive to their precipitation, or via a combination of these mechanisms.

A robust LTM program will be implemented as part of the final remedy for the OU-4/LPA Study Area (which encompasses the NW-14 and the eastern portion of the AOC). The monitoring program will include testing for VOCs, inorganics, and water quality parameters to evaluate groundwater geochemistry and COC concentrations until RAOs are achieved at OU-4 and would be analyzed in concert with the LTM results at the AOC.

EVALUATION OF REMEDIAL ALTERNATIVES

The NCP provides nine criteria to evaluate the different RAs individually, and against one another, in order to select a remedy. These criteria are as follows:

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

1. Overall Protectiveness of Human Health and the Environment – Determines whether a RA adequately protects human health and the environment, in the short- and long-term, from unacceptable risk posed by hazardous substances, pollutants or contaminants by eliminating, reducing or controlling exposures above remedial goals.
2. Compliance with ARARs – Evaluates whether the RA will attain applicable or relevant and appropriate requirements under Federal and State environmental laws or facility-siting statutes, or whether a waiver is justified. Identification of ARARs is dependent on 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. Please refer to Section 4.2 of the FFS (ARCADIS, 2014) for a more detailed discussion of ARARs.

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

3. Long-term Effectiveness and Permanence – Considers the ability of a RA to maintain protection of human health and the environment over time.
4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment – Evaluates a RA's use of treatment to reduce the harmful effects of hazardous substances, pollutants, or contaminants, their ability to move in the environment, and the amount of contamination present.
5. Short-term Effectiveness – Considers the length of time needed to implement a RA and the risks the RA poses to workers, residents, and the environment during implementation.
6. Implementability – Considers the technical and administrative feasibility of implementing the RA, including factors such as the relative availability of goods and services.

7. Cost – Includes estimated capital and annual O&M costs, as well as present worth cost. Present worth cost is the total cost of a RA over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of –30 to +50 percent.

Modifying Criteria – May be considered to the extent that information is available during the FFS, but can be fully considered only after public comment is received on this PP.

8. State/Support Agency Acceptance – Considers whether the State agrees with the site analysis in the RI/FS and the preferred alternative as presented in this PP.

9. Community Acceptance – Considers whether the local community agrees with the site analysis and Preferred RA. Comments received on the PP are an important indicator of community acceptance.

Comparative Analysis of Remedial Alternatives

This section summarizes the comparative analysis of RAs for the Site that were presented in the FFS (ARCADIS, 2014). State/Support Agency Acceptance and Community Acceptance for soil and groundwater RAs are discussed together at the end of the section. A chart summarizing this comparative analysis is included as **Table 6**. Each alternative is ranked 1 (being the best) through 3 (being the worst) for each of the criteria. The rankings are then averaged for each alternative.

Soil RA Comparative Analysis

Overall Protection of Human Health and the Environment

Alternative 1 does not address potential exposures at the site. Both alternatives SL-2 and SL-3 either remove or control possible future exposure to COCs in impacted soil.

Compliance with ARARs

Alternative SL-1 (No Action) fails to comply with the ARARs. Both alternatives SL-2 and SL-3 would be implemented in compliance with action-specific ARARs. There are no chemical-specific or location-specific ARARs identified for soils.

Long-Term Effectiveness and Permanence

Under Alternative SL-1, potential residual risk would remain unchanged and the adequacy and reliability of this alternative would be poor. Alternatives SL-2 and SL-3 would be effective in the long-term because they would reduce risk to human health by controlling or removing pathways of exposure to COCs in soil. For Alternative SL-2, LUCs are required to restrict land use and remove pathways of exposure. For Alternative SL-3, excavation of lead hot spots to remediate to established PRGs would eliminate the risk of exposure from soils for all land use scenarios. Of these three alternatives, Alternative SL-3 would be most effective in the long-term since it permanently removes impacted soils from the Site.

Reduction of Toxicity, Mobility, and Volume through Treatment

Alternatives SL-1, SL-2, and SL-3 would not reduce the toxicity, mobility, and volume through treatment of impacted soil at the Site. Under SL-3, contaminated soil would be removed from the site, but there is no treatment so it does not satisfy the requirement for reduction of toxicity, mobility or volume under this alternative.

Short-Term Effectiveness

Alternative SL-1 is effective in the short-term as there are no risks to human health under the current land use. However, Alternative SL-1 is ineffective overall because there is no action taken to address risk to human health under future land use scenarios. Alternative SL-2 is also effective in the short-term as it addresses risks to human health under future land use scenarios through controlling exposure pathways. Under Alternative SL-3, minimal short-term risks to the community and construction workers are present when soils are excavated and transported to an off-site facility for disposal. However, the potential for exposure during excavation would be reduced through the use of suitable protective clothing and equipment, good construction practices, and standard dust suppression techniques.

Implementability

The most readily implementable alternatives are Alternatives SL-1 and SL-2. Although more complex, Alternative SL-3 is readily implementable through standard industrial construction and excavation techniques.

Cost

Based on the present worth estimates of costs for the alternatives, Alternative SL-3 ($69,387) is less costly than Alternative SL-2 ($82,186), and it eliminates potential future risk by permanently removing COCs in soil at hot spot locations through excavation and off-site disposal and would therefore be the most cost-effective alternative for soil. Although there is no cost associated with Alternative SL-1, there is also no risk reduction under hypothetical land use scenarios or effectiveness provided by this alternative. Alternative SL-2 controls but does not eliminate the hazards posed by site COCs to receptors under future hypothetical land use scenarios. Therefore, when considering risk reduction applicable to future land use scenarios in relation to cost for these three alternatives, Alternative SL-3 is the most cost effective option.

Groundwater RA Comparative Analysis

Overall Protection of Human Health and the Environment

Under current land use, Alternatives GW-1 and GW-2 both provide protection to human health and the environment as there is no current risk. However, future land use scenarios at the Site present unacceptable risks. Alternative GW-2 would implement a groundwater use restriction which would control/prevent human contact with COCs in groundwater until contaminant levels decrease to allow for unlimited use and unrestricted exposure, which is expected to occur as reducing conditions change in response to the removal action at OU-4.

