SPRING VALLEY FORMERLY USED DEFENSE SITE PROJECT
RAB Meeting

November 10, 2015
7:00 – 8:30 p.m.

UNDERCROFT MEETING ROOM
ST. DAVID'S EPISCOPAL CHURCH
5150 MACOMB ST. NW, WASHINGTON, DC

Agenda

7:00 p.m. **I.** **Administrative Items**

Co-Chair Updates
- Introductions, Announcements

Task Group Updates

7:10 p.m. **II.** **USACE Program Updates**

Website Overview
Annual Project Funding
Groundwater Study
Glenbrook Road
Site-Wide Feasibility Study

8:00 p.m. **III.** **Community Items**

8:10 p.m. **IV.** **Open Discussion & Future RAB Agenda Development**

Upcoming Meeting Topics:
- Suggestions?
- Site-Wide Proposed Plan
- Introduction to the Groundwater RI Document
- 4825 Glenbrook Road Health Consultation Update (ATSDR)

*Next meeting: January 12, 2016

8:20 p.m. **V.** **Public Comments**

8:30 p.m. **VI.** **Adjourn**

Note: The RAB meets every odd month.

Spring Valley
Formerly Used Defense Site

Restoration Advisory Board Meeting

November 10, 2015

"The USACE Mission in Spring Valley is to identify, investigate and remove or remediate threats to human health, safety or to the environment resulting from past Department of Defense activities in the area."

US Army Corps of Engineers
BUILDING STRONG®

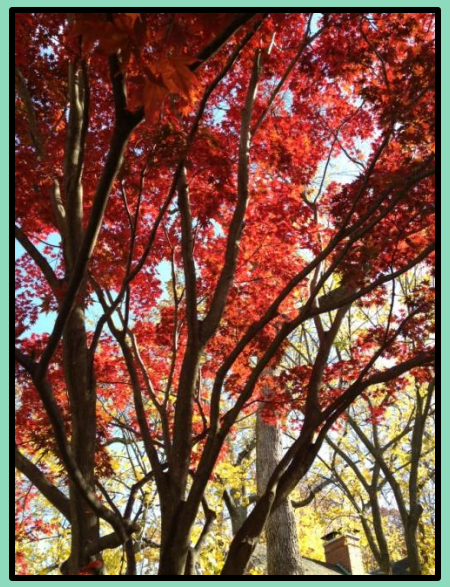
Agenda Review

- Co-Chair Updates
  - Introductions, Announcements
- USACE Updates
  - Website Overview
  - Annual Project Funding
  - Groundwater Study
  - Glenbrook Road
  - Site-Wide Feasibility Study
- Community Items
- Open Discussion & Future RAB Agenda Development
- Public Comments

Co-Chair Updates

Introductions

Co-Chair Updates



Announcements

- **Website Updates:**
  - **September & October Monthly Site-Wide Project Updates**
  - **Weekly 4825 Glenbrook Rd Project Updates with photos**
  - **August Partnering meeting minutes**
  - **September RAB meeting minutes**

Co-Chair Updates

Announcements

Soil Sampling Results

In October, the team completed an arsenic screening effort at a residential property on the 4300 Block of 44th Street.

The soil sampling results showed no arsenic contamination.

This property was one of ten residential properties that were not screened for arsenic because the property owner had not granted access permission.

Task Group Updates

Community Participation Overview

Community participation is vital to the success of the Spring Valley Formerly Used Defense Site. A critical component of the project includes the array of tools and methods that the partnership uses to effectively communicate with the public, including establishing a Restoration Advisory Board (RAB), tours, and regular face-to-face meetings with individual community members, mailings and an active Web site.

Restoration Advisory Board

The RAB is comprised of 13 Spring Valley community stakeholders as well as representatives from the Army Corps of Engineers, Environmental Protection Agency, the District Department of the Environment as well as the nearby public school and American University. The RAB also includes a community liaison from the government agencies engaged in the investigation and cleanup of the Spring Valley FUDS. The primary purpose of the RAB is to involve the local community in the decision making process. The RAB meets at 7 p.m. on the second Tuesday of every odd month at St. David's Episcopal Church, 5150 Macomb Street, N.W., Washington, D.C. Meetings are open to the public.

- RAB and Community Meeting Packages
- 2015 RAB Meeting Schedule
- RAB Operating Procedures
- RAB Membership
- RAB Application

Website Overview

Information

- Remedial Investigation Report Fact Sheet
- CERCLA Fact Sheet
- Quick Reference for Contractors Spanish
- Quick Reference for Contractors English
- Newsletters

