FINAL

SITE-SPECIFIC WORK PLAN FOR THE INVESTIGATION OF BURIAL PIT 3 4825 GLENBROOK ROAD

SPRING VALLEY FORMERLY USED DEFENSE SITE (SVFUDS), OPERABLE UNIT 3, WASHINGTON, D.C.
CONTRACT W912DY-04-D-0005, D.O. 0007
FUDS MEC/CWM PROJECT NO. C03DC091801

Prepared For:
U.S. ARMY
ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT

Prepared by:
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JULY 20, 2007

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SPRING VALLEY, WASHINGTON, D.C.

Prepared for:

U.S. Army Engineering and Support Center, Huntsville

and

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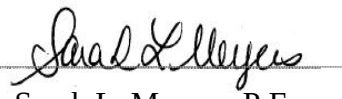
PREPARED BY: 

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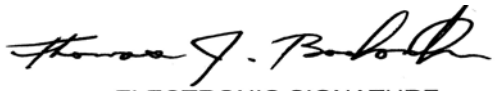
REVIEWED BY: 

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The appendices have been listed in a way to maintain consistency with the Site-Wide WP. Only the appendices shown in bold are actually attached to this Site-Specific WP. The other appendices (denoted with **) did not require any site-specific information and, therefore, have not been attached.

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APPENDIX G** MSD Calculation Sheets

APPENDIX H** Resumes

APPENDIX I** Technical Project Planning Worksheets

APPENDIX J CWM Air Monitoring/Soil Screening Plan and CWM Sample Analysis Plan ("ECBC Plans")

APPENDIX K** Product Manager for Non-Stockpile Chemical Materiel Plans

APPENDIX L** MEC Transportation Plan

APPENDIX M Engineering Control Structure Plan

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ABP	Agent Breakdown Product
AEGL	Acute Exposure Guideline Level
AHA	Activity Hazard Analysis
AMSL	Above Mean Sea Level
APP	Accident Prevention Plan
AR	Army Regulation
ARARs	Applicable, Relevant and Appropriate Requirements
AU	American University
AUES	American University Experiment Station
BGS	Below Ground Surface
CA	Chemical Agent
CACM	Chemical Agent Contaminated Media
CAFS	Chemical Agent Filtration System
CAMS	Chemical Agent Monitoring System
CENAB	U.S. Army Corps of Engineers, Baltimore District
CFM	Cubic Feet Per Minute
CG	Phosgene
CGI	Combustible Gas Indicator
CK	Cyanogen Chloride
CRZ	Contamination Reduction Zone
CSS	Chemical Safety Submission
CTF	Chemical Transfer Facility
CVAA	Chlorovinylarsenous Acid
CVAO	Chlorovinylarsenous Oxide
CWM	Chemical Warfare Materiel
DAAMS	Depot Area Air Monitoring System
DC	District of Columbia
DCMR	District of Columbia Municipal Regulation
DDESB	Department of Defense Explosives Safety Board
DDOE	District of Columbia Department of the Environment

ACRONYMS AND ABBREVIATIONS (CONT.)

Acronym	Definition
DERP	Defense Environmental Restoration Program
DID	Data Item Description
DOD	Department of Defense
DQCR	Daily Quality Control Report
ECBC	Edgewood Chemical Biological Center
ECS	Engineering Control Structure
EE/CA	Engineering Evaluation/Cost Analysis
EM	Engineer Manual
EOD	Explosives ordnance disposal
EPDS	Emergency Personnel Decontamination Station
EPP	Environmental Protection Plan
EZ	Exclusion Zone
FUDS	Formerly Used Defense Site
GFE	Government Furnished Equipment
H	Mustard Agent
HE	High Explosives
HEPA	High Efficiency Particulate Air
HTW	Hazardous and Toxic Waste
IAW	In Accordance With
IDW	Investigation Derived Waste
IHF	Interim Holding Facility
L	Lewisite Agent
MACS	Modular Aluminum Containment Structure
MC	Munitions Constituents
MCE	Maximum Credible Event
MEC	Munitions and Explosives of Concern
MD	Munitions Debris
MGFD	Munition with the Greatest Fragmentation Distance
MINICAMS	Miniature Continuous Air Monitoring System
MMAS	Mobile Munitions Assessment System

ACRONYMS AND ABBREVIATIONS (CONT.)

Acronym	Definition
MRA	Munitions Response Area
MRC	Multiple Round Container
MRS	Munitions Response Site
MSD	Minimum Separation Distance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAED	Public Access Exclusion Distance
PDS	Personnel Decontamination Station
PDT	Project Delivery Team
PID	photoionization detector
PINS	Portable Isotopic Neutron Spectroscopy
PM	Project Manager
PMNSCM	Product Manager for Non-Stockpile Chemical Materiel
POI	Point of Interest
PPE	Personal Protective Equipment
PPP	Public Protection Plan
PS	Chloropicrin
PSHM	Project Safety and Health Manager
PVC	Poly Vinyl Chloride
QA	Quality Assurance
QC	Quality Control
Q-D	Quantity-Distance
RCRA	Resource Conservation and Recovery Act
RCWM	Recovered Chemical Warfare Materiel
RDECOM	Research Development and Engineering Command
RI/FS	Remedial Investigation/Feasibility Study
ROE	Right-of-Entry
SA	Arsine
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure

ACRONYMS AND ABBREVIATIONS (CONT.)

Acronym	Definition
SOW	Statement of Work
SSHP	Site Safety and Health Plan
SSHO	Site Safety and Health Officer
SSWP	Site-Specific Work Plan
SVFUDS	Spring Valley Formerly Used Defense Site
SVOCs	Semi-Volatile Organic Compounds
SZ	Support Zone
TBD	To Be Determined
TCRA	Time-Critical Removal Action
TD	Technical Director
TE	U.S. Army 22nd Chemical Battalion (Technical Escort)
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USEPA	U.S. Environmental Protection Agency
UXO	Unexploded Ordnance
VCC	Vapor Containment Cover
VCS	Vapor Containment Structure
VOCs	Volatile Organic Compounds
WBGT	Wet Bulb Globe Temperature
WP	Work Plan
WPL	Worker Protection Limit

CHAPTER 1
INTRODUCTION

1.1 PROJECT AUTHORIZATION

1.1.0.1 Under Contract No. W912DY-04-D-0005, Delivery Order 0007, Parsons is serving as the prime contractor to the U.S. Army Engineering and Support Center, Huntsville (USAESCH) for the excavation of Burial Pit 3 at 4825 Glenbrook Road at the Spring Valley Formerly Used Defense Site (SVFUDS) in Washington, D.C.. This location was called Test Pit 23 during the earlier investigation at 4825 Glenbrook Road but is being referred to as "Burial Pit 3" for the purposes of the upcoming investigation because it is similar to the previously investigated Burial Pits 1 and 2 at 4801 Glenbrook Road. This project falls under the Defense Environmental Restoration Program/Formerly Used Defense Sites (DERP/FUDS). The Project Team will consist of Parsons, USAESCH, and U.S. Army Corps of Engineers (USACE), Baltimore District (CENAB) as well as other government and non-government agencies with specific expertise for implementation of specialized components of the field operations. For purposes of this Site-Specific Work Plan (SSWP), USAESCH and CENAB are referred to jointly as "USACE."

1.1.0.2 This SSWP applies to the activities that are specific to the continued investigation of 4825 Glenbrook Road and is not intended to be a standalone document. The details that are common to all SVFUDS activities under this contract are described in the *Site-Wide Work Plan for the Spring Valley Formerly Used Defense Site, Spring Valley, Washington, D.C.*, prepared by Parsons for USACE (USACE, March 2007), hereafter referred to as the Site-Wide Work Plan (WP).

1.1.0.3 This SSWP has been prepared consistent with the Data Item Description (DID) MR-001, *Type I Work Plan*, as applicable, and includes additional information necessary to address Recovered Chemical Warfare Materiel (RCWM) investigations. This SSWP references the applicable components of the Site-Wide WP. However, the content focuses on site-specific objectives, information and requirements, procedural decisions, and/or omissions from the site-wide documents. If revisions to this SSWP are required, a dated summary page listing all revised pages will document the associated changes and will be included with each revision.

1.1.0.4 Based on the known presence of RCWM/Munitions and Explosives of Concern (MEC) in Burial Pit 3 at 4825 Glenbrook Road, the investigation of Burial Pit 3 will be considered a Higher Probability Investigation as defined in the Site-Wide WP. However, some aspects of site preparation will be conducted in accordance with (IAW) low probability procedures as described in the Site-Wide WP and this SSWP.

1.2 PURPOSE AND SCOPE

1.2.0.1 The objectives of the Burial Pit 3 intrusive investigation are to:

1. Remove any MEC/potential RCWM, munitions debris (MD), laboratory waste, and other AUES-related debris remaining in Burial Pit 3; and
2. Collect data, as appropriate, to characterize investigated areas for the SVFUDS over-arching Remedial Investigation/Feasibility Study (RI/FS).

1.2.0.2 A variety of data will be collected to meet the objectives of the investigation including site visits, munitions constituent (MC) sampling, and Chemical Agent (CA) and Agent Breakdown Products (ABPs) sampling.

1.3 WORK PLAN ORGANIZATION

1.3.0.1 This SSWP covers the investigation and all associated preparatory activities necessary for intrusive investigation activities at Burial Pit 3, 4825 Glenbrook Road. The SSWP is organized to address each of the components of the Statement of Work (SOW) IAW DID MR-001 (Type I Work Plan) and comprises several sub plans, each discussing a different aspect of the investigations. These plans are summarized below.

- Introduction: Chapter 1 of this SSWP details the overall scope and objective of the project, presents the organization of the SSWP document, and presents an overview of the site and its history.
- Technical Management Plan: Chapter 2, the Technical Management Plan, details the site-specific organizational structure, lines of authority, and communication of the project team.
- Field Investigation Plan: Chapter 3, the Field Investigation Plan, describes the field methods and procedures planned for the site, and the approach to risk characterization and analysis.
- Quality (QC) Control Plan: There are no site specific QC procedures that differ from the Site-Wide WP, therefore this chapter is a place holder chapter as all the information required is contained within the Site-Wide WP. Chapter 4 of the Site-Wide WP, the Quality Control Plan, describes procedures for controlling and measuring the quality of work performed, including the required organization, responsibilities, and policies.
- Explosives Management Plan: This chapter is a place holder chapter as all the information required is contained within the Site-Wide WP. Chapter 5 of the Site-Wide WP, Explosives Management Plan, describes details for management of explosives used to destroy MEC items recovered during the project, including acquisition, receipt, storage, transportation, and inventory.

- Explosives Siting Plan: Chapter 6, Explosives Siting Plan, discusses the criteria for planning and siting explosives demolition events that may be required during the project.
- Environmental Protection Plan: Chapter 7, Environmental Protection Plan (EPP), provides general site specific information and applicable requirements.
- Property Management Plan: Chapter 8 provides detailed information on the types, quantities, and sources of equipment and materials that will be required to perform field and office operations on this project.
- Interim Holding Facility (IHF) Siting Plan for RCWM Projects: This chapter is a place holder chapter as all the information required is contained within the Site-Wide WP. Chapter 9 of the Site-Wide WP describes the provisions that will be made and the siting requirements for the storage of RCWM ordnance and containers, and MEC.
- Hazardous and Toxic Waste (HTW)-Contaminated Soil Excavation Plan: Chapter 10 is a place holder chapter as HTW-contaminated soil, other than that associated with Investigation Derived Waste (IDW) of Burial Pit 3, will not be removed under this plan. Excavation of arsenic-contaminated soil already identified at 4825 Glenbrook Road (and other HTW-contaminated soil that may be identified during this investigation) will be conducted during the separate test pit investigations at 4825 and 4835 Glenbrook Road.
- Physical Security Plan for RCWM Project Sites: Chapter 11, Physical Security Plan for RCWM Projects is not included in this document for security purposes and will serve as a placeholder chapter only. The Physical Security Plan for RCWM is maintained by CENAB.
- References: Chapter 12 includes a list of references used in the preparation of this SSWP.

1.3.0.2 This SSWP uses the same appendix designations as the Site-Wide WP to maintain the same overall work plan structure.

- Appendix A, Statement of Work: This appendix is a place holder as all the information required is contained within Appendix A of the Site-Wide WP.
- Appendix B, Site Maps: Maps provided in this document are included as Appendix B to this SSWP.
- Appendix C, Local Points of Contact: Various points of contact are listed in Appendix C to this SSWP.
- Appendix D, Accident Prevention Plan (APP) Supplement: This Appendix describes the health and safety procedures, personal protection standards, and environmental health hazards specific to this site in addition to the activity hazard analysis tables included in Appendix D of this SSWP. The Site-Wide WP contains the details of the SVFUDS APP.

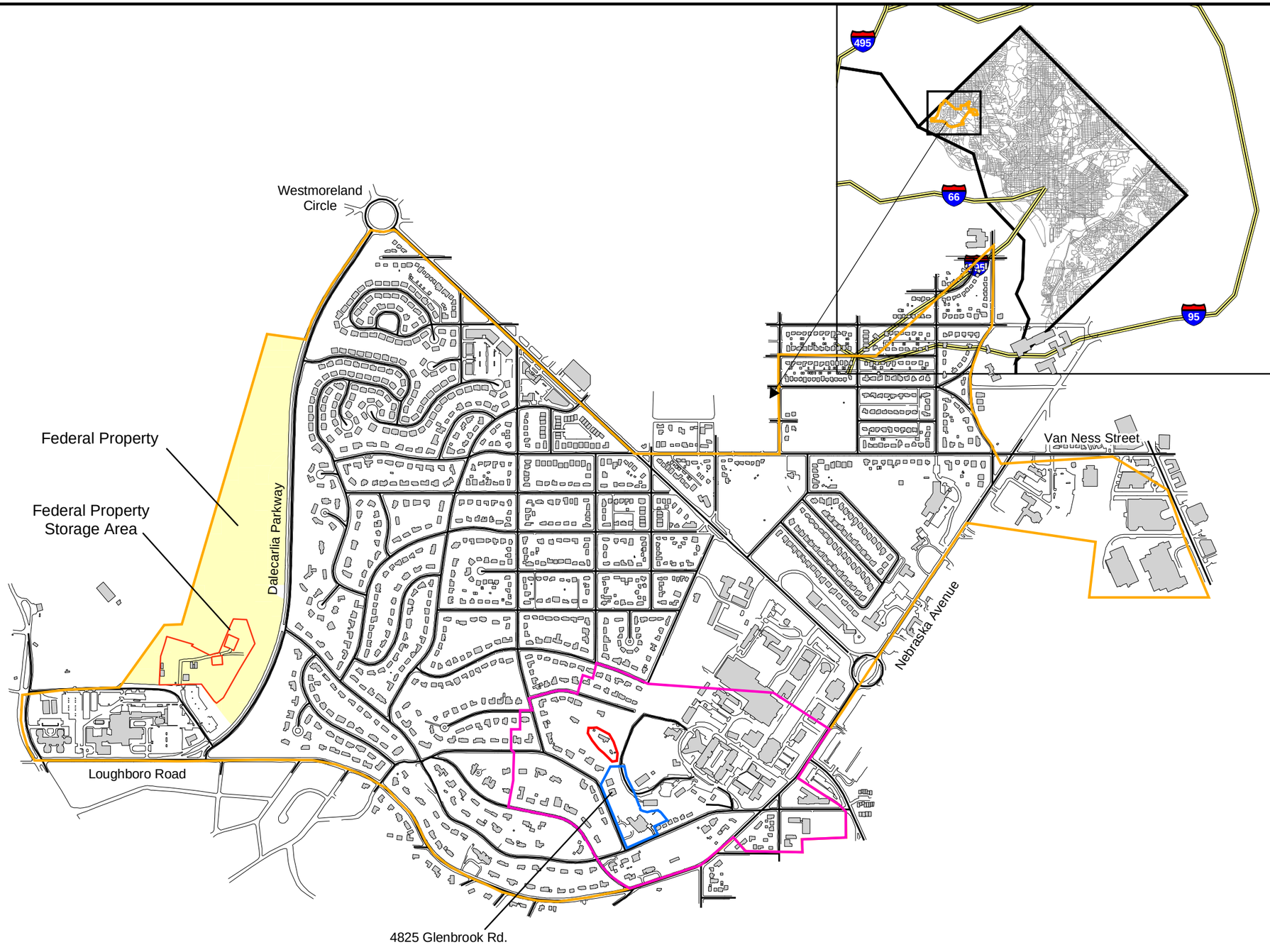
- Appendix E, Sampling and Analysis Plan (SAP): The SAP, Appendix E of the Site-Wide WP, outlines the anticipated sampling and analysis procedures for the project site, and contains a list of the required analytes and the associated sampling procedures. This appendix includes the standard operating procedures for the hydrogen cyanide monitor and confirmation detector tubes.
- Appendix F, Forms: This appendix is a place holder as all the information required is contained within the Site-Wide WP. Relevant forms and templates are provided in Appendix F of the Site-Wide WP.
- Appendix G, MSD Calculations: This appendix is a place holder as all the information required is contained within the Site-Wide WP. The calculations used to derive the minimum separation distance (MSD) to be employed for project operations are included in Appendix G of the Site-Wide WP.
- Appendix H, Résumés: This appendix is a place holder as all the information required is contained within the Site-Wide WP. The résumés of key personnel not listed in the Unexploded Ordnance (UXO) database are included in Appendix H of the Site-Wide WP.
- Appendix I, Technical Project Planning (TPP): The TPP process for the SVFUDS is implemented through the Spring Valley Partnering process. The Spring Valley Partners comprises stakeholders who meet monthly to discuss and plan the SVFUDS activities. This group predates the formal TPP process, therefore, Appendix I (TPP Planning Worksheets) is a placeholder only.
- Appendix J, CWM Air Monitoring/Soil Screening Plan And CWM Sample Analysis Plan: The site specific plans utilized for CA/ABP monitoring/soil screening and CWM sample analysis are provided in Appendix J.
- Appendix K, Product Manager for Non-Stockpile Chemical Materiel (PMNSCM) Plans: This appendix is a place holder as all the information required is contained within the Site-Wide WP. The plans for the storage and transportation of RCWM are in Appendix K of the Site-Wide WP.
- Appendix L, MEC Transportation Plan: This appendix is a place holder as all the information required is contained within the Site-Wide WP. A description of the procedures used to transport MEC items not transported as potential RCWM is contained in Appendix L of the Site-Wide WP.
- Appendix M, Engineering Control Structure Plans: A description of the engineering controls to be used in the investigation of Burial Pit 3 are included in Appendix M.

1.4 PROJECT LOCATION

1.4.0.1 The 4825 Glenbrook Road Site is located in the south central portion of the SVFUDS which is located in the northwest section of Washington, D.C. (Figure 1-1).

Figure 1-1
Spring Valley FUDS Location and Operable Units

Spring Valley
Washington, D.C.



Legend

- Buildings
- Road
- Federal Property
- Federal Property Storage Area

Operable Unit
- OU-2
- OU-3
- OU-4
- OU-5

Notes:
1. OU-1 encompasses all of the areas depicted as OU-2, 3, 4, and 5.
2. OU-4 and OU-5 do not include the smaller operable units shown within their boundaries (e.g., OU-4 does not include the areas shown as OU-2 and OU-3).

1,200 600 0 1,200 Feet

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1.5 SITE DESCRIPTION

1.5.0.1 The location of the SVFUDS and its environmental setting are described in Subchapter 1.5 of the Site-Wide WP.

1.6 SITE HISTORY

1.6.0.1 The history of the SVFUDS is described in Subchapter 1.6 of the Site-Wide WP.

1.7 CURRENT AND PROJECTED LAND USE

1.7.0.1 The property at 4825 Glenbrook Road is currently a single-family, detached residential dwelling (Figure 1-2) owned by American University. No changes to land use are projected.

1.8 PREVIOUS INVESTIGATIONS

1.8.0.1 Previous investigations across the entire SVFUDS are described in detail in Subchapter 1.8 of the Site-Wide WP. The following section describes the previous investigations that have been carried out on or adjacent to the 4825 Glenbrook Road property.

1.8.1 Geophysical Investigation - 1999

1.8.1.1 On February 22-24, 1999, a geophysical investigation was performed at 4825 Glenbrook Road that was concurrent with the reacquisition of Burial Pits 1 and 2 at the adjacent property 4801 Glenbrook Road (see Subchapter 1.8.2). The results of this investigation can be found in the *Geophysical Investigation Report, 4825 Glenbrook Road, Spring Valley Operable Unit 3, Washington, D.C.,* prepared for USACE by Parsons in May of 1999 (USACE, May 1999). During the investigation, Geophex acquired electromagnetic data using the GEM-3 sensor, and total field magnetic data using the G-858 cesium-vapor magnetometer, and used ground penetrating radar to confirm interpretations made in the field. Analysis of the geophysical data identified two anomalous areas of interest, Anomalies 6 and 7. However, these anomalies were determined not to be representative of pits or trenches. Anomaly 6 was later determined to be a partially buried manhole cover. A manhole is located in the vicinity of Anomaly 7. A test pit and trench were also later dug in the vicinity of Anomaly 7 with no significant findings in either the test pit or trench (see Subchapter 1.8.4 below). Figure 1-3 shows the location of the anomalies as well as the magnetic gradient results. It was later determined that a test pit investigation was warranted (see Subchapter 1.8.4).

1.8.2 Burial Pit EE/CA Investigation – 1999-2001

1.8.2.1 During a 1997 review (RI Evaluation Report, USACE, 1998) of the 1995 Operation Safe Removal FUDS RI Report, initiated by the D.C. Department of the Environment (DDOE), the area investigated on the American University (AU) campus during the 1995 RI as POI 24 was re-examined and re-positioned to 4801 Glenbrook Road. The 4801 Glenbrook Road

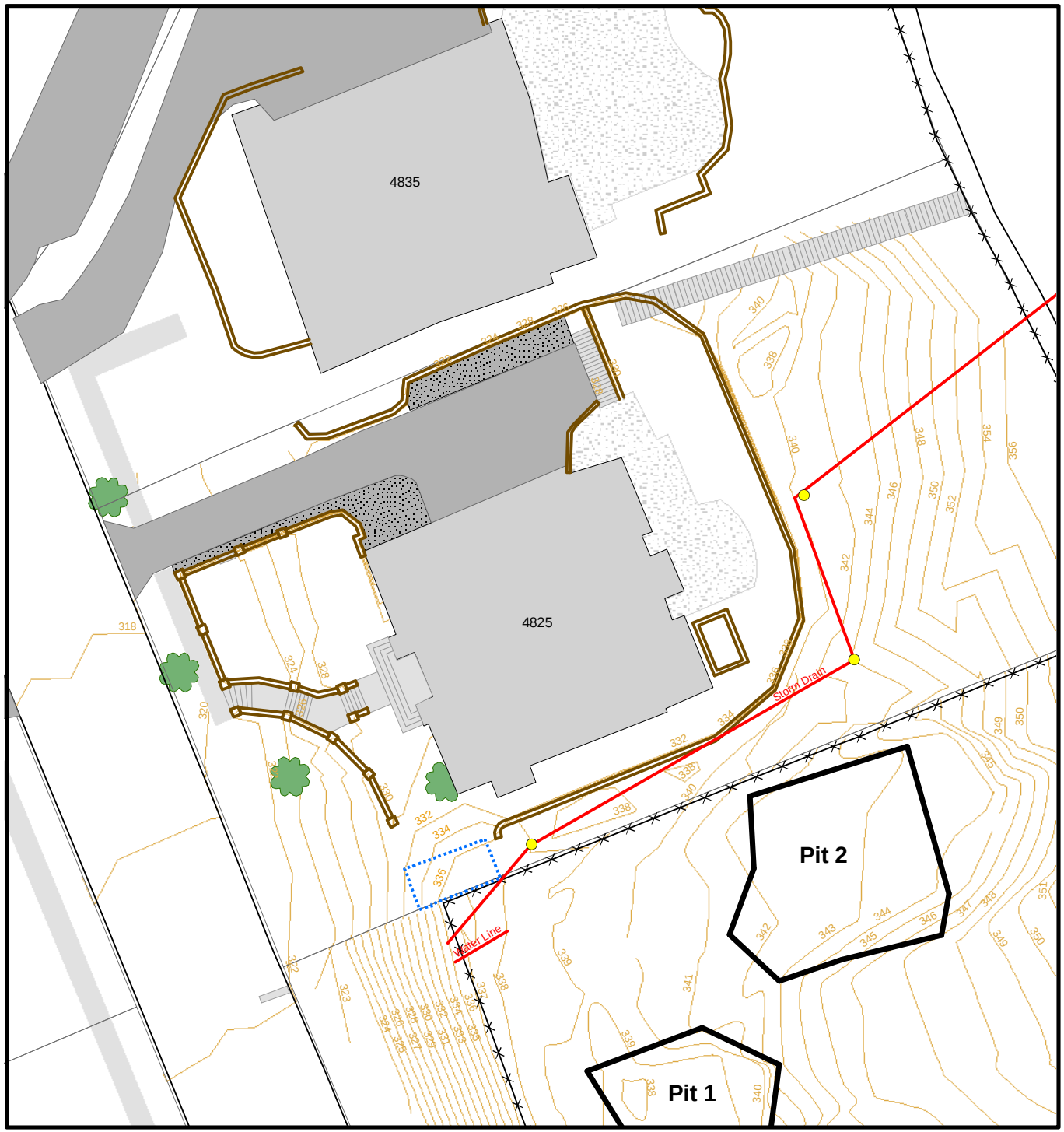

Figure 1-2
Site Map
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Deck/Porch
- Sidewalk
- Manhole
- Buildings
- Dense Shrubbery
- Elevation Contours
- Metal Grate
- Parcels
- Potential Location of MEC
- Retaining Wall
- Trees
- Property Fence
- Driveway
- Gravel Surface
- Pipe
- Pits 1 & 2 (POI-24R)

30 15 0 30 Feet

1 inch equals 30 feet

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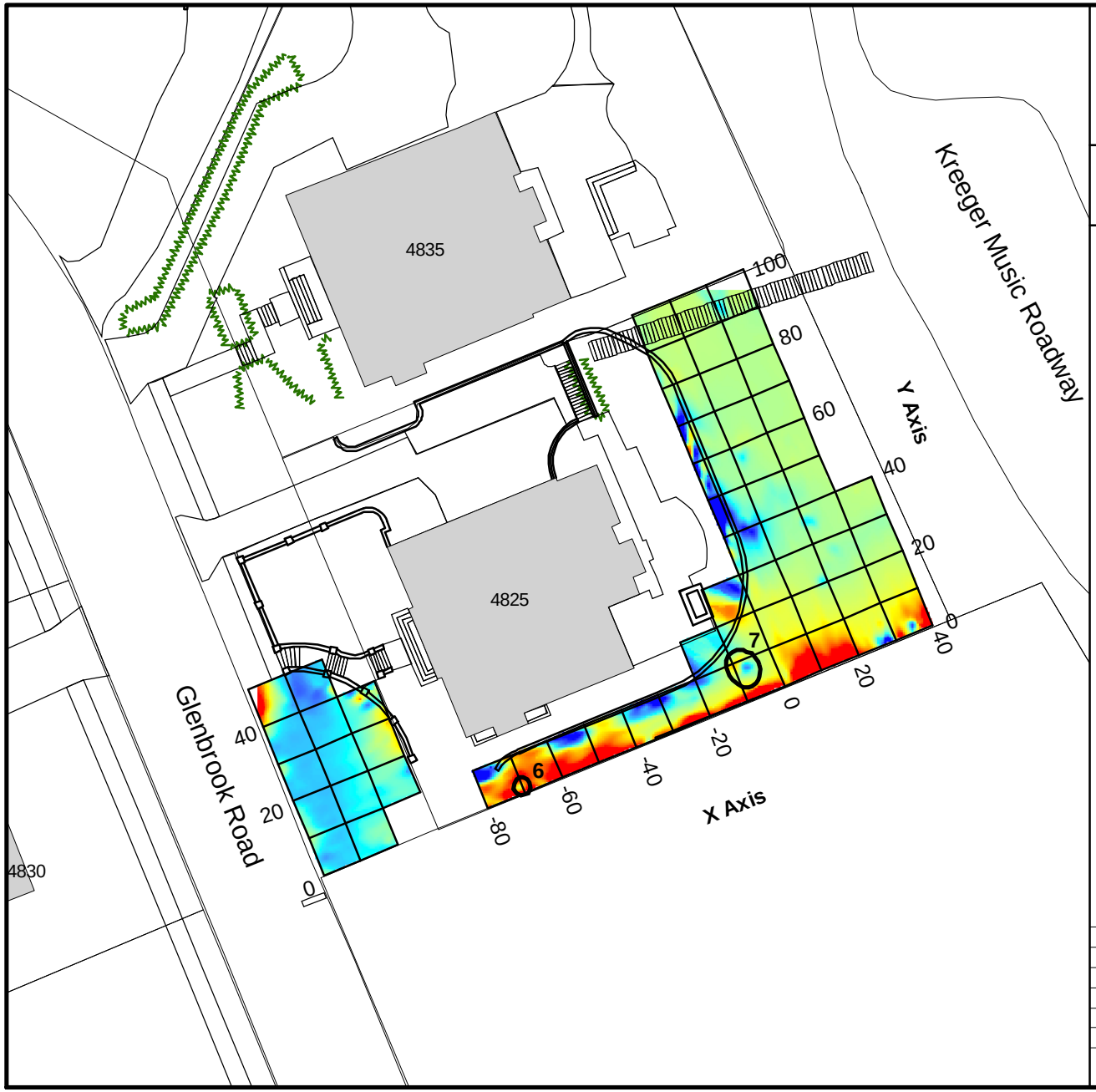

Figure 1-3
Magnetic Geophysical Survey Data
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Survey Grid (1999)
- Anomalies (1999 Survey)
- Hedge
- Sidewalk
- Roads
- Retaining Wall
- Driveway
- Buildings

Total Field Magnetic, 1999 (nT)

High : 58384.808594

Low : 35923.964844

40 20 0 40 Feet

1 inch equals 40 feet

Scale:	1:480
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property is located adjacent to the property at 4825 Glenbrook Road. POI 24 had been identified as a probable pit through interpretation of a 1918 aerial photograph. To further evaluate the situation, USACE performed a geophysical investigation of the grounds at 4801 Glenbrook Road to locate and characterize the potential burial pit. It was determined that two geophysical anomalies on the grounds of 4801 Glenbrook Road had the potential characteristics of pits or trenches. Nine other anomalies did not have the characteristics of pits or trenches. All eleven anomalies were investigated and resolved.

1.8.2.2 Investigative work on the two burial pits at 4801 Glenbrook Road began in March 1999 and concluded approximately one year later. The objective of the investigation was to determine the extent and nature of the material contained within the two burial pits. Approximately 299 ordnance-related items were recovered from these two test pits. In addition to these items, 175 glass bottles were recovered, 77 of which contained acids and other chemicals, as well as 39 cylinders and nine metal drums. Additional compounds detected in soil samples included various volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals (most notably arsenic). The excavation of the pits concluded when the pit characterization soil samples (floor and wall samples) did not detect agent, ABPs, or elevated levels of VOCs, SVOCs, or metals. Figure 1-4 shows the location of Burial Pit 2, the pit closest to 4825 Glenbrook Road.

1.8.3 Operable Unit 3 EE/CA

1.8.3.1 To address concerns of the DDOE, the U.S. Environmental Protection Agency (USEPA) Region III collected surface soil and subsurface soil samples in and around 4801, 4825, and 4835 Glenbrook Road to supplement their Risk Assessment (USEPA, 1999). Based on the results of this sampling, it was determined that the soil of these three properties could have been impacted by American University Experiment Station (AUES) activities in the vicinity of the two burial pits. Consequently, the USACE performed an Engineering Evaluation/Cost Analysis (EE/CA) for the three Operable Unit 3 (OU-3) properties in October 2000.

1.8.3.2 This EE/CA included extensive sampling to determine the nature and extent of contamination found in the surface and subsurface soils of the three OU-3 properties. The OU-3 EE/CA and baseline risk assessments for 4801, 4825, and 4835 Glenbrook Road addressed the potential hazard associated with arsenic contamination in the soil. The EE/CA was conducted to recommend and justify the appropriate preferred alternative to deal with the arsenic contamination in the soil. The conclusion of the risk assessment was that there was unacceptable risk with regard to exposure to arsenic in the surface soils. A Non-Time Critical Removal Action was performed to address the arsenic-contaminated soil at 4825 and 4801 Glenbrook Road. The soil removal was conducted from December 2000 to August 2002. Figure 1-4 shows the areas and depths of where soil was removed from the 4825 Glenbrook Road property.

1.8.3.3

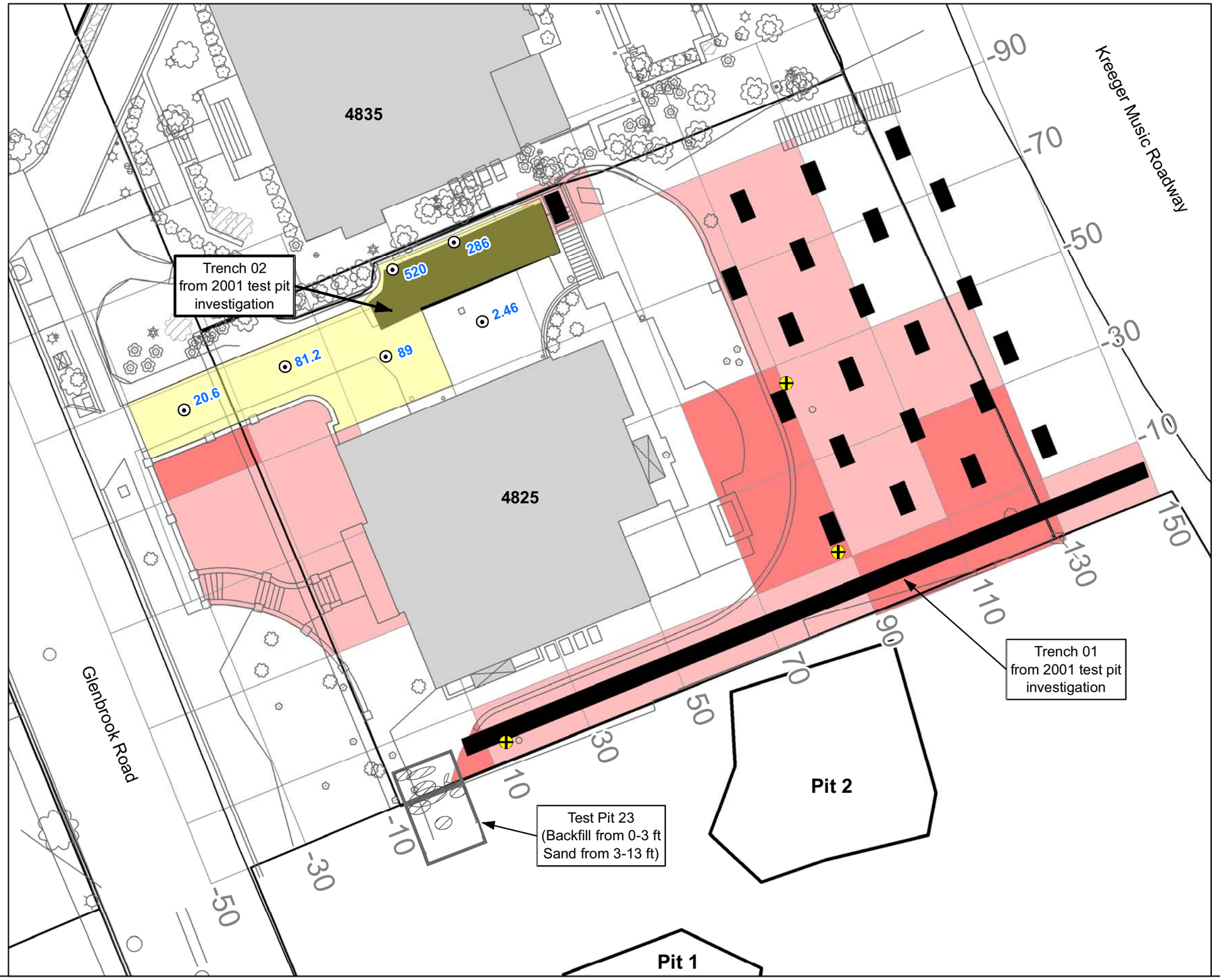

Figure 1-4
Test Pit and Arsenic
Removal Locations
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Driveway Borings (Jan 23, 2001)
- *520* Arsenic ppm in boring samples (locations with Arsenic > 20ppm will require removal under separate action)
- Manhole
- Property Boundaries
- Buildings
- Pits 1 & 2 (POI-24R)
- Test Pits investigated in 2001
- Test Pit 23
- Areas of Debris/Glassware
- 20' Grid
- Arsenic Grid to be Removed under a separate action
- Arsenic Grid Previously Removed (2')
- Arsenic Grid Previously Removed (4')

0 10 20 40 Feet

1 inch equals 20 feet

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1.8.4 4825 Test Pit Investigation

1.8.4.1 On May 21, 2001, the excavation of numerous test pits began at 4825 Glenbrook Road. Twenty-three test pits and two trenches were excavated at the property IAW *Addendum 10* to the *Site Safety Submission (SSS), March 1999 (Work Plan for Test Pit Investigation)* (USACE, 1999). A Vapor Containment Structure was used as an Engineering Control Structure (ECS) during the investigation of Test Pit 23 after MEC was uncovered. All the other test pits and trenches were investigated under a tent. Air monitoring during the excavation was performed by the Edgewood Chemical Biological Center (ECBC) air monitoring team. Figure 1-4 shows the majority of the test pit locations and Test Pit 23.

1.8.4.2 Trench 01 was excavated along the property line between the 4825 and 4801 Glenbrook Road properties to locate potential burial trenches. Trench 01 measured approximately 150 feet in length.

1.8.4.3 Trench 02 was excavated on the driveway at 4825 Glenbrook Road to investigate the source of the arsenic concentrations exhibited in the driveway soil boring samples. Trench 02 measured approximately 40 feet in length. The excavation stopped when a drainage pipe was encountered at a depth of five feet. Trench 02 was temporarily backfilled with the material that had been removed during the trench operation. Further investigation of Trench 02 is expected to occur when low probability work activity at 4825 Glenbrook Road resumes.

1.8.4.4 All the test pits were excavated to a depth of approximately 6 feet below the historic 1918 ground surface or the maximum depth achievable by equipment. Other than Test Pit 23, the maximum depth reached during the test pits investigation was 12 feet below the existing ground surface. There were no significant findings in any of the test pits except for Test Pit 23.

1.8.4.5 During the investigation of Test Pit 23, which ultimately measured approximately 32 feet by 17 feet by 14 feet in depth, a total of 11 RCWM-related items and 427 munitions-related items were recovered. All RCWM items were placed in the IHF at the Federal Property and were subsequently safely demilitarized IAW *Annex E to the Site-Wide Chemical Safety Submission (CSS), May 2003 (Explosive Destruction System Operations)* (USACE, 2003). Headspace analyses for mustard (H) and lewisite (L) were performed by ECBC on all MEC/RCWM items found in Test Pit 23. Eleven headspace samples were positive for H and/or L. Various types of glassware, artifacts, and general debris were also recovered from Test Pit 23. Some of the glassware contained unknown liquids. These items were placed in multiple round containers (MRCs) and transferred to the ECBC Central Transfer Facility (CTF) at Aberdeen Proving Ground, Maryland for screening. Some of the bottles sent to the CTF were found to contain mustard and lewisite breakdown products. One 75mm projectile was analyzed by Batelle and was found to contain arsine. This item and two with potentially similar fill were subsequently disposed of by Batelle. Figure 1-5 illustrates the general locations within Test Pit 23 from which all MEC and RCWM-related items were recovered. Items were also observed and removed from beneath a retaining wall in close proximity to the house foundation. Test Pit 23 was essentially bisected by the 4801-4825 property line. The northern portion is on the 4825 Glenbrook Road property. The southern portion, which is on the 4801 Glenbrook Road property, was completely excavated and cleared as part of the initial Test Pit 23 investigation.

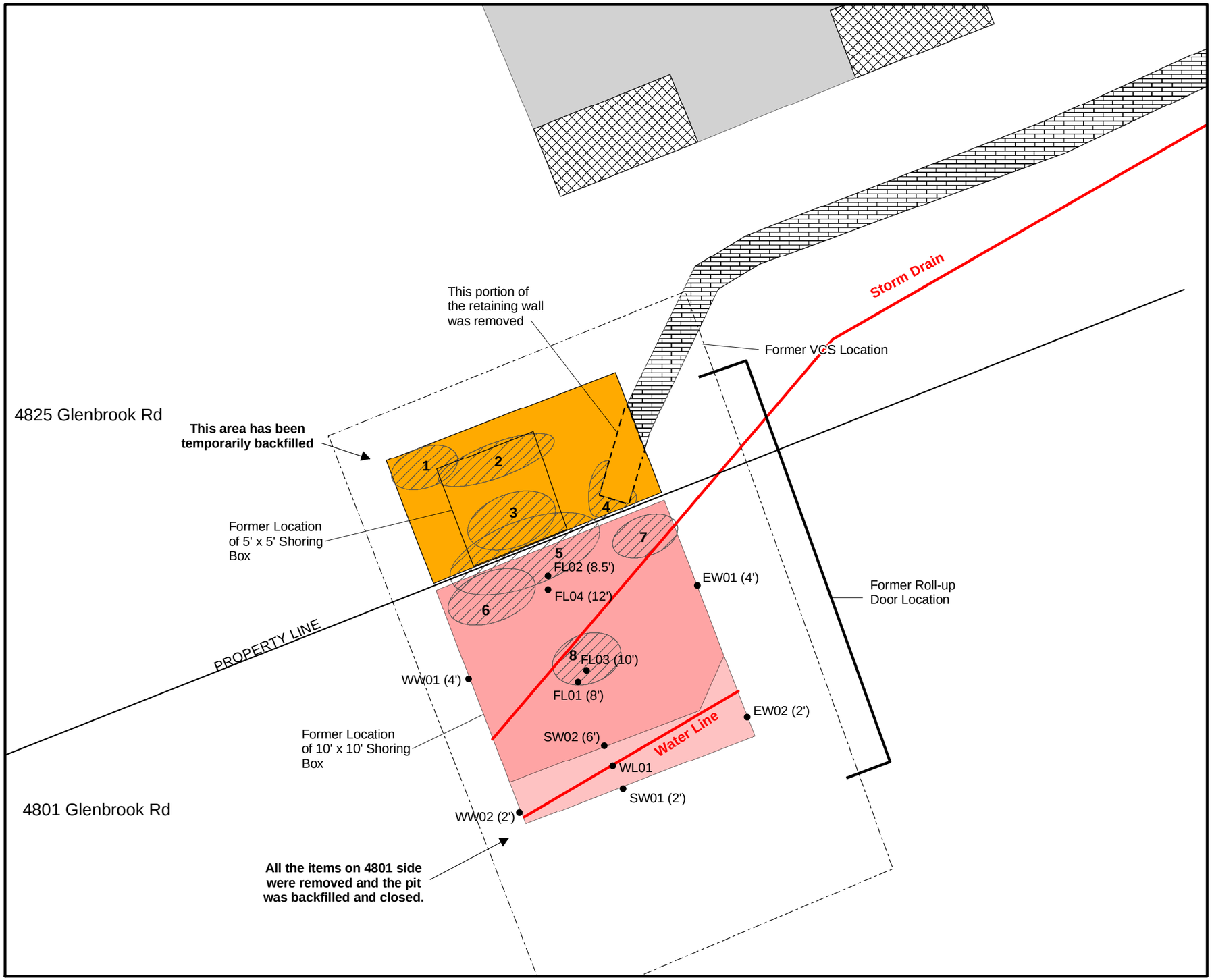

Figure 1-5
Location of MEC within
Test Pit 23

Spring Valley
Washington, D.C.