Compliance with ARARs

ARARs are not met by the No Action alternative. Under Alternative GW-2 exposure pathways are controlled and the LTM component of the remedy would establish a program to monitor COC concentrations in groundwater over time. There is no cohesive groundwater plume and active remedies would not be applicable or effective; however, LTM would document groundwater conditions and continue until such time as COC levels fall below respective MCLs and risk-based cleanup level. The time required to attain the RAOs will depend on the time for groundwater conditions to change in response to the removal action at nearby OU-4, which will be monitored annually and during the five-year review process.

Long-Term Effectiveness and Permanence

Under Alternative GW-1, potential residual risk would remain unchanged, not monitored, and the adequacy and reliability of this alternative would be poor. Alternative GW-2 is effective in the long-term because it would reduce risk to human health by restricting groundwater use, thus, removing pathways of exposure to COCs in groundwater until COC concentrations reduce to conditions that allow for unlimited use and unrestricted exposure. The long-term effectiveness of the remedy would be monitored through annual inspections and five-year reviews.

Reduction of Toxicity, Mobility, and Volume through Treatment

Alternatives GW-1 and GW-2 would not reduce the toxicity, mobility, and volume through treatment of impacted groundwater at the Site. However, there is no cohesive groundwater plume and active remedies would not be applicable or effective. As previously mentioned, a hydraulic containment groundwater treatment system was recently installed at the OU-4 / LPA Study Area located down-gradient of the eastern portion of the AOC land parcel where the highest impacts from inorganics in groundwater, specifically cobalt, have been observed. This system and the other on-going OU-4 source area treatment systems are expected to reduce VOC concentrations and affect groundwater quality parameters over time which may limit mobilization of inorganics within the LPA over time.

Short-Term Effectiveness

Implementation of either alternative does not pose any additional risks to the community, the workers, or the environment as there are no active remedial activities associated with them. LTM under alternative GW-2 is costed for 30 years and is an effective means of tracking the frequency of detections and concentrations of COCs at the Site. The actual time required to attain the RAOs will depend on the results of the annual monitoring and the five-year review process.

Implementability

There are no implementability concerns posed by Alternative GW-2 as minimal time and coordination of labor, materials, and resources are needed for completion.

Cost

Although there is no cost associated with Alternative GW-1, there is also no risk reduction or effectiveness provided by this alternative. Alternative GW-2 ($148,646) mitigates risk posed by groundwater use under future land-use scenarios via a groundwater use restriction. Therefore, when considering risk reduction applicable to future land use scenarios in relation to cost for these two alternatives, Alternative GW-2 is the most cost effective option.

State/Support Agency Acceptance

Acceptance of the Preferred RA presented in this PP by the state is expected. State acceptance will be further evaluated following the public comment period.

Community Acceptance

The USEPA has approved the release of this Plan to the public. Community acceptance of the Preferred RA will be evaluated at the conclusion of the public comment period. Community acceptance will be addressed in the ***Responsiveness Summary*** prepared for the ROD.

SUMMARY OF THE PREFERRED REMEDIAL ALTERNATIVE FOR THE SITE

The Preferred RA was recommended based on the best balance between the selection criteria for treatment of soil and groundwater contamination at the Site. The Preferred RA is:

- Alternative SL-3 and Alternative GW-2 – Soil Excavation with Off-Site Disposal, LTM and LUCs of Groundwater.

Based on the results of the comparative analysis and detailed evaluation presented in the FFS, the Army recommends that a combination of Alternative SL-3 (Hot Spot Excavation with Off-Site Disposal) and GW-2 (LUCs and LTM of groundwater) be implemented as the preferred alternative for remediation of contaminants in soil and groundwater at the Site.

Alternative SL-3 is the most appropriate remedy for the Site soil contamination because it achieves the threshold criteria and provides the best balance of tradeoffs relative to the five primary balancing criteria described in the Evaluation of Remedial Alternatives section above.

Because Alternative SL-3 proposes removing contaminated soil above the industrial PRG, the site wide EPC would be reduced below the residential PRG resulting in no unacceptable risk under future land use scenarios (including residential) upon completion of the excavation. Alternative SL-2 controls but does not eliminate the potential hazard. Alternative SL-3 provides the best protection to human health by permanently removing COCs (lead) in soil.

Alternative GW-2 is the most appropriate remedy for Site groundwater contamination as there is no cohesive groundwater plume and active remedies would not be applicable or effective.

It should be noted that the RAs recommended can be changed in light of new information or in response to public comment. Public comment will be received through the activities discussed in the next section.

Based on information currently available, the lead agency believes the Preferred RA meets the threshold criteria and provides the best balance of tradeoffs among the other RAs with respect to the balancing and modifying criteria. The Army expects the Preferred RA to satisfy the following statutory requirements of CERCLA 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element.

COMMUNITY PARTICIPATION

Public participation is an important component of remedy selection. The Army, AOC, USEPA, and MDE are soliciting input from the community on the Preferred RA. The comment period extends from **July 24, 2014 to August 22, 2014** (30 days). This period includes a public meeting at which the Army will present the PP as agreed to by the AOC, USEPA and MDE. The Army will accept both **oral and written** comments at this meeting and written comments during 30 days following the meeting.

A critical component of the FGGM Installation Restoration Program is to keep the public informed about the environmental cleanup activities and be involved in decision-making is the Restoration Advisory Board (RAB). 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. A detailed AOC update covering the site's CERCLA status, including the FFS, was presented to the RAB on March 20, 2014.