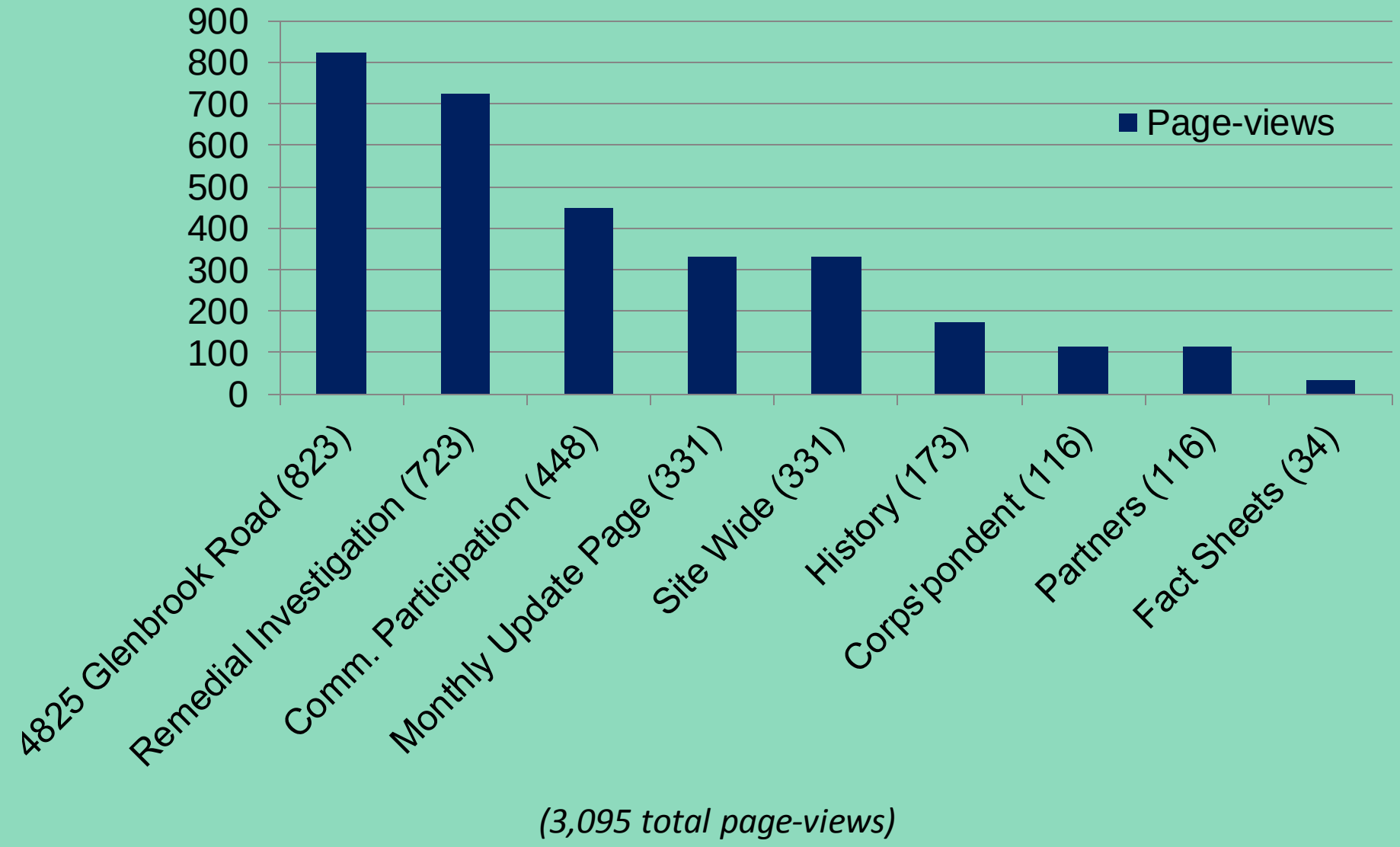
Baltimore District Web Overview

Spring Valley Online Public Use

Baltimore District's website is used by the public for reasons as varied as our missions

- **From 1 Nov 2014 through 30 October 2015, the Baltimore District's homepage was accessed 39,597 times.**
- **In that same timeframe, the Spring Valley FUDS homepage was accessed 2,707 times.**
  - **Nine separate landing pages.**
  - **More than 150 documents available.**
    - **These documents range from final reports, to RAB meeting packages, to newsletters, to fact sheets.**

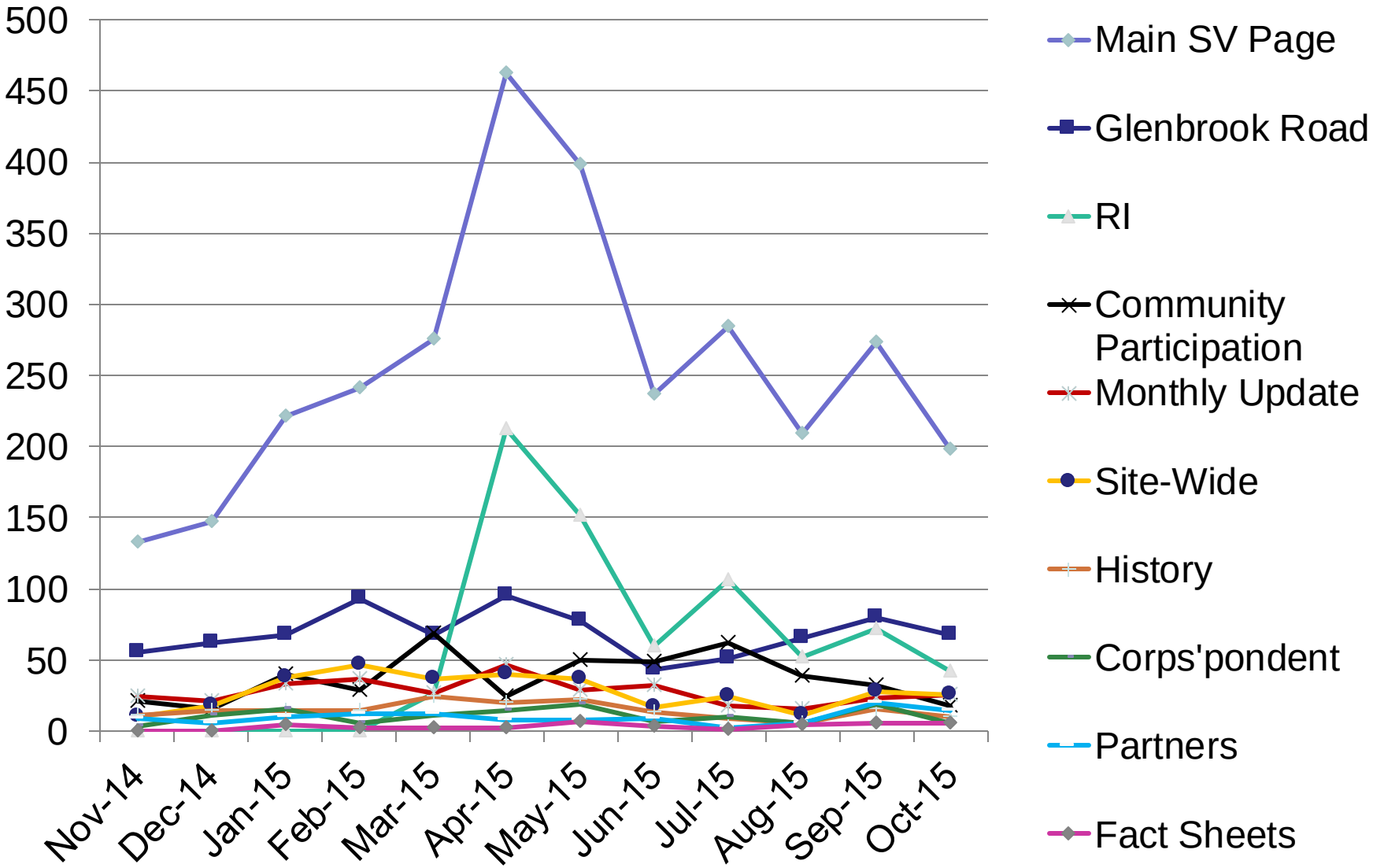
Total Page-views for 9 Spring Valley Pages
(1 Nov 2014 to 30 Oct 2015)