Legend

- Confirmation Sample Locations
- Areas of Debris/Glassware

Excavation Areas

- 13' 7" Deep
- 4ft Deep
- 8ft to 12ft Deep
- Buildings
- Former VCS Location
- Pipe
- Metal Grate
- Retaining Wall
- Removed Wall

Area	Ordnance Items	Glassware Items
1	249	-
2	133	2
3	18	6
4	24	6
5	-	74
6	2	-
7	-	16
8	1	-

5 2.5 0 5 Feet

1 inch equals 5 feet

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1.8.4.6 The southern portion is separated above-ground from the northern portion by a fence at the property line, and below-ground by a wooden retaining wall that provides support for the backfill material placed in the 4801 Glenbrook Road side of Test Pit 23 as part of the closure procedure.

1.8.4.7 Although the southern portion (4801 Glenbrook Road) was excavated and cleared, items observed under a retaining wall in close proximity to the 4825 Glenbrook Road house foundation still remain in the northern portion (4825 Glenbrook Road) of Test Pit 23. The northern portion of Test Pit 23 was temporarily backfilled in March 2002 because of right-of entry (ROE) issues. When the investigation was temporarily suspended, the Test Pit 23 excavation was lined with geotextile cloth and backfilled with sandy material to leave a visible indication of the excavation's extent when the work resumed. This remaining portion of Test Pit 23 is being referred to as Burial Pit 3 for purposes of this investigation.

1.9 INITIAL SUMMARY OF RISK FROM RECOVERED CHEMICAL WARFARE MATERIEL AND MUNITIONS AND EXPLOSIVES OF CONCERN

1.9.0.1 RCWM, CA-contaminated media (CACM), and MEC, are known to be present in Burial Pit 3. The 4825 Glenbrook property is accessible by the public and may constitute an imminent and substantial endangerment to the general public, site personnel and the environment. Access to these items and removal by unauthorized personnel is a concern.

1.9.0.2 Potential RCWM at Burial Pit 3 includes munitions, bulk containers (e.g., ceramic containers or drums), and laboratory bottles. CACM includes soil, water, or debris contaminated with chemical agents. A list of the types of munitions-related items encountered during the previous investigation of Test Pit 23 is included in Table 1.1. Based on this, the most common MEC items expected to be found in Burial Pit 3 include 75mm Mk II chemical projectiles with explosive bursters and 75mm shrapnel rounds. All site personnel will be given RCWM/UXO recognition training on the type of agent(s) and/or ordnance suspected of being present prior to commencing any field activities. In addition, in the event CACM, RCWM, or MEC is encountered, all site personnel will be instructed to proceed IAW the procedures described in Chapter 3 of this document.

Table 1.1
List of Munitions-Related Items Found at 4825 Glenbrook Road

Item Description/Nomenclature	Comments
75mm Mk II Chemical Projectile	Explosively configured.
75mm Shrapnel Round	Explosively configured.
3-inch Stokes Mortar Round	None confirmed to be explosively configured.

1.9.0.3 It is assumed that Burial Pit 3 is a former AUES disposal pit similar to Burial Pits 1 and 2 at 4801 Glenbrook Road. As Burial Pit 3 is a disposal pit, it is assumed that the AUES-

related items were placed into a pre-excavated pit and, therefore, Burial Pit 3 is assumed to be surrounded by undisturbed soil.

CHAPTER 2
TECHNICAL MANAGEMENT PLAN

2.1 PROJECT OBJECTIVES

2.1.0.1 The objective for this effort is to continue with the high probability intrusive investigation of Burial Pit 3 in order to fully characterize any RCWM/CACM/MEC hazards that remain there. Parsons will perform the high probability intrusive investigation of Burial Pit 3 IAW the approved CSS, the Site-Wide Work Plan, and this SSWP.

2.2 ORGANIZATION

2.2.0.1 Several organizations are directly involved in the operations planned at Burial Pit 3. The technical team and their respective roles for the work at Burial Pit 3 are listed in Table 2.1. More detailed information concerning the organization and roles of major team members is provided in Subchapter 2.2 of the Site-Wide WP.

Table 2.1 Organizations and Responsibilities

Responsibility	Organization
Project Manager (Site Operations Officer)	CENAB
Implementing Agency (Safety Specialist)	USAESCH
Contractor [Project Manager, Site Manager, Project Safety and Health Manager (PSHM), and Site Safety and Health Officer (SSHO)]	Parsons
Air Monitoring Team/Contract Surety Laboratory	ECBC
Personnel Decontamination Station (PDS) Operation, Emergency Rescue, Chemical Agent Response and Explosives Ordnance Disposal (EOD) Support	United States Army 22nd Chemical Battalion (Technical Escort) (TE)
RCWM Storage, Shipment, and Destruction	PMNSCM

2.3 FEDERAL, STATE, AND LOCAL AGENCIES

2.3.0.1 The Federal, State, and Local Agencies involved with the project at the SVFUDS are described in Subchapter 2.3 of the Site-Wide WP.

2.4 SPRING VALLEY PARTNERING GROUP

2.4.0.1 The Spring Valley Partnering Group is described in Subchapter 2.4 of the Site-Wide WP. For the project at 4825 Glenbrook Road, AU (the property owner) will participate in the meetings of the Spring Valley Partnering Group.

2.5 ANOMALY REVIEW BOARD

2.5.0.1 The SVFUDS Anomaly Review Board is described in Subchapter 2.5 of the Site-Wide WP.

2.6 PROJECT PERSONNEL

2.6.0.1 The key Parsons personnel that are planned for the project at 4825 Glenbrook Road are listed in Table 2.2. The roles of these personnel are described in Subchapter 2.6 of the Site-Wide WP.

Table 2.2 Key Parsons Project Personnel

Project Role	Name
Project Manager	Deepak Bhinge, P.E.
Site Manager	Christopher Yonat
PSHM	Ed Grunwald, C.I.H.
SSHO	Harry Craig
Technical Director	Tom Bachovchin, P.G.
Project Geophysicist	John Baptiste
Project Chemist	David Badio
Project QC Manager	Michael Short

2.7 PROJECT COMMUNICATION AND REPORTING

2.7.0.1 Project communication and reporting procedures are described in Subchapter 2.7 of the Site-Wide WP.

2.8 PROJECT DELIVERABLES

2.8.0.1 Project deliverables will meet the schedule requirements of the project and will be prepared IAW the applicable DID format referenced in the SOW. Deliverables will undergo internal Parsons review prior to submittal to other organizations. The following deliverables will be submitted as specified in the SOW:

- SSWP (draft, draft final, and final versions)
- Site-Specific Annex to the CSS (draft and final versions)
- Anomaly Investigation Report (draft, draft final, and final versions)

2.8.0.2 Other deliverables will include Daily Quality Control Reports (DQCRs) (submitted daily during investigation activities) and Sample Data Reports (for environmental samples).

2.9 PROJECT SCHEDULE

2.9.0.1 A project schedule has been prepared and includes project tasks such as work plan preparation, review and approval; mobilization and training; intrusive investigation; demobilization; and report preparation. The schedule is updated periodically (typically updated on a monthly basis) and presented to USACE. The dates on the project schedule are planned only and are subject to change based on ongoing project developments and discussions with the Project Delivery Team (PDT).

2.10 PERIODIC REPORTING

2.10.0.1 Periodic reporting requirements are described in Subchapter 2.10 of the Site-Wide WP.

2.11 COSTING AND BILLING

2.11.0.1 Costing and billing requirements are described in Subchapter 2.11 of the Site-Wide WP.

2.12 PROJECT PUBLIC RELATIONS SUPPORT

2.12.0.1 Details concerning project public relations support are described in Subchapter 2.12 of the Site-Wide WP.

2.13 SUBCONTRACTOR MANAGEMENT

2.13.0.1 The key subcontractors that will assist with the operations planned at 4825 Glenbrook Road are listed in Table 2.3. More detailed information concerning the organization and roles of the major subcontractors is provided in Subchapter 2.13 of the Site-Wide WP.

Table 2.3
Subcontractors

Responsibility	Organization
Site Support and Waste Disposal Subcontractor	Zimmer Environmental Solutions
UXO Subcontractor	USA Environmental
Site Electrician	MC Dean
Site Surveyor	C.P. Johnson
HTW Laboratory	GPL Laboratories
HTW Laboratory (Air Samples)	Clayton Group Services

2.14 MANAGEMENT OF FIELD OPERATIONS

2.14.1 Introduction

2.14.1.1 This subchapter describes the general steps relating to field operations that will be implemented during the investigation of Burial Pit 3. The descriptions of these general steps refer to the more detailed procedures elsewhere in this SSWP and in the Site-Wide WP.

2.14.2 Technical Project Planning

2.14.2.1 The SVFUDS has a pre-established process through the Spring Valley Partners whereby sites are selected and prioritized for geophysical and/or intrusive investigation, and site-specific objectives are developed. The site-specific objectives for the Burial Pit 3 investigation have been developed through this pre-established process.

2.14.3 Probability Assessment

2.14.3.1 No new probability assessment is required for the investigation as MEC and RCWM are already known to be present in Burial Pit 3.

2.14.4 Mobilization and Site Preparation

2.14.4.1 Mobilization and site preparation at the 4825 Glenbrook Road property will involve brush clearing in the vicinity of the planned excavation site and in areas where vegetation might obstruct site facilities (e.g., the PDS); tree removal; temporary removal of a portion of the fence between 4825 Glenbrook Road and 4801 Glenbrook Road; installation of a privacy fence; mobilization of equipment and facilities; construction of steps from the front yard to the driveway and extension of the existing steps along the northern boundary in the back yard; and erection of the ECS. The ECS for this investigation will be a Modular Aluminum Containment Structure (MACS) with an associated Vapor Containment Cover (VCC).

2.14.4.2 In order to install the ECS, fill material placed over the original Test Pit 23 excavation will be removed to an elevation of approximately 332 feet above mean sea level (AMSL). This is the approximate elevation of the existing ground surface on the north side of the retaining wall, between the retaining wall and the house. In addition to the fill material, some native soil west of the current Burial Pit 3 location will be also be removed in order to provide a level surface for the ECS. Native soil/fill at the northeast corner of the planned PDS location will be removed to create a level surface for the PDS. The native soil to be removed is not expected to contain MEC, RCWM, or CACM as this soil will be removed at elevations higher than where AUES-related items were encountered in Test Pit 23. The native soil will be removed under low probability excavation protocols with USAESCH oversight. Further information on site preparation and brush clearing is described in Subchapters 3.3 and 3.4.

2.14.5 Geophysical Surveys/Anomaly Reacquisition

2.14.5.1 Because the location of Burial Pit 3 is already known, and also because the proximity of the test pit to the house and the retaining wall will cause instrument interference, no geophysical surveys will be conducted before or after the intrusive investigation. For these reasons, no anomaly reacquisition will be required.

2.14.6 Intrusive Investigations

2.14.6.1 The intrusive investigation of Burial Pit 3 will begin over the original 4825 Glenbrook Road portion of the Burial Pit 3 excavation site. After removing soil down to 332 feet AMSL Parsons will remove the soil down to the depth where MEC and AUES-related debris are known to remain. This will be done using the previously installed geotextile barrier and sandy fill material as indicators of the limits of the previous investigation. This fill removal (i.e., after removal to 332 feet AMSL) will be performed under engineering controls. Once all fill material is removed, Parsons will then excavate soil to determine the horizontal extent of the AUES-related material. Once the horizontal extent is roughly determined, Parsons will then excavate to determine the vertical extent of the AUES-related material.

2.14.6.2 The intrusive investigation of Burial Pit 3 will be performed under an ECS combined with a chemical agent filtration system (CAFS). Air monitoring will be performed during excavation activities using the procedures described in the APP Supplement (Appendix D) and the CWM Air Monitoring Plan (Appendix J). The excavation team will perform the initial intrusive investigation. If potential RCWM or MEC items are found during the excavation, the

excavation team will perform an initial reconnaissance as described in Subchapter 16.14.3 of the Site-Wide SSHP (also provided as Attachment D-2 of the APP/SSHP Supplement in Appendix D of this SSWP).

2.14.6.3 Initially, the excavation team will evaluate potential ordnance and RCWM items. If the excavation team determines that an item is potential RCWM, TE personnel will confirm the determination. If the item is potential RCWM, qualified TE personnel will be responsible for packaging it in an MRC and transporting it to the IHF containers in the Federal Property Storage Area for additional evaluation, if required. If the excavation team or TE personnel determine that an item is not potential RCWM but is MEC, qualified UXO personnel will be responsible for placing these items in suitable containers and having them transported to the Federal Property Storage Area for additional evaluation, if required. Details regarding the intrusive investigation methods are described in Chapter 3.

2.14.6.4 Burial Pit 3 will be excavated until the excavation is cleared or until the excavation cannot be safely continued. The excavation will be considered cleared once: (1) it no longer contains AUES-related items; and (2) the Parsons geologist or equivalent determines that the excavation has reached bedrock, saprolite, or native soil. Clearance decisions will be concurred by USACE. Unsafe conditions for continued excavation would include but are not limited to: AUES-related items extending past the limits of the ECS and/or the items are too deep for the shoring to provide adequate protection. If these unsafe conditions are encountered during the excavation, the PDT will re-evaluate the investigative approach.

2.14.7 HTW-Contaminated Soil Removal

2.14.7.1 No HTW-contaminated soil excavation is planned to take place during this investigation at 4825 Glenbrook Road. If excavation of HTW-contaminated soil is required, the operation will be conducted IAW Chapter 10 of the Site-Wide WP. Soil excavated from Burial Pit 3 during the course of the intrusive investigation will be disposed of as IDW, the handling of which is described in Subchapter 3.9.

2.14.8 MEC/RCWM Storage

2.14.8.1 The Federal Property Storage Area will be used for storing potential MEC/RCWM recovered from intrusive investigations. The Federal Property Storage Area is described in Subchapter 2.14.6 and Chapter 9 of the Site-Wide WP.

2.14.9 Disposal

2.14.9.1 All waste items and materials will be properly disposed of IAW Department of Defense (DOD), federal, state, and local regulations as described in Subchapter 3.9 of this SSWP, and Subchapters 3.8.14, 3.8.15, and 3.9 of the Site-Wide WP.

2.14.9.2 MEC will be disposed of IAW applicable Department of the Army and DOD regulations. If required, these operations will be performed under a separate SSWP.

2.14.9.3 The PMNSCM will be responsible for destruction of any RCWM. If required, these operations will be performed under a separate SSWP.

2.14.9.4 IDW determined to be hazardous based on analytical results will be sent to either a Resource Conservation and Recovery Act (RCRA)-permitted hazardous waste landfill (solid IDW) or a RCRA-permitted incinerator (solid and liquid IDW), depending upon the nature of the HTW material. Solid IDW determined to be "non-hazardous" based on analytical results may be disposed of at a non-hazardous waste landfill. For this operation, liquid IDW is expected to consist of decontamination water that may contain decontamination fluids such as bleach. Therefore, liquid IDW that does not contain RCWM and is non-hazardous will be processed by an industrial wastewater treatment facility.

2.14.10Engineering Report

2.14.10.1Following completion of the field effort and evaluation of the data collected, an Engineering Report will be prepared to document the intrusive investigation. The information presented in the report will be compiled and assessed as part of a Site-Wide RI/FS.

CHAPTER 3
FIELD INVESTIGATION PLAN

3.1 OVERALL APPROACH TO MUNITIONS RESPONSE ACTIVITIES

3.1.0.1 The overall approach to munitions response activities is described in Subchapter 3.1 of the Site-Wide WP.

3.2 IDENTIFICATION OF AREAS OF CONCERN

3.2.0.1 As discussed in Subchapter 1.8, Burial Pit 3 has been identified as the area of concern for this investigation.

3.3 SITE MOBILIZATION/DEMOBILIZATION AND SUPPORT PLAN

3.3.1 Objective

3.3.1.1 The objective of this subchapter is to describe the logistics of mobilizing personnel, equipment, and facilities to begin the project; and demobilizing personnel, equipment, and facilities upon completion of the excavation of Burial Pit 3.

3.3.2 Overview

3.3.2.1 Mobilization activities for this investigation will be conducted at two locations. They include the Federal Property and the 4825 Glenbrook Road site. The 4825 Glenbrook Road site includes the property itself and a small area on the AU campus at the top of the hill behind 4825 Glenbrook Road where the site trailers will be located.

3.3.3 Right-of-Entry

3.3.3.1 CENAB will obtain the appropriate rights-of-entry (ROEs) to perform the work outlined in this SSWP. CENAB will notify the property owners of the field investigation schedule prior to the start of work at the 4825 Glenbrook Road property. If an ROE cannot be obtained, work will not be permitted to proceed at the property and the project completion date may need to be extended.

3.3.4 Permits

3.3.4.1 Building/Erosion and Sediment Control

3.3.4.1.1 Title 21, Water and Sanitation, Section 502.1 of the District of Columbia Municipal Regulations (DCMR) requires any person engaging in “land disturbing” activities to obtain a

building permit. Land disturbing activities include stripping, grading, excavating, and transporting and filling of land. Approval of a building permit is conditioned on the submission by the permit applicant of an erosion and sediment control plan that has been reviewed and approved by the Department of Consumer and Regulatory Affairs. Parsons has obtained a building permit based on the information in this plan.

3.3.4.2 Storm Water Management Permit

3.3.4.2.1 Under 21 DCMR § 526.1, any earth moving or land change activities in the District of Columbia must institute appropriate storm water management measures to control or manage runoff, unless exempt. Exempt activities include construction or grading operations that do not disturb more than sixty-five thousand square feet of land, unless the operation is part of an approved subdivision that contains provisions for storm water management. Because the operation involves disturbing less than sixty-five thousand square feet, a storm water permit will not be required.

3.3.4.3 Permit to Discharge to Sanitary Sewer

3.3.4.3.1 Based on the previous investigation of Test Pit 23, significant quantities of water are not expected to be encountered in the excavation. For this reason, no discharges to the sanitary sewer are expected to be necessary and no temporary discharge permit will be required.

3.3.4.4 Public Space Permit

3.3.4.4.1 D.C. requires anyone using space in a public street to obtain a public space permit. Parsons will secure this permit from D.C. prior to the beginning of site mobilization. Reflective cones will be placed in front of 4825 Glenbrook Road to prevent parking in this area. Parsons has obtained a public space permit for this investigation.

3.3.5 Utility Protection Service

3.3.5.1 Parsons will notify Miss Utility, the utility protection service for the area, at least 48 hours prior to any intrusive work. The phone number for Miss Utility is (800) 257-7777. Parsons will also coordinate with property owners to ensure that utilities are not damaged inadvertently.

3.3.6 Federal Property

3.3.6.1 The Federal Property will be the primary staging area for all mobilizations and is described in Subchapter 3.3.5 of the Site-Wide WP. Facilities such as offices and MEC/RCWM storage facilities already exist at the Federal Property and, therefore, minimal mobilization activity will be necessary at the Federal Property. ECBC will mobilize their Mobile Analytical Platform to the Federal Property for agent analysis.

3.3.7 Intrusive Investigation Site

3.3.7.1 Mobilization at the intrusive investigation site will be sequenced to ensure that all contractors involved minimize impact to residents.

3.3.7.2 Figure 3-1 depicts the proposed site layout for the intrusive investigation of Burial Pit 3. This figure shows the relative locations of support facilities to be used. Locations of site facilities may be adjusted in response to field conditions.

3.3.7.3 Excavation locations may be adjusted in the field. Figure 3-2 shows the front yard and side profile of the 4825 Glenbrook Road property. Figure 3-3 shows the location where the excavation of Burial Pit 3 will take place.

3.3.7.4 Preparation

3.3.7.4.1 Suitable compactable fill material will be added as needed beneath the west end of the planned MACS location and in the planned drum handling area (Figure 3-1) to provide a stable platform for the ECS and to facilitate drum movement.

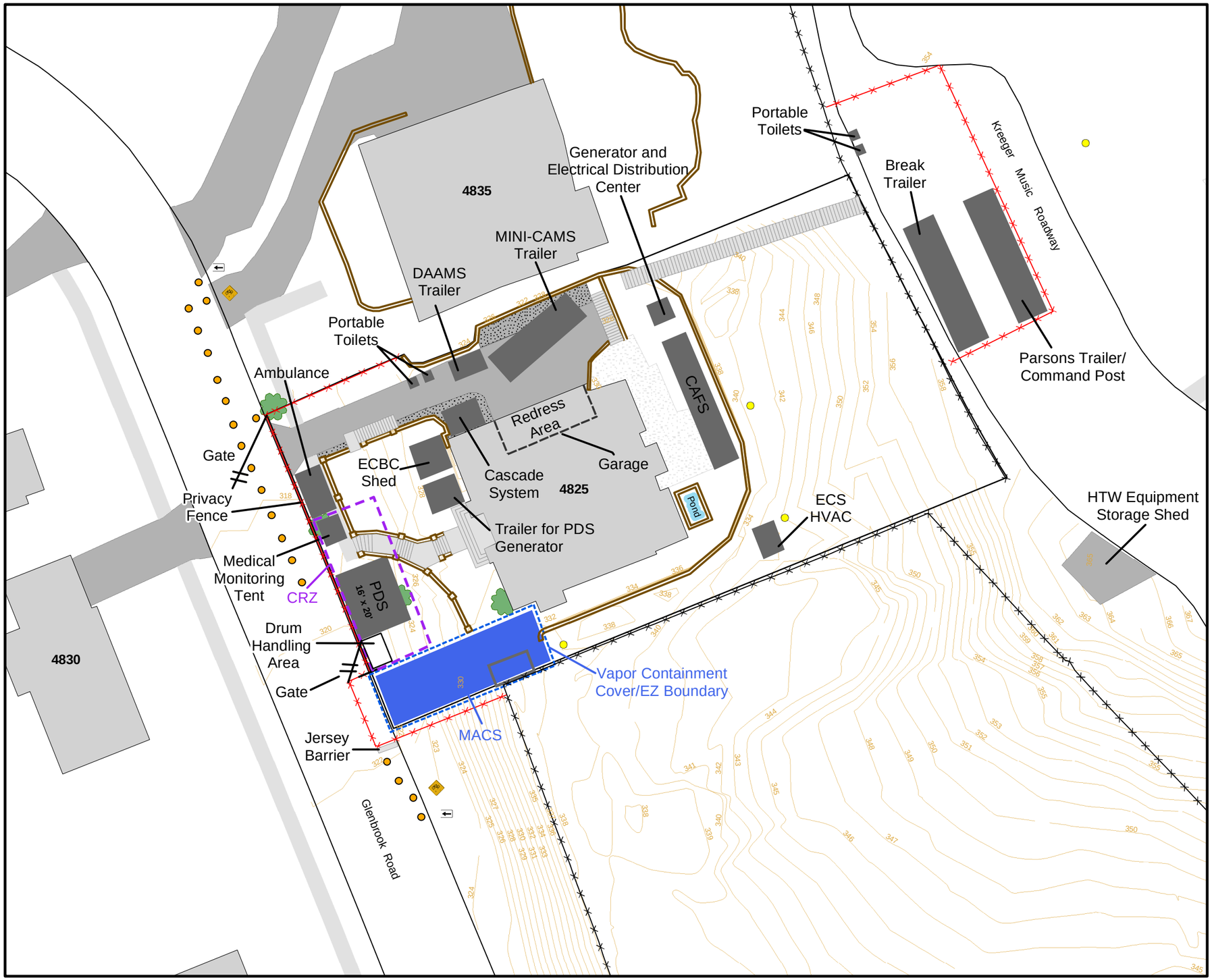
3.3.7.4.2 In addition to adding fill material to provide a stable platform for the ECS, some existing soil will need to be removed. Figure 3-4 shows the proposed location of soil removal. Soil and backfill material in the ECS location will be removed to be level with the existing ground surface between the retaining wall and the house. The material to be removed will include the sandy material used to backfill Test Pit 23 as well a small amount of native fill material as discussed previously. Native soil/fill at the northeast corner of the planned PDS location will be removed to create a level surface for the PDS.

3.3.7.4.3 The fill (and native material) will be removed with a UXO escort IAW low probability excavation protocols and USAESCH safety oversight as described in the Site-Wide WP. If any potential AUES-related items are uncovered during this grading operation, then the Low Probability Contingency Plan will be implemented (Subchapter 16.13 of the Site-Wide SSHP, which is also provided as Attachment D-1 of the APP/SSHP Supplement in Appendix D of this SSWP for ease of reference). If potential AUES-related items are recovered and the Spring Valley PDT determines that work cannot continue using low probability excavation protocols, then further grading will be stopped and the ECS will be built at the current elevation. However, the area to be excavated without engineering controls is small and is above the elevation at which the original Test Pit 23 items were encountered. Any material removed for grading will be stockpiled and reused for future site restoration activities at 4825 Glenbrook Road. This will include the native material as long as no potential AUES items are uncovered during the grading activities.

3.3.7.4.4 In addition to the soil, a small portion of the western end of the existing retaining wall will be removed down to an elevation of approximately 332 feet AMSL as determined through surveying.

Figure 3-1
Proposed Site Layout for 4825 Glenbrook Road

Spring Valley
Washington, D.C.



Legend

- Buildings
- Deck/Porch
- Sidewalk
- Stairs
- Driveway
- Gravel Surface
- Metal Grate
- Trees
- Privacy Fence
- Property Fence
- Elevation Contours
- Manhole
- Test Pit 23
- Trailers
- VCC
- MACS
- 36" High Reflective Cones
- Excavation Ahead Sign
- Sidewalk Closed Sign

30 0 30
Feet
1 inch equals 30 feet

Scale:	1:360
Created By:	Parsons
File:	20070321 4825 Glenbrook Rd Proposed Site Layout.mxd
Date:	4/05/2007
Figure Number:	3-1
Page Number:	3-4

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Figure 3-2 4825 Glenbrook Road Front Yard Photograph

Figure 3-3 4825 Glenbrook Road Burial Pit 3 Location

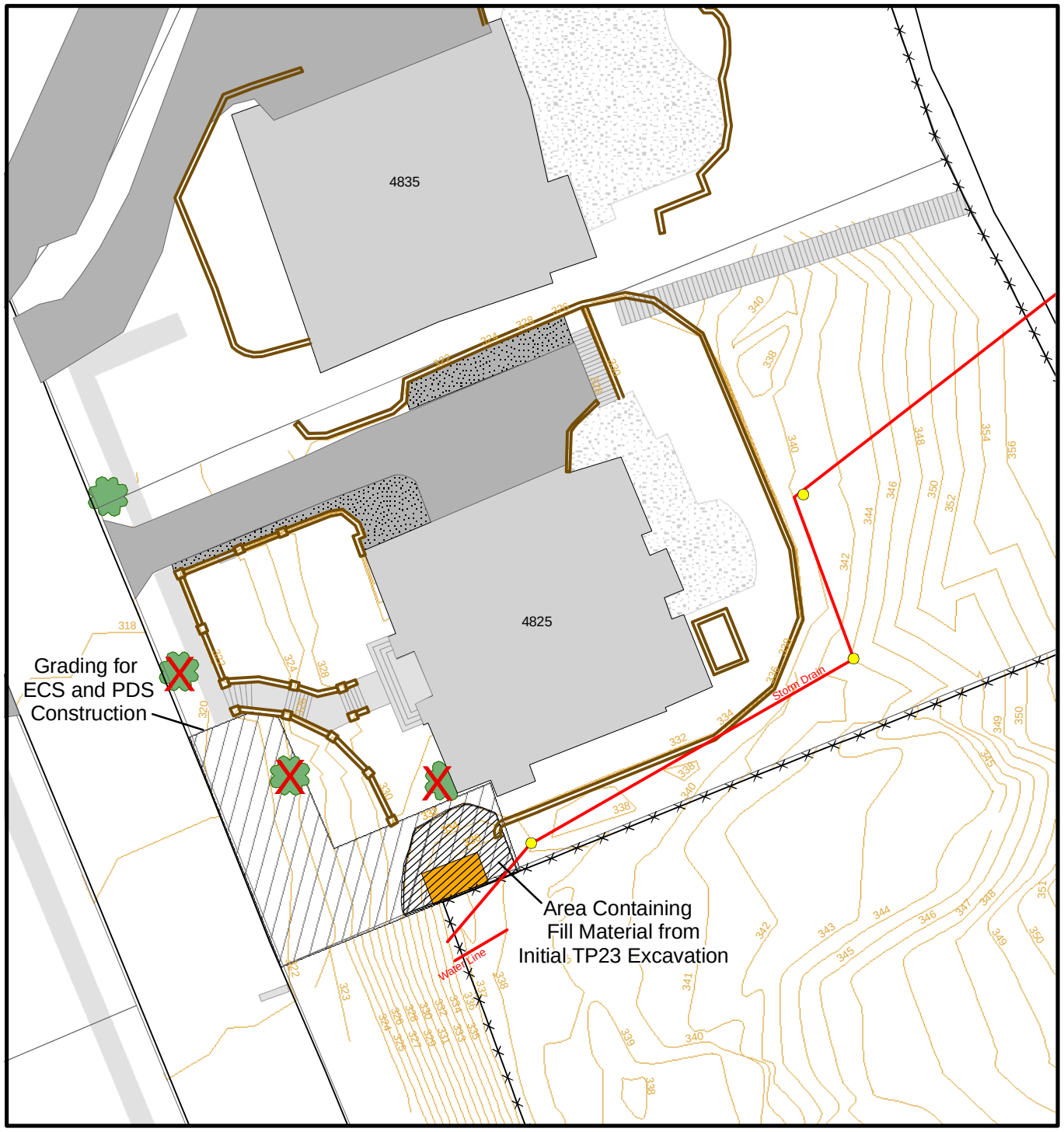

Figure 3-4
Site Preparation
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Deck/Porch
- Sidewalk
- Manhole
- Buildings
- Test Pit 23
- Dense Shrubbery
- Elevation Contours
- Metal Grate
- Parcels
- Retaining Wall
- Trees
- Trees to be Removed
- Property Fence
- Driveway
- Gravel Surface
- Pipe
- Area to be Graded
- Area of Fill Removal

30 15 0 30
Feet
1 inch equals 30 feet

Scale:	1:360
Created By:	Parsons
File:	20070115 4825 Glenbrook Road Site Preparation.mxd
Date:	5/1/2007
Figure Number:	3-4
Page Number:	3-6

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3.3.7.4.5 In conjunction with the grading activities, speed shoring panels will be installed to shore-up the wall along the 4825 and 4801 Glenbrook Road property boundary. This shoring will eventually form the east wall and a portion of the south wall of the MACS.

3.3.7.5 Utility Tie-in

3.3.7.5.1 The following is a list of equipment and their respective electrical power requirements:

- Air Monitoring Team Miniature Continuous Air Monitoring System (MINICAMS) trailer and CAFS – 480V, 3-phase, 150A (standalone)
- Two trailers (Command Post and Break Trailer) – 60A each (total 120A)
- PDS and MACS – 30A each (total 60A)
- A six-ton air conditioning unit - 10.5A at 460V, 3-phase

3.3.7.5.2 Electrical services will be supplied from Watkins and Kreeger Halls. The CAFS will include a generator back-up supplied by ECBC.

3.3.7.5.3 Parsons will use the external water taps at 4825 Glenbrook Road to supply water to the PDS.

3.3.7.6 Facility Construction

3.3.7.6.1 Figure 3-1 shows the proposed general layout of the facilities. The majority of the facilities will be pre-fabricated or self-contained. Two trailers, a storage shed, and two portable toilets will be placed within a fenced area behind 4825 Glenbrook Road on the AU Campus. One trailer will be used as the Command Post and Parsons/USAESCH office trailer. The second trailer will be used as a break trailer. The storage shed already at the site will be used to store sampling materials. Stairs will be constructed leading from the front yard to the driveway and the existing steps along the northern boundary of the back yard will be extended to the retaining wall.

3.3.7.6.2 ECBC will provide an office trailer on the 4825 Glenbrook Road property to house the MINICAMS. The 4825 Glenbrook Road garage will be used as the redress area. Medical personnel will perform pre-work and post-work monitoring of EZ personnel in the garage area. Two additional portable toilets will be placed on the driveway. TE will supply the PDS, cascade system, and the Medical Monitoring Tent. Parsons will supply the ECS air conditioning system.

3.3.7.6.3 In addition to the above referenced facilities, Parsons will construct the ECS. The ECS will be a MACS covered by a VCC. The MACS will be connected to a CAFS with the appropriate airflow as determined by ECBC. Details regarding the configuration and materials for the MACS and VCC are in the *Engineering Control Evaluation for 4825 Glenbrook Road, Washington D.C.,* (ECS Evaluation) prepared by Parsons for the USACE (USACE December 2006). Appendix M provides the details of how the MACS and VCC will be constructed IAW with the design described in the ECS Evaluation (USACE, December 2006).

3.3.7.7 Work Area Establishment

3.3.7.7.1 The 4825 Glenbrook Road property is bounded to the north, south, and east sides by walls or fences. An additional fencing with privacy screen will be temporarily constructed at the front of the property along Glenbrook Road to ensure the entire property is enclosed. This fence will extend approximately 3 feet into the street for a distance of approximately 20 feet where the MACS is located. Gates will be provided in this fence to provide access to the driveway and the drum handling area.

3.3.7.8 Site Security

3.3.7.8.1 A security guard contracted by CENAB will be present at the site during non-working hours to periodically monitor the support zone to ensure that no unauthorized personnel enter the site during non-working hours.

3.3.8 Demobilization

3.3.8.1 Demobilization activities will be performed IAW Subchapter 3.3.7 of the Site-Wide WP.

3.4 BRUSH CLEARING AND DEBRIS REMOVAL PLAN

3.4.1 Introduction

3.4.1.1 This subchapter details the location and method for brush clearing and debris removal, including removal of fences.

3.4.2 Brush Clearing

3.4.2.1 Brush clearing will be required in the front yard of 4825 Glenbrook Road to facilitate access for the intrusive investigation. Figure 3-5 shows the approximate area that will require brush clearing to allow access to the intrusive site. However, removal of vegetation will be kept to a minimum, especially in landscaped areas. Efforts will be made, wherever practical, to tie back branches and limbs to keep them out of the way of field activities in order to minimize the need to destroy or remove vegetation. The tree located at the southwest corner of the site on the adjacent property (4801 Glenbrook Road) will be limbed up and preserved. Brush clearing will be limited to the extent necessary to carry out investigation activities in vegetated areas.

3.4.2.2 At least three trees located in the front yard of the property will be removed during site preparation. Smaller trees adjacent to the investigation area may also require removal. Parsons will obtain approval from USACE prior to removing any trees.

Figure 3-5 Approximate Area of Brush Clearance

3.4.2.3 A landscape survey and a hardscape survey were conducted at 4825 Glenbrook Road in April 2007 to record the baseline conditions prior to the removal of any vegetation or alteration of hardscape. In addition, a condition assessment of the interior and exterior of the house was performed to determine the pre-intrusive investigation condition of the dwelling.

3.4.3 Fence Removal

3.4.3.1 A section of the fence between 4801 and 4825 Glenbrook Road will be temporarily removed to allow erection of the MACS. A temporary fence will be placed around the MACS to provide a barrier between 4801 Glenbrook Road and the work area. No fencing will be removed without prior approval from USACE. CENAB will also obtain the ROE for 4801 Glenbrook Road to allow these non-intrusive activities on this property.

3.4.4 Surface Debris

3.4.4.1 Surface debris is not a concern for the Burial Pit 3 investigation and, therefore, no surface clearance will be required.

3.5 GEOPHYSICAL PROVE-OUT PLAN

3.5.0.1 No geophysical prove-out will be required for the operations at 4825 Glenbrook Road as no geophysical investigation or anomaly reacquisition are planned for this site.

3.6 GEOPHYSICAL INVESTIGATION PLAN

3.6.0.1 No geophysical data acquisition or anomaly reacquisition will be required for the operations at 4825 Glenbrook Road because the location of Burial Pit 3 is already known. Additionally since the proximity of the test pit to the house and the retaining wall are known to cause instrument interference, digital geophysical data acquisition is not feasible.

3.6.0.2 Handheld analog instruments, such as the Schonstedt GA-52Cx magnetic locator and the Fisher 1266-X metal detector, may be used for anomaly avoidance and for use in excavations for initial determinations of excavation depths. These instruments will undergo QC checks IAW Subchapter 3.6.3.9 of the Site-Wide WP.

3.7 GEOSPATIAL INFORMATION AND ELECTRONIC SUBMITTALS

3.7.0.1 Geospatial information and electronic submittals will be maintained and submitted IAW Subchapter 3.7 of the Site-Wide WP.

3.7.1 Location Survey and Mapping

3.7.1.1 A Maryland-licensed land surveyor will locate and/or establish the following:

- Intrusive excavation location;
- Topography;
- General site and landscape features; and
- Local grid control point(s).

3.7.1.2 All points identified by the surveyor in the field will be of second order, class I accuracy, and referenced to the Maryland State Plane Coordinate System (NAD83).

3.7.1.3 If required, control around the site perimeter will be established with permanent or semi-permanent benchmarks.

3.7.1.4 A follow-up survey will be performed to delineate the footprint and depth of the excavated area prior to backfilling.

3.7.2 Geospatial Information Formats

3.7.2.1 The geospatial information formats to be used during this project are described in Subchapter 3.7.2 of the Site-Wide WP.

3.7.3 Metadata

3.7.3.1 Metadata standards to be used during this project are described in Subchapter 3.7.3 of the Site-Wide WP.

3.7.4 Electronic Submittals

3.7.4.1 Electronic submittal formats to be used during this project are described in Subchapter 3.7.4 of the Site-Wide WP.

3.8 INTRUSIVE INVESTIGATION PLAN

3.8.1 General Methodology

3.8.1.1 Intrusive investigations will be performed IAW procedures outlined in this SSWP and the Site-Wide WP as appropriate, including all reference regulations and procedures. In addition, the excavation of Burial Pit 3 will be performed IAW Higher Probability protocols as described within the APP in Appendix D of the Site-Wide WP, once all fill material has been removed. At any point during the intrusive investigation, if recovered items, analytical results, or field observations are inconsistent with what is addressed by the Site-Wide WP or this SSWP and the related APP/SSHP, work shall cease until the inconsistencies are resolved.

3.8.1.2 Equipment Needs

3.8.1.2.1 Typical equipment needs for site operations are presented in Table 3.1.

Table 3.1
Equipment Needs (Typical)

Investigation Site	MACS	MINICAMS
	CAFS	Weather station
	Air conditioning unit	MRCs
	PDS	Shovels, etc.
	Backhoe/Mini Excavator	Ambulance
	General purpose vehicles	Command post
	Geophysics instruments	Radios
	DAAMS tubes	Camera
	EPDS	Man-lift
Federal Property	X-Ray	Emergency Personnel Decon. Station
	PINS	Glove box
	Forklift	DAAMS
	Soil roll-offs	MINICAMS

3.8.1.3 Staff

3.8.1.3.1 Staff requirements for the excavation of Burial Pit 3 are summarized in the following paragraphs.

3.8.1.3.2 All Field Operations: The following staff (or designee) will be present during high probability intrusive field operations on Burial Pit 3:

- Site Operations Officer (CENAB)
- Safety Specialist (USAESCH)
- Site Manager (Parsons)
- SSHO (Parsons)
- UXO Quality Control Specialist (Parsons)
- Air Monitoring Team (ECBC)
- EOD Team (TE)
- Excavation Team – Three UXO personnel and Equipment Operator (Parsons)
- RCWM Team (TE)
- PDS Team (TE)
- Sample Team Coordinator (Parsons)
- Two Medics (George Washington Hospital contracted through CENAB)

3.8.1.3.3 The above personnel are those needed during the intrusive operations involving the excavation of Burial Pit 3 after any fill material is removed. Parsons will have three Excavation Teams to rotate in and out of the MACS in shifts, as determined by the SSHO (see Chapter 9 of the APP/SSHP Supplement in Appendix D of this SSWP for a description of work/rest regimens). For fill material removal, at a minimum, the following people (or designee) will be present:

- Site Operations Officer (CENAB)
- Safety Specialist (USAESCH)
- Site Manager (Parsons)
- SSHO (Parsons)
- Excavation Team – Three UXO personnel and Equipment Operator (Parsons)

3.8.1.3.4 Assessments at Federal Property: The assessment operations at the Federal Property will be staffed as described in Paragraph 3.8.1.4.3 of the Site-Wide WP.

3.8.1.4 Daily Operations

3.8.1.4.1 Daily operations for Burial Pit 3 intrusive operations after mobilization are presented in Table 3.3. A pre-operations checklist is presented as Table 3.8 of the Site-Wide WP. The SSHO will maintain the file of completed pre-operations checklists.

Table 3.3 Daily Operations

Air Monitoring Team positions monitoring equipment, monitoring lines, and challenges the MINICAMS. Monitoring personnel will receive tailgate health and safety briefing on site-prior to operations.
All workers and support staff arrive at the Federal Property or at the work site.
All personnel receive a daily safety briefing by the SSHO.
All team leaders receive a daily operations schedule.
All support personnel (security guards, medical) receive a daily operations schedule.
Air Monitoring Team personnel perform equipment checks prior to beginning intrusive investigations.
Medical personnel set up the ambulance for operations, perform pre-work monitoring of personnel that will be entering the Exclusion Zone (EZ).
Work force sets up the equipment in the EZ (air-lines, video, lighting, barricades as required).
The SSHO and USAESCH Safety Specialist will ensure all monitoring equipment (i.e., MINICAMS, Breathing Zone monitors, video) is operational, PDS and Emergency PDS are established.
The SSHO will give a short site-specific safety briefing to the EZ personnel and work will commence IAW the SSWP and Site-Wide WP.
Samples that are collected during the day's operations will be processed IAW the SSWP and Site-Wide WP.
Potential RCWM items will be packaged in MRCs and transported to the IHF containers at the end of the day (if applicable).
Air Monitoring Team personnel will gather all monitoring media for subsequent processing back at the Federal Property.
Medical personnel will perform post-operations monitoring of personnel that worked in the EZ.
The CENAB Site Operations Officer may or may not conduct a daily debrief for the day's operations.
Air Monitoring Team personnel will process DAAMS tubes collected during the day.
Soil and IDW containers generated during the day will be placed in the appropriate temporary storage area at the Federal Property, as required (containers may be left on site if it is considered safe to do so).

3.8.1.5 Site Layout and Control

3.8.1.5.1 The general site layout for the Burial Pit 3 investigation is presented in Figure 3-1. The work zone will be defined by the location of the MACS. The MACS is situated over the known location of Burial Pit 3.

3.8.1.5.2 The Exclusion Zone (EZ) will be the footprint of the ECS. The Contamination Reduction Zone (CRZ) will include the drum handling area and PDS. The Support Zone (SZ) will be those areas outside of the EZ and CRZ but within the fenced areas of 4825 Glenbrook Road and command post area of the AU Campus.

3.8.1.5.3 Road traffic will be limited to local traffic only to the extent practical through the use of "Local Traffic Only" signs at the closest crossroads to 4825 Glenbrook Road. This will be done to limit the amount of cut through traffic.

3.8.1.6 QA/QC of Excavation

3.8.1.6.1 Geophysical QC is not required for the intrusive investigation as the location of Burial Pit 3 is not based on the location of a geophysical anomaly.

3.8.1.7 Backfill and Site Restoration

3.8.1.7.1 Backfill and site restoration will be conducted IAW Subchapter 3.8.1.8 of the Site-Wide WP. Currently, the approved backfill source is AgTrans in Hanover, Maryland. If this source is no longer available, another source will be identified, sampled and approved for use as described in the Site-Wide WP.

3.8.2 Accountability and Records Management for MEC and RCWM

3.8.2.1 Accountability and records management for MEC and RCWM will be conducted IAW Subchapter 3.8.2 of the Site-Wide WP.

3.8.3 Personnel Qualifications

3.8.3.1 UXO teams will consist of qualified personnel IAW DDESB TP 18 "Minimum Qualifications for UXO Technicians and Personnel". Qualifications for UXO personnel are also described in Subchapter 3.8.3 of the Site-Wide WP.

3.8.4 MEC/RCWM/CA Sampling Overview

3.8.4.1 The location of Burial Pit 3 is known based on the previous investigations at 4825 Glenbrook Road. It is located off the southwest corner of the house (see Figure 1-2).

3.8.4.2 Various types of samples will be collected during intrusive excavation activities at Burial Pit 3 as summarized below and explained in subchapter 3.8.6. These include: pit characterization (soil), soil disposal (excavated soil), aqueous IDW (decontamination water),

scrap, and non-agent intact containers. These samples will be analyzed for two general types of compounds: CA (including ABPs) and HTW constituents.