Table 6: Comparative Analysis Chart

	Remedial Alternative SL-1 and GW-1 -No Action		Remedial Alternative SL-2 - LUCs		Remedial Alternative SL-3 – Hot Spot Soil Excavation with Off-Site Disposal		Remedial Alternative GW-2 – LUCs and LTM of Groundwater	
Evaluation Criteria	**Description**	**Rank**	**Description**	**Rank**	**Description**	**Rank**	**Description**	**Rank**
Overall Protection of Human Health and the Environment	Unacceptable risk under future land use scenarios	3	Provides protection to human health through the use of institutional controls or land-use controls to prevent site constituents from reaching human populations. There is no unacceptable risk to ecological receptors under this alternative	2	Protective of human health through removal of impacted soil presenting risk under reasonably anticipated future land use. There is no unacceptable risk to ecological receptors under this alternative.	1	Provides protection to human health through the use of institutional controls or land-use controls to prevent site constituents from reaching human populations. There is no unacceptable risk to ecological receptors under this alternative	2
Compliance with ARARs	Would not be incompliance with chemical-specific ARARs because constituents would remain in soil and groundwater. Location- and action-specific ARARs would not apply to this alternative.	3	Alternative would be implemented in compliance with action-specific ARARs. There are no chemical- or location-specific ARARs.	1	Alternative would be implemented in compliance with action-specific ARARs. There are no chemical-or location-specific ARARs.	1	Under the reasonable anticipated future land use there are no unacceptable risks or hazards and therefore chemical specific ARARs do not apply. However, under hypothetical future residential land use there are calculated risks, and MCL exceedances are documented, so Land Use Controls would be required.	2
Long-term Effectiveness and Performance	Ineffective in long-term due to unacceptable risk remaining	3	Land Use Controls would be effective in the long-term. The permanence would require that the land-use controls be maintained.	2	Effective through removal of impacted media.	1	Land Use Controls would be effective in the long-term. The permanence would require that the land-use controls be maintained.	2
Reduction of Toxicity, Mobility, and Volume through Treatment	No reduction of toxicity, mobility or volume under this alternative.	2	No reduction of toxicity, mobility or volume under this alternative.	2	The contaminated soil would be removed from the site, but there is no treatment so it does not satisfy the requirement for reduction of toxicity, mobility or volume under this alternative.	2	No reduction of toxicity, mobility or volume under this alternative. It should be noted that a hydraulic containment groundwater treatment system was recently installed at the OU-4 / LPA Study Area located down-gradient of the eastern portion of the AOC land parcel where the highest impacts from inorganics in groundwater, specifically cobalt, have been observed. This system and the other on-going OU-4 source area treatment systems are expected to reduce VOC concentrations and affect groundwater quality parameters overtime which may limit mobilization of inorganics within the LPA over time.	2
Short-term Effectiveness	Effective in short-term because there is no risk under current use	1	Effective in short-term because there is no risk under current use	1	Effective in short-term because there is no risk under current use	1	Effective in short-term because there is no risk under current use	1
Implementability	Readily implemented (no action)	1	Readily implemented through existing LUCs	2	Low complexity to implement	3	Readily implemented	2
Cost	Low cost	1	Low to moderate cost	2	Low to Moderate cost	2	Low to moderate cost	2
State/Support Agency Acceptance	TBD		TBD		TBD		TBD	
Community Acceptance	TBD		TBD		TBD		TBD	
Averaged ranking	2		1.71		1.43		1.86	
Overall rank	3		2		1		1	

TBD – to be determined

Public Comment Period

The Army is providing a 30-day comment period from **July 24, 2014 to August 22, 2014**, to provide an opportunity for public involvement in the decision-making process for the proposed action. The public is encouraged to review and comment on this PP. During the public comment period, the public is encouraged to review the following reports and other documents pertinent to this site and the Superfund process: FFS for the Site the Architect of the Capitol (ARCADIS, 2014) and the RI Report (Malcolm Pirnie, 2008), the Technical Memorandum (Malcolm Pirnie, 2007), the Supplemental RI including a Revised HHRA (ARCADIS, 2013b). This information is available at the Anne Arundel County Library, West County Area Branch located at 1325 Odenton Road in Odenton, Maryland, and the FGGM Environmental Management Office, located at 4215 Roberts Avenue, Room 320 Fort Meade, Maryland 20755.

To obtain further information, the following representatives may be contacted:

Ms. Mary Doyle
U.S. Army Garrison Fort George G. Meade
Public Affairs Office
4409 Llewellyn Avenue
Fort Meade, MD 20755
(301) 677-1361

Mr. John Burchette
Remedial Project Manager - USEPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3378

Ms. Elisabeth Green, Ph.D.
Maryland Department of the Environment
Federal Facilities Division
1800 Washington Blvd. Suite 625
Baltimore, MD 21230-1719
(410) 537-3346

Written Comments

If the public would like to comment in writing on the PP or other relevant issues, comments should be delivered to the Army at the public meeting or mailed (postmarked no later than **August 22, 2014**) to Ms. Mary Doyle at the address above.

Public Meeting

The Army will hold a public meeting to accept comments on this PP on **August 7, 2014 at 7:00 p.m.**, at the Courtyard BWI Business District, 2700 Hercules Road, Annapolis Junction, Maryland 20701-1030. 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.

Army's Review of Public Comment

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

ACRONYMS AND ABBREVIATIONS

--	Not Relevant
µg/dL	micrograms per deciliter
µg/L	micrograms per liter
AOC	Architect of the Capitol
AR	Army Regulation
ARARs	Applicable or Relevant and Appropriate Requirements
ARCADIS	ARCADIS U.S., Inc.
Army	U.S. Department of the Army
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	Contaminants of Concern
COMAR	Code of Maryland Regulation
COPC	Contaminants of Potential Concern
DERP	Defense Environmental Restoration Program
EPC	Exposure Point Concentration
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FGGM	Fort George G. Meade
FGGM-74	Architect of the Capitol
ft	feet
GIS	Geographic Information System
GW-	groundwater alternative
HHRA	Human Health Risk Assessment
HI	Hazard Index
IC	Institutional Control
IEUBK	Integrated Exposure Uptake Biokinetic
LPA	Lower Patapsco Aquifer
LTM	Long-Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
MDE	Maryland Department of the Environment
mg/kg	milligrams per kilogram
NA	Not Applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priority List
NS	No Standard
NSA	National Security Agency
O&M	Operation and Maintenance
OU-4	Operable Unit 4
PP	Proposed Plan
PQL	Practical Quantitation Limit
PRG	Preliminary Remediation Goal
RA	Remedial Alternative
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RBC	Risk Based Concentration
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
ROE	Right of Entry
RSL	Regional Screening Level
SL-	soil alternative
SLERA	Screening Level Ecological Risk Assessment
TBD	To Be Determined
U.S.	United States
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WWI	World War I

GLOSSARY OF TERMS

Administrative Record: This is a collection of documents (including plans, correspondence and reports) generated during site investigation and remedial activities. Information in the Administrative Record is used to select the Preferred Response Action and is available for public review. 40 CFR 300.800.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and State requirements that a selected remedy will attain. These requirements may vary among sites and RAs. 40 CFR 300.5

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 (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 in connection with the cleanup of inactive hazardous waste disposal sites that endanger public health and safety or the environment.