(3,095 total page-views)

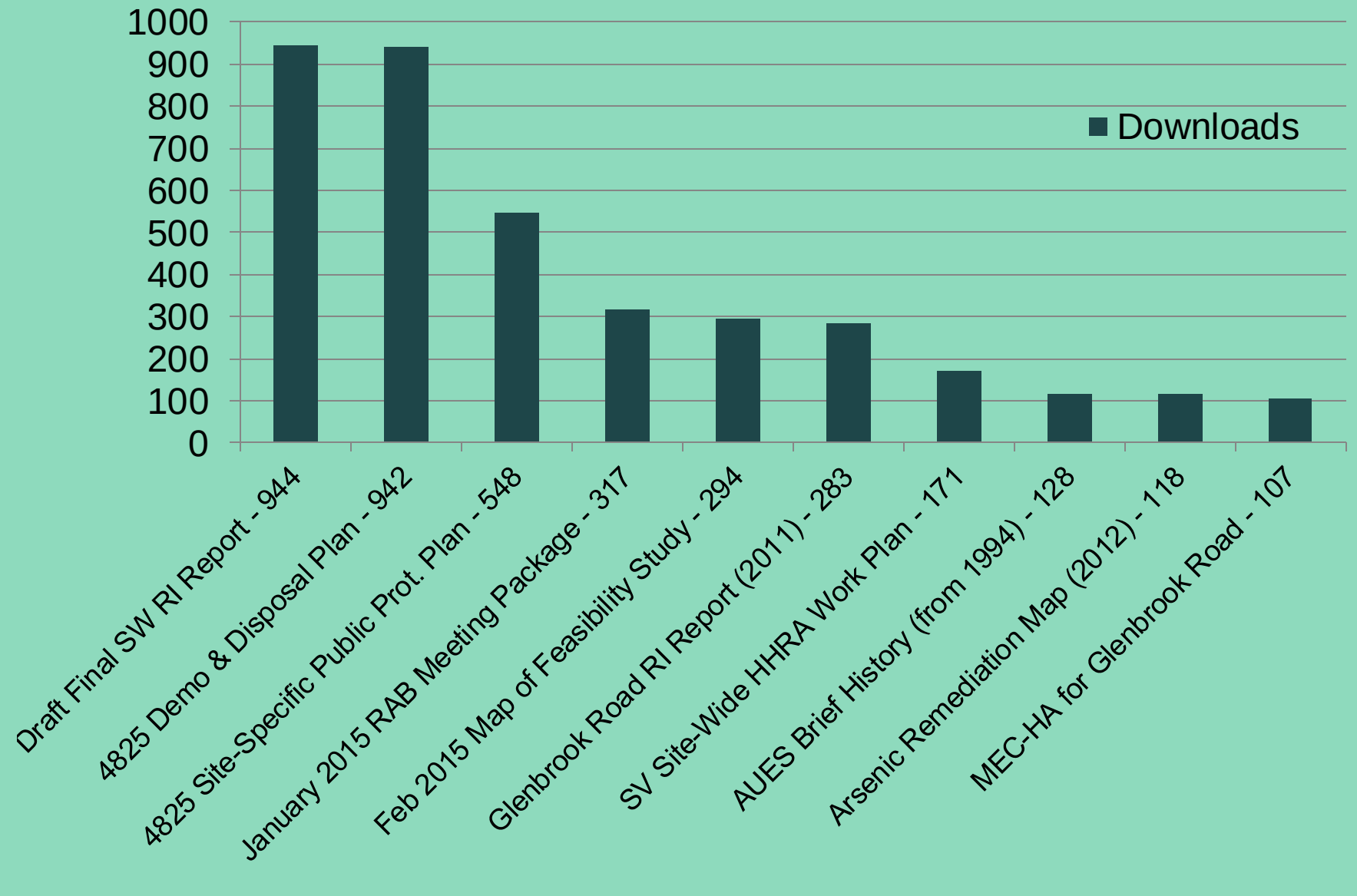
Monthly Page-views for 9 Spring Valley Pages