3.8.4.3 For the 4825 Glenbrook Road investigation, CA is limited to mustard and lewisite. ABPs will also be analyzed. The mustard breakdown products are thiodiglycol, dithiane, and oxathiane. The lewisite breakdown products are chlorovinylarsenious oxide (CVAO) and chlorovinylarsenious acid (CVAA). At the SVFUDS, ricin is also a potential contaminant of concern. Although not categorized as CA/ABPs, ricin is included with this grouping.

3.8.4.4 CA/ABP and ricin samples will be transported off-site to the ECBC laboratories located at Aberdeen Proving Ground, Maryland.

3.8.4.5 HTW constituents, which include disposal parameters, will be sampled and analyzed IAW the SAP in Appendix E of the Site-Wide WP. For waste profile and pit characterization samples, this will include the SVFUDS Comprehensive List compounds.

3.8.5 Intrusive Investigation Procedures for the Excavation of Burial Pit 3

3.8.5.1 All fill material previously placed by USACE as part of the temporary closure of Test Pit 23 will be excavated using low probability procedures. A geotextile fabric barrier was placed between the temporary fill and the unexcavated portions of Test Pit 23 and this will act as a marker for the limits of the previous investigation. Once all of the original fill material has been removed or previously unexcavated material is encountered, further excavation will be conducted under an ECS using high probability procedures.

3.8.5.2 Further excavation will be performed to maximize the use of benching and sloping techniques and to minimize the use of shoring. This will involve sloping the excavation from the bottom of the original pit up towards the west end of the ECS to the extent practical. Shoring panels will be used for the north, south, and east walls of the excavation. Designs for these systems have been prepared and sealed by a registered professional engineer and will be kept at the site for the duration of the investigation. Cribbing material will be used to support the storm drain if required.

3.8.5.3 Though no geophysical data is available for Burial Pit 3, dig sheets will be used to record the location of items uncovered during the intrusive investigation. Prior to the start of work, the excavation area will be overlain with a grid system to facilitate the recording of locations of recovered items and collected samples. The dig sheets will reference this local grid. As discussed previously, the local grid will be based on surveyed points to ensure the data collected can be incorporated into the Parsons Geographic Information System database.

3.8.5.4 The initial excavation under the ECS will be performed using a miniature excavator. The excavator will be operated by a heavy equipment operator and the excavation will be monitored by a UXO Technician II or higher at all times. During excavation activities, each lift of excavated material will be inspected by a UXO Technician II or higher for items of interest (potential items, munitions debris, etc.) before the next lift is excavated.

3.8.5.5 Material will be removed from the excavation in 6- to 12-inch lifts, until the UXO technician monitoring the operation determines that the excavation is a minimum of 12 inches from any potential item. At this point, mechanical excavation will be stopped and the Excavation Team will complete the excavation using hand digging. Mechanical excavation will continue until such time as it becomes impractical or unsafe as determined by the Site Manager and/or the SSHO. If mechanical excavation becomes impractical or unsafe, the excavation will continue using hand excavation techniques.

3.8.5.6 Potential ordnance items will be evaluated initially by Parsons UXO technicians to determine whether the item is acceptable to move or if TE EOD is required. All potential items will be evaluated following the procedures detailed in Subchapter 16.14 of the Site-Wide SSHP (also provided as Attachment D-2 of the APP/SSHP Supplement in Appendix D of this SSWP for ease of reference). Potential RCWM items will be evaluated by the TE EOD team, packaged in MRCs, and transported to the Federal Property for additional evaluation IAW Subchapter 3.8.14 of the Site-Wide WP.

3.8.5.7 When excavating inside the ECS, the closest the excavation will be allowed to come to any exterior wall is two (2) feet. When any potential ordnance item is uncovered and brought to ground level, a stand-off distance of two feet from the MACS walls will be maintained until the item is properly packaged or determined acceptable to move.

3.8.5.8 Information will be collected during the intrusive investigation in accordance with Subchapter 3.8.5 of the Site-Wide WP.

3.8.5.9 As soil is excavated, it will be directly loaded into drums, or stockpiled on geotextile fabric inside the ECS for later loading into drums. Soil can be loaded directly into drums if the soil has been inspected by a UXO technician for items of interest (potential ordnance or RCWM items, munitions debris, etc.) or if the soil has been hand excavated. Enough room will be left in the drum to allow the lid to be properly attached (generally the drums will be approximately 2/3 full). Drums of soil will be staged at the western end of the ECS until such time as the Site Manager and/or Excavation Team leader determines that the drums can be brought outside. The drums will be cleaned with a dry brush and will be kept free of loose soil and debris to prevent contamination from being transported outside the ECS. A roller-bed will be used, to the extent practical, to facilitate the movement of drums outside of the ECS. Drums will be removed from the ECS only when approved by the Site Manager and SSHO. At a minimum, drums will not be removed when high probability intrusive excavation activities are occurring or during potential item packaging operations.

3.8.5.10 Once drums are being prepared to be moved outside the ECS, the drum handling truck will be brought to the gate outside the drum handling area. When the truck is maneuvering into place and drums are loaded onto the truck, traffic in both directions will be temporarily blocked along Glenbrook Road. This will be done by flagmen positioned before the south-side of the MACS and before the 4825 Glenbrook driveway. The actual traffic blocked should be minimal as there should only be local traffic using that portion of Glenbrook Road.

3.8.5.11 As there is no magnetic anomaly, resolution of Burial Pit 3 will be based on removal of all AUES related items, and lithology. Burial Pit 3 will be excavated until the excavation is

cleared or until the excavation cannot be safely continued (as determined by the USAESCH Safety Specialist and the Parsons SSHO). The excavation will be considered cleared once: (1) it no longer contains AUES-related items and (2) the Parsons geologist or equivalent determines that the excavation has reached undisturbed soil. Evidence of undisturbed soil will be determined based on the presence of saprolite, bedrock, or other indications that the soil is native and undisturbed. A determination as to whether the excavation has reached undisturbed soil will be made by the Parsons geologist or equivalent and concurred by USACE. If conditions are encountered such that the excavation cannot be continued safely, USACE will re-evaluate the investigation approach.

3.8.5.12 Once the Burial Pit 3 excavation is considered to be resolved, pit characterization samples will be collected and analyzed (Subchapter 3.8.6). If no agent/ABPs or ricin are detected in these pit characterization samples, the excavation of Burial Pit 3 will be confirmed as complete. If agent/ABPs or ricin (if applicable) are detected, the pit will be over-excavated as described in Subchapter 3.8.6.

3.8.5.13 If the soil is found to be free of agent/ABPs and ricin (if applicable) but is identified to contain HTW compounds, the Spring Valley Partners will discuss the appropriate action to be taken. The possible actions could be to:

- Collect additional samples; or
- Perform additional soil removal; or
- Take no action (demonstrate that no risk remains by risk assessment); or
- Defer action until a later date.

3.8.5.14 If removal of HTW-contaminated soil is determined to be required, it will be addressed under a separate SSWP.

3.8.5.15 With the exception of the fill material excavated at the beginning of the operation, which is assumed to be clean, excavated soil will be sampled IAW Subchapter 3.8.6 and disposed of IAW Subchapter 3.9 of the Site-Wide WP.

3.8.5.16 Non-RCWM intact containers, scrap, and IDW will be handled and disposed of IAW Subchapter 3.8.14 and 3.9 of the Site-Wide WP.

3.8.5.17 Once the excavation has been confirmed as completed, soil will be backfilled into the hole and compacted IAW Subchapter 3.8.1.8 of the Site-Wide WP. Backfill and site restoration will be conducted IAW Subchapter 3.8.1.8 of the Site-Wide WP. Currently, the approved backfill source is AgTrans in Hanover, Maryland. If this source is no longer available, another source will be identified, sampled and approved for use as described in the Site-Wide WP.

3.8.6 Burial Pit 3 Analytical Sampling Procedures

3.8.6.1 Pit Characterization Samples

3.8.6.1.1 Once the excavation of Burial Pit 3 is considered to be resolved (Subchapter 3.8.5), pit characterization samples will be collected and analyzed IAW Subchapter 3.8.6.1 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP. In general a representative pit characterization sample will be collected from the center of the floor for each 20 linear feet of excavation. For example, a floor sample will be collected from the center of each 20-foot by 12-foot section (12 feet is the maximum achievable excavation width inside the MACS). Pit characterization samples will also be collected from the midpoint of each outer sidewall (generally one per 20 linear feet), halfway between ground level and the pit floor (on the outer boundary of the proposed excavation area) or near the elevation where scrap or any containers that were encountered. If the area being sampled has been excavated to a greater depth than an adjacent excavated area, pit characterization samples will also be collected on the sidewall bordering that adjacent area. These samples will be collected from the horizontal/vertical midpoint of that sidewall.

3.8.6.1.2 In addition to analyzing the pit characterization samples for agent/ABPs, the pit characterization floor sample will also be analyzed for ricin by ECBC IAW Subchapter 3.8.6.1 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP.

3.8.6.1.3 If it is determined that further excavation is required based on the results of the pit characterization sampling for agent/ABPs and/or ricin, over-excavation of the pit will be performed. If further excavation is required at the pit floor, the excavation will proceed one foot deeper, or until bedrock has been reached. If further excavation is required for a sidewall, the excavation will be taken one foot farther.

3.8.6.1.4 Following the over-excavation of the pit, additional pit characterization samples will be collected and the process will be repeated until the pit is determined to be clear for agent/ABPs and/or ricin, or until bedrock has been reached.

3.8.6.1.5 If agent/ABPs or ricin are not detected in the pit characterization samples but the analysis indicates the presence of HTW compounds, the Partners will discuss the appropriate action to be taken. Over excavation of any HTW-contaminated soil may be conducted under a separate SSWP.

3.8.6.2 Soil Disposal Characterization Samples

3.8.6.2.1 Soil disposal characterization samples will be collected and analyzed IAW Subchapter 3.8.6.2 of the Site-Wide WP and the SAP (Appendix E of the Site-Wide WP) and as further clarified below. In addition to analysis for agent/ABPs, disposal characterization samples will be analyzed for ricin by ECBC.

3.8.6.2.2 Following agent/ABP and ricin clearance, soil disposal characterization samples (i.e., "RCRA samples") and generator knowledge (or "waste profile") samples will be collected and analyzed to determine the waste profile and meet the disposal facility requirements during the intrusive investigation. This is explained further below.

3.8.6.2.3 CA and Ricin Analysis

- During the excavation of Burial Pit 3, one representative composite soil sample will be collected for every three drums of excavated soil. These representative samples will be composited as described in Table 4.3 of the Site-Wide Sampling and Analysis Plan (Appendix E of the Site-Wide WP). Following headspace analysis for agent clearance by the Air Monitoring Team, this sample will be analyzed for agent/ABPs by ECBC.
- In addition to analysis for agent/ABPs, these samples will be analyzed for ricin by the ECBC. Initially, the frequency of ricin analysis will match that of analysis for agent/ABPs (i.e., one sample for every three drums of excavated soil). However, based on the results of the ricin analysis, this frequency may be reduced following consensus agreement by the Partners. Should the first week's samples indicate negative results for ricin, the Partners will reevaluate the situation, and potentially reduce the sampling frequency to one per day, instead of the composite of every three drums. The daily frequency may in turn be reduced to weekly should the results continue to show that ricin is not being detected.

3.8.6.2.4 RCRA Disposal Samples

- One RCRA soil sample will be collected and analyzed for each day of the intrusive investigation IAW Subchapter 3.8.6.2 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP. During the excavation of Burial Pit 3, one representative composite soil sample will be collected for every three drums of excavated soil. These representative samples will be composited as described in Table 4.3 of the Site-Wide Sampling and Analysis Plan (Appendix E of the Site-Wide WP). These samples will be kept on site, on ice or in a refrigerator in a secure location, until a separate aliquot has been cleared for the presence of agent/ABPs and ricin as specified above. When the individual composite samples have been cleared for agent/ABPs and ricin as specified above, they will be further composited into a single sample representing the day's production, and submitted to the HTW Laboratory (samples for VOC analysis will not be composited). These samples will be analyzed for RCRA disposal characterization parameters IAW the SAP in Appendix E of the Site-Wide WP.

3.8.6.2.5 Waste Profile Samples

- The purpose of the waste profile sample is to ensure that the disposal facility has sufficient knowledge of potential contaminants not addressed by the RCRA samples. The waste profile disposal sample will be generated by compositing the samples from drums generated once AUES-related items begin to be encountered in the excavation and will continue for 2 days after that. The Sample Team Leader will collect the composite portions from a range of containers/days to produce a representative sample, while maintaining overall sample holding times. The waste profile samples will be kept on site, on ice or in a refrigerator in a secure location,

until the associated soil is cleared for the presence of agent/ABPs and ricin as specified above. Following agent/ABP and ricin clearance as specified above, the waste profile sample will be shipped to the HTW laboratory for analysis IAW the SAP in Appendix E of the Site-Wide WP.

3.8.6.3 Scrap Samples

3.8.6.3.1 General scrap recovered during the investigation will be sampled and analyzed IAW Subchapter 3.8.6.3 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP.

3.8.6.4 Aqueous Samples

3.8.6.4.1 Aqueous IDW generated during the investigation will be sampled and analyzed IAW Subchapter 3.8.6.4 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP.

3.8.6.5 Intact Container Samples

3.8.6.5.1 Intact containers recovered during the investigation will be sampled and analyzed IAW Subchapter 3.8.6.5 and 3.8.14 of the Site-Wide WP and the SAP in Appendix E of the Site-Wide WP.

3.8.6.6 Other Samples

3.8.6.6.1 The excavation team may initiate additional soil sampling based on field observations such as stained soil or ash, or the presence of leaking containers or scrap. This sampling will only be performed after obtaining concurrence and approval from the on-site USAESCH Safety Specialist and CENAB Site Operations Officer. These samples will be kept on site, on ice or in a refrigerator in a secure location, until cleared for the presence of agent/ABPs and ricin as specified previously. When the samples have been cleared for agent/ABPs and ricin as specified previously, analysis will be performed for parameters specified in the SAP in Appendix E of the Site-Wide WP.

3.8.6.6.2 Additionally, if a consensus member of the Spring Valley Partners requests that a sample be taken, USACE will consider the request. The item or an adequate volume of material to be sampled will be stored appropriately until a decision is made regarding the analysis of the sample. In the case of a disagreement among the Spring Valley Partners, the material will be stored appropriately until the disagreement is resolved. Once the decision regarding the analysis is made, the sample will be cleared for the presence of agent/ABPs and ricin as specified previously. When the sample has been cleared for agent/ABPs and ricin as specified previously, analysis will be performed for parameters specified in the SAP in Appendix E of the Site-Wide WP.

3.8.6.7 Sample Designations

3.8.6.7.1 Sample designations will be assigned in general accordance with Chapters 4 and 5 of the SAP in Appendix E of the Site-Wide WP. Examples of the site-specific designations to be used during the Burial Pit 3 investigation follow.

- Pit Characterization SW-BP3-(Location)(Sample Number)-(Depth Taken)
- Soil – RCWM SW-BP3-CWM-(Sample Number)-(Date)
- Soil – RCRA Disposal SW-BP3-HTW-(Date)
- Soil – Waste Profile SW-BP3-WP-(Date)
- Scrap SW-BP3-SCR-(Sample Number)
- Intact Container SVS-Year-Sample Number
- IDW Sample SW-BP3-IDW-(Date)

3.8.6.7.2 For all samples except intact containers, the first two letters of the sample number ("SW") denote site-wide operations. The next three digits identify the site-specific location: "BP3" will be assigned to the Burial Pit 3 investigation. For all of these samples except pit characterization samples, the next code denotes the type of sample (see above).

3.8.6.7.3 Pit characterization samples will be further numbered using the location within the pit at which the sample was collected (e.g., NW [north wall], EW [east wall], FL [floor], etc.), the sample number, and the depth in feet at which the sample was collected. For example, sample #1 collected from the east wall of Burial Pit 3 at a depth of 3½ feet would be numbered "SW-BP3-EW01-(3.5')."

3.8.6.7.4 Soil disposal characterization samples sent for agent/ABP analysis will be further numbered by assigning a sequential sample number, beginning with 001, and the six digit date when the sample was collected. For example, the fourth composite disposal characterization sample collected on July 25, 2007 that was sent for agent/ABP analysis would be identified as "SW-BP3-CWM-004-072507."

3.8.6.7.5 Soil disposal characterization (RCRA) samples sent for HTW analysis will be further numbered using the date on which the composites were collected. In this way, the sample number will have the same date as the samples that were screened for CA and the corresponding sample numbers will relate to each other. For example, the composite soil disposal characterization sample composed of the screened agent/ABP samples above (collected on July 25, 2007) would be identified as "SW-BP3-HTW-072507."

3.8.6.7.6 Soil waste profile samples sent for HTW analysis will be further numbered using the date that they are composited and sent to the HTW lab for analysis. For example, the soil waste profile sample composited and sent for analysis on August 23, 2007 would be identified as "SW-BP3-WP-082307."

3.8.6.7.7 Scrap samples will be further numbered using the number of the scrap container that the sample is drawn from. For example, scrap sampled from container SCR-BP3-003 would be identified as "SW-BP3-SCR-003."

3.8.6.7.8 Non-agent intact container samples will be further numbered by assigning a sequential sample number, beginning with 001. For example, the fourth non-agent intact container sent for analysis in 2007 would be identified as "SVS-07-004."

3.8.6.7.9 Samples of IDW sent for disposal analysis will be further numbered using the date on which they were collected and sent for analysis. For example, the IDW sample collected and sent for analysis on September 30, 2007 would be identified as "SW-BP3-IDW-093007."

3.8.6.7.10 Where sequential numbers are used, sample numbers will begin with 01 or 001, as appropriate. Where sample depths are used, they will be noted in feet or fraction thereof; for example 4' or 0.5'.

3.8.7 Sampling Procedures at Low Probability Sites

3.8.7.1 The intrusive investigation at Burial Pit 3 will be conducted as a high probability investigation and, therefore, low probability sampling protocols will not be employed.

3.8.8 Maximum Credible Event and Munition with the Greatest Fragmentation Distance

3.8.8.1 The Maximum Credible Event (MCE) is selected for high probability sites based on the maximum release of a chemical agent from a munition, bulk container, or process that could occur as a result of an unintended, unplanned, or accidental incident. The event must be realistic with reasonable probability of occurrence. For operations at the 4825 Glenbrook Road property, USAESCH has identified the MCE to be the instantaneous release of arsine from a non-explosively configured 75mm Mk II chemical projectile.

3.8.8.2 The Munition with the Greatest Fragmentation Distance (MGFD) is selected for high probability sites based on the ordnance item with the greatest fragmentation distance that can reasonably be expected to be found at the site. Based on the record of items discovered at the SVFUDS to date, the MGFD is a 75mm Mk II chemical projectile with an explosive burster.

3.8.9 AEGL-2 Distance, MSD, and EZ

3.8.9.1 The Acute Exposure Guideline Level-2 (AEGL-2) distance is the distance beyond which the public will not experience irreversible or other serious, long-lasting health effects, or an impaired ability to escape associated with a chemical agent release. The AEGL-2 distance is used to delineate site work zones and design contingency plans. A computer model called D2SV, specifically tailored to the SVFUDS, is used to predict the AEGL-2 distance based on the selected MCE, meteorological data, and the nature of the work to be performed. The AEGL-2 distance will be calculated periodically throughout the day for the specific MCE and weather conditions at each site.

3.8.9.2 The typical MCE-based AEGL-2 distance for atmospheric stability factor D and a wind speed of 1 m/s, under summer conditions (95°F) is 226 meters (742 Feet). An ECS in conjunction with a CAFS will be used to limit the AEGL-2 distance to within the ECS.

3.8.9.3 The fragmentation distance for the MGFD (an explosively configured 75mm Mk II chemical projectile) is 1,194 feet and the Hazardous Fragment Distance is 200 feet. Based on the Hazardous Fragment Distance for the MGFD, the MSD used for site-wide operations will be 200 feet. The MACS will contain the fragments within the ECS. This will reduce the MSD to the limits of the ECS.

3.8.9.4 The EZ will be defined as the confines of the ECS as the MACS and VCC combination will contain the hazards associated with fragmentation and agent release.

3.8.10 Evacuation

3.8.10.1 No evacuation is planned for the Burial Pit 3 operations as engineering controls will be used to reduce the hazard distances to within the ECS.

3.8.10.2 In the unlikely event that engineering controls fail, the CENAB Site Operations Officer will implement the Public Protection Plan (PPP) for Burial Pit 3 based on the nature and quantity of the release. The PPP is maintained by CENAB as a separate document.

3.8.11 MEC/RCWM Identification

3.8.11.1 In the event that the Low Probability Contingency Plan is initiated during site grading activities because potential AUES items are encountered, subsequent actions taken will be determined according to the nature of the potential item. For ease of reference, the Low Probability Contingency Plan is included as D-1 of the APP/SSHP Supplement (Appendix D of this SSWP).

3.8.11.2 If a potential RCWM container or MEC item is encountered during the high probability investigation, the Excavation Team and/or TE will perform an initial reconnaissance. If during the initial reconnaissance the item is determined to be potential RCWM, the procedures described in Subchapter 16.14 of the Site-Wide SSHP will be performed. For ease of reference, these procedures are also included as Attachment D-2 of the APP/SSHP Supplement (Appendix D of this SSWP). For the purposes of high probability investigations, a potential RCWM container is defined as either (a) a container with markings denoting chemical agent or RCWM, or (b) an unidentifiable intact container that contains liquid. Note that, during an investigation at a high probability site, any discovered unidentifiable intact container that contains liquid will be assumed to be potential RCWM until determined otherwise.

3.8.12 MEC/RCWM Removal

3.8.12.1 In the event that the Low Probability Contingency Plan is initiated because potential AUES items are encountered during site preparation activities, subsequent actions taken will be determined according to the nature of the potential item as summarized in the Subchapter 16.13 of the Site-Wide SSHP (also provided as Attachment D-1 of the APP/SSHP Supplement in Appendix D of this SSWP for ease of reference).

3.8.12.2 If potential MEC/RCWM is encountered during the high probability investigation, the Excavation Team and/or TE will perform an initial reconnaissance following the procedures described in Subchapter 16.14 of the Site-Wide SSHP (also provided as Attachment D-2 of the APP/SSHP Supplement in Appendix D of this SSWP).

3.8.12.3 MEC/RCWM will be transported to the IHF via the route shown in Figure 3-6.

3.8.13 MEC/RCWM Storage

3.8.13.1 MEC/RCWM storage for this project is addressed in Subchapter 3.8.13 of the Site-Wide WP.

3.8.14 Intact Container Monitoring and Disposal

3.8.14.1 Intact container monitoring and disposal is addressed in Subchapter 3.8.14 of the Site-Wide WP.

3.8.15 MEC Disposal

3.8.15.1 MEC disposal is addressed in Subchapter 3.8.15 of the Site-Wide WP.

3.8.16 MEC Disposal Alternatives

3.8.16.1 MEC disposal alternatives are addressed in Subchapter 3.8.16 of the Site-Wide WP.

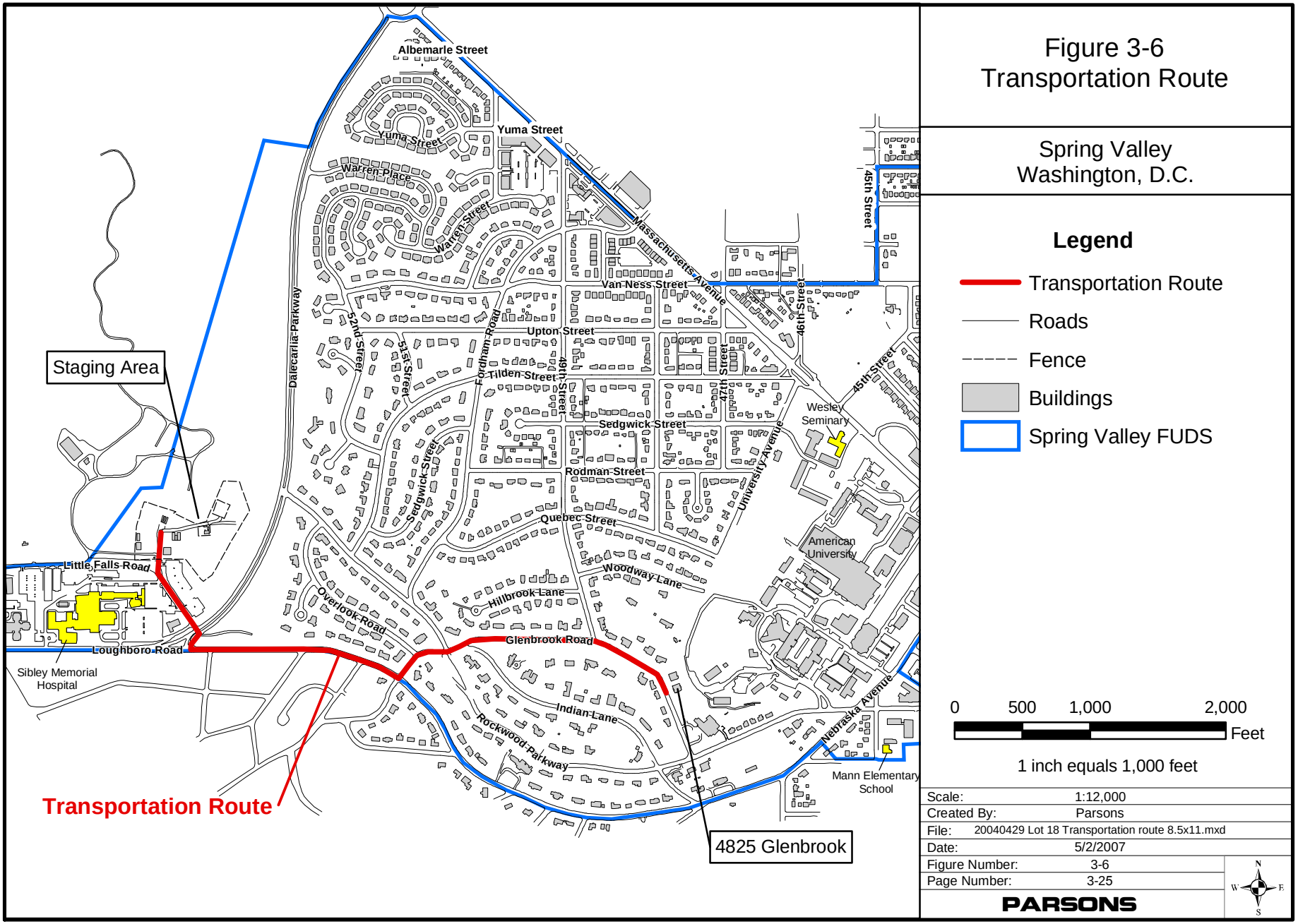


Figure 3-6
Transportation Route

Spring Valley
Washington, D.C.

Legend

- Transportation Route
- Roads
- Fence
- Buildings
- Spring Valley FUDS

0 500 1,000 2,000 Feet

1 inch equals 1,000 feet

Scale:	1:12,000
Created By:	Parsons
File:	20040429 Lot 18 Transportation route 8.5x11.mxd
Date:	5/2/2007
Figure Number:	3-6
Page Number:	3-25

PARSONS

3.9 INVESTIGATION DERIVED WASTE PLAN

3.9.0.1 The IDW Plan to be followed during all investigations at the SVFUDS is described in Subchapter 3.9 of the Site-Wide WP. Waste streams requiring disposal that may be generated during operations at 4825 Glenbrook Road could potentially include scrap, soil, decontamination water, PPE, solid waste, and on-site air monitoring laboratory-generated waste, which are all considered IDW. IDW will be transported to the Federal Property via the route shown in Figure 3-6.

3.9.0.2 The following are examples of container designations:

- For munitions debris: MD-BP3-005, MD-BP3-006, etc.
- For general scrap: SCR-BP3-180, SCR-BP3-181, etc.
- For excavated soil waste: ESW-BP3-666, ESW-BP3-667, etc.
- For intact containers: IC-BP3-001, IC-BP3-002, etc
- For all other IDW: IDW-BP3-240, IDW-BP3-241, etc.

3.9.0.3 All other details of the IDW Plan are described in Subchapter 3.9 of the Site-Wide WP.

3.10 RISK CHARACTERIZATION AND ANALYSIS

3.10.0.1 Risk characterization and analysis is addressed in Subchapter 3.10 of the Site-Wide WP.

3.11 ANALYSIS OF INSTITUTIONAL CONTROLS

3.11.0.1 Analysis of institutional controls is addressed in Subchapter 3.11 of the Site-Wide WP.

3.12 PREPARATION OF RECURRING REVIEW PLAN

3.12.0.1 Preparation of recurring review plans is addressed in Subchapter 3.12 of the Site-Wide WP.

CHAPTER 4
QUALITY CONTROL PLAN

4.0.0.1 The Quality Control Plan for the project is described in Chapter 4 of the Site-Wide WP.

CHAPTER 5
EXPLOSIVES MANAGEMENT PLAN

5.0.0.1 The Explosives Management Plan for the project is described in Chapter 5 of the Site-Wide WP.

CHAPTER 6
EXPLOSIVES SITING PLAN

6.1 INTRODUCTION

6.1.0.1 This Explosives Siting Plan outlines the procedures to be used during the SVFUDS investigation and describes the explosives safety criteria to be employed during operations. This plan was prepared IAW DID MR-005-04 and all requirements given in the DID are implied in this document. The Explosives Siting Plan for site-wide operations is in Chapter 6 of the Site-Wide WP.

6.1.0.2 USACE documents used to predict and mitigate blast effects are listed in Chapter 6 of the Site-Wide WP.

6.1.0.3 Transportation of conventional MEC items and associated explosive components that have been certified by the Air Monitoring Team to have no detectable chemical agent contamination and that are acceptable to move will be performed IAW the MEC Transportation Plan provided as Appendix L of the Site-Wide WP. Figure 3-6 illustrates the transportation route from 4825 Glenbrook Road to the Federal Property.

6.2 MUNITIONS RESPONSE AREA

6.2.0.1 The Munitions Response Area (MRA) for this project is designated as the SVFUDS. The MSD calculated for this MRA is based on the MGFD, which is a 75mm Mk II chemical projectile with an explosive burster.

6.2.1 Minimum Separation Distance

6.2.1.1 The MSD to protect non-essential personnel during intrusive operations has been calculated to be 200 feet based on the MGFD for this site (Subchapter 3.8.8 and 3.8.9). However, an ECS will be used during the investigation to contain any fragments that might result from an unintentional detonation (Subchapter 6.5). This will reduce the MSD to the limits of the ECS.

6.2.1.2 If during the course of the investigation MEC with a greater fragmentation range than the MGFD is encountered, then the distances in DoD 6055.9 STD, Chapter 9, Paragraph C9.4.1 will be used, the Quantity-Distance (Q-D) arc will be adjusted, and an amendment to this SSWP will be submitted for approval.

6.2.2 Demolition Areas

6.2.2.1 No on-site demolition is planned for this Munitions Response Site

6.3 FOOTPRINT AREAS

6.3.0.1 Footprint areas for intrusive operations are presented in Figure 3-1. The footprint areas have been approved by the USACE Military Munitions Center of Expertise.

6.3.1 Blow-In-Place

6.3.1.1 No blow-in place operations are planned for this MRA.

6.3.2 Collection Points

6.3.2.1 The Federal Property Storage Area will be used as a collection point IAW Chapter 9 of the Site-Wide WP.

6.3.3 In-Grid Consolidated Shots

6.3.3.1 No In-Grid Consolidated Shots are planned for this MRA.

6.4 EXPLOSIVES STORAGE MAGAZINES

6.4.0.1 See Chapter 9 of the Site-Wide WP for a discussion of the Explosives Storage Magazine siting.

6.5 ENGINEERING CONTROLS

6.5.0.1 A Department of Defense Explosives Safety Board-approved ECS will be used at 4825 Glenbrook Road to mitigate fragmentation resulting from an unintentional detonation. Details of this ECS are presented in Appendix M to this SSWP.

CHAPTER 7
ENVIRONMENTAL PROTECTION PLAN

7.1 INTRODUCTION

7.1.0.1 The Environmental Protection Plan (EPP) for site-wide field activities at the SVFUDS is described in Chapter 7 of the Site-Wide WP. The details included in this EPP address site-specific measures to be implemented at the 4825 Glenbrook Road property during the investigation of Burial Pit 3. In any instance where something is not addressed in this chapter, the EPP for site-wide field activities will be followed.

7.2 IDENTIFICATION AND COMPLIANCE WITH PRELIMINARY ARARS

7.2.0.1 Potential Applicable or Relevant and Appropriate Requirements (ARARs) are outlined in Subchapter 7.2 of the Site-Wide WP.

7.3 AFFECTED ENVIRONMENT

7.3.0.1 The environment at the SVFUDS is described in Subchapter 7.3 of the Site-Wide WP.

7.4 MITIGATION PROCEDURES

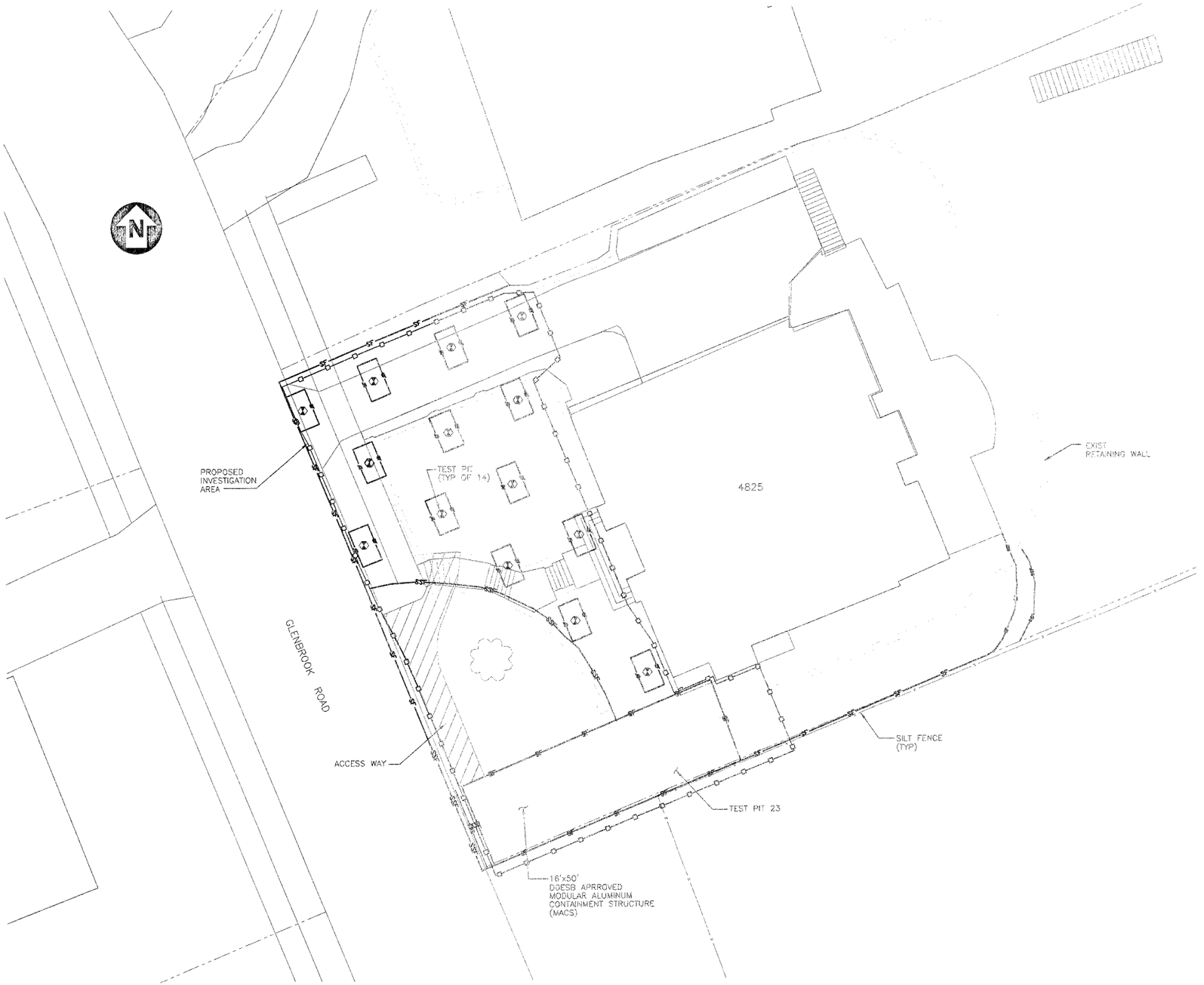
7.4.0.1 The mitigation procedures to be used to protect the environment during all field activities are detailed in Subchapter 7.4 of the Site-Wide WP. Specific procedures to be implemented for the investigation at 4825 Glenbrook Road are described below. These specific procedures involve erosion and sediment control and the mitigation of noise.

7.4.1 Erosion and Sediment Control

7.4.1.1 Erosion and sediment control measures will be installed and maintained as described in the Erosion and Sediment Plan submitted to D.C. in order to obtain the building permit and subchapter 7.4.9 of the Site-Wide WP. Figure 7-1 illustrates the proposed erosion and sediment control measures (i.e., silt fence) for 4825 Glenbrook Road.

7.4.2 Noise Abatement

7.4.2.1 Noise abatement measures will be employed to ensure that noise generated by the CAFS is controlled sufficiently to comply with DCMR regarding noise control. During site preparation activities, Parsons will conduct noise monitoring around the boundary of the work area and coordinate measures required to keep noise levels in compliance during site activities (below 60dBA at the property line).



EXCAVATION SITE AND EROSION AND SEDIMENT PLAN

SCALE: 1"=10'-0"

10 5 0 10

NOTES

1. REMOVE HARDSCAPE FEATURES WITHIN THE INVESTIGATION AREA.
2. INSTALL CONSTRUCTION ENTRANCES AND EXTEND EXISTING TEMPORARY ROAD.
3. CLEAR ONLY ENOUGH TO INSTALL DIVERSIONS AND SILT FENCES AS SHOWN ON PLANS.
4. INSTALL SILT FENCES AS SHOWN ON PLANS.
5. IMMEDIATELY RESEED BACKFILLED EXCAVATIONS WITH BERMUDA GRASS OR EQUIVALENT WHERE GROUND SURFACE REMAINS EXPOSED.
6. CONSTRUCT ALL CONTROLS AS SHOWN ON PLANS.
7. COMPLETE FINAL GRADING.
8. UPON COMPLETION OF FINAL GRADING, RE-SEED ACCORDING TO VEGETATIVE PRACTICES SPECIFICATIONS.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONLY AFTER PERMANENT VEGETATION IS WELL-ESTABLISHED.

EXCAVATION NOTES

1. EXCAVATION OF TEST PIT 23 WILL BE CONDUCTED UNDER AN ENGINEERING CONTROL STRUCTURE, AND EXCAVATED SOIL WILL BE DRUMMED AND DISPOSED OF OFFSITE, IN ACCORDANCE WITH THE SITE-SPECIFIC WORK PLAN.
2. SHORING WILL BE IMPLEMENTED IN EXCAVATIONS GREATER THAN 4 FEET IN DEPTH.
3. FOLLOWING THE TEST PIT 23 INVESTIGATION, 14 EXPLORATORY TRENCHES, 3 FT BY 6FT BY 6 - 10 FT DEEP WOULD BE EXCAVATED IN OPEN AIR. THE EXCAVATED SOIL WILL BE PLACED BACK IN THE EXCAVATION IF NO AMERICAN UNIVERSITY EXPERIMENTAL STATION (AUES) RELATED ITEMS ARE UNCOVERED.
4. FOR THE EXPLORATORY TRENCHES, GUARD RAIL TO PREVENT FALLS INTO EXCAVATION WOULD BE INSTALLED DURING EXCAVATION OF ALL TRENCHES.
5. NO PERSONNEL WOULD BE PERMITTED TO ENTER EXCAVATION.
6. THE TEST PIT 23 EXCAVATION WOULD BE BACKFILLED WITH AN APPROVED BACKFILL MATERIAL AS SOON AS THE INVESTIGATION IS COMPLETE.
7. IF AUES RELATED MATERIAL IS UNCOVERED IN ANY EXPLORATORY TRENCH, THE EXCAVATION WILL BE BACKFILLED WITH AN APPROVED BACKFILL MATERIAL AS SOON AS THE INVESTIGATION IS COMPLETE.

Rev	Date	Description	By

Job No. 744507
Designed JOT
Drawn SPF
Checked DR
Reviewed JOT
Approved JOT
Reg. No.
Date 01/26/07

Issue Identification

DISTRICT OF COLUMBIA
JAMES TAYLOR
No. 15388
REGISTERED
PROFESSIONAL ENGINEER

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U.S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE & U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT

4825 GLENBROOK ROAD TEST PITS INVESTIGATION
SPRING VALLEY DERP/FUDS SITE

EXCAVATION SITE, TEST PIT AND EROSION AND SEDIMENT PLAN AND NOTES

FIGURE 7-1

J:\744\744507 (Spring Valley)\4825 glenbrook rd\744507c02.dwg Jan 26, 2007 - 4:45pm

7.4.2.2 As an additional measure to minimize noise impacts, the CAFS blower and generators at the site will not be operated during non-working hours. The shutdown of the CAFS blower may be reassessed by the Partners if it has significant adverse effects on project operations.

7.4.2.3 During the operation at 4825 Glenbrook Road, additional noise monitoring and/or noise abatement measures may be implemented subsequently if considered necessary by the Partners.

7.5 PROCEDURES FOR POST-ACTIVITY CLEAN-UP

7.5.0.1 Drummed IDW that has been moved from the ECS to the on-site drum staging area will be removed from the site daily upon completion of field activities and transported to the Staging Area for HTW-related IDW at the Federal Property Storage Area. It will be held there pending final disposal/disposition. Thus, no post-activity clean up will be required, but post-activity site restoration will be performed as necessary.

7.5.0.2 Following completion of the intrusive investigation at 4825 Glenbrook Road, all investigated areas will be backfilled using clean soil (such as the fill and native soil removed as part of the grading activities performed during site preparation). In previously grassed areas, backfill will be seeded or covered with sod during site restoration.

7.6 ENVIRONMENTAL DOCUMENTATION UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

7.6.0.1 Environmental compliance requirements under the National Environmental Policy Act are addressed in Subchapter 7.6 of the Site-Wide WP.

7.7 AIR MONITORING PLAN

7.7.0.1 Air monitoring during intrusive investigations will be conducted as defined in Appendix D of this SSWP and the SSHP, which is Attachment D-1 to Appendix D of the Site-Wide WP.

CHAPTER 8
PROPERTY MANAGEMENT PLAN

8.0.0.1 The Property Management Plan for the project is described in Chapter 8 of the Site-Wide WP.

8.0.0.2 Estimates of the types, quantities, and sources of equipment proposed for the investigation at 4825 Glenbrook Road are summarized in Table 8.1.

Table 8.1
List of Equipment

Office/Field Operations	Equipment Type (or equivalent)	Number of Units	Anticipated Source	Status
Communication during fieldwork	Motorola HT-1000 radios	10	USACE/ Vendor	Rent
Processing and interpretation of field data	Field computer, printer, plotter	2	Parsons/ Vendor	Rent/ GFE
Excavation/Site Set-up	Excavator	1	Vendor	Lease
Geophysical Instrument	Schonstedt magnetic locator (GA-52Cx)	1	Vendor	Rent
Communication during fieldwork	Remote video camera system	1	Parsons	GFE
Transportation of personnel and field equipment	Ford Explorers or equivalent	1	Parsons/ Enterprise	Lease
Transportation of personnel and field equipment	Vehicle – passenger car	1	Hertz	Rent
Transportation of personnel and field equipment	Vehicle - pickup 4 X 2	1	Enterprise/ Ford	Lease
Site office	Office trailers	2	Vendor	Rent
Sanitation	Portable Toilets	4	Vendor	Rent

Table 8.1
List of Equipment (cont.)