Defense Environmental Restoration Program (DERP): Addresses the cleanup of Department of Defense hazardous waste sites consistent with the requirements of CERCLA. The three main objectives of DERP 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.

Focused Feasibility Study (FFS): This CERCLA document reviews the chemicals of concern at a site, and evaluates multiple remedial technologies for use at the site. Finally, it identifies the most feasible Remedial Alternative.

National Oil and Hazardous Substances Contingency Plan (NCP): The CERCLA codification that governs the response to the problems of abandoned or uncontrolled hazardous waste disposal sites as well as to certain incidents involving hazardous wastes (e.g., spills).

National Priorities List (NPL): A list compiled by EPA pursuant to CERCLA Sec. 105, of uncontrolled hazardous substance releases in the US that are priorities for long-term remedial evaluation and response.

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

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.

Record of Decision (ROD): This legal document is signed by the parties to the FFA Army and the USEPA and will be reviewed by the MDE for review and comment. It provides the cleanup action or remedy selected for a site, the basis for selecting that remedy, public comments, responses to comments, and the estimated cost of the remedy.

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 environmental risks that result from the contamination.

Responsiveness Summary: A part of the ROD in which the Army documents and responds to written and oral comments received about the PP.

REFERENCES

ARCADIS U.S., Inc. (ARCADIS). 2013a. Final Remedial Investigation Package, Architect of the Capitol, Fort George G. Meade, Maryland. April.

ARCADIS. 2013b. Final Supplemental Remedial Investigation – Subsurface Lead Delineation and Revised Human Health Risk Assessment, Architect of the Capitol, Fort George G. Meade, Maryland. March.

ARCADIS. 2014. Final Focused Feasibility Study, Revision 1, Architect of the Capitol, Fort George G. Meade, Maryland. July.

Malcolm Pirnie, Inc. 2001. Final Soil Background Concentration Report of Fort George G. Meade, Maryland. July 2001.

Malcolm Pirnie, Inc. 2007. Technical Memorandum. Human Health Risk Assessment and Screening Level Ecological Risk Assessment. January.

Malcolm Pirnie, Inc. 2008. Revised Final Remedial Investigation. Architect of the Capitol, Library of Congress, Remedial Investigation, Fort George G. Meade, Maryland. 2006 Final RI Report, Revised December 2008.

URS Group Inc. (URS). 2013. Site Management Plan, Fort George G. Meade, Maryland, Final. Prepared for U.S. Army Corps of Engineers Baltimore District.

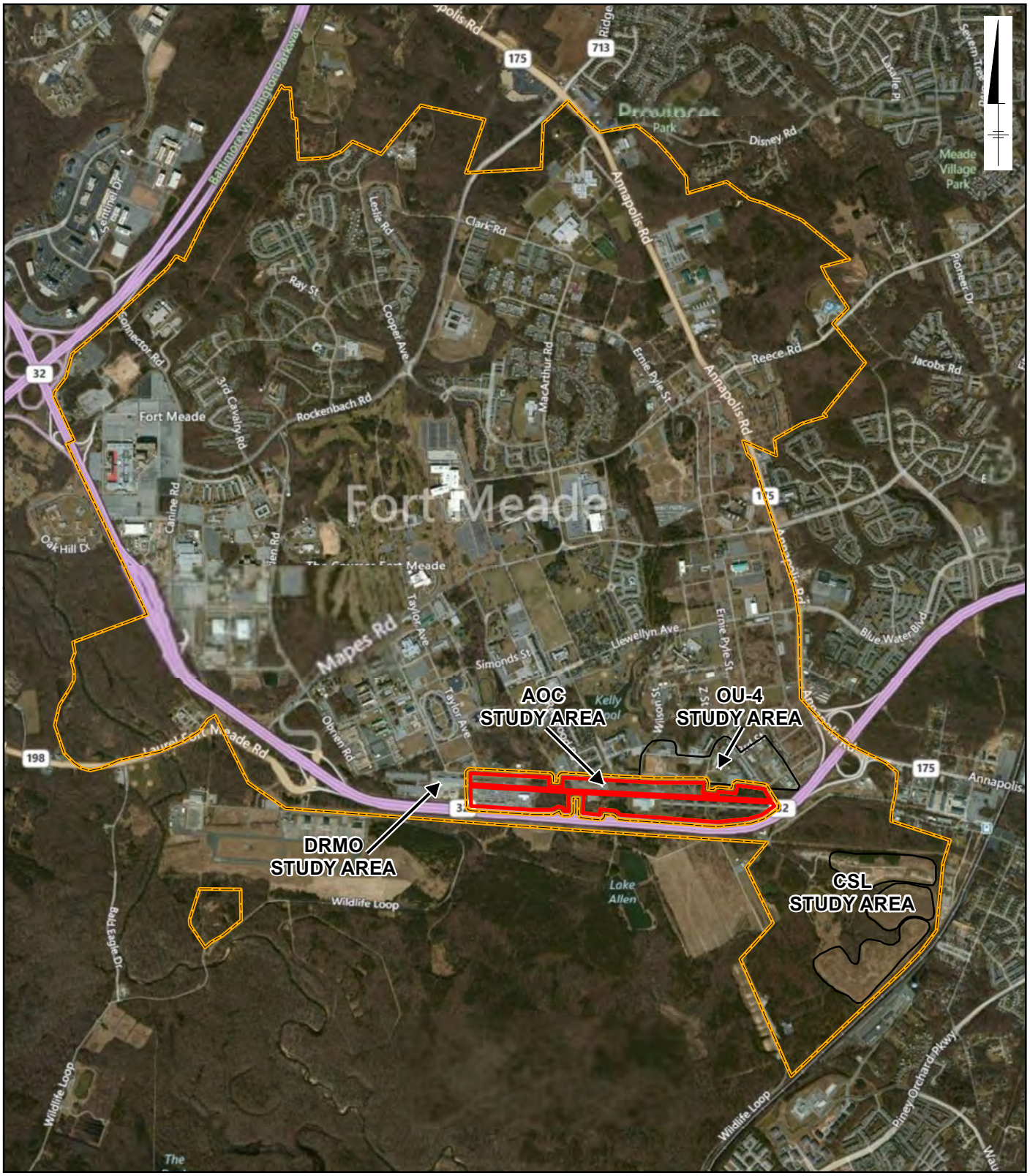
United States Environmental Protection Agency (USEPA). 1991. Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). EPA/540/R-92/003. December.