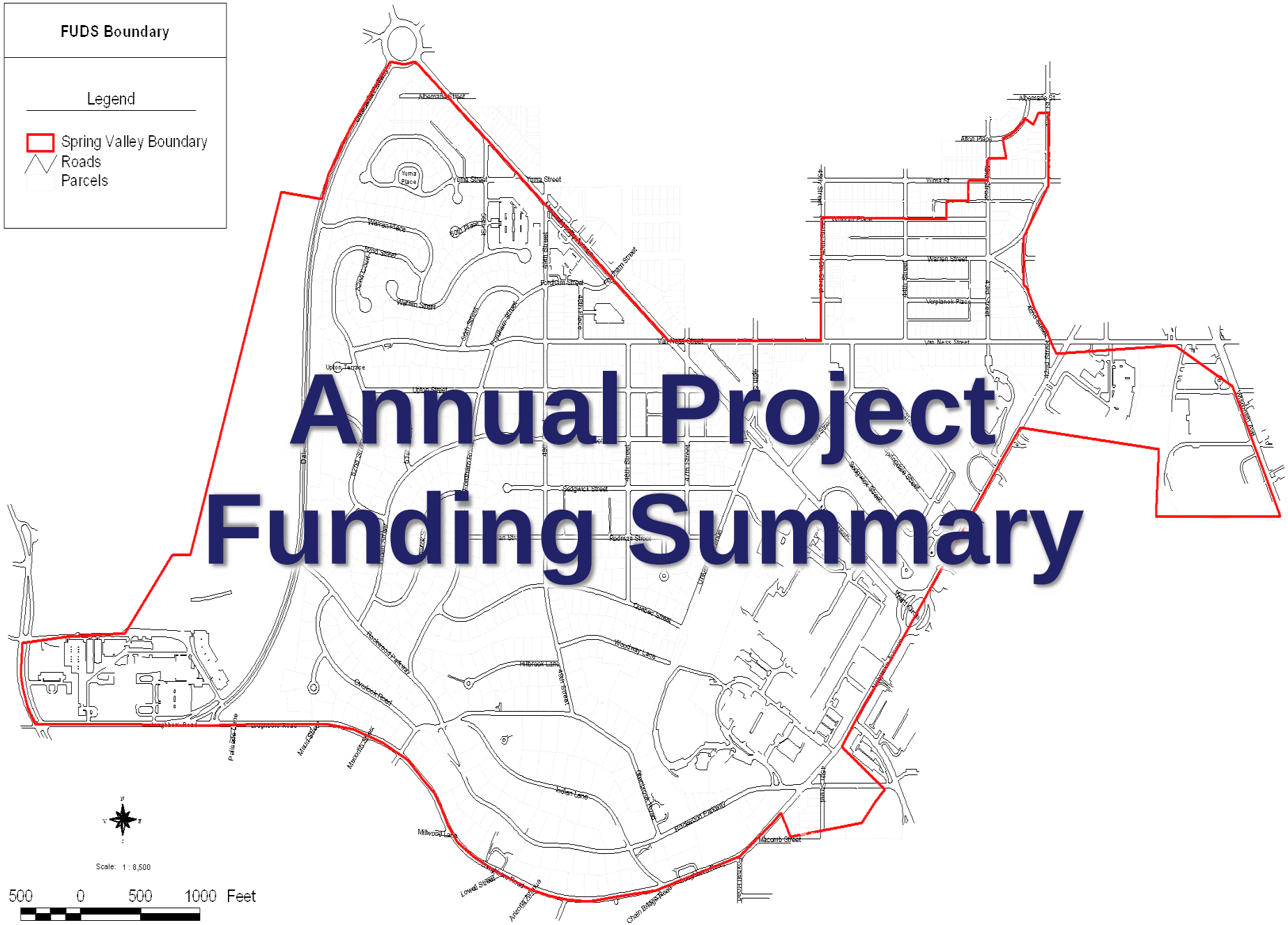
(1 Nov 2014 to 30 Oct 2015)



Total Downloads for Top 10 Documents

(1 Nov 2014 to 30 Oct 2015)




FUDS Boundary
Legend
Spring Valley Boundary
Roads
Parcels
Annual Project
Funding Summary
Scale: 1 : 8,500
500 0 500 1000 Feet

Spring Valley FUDS Funding Summary

- **FY15 ($3.561 M)**
  - **Military Munitions Response Program ($2.46 M)**
    - Site-Wide RI/FS Report
    - Conduct Remedial Action at 4825 Glenbrook Road
    - Stakeholder Outreach
    - Site Security
  - **Hazardous Toxic Waste ($0.758 M)**
    - Site-Wide RI/FS Report
    - Groundwater Investigation
    - Removal Action, one property
  - **Potentially Responsible Party ($0.316 M)**
    - Conduct PRP Investigation
  - **Technical Assistance for Public Participation (TAPP) ($0.027 M)**
    - RAB Technical Consultant