Office/Field Operations	Equipment Type (or equivalent)	Number of Units	Anticipated Source	Status
PPE	Respirators, Interspiro	14	Vendor/ Parsons	Rent/ Purchase/ maybe GFE
Intrusive fieldwork	hand tools/equipment	Multiple	Vendor	Purchase
ECS assembly	Crane, all-terrain forklifts, man lifts	1 ea.	Vendor	Rent
Drum movement	Bobcat	1	Vendor	Lease
Photo documentation of fieldwork	Cameras	1	Parsons	Own
Office communication equipment	Office trailer phone/answering machine	1	Parsons	Purchase
Office communication equipment	Fax machine	1	Parsons	Purchase
Weigh drums containing MD	Drum Scale	1	Parsons	GFE

CHAPTER 9
INTERIM HOLDING FACILITY SITING PLAN FOR RCWM PROJECTS

9.0.0.1 The IHF Siting Plan for the project is described in Chapter 9 of the Site-Wide WP.

CHAPTER 10
HTW-CONTAMINATED SOIL EXCAVATION PLAN

10.0.0.1 No HTW-contaminated soil excavation is planned to take place during the intrusive operations at Burial Pit 3. Removal of the remaining arsenic-contaminated soil associated with grid and boring samples previously collected at 4825 Glenbrook Road (see Figure 1-4) will be conducted under a separate action. If excavation of additional contaminated soil is required (i.e., based on samples collected during the Burial Pit 3 investigation), the operation will be conducted IAW Chapter 10 of the Site-Wide WP, separate from the high probability investigation.

CHAPTER 11
PHYSICAL SECURITY PLAN FOR RCWM

11.0.0.1 For security purposes, the Physical Security Plan for RCWM for this project is not included in this document. The Physical Security Plan for RCWM is maintained by CENAB.

CHAPTER 12
REFERENCES

DoD 6055.9-STD, Ammunition and Explosives Safety Standards

USACE, 1995. Remedial Investigation Report for the Operation Safe Removal Formerly Used Defense Site, Washington D.C. Prepared for US Army Corps of Engineers, Huntsville Division and Baltimore District. Prepared by Parsons Engineering Science, Inc.

USACE, 1998. Remedial Investigation Evaluation Report for the Operation Safe Removal Formerly Used Defense Site, Washington D.C. Prepared for US Army Engineering and Support Center, Huntsville; US Army Corps of Engineers, Baltimore District. Prepared by US Army Engineering and Support Center, Huntsville; US Army Corps of Engineers, Baltimore District; and Parsons Engineering Science, Inc.

USACE, March 1999. Addendum 10 to the Site Safety Submission (SSS), Work Plan for Test Pit Investigation

USACE, May 1999. Geophysical Investigation Report, 4825 Glenbrook Road, Spring Valley Operable Unit 3, Washington, D.C. Prepared by Parsons Engineering Science, Inc.

USACE, May 2003. Site-Wide Chemical Safety Submission, Site Specific Annex E, Explosive Destruction System Operations, Revision. Prepared by Parsons.

USACE, December 2006. Site-Wide Work Plan for the Spring Valley Formerly Used Defense Site Spring Valley, Washington D.C. Prepared by Parsons

USACE, December 2006. Engineering Control Evaluation for 4825 Glenbrook Road, Washington D.C. Prepared by Parsons

USEPA, October 1999. Draft Risk Assessment Report, Spring Valley, Washington, D.C. USEPA Region III.

APPENDIX A
SCOPE OF WORK

This appendix is a place holder as all the information required is contained in the Site-Wide WP.

APPENDIX B
SITE MAPS

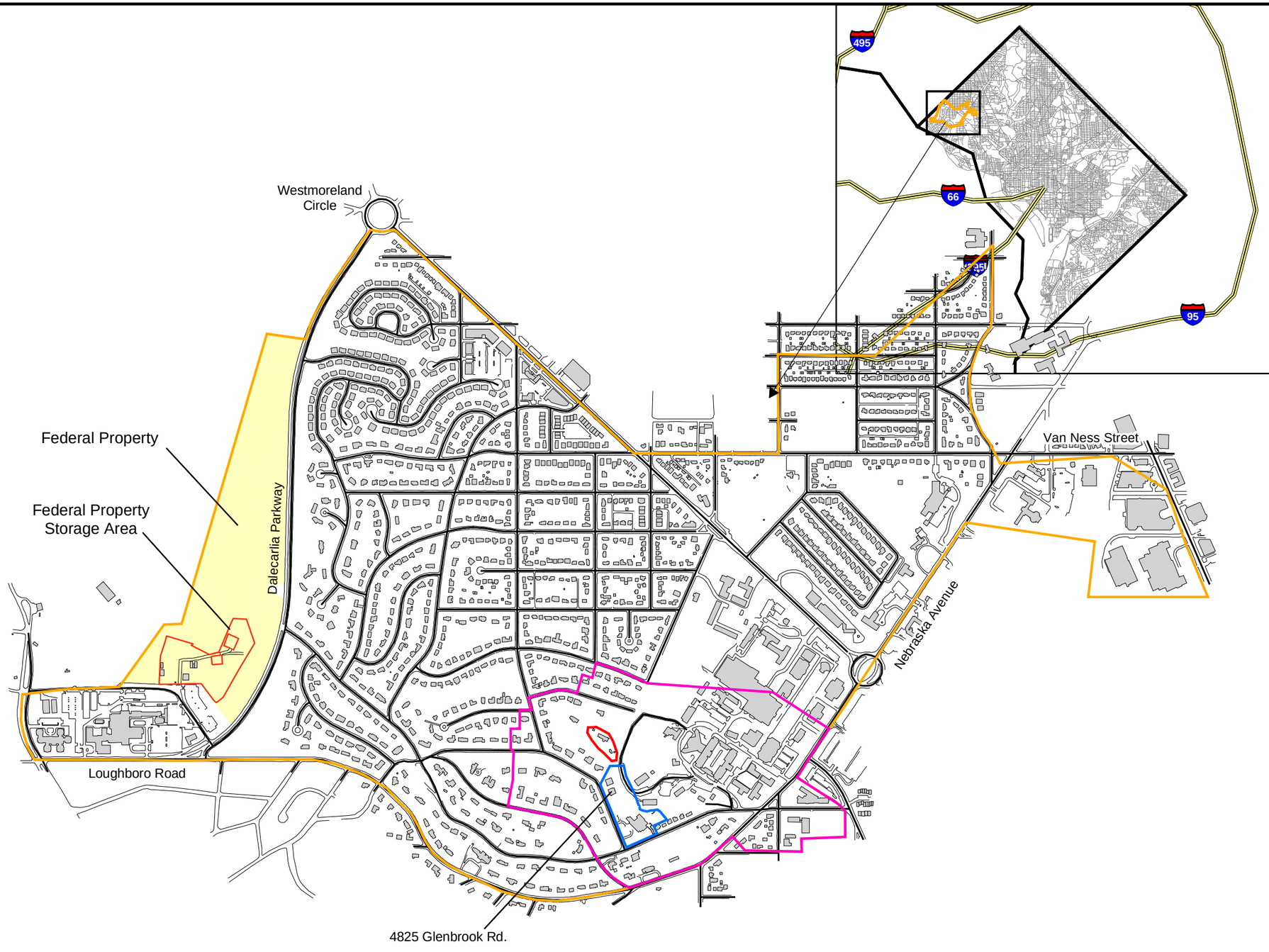
APPENDIX B
SITE MAPS

The following Maps can be found in this Appendix:

Figure 1-1	Spring Valley FUDS Location and Operable Units
Figure 1-2	Site Map 4825 Glenbrook Road
Figure 1-3	Magnetic Geophysical Survey Data
Figure 1-4	Test Pit and Arsenic Removal Locations
Figure 1-5	Location of MEC within Test Pit 23
Figure 3-1	Proposed Site Layout
Figure 3-4	Site Preparation Map
Figure 3-6	Transportation Route
Figure 7-1	Excavation Site and Erosion and Sediment Control Plan
Hospital Route Map	

Figure 1-1
Spring Valley FUDS Location and Operable Units

Spring Valley
Washington, D.C.



Legend

- Buildings
- Road
- Federal Property
- Federal Property Storage Area

Operable Unit
- OU-2
- OU-3
- OU-4
- OU-5

Notes:
1. OU-1 encompasses all of the areas depicted as OU-2, 3, 4, and 5.
2. OU-4 and OU-5 do not include the smaller operable units shown within their boundaries (e.g., OU-4 does not include the areas shown as OU-2 and OU-3).

1,200 600 0 1,200 Feet

Scale:	
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File:	20030825 SV FUDS Location & Operable Units_11x17.mxd
Date:	08/25/2003
Figure Number:	1-1
Page Number:	1-5

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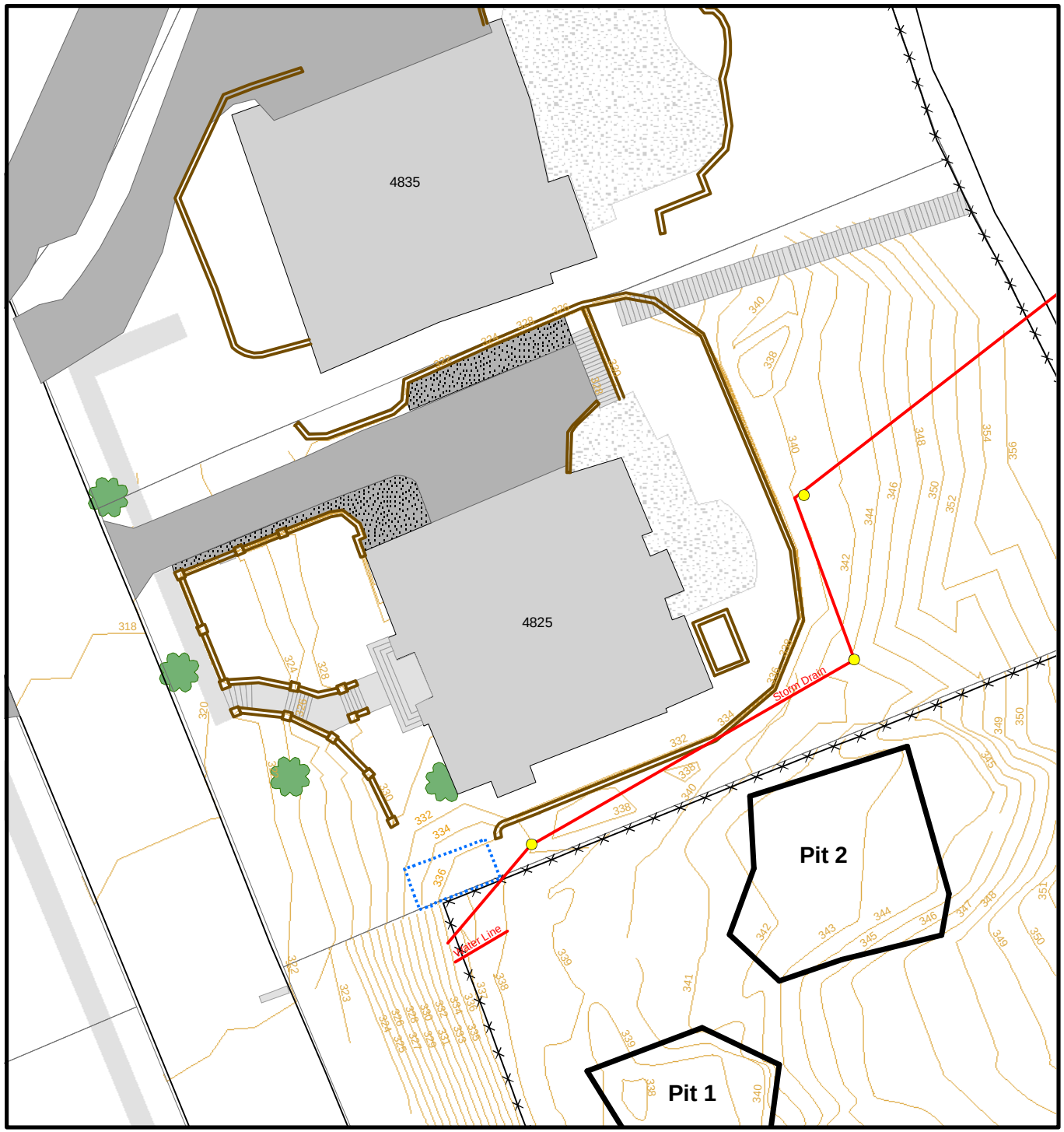

Figure 1-2
Site Map
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Deck/Porch
- Sidewalk
- Manhole
- Buildings
- Dense Shrubbery
- Elevation Contours
- Metal Grate
- Parcels
- Potential Location of MEC
- Retaining Wall
- Trees
- Property Fence
- Driveway
- Gravel Surface
- Pipe
- Pits 1 & 2 (POI-24R)

30 15 0 30 Feet

1 inch equals 30 feet

Scale:	1:360
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File:	20051221_4825 Glenbrook Rd Site Layout_Letter_Fig1-2.mxd
Date:	5/1/2007
Figure Number:	1-2
Page Number:	1-7

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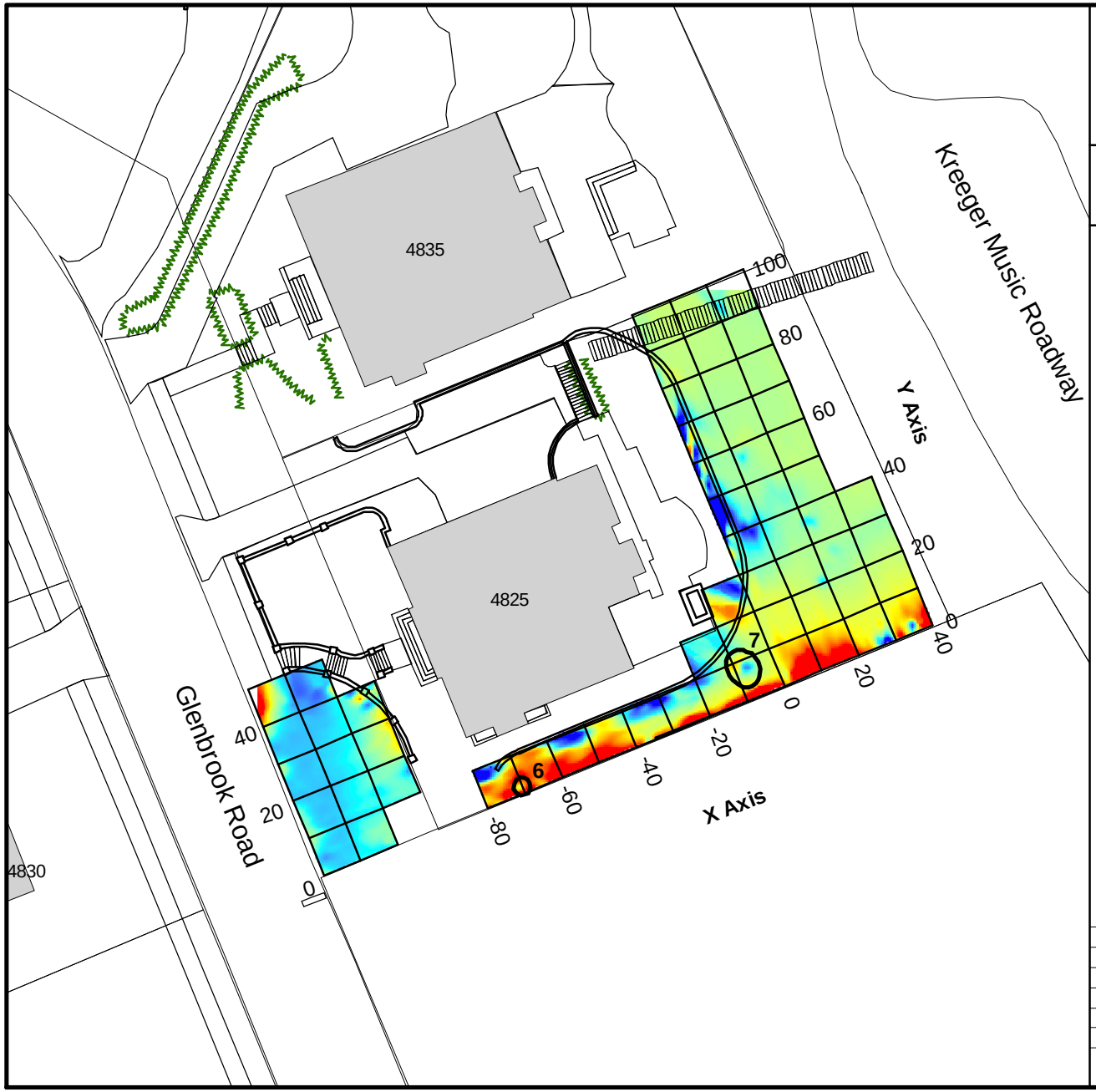

Figure 1-3
Magnetic Geophysical Survey Data
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Survey Grid (1999)
- Anomalies (1999 Survey)
- Hedge
- Sidewalk
- Roads
- Retaining Wall
- Driveway
- Buildings

Total Field Magnetic, 1999 (nT)

High : 58384.808594

Low : 35923.964844

40 20 0 40 Feet

1 inch equals 40 feet

Scale:	1:480
Created By:	Parsons
File:	20070606 4825 Glenbrook Rd - 1999 Geophys Survey.mxd
Date:	12/20/2006
Figure Number:	1-2
Page Number:	1-8

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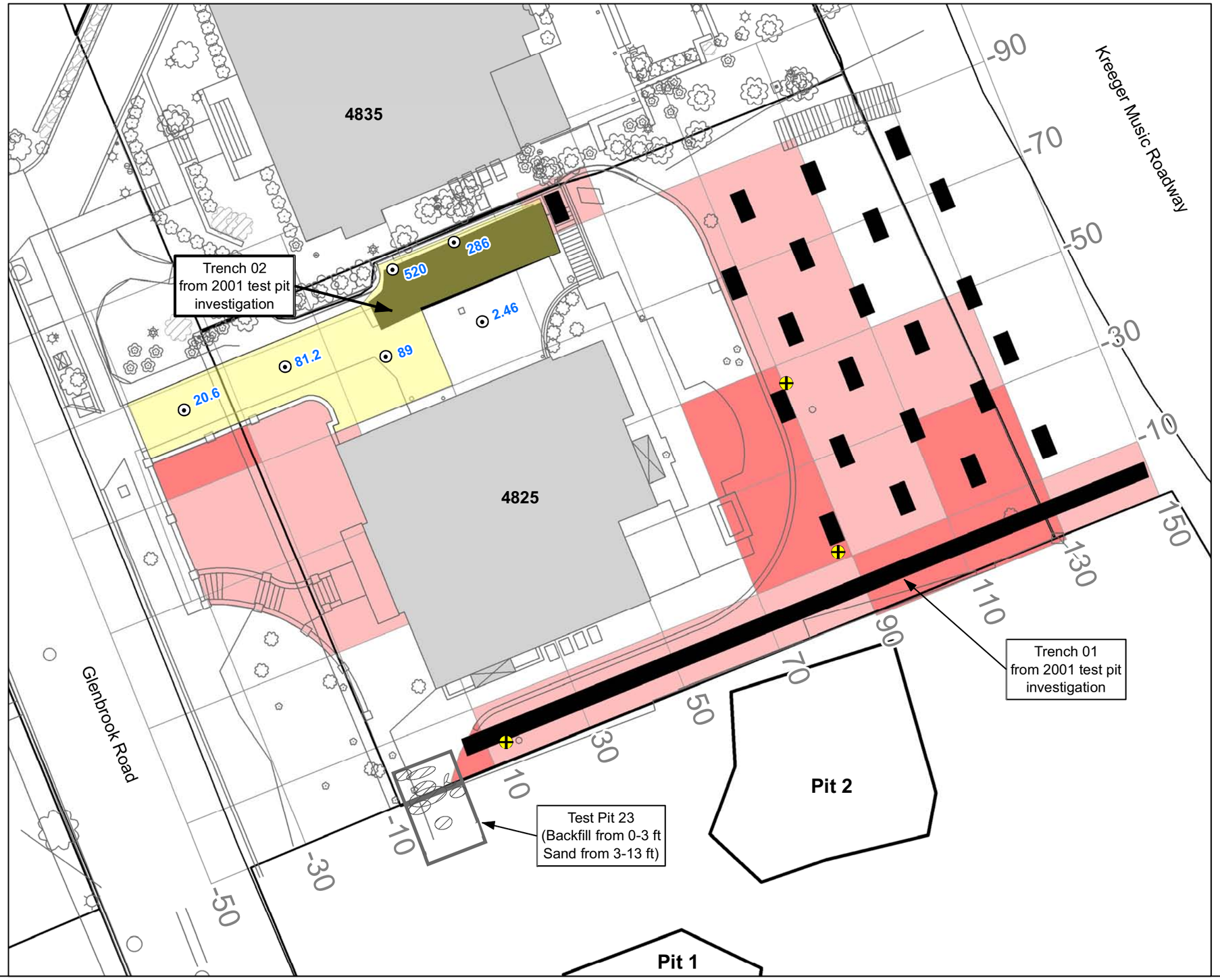

Figure 1-4
Test Pit and Arsenic
Removal Locations
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Driveway Borings (Jan 23, 2001)
- *520* Arsenic ppm in boring samples (locations with Arsenic > 20ppm will require removal under separate action)
- Manhole
- Property Boundaries
- Buildings
- Pits 1 & 2 (POI-24R)
- Test Pits investigated in 2001
- Test Pit 23
- Areas of Debris/Glassware
- 20' Grid
- Arsenic Grid to be Removed under a separate action
- Arsenic Grid Previously Removed (2')
- Arsenic Grid Previously Removed (4')

0 10 20 40 Feet

1 inch equals 20 feet

Scale:	1:240
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File:	20070719 4825 Glenbrook Road Site Layout.mxd
Date:	7/19/2007
Figure Number:	1-4
Page Number:	1-10

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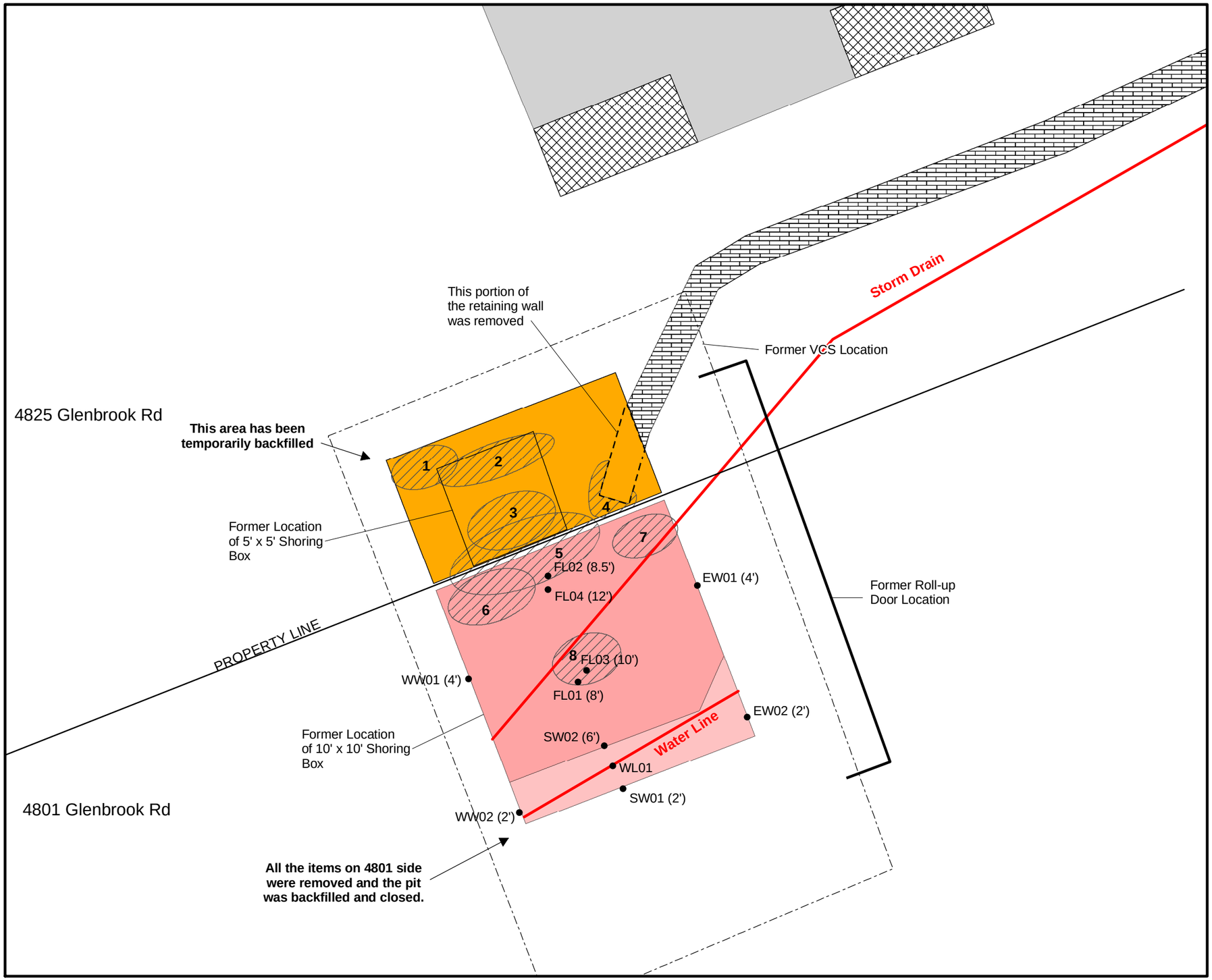

Figure 1-5
Location of MEC within
Test Pit 23

Spring Valley
Washington, D.C.

Legend

- Confirmation Sample Locations
- Areas of Debris/Glassware

Excavation Areas

- 13' 7" Deep
- 4ft Deep
- 8ft to 12ft Deep
- Buildings
- Former VCS Location
- Pipe
- Metal Grate
- Retaining Wall
- Removed Wall

Area	Ordnance Items	Glassware Items
1	249	-
2	133	2
3	18	6
4	24	6
5	-	74
6	2	-
7	-	16
8	1	-

5 2.5 0 5 Feet

1 inch equals 5 feet

Scale:	1:60
Created By:	Parsons
File:	20030219 Test Pit 23 Investigation 11x17.mxd
Date:	03/10/06
Figure Number:	1-5
Page Number:	1-12

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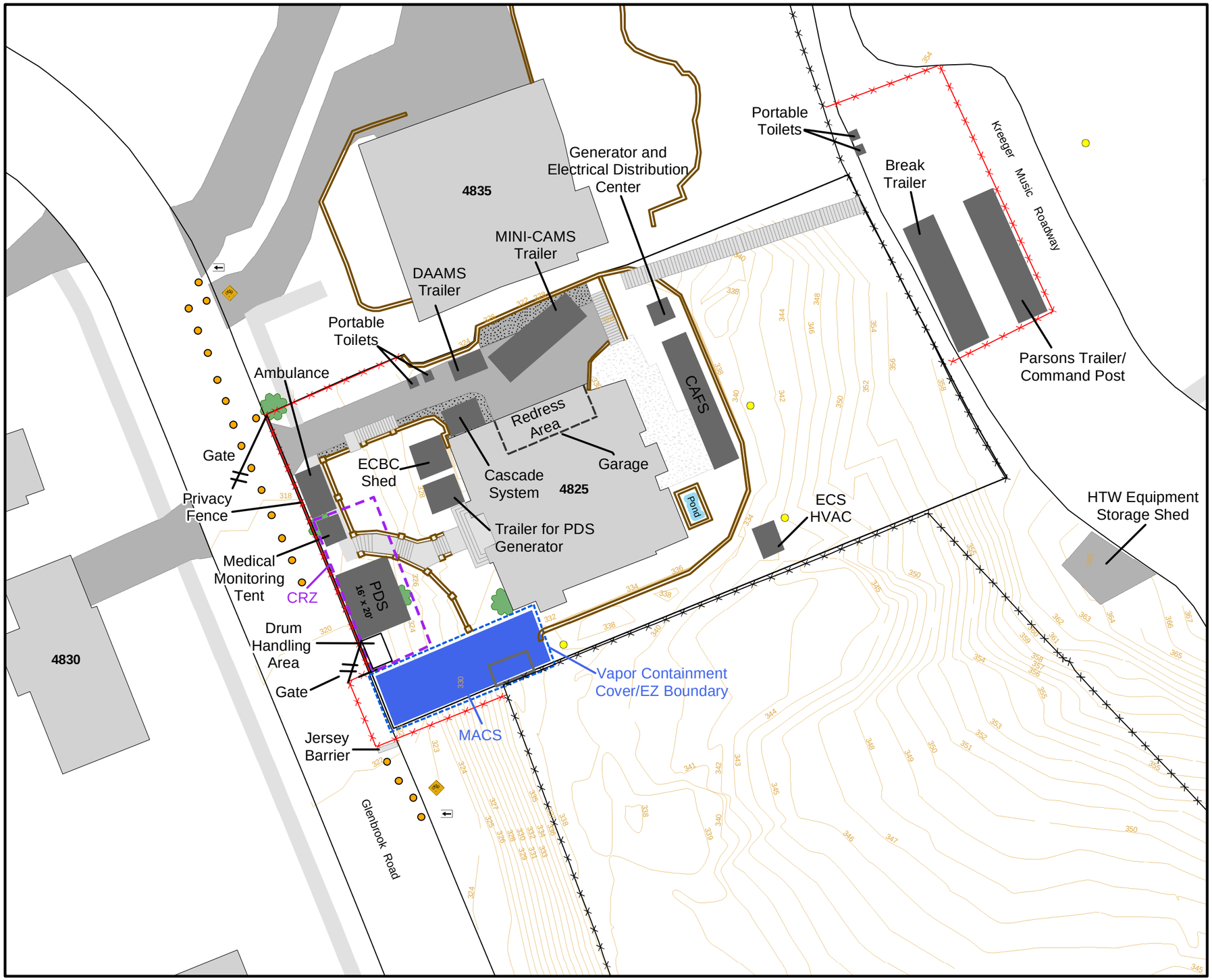
Figure 3-1
Proposed Site Layout for 4825 Glenbrook Road

Spring Valley
Washington, D.C.



Legend

- Buildings
- Deck/Porch
- Sidewalk
- Stairs
- Driveway
- Gravel Surface
- Metal Grate
- Trees
- Privacy Fence
- Property Fence
- Elevation Contours
- Manhole
- Test Pit 23
- Trailers
- VCC
- MACS
- 36" High Reflective Cones
- Excavation Ahead Sign
- Sidewalk Closed Sign

30 0 30
Feet
1 inch equals 30 feet

Scale:	1:360
Created By:	Parsons
File:	20070321 4825 Glenbrook Rd Proposed Site Layout.mxd
Date:	4/05/2007
Figure Number:	3-1
Page Number:	3-4

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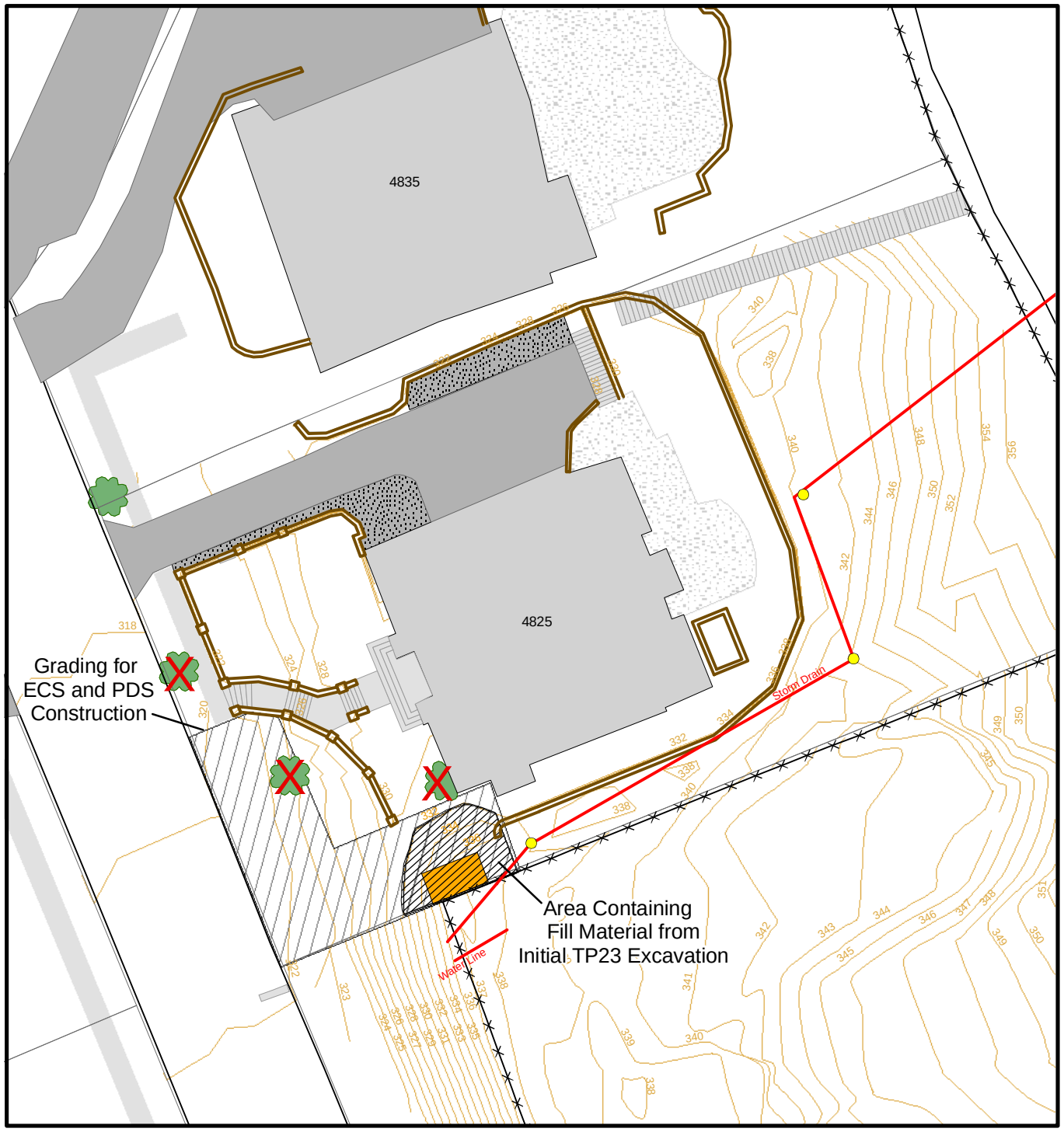

Figure 3-4
Site Preparation
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Deck/Porch
- Sidewalk
- Manhole
- Buildings
- Test Pit 23
- Dense Shrubbery
- Elevation Contours
- Metal Grate
- Parcels
- Retaining Wall
- Trees
- Trees to be Removed
- Property Fence
- Driveway
- Gravel Surface
- Pipe
- Area to be Graded
- Area of Fill Removal

30 15 0 30
Feet
1 inch equals 30 feet

Scale:	1:360
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Date:	5/1/2007
Figure Number:	3-4
Page Number:	3-6

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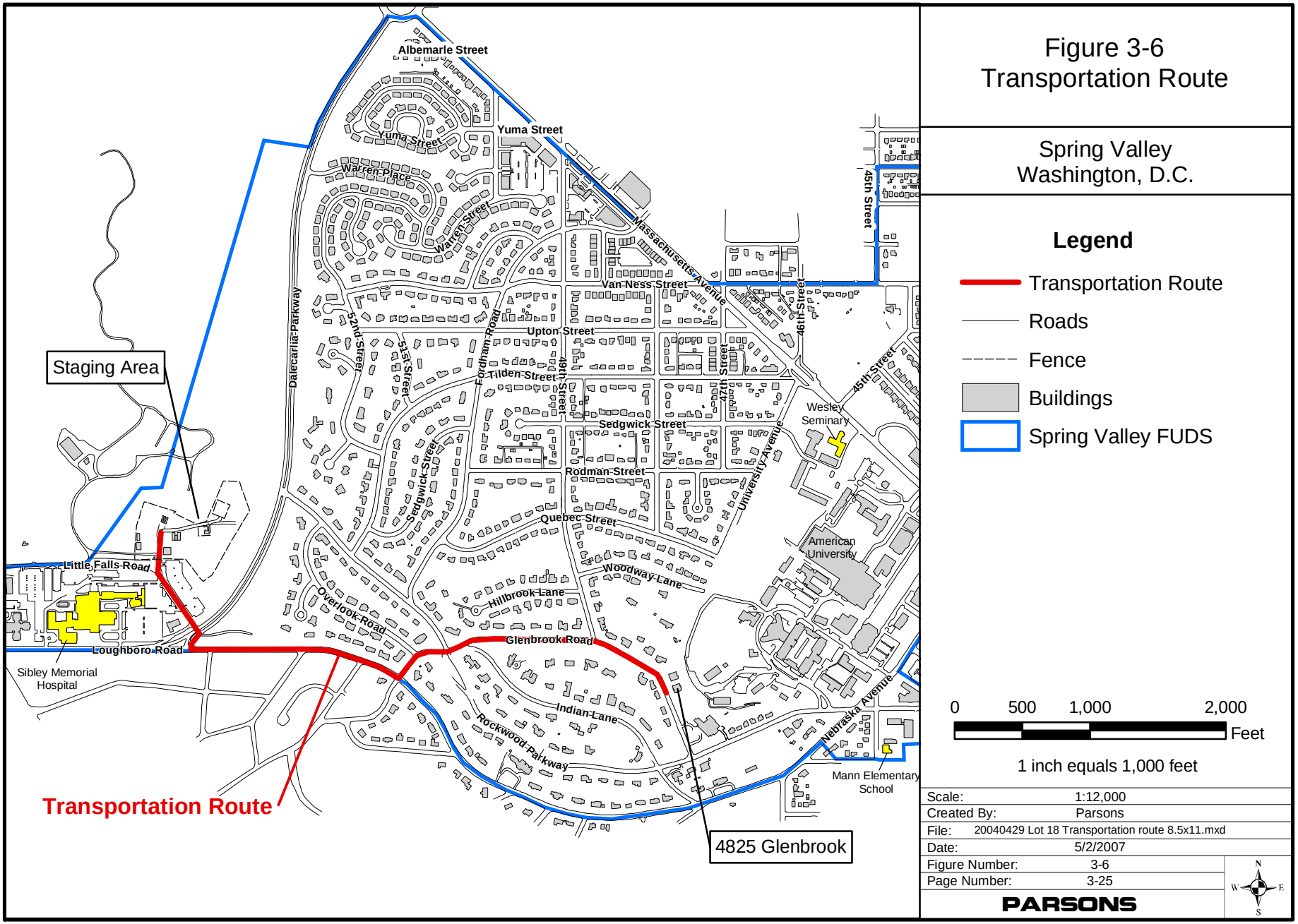

Figure 3-6
Transportation Route

Spring Valley
Washington, D.C.

Legend

- Transportation Route
- Roads
- Fence
- Buildings
- Spring Valley FUDS

0 500 1,000 2,000 Feet

1 inch equals 1,000 feet

Scale:	1:12,000
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File:	20040429 Lot 18 Transportation route 8.5x11.mxd
Date:	5/2/2007
Figure Number:	3-6
Page Number:	3-25

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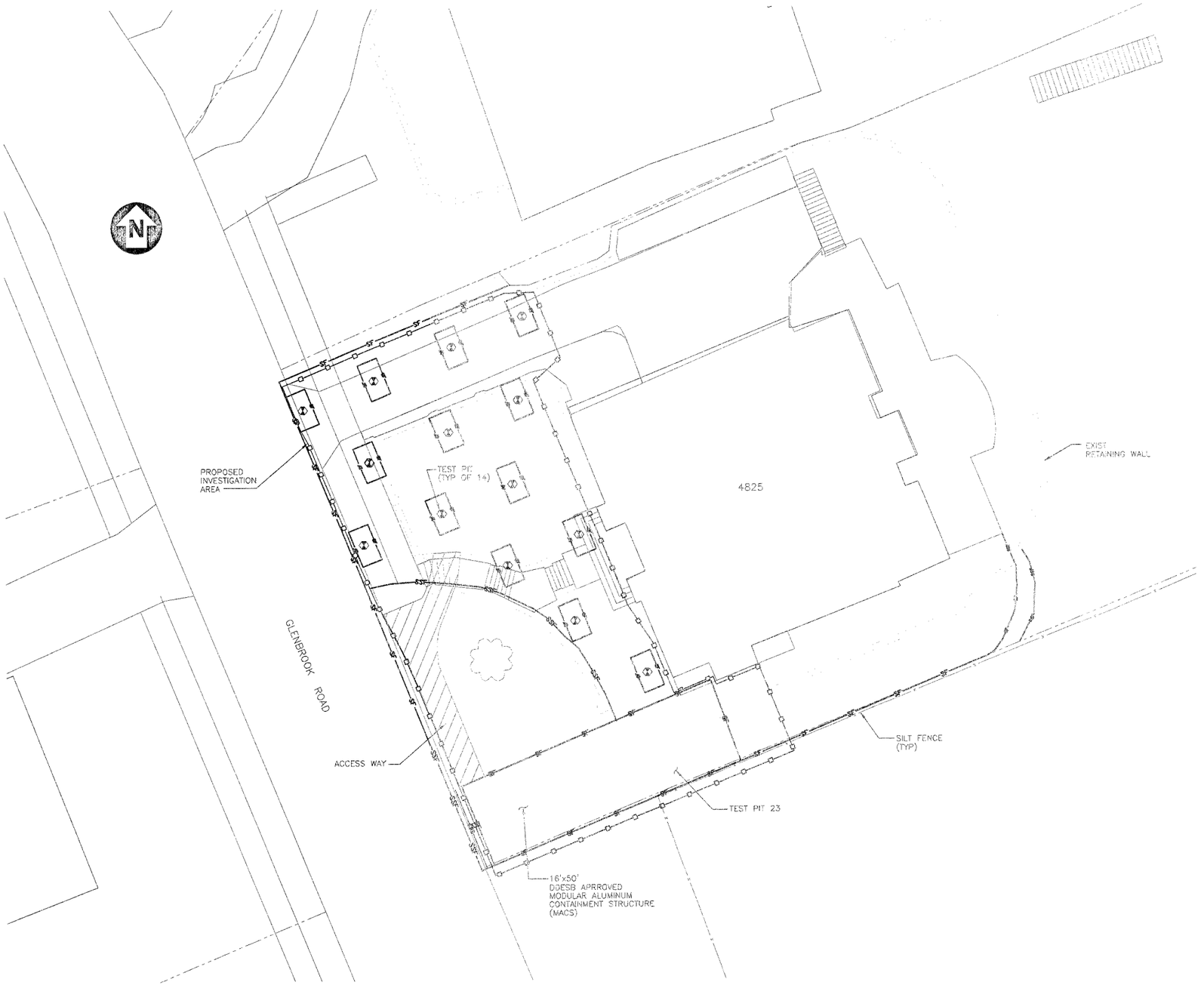

EXCAVATION SITE AND EROSION AND SEDIMENT PLAN

SCALE: 1"=10'-0"

10 5 0 10

NOTES

1. REMOVE HARDSCAPE FEATURES WITHIN THE INVESTIGATION AREA.
2. INSTALL CONSTRUCTION ENTRANCES AND EXTEND EXISTING TEMPORARY ROAD.
3. CLEAR ONLY ENOUGH TO INSTALL DIVERSIONS AND SILT FENCES AS SHOWN ON PLANS.
4. INSTALL SILT FENCES AS SHOWN ON PLANS.
5. IMMEDIATELY RESEED BACKFILLED EXCAVATIONS WITH BERMUDA GRASS OR EQUIVALENT WHERE GROUND SURFACE REMAINS EXPOSED.
6. CONSTRUCT ALL CONTROLS AS SHOWN ON PLANS.
7. COMPLETE FINAL GRADING.
8. UPON COMPLETION OF FINAL GRADING, RE-SEED ACCORDING TO VEGETATIVE PRACTICES SPECIFICATIONS.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONLY AFTER PERMANENT VEGETATION IS WELL-ESTABLISHED.