USEPA. 2009. Update of the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameter.

USEPA. 2011. Regional Screening Level Table and User's Guide. May.

USEPA. 2012. Regional Screening Level Table and User's Guide. May. Accessed via http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm.

Figures



Legend:

- Architect of the Capitol Boundary
- Installation Boundary

0 1,500 3,000 Feet

GRAPHIC SCALE

Notes:

1. Imagery accessed through Bing Maps via ArcGIS Online Layer Packages by ESRI (12/1/2010) (C) 2010 Microsoft Corporation and its data suppliers accessed on 5/1/2012 through ArcGIS 10

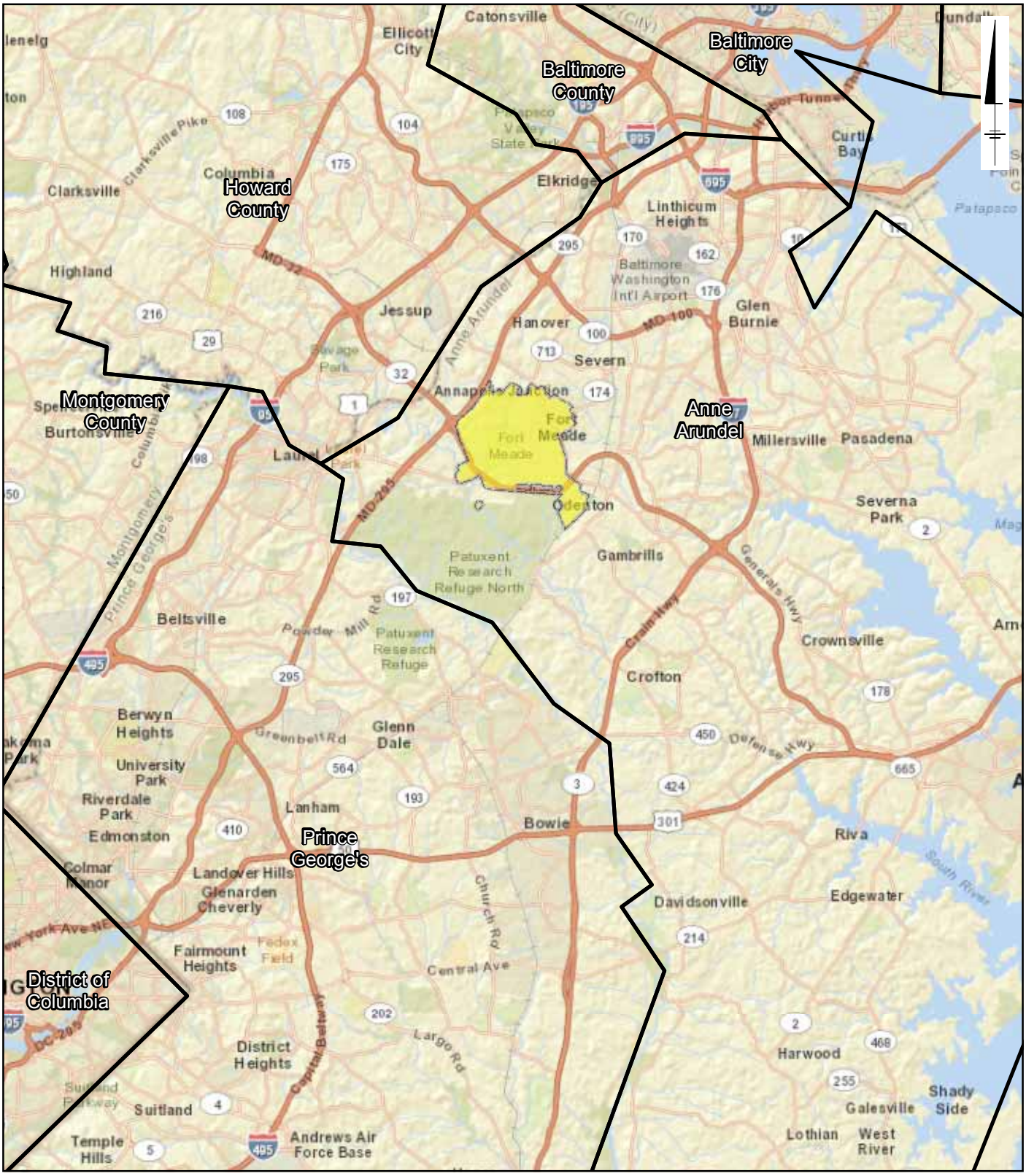
FGGM-74 ARCHITECT OF THE CAPITOL
FORT GEORGE G. MEADE, MARYLAND

Architect of the Capitol Location

ARCADIS

FIGURE
1

CITY: MPLS DIV/GROUP: IM DB: MG LD: KS
FORT MEADE
Path: G:\GIS\Projects\Fort_Meade\ArcMap\AOC\AOC_FFS\AOC_Location_20130628.mxd