Spring Valley FUDS Funding Summary

- **FY16 ($7.411 M)**
  - **Military Munitions Response Program ($6.722 M)**
    - Site-Wide RI/FS Report and Proposed Plan
    - Conduct Remedial Action at 4825 Glenbrook Road
    - Pilot Project
    - Stakeholder Outreach
    - Site Security
  - **Hazardous Toxic Waste ($0.605 M)**
    - Site-Wide RI/FS Report and Proposed Plan
    - Groundwater Investigation
    - Arsenic Soil Removal
    - Landscape Reimbursement
  - **Potentially Responsible Party ($0.06 M)**
    - Conduct PRP Investigation
  - **Technical Assistance for Public Participation (TAPP) ($0.03 M)**
    - RAB Technical Consultant

Spring Valley FUDS Funding Summary

FY	1993	1994	1995	1996	1997	1998	1999	2000
$$ in M	11.859	8.861	1.744	0.087	0.292	1.164	8.874	10.892

FY	2001	2002	2003	2004	2005	2006	2007	2008[a]
$$ in M	9.824	19.819	11.000	11.471	20.362	11.063	13.843	20.871

FY	2009	2010	2011	2012	2013	2014	2015	2016[b]
$$ in M	15.700	19.345	17.220	6.501	9.210	33.280	3.561	7.411

Spent through FY 2015: $ 266.843M

a = FY08 includes $3.2 M Congressional additional funding

b = Planned funding for FY16

Groundwater Update

Groundwater

Groundwater Remedial Investigation Report

The team concluded their response to the Army's Center of Expertise (CX) comments.

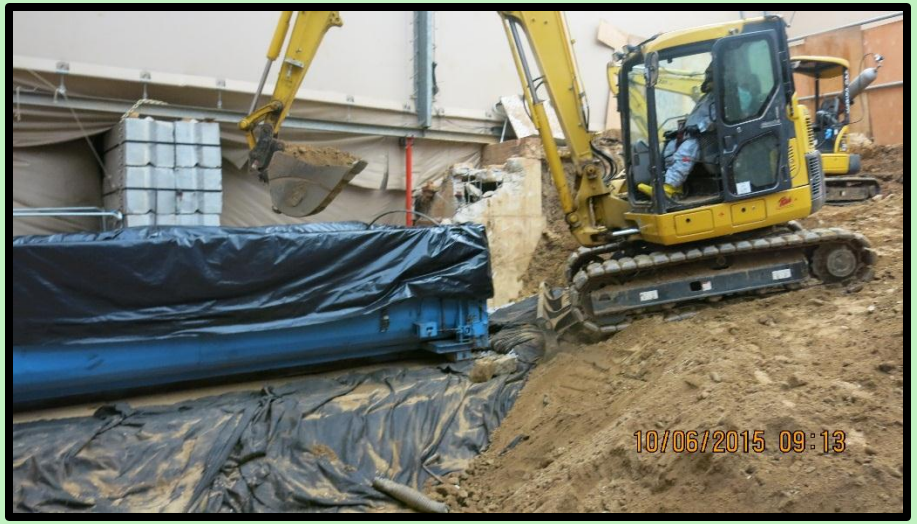
The edited Draft Final Groundwater RI is being reviewed by our Partners (EPA and DOEE) and the project's independent technical consultant (Dr. Peter DeFur).

Partner comments are expected in December.

4825 Glenbrook Road

4825 Glenbrook Road

High Probability



In early October, the crews began the final surface scraping of the areas fully excavated to competent saprolite under Tent 2 and preparing for the final soil sampling effort and inspections.

The resulting soil and bedrock were transported to the Federal Property.

4825 Glenbrook Road

High Probability

After completing the final surface scraping, the Army Corps' Geologist, whose role is to officially assess if we consistently reached competent saprolite in the defined excavation areas, confirmed that the team had completed their efforts under Tent 2.

4825 Glenbrook Road

High Probability

Once confirmation that saprolite had been reached, the team laid out sampling grids across the whole excavated area and collected confirmation soil samples.

This final stage of sampling will provide the required data to ensure that no soil contamination remains under Tent 2. The confirmation results are expected later this month.

4825 Glenbrook Road

Summary of Findings Recovered Under Tent 2

Totals for the high probability excavation operation under the second tent:

- **Roll-offs and Drums:** 106 roll-offs (20 cubic yards each) of soil, 487 drums of soil, 19 roll-offs of rubble, and 226 drums of rubble have been removed.
- **Soil Removed:** 910 yds^3.
- **~58 lbs. of glass:** Cleared headspace analysis.
- **No intact glass containers, five intact 75mm munitions debris (MD) items, one open cavity 75mm MD, one intact cylinder metallic item, and two 4.7" projectiles material deemed as safe (empty).**

- **There were no detections of chemical agent on the MINICAMS (near real time continuous air monitoring system) at the pre-filter (inlet to the Chemical Agent Filtration System, or CAFS) under the second tent.**

Beginning of Tent 2 excavation in January 2015; stockpiled soils.

Completion of Tent 2 in mid-October 2015.

4825 Glenbrook Road

Tent Move Activities

The crew completed the decontamination process on all the equipment. The cleaned equipment is stored at Federal Property during the tent move activities.

The decontamination efforts also included wiping down the inside of the large tent and then taking wipe samples to ensure there is no contamination, before partially dismantling the tent's fabric and frame. These sampling results were clear of chemical agent.