EXCAVATION NOTES

1. EXCAVATION OF TEST PIT 23 WILL BE CONDUCTED UNDER AN ENGINEERING CONTROL STRUCTURE, AND EXCAVATED SOIL WILL BE DRUMMED AND DISPOSED OF OFFSITE, IN ACCORDANCE WITH THE SITE-SPECIFIC WORK PLAN.
2. SHORING WILL BE IMPLEMENTED IN EXCAVATIONS GREATER THAN 4 FEET IN DEPTH.
3. FOLLOWING THE TEST PIT 23 INVESTIGATION, 14 EXPLORATORY TRENCHES, 3 FT BY 6FT BY 6 - 10 FT DEEP WOULD BE EXCAVATED IN OPEN AIR. THE EXCAVATED SOIL WILL BE PLACED BACK IN THE EXCAVATION IF NO AMERICAN UNIVERSITY EXPERIMENTAL STATION (AUES) RELATED ITEMS ARE UNCOVERED.
4. FOR THE EXPLORATORY TRENCHES, GUARD RAIL TO PREVENT FALLS INTO EXCAVATION WOULD BE INSTALLED DURING EXCAVATION OF ALL TRENCHES.
5. NO PERSONNEL WOULD BE PERMITTED TO ENTER EXCAVATION.
6. THE TEST PIT 23 EXCAVATION WOULD BE BACKFILLED WITH AN APPROVED BACKFILL MATERIAL AS SOON AS THE INVESTIGATION IS COMPLETE.
7. IF AUES RELATED MATERIAL IS UNCOVERED IN ANY EXPLORATORY TRENCH, THE EXCAVATION WILL BE BACKFILLED WITH AN APPROVED BACKFILL MATERIAL AS SOON AS THE INVESTIGATION IS COMPLETE.

Rev	Date	Description	By

Job No. 744507
Designed JOT
Drawn SPF
Checked DR
Reviewed JOT
Approved JOT
Reg. No.
Date 01/26/07

Issue Identification

DISTRICT OF COLUMBIA
JAMES TAYLOR
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PROFESSIONAL ENGINEER

PARSONS
FAIRFAX VIRGINIA
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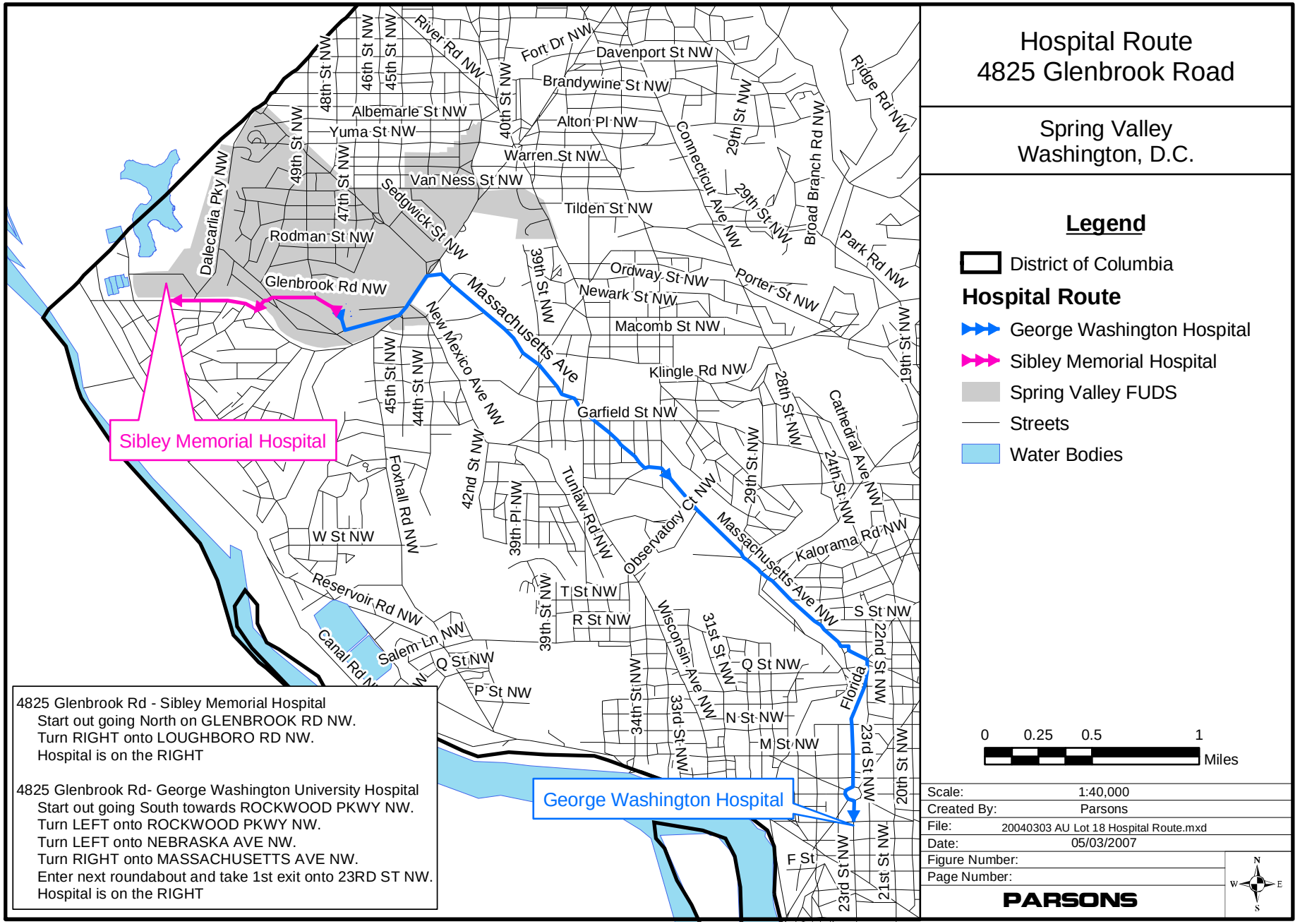
U.S. ARMY ENGINEERING & SUPPORT CENTER, HUNTSVILLE & U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT

4825 GLENBROOK ROAD TEST PITS INVESTIGATION
SPRING VALLEY DERP/FUDS SITE

EXCAVATION SITE, TEST PIT AND EROSION AND SEDIMENT PLAN AND NOTES

FIGURE 7-1

J:\744\744507 (Spring Valley)\4825 glenbrook rd\744507c02.dwg Jan 26, 2007 - 4:45pm


Hospital Route
4825 Glenbrook Road
Spring Valley
Washington, D.C.
Legend
District of Columbia
Hospital Route
George Washington Hospital
Sibley Memorial Hospital
Spring Valley FUDS
Streets
Water Bodies
Sibley Memorial Hospital
George Washington Hospital
4825 Glenbrook Rd - Sibley Memorial Hospital
Start out going North on GLENBROOK RD NW.
Turn RIGHT onto LOUGHBORO RD NW.
Hospital is on the RIGHT
4825 Glenbrook Rd- George Washington University Hospital
Start out going South towards ROCKWOOD PKWY NW.
Turn LEFT onto ROCKWOOD PKWY NW.
Turn LEFT onto NEBRASKA AVE NW.
Turn RIGHT onto MASSACHUSETTS AVE NW.
Enter next roundabout and take 1st exit onto 23RD ST NW.
Hospital is on the RIGHT
0 0.25 0.5 1
Miles
Scale: 1:40,000
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File: 20040303 AU Lot 18 Hospital Route.mxd
Date: 05/03/2007
Figure Number:
Page Number:
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APPENDIX C
POINTS OF CONTACT

APPENDIX C
POINTS OF CONTACT

These contacts should be posted prominently at the site.

Agency/Contact	Activity	Telephone Number
Police		911
Fire		911
Ambulance		On site/911
Emergency Response (Spills/Releases-Only)	Emergency Response Coordinator for Area	911
Hospital for Non-Trauma/Non-Chemical	Sibley Hospital	202-537-4000
Hospital for Trauma/Chemical	George Washington University Hospital	202-994-3211
National Response Center		800-424-9500
Poison Control Center		800-288-9999

Responsible Person	Telephone Numbers	
	Work	Other
CENAB Site Operations Officer – **Capt. Drew White**	202-686-3632	443-986-3450 (cell)
CENAB MMRP Project Manager – **Dan Noble**	410-962-6782	443-676-4235 (cell)
USAESCH Project Manager - **Allyn Allison**	256 895-1121	256 426-5841 (cell)
USAESCH Deputy Project Manager – **Bruce Whisenant**	256 895-1633	256-684-2855 (cell)
USAESCH Safety Specialist – **Ken Shott**	256-895-1587	256-656-2405 (cell)
USAESCH Safety Specialist POC – **Wilson Walters**	256-895-1290	256-990-1512 (cell)
Parsons Project Manager – **Deepak Bhinge**	703-218-1092	703-609-3963(cell)
Parsons Site Manager – **Christopher Yonat**	202-686-3747	202-276-6042 (cell)
Parsons Project Safety and Health Manager – **Ed Grunwald**	678-969-2394	678-429-6887
Parsons Site Safety and Health Officer – **Harry Craig ("Butch")**	256-442-4962	804-310-4565 (cell)
TE Emergency Contact – **RDECOM Emergency Command Post**	410-436-2148	-
ECBC Emergency Contact - **RDECOM Emergency Command Post**	410-436-2148	-

APPENDIX D
ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN SUPPLEMENT

ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN SUPPLEMENT

FOR THE

INVESTIGATION OF BURIAL PIT 3, 4825 GLENBROOK ROAD SPRING VALLEY FORMERLY USED DEFENSE SITE, OPERABLE UNIT 3 SPRING VALLEY, WASHINGTON, D.C.

Prepared for:

U.S. Army Engineering and Support Center, Huntsville

and

Baltimore District
U.S. Army Corps of Engineers

Prepared by:

PARSONS

10521 Rosehaven Street, Suite 200
Fairfax, Virginia

July 20, 2007

APPROVED BY: Deepak Bhinge. ELECTRONIC SIGNATURE

Parsons Project Manager – Deepak Bhinge, P.E. (703-218-1092)

APPROVED BY: Edward Grunwald

Project Health and Safety Manager – Ed Grunwald, C.I.H.(678-969-2394)

APPROVED BY: Kenneth Stockwell

Vice-President – Kenneth Stockwell, P.E. (678-969-2351)

The views, opinions, and/or findings contained in this document are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentations.

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CHAPTER 1
OVERVIEW

1.1 INTRODUCTION

1.1.0.1 This Accident Prevention Plan (APP)/Site Safety and Health Plan (SSHP) Supplement are appended to the Site-Specific Work Plan (SSWP) for the Investigation of Burial Pit 3, 4825 Glenbrook Road at the Spring Valley Formerly Used Defense Site (SVFUDS). This SSWP describes the site-specific methods and procedures to be implemented during field operations at 4825 Glenbrook Road for the intrusive investigation of Burial Pit 3.

1.1.0.2 For the most part, the safety programs and procedures that will be implemented during the investigation at 4825 Glenbrook Road are addressed in the Site-Wide APP and SSHP for the SVFUDS, both of which are located in Appendix D of the *Site-Wide Work Plan for the Spring Valley Formerly Used Defense Site, Spring Valley, Washington D.C.*, prepared by Parsons for the United States Army Corps of Engineers (USACE) (USACE, March 2007). This document is referred to as the Site-Wide Work Plan (WP). However, several elements in the Site-Wide APP and SSHP are referenced as being specified in the SSWP; these elements will be addressed in this site-specific APP/SSHP Supplement (Subchapter 1.3).

1.1.0.3 Accident prevention is a key program element to achieve compliance and strive towards our ultimate goal of zero safety incidents. Personnel active in site operations at 4825 Glenbrook Road will be thoroughly familiar with the programs and procedures outlined in both the Site-Wide APP and SSHP and this site-specific APP/SSHP Supplement prior to conducting work at the site. The Low Probability Contingency Plan and the High Probability Contingency Plan (Subchapters 16.13 and 16.14, respectively, of the Site-Wide SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP) are provided as Attachments D-1 and D-2 of this supplement for ease of reference.

1.1.0.4 The Site-Wide APP/SSHP includes discussions on procedures and methods for conducting investigations at both suspected "Recovered Chemical Warfare Materiel (RCWM) sites" and "non-RCWM sites" at the SVFUDS. For purposes of the investigation of Burial Pit 3, USACE has determined the property at 4825 Glenbrook Road to be a suspect RCWM site (also referred to as a "high probability" site) and, therefore, the APP/SSHP procedures and methods followed during the investigation of Burial Pit 3 will be those that apply to high probability sites.

1.2 HAZARDOUS ACTIVITIES

1.2.0.1 The work at 4825 Glenbrook Road will involve potentially hazardous activities during the course of operations. Site-specific Activity Hazard Analyses (AHAs) are presented as Attachment D-3 to this APP and detail each activity to be performed during the project and the

associated preventative measures for avoiding accidents. Personnel involved with hazardous tasks will be qualified to participate by previous or site-specific training, as applicable.

1.2.0.2 The following is a list of potential activities associated with the work being performed at the SVFUDS for which AHAs have been prepared:

- Site mobilization/preparation.
- Property surveying and mapping.
- Landscape surveying.
- Tree removal.
- Intrusive investigation.
- Drum/Multiple Round Container (MRC) handling.
- Personnel Decontamination Station (PDS) operation.
- Emergency rescue.
- Air monitoring.
- Excavation backfill.
- Interim Holding Facility (IHF) Entry
- X-Ray/Portable Isotopic Neutron Spectroscopy (PINS) Assessment.

1.3 SITE-SPECIFIC HEALTH AND SAFETY DETAILS

1.3.0.1 Table D.1.1 lists the elements of the Site-Wide APP and SSHP that are referenced as being specified in the SSWP for high probability sites. This table also describes where these elements are addressed: either in the main body of the SSWP or in this site-specific APP/SSHP Supplement.

Table D.1.1
Location of Site-Specific APP/SSHP Elements

Site-Wide APP/SSHP Element	Addressed in:
AHAs	Attachment D-3 to this APP/SSHP Supplement
Name of Site Safety and Health Officer (SSHO)	Subchapter 2.6 of the SSWP
Map showing route to hospital(s)	Outside back cover of the SSWP
Site-specific air monitoring details	Chapter 2 of this APP/SSHP Supplement
Engineering Control Structure (ECS) details	Appendix M of the SSWP
Maximum Credible Event (MCE) for site operations	Subchapter 3.8.8 of the SSWP
Munition with the Greatest Fragmentation Distance (MGFD) for site operations	Subchapter 3.8.8 of the SSWP
Exclusion Zone (EZ) distance	Subchapter 3.8.9 of the SSWP
Map showing site layout and work zones	Figure 3-1 in Chapter 3 of the SSWP
List of important contacts	Appendix C of the SSWP
Transportation route to the IHF	Figure 3-6 in Chapter 3 of the SSWP

CHAPTER 2
EXPOSURE AIR MONITORING AND AIR SAMPLING DETAILS

2.1 GENERAL

2.1.0.1 Air monitoring at 4825 Glenbrook Road will be conducted by the Air Monitoring Team and the Excavation Team during intrusive excavations of Burial Pit 3. The air monitoring matrix for chemicals of concern is summarized in Table D1.8.1 in the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP. Specific details concerning analytical methods are presented in the Air Monitoring Team SOPs maintained with the analytical equipment and in Appendix J of the Site-Wide WP. Details for the intrusive investigation of Burial Pit 3 are provided in the following sections.

2.2 AIR MONITORING METHODS

2.2.0.1 The following air monitoring methods will be used during the intrusive investigation of Burial Pit 3:

- Miniature Continuous Air Monitoring System (MINICAMS) for detection of mustard and lewisite agents, phosgene, chloropicrin, and cyanogen chloride.
- Depot Area Air Monitoring System (DAAMS) for mustard and lewisite to confirm MINICAMS detections and for Worker Population Limit (WPL) monitoring.
- Electrochemical Detector for detection of arsine (SA).
- Photoionization Detector (PID) for detection of volatile organic compounds (VOCs).
- Electrochemical Detector for detection of hydrogen cyanide (HCN).
- Combustible Gas Indicator (CGI) if permit-required confined space entry is required.
- Colorimetric tubes may be used to confirm detections of arsine (SA), hydrogen cyanide (HCN), phosgene (CG), cyanogen chloride (CK), and chloropicrin (PS).

2.2.0.2 With the exception of HCN monitoring, each of the air monitoring methods is further described in Subchapter 8.3.2 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP. HCN monitoring is further described in Subchapter 2.4.5 below.

2.2.0.3 Because excavation activities are being conducted within an ECS, neither DAAMS perimeter monitoring nor particulate monitoring will be required during the intrusive investigation of Burial Pit 3.

2.3 AIR MONITORING LOCATIONS

2.3.1 Within the ECS

2.3.1.1 The Air Monitoring Team will use the MINICAMS to perform near-real-time monitoring at several locations in the Chemical Agent Filtration System (CAFS) to detect mustard and lewisite agents, phosgene, cyanogen chloride, and chloropicrin within the ECS. Typically, these locations will be as follows:

- Before the High Efficiency Particulate Air (HEPA) filter. This will be the first indication of agent vapors entering the filter bed.
- Between the two charcoal filter beds (mid-bed). This will indicate possible agent breakthrough of the first charcoal filter bed. If agent is confirmed at this location, public safety protocols will be implemented.
- In the filter exhaust. This will indicate the possible release of chemical agent to the atmosphere. If agent is confirmed at this location, public safety protocols will be implemented.

2.3.1.2 In addition to near-real-time monitoring during intrusive activities, the MINICAMS units monitoring the ECS will be used to ensure that the environment within the ECS does not exceed the WPL for the chemical agents of concern (STEL/C for mustard and lewisite agents, and cyanogen chloride) before any personnel enter the ECS in Level D PPE to perform routine, non-intrusive maintenance activities (Subchapter 8.3.5 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP).

2.3.1.3 During intrusive investigation activities, the Excavation Team will continuously monitor the excavation for the presence of arsine using an electrochemical detector. A second electrochemical detector will be installed at the CAFS mid-bed and a third electrochemical detector will be installed at the CAFS exhaust to monitor for arsine.

2.3.1.4 The Excavation Team will use a PID in the breathing zone at the excavation to perform real-time monitoring for detection of VOCs occurring within the ECS. Detection of VOCs may trigger conditions for the upgrade of worker PPE within the ECS (Subchapter 5.2.8 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP).

2.3.1.5 During intrusive investigation activities, the Excavation Team will continuously monitor the excavation for the presence of hydrogen cyanide using an electrochemical detector.

2.3.1.6 The Air Monitoring Team will continuously sample the air exhausting from the air filtration system stack using DAAMS tubes. These samples will be analyzed daily regardless of other alarms.

2.3.1.7 The Air Monitoring Team will also use DAAMS tubes within the ECS for monitoring to the WPL. In conjunction with WPL monitoring, the SSHO, or designate, will

maintain administrative controls to record the amount of time that workers are present in the ECS in Level D PPE (e.g., workers performing routine, non-intrusive maintenance tasks).

2.3.1.8 If entry is required into the excavation and it meets the criteria for a permit-required confined space, or discolored soil is uncovered without a ringoff, the excavation will be continually monitored with a CGI. The inlet tube for the CGI will be lowered into the excavation and the meter monitored by the Excavation Team attendant.

2.3.2 Within the Contamination Reduction Zone (decontamination tent)

2.3.2.1 A MINICAMS will be used for chemical casualty monitoring in the medical monitoring tent, if needed (Subchapter 13.4.3 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP).

2.3.3 Top of Hill behind 4825 Glenbrook Road

2.3.3.1 An arsine detector will be placed at the top of the hill behind the house at 4825 Glenbrook Road.

2.4 RESPONSES TO ALARMS/RINGOFFS

2.4.1 MINICAMS Alarm/Ringoff Definitions

2.4.1.1 For the purposes of this plan, the following definitions are used with regard to the MINICAMS:

- An “alarm” is any MINICAMS reading above the alarm set point.
- A “ringoff” is three consecutive alarms at a single MINICAMS monitoring position.
- A “confirmed ring-off” is one or more alarms that have been confirmed by DAAMS tube analysis.

2.4.2 Responses to MINICAMS Alarms/Ringoffs

2.4.2.1 Responses to MINICAMS alarms/ringoffs and alarm/ringoff confirmation procedures are described in detail in Subchapter 8.3.4 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP.

2.4.2.2 Actions will be taken and notifications will be made in response to alarms and ring-offs as shown in Table D.2.1 during the investigation of Burial Pit 3 at 4825 Glenbrook Road. The United States Army Engineering and Support Center, Huntsville (USAESCH) Safety Specialist and the USACE, Baltimore District (CENAB) Site Operations Officer will be responsible for implementing agency and public notification as per the Public Protection Plan (PPP), as necessary.

2.4.3 Arsine Electrochemical Detector Alarm Definitions

2.4.3.1 For the purposes of this plan, the following definitions are used with regard to the Arsine Electrochemical Detector:

- An "alarm" is any electrochemical detector reading above 50 ppb for a sustained period of 10 seconds.
- A "confirmed detection" is an alarm that has been confirmed by collection of a colorimetric tube sample.

2.4.4 Responses to Arsine Electrochemical Detector Alarms

2.4.4.1 Responses to arsine alarms and confirmation procedures are described in detail in Subchapter 8.3.5 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP.

2.4.4.2 Actions will be taken and notifications will be made in response to alarms and confirmed detections as shown in Table D.2.2 during the investigation of Burial Pit 3 at 4825 Glenbrook Road. The standard operating procedures for the arsine detector and colorimetric tubes are provided in the Sampling and Analysis Plan (SAP), which is Appendix E of the Site-Wide WP. The USAESCH Safety Specialist and the CENAB Site Operations Officer will be responsible for implementing agency and public notification as per the PPP, as necessary.

2.4.4.3 The arsine detector at the top of the hill behind 4825 Glenbrook Road will be monitored if there is an arsine alarm at the CAFS exhaust. If there is an alarm on this detector AU (i.e., readings above 50 ppb for a sustained period of 10 seconds), AU will be notified.

2.4.5 Hydrogen Cyanide Monitoring

2.4.5.1 Hydrogen cyanide monitoring will be performed inside the ECS. During intrusive excavation activities in the ECS, the Excavation Team will monitor for hydrogen cyanide using an electrochemical detector. The HCN monitor will be placed at the workers' breathing zone and will be monitored every 30 minutes; the monitor will be set to alarm at 4.7 and 200 ppm. The standard operating procedures for the hydrogen cyanide monitor are provided in Appendix E, Attachment E-1 of this SSWP. If hydrogen cyanide is detected above 4.7 ppm, the following steps will be taken:

- Contact SSHO and verify adequate worker PPE. If necessary, workers will withdraw from the ECS, upgrade PPE level, and then return.
  - HCN concentration less than 4.7 ppm: Modified Level D
  - HCN concentration between 4.7- 200 ppm: Level B
  - HCN concentration higher than 200 ppm: Level A

- Confirm presence of hydrogen cyanide using colorimetric detector tube (standard operating procedures for the confirmation detector tubes are provided in Appendix E, Attachment E-1 of this SSWP).
- If hydrogen cyanide is confirmed, the Excavation Team will check for possible sources and mitigate if obvious source present.
- Continue work in appropriate PPE.

2.5 WPL MONITORING

2.5.0.1 WPL monitoring procedures for worker safety are described in detail in Subchapter 8.3.5 of the SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP.

2.6 PUBLIC SAFETY

2.6.0.1 The public safety protocols are described in Chapter 11 of the Site-Wide SSHP.

2.6.0.2 A site specific PPP for 4825 Glenbrook Road investigations has been prepared by CENAB and will be maintained on the site by the CENAB Site Operations Officer. The PPP contains shelter-in-place procedures. Site security and air monitoring for chemical agents will be performed during intrusive investigation.

2.6.0.3 Sirens and other methods of public notification will be used to contact the residents in case of an emergency as detailed in the PPP.

Table D.2.1: Monitoring Alarms: Interpretation and Resultant Actions with ECS

Monitoring Location			Response To Alarm	
ECS (Pre-Filter)	**Mid Bed**	**Outside (Exhaust)**	**Interpretation**	**Action**
📣			Possible agent presence	Verify workers have adequate PPE. Locate and mitigate source. Continue working.
📣📣			Possible agent presence	Pull DAAMS tube at pre-filter. Locate and mitigate source. Continue working.
📣📣📣 or 📣📣 & DAAMS			Confirmed agent presence	Confirmed agent presence: Notify Partners of agent detection. Continue working to locate and mitigate source. **Note:** Agent is contained within the ECS.
📣📣📣 or 📣📣 & DAAMS	📣		Possible agent breakthrough	Confirmed agent presence, continue to locate and mitigate source. **Note:** Agent has **NOT** been released to the environment.
📣📣📣 or 📣📣 & DAAMS	📣📣		Possible agent breakthrough	Pull DAAMS tube at mid-bed. Continue to locate and mitigate source. **Note:** Agent has **NOT** been released to the environment.
📣📣📣 or 📣📣 & DAAMS	📣📣📣 or 📣📣 & DAAMS		Confirmed agent breakthrough	Implement agency notification, and notify residents within AEGL-2 distance to shelter-in-place as per PPP; continue to locate and mitigate source. **Note:** Agent has **NOT** been released to the environment.
📣📣📣 or 📣📣 & DAAMS	📣📣📣 or 📣📣 & DAAMS	📣	Probable release to environment	Maintain shelter-in-place within the AEGL-2 distance as per PPP; continue to locate/mitigate source.
📣📣📣 or 📣📣 & DAAMS	📣📣📣 or 📣📣 & DAAMS	📣📣	Probable release to environment	Pull DAAMS tube at the exhaust. Maintain shelter-in-place within the AEGL-2 distance as per PPP. Continue to locate/mitigate source.
📣📣📣 or 📣📣 & DAAMS	📣📣📣 or 📣📣 & DAAMS	📣📣📣 or 📣📣 & DAAMS	Confirmed agent release to environment	Maintain shelter-in-place within the AEGL-2 distance as per PPP; continue to locate/mitigate source.
~~📣📣📣~~	~~📣📣📣~~	~~📣📣📣~~	All Clear	If there has been a confirmed breakthrough, replace charcoal filters and test CAFS prior to resuming operations.

📣 MINICAMS Alarm ~~📣~~ Clear MINICAMS cycle

DAAMS Confirmed DAAMS tube result for H & L (confirmation for CG, CK, & PS is considered to be three consecutive alarms)

Table D.2.2: Arsine Electrochemical Detector Monitoring Alarms: Interpretation and Resultant Actions with ECS

Monitoring Location			Response To Alarm	
Inside ECS (Dig Site)	**CAFS Mid-bed**	**Outside (CAFS Exhaust)**	**Interpretation**	**Action**
✓			Possible arsine presence	Verify workers have adequate PPE. Collect colorimetric tube sample. Locate and mitigate source. Continue working..
✓ + CT			Confirmed arsine presence	Notify Partners of arsine detection. Continue to locate and mitigate source. **Note:** Arsine is contained within the ECS.
✓ + CT	✓		Possible arsine breakthrough	Collect colorimetric tube sample. Locate and mitigate source. Continue working. **Note:** Arsine has **NOT** been released to the environment.
✓ + CT	✓ + CT		Confirmed arsine breakthrough	Implement agency notification and notify residents within AEGL-2 distance to shelter-in-place as per PPP; continue working to locate/mitigate source. **Note:** Arsine has **NOT** been released to the environment.
✓ + CT	✓ + CT	✓	Probable arsine release to environment	Maintain shelter-in-place as per PPP; continue working to locate/mitigate source. Collect colorimetric tube sample at exhaust.
✓ + CT	✓ + CT	✓ + CT	Confirmed arsine release to environment	Maintain shelter-in-place as per PPP; continue working to locate/mitigate source.
NFD	NFD	NFD	All Clear	Arsine no longer present. If there has been a confirmed breakthrough, replace charcoal filters and test CAFS prior to resuming operations.

✓ Arsine Alarm (i.e., > 50 ppb for 10 sec) CT Confirmed colorimetric tube result for arsine. NFD No further detection.

CHAPTER 3
HEAT STRESS AND WORK/REST REGIMENS

3.1 GENERAL

3.1.0.1 Heat stress and heat stress related problems are a concern for the investigation at Burial Pit 3. Heat stress is discussed in detail in Chapter 9 of the Site-Wide SSHP (Attachment 1 to the Site-Wide APP, which is Appendix D of the Site-Wide WP). The SSHO will establish work/rest regimens for the investigation at Burial Pit 3 to manage the risk for heat stress exposures. For ease of reference, the following sections are repeated from the Site-Wide SSHP.

3.2 HEAT STRESS

3.2.1 General

3.2.1.1 Sweating does not cool the body unless the sweat is evaporated from the body. The use of some PPE can reduce the body's ability to eliminate large quantities of heat because the evaporation of sweat is decreased. The body's effort to maintain an acceptable temperature may become impaired and this may cause heat stress. Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks. If semi-permeable and impermeable PPE is used at the site, heat stress is a MAJOR HAZARD to involved site workers.

3.2.1.2 Heat stress related problems include heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Heat rash occurs because sweat is not evaporating, making the skin wet most of the time. Standing erect and immobile allows blood to pool in the lower extremities. As a result, blood does not return to the heart to be pumped back to the brain and fainting may occur. Heat cramps are painful spasms of the muscles as a result of excessive salt loss from profuse sweating. Heat exhaustion occurs because of the large fluid and salt loss from profuse sweating. A person's skin is clammy and moist; and nausea, dizziness, and headaches may occur.

3.2.1.3 Heat stroke occurs when the body's temperature regulatory system has failed. Skin is hot, dry, red, and spotted. These skin color changes may not be readily evident in darker skinned individuals and other signs must be relied upon. The affected person may be mentally confused, delirious, and convulsions may occur. A person exhibiting signs of heat stroke should be removed from the work area to a shaded area immediately. The person should be soaked with water and fanned to promote evaporation. Medical attention must be obtained immediately. EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.

3.2.2 Early Symptoms of Heat Stress Related Problems

3.2.2.1 Workers should recognize the early symptoms of heat stress. These symptoms include:

- Decline in task performance,
- Lack of coordination,
- Decline in alertness,
- Unsteady walk,
- Excessive fatigue,
- Muscle cramps, or
- Dizziness.

3.2.3 Engineering Controls

3.2.3.1 For site operations where Level C PPE or higher is required, a cool-down area will be made available on site.

3.2.3.2 WBGT will be tracked continuously by the SSHO when temperatures on site exceed 80°F.

3.3 WORK/REST REGIMENS

3.3.1.1 The management of risk for heat stress exposures centers around the principal of job-specific controls. Controls that will be implemented to reduce the potential for worker heat stress includes: use of acclimated workers, providing adequate replacement fluids, educating workers to recognize the early symptoms of heat stress, use of cooling vests, physiological monitoring, and development of a work/rest regimen that will prevent the onset of heat stress.

3.3.1.2 Work-rest regimens will be implemented in accordance with the limits specified in Table D.3.1, for Level D and Modified Level D PPE, and Table D.3.2, for Level C PPE and higher) unless modified as described below.

3.3.1.3 Work schedules may be adjusted in accordance with heat stress monitoring results.

3.3.1.4 If the core body temperature exceeds 38°C (100.4°F) for any team member, then the next lower work-rest regimen will be instituted.

3.3.1.5 If no team member's core body temperature exceeds 37.5°C (99.5°F), then the next higher work-rest regimen may be instituted.

Table D.3.1
Permissible Heat Exposure Threshold Limit Values [°C and (°F) WBGT]
when Level D or Modified Level D PPE is worn

Work-Rest Regimen	Workload		
	Light	Moderate	Heavy
Continuous work	29.5 (85.1)	27.5(82)	26 (77)
75% Work 25% Rest, each hour	30.5 (87)	28.5 (82)	27.5 (78)
50% Work 50% Rest, each hour	31.5 (89)	29.5 (85)	28.5 (82)
25% Work 75% Rest, each hour	32.5 (90)	31 (88)	30.0 (86)

NOTE: The workload category may be established by ranking each job into light, medium, or heavy categories on the basis of type of operation:

Light: (up to 200 kcal/hr or 800 Btu/hr): e.g., sitting or standing to control machines, performing light hand or arm work.

Moderate: (200-350 kcal/hr or 800-1400 Btu/hr): e.g., walking about with moderate lifting and pushing.

Heavy: (350-500 kcal/hr or 1400-2000 Btu/hr): e.g., pick and shovel work.

Table D.3.2
Permissible Heat Exposure Threshold Limit Values [°C and (°F) WBGT]
when Level C, B, or A PPE are worn

Work-Rest Regimen	Workload		
	Light	Moderate	Heavy
Continuous work	24.5 (76.1)	22.5 (72.5)	21 (69.8)
75% Work 25% Rest, each hour	25.5 (77.9)	23.5 (74.3)	22.5 (72.5)
50% Work 50% Rest, each hour	26.5 (79.7)	24.5 (76.1)	23.5 (74.3)
25% Work 75% Rest, each hour	27.5 (81.5)	26 (78.8)	25 (77)

3.3.1.6 The SSHO and site medics will track WBGT readings and compare these to the highest core body temperature for each team. These trend data will used to establish initial work-rest regimens. For example, if PPE is upgraded to Level C (from Modified Level D PPE) and the WBGT is 76°F, the work-rest regimen per Table D.3.2 is 50%/50%. However, if trend data indicate that personnel have been in Level C PPE at WBGT 76°F and have maintained core body temperatures <37.5°C (99.5°F), then the initial work-rest regimen will be 75%/25%. If the core body temperature exceeds 38°C (100.4°F) for any team member, then the next lower work-rest regimen will be instituted.

3.3.1.7 Whenever a new team member begins work on site, that member's entire team will use the appropriate table for establishing the work-rest regimen until the new team member is acclimated.

3.3.1.8 Use of cooling vests by team members may also modify the work-rest regimen or the time of stay for continuous work. In this event, work-rest regimens will be modified as described in Paragraphs 3.3.1.3 through 3.3.1.6.

3.4 PREVENTION OF HEAT STRESS

3.4.1.1 Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illnesses. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
    - Modify work/rest regimens as described above.
    - Mandate work slowdowns as needed.
- Perform work during cooler hours of the day, if possible.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Ensure workers are acclimated to weather conditions and have extensive experience in the selected level of PPE. Workers can be acclimatized by gradually increasing the workload over a period of days.
- Worker heart rate and temperature will be monitored and tracked when workers are wearing Level C PPE or higher.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluids intake must approximately equal the amount of water lost in sweat, e.g. 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kg) of weight loss. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

- Maintain water temperature at 50° to 60°F (10° to 16.6°C).
- Provide small disposable cups that hold about 4 ounces (0.1 liter).
- Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or diluted drinks) before beginning work.
- Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat-related illnesses.
- Provide potassium supplements (banana or potassium chloride tablets).
- Rotate personnel and alternate job functions.

3.5 COLD-RELATED ILLNESS

3.5.1 General

3.5.1.1 Exposure to low temperatures presents a risk to employee safety and health both through the direct effect of the low temperature on the body and collateral effects such as slipping on ice, decreased dexterity, and reduced dependability of equipment. Work conducted in the winter months can become a hazard for field personnel as a result of cold exposure. All personnel must exercise increased care when working in cold environments to prevent accidents that may result from the cold. The effects of cold exposure include frostbite and hypothermia. Wind increases the impact of cold on a person's body. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite. Recognition of the symptoms of cold-related illness will be discussed during the health and safety briefing conducted prior to the onset of site activities.

3.5.1.2 Hypothermia is a life-threatening condition in which the core body temperature falls below 95°F. Hypothermia can occur at temperatures above freezing particularly when the skin or clothing becomes wet. During exposure to cold, maximum shivering occurs when the core temperature falls to 95°F. As hypothermia progresses, depression of the central nervous system becomes increasingly more severe (Table D1.9.3). This accounts for the progressive signs and symptoms ranging from sluggishness and slurred speech to disorientation and eventually unconsciousness.

Table D.3.3
Progressive Clinical Symptoms of Hypothermia

Core Temperature	Clinical Signs
95°F	Maximum shivering
87°F - 89°F	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated
84°F - 86°F	Progressive loss of consciousness; muscular rigidity; respiratory rate decreases
79°F	Victim rarely conscious
70°F - 72°F	Maximum risk of ventricular fibrillation

3.5.1.3 Frostbite is both the general and medical term given to areas of cold injury. Unlike hypothermia, frostbite rarely occurs unless environmental temperatures are less than freezing and usually less than 20°F. Frostbite injuries occur most commonly on the distal parts of the body (nose, earlobes, hands, and feet) that are subject to intense vasoconstriction. The three general categories of frostbite are:

- **Frostnip** - A whitened area of the skin that is slightly burning or painful.
- **Superficial frostbite** - Waxy, white skin with a firm sensation but with some resiliency. Symptomatically feels "warm" to the victim with a notable cessation of pain.
- **Deep frostbite** - Tissue damage deeper than the skin, at times, down to the bone. The skin is cold, numb and hard.

3.5.2 Preventing Cold Exposure

3.5.2.1 In preventing cold stress, the SSHO must consider factors relating to both the worker and the environment. Training, medical screening, establishment of administrative controls, selecting proper work clothing, and wind-chill monitoring all contribute to the prevention of hypothermia and frostbite.

- **Training** - Recognizing the early signs and symptoms of cold stress can help prevent serious injury. Therefore, workers will be trained to recognize the symptoms of hypothermia and frostbite and have appropriate first-aid instruction. When the air temperature is below 50°F, the SSHO will inform workers of the

proper clothing requirements and any work practices that are in effect to reduce cold exposure.

- **Administrative Controls** - The SSHO will establish a work/rest schedule based upon worker monitoring. At the first sign of uncontrollable shivering the worker will be rested in a heated shelter. Work will stop when the air temperature reaches 0°F.
- **Clothing** - Workers will be encouraged to layer clothing when air temperature is below 50°F. Clothing that has a high insulation value will be worn under protective garments. Insulated gloves will be worn when the wind chill index is below 32°F.

ATTACHMENT D-1
LOW PROBABILITY CONTINGENCY PLAN

The following is Subchapter 16.13 of the Site-Wide SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP. It has been included here for ease of reference.

16.13 MEC/RCWM CONTINGENCY PLAN FOR LOW PROBABILITY SITES

16.13.1 Introduction

16.13.1.1 The purpose of this contingency plan is to define the procedures that will be followed in the unlikely event that items potentially related to the American University Experiment Station (AUES) are encountered during non-intrusive activities at the SVFUDS, or during intrusive activities at low probability sites. For purposes of differentiation between this plan and the contingency plan used for higher probability sites, this plan will be referred to as the Low Probability Contingency Plan.

16.13.2 Definitions

16.13.2.1 Items that are potentially related to AUES will be defined as "potential AUES items" for the purposes of this Low Probability Contingency Plan. These items include but are not limited to:

- Any item identified as potential MEC/RCWM or as being related to MEC/RCWM; or
- Any sealed container that cannot be positively identified to be unrelated to AUES (e.g., paint cans, etc. are known to be unrelated to AUES activities); or
- Any unsealed container or identifiable fragment thereof that cannot be positively identified to be unrelated to AUES (e.g., beer bottles, etc. are known to be unrelated to AUES activities); or
- Any other item that is potentially agent-related material or that potentially contains agent-related material; or
- Any other item that cannot be positively identified as an obvious cultural feature or a post-1918 feature (obvious cultural features or post 1918 features include such items as root ball baskets, poly vinyl chlorinated [PVC] piping, wiring, etc.).

16.13.3 Low Probability Contingency Plan Initiation

16.13.3.1 The Low Probability Contingency Plan will be initiated if any potential AUES items (as defined above) are encountered during site activities, or if personnel at a low probability site exhibit symptoms that may be attributable to a chemical exposure (i.e., respiratory irritation and/or irritation of the eyes or skin).

16.13.3.2 In the event that the Low Probability Contingency Plan is initiated for any reason, intrusive activities will be halted immediately. EXCEPTION: see Paragraphs 16.13.8.2 through 16.13.8.4.

16.13.4 Initiation Procedures for Potential AUES Items

16.13.4.1 In the event that the Low Probability Contingency Plan is initiated because potential AUES items are encountered during site activities, subsequent actions taken will be determined according to the nature of the potential item. This procedure is summarized in Figure D1-16-1 and in Sections 16.13.5 through 16.13.8.

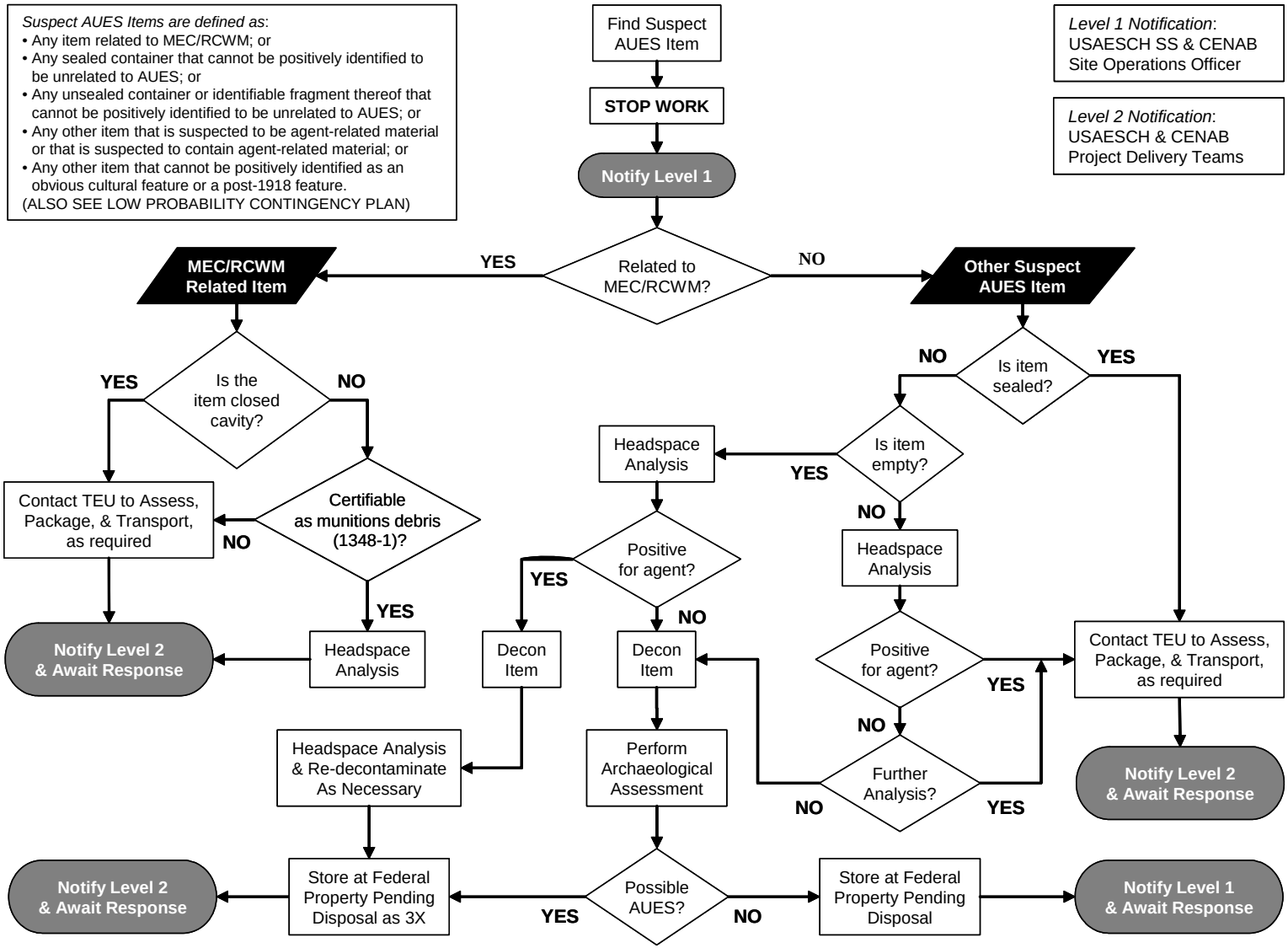
16.13.4.2 After initiation of the Low Probability Contingency Plan and the cessation of intrusive activities, the Site Manager or designate will contact the USAESCH Safety Specialist and CENAB Site Operations Officer and inform them that the Low Probability Contingency Plan has been initiated. The USAESCH Safety Specialist will coordinate further response with USAESCH, TE, and the Air Monitoring Team, as necessary. The CENAB Site Operations Officer will notify other outside agencies, as required. EXCEPTION: see Paragraphs 16.13.8.2 through 16.13.8.4.