FGGM-74 ARCHITECT OF THE CAPITOL
FORT GEORGE G. MEADE, MARYLAND

Fort George G. Meade Location Map

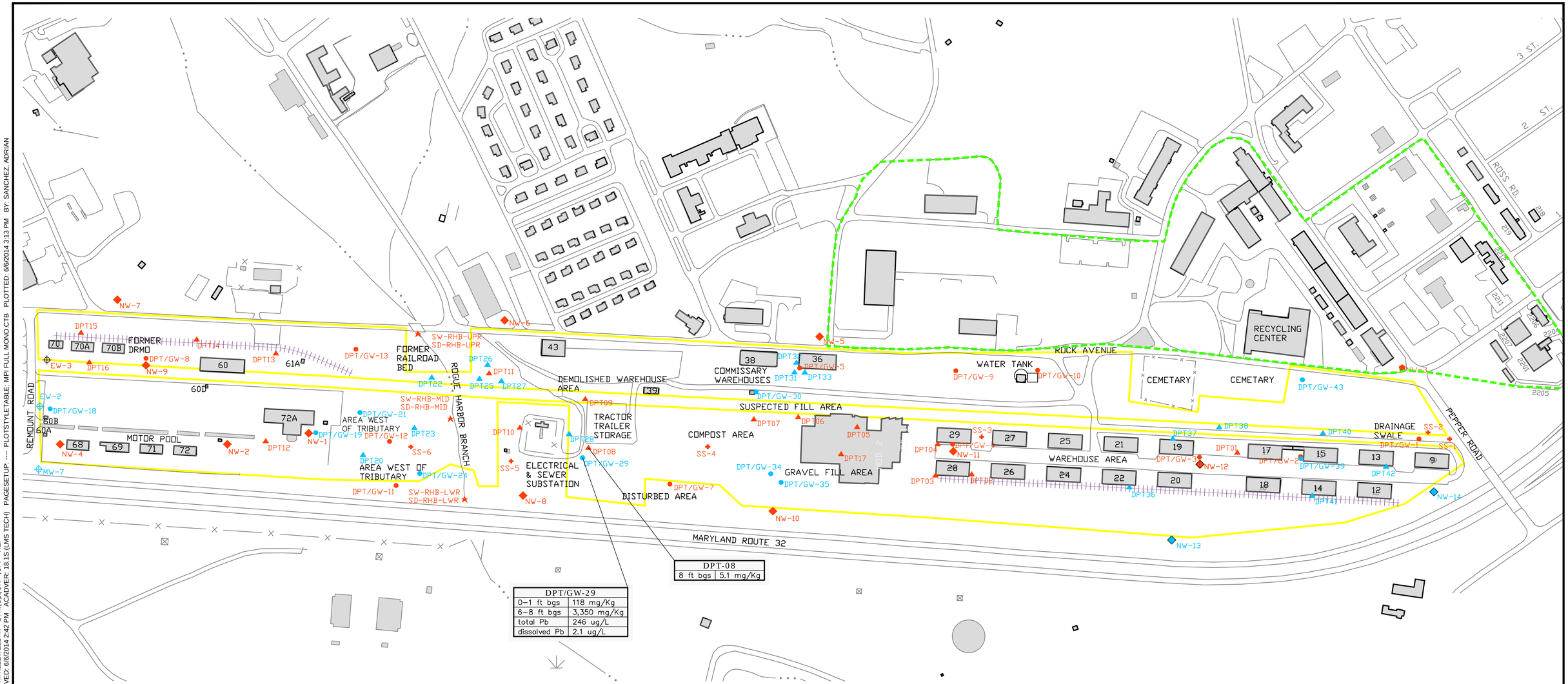
ARCADIS

FIGURE
2

Notes:

1. Imagery accessed through Bing Maps via ArcGIS Online Layer Packages by ESRI (12/1/2010) (C) 2010 Microsoft Corporation and its data suppliers accessed on 5/1/2012 through ArcGIS 10

CITY: MPLS DIV/GROUP: IM DB: MG LD: KS
FORT MEADE
Path: G:\GIS\Projects\Fort_Meade\ArcMap\AOC\2013-05\Location_Map_20130501.mxd



LEGEND

2000/2001 SAMPLING EVENT

- NEW FLUSH MOUNTED WELL (NW)
- DPT SOIL & GROUNDWATER – SAMPLED (DPT/GW)
- DPT SOIL (DPT)
- EXISTING WELL – SAMPLED (EW)
- SURFACE SOIL (SS)
- SURFACE WATER & SEDIMENT (SW/SD)
- HSA SOIL
- DPT SOILS & GROUNDWATER – NOT SAMPLED (DPT/GW)

2004/2005 SAMPLING EVENT

- GROUNDWATER MONITORING WELL LOCATION (NW)
- DPT SOIL & GROUNDWATER SAMPLING LOCATION (DPT/GW)
- DPT SOIL SAMPLING LOCATION (DPT)
- EXISTING WELL (EW)
- DPT GROUNDWATER SAMPLING LOCATION (DPT/GW)

OTHER

- RI PROJECT AREA
- DEMOLISHED BUILDINGS
- EXISTING BUILDINGS
- STREAM
- FENCE
- RAILROAD TRACKS
- AOC BOUNDARY
- OPERABLE UNIT 4

N

100' 0' 200'

NOTES:

1. RESULTS SHOWN ARE FOR LEADS IN SOIL AND GROUNDWATER.
2. SOIL RESULTS EXPRESSED IN MILLIGRAM PER KILOGRAM (mg/Kg).
3. GROUNDWATER RESULTS EXPRESSED IN MICROGRAMS PER LITER (ug/L).
4. DEPTH REPRESENTED IN FEET BELOW GROUND SURFACE (ft bgs).