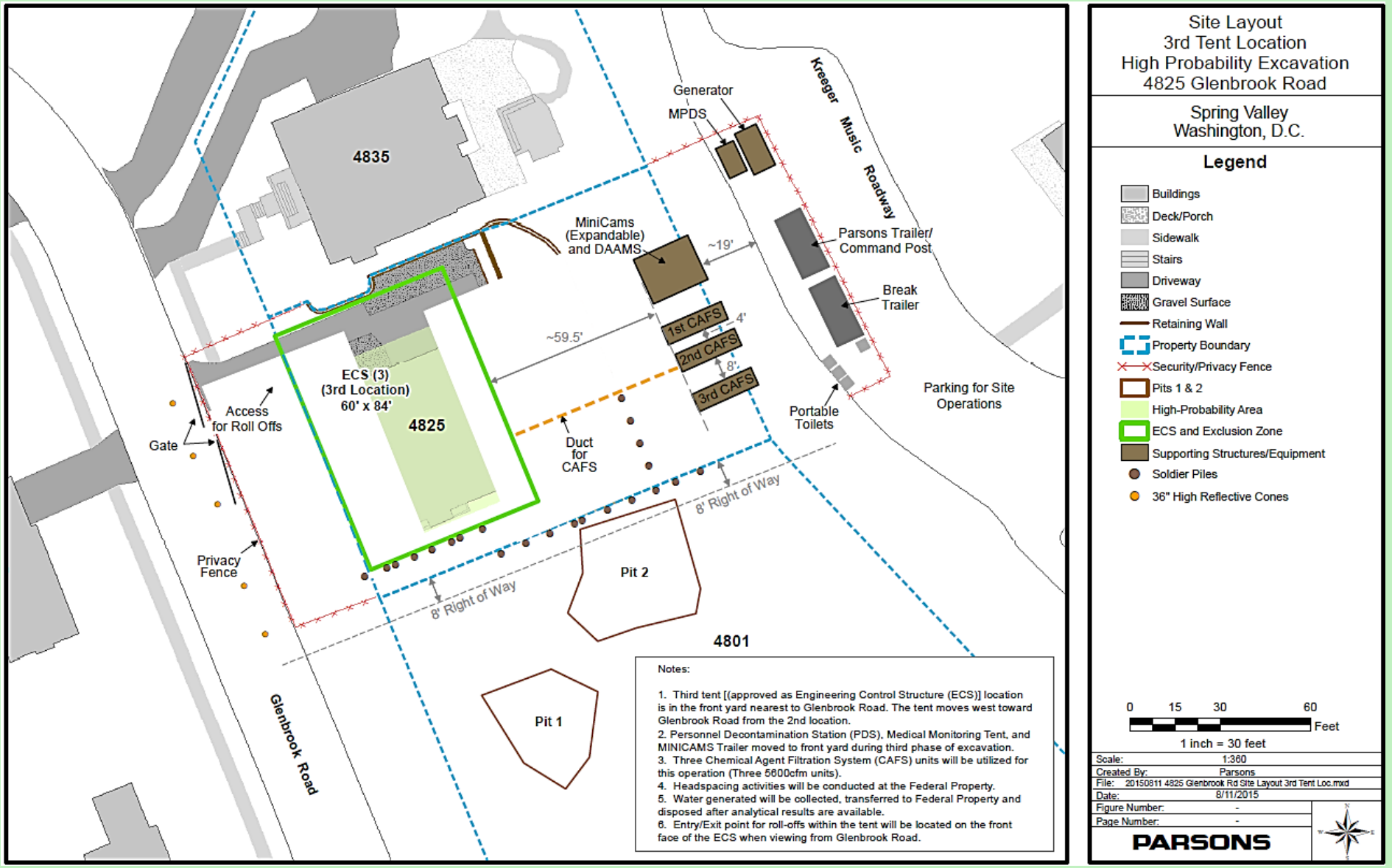
4825 Glenbrook Road
Tent Move Activities

The **Shelter-in-Place** system has been suspended from November to January. There will be no siren tests for these three months.