16.13.5 Initiation Procedures for MEC/RCWM-Related Items

16.13.5.1 If the potential item is potentially related to MEC/RCWM, the following step-by-step procedure will be followed:

- If the potential item requires closed cavity assessment or is not certifiable as munitions debris in accordance with DoD Regulation 4160-21.M, the USAESCH Safety Specialist will contact TE so that the item can be assessed, photographed, packaged, and transported, as appropriate, in accordance with TE SOPs. After TE has been contacted, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation.

Figure D1-16-1
Low Probability Contingency Plan Decision Flowchart



- If the potential item is certifiable as munitions debris in accordance with DoD Regulation 4160-21.M, then the item will be double-bagged in plastic lock bags by personnel wearing Nitrile gloves. The item will be given a tracking number in accordance with Section 16.13.10, and also be photographed unless it is considered unsafe to do so. The item will then be transferred to the Air Monitoring Team for headspace analysis for mustard and lewisite in accordance with their SOPs, and the excavation area will be covered with polyethylene sheeting and anchored at the edges with sandbags pending the analysis results. Once the item has been packaged for transfer, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation.
- Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.

16.13.6 Initiation Procedures for Potential Sealed Items

16.13.6.1 If the potential item is sealed, the USAESCH Safety Specialist will contact TE so that the item can be assessed, photographed, packaged, and transported, as appropriate, in accordance with TE SOPs. After TE has been contacted, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation.

16.13.6.2 Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.

16.13.7 Initiation Procedures for Potential Unsealed Items Containing Liquids or Solids

16.13.7.1 If the potential item is unsealed and contains a liquid or a solid substance, the following step-by-step procedure will be followed:

- The item will not be moved and the excavation area will be secured and covered with polyethylene sheeting, and anchored at the edges with sandbags.
- The USAESCH Safety Specialist will then contact the Air Monitoring Team to request that they come to the site to perform headspace analysis of the potential item for mustard and lewisite in accordance with their SOPs.
- If the item is positive for agent, the USAESCH Safety Specialist will contact TE so that the item can be assessed, photographed, packaged and transported, as appropriate, in accordance with TE SOPs. After TE has been contacted, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation.
- If the item is not positive for agent, the SSHO will perform a visual assessment of the item to evaluate whether the contents should be recommended for further analysis. Agent-related material may be viscous (oil-like) liquid that is clear,

yellow, brown, black, or milky in appearance, or unidentifiable solid that is white, yellow, green, brown, or black in appearance.

- If the SSHO deems that there is any reason for the contents to undergo further analysis, the USAESCH Safety Specialist will contact TE so that the item can be assessed, photographed, packaged, and transported, as appropriate, in accordance with TE SOPs. After TE has been contacted, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation. Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.
- If the contents of the item clearly appear to be uncontaminated soil, mud, or groundwater, the SSHO will request the USAESCH Safety Specialist's concurrence with this assessment. If the USAESCH Safety Specialist does not concur with the SSHO's assessment, TE will be contacted as described in the previous step. However, if the USAESCH Safety Specialist does concur with the assessment, the item will be photographed, decontaminated in a container of 5% bleach solution, and then double-bagged, labeled (Section 16.13.10), and transferred to the Project Archaeologist for archaeological assessment. The item will be placed into the decontamination solution using tongs or other method to avoid physical contact with the item during decontamination, and the decontamination solution used will be kept segregated until after the results of the archaeological assessment, to allow analysis of the solution if necessary. Following this archaeological assessment, if the item is determined not to be AUES-related, the USAESCH Safety Specialist and the CENAB Site Operations Officer will be informed and may then give permission for intrusive activities to continue at the site. The decontaminated item will be held in a labeled drum at the Federal Property, pending appropriate disposal, and the segregated decontamination solution will be placed in the decontamination water drum.
- If the item is determined to be potentially AUES-related following this archaeological assessment, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation. Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist. The decontaminated item will be held in a labeled drum at the Federal Property, pending disposal as 3X scrap, and the segregated decontamination solution will be kept in a labeled container, pending the decision on whether or not it requires analysis.

16.13.8 Initiation Procedures for Other Potential AUES Items

16.13.8.1 If the potential item is neither MEC/RCWM-related nor a sealed item, and it does not contain any liquid or solid substances, the following step-by-step procedure will be followed:

- The item will be photographed and then double-bagged in plastic lock bags by personnel wearing Nitrile gloves. The item will then be transferred to the Air Monitoring Team for headspace analysis for mustard and lewisite in accordance with their SOPs, and the excavation area will be covered with polyethylene sheeting and anchored at the edges with sandbags pending the analysis results.
- If the item is positive for agent, the item will be decontaminated in a container of 5% bleach solution, and then tested again using headspace analysis to confirm decontamination. The item will be placed into the decontamination solution using tongs or other method to avoid physical contact with the item during decontamination. If the item is still positive for agent following this decontamination process, it will be decontaminated again and retested using headspace analysis. This two-step process will be repeated as necessary until decontamination is confirmed. Once the item is decontaminated, it will be double-bagged and labeled in accordance with Section 16.13.10. The USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation and the decontaminated item will be held in a labeled drum at the Federal Property, pending disposal as 3X scrap. Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.
- If the item is not positive for agent, the item will be decontaminated in a container of 5% bleach solution and then double-bagged, labeled (Section 16.13.10), and transferred to the Project Archaeologist for archaeological assessment. The item will be placed into the decontamination solution using tongs or other method to avoid physical contact with the item during decontamination, and the decontamination solution used will be kept segregated until the results of the archaeological assessment are known, to allow subsequent analysis of the solution if necessary. Following this archaeological assessment, if the item is determined not to be AUES-related, the USAESCH Safety Specialist and the CENAB Site Operations Officer will be informed and may then give permission for intrusive activities to continue at the site. The decontaminated item will be held in a labeled drum at the Federal Property, pending appropriate disposal, and the segregated decontamination solution will be placed in the decontamination water drum.
- If the decontaminated item is determined to be potentially AUES-related following this archaeological assessment, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation. The decontaminated item will be held in a labeled drum at

the Federal Property, pending disposal as 3X scrap, and the segregated decontamination solution will be kept in a labeled container, pending the decision on whether or not it requires analysis. Intrusive activities will not resume at the site until authorization to continue is received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.

16.13.8.2 The above procedure may be modified in the event that multiple potential items are recovered that are neither MEC/RCWM-related, nor sealed items, and that do not contain any liquid or solid substances (e.g., the team are digging in an area of trash). Under these circumstances, the field team will not be required to stop work and may continue with excavation activities at the low probability site as long as the following conditions have been met:

- The initial potential item find(s) have been sent for headspace analysis and no agent has been detected.
- The USAESCH and CENAB PDTs have been informed of these finds and have agreed to allow the modification of the procedure.

16.13.8.3 Under these conditions, any potential items recovered that are neither MEC/RCWM-related, nor sealed items, and that do not contain any liquid or solid substances will be containerized (e.g., placed 55-gallon drum) and sent for headspace analysis at the end of each day. Results of these analyses will be reported to the USAESCH and CENAB PDTs the following morning, via the USAESCH Safety Specialist and the CENAB Site Operations Officer, respectively,. Excavation will halt if agent has been detected.

16.13.8.4 Subsequent to this procedure modification, in the event that any items are recovered that are addressed in Sections 16.13.5, 16.13.6, or 16.13.7 of this Low Probability Contingency Plan, or if the Parsons Site Manager, USAESCH Safety Specialist, or CENAB Site Operations Officer otherwise deem it necessary, further intrusive activities will be halted immediately and the appropriate Contingency Plan procedures will be followed.

16.13.9 Initiation Procedures for Possible Agent Exposure

16.13.9.1 In the event that the Low Probability Contingency Plan is initiated because site personnel exhibit symptoms that may be attributable to a chemical exposure, the following step-by-step procedure will be carried out:

- Personnel will move upwind of the excavation or other potential source of exposure.
- The USAESCH Safety Specialist and CENAB Site Operations Officer will be contacted and informed that the Low Probability Contingency Plan has been initiated. The USAESCH Safety Specialist will coordinate further response with USAESCH, TE, and the Air Monitoring Team, as necessary. The CENAB Site

Operations Officer will notify and coordinate with other outside agencies, as required.

- Potentially exposed personnel may be processed through the EPDS, if signs of exposure are observed on their skin or clothing. Areas of the body suspected to be exposed will be flushed with copious quantities of water. Potentially exposed clothing or PPE will be removed and decontaminated in accordance with the procedures described in Chapter 13 of this SSHP.
- George Washington Hospital will be notified (telephone: 202-934-3211) and, if present, the onsite ambulance will be contacted and used to transport any personnel exhibiting chemical exposure symptoms, or other personnel potentially exposed, to that facility. If no ambulance is on-site, George Washington Hospital will be notified and 911 will be called. At this time, George Washington Hospital will be informed whether the potentially exposed personnel have been processed through the EPDS, though they will be advised that the potentially exposed personnel may require additional decontamination upon arrival at the hospital if decontamination has not been confirmed on site using agent monitoring.
- The excavation area will be covered with polyethylene sheeting and anchored at the edges with sandbags and the USAESCH Safety Specialist will contact the Air Monitoring Team to perform headspace analysis at the excavation. Also, the USAESCH Safety Specialist and the CENAB Site Operations Officer will contact their respective PDTs to apprise them of the situation.
- Intrusive activities will not resume until authorization to continue has been received from the USAESCH and CENAB PDTs, via the USAESCH Safety Specialist.

16.13.10 On-Site Tracking for Low Probability Contingency Plan

16.13.10.1 Every potential item uncovered that causes the Low Probability Contingency Plan to be triggered will be tracked using unique alphanumeric tracking numbers. General details of the numbering systems to be used are described below, though specific details will be included in each SSWP.

16.13.10.2 The Site Manager will enter descriptions of all potential items in the Field Log Book (e.g., dimensions, color, material of construction, other notable features). Photographs will be taken of potential items, as specified in Section 16.13.6. All photographs of potential items will include a visual scale in order that the dimensions of the item can be estimated using the photograph.

16.13.10.3 On any day that the Low Probability Contingency Plan is initiated, the Site Manager will complete a Contingency Plan Initiation Summary and include it in the Daily Report (Section 4.9 of the WP). Both the Site Manager and the USAESCH Safety Specialist will sign this Contingency Plan Initiation Summary.

16.13.10.4 Items Removed by TE

16.13.10.4.1 If the item has been removed by TE during a low probability intrusive investigation, Parsons will assign a unique alphanumeric tracking number for internal reference and tracking purposes. The first two characters of this number will be "TE" (to denote an item removed by TE). The next set of characters will denote the overall site location (e.g., "4801GR" for 4801 Glenbrook Road). The next four characters will indicate the specific location at which the item was recovered (AN for anomaly number). The last number will be a unique number assigned to each item recovered at that location which is removed by TE.

16.13.10.5 The following is an example of designations for items removed by TE:

TE-4801GR-AN22-010, TE-4801GR-EX22-011, etc.

16.13.10.6 Munitions Debris

16.13.10.6.1 Each item of munitions debris encountered during a low probability intrusive investigation will be given a unique alphanumeric tracking number. The first three characters of this number will be "SCR" (to denote munitions debris). The next set of characters will denote the overall site location (e.g., "4710WL" for 4710 Woodway Lane). The next four characters will indicate the specific location at which the item was recovered (AN for anomaly number). The last number will be a unique number assigned to each munitions debris item recovered at that location.

16.13.10.6.2 The following is an example of munitions debris item designations:

SCR-4710WL-AN22-010, SCR-4710WL-AN22-011, etc.

16.13.10.7 Other Potential Items

16.13.10.7.1 Other potential items encountered during low probability, intrusive investigations will be given a unique alphanumeric tracking number, which will be marked on the bag in which the item is placed. Additionally, the date of generation will be marked on the bag. The first two characters of this number will be "PI" (potential item). The next set of characters will denote the overall site location (e.g., "5058SegS" for 5058 Sedgwick Street). The next four characters will indicate the specific location at which the item was recovered (AN for anomaly number). The last number will be a unique number assigned to each potential item recovered at that location.

16.13.10.7.2 The following is an example of designations for other potential items:

PI-5058SegS-AN01-001, PI-5058SegS- AN01-002, etc.

16.13.10.7.3 In the event that the procedures detailed in Paragraphs 16.13.8.2 through 16.13.8.4 are followed, other potential items will be containerized and tracked by batch using a unique alphanumeric tracking number, which will be marked on the container in which each batch of items is placed. Additionally, the date of generation will be marked on the container. The first two characters of this number will be "PI" (potential item). The next set of characters will denote the overall site location (e.g., "5058SegS" for 5058 Sedgwick Street). The next four characters will indicate the specific location at which the item was recovered (AN for anomaly number). The next part of the code will be "BATCH" to denote that this tracking number refers to multiple items. The last number will be a unique number assigned to each potential item recovered at that location.

16.13.10.7.4 The following is an example of designations for other potential items using the modified procedures:

PI-5058SegS-AN01-BATCH-001, PI-5058SegS- AN01- BATCH-002, etc.

ATTACHMENT D-2
HIGH PROBABILITY CONTINGENCY PLAN

The following is Subchapter 16.14 of the Site-Wide SSHP, which is Attachment 1 to the APP in Appendix D of the Site-Wide WP. It has been included here for ease of reference.

16.14 MEC/RCWM CONTINGENCY PLAN FOR HIGH PROBABILITY SITES

16.14.1 Introduction

16.14.1.1 This contingency plan defines the procedures that will be followed in the event that potential MEC/RCWM items are encountered during intrusive activities at high probability sites in order to ensure the safety and the protection of the public and workers, and to ensure the proper disposal of discovered MEC/RCWM items. For purposes of differentiation between this plan and the contingency plan used for low probability sites, this plan will be referred to as the High Probability Contingency Plan.

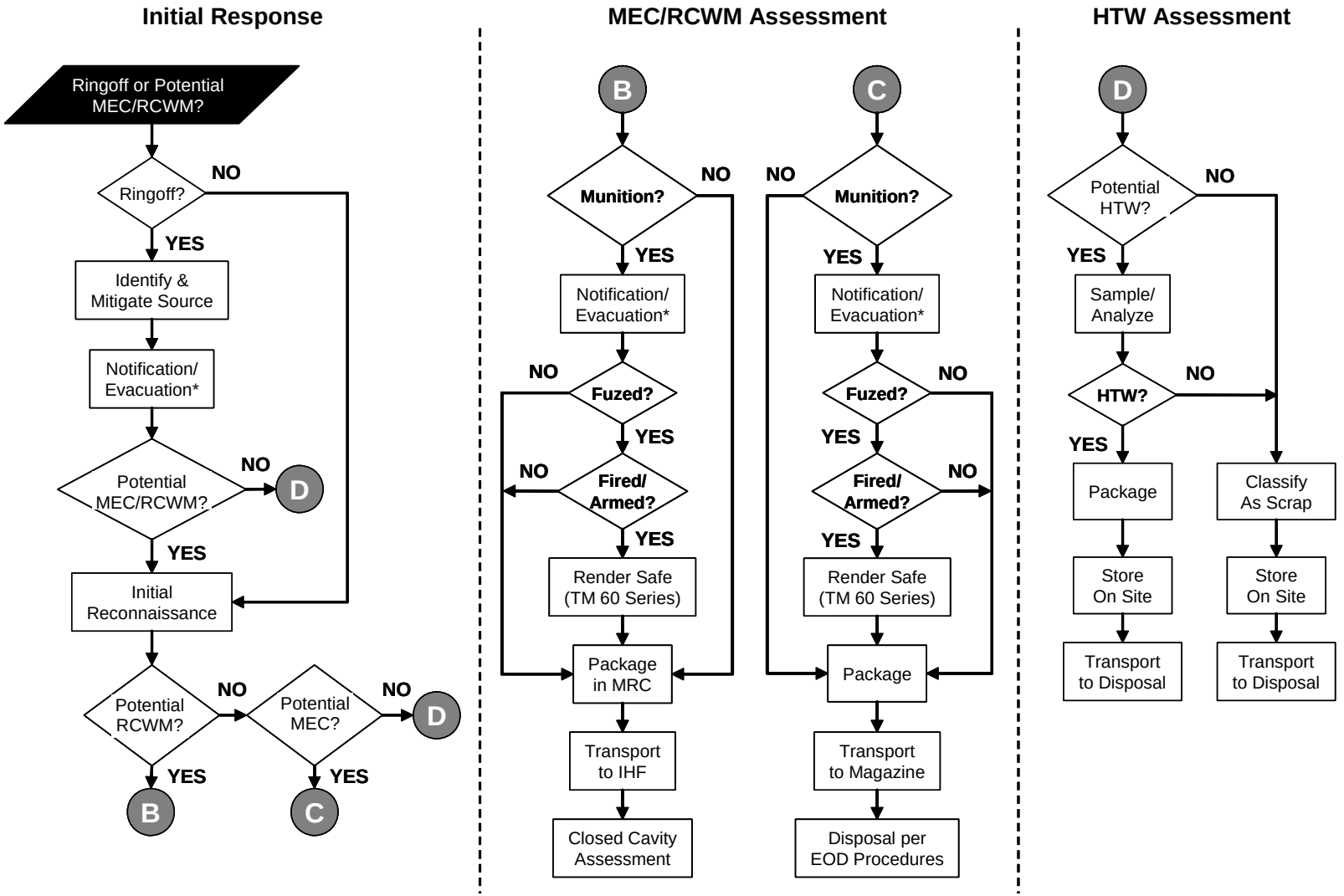
16.14.1.2 Responses to air monitoring alarms/ringoffs are described in Sections 8.3.4 and 8.3.5 of this SSHP.

16.14.2 Initial Response

16.14.2.1 If there is an alarm or a potential RCWM item is encountered, the excavation team will respond according to the procedures described below and illustrated in Figure D1-16-2.

16.14.2.2 If an air monitoring alarm has occurred with no apparent potential RCWM container present and the excavation team is in the proper level of PPE, they will take immediate action to investigate and mitigate the source, as necessary. If they are not in the appropriate level of PPE, the excavation team will exit the EZ, upgrade PPE depending upon the alarm level, and then reenter the EZ and work towards investigating and mitigating the source, as necessary. Mitigation procedures will include identifying the source of the alarm, and containerizing the surrounding soil until there are no additional alarms recorded. If, during source mitigation, a potential RCWM container or MEC item is encountered, the excavation team will perform an initial reconnaissance.

Figure D1-16-2
High Probability Contingency Plan Decision Flowchart



* Notification/evacuation is only applicable if the public is not adequately protected by engineering controls or by prior withdrawal

16.14.2.3 Following investigation of possible source of an air monitoring alarm, if potential chemical agent-related gross liquid contamination is observed, the excavation team will mitigate the source by covering the area with plastic and will then exit the EZ through the PDS. Personnel will then upgrade PPE to an adequate level for dealing with liquid contamination (Chapter 5 of this SSHP) and may then enter the EZ to further mitigate and/or containerize the potential liquid source.

16.14.2.4 Excavation may continue once the alarm/ringoff has been cleared. However, PPE may be upgraded depending upon the alarm level.

16.14.3 Initial Reconnaissance

16.14.3.1 If a potential RCWM container or MEC item is encountered, the excavation team and/or TE will perform an initial reconnaissance. For the purposes of this High Probability Contingency Plan, a potential RCWM container is defined as either (a) a container with markings denoting chemical agent or RCWM, or (b) an unidentifiable intact container that contains liquid. Note that, during an investigation at a high probability site, any discovered unidentifiable intact container that contains liquid will be assumed to be potential RCWM until determined otherwise.

16.14.3.2 If, during the initial reconnaissance, the item is determined to be potential RCWM, the assessment procedures described in Section 16.14.4 will be performed.

16.14.3.3 If an item is identified as potential MEC, the UXO team will assess the potential MEC using their SOPs. Based upon their assessment, established procedures described in Section 16.14.5 will be implemented, if necessary.

16.14.3.4 If it is determined that a potential container is neither a RCWM container nor a MEC item, it will be categorized as potential HTW and assessed according to the procedures described in Section 16.14.6.

16.14.4 RCWM Assessment

16.14.4.1 If the item is categorized as potential RCWM, TE will perform an assessment in accordance with their assessment SOPs. This assessment will be performed at the Federal Property under the supervision of the USAESCH Safety Specialist and the SSHO.

NOTE: IN THE EVENT THAT A RCWM ITEM RECOVERED DURING AN INVESTIGATION IS DETERMINED TO BE INCONSISTENT WITH THE MCE STATED IN THE SSWP, WORK WILL CEASE AND THE SITE-SPECIFIC MCE WILL BE REEVALUATED. IF THE MCE IS REVISED TO A GREATER HAZARD, THE AEGL-2 DISTANCE WILL BE RECALCULATED AND THE NEW AEGL-2 DISTANCE WILL BE IN EFFECT FOR THE REMAINDER OF THE INVESTIGATION. THE REVISED MCE AND AEGL-2 DISTANCE WILL BE APPROVED BY USAESCH PRIOR TO IMPLEMENTATION. AN AMENDMENT TO THE CSS OR ANNEX WILL BE PREPARED AND SUBMITTED FOR APPROVAL.

16.14.4.2 If an item is assessed to be a munition, the following steps will be taken.

- The CENAB Site Operations Officer, SSHO, USAESCH Safety Specialist, and Site Manager will be notified immediately. If not previously implemented, the CENAB Site Operations Officer may implement public evacuation or shelter-in-place in accordance with the CENAB PPP if the public is not adequately protected by engineering controls or a prior withdrawal.
- If the item is fuzed and fired/armed, it will be rendered acceptable to move by TE EOD personnel in accordance with TM 60 Series, packaged in a MRC, transported to the IHF containers, and subjected to closed cavity item assessment in accordance with TE assessment procedures (Section 3.8.13 of the WP). The transportation route to the IHF containers will be determined on a site-specific basis and will be included in the SSWP.
- If the item is not acceptable to move, work will stop and appropriate TM 60 series actions, in conjunction with engineering controls, will be selected. These measures will be applied only after review and approval by the on-site USAESCH Safety Specialist (reference TM 60A-1-1-22).
- If the item has not been fired/armed, it will be packaged in a MRC, transported to the IHF containers, and subjected to closed cavity item assessment in accordance with TE assessment procedures (Section 3.8.13 of the WP).

16.14.4.3 If the item is not a munition (i.e., it is an intact container), it will be packaged in a MRC, transported to the IHF containers, and subjected to closed cavity item assessment in accordance with TE assessment procedures (Section 3.8.13 of the WP).

16.14.5 MEC Assessment

16.14.5.1 If the item is not potential RCWM but is a potential MEC item, qualified UXO technicians will perform the assessment.

NOTE: IN THE EVENT THAT A MEC ITEM RECOVERED DURING AN INVESTIGATION IS DETERMINED TO BE INCONSISTENT WITH THE MGFD STATED IN THE SSWP, WORK WILL CEASE AND THE SITE-SPECIFIC MGFD WILL BE REEVALUATED. IF THE MGFD IS REVISED TO A GREATER HAZARD, THE RELATED MSD WILL BE RECALCULATED AND THE NEW MSD WILL BE IN EFFECT FOR THE REMAINDER OF THE INVESTIGATION. THE REVISED MGFD AND MSD WILL BE APPROVED BY USAESCH PRIOR TO IMPLEMENTATION. AN AMENDMENT TO THE CSS OR ANNEX WILL BE PREPARED AND SUBMITTED FOR APPROVAL.

16.14.5.2 If the MEC item is assessed to be a munition, the following steps will be taken:

- The CENAB Site Operations Officer, SSHO, USAESCH Safety Specialist, and Site Manager will be notified immediately. If not previously implemented, the CENAB Site Operations Officer may implement public evacuation or shelter-in-

place in accordance with the CENAB PPP if the public is not adequately protected by engineering controls or a prior withdrawal.

- If the item is fuzed and fired/armed, EOD support shall be requested for further action.
- If the item is not acceptable to move, work will stop and appropriate safety precautions, in conjunction with engineering controls, will be selected. These measures will be applied only after review and approval by the on-site USAESCH Safety Specialist (reference TM 60A-1-1-22).
- If the item has not been fired/armed, it will be packaged by UXO personnel, transported to the magazine at the Federal Property, and disposed of in accordance with applicable guidelines in coordination with USAESCH.

16.14.6 HTW Assessment

16.14.6.1 If the item is not MEC or RCWM but is a potential HTW item, it will undergo HTW assessment at the Federal Property assessment area. The potential HTW item will undergo headspace analysis and liquid or solid samples will be collected from the item by the Sample Team and submitted to the HTW laboratory. If the item itself cannot be sampled, soil samples will be collected from the vicinity in which the item was recovered and these will be analyzed and used to characterize the item.

16.14.6.2 If the item contains HTW components, it will be packaged in a polyethylene drum overpack and stored at the Federal Property with secondary containment until shipped for disposal.

16.14.6.3 All items that are obviously scrap or proven to be scrap will be staged at the Federal Property until shipped for disposal.

ATTACHMENT D-3
ACTIVITY HAZARD ANALYSES

ACTIVITY: SITE MOBILIZATION/PREPARATION

Summary: Prior to intrusive operations, mobilization and site preparation activities will be required. These activities include site preparation, installation of erosion and sediment controls, removal of vegetation, removal of fill material and grading, and erection of an ECS.

Principal Steps	Potential Hazards	Controls
General Mobilization/Preparation Hazards	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and heat stress injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Tripping hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Site preparation	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the crane/bucket swing radius and make sure they have the attention of the equipment operator and that excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distance.
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.

Principal Steps	Potential Hazards	Controls
Brush/obstacle removal	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the crane/bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances. Crane and forklift safety protocols will be observed.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.
Erect and remove security fence/construction fence; Install/remove erosion and sediment controls	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the crane/bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances. Crane and forklift safety protocols will be observed.

Principal Steps	Potential Hazards	Controls
Erect and remove security fence/construction fence; Install/remove erosion and sediment controls (contd.)	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.
Position support trailers and equipment	Injury from vehicle and heavy equipment traffic in work area	A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances. Crane and forklift safety protocols will be observed.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).

Principal Steps	Potential Hazards	Controls
Position support trailers and equipment (contd.)	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.
Establish power hook-ups (generator or line)	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO. Electrical work will only be performed by qualified personnel who are familiar with applicable code requirements.
	Electrical hazards	No frayed electrical cords will be permitted on site. GFCI devices will be used on all outdoor circuits. Proper lock-out/tag-out procedures will be used when repairing or installing electrical equipment and only qualified personnel will perform electrical hook-ups.
Fill material excavation and regrading	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.
	Excavation	Shoring will be installed or benching/sloping implemented when excavation exceeds 4 feet, if workers are required to enter. All water will be pumped from the excavation prior to worker entrance. Excavation will be inspected by the SSHO prior to entrance by workers. Proper ingress and egress will be provided.
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.

Principal Steps	Potential Hazards	Controls
Fill material excavation and regrading (contd.)	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
Erection of ECS	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the crane swing radius and make sure they have the attention of the equipment operator. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances. Crane and forklift safety protocols will be observed.
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.

Personal Protective Equipment Requirements:

Level D PPE

Hardhat (as required)

Hearing Protection (as required)

Safety glasses (as required)

Face shield when using chainsaw or brush trimmers

Chaps when using chainsaw

Leather gloves (as required)

Equipment to be used:

Common hand tools

Common power tools (chain saws, brush trimmers)

Vehicles: excavator, front-end loader, crane, forklift, man lift

Inspection Requirements:

The SSHO will inspect the entire work area daily. Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced. All construction vehicles in use will be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use: service brakes, including trailer brake connections; parking system (hand brake); emergency stopping system (brakes); tires; horn; steering mechanism; coupling devices; seat belts; operating controls; and safety devices. All defects will be corrected before the vehicle is placed in service. If during inspection or during use, equipment fails to function properly, the equipment will be turned in for repair/ replacement. Cranes will be inspected daily by the operator

following the guidelines presented in EM 385-1-1, Appendix H. Documentation of annual crane inspection must be available at the site for review by the SSHO.

Training Requirements:

All on site personnel (except land surveyors and landscape valuation assessors) will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER) and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additionally, site personnel will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP. Heavy equipment and cranes will be operated by designated qualified personnel. Forklift operators must complete training in accordance with 29 CFR 1910.178. A minimum of two people trained in First Aid and CPR will be on site during operations.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: PROPERTY SURVEY AND MAPPING

Summary: Prior to intrusive operations, the site may be surveyed and the area(s) to be investigated may be marked out and mapped by a licensed surveying subcontractor.

Principal Steps	Potential Hazards	Controls
General property survey and mapping hazards	Slips, trips, and falls	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and heat stress injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). Beverages will be available on site. SSHO will monitor weather conditions and stress symptoms in workers.

Personal Protective Equipment Requirements:

Level D PPE

Equipment to be used:

Surveying Equipment

Inspection Requirements:

The SSHO will inspect the entire work area daily. Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced.

Training Requirements:

A minimum of two people trained in First Aid and CPR will be on site during operations. All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: LANDSCAPE SURVEY

Summary: Prior to and/or following intrusive operations, a landscape surveyor may inspect the investigation area to assess the baseline landscape and/or evaluate whether any impacts have resulted from the investigation.

Principal Steps	Potential Hazards	Controls
General Landscape Survey Hazards	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and heat stress injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). Beverages will be available on site. SSHO will monitor weather conditions and stress symptoms in workers.
	Slips, trips, and falls	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.

Personal Protective Equipment Requirements:

Level D PPE

Equipment to be used:

Camera

Video Equipment

Inspection Requirements:

The SSHO will inspect the entire work area daily. Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement.

Training Requirements:

A minimum of two people trained in First Aid and CPR will be on site during operations. All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: TREE REMOVAL

Summary: There is a possibility that tree removal may be required during site preparation to allow siting of equipment or the erection of the ECS. In this event, a subcontractor would be retained to take down and remove trees, as necessary.

Principal Steps	Potential Hazards	Controls
General Tree Removal Hazards	Slips, trips, and falls	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and heat stress injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). Beverages will be available on site. SSHO will monitor weather conditions and stress symptoms in workers.
	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances.
	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Manual lifting	Workers will be made aware of proper lifting techniques and the potential for injuries due to lifting during morning safety briefings. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).

Principal Steps	Potential Hazards	Controls
General Tree Removal Hazards (contd.)	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Tree Removal	Ensure personnel wear hard hats and ensure no personnel are in the fall zone of trees. Personnel will wear hearing and eye protection and chaps when operating chainsaws.
	Injury from hand tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.

Personal Protective Equipment Requirements:

Level D PPE

Hardhat

Hearing Protection

Safety glasses

Leather gloves

Face shield when using chainsaw or brush trimmers

Chaps when using chainsaw

Equipment to be used:

Common hand tools

Common power tools (chain saws, brush trimmers)

Excavator (as needed)

Inspection Requirements:

The SSHO will inspect the entire work area daily. Workers will inspect all equipment each day prior to use. If, during inspection or during use, equipment fails to function properly, it should be turned in for repair/replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it is repaired/replaced.

Training Requirements:

A minimum of two people trained in First Aid and CPR will be on site during operations. All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: INTRUSIVE INVESTIGATION

Summary: Once the fill material has been removed, soil and materials will be excavated from Test Pit 23. Intrusive investigations will be performed within an ECS, either manually (hand digging) or using mechanical equipment, as necessary. Excavated material will be sorted by sifting and suspect MEC items, intact containers, and other suspect glassware or debris will be segregated for further assessment. Excavated soil will be transferred into drums. The soil will be sampled as necessary before the containers are sealed.

Principal Steps	Potential Hazards	Controls
General Initial Intrusive Investigation Activities	Chemical Warfare Agents, UXO, and other potentially hazardous laboratory chemicals	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring will be performed using the MINICAMS for chemical warfare agents, an electrochemical detector for arsine, and a PID for HTRW contaminants.
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring will be performed IAW SSHP.
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Hand Digging	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.

Principal Steps	Potential Hazards	Controls
Hand Digging (contd.)	Contact with MEC/RCWM	Excavation will proceed with caution and will be performed by UXO Technicians who will halt the excavation if an item is discovered. The Command Post will be contacted for instructions prior to proceeding. The MEC/RCWM Contingency Plan will be implemented.
	Excavation and trenching	Shoring will be installed or benching/sloping implemented when excavation exceeds 4 feet, if workers are required to enter. All water will be pumped from the excavation prior to worker entrance. Excavation will be inspected by the SSHO prior to entrance by workers. Proper ingress and egress will be provided.
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
Mechanical Excavation	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.
	Contact with MEC/RCWM	Excavation will proceed with caution in six (6) inch lifts. A spotter will be positioned to observe the bucket and will halt the excavation if an item is discovered. The Command Post will be contacted for instructions prior to proceeding. The MEC/RCWM Contingency Plan will be implemented.
	Excavation and trenching	Shoring will be installed or benching/sloping implemented when excavation exceeds 4 feet, if workers are required to enter. All water will be pumped from the excavation prior to worker entrance. Excavation will be inspected by the SSHO prior to entrance by workers. Proper ingress and egress will be provided.

Principal Steps	Potential Hazards	Controls
Mechanical Excavation (contd.)	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.
	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment.
	Inadvertent breakage of intact container	Excavation will proceed with caution in six (6) inch lifts. A dig team member will be positioned to observe the bucket and will halt the excavation if an item is discovered. The Command Post will be contacted for instructions prior to proceeding. If an item is broken, the team will cease excavation, the area will be mitigated/secured, and the excavation team will follow the directions of the Command Post. The MEC/RCWM Contingency Plan will be implemented.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
Sifting and Transfer of Soil	Contact with MEC/RCWM	Sifting will be performed by UXO Technicians, who will cease work if an item is discovered. The Command Post will be contacted for instructions prior to proceeding. The MEC/RCWM Contingency Plan will be implemented.
	Inadvertent breakage of intact container	Sifting will be performed by UXO Technicians, who will cease work if an item is discovered. If an item is broken, the team will cease operations, the area will be mitigated/secured, and the excavation team will follow the directions of the Command Post. The MEC/RCWM Contingency Plan will be implemented.
Collect RCWM/HTW samples	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.
Segregate suspect items for further assessment by EOD	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.

Principal Steps	Potential Hazards	Controls
Segregate suspect items for further assessment by EOD (contd.)	Glass cuts	Personnel will wear leather work gloves.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).

Personal Protective Equipment Requirements:

Level B or Level C PPE initially (upgrade in accordance with this plan)

Hardhat (as required)

Face shield (as required)

Hearing Protection (as required)

Rubber gloves with leather outer gloves

Leather gloves (as required)

Equipment/Materials to be Used:

Vehicles: excavator

Hand tools

Shoring (as required)

Multiple Round Containers (MRCs)

Inspection Requirements:

PPE will be inspected in accordance with the manufacturer's instructions by workers daily prior to use. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. All safety guards designed on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be

placed out of service until it can be repaired/replaced. The SSHO will conduct a brief visual inspection of the ECS each day to confirm that controls remain as originally constructed. The SSHO will inspect or survey the excavation at least daily or right after any major changes in conditions (i.e., heavy rain, large amounts of soil removed). The SSHO will look for fissures and cracks in the walls and will ensure that engineering controls are still appropriate. During site set-up, any equipment generating noise will be monitored by the SSHO to assess whether hearing protection is required.

Training Requirements:

All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), enrolled in a medical monitoring program, and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additionally, site personnel will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP. Operators will be trained in the safe use of required equipment and in the required PPE. All persons performing UXO operations will be graduates of USAESCH-approved courses and be accepted by USAESCH Contracting. Before entering a permit-required confined space, all personnel will show proof of confined space training to the SSHO. All personnel operating heavy equipment will provide proof of competency with the equipment to the SSHO prior to operating the equipment. All personnel required to wear respiratory protection will be fit tested. All documentation will be maintained on site by the SSHO.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: DRUM/MRC HANDLING

Summary: Drums of soil or scrap will be transferred outside the ECS and will then be loaded for transport to the Federal Property. MRCs will also be transported to the Federal Property for assessment and subsequent storage at the Interim Holding Facility, pending appropriate disposition.

Principal Steps	Potential Hazards	Controls
General Drum/MRC Handling Activities	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Load/unload drums/MRC to/from transport vehicle	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the drum handling adapter swing radius and make sure they have the attention of the equipment operator and that the loader's drum adapter is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances.

Principal Steps	Potential Hazards	Controls
Transfer drums/MRC to Federal Property	Injury from vehicle and heavy equipment traffic in work area	A ground guide will be used when backing. All vehicles will have back up alarms. Posted speed limits will be observed.
Refueling transport vehicle(s)	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.

Personal Protective Equipment Requirements:

Level B PPE initially (upgrade in accordance with this plan) for personnel inside the ECS

Modified Level D PPE for personnel outside the ECS

Hardhat

Hearing protection (as required)

Safety glasses (as required)

Leather gloves

Equipment to be used:

Vehicles: drum transport vehicle with lift gate, mini-excavator/loader w/drum handling adapter

Drum dolly

Inspection Requirements:

All PPE will be inspected daily by workers prior to use. All drum handling equipment will be inspected daily prior to use or anytime equipment is reconfigured. If, during inspection or during use, equipment fails to function properly, equipment is to

be placed out of service until repaired or replaced. All safety guards designed on equipment will remain in place. If any safety device on equipment is missing, that piece will be placed out of service until repaired or replaced.

Training Requirements:

Operators will be trained in the safe use of required equipment and in the required PPE. All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), be enrolled in a medical monitoring program, and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). All personnel operating heavy equipment will provide proof of competency with the equipment to the SSHO prior to operating the equipment. Forklift operators must complete training in accordance with 29 CFR 1910.178. Additionally, site personnel will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: PERSONNEL DECONTAMINATION STATION OPERATION

Summary: Intrusive investigation personnel exiting the ECS will be processed through the Personnel Decontamination Station (PDS) to be decontaminated. Equipment used during the excavation will also be decontaminated. PDS personnel will also support rescue personnel, as required.

Principal Steps	Potential Hazards	Controls
General PDS Activities	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Daily PDS set-up (fill pans & connect hoses)	Exposure to bleach solution	All personnel will don the proper PPE commensurate with the potential chemical hazard. Workers will wear face shields if splash hazard exists.
Decontaminate personnel leaving ECS	Chemical Warfare Agents	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.

Principal Steps	Potential Hazards	Controls
Decontaminate personnel leaving ECS (contd.)	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site-specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.
Decontaminate items and equipment brought out of ECS	Chemical Warfare Agents	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.
	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site-specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.
Daily breakdown of PDS	Chemical Warfare Agents	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.
	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site-specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring of work zone where PDS personnel are working.

Personal Protective Equipment Requirements:

Level C PPE at minimum, during decontamination activities

Two-way radios

Face shield (as required)

Splash protection (as required)

Hearing Protection (as required)

Equipment/Materials to be Used:

Decontamination buckets

Brush

Bleach, dilute solution

Detergent/soap

Water

Inspection Requirements:

Equipment will be inspected by workers daily prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it can be repaired/replaced. The SSHO will ensure prior to daily operations that the PDS is ready for operations.

Training Requirements:

All PDS personnel will be trained in the safe use of required equipment and in the required PPE. All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), enrolled in a medical monitoring program, and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additionally,

site personnel will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP. All personnel required to wear respiratory protection will be fit tested. All documentation will be maintained on site by the SSHO.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: EMERGENCY RESCUE

Summary: In the event that one or more members of the intrusive investigation team are injured during activities within the ECS, personnel will enter the ECS to rescue the injured worker(s).

Principal Steps	Potential Hazards	Controls
General Emergency Rescue Activities	Chemical Warfare Agents	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air Monitoring will be performed IAW the SSHP.
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site-specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring will be performed IAW the SSHP.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Enter ECS	*See general hazards above*	*See general hazards above.*
Extract personnel & exit ECS	Biological hazards	SSHO will provide training regarding blood borne pathogens during site-specific training.

Principal Steps	Potential Hazards	Controls
Extract personnel & exit ECS (contd.)	Confined space entry	Confined space entry program will be implemented in concert with excavation and trenching procedures (i.e., if excavation and trenching procedures are implemented, the excavation will be considered to be a confined space). Periodic trench inspections will be performed by SSHO.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).

Personal Protective Equipment Requirements:

All levels of PPE: rescue personnel will upgrade to an equal or higher level of protection than the worker(s) requiring rescue

Equipment/Materials to be Used:

Rescue litter

Mechanical retrieval device or pre-positioned equipment suitable for lifting litter

Inspection Requirements:

All rescue equipment will be inspected by workers prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be replaced. All safety guards designed on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it can be repaired/replaced.

Training Requirements:

All rescue personnel will be trained in rescue procedures. Rescue teams will practice rescue operations before the start of initial operations. All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), enrolled in a medical monitoring program, and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additionally, site personnel will receive site-specific and hazard

communication training in accordance with Chapter 4 of the SSHP. Rescue personnel will be trained in UXO awareness during site-specific training. All personnel will provide proof of competency with the equipment to the SSHO prior to operating. Before entering a permit-required confined space, personnel will show proof of confined space training to the SSHO. All personnel required to wear respiratory protection will be fit tested. All documentation will be maintained on site by the SSHO.

Analyzed By: James Salisbury

Date: May 4 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: AIR MONITORING

Summary: Air monitoring for chemical agents and industrial chemicals will be performed by the Air Monitoring Team during investigations. Related activities include set-up and calibration of equipment, and operation during site activities.

Principal Steps	Potential Hazards	Controls
General Air Monitoring Activities	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Calibrate and set up monitoring equipment	Injury from pressurized cylinders	Pressurized cylinders will be inspected periodically by the air monitoring team. All cylinders will be secured and stored in accordance with the SSHP.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
Monitor EZ with MINICAMS	Injury from pressurized cylinders	Pressurized cylinders will be inspected periodically by the air monitoring team. Cylinders will be stored in accordance with the SSHP.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
Confirmation sampling with DAAMS	Chemical Warfare Agents	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring will be performed IAW SSHP.

Principal Steps	Potential Hazards	Controls
Confirmation sampling with DAAMS (contd.)	Contact with contaminated soil, air, liquid	All personnel will don the proper PPE in accordance with the PPE matrix. RCWM, UXO, and HTW training and safety awareness during site-specific training and refreshed during morning tailgate briefing. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Air monitoring will be performed IAW SSHP.
Break down monitoring equipment	Injury from pressurized cylinders	Pressurized cylinders will be inspected periodically by the air monitoring team. Cylinders will be stored in accordance with the SSHP.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).

Personal Protective Equipment Requirements:

Modified Level D PPE

Hearing protection (as required)

Equipment to be Used:

MINICAMS monitoring equipment (for chemical agent and industrial chemicals)

DAAMS tubes and portable sampling pumps

Electrochemical detector (for arsine)

PID (for VOCs)

Inspection Requirements:

All air monitoring equipment will be inspected and calibrated prior to use in accordance with SOPs and/or manufacturer's recommendations. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/replacement. Cylinders will be inspected daily by Air Monitoring Team to ensure proper placement and storage.

Training Requirements:

All on-site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), be enrolled in a medical monitoring program and have a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Additionally, site personnel will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: EXCAVATION BACKFILL

Summary: Once the intrusive investigation activities are completed, the excavation will be backfilled using clean soil.

Principal Steps	Potential Hazards	Controls
General Backfill Activities	Biological hazards	SSHO will walk site and identify potentially hazardous areas and these will be identified in the daily tailgate briefing. Site personnel will wear protective clothing to prevent exposure to biological hazards such as poison ivy. Personnel will exercise caution when moving obstacles, items, etc., that could be homes to snakes, spiders, or other animals or insects.
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.
Delivery and stockpiling of backfill material	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances.
Mechanical placement of backfill	Excavation and trenching	Shoring will be installed or benching/sloping implemented when excavation exceeds 4 feet, if workers are required to enter. All water will be pumped from the excavation prior to worker entrance. Excavation will be inspected by the SSHO prior to entrance by workers. Proper ingress and egress will be provided.