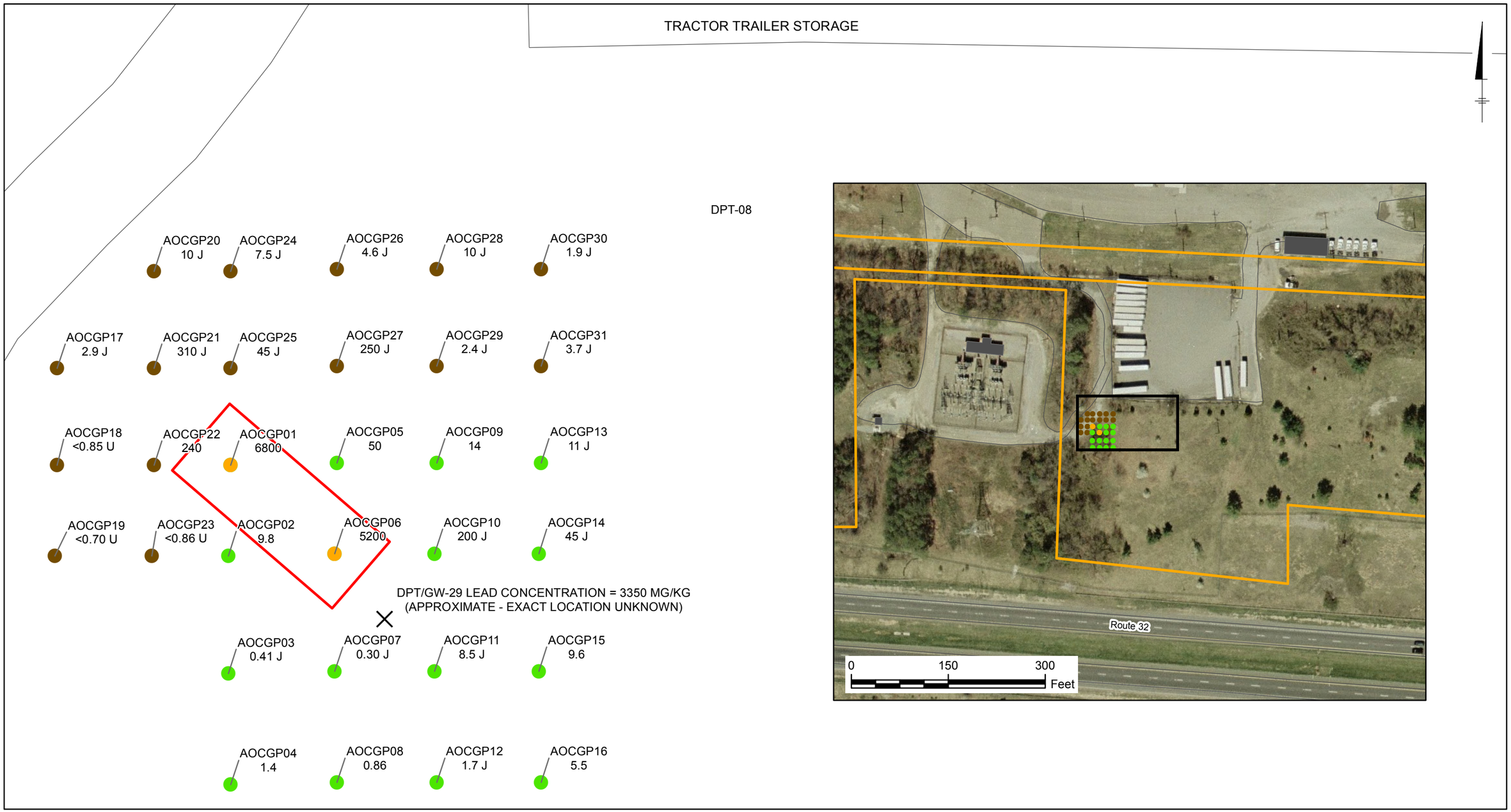
FGGM-74 ARCHITECT OF THE CAPITOL
FORT GEORGE G. MEADE, MARYLAND

SAMPLING LOCATIONS - REMEDIAL INVESTIGATION

ARCADIS

FIGURE 3

CITY:SYR DIV/GROUP:ENVCAD DB:AS LD:(Opt) PIC:T.E.TALELE PM:T.LLEWELLYN TM:T.LLEWELLYN LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\GP09MEAD\AOC0\EA001\GP09MEAD F3-1.dwg LAYOUT: 3-1 SAVED: 6/6/2014 2:42 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: MPI FULL MONO.CTB PLOTTED: 6/6/2014 3:13 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: ----
Xref_Base_FtMeade



LEGEND:

- SOIL BORING LOCATION - ROUND 1
- SOIL BORING LOCATION - ROUND 2
- DETECTION ABOVE CRITERIA
- ARCHITECT OF THE CAPITOL (AOC) BOUNDARY (APPROXIMATE)
- INDICATES HOT SPOT FOR LEAD REPRESENTING THE GREATEST POTENTIAL RISK TO A POTENTIALLY EXPOSED POPULATION
- DPT SOIL & GROUNDWATER SAMPLING LOCATION

0 10 20 Feet
GRAPHIC SCALE

NOTES:

1. THE COMPARISON CRITERIA USED DURING THE LEAD INVESTIGATION WAS 400 MILLIGRAMS PER KILOGRAM (RESIDENTIAL VALUE)
2. LABORATORY ANALYSIS FOR LEAD CONDUCTED USING UNITED STATES ENVIRONMENTAL PROTECTION AGENCY METHOD 6010C
3. LEAD RESULTS REPORTED IN MILLIGRAMS PER KILOGRAM (MG/KG)
4. J = ESTIMATED CONCENTRATION
5. U = NON-DETECT
6. AOCGP01 - SAMPLE LOCATION IDENTIFICATION
7. 1.7 J - DETECTION CONCENTRATION