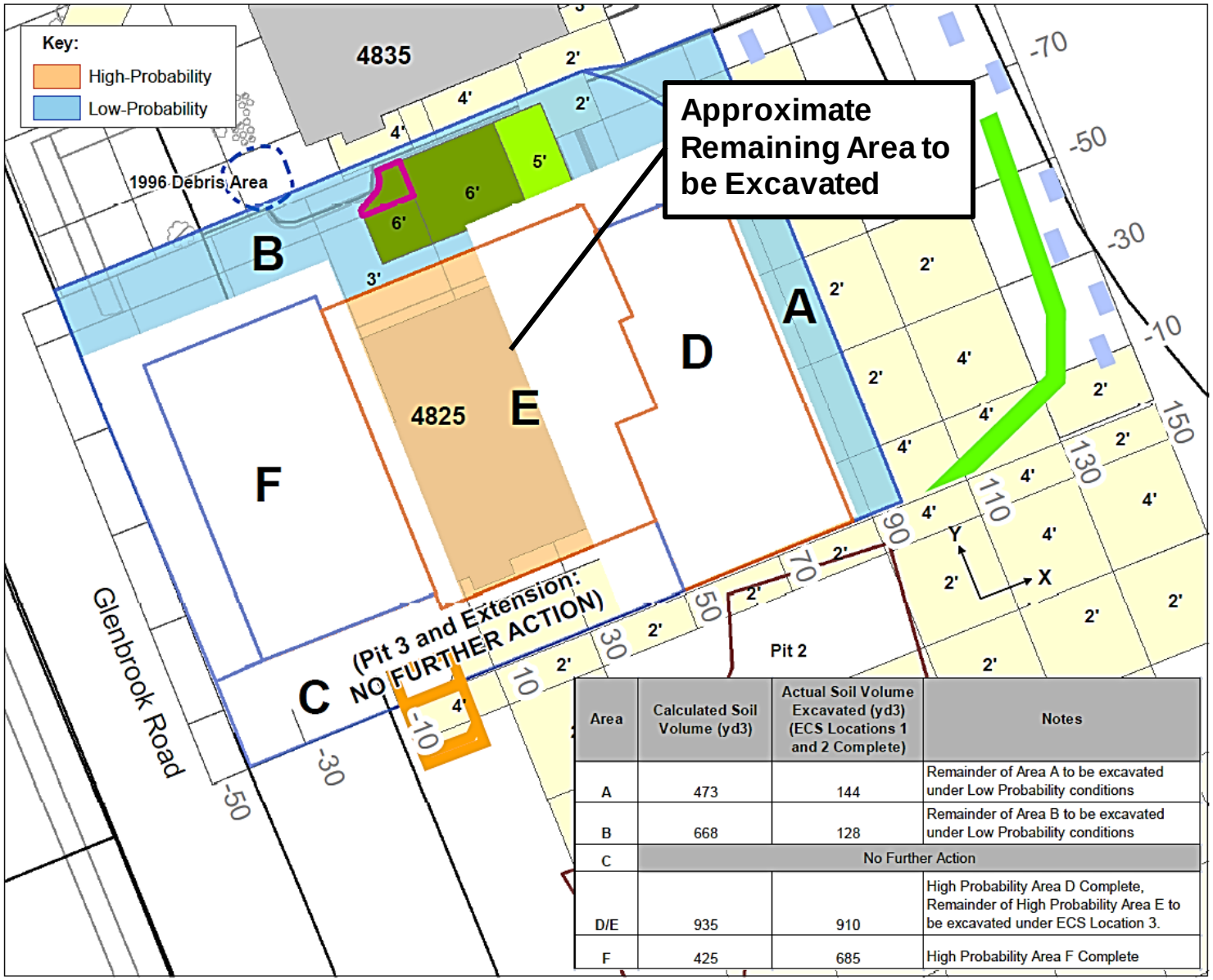
No high probability excavation work will take place during the tent move operations. The tent move activities are expected to last three months, November - January. We anticipate resuming high probability operations in **February**.

Approximately 30 days prior to the start of the next phase (operations under tent 3), we will begin testing the Shelter-in-Place system to ensure that it is fully functional and provide any necessary re-training for the residents within the Shelter-in-Place zone. We will notify everyone prior to reinstating the program.

Tent 3 Location



Tent 3 Location



Area	Calculated Soil Volume (yd3)	Actual Soil Volume Excavated (yd3) (ECS Locations 1 and 2 Complete)	Notes
A	473	144	Remainder of Area A to be excavated under Low Probability conditions
B	668	128	Remainder of Area B to be excavated under Low Probability conditions
C	No Further Action		
D/E	935	910	High Probability Area D Complete, Remainder of High Probability Area E to be excavated under ECS Location 3.
F	425	685	High Probability Area F Complete

Figure 1
Remedial Action
4825 Glenbrook Road

Spring Valley
Washington, D.C.

Legend

- Buildings
- Property Boundaries
- 20' Grid
- Pits 1 and 2
- Remaining High-Probability Investigation
- Test Pit 23 (Burial Pit 3)
- Arsenic Exceedance to be Further Excavated

Additional Low Probability Investigation

- Test Pits
- Trench for Rerouted Sewer Line

Arsenic Soil

- Arsenic Grid Previously Removed [5'] (2009)
- Arsenic Grid Previously Removed [6'] (2009)
- 1996 APEX Tree Removal (Debris Area) Perimeter
- Previously Excavated Arsenic: Adjacent Properties

Note:
Excavation depths shown from previous arsenic removal.

0 10 20 40 Feet

1 inch = 20 feet

Scale:	1:240
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PARSONS

4825 Glenbrook Road
Tent Move Activities

- **Activities during the tent move:**
  - Remove equipment from the tent, including lights, cameras, hoses, and excavator. Backfill under the second tent.
  - Relocate the 'Personal Decontamination Station' (PDS), redress tent, and other support equipment.
  - Mobilize the crane on the former front yard, which will then move the tent in three sections to the middle of the property.
  - Replace the 'skin' of the tent.
  - Install equipment back in tent and re-align CAFS ducting.
  - Perform a smoke test to ensure negative pressure.

4825 Glenbrook Road
Schedule Update

✓ **December 2012 through May 2013**

Site Preparation/ Initial Low Probability Work

- **Test pits in backyard and re-locating utilities**
- **Install soldier piles to support embankments**