Principal Steps	Potential Hazards	Controls
Mechanical placement of backfill (contd.)	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances.
Mechanical compaction of backfill	Excavation and trenching	Shoring will be installed or benching/sloping implemented when excavation exceeds 4 feet, if workers are required to enter. All water will be pumped from the excavation prior to worker entrance. Excavation will be inspected by the SSHO prior to entrance by workers. Proper ingress and egress will be provided.
	Injury from vehicle and heavy equipment traffic in work area	Personnel will remain out of the bucket swing radius and make sure they have the attention of the equipment operator and that the excavator's bucket is lowered to the ground prior to approaching the equipment. A ground guide will be used when backing. All vehicles will have back up alarms. Equipment will be immediately grounded if unauthorized personnel enter the work zone. If there are overhead power lines in the vicinity of the work area, a ground guide will be used to ensure that equipment maintains proper safe distances.
	Injury from hand tool/power tool usage	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools/power tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.
Refueling equipment	Handling flammable liquid during fueling	Gasoline will be stored in approved flammable liquid containers. Fueling will be carried out in areas free of combustible debris/vegetation. Fueling will not be performed in back of a pick-up truck with a bed liner. All engines will be turned off prior to fueling. Containers will be bonded and grounded during transfer of flammable liquids.

Personal Protective Equipment Requirements:

Level D PPE

Hardhat (as required)

Hearing protection (as required)

Leather gloves (as required)

Equipment/Materials to be Used:

Vehicles: excavator, loader, compactor

Hand tools (i.e., shovels, rakes)

Inspection Requirements:

Workers will inspect PPE, equipment, hand and power tools daily prior to use in accordance with the manufacturer's instructions. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair/ replacement. All safety guards on equipment will remain in place. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it can be repaired/replaced. The SSHO will inspect or survey the excavation at least daily or right after changes in conditions (i.e., heavy rain, large amounts of soil removed). The SSHO will ensure that there is no water in the excavation and that there are no fissures and cracks in the walls, and will also ensure that engineering controls are still appropriate.

Training Requirements:

All on site personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). Operators will be trained in the safe use of required equipment. All personnel operating heavy equipment will provide proof of competency with the equipment to the SSHO prior to operating the equipment. All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: IHF ENTRY

Summary: When items are already stored within an IHF container, first entry monitoring will be conducted to confirm that it is safe to enter prior to personnel entering to store a MRC or perform other tasks.

Principal Steps	Potential Hazards	Controls
Set up and operate monitoring equipment	Chemical Warfare Agents, UXO, and other potentially hazardous laboratory chemicals	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Personnel will wear PPE commensurate with chemical hazard. When items are already stored within an IHF container, first entry air monitoring will be performed for chemical warfare agents and arsine, as appropriate..
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Electrical Hazards	No frayed electrical cords will be permitted on site. GFCI devices will be used on all outdoor circuits. Proper lock-out/tag-out procedures will be used when repairing or installing electrical equipment.
	Injury from pressurized cylinders	Pressurized cylinders will be inspected periodically by the air monitoring team. All cylinders will be secured and stored in accordance with the SSHP.
	Noise	SSHO will ensure that hearing protection is worn in hazardous noise areas (where shouting is required for face-to-face communication within three feet).
	Vehicle traffic in work area	Operation of vehicles will be conducted in accordance with the SSHP. Personnel will be briefed to remain alert when working around vehicles. Ground guide will be used for the backing of vehicles.

Principal Steps	Potential Hazards	Controls
Working in IHF	Chemical Warfare Agents, UXO, and other potentially hazardous laboratory chemicals	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Personnel will wear PPE commensurate with chemical hazard. When items are already stored within an IHF container, first entry air monitoring will be performed for chemical warfare agents and arsine, as appropriate..
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).
	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.

Personal Protective Equipment Requirements:

Modified Level D PPE initially (upgrade in accordance with this plan)

Equipment to be used:

MINICAMS monitoring equipment

DAAMS tubes

Electrochemical detector for arsine

Vehicles

Inspection Requirements:

All air monitoring equipment will be inspected prior to use by air monitoring team and calibrated, when required. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair or replacement. Cylinders will be inspected daily by SSHO and air monitoring team to ensure proper placement and storage. During site set-up, equipment-generating noise will be monitored by the SSHO to determine whether or not hearing protection is required.

Training Requirements:

Air monitoring personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

ACTIVITY: X-RAY/PINS ASSESSMENT

Summary: Once a suspect item has been packaged and transported to the Federal Property Storage Area, it may be assessed using X-Ray Analysis and/or Portable Isotopic Neutron Spectroscopy (PINS).

Principal Steps	Potential Hazards	Controls
Assessment of suspect CWM using X-Ray and PINS analysis	Chemical Warfare Agents, UXO, and other potentially hazardous laboratory chemicals	SSHO will include RCWM and UXO training and safety awareness training during site-specific health and safety training. This training will be refreshed during tailgate safety briefings. During site-specific health and safety training, workers will be briefed concerning their rights and responsibilities regarding hazard communication. Material safety data sheets for relevant chemicals will be kept available on site at all times. Personnel will wear PPE commensurate with chemical hazard. When items are already stored within an IHF container, first entry air monitoring will be performed for chemical warfare agents and arsine, as appropriate.
	Cold and Heat Stress Injuries	SSHO will implement heat stress/cold injury control program (when daily temperature is predicted to be greater than 80ºF or less than 40ºF). SSHO will monitor weather conditions and stress symptoms in workers.
	Electrical Hazards	No frayed electrical cords will be permitted on site. GFCI devices will be used on all outdoor circuits. Proper lock-out/tag-out procedures will be used when repairing or installing electrical equipment.
	Exposure to ionizing radiation	Workers will be briefed concerning potential radiation injuries. Area in front of X-ray and/or PINS equipment will be closed to personnel to avoid exposure to radiation.
	Injury from hand tool use	SSHO and Site Manager will ensure that all tools used on site are in proper working order and are in good condition. Use of hand tools will be monitored periodically by SSHO. Workers will inform supervisors if tools require repair or replacement and no damaged equipment will be used until repaired or replaced. Workers will ensure other personnel are clear of the swing arc of hand tools. Face shield, leather gloves, and/or chaps will be used as prescribed by the SSHO.
	Manual lifting	Workers will be trained in proper lifting techniques and the potential for injuries due to lifting, to be discussed during site-specific training. No bulky item or items assessed at over 50 lbs will be lifted without assistance or use of a lift assist device (e.g., handcart).

Principal Steps	Potential Hazards	Controls
Assessment of suspect CWM using X-Ray and PINS analysis (contd.)	Tripping Hazards	SSHO will ensure that workers are aware of potential slippery surfaces and tripping hazards. Personnel will inform site manager or SSHO of any observed potential slip, trip, or fall hazards.

Personal Protective Equipment Requirements:

Modified Level D PPE initially (upgrade in accordance with this plan)

Equipment to be used:

X-Ray equipment

PINS equipment

Common hand tools

Personal radiation dosimeter

Inspection Requirements:

All PPE will be inspected by workers prior to use. Equipment will be inspected prior to use by assessment team and calibrate when required. If during inspection or during use, equipment fails to function properly, equipment is to be turned in for repair or replacement. If any safety device on equipment is missing, that piece of equipment will be placed out of service until it can be repaired or replaced.

Training Requirements:

Personnel performing assessments will be trained and certified to perform PINS and X-Ray operations. Personnel will be current in OSHA training in accordance with 29 CFR 1910.120 (HAZWOPER), and be enrolled in a medical monitoring program with a current occupational physical with physician's certificate in accordance with 29 CFR 1910.120(f). All personnel on site will receive site-specific and hazard communication training in accordance with Chapter 4 of the SSHP.

Analyzed By: James Salisbury

Date: July 20, 2007

Approved By: Ed Grunwald, CIH
Project Safety and Health Manager

Date: July 20, 2007

APPENDIX E
SAMPLING AND ANALYSIS PLAN (SAP)

The SAP, Appendix E of the Site-Wide WP, outlines the anticipated sampling and analysis procedures for the project site, and contains a list of the required analytes and the associated sampling procedures. This appendix includes the standard operating procedures for the hydrogen cyanide monitor and confirmation detector tubes.

ATTACHMENT E-1
HYDROGEN CYANIDE MONITOR
STANDARD OPERATING PROCEDURE

ATTACHMENT E-1

HYDROGEN CYANIDE MONITOR
STANDARD OPERATING PROCEDURE

E-1.1 GUIDELINES

The guidelines for operational check, operation and maintenance of the hydrogen cyanide monitor are outlined below. Operational checks will be performed daily in accordance with the manufacturer's instructions. The manufacturer's operation manual should be consulted for detailed instructions concerning the operation of various makes and models of arsine detectors. The procedures below are based on operation of the Industrial Scientific T-82 monitor, but an equivalent monitor could also be used in which case the manufacturer's operating instructions should be consulted.

E-1.1.1 Functional Test (each morning)

1. To turn on the instrument, press and hold the function switch. The display will show ON and the instrument will beep once. After 1 second, all display segments and annunciators will light at which time the function switch may be released.
2. Wait for the instrument to complete the 5-second startup sequence.
3. Expose the instrument to a hydrogen cyanide concentration greater than the alarm set point (e.g., greater than 4.7 ppm).
4. If the alarm sounds, the instrument is operating properly.
5. If the alarm does not sound, recalibrate the instrument per manufacturer's instructions before use.

E-1.1.2 Operations

After the functional check is completed satisfactorily, place the sensor near the location to be monitored.

E-1.1.3 Preventive Maintenance

After daily use of the hydrogen cyanide monitor, the unit will be inspected and cleaned as necessary. The batteries will be replaced or recharged for use the next day. The monitor will be calibrated at least once a month, or whenever the instrument fails to operate properly during the functional test.

ATTACHMENT E-2
DRÄGER TUBES FOR HYDROGEN CYANIDE CONFIRMATION
STANDARD OPERATING PROCEDURE

ATTACHMENT E-2

DRÄGER TUBES FOR HYDROGEN CYANIDE CONFIRMATION STANDARD OPERATING PROCEDURE

E-2.1 GUIDELINES

The guidelines for the operation and maintenance of dräger tubes for hydrogen cyanide confirmation are outlined below. The hydrogen cyanide dräger tube measures arsine within the range of 2 to 30 ppm (parts per million).

E-2.1.1 Operations

1. The tips of the dräger tube are broken and the tube is inserted at the sampling port of the dräger bellows pump.
2. Air is drawn through the tube by dräger bellow pump (5 strokes drawing approximately 100 ml of ambient air total).
3. After 5 strokes of the pump (approximately 1 minute) the presence of hydrogen cyanide can be confirmed by the change in color of the chemical reagent present in the tube. The color changes from yellow orange color to red if arsine is present in the air.
4. The hydrogen cyanide dräger tubes are calibrated for reading the concentration of hydrogen cyanide by the length of color change in the tube. If a color change is seen, read the level or concentration of hydrogen cyanide up to the level of color change.

E-2.1.2 Preventive Maintenance

After use, the tubes should be removed and disposed safely. The dräger pump should be cleaned and properly stored. Dräger tubes are pre-calibrated for two years. The dräger tubes should be stored out of direct sunlight and at a temperature less than 25 °C (77 °F).

APPENDIX F
FORMS

This appendix is a place holder as all the information required is contained within the Site-Wide WP. Relevant forms and templates are provided in Appendix F of the Site-Wide WP.

APPENDIX G
MSD CALCULATIONS

This appendix is a place holder as all the information required is contained within the Site-Wide WP. The calculations used to derive the minimum separation distance (MSD) to be employed for project operations are included in Appendix G of the Site-Wide WP.

APPENDIX H
RÉSUMÉS

This appendix is a place holder as all the information required is contained within the Site-Wide WP. The résumés of key personnel not listed in the Unexploded Ordnance (UXO) database are included in Appendix H of the Site-Wide WP.

APPENDIX I
TECHNICAL PROJECT PLANNING (TPP)

The TPP process for the SVFUDS is implemented through the Spring Valley Partnering process. The Spring Valley Partners comprises stakeholders who meet monthly to discuss and plan the SVFUDS activities. This group predates the formal TPP process, therefore, Appendix I (TPP Planning Worksheets) is a placeholder only.

APPENDIX J
CWM AIR MONITORING/SOIL SCREENING PLAN AND CWM SAMPLE ANALYSIS PLAN

EDGEWOOD CHEMICAL BIOLOGICAL CENTER

CHEMICAL APPLICATIONS DIVISION

MONITORING BRANCH

CHEMICAL WARFARE MATERIEL (CWM)
AIR MONITORING PLAN
FOR
HIGHER PROBABILITY INVESTIGATION OF BURIAL PIT 3
4825 Glenbrook Road
Spring Valley, Washington D.C.

March 2007
Version 1

U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND

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1.0 INTRODUCTION

This document presents a monitoring plan for the U.S. Army Engineering and Support Center - Huntsville (USAESCH) remediation efforts at 4825 Glenbrook Road Spring Valley, Washington, D.C.

1.1 PURPOSE

The purpose of this plan is to illustrate the strategy used by USAESCH to monitor the airborne concentrations of chemical warfare materiel (CWM) during remediation operations at Burial Pit 3 at the 4825 Glenbrook Road site.

1.2 SCOPE

This plan establishes the policies, objectives, procedures, and responsibilities for the execution of a monitoring program for the investigation of Burial Pit 3 at the 4825 Glenbrook Road site. This plan describes the rationale for monitoring strategies for general area air monitoring and choice of monitoring equipment. This monitoring plan applies to all facilities and operations within the 4825 Glenbrook Road site involving air sampling and screening of soils containing suspected CWM.

1.3 OBJECTIVES

The objectives of this plan are:

A. To illustrate the monitoring method used for each RCWM operation performed at Burial Pit 3, 4825 Glenbrook Road.

B. To assure that workers and public safety and health are maintained by providing adequate environmental monitoring as specified in AR 385-61.

2.0 RESPONSIBILITIES

The U.S. Army Research, Development and Engineering Command (RDECOM) will:

Collect and retain all CWM-related air monitoring data generated during this project.

Provide guidance on monitoring operations conducted on-site.

Conduct on-site analysis and confirmation for air samples and headspace samples collected from soil, scrap, personal protective equipment (PPE), and bulk item samples. Aqueous and screened soil samples requiring low level CWM determination shall be sent to ECBC laboratory in Edgewood, MD for extraction and analysis.

Provide equipment and trained and certified personnel to operate MINICAMS and maintain certification data as part of the Monitoring Branch 40-year database.

Provide trained and certified personnel to set up, calibrate monitoring equipment, and collect

monitoring samples for work space and historical monitoring stations.

Perform air monitoring procedures as outlined in the Corps of Engineers Scope of Work, and consistent with RDECOM monitoring capabilities.

3.0 MONITORING.

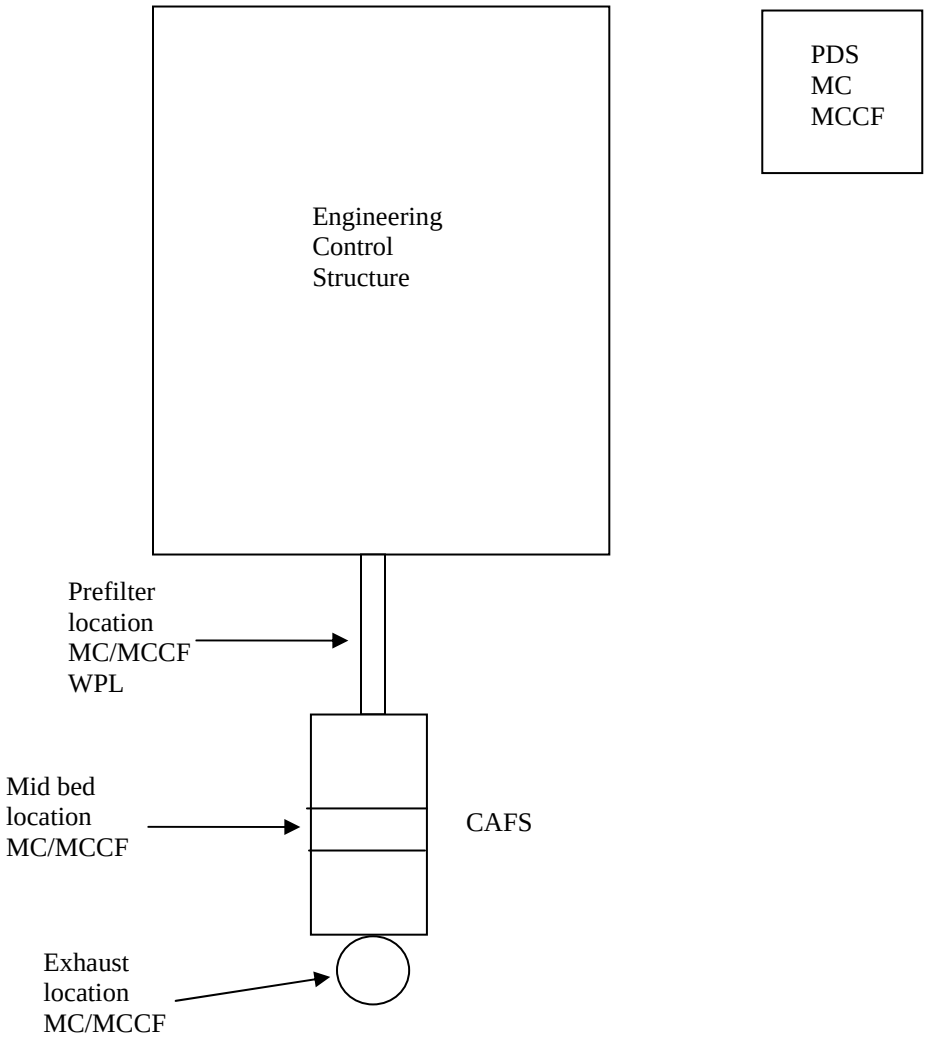
The intent of air monitoring is to indicate to workers when a hazardous atmosphere is present and to maintain a record of worker exposure to airborne CWM, thus ensuring the safety of the operators, the environment, and the surrounding communities. The choice of monitoring equipment is based on the type of monitoring to be performed and the types of agent involved. The location of monitors or sample ports is based on the operation, the airflow in the area, and the location of the source of agents. A general site layout of the sample locations during operations conducted under the engineering control structure (ECS) is detailed in Figure 1.

Table 1 Chemicals of Interest for 4825 Glenbrook Road

Chemical Name	Abbreviation	**CAS Number**	**Airborne Exposure Limit**	
			WPL (mg/m^3)	**STEL (mg/m^3)**
Bis(2-chloroethyl)sulfide	Mustard, H, HS, HD	505-60-2	0.0004	0.003
2-Chlorovinylarsonous dichloride	Lewisite, L	541-25-3	N/A	0.003
Carbonic dichloride	Phosgene, CG	75-44-5	N/A	0.40 [a] (0.1 ppm)
Cyanogen Chloride	CK	506-77-4	N/A	0.75 [a] (0.3 ppm)
Trichloronitromethane	Chloropicrin, (PS)	76-06-2	N/A	0.7 [a] (0.1 ppm)

[a] Permissible Exposure Limit (PEL)

Figure 1 – Monitoring Configuration for Intrusive Operations within the Engineering Control Structure



Key:
MC – MINICAMS
MCCF – DAAMS confirmation
WPL – DAAMS

3.1 TERMS, DEFINITIONS, AND MONITORING SYSTEM DESCRIPTIONS.

3.1.1 Airborne Exposure Limits (AELs).

An airborne exposure limit is a general term that describes the maximum allowable air concentrations for occupational and general population exposure to chemical warfare materiel. Airborne exposure limits (AELs) for chemical warfare agents are contained in AR 385-61. The U.S. Army has published revised AELs in the Implementation Guidance Policy for Revised Airborne Exposures Limits for GB, GA, GD, GF, VX, H, HD, and HT. The U.S. Army Chemical Materials Agency has published AELs for Lewisite and some industrial compounds in the Chemical Materials Agency Monitoring Concept Plan.

3.1.2 Worker Population Limit (WPL).

The WPL is the maximum allowable 8 hour time-weighted average concentration that an unmasked worker could be exposed to for an 8 hour workday, 40 hours per week, for 30 years without adverse effect. There is no health significance from a single or short-term exposure of this concentration. Low level monitoring using either a near real time monitor or an historical monitor is conducted if workers are unmasked. If CWM is detected above the WPL, ECBC will implement its WPL Excursion Plan. The Excursion Plan will ensure that corrective actions are taken to prevent continuous exposure above the WPL.

3.1.3 Short Term Exposure Limit (STEL).

The STEL is the maximum concentration to which unprotected chemical workers may be exposed for up to 15 minutes. Near real time monitoring is conducted at the STEL in areas where CWM may be present.

3.1.4 Immediately Dangerous to Life and Health (IDLH).

A condition posing an immediate threat to life or health regardless of PPE use, including situations where concentrations of contaminants (including military toxic chemical agents) require self-contained, full face piece, positive pressure supplied air respirators. This condition represents the maximum concentration from which, in the event of respirator failure, the wearer could escape without the respirator and without experiencing any escape impairing or irreversible health effects. For the purpose of the military toxic chemical agent program, IDLH includes atmospheres where oxygen content by volume is less than 19.5 percent.

3.1.5 3X (XXX).

XXX indicates that the item has been surfaced decontaminated by approved procedures, bagged or contained, and that appropriate tests or monitoring have verified that vapor concentrations above the STEL limits for the specific agent(s) do not exist. The ECBC Monitoring Branch utilizes a headspace procedure for determining XXX; see section 3.3.5 for the specific procedure. The term XXX does not apply to a decontaminated liquid, detoxified liquid, soil, or a gas. Some items may be released from Government control if appropriate monitoring is performed and all Federal, State and local provisions have been met.

3.1.6 Depot Area Air Monitoring System (DAAMS).

The DAAMS is a portable air-sampling unit, which is designed to draw a controlled volume of air through a glass tube filled with a solid sorbent collection material (for example Tenax TA). As the air is passed through the solid sorbent tube, agent is collected on the sorbent bed. After sampling for the predetermined period of time and at a predetermined flow rate, the tube is removed from the vacuum line. The tube is transferred to the Mobile Analytical Platform where it is analyzed (approximately one hour process time) or, if necessary to prevent work stoppages, sent to the ECBC Monitoring Branch laboratory. DAAMS monitoring is performed for one of two purposes. The purpose of DAAMS confirmation samples is to confirm or refute a near real time (MINICAMS) alarm. The purpose of historical DAAMS samples is to verify the absence of low level CWM in and around the site.

3.1.7 Work Space Monitoring.

Work space monitoring provides notification to personnel that there is a problem and that action must be taken. Monitoring devices or sample lines are placed in strategic locations in the work area where there is a potential for encountering agent vapors. The sample locations are determined based on such factors as the agent involved, the airflow patterns in the area, the operation(s) being performed, and the location of the source of the potential release. For ECS operations, the pre-filter monitoring location serves as work space monitoring.

3.1.8 Miniature Continuous Air Monitoring System (MINICAMS®).

A MINICAMS® is an automatic air monitoring system that collects compounds on a solid sorbent trap, thermally desorbs them into a capillary gas chromatography column for separation, and detects the compounds with a Halogen Specific Detector (XSD). It is a lightweight, transportable, low-level monitor designed to respond in less than ten minutes. The MINICAMS® is designed to provide a visual and audible alarm if agent vapors exceed the alarm set point. MINICAMS® can be configured to detect industrial compounds including phosgene, chloropicrin, and cyanogen chloride. These units are configured with a sample loop and XSD detector.

3.1.9 Mobile Analytical Platform (MAP).

The MAP is a self-contained mobile platform that can be moved from site to site. It contains all the equipment necessary to analyze and confirm samples taken with DAAMS tubes. Although it may also be configured with the capability to extract soil and surface water samples, these samples are most often cleared for shipment and analyzed at the ECBC fixed site laboratory. The MAP will function as the on-site laboratory to support the critical on-site chemical analysis and monitoring needs of this project.

3.1.10 Internal Operating Procedures (IOP).

Previously approved written monitoring and analysis procedures used by the RDECOM at remediation sites. ECBC IOP's will be located within the MAP vehicle and monitoring sheds.

3.1.11 Low-level Alarm.

A low-level alarm is a device used in conjunction with a low-level monitor or detector, which produces an audible sound and flashing light when the appropriate concentration (STEL) is detected.

3.1.12 Low-level Detection System.

Low-level detection systems are those detection devices or systems that can provide detection capability for concentrations at or below the established exposure limit for Chemical Warfare Material. Examples of low level detection systems are MINICAMS, DAAMS and the instrumentation used in the MAP.

3.1.13 QL.

A Quality Laboratory sample is a quality control sample that has been spiked with a solution of an analyzed dilute chemical agent in the laboratory but which has not been aspirated at a sampling site.

3.1.14 QP.

A Quality Process sample is a quality control sample that has been spiked with a solution of an analyzed dilute chemical agent and exposed to the sampling environment.

3.1.15 Flow Log.

The Flow Log is an ECBC, Monitoring Branch record of the flow measurements taken during the set up and operations of monitoring stations.

3.1.16 Scratch Log.

The Scratch Log is an ECBC, Monitoring Branch record that contains all pertinent sample information and is also used as a chain of custody document.

3.2 MONITORING CONCEPTS FOR 4825 GLENBROOK ROAD

3.2.1 Near-real-time Monitoring.

ECBC will conduct near real time monitoring for CWM and industrial compounds using MINICAMS during remediation operations. When an engineering control structure (ECS) with a chemical agent filtration system (CAFS) is utilized, the CAFS will provide vapor containment and be monitored to the STEL at the inlet, mid-bed, and exhaust locations. The CAFS will be monitored for H, L, CG, PS, and CK using MINICAMS. Industrial agent sampling at the mid-bed of the CAFS may be conducted with a single MINICAMS unit.

3.2.2 Confirmation Monitoring.

Confirmation monitoring for H/L will be performed using DAAMS. DAAMS samples will be collected concurrently at all H/L MINICAMS sample locations. DAAMS samples are not used

to immediately warn of hazardous conditions, but will be used to confirm the results of the real time monitors. Confirmation DAAMS samples are not quantified and are only analyzed if the corresponding near real time monitor alarms**.** DAAMS samples may be analyzed in the on-site mobile analytical platform (MAP), or if the analytical equipment is not operational, samples will be mailed via commercial courier to the ECBC Laboratory at APG.

DAAMS confirmation methods for the industrial compounds CG, PS, and CK are not effective and are therefore not employed. Confirmation of industrial compounds will be based on three consecutive MINICAMS alarms.

3.2.3 Historical Monitoring.

DAAMS samples are collected to provide historical evidence that agent concentrations in the area did not exceed published limits. Historical DAAMS samples are collected to document that no agent was released to the environment and/or that workers are not exposed to very low concentrations over long periods of time. Worker population limit (WPL) monitoring will be conducted based on local requirements and conditions. WPL monitoring is required when unmasked workers are in an area of potential exposure to CWM. WPL monitoring is performed using historical DAAMS samples. All WPL and historical DAAMS samples will be analyzed. MINICAMS may be used to meet WPL monitoring requirements for L.

3.2.4 First Entry Monitoring.

If an interim holding facility is present and in use, MINICAMS will be used to verify that chemical vapors of H, L, CG, PS, and CK are not present prior to entering the facility after a suspect item has been placed in storage.

3.2.5 Soil Sample Headspace Monitoring and Verification.

Prior to shipment to ECBC laboratory for low-level agent analysis, headspace monitoring of soil samples for H and L will be completed through the use of the “Soil Headspace Monitoring” procedure with (Section 3.3.4) MINICAMS and/or DAAMS.

3.2.6 Scrap/PPE/Bulk Item Headspace Monitoring.

The ECBC will conduct headspace monitoring, for the purpose of XXX determination, for recovered scrap and bulk items. The procedure is located in Section 3.3.5 using MINICAMS and DAAMS for the detection of H and L as required by site-specific requirements. Used personnel protective equipment (PPE) will be monitored to the WPL using DAAMS prior to being cleared for re-use.

3.2.7 Monitoring of Potentially Exposed Worker.

Workers that have been exposed or who have potentially been exposed to chemical agent will be monitored as outlined in Appendix A: Procedures for Near-Real-Time Monitoring of Agent-Contaminated Workers on Non-Stockpile Sites. Monitoring potentially exposed workers will take place in an isolated portion of the PDS. PDS personnel assigned to assist in doffing of PPE will use the distal end of the MINICAMS heated sample transfer line to sample subject personnel.

3.2.8 MINICAMS Alarm Conditions – the following terminology will be used when referring to MINICAMS alarm conditions:

i. MINICAMS Alarm – A single event when the MINICAMS result exceeds the alarm set point. The CP is notified by the MINICAMS operator. The operator reports the MINICAMS reading in STEL units.

ii. MINICAMS Ring off – Three consecutive alarms from a MINICAMS. DAAMS confirmation is required for all chemical agent ring offs (industrial agents are addressed below).

iii. Confirmed Ring off – If DAAMS results confirm a chemical agent MINICAMS ring off, the event is considered confirmed. For industrial agents (loop MINICAMS), three consecutive alarms is automatically considered a confirmed ring off.

3.3 MONITORING PROCEDURES/ANALYSIS.

3.3.1 Process Controls.

Upon receipt of the DAAMS sample tubes and signing of the proper chain-of-custody sheets, the DAAMS tubes will be desorbed on a thermal desorption unit and analyzed on a gas chromatograph (GC) with a mass selective detector (MSD) per IOP #MT-13, "Analysis of CWA and Degradation Products on DAAMS Tubes Using GCMS".

All MINICAMS will be operated in accordance with MINICAMS IOP # MT-16 "Operation and Maintenance Procedures for MINICAMS Mounted in a Mobile Vehicle" or in accordance with MINICAMS IOP # MT-2 "Operation and Maintenance Procedures for Fixed Site MINICAMS". A matrix of monitoring procedures is attached as Table 1.

During the project, ECBC will maintain control over all results and data generated from the analyses. All monitoring operations will be conducted in accordance with the ECBC Monitoring Branch's Quality Control Plan. All requested data generated during the project would be tabulated, formalized and turned over to the USAESCH after completion of the project. ECBC will incorporate the data generated into the Monitoring Branch 40 year data storage program, should access to additional information be required.

3.3.2 Near Real Time Monitoring

3.3.2.1 MINICAMS

3.3.2.1.1 Near real time air monitoring will be accomplished by using MINICAMS set to alarm at 0.4 times the STEL hazard level for H and L (0.003 mg/m^3). The MINICAMS system will provide warning of airborne exposure hazards at the work site. For reporting and confirmation purposes, the alarm level for HD is 0.7 STEL. (The MINICAMS software is only capable of setting one alarm level. Therefore, the alarm level is set to the lower of the two levels.

3.3.2.1.2 The MINICAMS consists of a monitor (sample collection, analysis, detection, and alarm equipment), vacuum pump, heated sample transfer lines, compressed gases, and computer.

In the sampling cycle, a vacuum pump draws air into the MINICAMS system through a heated sample transfer line. The transfer line is heated to prevent condensation of any CWM material on the walls of the transfer line. The current maximum length of the heated sample line shall not exceed 150 feet. The air sample is drawn through an automated gas chromatograph that first collects agent on a solid sorbent, or in a specific volume sample loop, and then thermally desorbs the agent into a separation column for analysis. A direct readout, in units of the hazard level, is provided. A permanent trace of the chromatogram is stored in the computer. If CWM is detected at the hazard level preprogrammed by the operator, the MINICAMS system alarm will activate and the workers will take immediate actions. The MINICAMS is considered a near real time monitor because it does not sample continuously, air sampling is stopped during the thermal-desorption step.

3.3.2.1.3 The MINICAMS unit shall be calibrated IAW the instructions given in the appropriate IOP. After the calibration has been completed, a challenge injection containing 1.00 STEL of the agent shall be made. If the MINICAMS response is between 0.75 and 1.25 STEL, the calibration is considered satisfactory.

3.3.2.1.4 Near Real Time Data Evaluation. The performance of the MINICAMS is monitored daily. Each day a QL challenge is made to the MINICAMS using standards of known concentration. Each standard is prepared to reflect the 1.00 STEL level for the agent being monitored. The area, peak height, retention time, peak width, injection volume, and the name of the technician are recorded on a log sheet.

3.3.2.1.5 Near Real Time Data Notification. The USAESCH Safety Officer at the Spring Valley Site shall be notified in the event of any MINICAMS alarm. The USAESCH Site Safety Officer shall be re-notified in the event of any subsequent or additional consecutive MINICAMS alarms.
The USAESCH Site Safety Officer's actions will depend on the number of MINICAMS alarms. Actions include, but are not limited to: await the result of the next MINICAMS cycle and evaluate current level of PPE, increase the level of PPE, determine possible location and/or source of contamination, attempt to locate and mitigated the source of contamination, evacuation of personnel inside the EZ, and actions to confirm MINICAMS alarms with DAAMS tubes. It is important to note that the final decision on the course of actions to be taken resides with the USAESCH Site Safety Officer.

3.3.2.1.6 Near Real Time Control Samples: Each day a QP challenge shall be injected at the end of the heated sample line of the MINICAMS using standard solutions of chemical agents at concentrations equaling 1.00 STEL.

3.3.2.1.7 Agent Challenge Log Sheet: All challenges of chemical agent monitors with agent will be recorded on an agent challenge log sheet.

Table 2
RDECOM Monitoring Matrix

	MINICAMS (CWA Monitoring)	MINICAMS (Industrial Chemicals)	DAAMS (Confirmation)	DAAMS (Historical)
Locations	CAFS inlet CAFS midbed CAFS exhaust PDS IHF - FEM	CAFS inlet CAFS midbed CAFS exhaust IHF - FEM	CAFS inlet CAFS midbed CAFS exhaust PDS (available) IHF (available)	CAFS inlet as required
Sampling Frequency	Continuously during intrusive operations	Continuously during intrusive operations	Confirmation – up to 12 hrs	Historical - up to 8 hours
Analysis Time	10 minutes	10 minutes	Approximately 30-60 minutes	Approximately 30-60 minutes
Number of People Required	2 MINICAMS Operators	2 MINICAMS Operators	1 Sample Technician 1 GC Operator	1 Sample Technician 1 GC Operator
Target Agents	Mustard (H) Lewisite (L)	Phosgene (CG) Chloropicrin (PS) Cyanogen chloride (CK)	Mustard (H) Lewisite (L)	Mustard (H) Lewisite (L)
Lowest Level Of Detection	H, L: 0.00075 mg/m^3 (0.25 STEL)	CG: 0.1 mg/m^3 (0.25 STEL) PS: 0.175 mg/m^3 (0.25 STEL) CK: 0.15 mg/m^3 (0.25 STEL)	H[1]: 0.00008 mg/m^3 L[1]: 0.00008 mg/m^3	H[1]: 0.00008 mg/m^3 L[1]: 0.00008 mg/m^3
Required USAESCH Site Safety Notification Level	H, L: 0.0012 mg/m^3 (0.4 STEL)	CG: 0.28 mg/m^3 (0.7 STEL) PS: 0.49 mg/m^3 (0.7 STEL) CK: 0.42 mg/m^3 (0.7 STEL)	H, L: Any Confirmed Detection	H, L: Any Confirmed Detection

1: Detection limit for the DAAMS tubes assumes a 24 liter sample is collected.

3.3.3 Confirmation/Historical Monitoring.

Historical/Confirmation monitoring utilizes DAAMS samplers located as near as operationally possible to the sampling point of the MINICAMS. The MINICAMS and DAAMS station will be collecting samples at the same time. Therefore, depending upon the time of a MINICAMS alarm the DAAMS sampling station may be used to confirm the alarm. Each pump collects a set of two DAAMS tubes and pumps are set to run for a maximum of twelve hours or a minimum of one hour. Flow rates for monitoring pumps are determined in accordance with sample collection internal operating procedures. Each DAAMS sampling station consists of a pump and two DAAMS tubes. The second tube is used as a back up and may be analyzed if there is a problem with the first tube or if further analysis is necessary to confirm agent identification.

3.3.3.1 Confirmation/Historical Data Notification: The USAESCH Safety Officer at the 4825 Glenbrook site will be notified of all confirmed detections of any monitored compound. This includes concentration levels below the STEL or WPL value.

3.3.3.2 Confirmation/Historical Air Sampling Records: Copies of all confirmation/historical air sampling results will be maintained. A copy of the results will be forwarded to the USAESCH, Project Health and Safety Manager for further disposition.

3.3.4 Soil Headspace Analysis Procedures.

3.3.4.1 Under normal conditions soil sample headspace analysis will be conducted using the MINICAMS. If DAAMS tubes are used in place of MINICAMS, start the following sequence at step 11. DAAMS tubes must be used to confirm all positive MINICAMS readings (i.e. readings above the alarm set point). This monitoring shall be used to screen soil samples for H and L contamination. Once agent has been confirmed in soil/debris from a location, confirmation of MINICAMS alarms may be discontinued with written approval from the USAESCH Safety Officer. Headspace Monitoring Procedures of soil samples using the MINICAMS and DAAMS are as follows:

1. Contractor delivers soil sample to monitoring personnel with proper chain of custody documentation.

2. Don protective gloves. Don protective mask when soil sample is collected by personnel wearing EPA/OSHA Level C PPE or above.

3. Place up to six samples in a heated sample box. Open bags and remove sample jar lids. Insert temperature probe into a selected soil sample. Close sample box lid and allow samples to equilibrate at 90° ± 10 degrees Fahrenheit for 15 minutes.

4. Insert MINICAMS probe into the heated sample box. Monitor headspace for two complete cycles on the MINICAMS.

a. If both MINICAMS results are below 0.25 STEL, go to step 13.

b. If either of the MINICAMS results is at or above 0.25 STEL reading, go to step 5.

5. Don Mask and Gloves.

6. Open sample box and replace lids on sample containers and close bags.

7. Allow sample box to re-equilibrate for 15 minutes.

8. Insert MINICAMS into heated sample box and monitor headspace. Once the MINICAMS result is below the alarm set point go to step 9.

9. Don mask and gloves, open lid of sample box. Samples will be monitored one at a time.

10. Open bag and remove lid from a single sample container. Insert temperature probe into soil sample. Close sample box lid and allow sample to equilibrate at 90° ± 10 degrees Fahrenheit for fifteen (15) minutes.

11. Insert MINICAMS probe into the heated sample box. Monitor the headspace for two complete cycles on the MINICAMS.

a. If the MINICAMS result is below 0.25 STEL, replace lid and close bag, go to step 9 for next sample container.

b. If the MINICAMS result is at or above 0.25 STEL, the sample must be confirmed with DAAMS tubes. Go to step 12.

12. Allow samples to re-equilibrate at 90° ± 10 degrees Fahrenheit for 15 minutes. Collect DAAMS tubes at 400 milliliters per minute for 60 minutes. Transport DAAMS tubes to the MAP for analysis by Dynatherm/GC/MS.

a. If agent is detected from the DAAMS tubes analysis, the USAESCH Site Safety Officer must be immediately notified.

b. If DAAMS analysis results in a non-detect for agent the go to step 13.

13. Give clear samples to the contractor for proper disposition.

3.3.4.2 Soil Headspace Data Notification: The USAESCH Site Safety Officer will be notified of all confirmed detections. This includes concentration levels below the STEL or WPL value.

3.3.4.3 Soil Resample Procedure: In the event that soil has been decontaminated, the soil can not be re-sampled using the headspace analysis procedure. Therefore, the ECBC shall request a sample of the decontaminated soil for extraction and subsequent analysis for H and L by GC/MS to confirm complete decontamination.

3.3.4.4 Soil Headspace Sampling Records. Copies of all soil headspace air sampling results will be maintained.

3.3.5 Scrap/PPE/Bulk Item Headspace Analysis Procedures.

3.3.5.1 A sample of scrap, discarded PPE, or a bulk item must be contained in an environment

heated to a minimum of 70°F for 4 hours prior to monitoring with the MINICAMS/DAAMS. The item may be monitored at temperatures of at least 50°F if the item is under full sunlight for 4 hours. However, the use of a heated box may be used to raise the temperature of the items in the case of inclement weather. PPE monitored for re-use must meet the above temperature/time requirements and be monitored to the WPL using DAAMS.

3.3.5.2 Once the item has been contained for 4 hours and meets the referenced temperatures, monitoring may proceed in accordance with the procedure, "Scrap/PPE/Bulk Headspace Analysis". Any items suspected of CWM contamination and all PPE that will be re-used must follow the procedures using the DAAMS tubes rather than screening with MINICAMS.

1. Contractor delivers scrap/PPE/bulk sample to monitoring personnel with proper chain of custody documentation.

2. Utilize heated sample box, if necessary, to achieve temperature requirements stated in Section 3.3.5.1.

3. Don protective gloves and safety glasses. Don protective mask when sample is collected by personnel wearing EPA/OSHA Level C PPE or above.

4. Insert MINICAMS probe directly into single sample bag or container. Monitor headspace for two complete cycles on the MINICAMS.

a. If the MINICAMS result is below a 0.25 STEL reading, go to step 6.

b. If the MINICAMS result is above the alarm set point or the result is at or above 0.25 STEL reading, go to step 5.

5. Allow samples to re-equilibrate at 70° ± 10 degrees Fahrenheit for 4 hours. Collect DAAMS tubes at 400 milliliters per minute for 60 minutes. Transport DAAMS tubes to for analysis by Dynatherm/GC/MS.

a. If DAAMS sample analysis indicates an agent detection, the SSO must be immediately notified.

b. If DAAMS analysis results in a non-detect for agent then go to step 6.

6. Give clear samples to the contractor for proper disposition.

3.3.5.4 Headspace Data Notification.

The USAESCH Site Safety Officer will be notified of all confirmed detections. This includes concentration levels below the STEL value.

3.3.5.5 Headspace Sampling Records.

Copies of all headspace air sampling results will be maintained.

3.3.6 First Entry Monitoring.

Prior to entry of personnel into the ECS, both filtration systems will be active and monitoring results (two MINICAMS cycles) will indicate that the atmosphere inside the ECS is below 1.00 STEL. Prior to entry into an Interim Holding Facility (IHF), first entry monitoring (FEM) will be conducted in accordance with the IHF Plan.

3.3.7 Monitoring of Unmasked Workers in the ECS

If unmasked workers are present in the ECS before daily operations or at the end of the operational day, WPL monitoring will be performed at the CAFS inlet using DAAMS. WPL DAAMS tubes may be aspirated outside of the ECS (in order to complete the required sample collection time) once unmasked workers have exited the ECS.

3.4 Historical Records. The ECBC Monitoring Branch shall maintain an electronic database for all samples collected, including DAAMS samples, a record of all MINICAMS analyses, and calibration and quality control data for all monitoring systems. Monitoring branch personnel shall be responsible for certifying that monitoring operations are conducted according to this plan. ECBC will prepare a final report in support of the 4825 Glenbrook site project and forward copies of all analytical results to the USAESCH Project Manager.

3.5 Quality Control. At **least one QP sample** shall be run daily for each DAAMS method performed. A QP sample for each method employed shall be run every 20 samples on the DAAMS system and a minimum of every four hours on the MINICAMS.

3.6 Monitoring Contingency. In the event of unforeseen circumstances, the Monitoring Branch will notify the Site Safety Officer to briefly halt operations in order to catch up in the analysis of field samples.

Appendix A

Procedures for Near-Real-Time Monitoring of Agent-Contaminated Workers on Non-Stockpile Sites

1. Purpose. This guidance provides monitoring procedures for workers that are contaminated or potentially contaminated with mustard (sulfur or nitrogen), Lewisite, or nerve agents.

2. Applicability. These procedures will be followed during activities where workers may potentially encounter chemical warfare agents on suspected non-stockpile Chemical Warfare Materiel (CWM) sites where Reference a applies. A waiver must be obtained if these procedures are not followed. All waivers shall be submitted to the USAESCH for approval.

3. References.

    a. Memorandum dated 1997, Subject: Interim Guidance on Biological Warfare Materiel (BWM) and Non-Stockpile Chemical Warfare Materiel (CWM) Response Activities.

    b. Memorandum dated June 10, 2003, Subject: Interim Guidance on Nerve and Mustard Agent Decontamination and Medical Services in Industrial Activities.

    c. Department of Army Pamphlet 50-6, Chemical Accident or Incident Response & Assistance Operations (CAIRA), dated 26 March 2003.

4. Definitions.

    a. Exposed worker. An individual working in an agent environment who exhibits clinical signs or symptoms of agent exposure.

    b. Potentially exposed worker. A potentially exposed worker is an individual who works in an agent environment where:

        i. Levels of chemical warfare agent exceed the protective capability of the personal protective equipment (PPE) or

        ii. Levels of chemical warfare agent are above the exposure limit and there is a breach in the PPE, or

        iii. There is an indeterminate casualty from an agent environment.