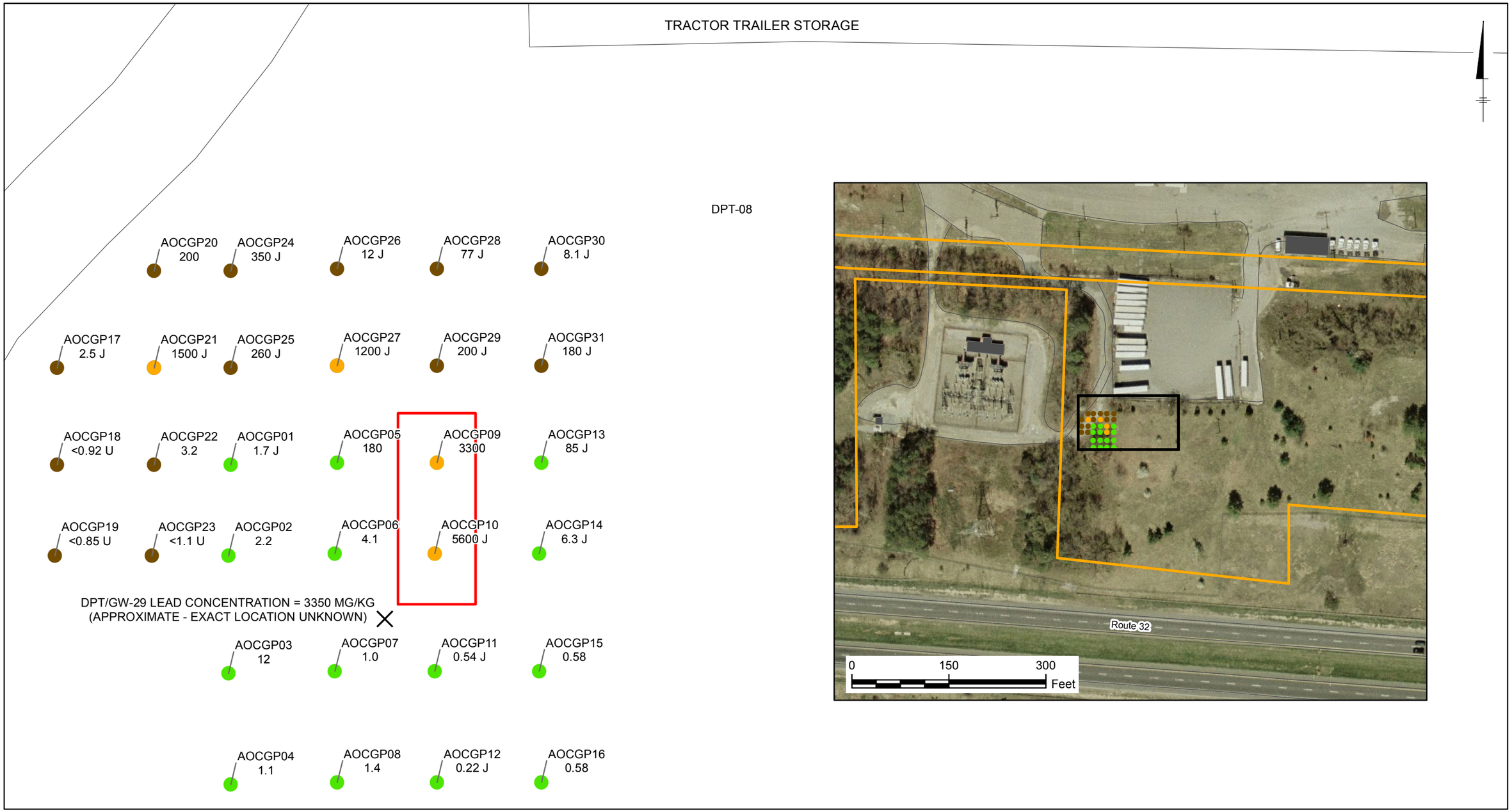
FGGM-74 ARCHITECT OF THE CAPITOL
FORT GEORGE G. MEADE, MARYLAND

LEAD HOTSPOT REMOVAL AREA AT 7 FEET BELOW GROUND SURFACE

ARCADIS

FIGURE
4

CITY: MPLS DIV/GROUP: 40 DB: MG LD: BE PM: TL
FT. MEADE (GP09MEAD.C000)
Path: G:\GIS\Projects\Fort_Meade\ArcMap\AOC\2013-06\Lead_HS_SO_7ft_20130614.mxd



LEGEND:

- SOIL BORING LOCATION - ROUND 1
- SOIL BORING LOCATION - ROUND 2
- DETECTION ABOVE CRITERIA
- ARCHITECT OF THE CAPITOL (AOC) BOUNDARY (APPROXIMATE)
- INDICATES HOT SPOT FOR LEAD REPRESENTING THE GREATEST POTENTIAL RISK TO A POTENTIALLY EXPOSED POPULATION
- DPT SOIL & GROUNDWATER SAMPLING LOCATION

0 10 20 Feet
GRAPHIC SCALE

NOTES:

1. THE COMPARISON CRITERIA USED DURING THE LEAD INVESTIGATION WAS 400 MILLIGRAMS PER KILOGRAM (RESIDENTIAL VALUE)
2. LABORATORY ANALYSIS FOR LEAD CONDUCTED USING UNITED STATES ENVIRONMENTAL PROTECTION AGENCY METHOD 6010C
3. LEAD RESULTS REPORTED IN MILLIGRAMS PER KILOGRAM (MG/KG)
4. J = ESTIMATED CONCENTRATION
5. U = NON-DETECT
6. AOCGP01 - SAMPLE LOCATION IDENTIFICATION
7. 1.7 J - DETECTION CONCENTRATION

FGGM-74 ARCHITECT OF THE CAPITOL
FORT GEORGE G. MEADE, MARYLAND

LEAD HOTSPOT REMOVAL AREA AT 10 FEET BELOW GROUND SURFACE

ARCADIS

FIGURE
5

CITY: MPLS DIV/GROUP: 40 DB: MG LD: BE PM: TL
FT. MEADE (GP09MEAD.C000)
Path: G:\GIS\Projects\Fort_Meade\ArcMap\AOC\2013-06\Lead_HS_SO_10ft_20130614.mxd

Appendix A

Response to Comments