5. Discussion.

    a. Hospital Evaluation. Any exposed or potentially exposed worker working in mustard, Lewisite or nerve agent environment is required by Army Regulation to be sent immediately to the supporting medical facility for a medical evaluation. Therefore, any exposed or potentially exposed worker on a non-stockpile site shall be sent to the designated health clinic or hospital. These workers shall not return to duty on a non-stockpile site until medically cleared.

b. Monitoring. Army Regulation also requires, that prior to sending an exposed or potentially exposed worker to a medical facility, the worker must be decontaminated and monitored with a low-level monitor to ensure complete decontamination.

c. Traumatic Injury. At any time during the decontamination procedure, the site safety personnel in coordination with the on-site medical staff and the hospital may decide to transport the contaminated worker to the contract hospital. Lifesaving measures for traumatic injury have priority over immediate decontamination, provided that medical personnel remain protected against the chemical agent. If the medical personnel are not properly protected against the chemical agent, at a minimum,

i. The person shall go through decontamination, and

ii. The Site Safety Officer shall notify the medical personnel (ambulance and hospital) of the extent of decontamination of the potentially contaminated workers and whether low-level monitoring was conducted.

6. Monitoring Procedures.

a. *Action Level*. Workers who are exposed or potentially exposed to chemical agent shall be decontaminated to below 1.00 STEL before the worker is transported to the contracted hospital.

b. *Instrument.* The primary type of instrument for low-level monitoring of potentially contaminated personnel is a near real-time chemical agent monitor, the Miniature Chemical Agent Monitoring System (MINICAMS). Trained personnel shall maintain, calibrate, and operate the low level near real-time monitor. A dedicated MINICAMS will be used for this monitoring. It must be operational and stationed inside a monitoring vestibule prior to the start of intrusive operations on-site. Note: This MINICAMS may be used for other activities but only after intrusive operations have ceased.

c. *Monitoring Location*. The decontamination line shall include a monitoring chamber between the dirty side and the clean side. This chamber shall be large enough to contain a stretcher and one other worker. It shall contain a port and a stand for the MINICAMS probe. The monitoring chamber can remain open during non-emergency operations but shall be capable of being closed off when monitoring is required. Once closed, the chamber must maintain an ambient temperature of at least 65 degrees Fahrenheit.

d. *Monitoring Procedures*. Properly protected site personnel shall enter the chamber with the decontaminated worker. Upon notification of the start of the MINICAMS sampling cycle, the site personnel shall pass the MINICAMS probe slowly and deliberately within one to two inches of the contaminated worker's body. The probe shall be moved over all potentially contaminated areas of the worker's body. The MINICAMS operator must remain in constant communication to ensure the entire body is screened within one MINICAMS sampling cycle.

i. If the MINICAMS result is less than the alarm level, the casualty shall be moved to the ambulance.

ii. If the MINICAMS result is greater than or equal to the alarm level, the casualty shall be moved back into the dirty area of the decontamination line and be decontaminated again. The casualty shall be re-decontaminated as long as the medical situation permits.

iii. **Note**: Lifesaving measures for a traumatic injury have priority over immediate decontamination, provided that rescuers/medical personnel remain protected against chemical agent.

7. Training. This monitoring procedure should be included as part of the site-specific training conducted at non-stockpile CWM site.

EDGEWOOD CHEMICAL BIOLOGICAL CENTER

CHEMICAL APPLICATIONS DIVISION

MONITORING BRANCH

SAMPLE ANALYSIS PLAN
FOR
HIGHER PROBABILITY INVESTIGATION OF BURIAL PIT 3
4825 GLENBROOK ROAD
SPRING VALLEY
WASHINGTON, D.C.

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U.S. ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND

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1.0 INTRODUCTION.

This document presents a soil and aqueous sample analysis plan for the U.S. Army Corps of Engineers, Huntsville higher probability investigation at 4825 Glenbrook Road.

1.1 PURPOSE.

The purpose of this plan is to illustrate the strategy used by U. S. Army Edgewood Chemical Biological Center (ECBC) to analyze soil and aqueous samples for the presence of chemical warfare agents and specific breakdown products during operations at 4825 Glenbrook Road.

1.2 SCOPE.

This plan establishes the policies, objectives, procedures, and responsibilities for the execution of an analysis program for the higher probability investigation at 4825 Glenbrook Road. This monitoring plan applies to all facilities and operations within 4825 Glenbrook Road and at the ECBC laboratory in Edgewood, Maryland, involving analysis of samples suspected of containing chemical or biological warfare materiel.

1.3 OBJECTIVES.

The objectives of this plan are:

A. To illustrate the methods used for each analysis of soil and aqueous samples performed within the on-site mobile analytical platform or at the ECBC laboratory in Edgewood, Maryland.

B. To assure that workers and public safety and health are maintained by providing adequate environmental monitoring as specified in AR 385-61.

2.0 RESPONSIBILITIES.

The U.S. Army Research, Development and Engineering Command (RDECOM) will:

- Collect and retain all ECBC analytical data generated during this project.
- Provide guidance on monitoring operations conducted on-site.
- Conduct analysis of soil samples for biological and chemical warfare agents and specific breakdown products as listed in Section 3.0.
- Provide equipment capable of completing analyses utilizing the ECBC laboratory in Edgewood, Maryland.
- Provide trained and certified personnel to operate the laboratory and maintain

certification data as part of the Monitoring Branch 40-year database.

- Provide trained and certified personnel to set-up and calibrate equipment, and analyze soil and aqueous samples for chemical and biological warfare agents and specific breakdown products.

- Perform sample analysis procedures as outlined in the Corps of Engineers Scope of Work, and consistent with RDECOM capabilities.

3.0 SOIL AND AQUEOUS SAMPLE MONITORING.

3.0.1 The intent of this monitoring is to properly profile the waste characteristics of the excavated soil and aqueous samples to ensure appropriate off-site disposal. The monitoring will provide information documenting the cleanup effort by indicating low-level CWM contamination areas. The results will also ensure that soils and aqueous samples may be safely shipped to off-site contractors for further HTW analyses. Soil samples may be analyzed for the presence of the following compounds based on site requirements and request:

Table 1: List of Chemicals of Interest for 4825 Glenbrook Road

Chemical Name	Abbreviation	Chemical Abstract Number (CAS)
Bis(2-chloroethyl)sulfide	Mustard, H	505-60-2
Dichloro(2-chlorovinyl)arsine	Lewisite, L	541-25-3
2-chlorovinyl arsenous acid	CVAA	85090-33-1
2-chlorovinyl arsenous oxide	CVAO	3088-37-7
1,4-dithiane		505-29-3
1,4-oxathiane	1,4-thioxane	15980-15-1
Thiodiglycol	TDG	540-63-6
Ricin	not applicable	not applicable

3.0.2 Samples with detection of 1,4-dithiane or 1,4-thioxane greater than the reporting limit, but negative for HD, will be extracted and analyzed for thiodiglycol (TDG). The analysis method for L also detects the breakdown products 2-chlorovinyl arsenous acid (CVAA) and 2-chlorovinyl arsenous oxide (CVAO). Data reported for L could be any of or a combination of these three compounds. Soil samples will be extracted and analyzed at ECBC (Edgewood, Maryland), after on-site headspace clearance and shipment by commercial carrier.

3.0.3 Ricin analysis is performed using an electrochemiluminescent (ECL) immunoassay that is specific for the A-chain subunit of the ricin glycoprotein. The assay is obtained from the Critical Reagent Program (Edgewood, Maryland) and is performed on a BioVeris M8 Analyzer. The assay is sensitive to approximately 1 ng of material in a pristine sample. Solid samples are combined with clean buffer and the supernatant is analyzed for ricin. Liquid samples are diluted into clean buffer prior to analysis. Samples that are unable to be processed with the M8 platform will be analyzed with hand held immunoassays if possible.

3.1 ANALYTES OF CONCERN

The following table contains the analytes of concern for the CWM analyses and also the specific breakdown products.

Table 2: Soil and Aqueous Sample Analytes of Concern

Analyte	Method of Analysis	Reporting Limit Soil Matrix (µg/kg)	Reporting Limit Aqueous Matrix (µg/L)
H	1	10	10
L, CVAA, CVAOA	1	100	100
1,4-Dithiane	1	100	100
1,4-Thioxane	1	100	100
Thiodiglycol	2	5000	5000

1: "Application of Gas Chromatography/Mass Spectroscopy (GC/MS) for the Detection of Military Agents Mustard and Lewisite, Nerve Agent Breakdown Products DIMP and DMMP, and Mustard Breakdown products 1,4-Dithiane and 1,4-Thioxane in Water and Soil" "Analysis of Chemical Warfare Agents in Extracts using a Gas Chromatograph/Mass Spectrometer System"
2: "Analysis of Chemical Warfare Agent Breakdown Products by High Performance Liquid Chromatography (HPLC)".

3.2 QUALITY CONTROL

3.2.1 The mass spectrometer instrument utilized for the analysis of the soil and water will be calibrated and challenged in accordance with the EML Laboratory and Monitoring Quality Control Plan (Revision 0, December 2004). Table 3 contains the quality control requirements for these analyses. The current laboratory limits have been established based on laboratory historical data and are in Table 4.

Table 3. Quality Control Requirements

QC Sample	Frequency	Acceptance Limits	Corrective Action
Method Blank: DI water for liquid samples Clean solid (e.g., clean sand) for solid samples	1 per batch of 20 or fewer samples	Target analytes less than reporting limit.	Reanalyze all samples associated with unacceptable blank.
Laboratory Control Spike/ Laboratory Control Spike Duplicate (LCS/LCSD)	1 per batch of 20 or fewer samples	Recovery within current laboratory control limits. Limits updated annually at a minimum.	Verify calculations. Reinject sample to verify validity of analysis. If still non-compliant, re-extract the entire batch.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	Conducted with specified samples or batch samples.	No limits applied. Not used to control laboratory operations.	Verify calculations. Correct if needed. If calculations are correct, note in narrative.
Surrogate	Spiked into every field sample and laboratory QC sample	Recovery within current laboratory control limits.	Verify calculations. Reinject sample to verify the validity of analysis. If still non-compliant, re-extract the sample with MB, LCS, and LCSD.

Table 4. Current Laboratory Control Limits (applicable to analyses conducted 11/1/06 to 10/31/07)

	Soil				Water			
	LCS/LCSD		MS/MSD*		LCS/LCSD		MS/MSD*	
Spiking Compound	**%R**	**RPD**	**%R**	**RPD**	**%R**	**RPD**	**%R**	**RPD**
Sulfur mustard (H)	71-139	21	62-150*	31*	63-143	25	55-150*	27*
Lewisite (L,CVAA, CVAO)	36-158	26	10-179*	31*	23-157	23	0-169*	43*
1,4-Dithiane	75-129	20	64-139*	31*	72-134	26	55-149*	29*
1,4-Thioxane	74-133	20	66-138*	25*	69-133	22	56-143*	23*
Thiodiglycol (TDG) by HPLC	50-130^{+}	30^{+}	50-130*	30*	50-130^{+}	30^{+}	50-130*	30*

*Advisory limits only.

+ Tentative limits based on fewer than 20 data points. To be updated as more points are generated.

3.2.2 A set of MS/MSD samples must be extracted and analyzed in every analytical batch. ECBC will use the specified sample if listed on the COC. If there were no samples requested for MS/MSD analyses on the COC, ECBC will use a batch sample for the MS/MSD analyses.

3.2.3 The instrument is calibrated by analyzing multiple concentrations using the parameters described in the specific methods. The calibration is accepted if the correlation coefficient (r^2) is greater than or equal to 0.99. A method blank and LCS/LCSD are analyzed with every batch.

3.2.4 Calibration verification samples are standards that are analyzed, at a minimum, at the beginning and end of an injection batch, although more frequent verification analyses are encouraged.. These standards reveal to the analyst whether the calibration of the instrument continues to be in control. The control limits are ±25%D for L and ±20%D for all other target compounds. If the calibration check sample is greater than these limits, analysis must stop, however previous samples may be reported according to the Appendix II of the Environmental Monitoring Laboratory IOP Number MT-8, June 2006, Revision 4.

3.3 DATA REPORTING

The ECBC shall report the results of each soil and water analytical batch on an Analytical Report that will document the following information; (1) Date of analyses, (2) Location of analyses, (3) Analyst name, (4) Field sample identification number, located on the chain-of-custody received, (5) Results for each analysis, including units and (6) Results of quality control samples. Additional data reporting shall be provided including the information contained in ECBC IOP MT-08.

3.4 HISTORICAL RECORDS

Monitoring branch technicians shall maintain the electronic database for all soil and aqueous samples extracted and analyzed. Monitoring branch personnel shall be responsible for certifying that operations are conducted according to this plan or the site-specific QC plan. ECBC will prepare a final report, if requested, in support of the remediation efforts at 4825 Glenbrook Road and forward copies of all analytical results to the USACE - Huntsville Project Manager.

APPENDIX K
PRODUCT MANAGER FOR NON-STOCKPILE CHEMICAL MATERIEL (PMNSCM) PLANS

This appendix is a place holder as all the information required is contained within the Site-Wide WP. The plans for the storage and transportation of RCWM are in Appendix K of the Site-Wide WP.

APPENDIX L
MEC TRANSPORTATION PLAN

This appendix is a place holder as all the information required is contained within the Site-Wide WP. A description of the procedures used to transport MEC items not transported as potential RCWM is contained in Appendix L of the Site-Wide WP.

APPENDIX M
ENGINEERING CONTROL STRUCTURE PLAN

ENGINEERING CONTROL STRUCTURE

FOR THE
INVESTIGATION OF BURIAL PIT 3
4825 GLENBROOK ROAD
SPRING VALLEY FORMERLY USED DEFENSE SITE
SPRING VALLEY, WASHINGTON, D.C.

Prepared for:

U.S. Army Engineering and Support Center, Huntsville

and

Baltimore District
U.S. Army Corps of Engineers

Prepared by:

PARSONS
10521 Rosehaven Street, Suite 200
Fairfax, Virginia

July 2007

The views, opinions, and/or findings contained in this document are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentations.

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APPENDIX M
ENGINEERING CONTROL DESIGN AND SPECIFICATION INFORMATION

1.1 INTRODUCTION

1.1.0.1 The Modular Aluminum Containment Structure (MACS) is a type of engineering control structure (ECS) that can be constructed in a variety of shapes and sizes using standardized metal shoring panels, which are then reinforced with additional metal sheeting for blast and fragment containment. As such, it can be adapted to suit a large range of site space and topographical constraints.

1.1.0.2 Previous configurations of the MACS have been approved by Department of Defense Explosives Safety Board (DDESB) for containment of the munition with the greatest fragmentation distance (MGFD) at the Spring Valley Formerly Used Defense Site (SVFUDS), which is a 75mm Mk II chemical projectile with an explosive burster. The MACS will control the MGFD by containing the fragments and withstanding the overpressure resulting from the detonation of the MGFD. The MACS has also been approved for the containment of an evaporative release of chemical agent (when combined with a chemical agent filtration system [CAFS]). These previously-approved configurations have been successfully used at SVFUDS and other sites.

1.1.0.3 The previous configurations of the MACS have not been approved for containment of an agent release resulting from the detonation of a chemical munition, as it is uncertain that the MACS could contain the detonation of the munition and still maintain integrity to control the simultaneous release of agent. In the Engineering Control Evaluation for 4825 Glenbrook Road, Washington, D.C., prepared by Parsons for the US Army Corps of Engineers (USACE) (USACE December 2006), hereafter referred to as the "ECS Evaluation," Parsons recommended the MACS will be combined with a Vapor Containment Cover (VCC) to contain such an agent release. Detailed analysis and design parameters for the proposed structure and the VCC are found within the ECS Evaluation.

1.1.0.4 The VCC will be constructed of polyurethane coated nylon or poly vinyl chloride (PVC) coated polyester cover and will cover the MACS to provide vapor containment. The VCC will be designed with enough fabric to expand and capture any vapors or air that would escape the MACS and will be anchored at the bottom with wood or metal framing materials, sandbags, or other suitable methods.

1.1.0.5 The MACS will be connected to a CAFS that will maintain negative pressure within the MACS and VCC and all higher probability intrusive operations will be carried out within the footprint of the MACS. As described above, the MACS will contain the fragmentation and overpressure hazards associated with a detonation of the MGFD, while the VCC surrounding it

will contain agent vapors resulting from the maximum credible event (MCE) that might escape the MACS. The integrity of the VCC will be protected from fragment and overpressure damage by the MACS as described in the ECS Evaluation.

1.1.0.6 The preferred configuration that considers site limitations and use of mechanical equipment is a 16-foot by 50-foot rectangular box, 8 feet to 20 feet high. The following figures are graphically placed on a perspective generated by the BLASTFX code to illustrate the terrain features and interaction with the MACS:

- Figure 1-1 is a view of the terrain showing the slope and relation to the MACS structure
- Figure 1-2 is a top-down view of the MACS showing its location and relation to the house
- Figure 1-3 is a view from the eastern side of the property showing the MACS and its relation to the house and other site features.
- Figure 1-4 is a view from the northwest corner of the property from above, showing the MACS structure and its relation to the House and site terrain.
- Figure 1-5 is a wire frame representation of the MACS and house.

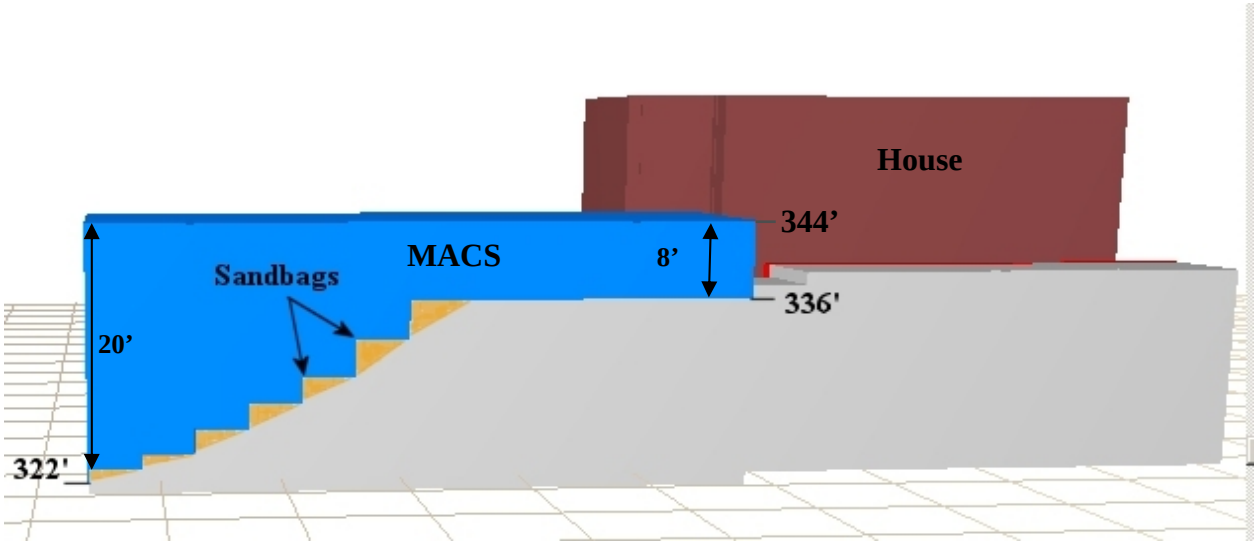

Figure 1-1: View of the terrain showing the slope and relation to the MACS structure

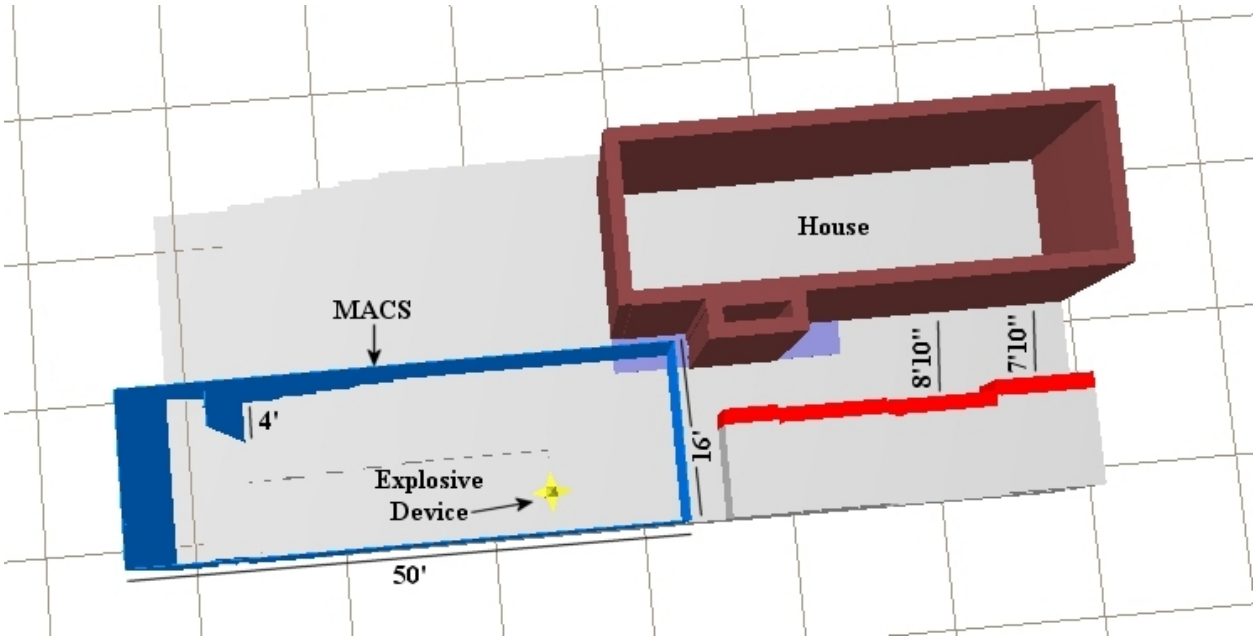

Figure 1-2: Top-down View of the MACS Structure showing its Locations and Relation to the House

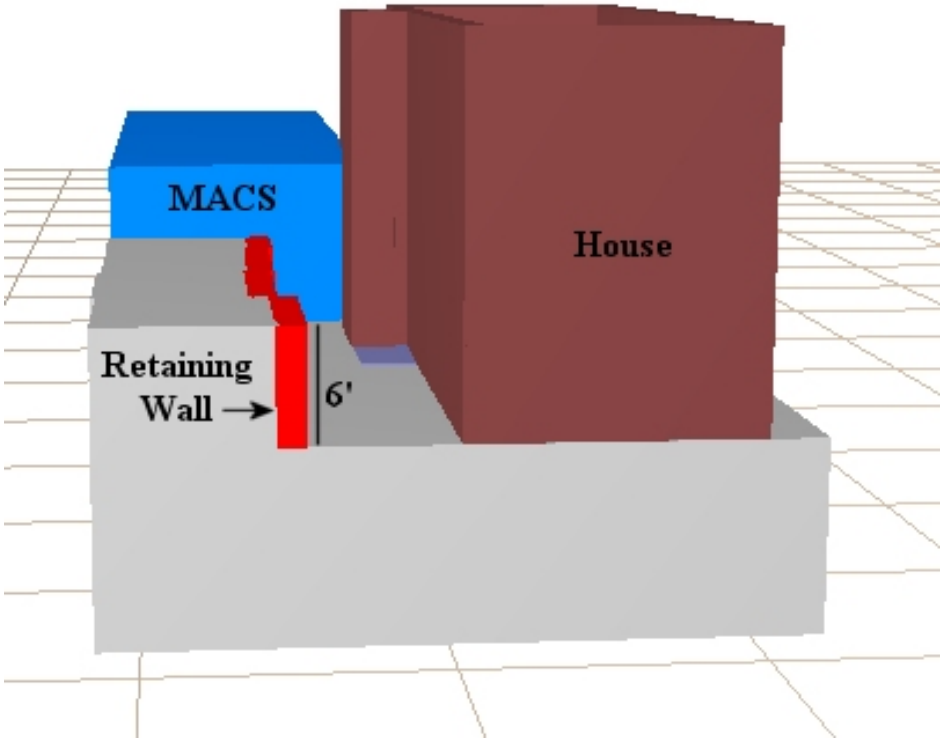

Figure 1-3: View from the eastern side of the property showing the MACS structure and its Relation to the House and other site features

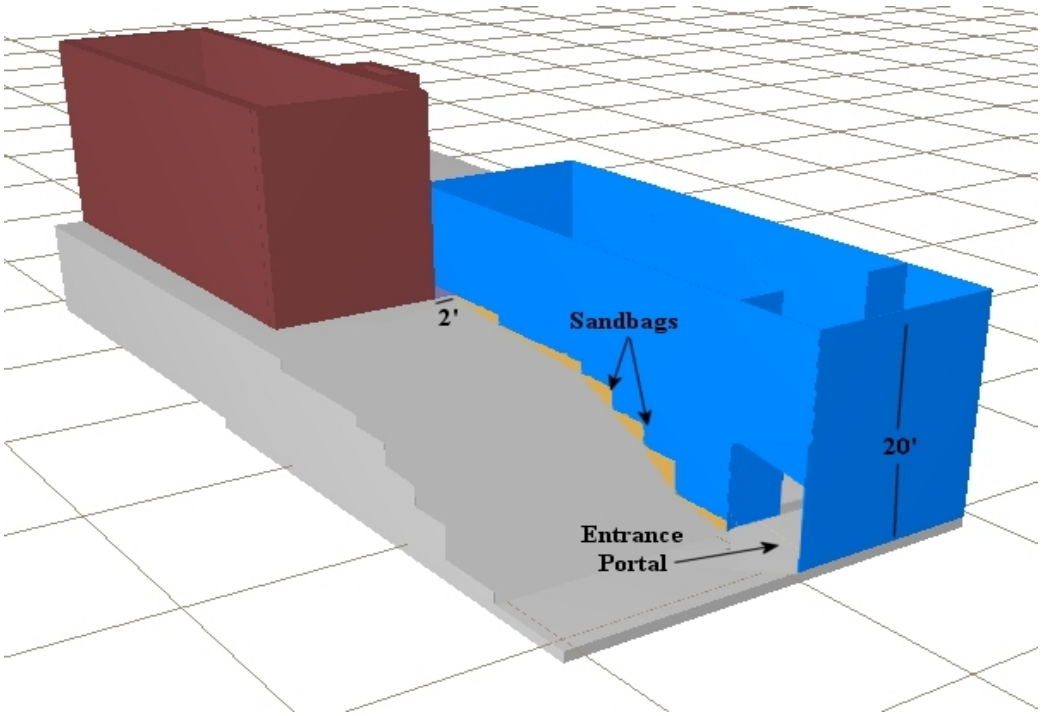

Figure 1-4: View from the northwest corner of the property from above showing the MACS structure and its relation to the house and other site features

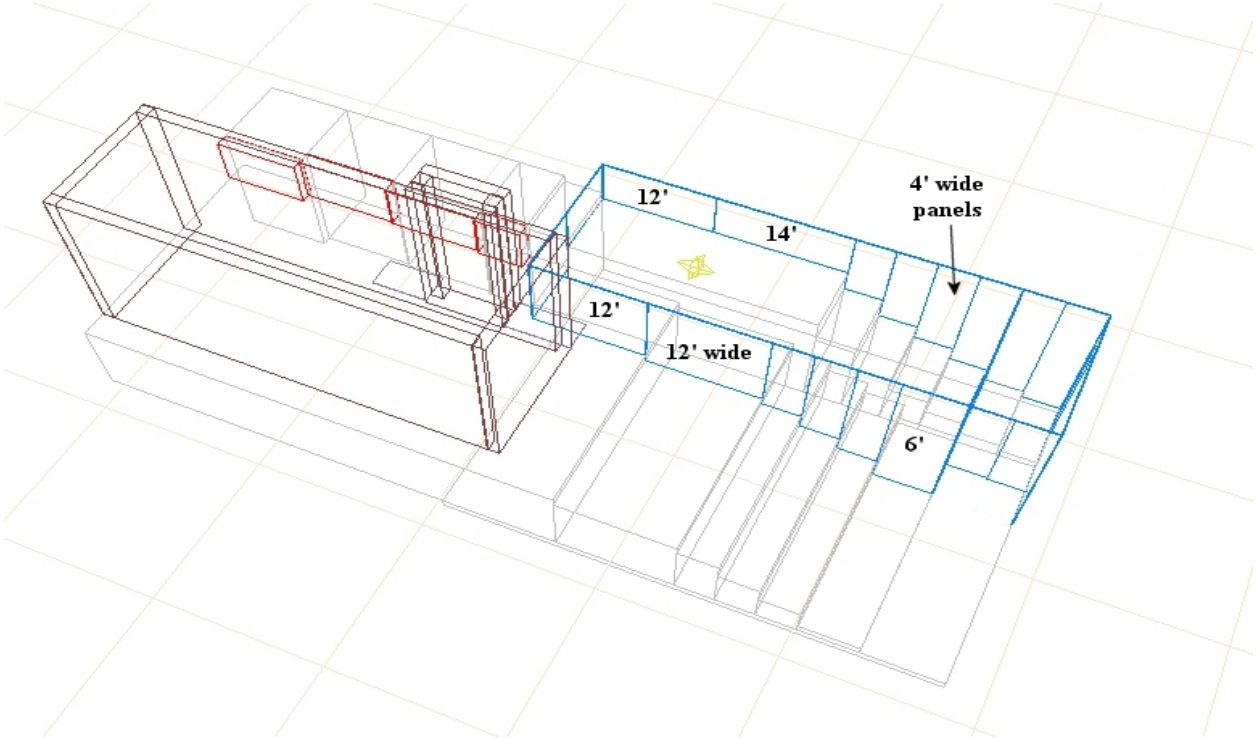

Figure 1-5: Wire frame structure of the MACS and house showing (Typical)

1.1.0.7 Attachment 1 contains the approval documentation for this configuration of the MACS and VCC to be used at the SVFUDS.

1.2 MACS AND VCC SETUP

1.2.1 Site Preparation

1.2.1.1 Significant ground surface improvements are required prior to installing the MACS. The area will be cleared and grubbed of existing vegetation down to the soil surface, some overhead tree limbs will be removed, and approximately 5 feet of soil previously backfilled on the south-east side of the site will be excavated. The approximate level of the graded soil will be 332 feet. The ground will be surveyed and prepared to fit the profile of the side of the MACS.

1.2.2 Construction of the MACS

1.2.2.1 End members have been custom cut, so it is important to use the correct lengths on the designated columns. A crane will be on site to assist with construction as most of the elements of the MACS will be too heavy to lift by hand, particularly given the height of the structure. Extended steel pins will be used to connect the top end members as they will also need to penetrate the 5/16-inch aluminum plates on the sides. Elevations will be verified when placing the metal shoring panels. As necessary, sandbags will be used to elevate portions of the metal shoring panels to provide level surfaces and minor hand grading will be performed to set panels to specified heights. The existing fill material will be used in sandbags.

1.2.3 Installation of Aluminum Plates

1.2.3.1 The MACS will be covered with a layer of 5/16-inch aluminum plates, Grade 6061, to complete the blast protection. Plates on the roof will lie directly on the metal shoring panels with approximately two-inches of overlap. Side plates will hang from the top end member using existing steel pins and hanging plates will not exceed 10 feet in length. For walls higher than 10 feet, additional plates will be placed on the ground and tucked behind hanging plates; approximately two (2) feet of overlap will occur at these points. The entire structure will be held in place with rope, ratchet straps, or cables in a binding manner to prevent movement in the case of wind gusts or other movement of the MACS.

1.2.4 Placement of Vapor Containment Cover

1.2.4.1 The VCC will be constructed in place utilizing the MACS as the support structure for the cover. A crane will be required to lift the VCC above the MACS. Pieces of the VCC will be lifted into place and assembled along the seams in accordance with the manufacturer's specifications.

1.2.4.2 The VCC will have one access opening for personnel and vehicles on the north side of the structure with dual zipper closures. The VCC will also have one opening on the east side of the structure to accommodate air transfer equipment (CAFS and air conditioner ducts). The top fabric panel will extend over each side by 1 foot and the side fabric panels will extend over the ground an additional 3 feet. It is important to leave the excess material slack to allow the material to react to explosions as designed. The outer edges of the VCC will be secured with tent stakes and sand bags to maintain the integrity of the containment around the MACS.

1.2.5 Equipment, Personnel, and Material Requirements

1.2.5.1 The equipment, personnel, and material required for the construction of the MACS and VCC are provided in Table 2.1.

Table 1.1 - Equipment, Personnel, and Material Requirements

Requirement	Site Preparation	MACS	Aluminum Plates	VCC
Equipment	Bucket Loader, Dump Truck, Hand Tools (shovels and rakes)	Crane, Flat Bed or Bump Truck, Fork Lift, Hand Tools (shovels and rakes)	Crane, Flat Bed or Dump Truck, Fork Lift, Drills and Bits for Aluminum, Hand Tools (shovels and rakes)	Crane, Flat Bed or Dump Truck, Hand Tools (shovels and rakes)
Personnel	Loader and Truck Operators, Surveyors, Light Construction Workers	Crane and Truck Operators, Surveyors, Light Construction Workers	Crane and Truck Operators, Light Construction Workers	Crane and Truck Operators, Light Construction Workers
Material	n/a	Sandbags (200 ea), Additional Sand	Extra long steel pins for MACS top end members, Binding Material, Sandbags, Sand	Tent Stakes, Sandbags, Sand

1.2.6 CAFS

1.2.6.1 The MACS will be maintained under negative pressure using a CAFS that has been sized specifically to remove and filter chemical agent vapors from the ECS. The CAFS will be continually monitored for chemical agents using a Miniature Continuous Air Monitoring System.

1.2.6.2 The CAFS filter assembly comprises:

- Pre-filters
- HEPA filter to remove particulates
- Two charcoal filter beds in series, and
- Exhaust stack.

1.2.6.3 The combination of the selected ECS and CAFS meet the design requirements specified in DA Pam 385-61 for potentially encountering mustard agent or lewisite. These design requirements include:

- The overall structure must maintain negative pressure.
- Airflow must not exceed chemical agent filter design

1.2.6.4 Edgewood Chemical Biological Center will install the CAFS for this project and conduct air monitoring for chemical agents in accordance with the Air Monitoring and Sampling Plan.

ATTACHMENT 1
DDESB APPROVALS

The approval letter will be included in the final document upon receipt of the approval

DEPARTMENT OF THE ARMY
US ARMY DEFENSE AMMUNITION CENTER
1 C TREE ROAD
MCALESTER OK 74501-9053

REPLY TO
ATTENTION OF

SJMAC-ESM

10 JAN 2007

MEMORANDUM FOR Department of Defense Explosives Safety Board-, (DDESB-PE), 2461 Eisenhower Avenue, Alexandria, VA 22331-0600

SUBJECT: Engineering Controls Evaluation for 4825 Glenbrook Road, Spring Valley, Formerly Used Defense Site (FUDS), Washington, DC, Modular Aluminum Containment Structure (MACS) Engineering Controls, 10 November 2006, Revised Configuration

1. References:

a. AR 385-64, US Army Explosives Safety Program.

b. AR 385-61, The Army Chemical Agent Safety Program.

c. DOD 6055.9-STD, DOD Explosives Safety Standards.

2. This submission is to merge the blast mitigation of the MACS with a vapor containment cover (VCC). This is being done because of the close proximity to private residences near the excavation site.

3. The following supplemental information is provided to assist with your review:

a. This will allow removal of Munitions and Explosives of Concern (MEC) and Recovered Chemical Warfare Materiel (RCWM) or other American University Experimental Station (AUES) related items that remain in Test Pit 23.

b. The north end of Test Pit 23 is located at the southwest corner of the house at 4825 Glenbrook Road. The south end of Test Pit 23 is located on the property at 4801 Glenbrook Road, the South Korean Ambassador's residence. Both properties were part of AUES testing grounds for chemical weapons during World War I.

c. The maximum credible event (MCE) for this operation is the explosive release of a 75 mm MkII chemical round containing mustard agent.

d. Both the MACS and the VCC have been approved and used at other locations. Approval of this site plan will allow the MACS to be placed under a VCC. The MACS would mitigate hazards from the munition with the greatest fragmentation distance (MGFD) (75 mm MkII) while the VCC would provide containment of the MCE.

e. The combination of the VCC with the MACS provides the advantage of not requiring evacuation of residences and having the flexibility to meet site space constraints.

SJMAC-ESM
SUBJECT: Engineering Controls Evaluation for 4825 Glenbrook Road, Spring Valley, Formerly Used Defense Site (FUDS), Washington, DC, Modular Aluminum Containment Structure (MACS) Engineering Controls, 10 November 2006, Revised Configuration

4. This submission has been reviewed against the criteria of DOD 6055.9-STD as implemented by AR 385-61 and AR 385-64. Based on the information provided, this submission is granted Army approval and provided for your review with our recommendation for approval.

5. Point of contact is Dr. Jimmy Langley, SJMAC-ESM, DSN 956-8767, (918) 420-8767, facsimile DSN 956-8503, (918) 420-8503, or Jimmy.L.Langley@us.army.mil.

FOR THE DIRECTOR:

Jesse M. Granger

Encls
as

JESSE M. GRANGER
Toxic Chemical Agent Team Leader
Explosives Safety Knowledge,
OE and Chemical Division

CF (w/o encls):
Office of the Director of Army Safety (DACS-SF/Mr. Proper), 223 23rd Street, Crystal Plaza 5, Room 980, Arlington, VA 22202
US Army Corps of Engineers, Huntsville Center, ATTN: CEHNC-OE-CX, Mr. Hank Hubbard, P.O. Box 1600, Huntsville, AL 35807-4301.

DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF:

CEHNC-DE

NOV 2 2 2006

MEMORANDUM FOR US Army Technical Center for Explosives Safety, Explosives Safety Knowledge, Ordnance and Explosives (OE) and Chemical Division, (SJMAC-ESM/Mr. Jesse Granger), Building 35, 1 C Tree Road, McAlester, OK 74501-9053

SUBJECT: Engineering Controls Evaluation for 4825 Glenbrook Road, Spring Valley, Formerly Used Defense Site (FUDS), Washington, DC, Modular Aluminum Containment Structure (MACS) Engineering Controls, 10 November 2006, Revised Configuration

1. References:

a. Modular Containment Structure Design and Specifications for Spring Valley DERP/FUDS Site Wide, 29 July 2002.

b. Memorandum, DDESB-KO, 9 August 2002, subject: Final Site Wide Chemical Safety Submission (CSS) for Spring Valley, Washington, DC, approval.

c. Memorandum, DDESB-KO, 12 March 2003, subject: Amendment 1 to the Chemical Safety Submission (CSS) for Recovered Chemical Warfare Materiel (RCWM) Site Wide CSS for Spring Valley, Washington, DC, approval.

d. Memorandum, DDESB-KO, 2 May 2003, subject: Amendments 2 and 3 to the Site Wide Chemical Safety Submission for Spring Valley, Washington, DC, approval.

e. Memorandum, DDESB-KO, 20 March 2004, subject: Amendment 4 to the Site Wide Chemical Safety Submission for Spring Valley, Washington, DC, approval.

f. Memorandum, DDESB-KO, 17 March 2004, subject: Amendment 5 to the Site Wide Chemical Safety Submission for Spring Valley, Washington, DC, approval.

g. Memorandum, CESO-E, 25 March 2003, subject: Headquarters, Corps of Engineers, Delegation of Authority.

2. Reference 1(b) provided DDESB approval for the MACS for blast and fragment mitigation of the explosive burster from a 75mm chemical projectile (.01 pounds of TNT equivalent). This reference also approved the MACS for the containment of an evaporative release of agent from the maximum credible event of five gallons of lewisite from a non-explosively configured container, or mustard from a non-explosively configured 75mm projectile.

NOV 2 2 2006

CEHNC-DE
SUBJECT: Engineering Controls Evaluation for 4825 Glenbrook Road, Spring Valley Formerly Used Defense Site, Washington, DC, Modular Aluminum Containment Structure (MACS) Engineering Controls, 10 November 2006, Revised Configuration

3. This submission merges the blast mitigation and the vapor containment capabilities of the MACS. This is accomplished by the addition of a vapor containment cover (VCC) to the MACS assembly. The specifications for the complete ensemble are included in this submittal.

4. This configuration of the MACS is anticipated to be used at 4825 Glenbrook Road, Spring Valley, Washington, DC. The extremely confined geographical area of this intrusive investigation necessitates this protective ensemble to ensure public protection.

5. The projected start date for intrusive operations at this location using the revised MACS configuration is early March 2007.

6. If you have any questions, please call Mr. Hank Hubbard at 256-895-1586.

Encl

LARRY D. McCALLISTER
Colonel, Corps of Engineers
Commanding

CF:
Commander, USACE, (CESO-SWD/Ms. Blanca Roberts) (wo/encl)

DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY BOARD
2461 EISENHOWER AVENUE
ALEXANDRIA VIRGINIA A 22331-0600

AUG 0 9 2002

DDESB-KO

MEMORANDUM FOR DIRECTOR OF ARMY SAFETY (ATTENTION: DACS-SF)

SUBJECT: Final Site-Wide Chemical Safety Submission (CSS) for Spring Valley, Washington, D.C.

References: (a) DACS-SF Memorandum dated 31 July 2002, Subject as above

(b) E-mail from USATCES to DDESB dated 08 August 2002, Subject: Change pages for SV CSS

(c) E-mail from USATCES to DDESB dated 08 August 2002, Subject: Friday Changes to SV CSS

(d) E-mail from USATCES to DDESB dated 08 August 2002, Subject: Final SV CSS Change

(e) DoD 6055.9-STD, Department of Defense Ammunition and Explosives Safety Standards, dated July 1999

(f) E-mail from USATCES to DDESB dated 30 July 2002, Subject: MACS Update for Spring Valley

(g) DACS-SF Memorandum dated 07 June 1999, Subject: Approval of Spring Valley Operable Unit 3 Site Safety Submission Addendum

The Department of Defense Explosives Safety Board Secretariat has reviewed the subject site safety submission, forwarded by reference (a), and amended by reference (b), reference (c), and reference (d), with respect to explosives and toxic chemical safety criteria of reference (e). Based on the information provided, final approval is granted for the subject submission. The following pertain to this approval:

a. The Modular Aluminum Containment Structure (MACS):

(1) The MACS, minimum total capacity of 1440 ft^3 (10W by 12L by 12H), is approved to contain fragments and blast overpressure from one 75 mm round with burster only (0.1 pounds of TNT equivalent) as described in reference (f). Reference (b) identified the non-agent filled 75 mm round with burster as the Most Probable Munition. The MACS is also approved as containment for the Maximum Credible Event of an evaporative

release of lewisite chemical agent from a 5 gallon container or Mustard agent from non-explosively configured 75 mm round or Livens Projector (reference (b)). The stand-off distance from MACS interior walls must be at least 8 ft.

(2) MACS must maintain a negative pressure with respect to outside ambient pressure during operations.

(3) Before beginning daily operations, an inspection must be conducted to ensure that the ventilation system of the MACS is in optimal operating condition.

b. Hazard Class of the Recovered Munitions with high explosives: In the absence of documented hazard classification signed by appropriate authority, the recovered munitions with high explosives are considered Hazard Division (HD) 1.1.

c. Explosive Storage: The net explosive weight for the explosive storage magazine, located at Federal property in Spring Valley, is limited to 10.5 pounds of TNT equivalent (HD 1.1), Annex 3 in reference (g), with an exclusion zone of 220 ft.

d. Soil Waste Handling: The 55 gallon drums that contain agent-contaminated soil must be monitored for the suspected agents on a regular basis. The contaminated soils and drums must be decontaminated as soon as possible. Plastic containers will not be relied upon for extended storage of agent-contaminated soil as the plastic will adsorb chemical agents then desorb it at a later time.

e. Filtration System: The performance of the filtration system must be closely monitored. Operations inside the MACS must not degrade the performance of the ventilation and filtration system.

f. Back-up Power Supply: Back-up power supply must be provided to ensure the filtration and ventilation system is continually operating. The back-up power supply must be supported by an uninterrupted power system to eliminate the lag time between the power interruption and back-up power supply kick off.

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