✓ **May 2013 through September 2013**

ECS Set Up, High Probability training, and Pre-Operational Exercises

→ **September 2013 through Winter 2016/2017**

High Probability Excavation

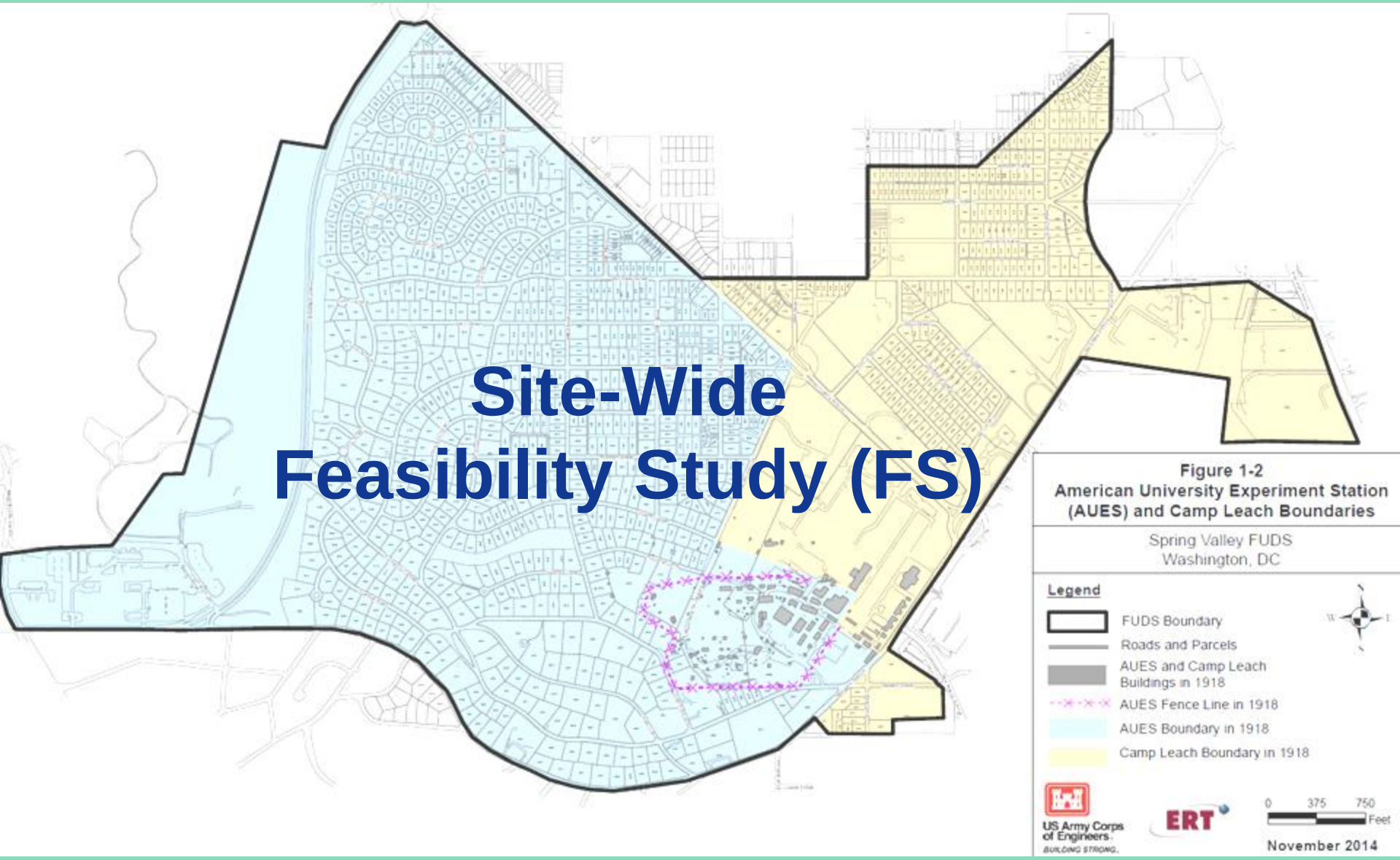
Winter 2017 through Spring 2017

Final Low Probability Excavation

Spring 2017 through Summer 2017

Site Restoration

USACE Updates



The CERCLA Process

(The Comprehensive Environmental Response, Compensation, and Liability Act)

Preliminary Assessment

Site Inspection

Remedial Investigation

Feasibility Study

General Purpose: To develop, screen, and evaluate alternatives for clean-up.

General Purpose: Collect data to characterize site conditions: Determine the nature of the waste; Assess risk to human health and the environment; & Evaluate treatment options.

Information gathered as part of the RI influences the development of the FS which, in turn, may require further data collection and field investigations.

Decision Document

General Purpose: Select the alternative as well as provide an overview of the project. This would include site history, previous and current investigations, and characterization of contamination.

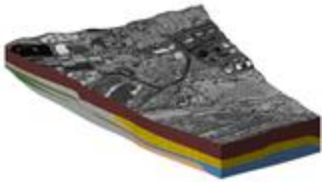
Proposed Plan

General Purpose: Presents the evaluation of clean-up alternatives and provides a recommendation for the preferred alternative.

This document is made available for public review and comment.

Removal Action

General Purpose: If prompt action is deemed appropriate prior to the completion of the RI/FS process, USACE will begin removal of the contaminants of concern.



Remedial Design/ Remedial Action

General Purpose: Implementation of the action determined in the Decision Document.

Long Term Monitoring

General Purpose: To conduct any long term monitoring necessary and conduct five year reviews of the Formerly Used Defense Site.

Spring Valley FUDS Site-Wide FS

Overview

- **Within the CERCLA process for the Spring Valley Formerly Used Defense Site (SVFUDS), the Site-Wide Remedial Investigation (RI) Report identified the problem(s). It was finalized in June 2015.**

- **The Site-Wide Feasibility Study (FS) identifies the solution(s). It is currently being reviewed by the Partners.**

Spring Valley FUDS Site-Wide FS

Report Organization

- **The FS was organized in accordance with the Army Military Munitions Response Program (MMRP) RI/FS Guidance and the EPA Guidance for Conducting RI/FS:**
  - **Executive Summary**
  - **Section 1** – Introduction
  - **Section 2** – Remedial Action Objectives
  - **Section 3** – Identification and Screening of Technologies
  - **Section 4** – Development and Screening of Alternatives
  - **Section 5** – Detailed Analysis of Alternatives
  - **Appendices** – Figures, Costing Backup, List of Properties Recommended for Further Action

Spring Valley FUDS Site-Wide FS

Introduction

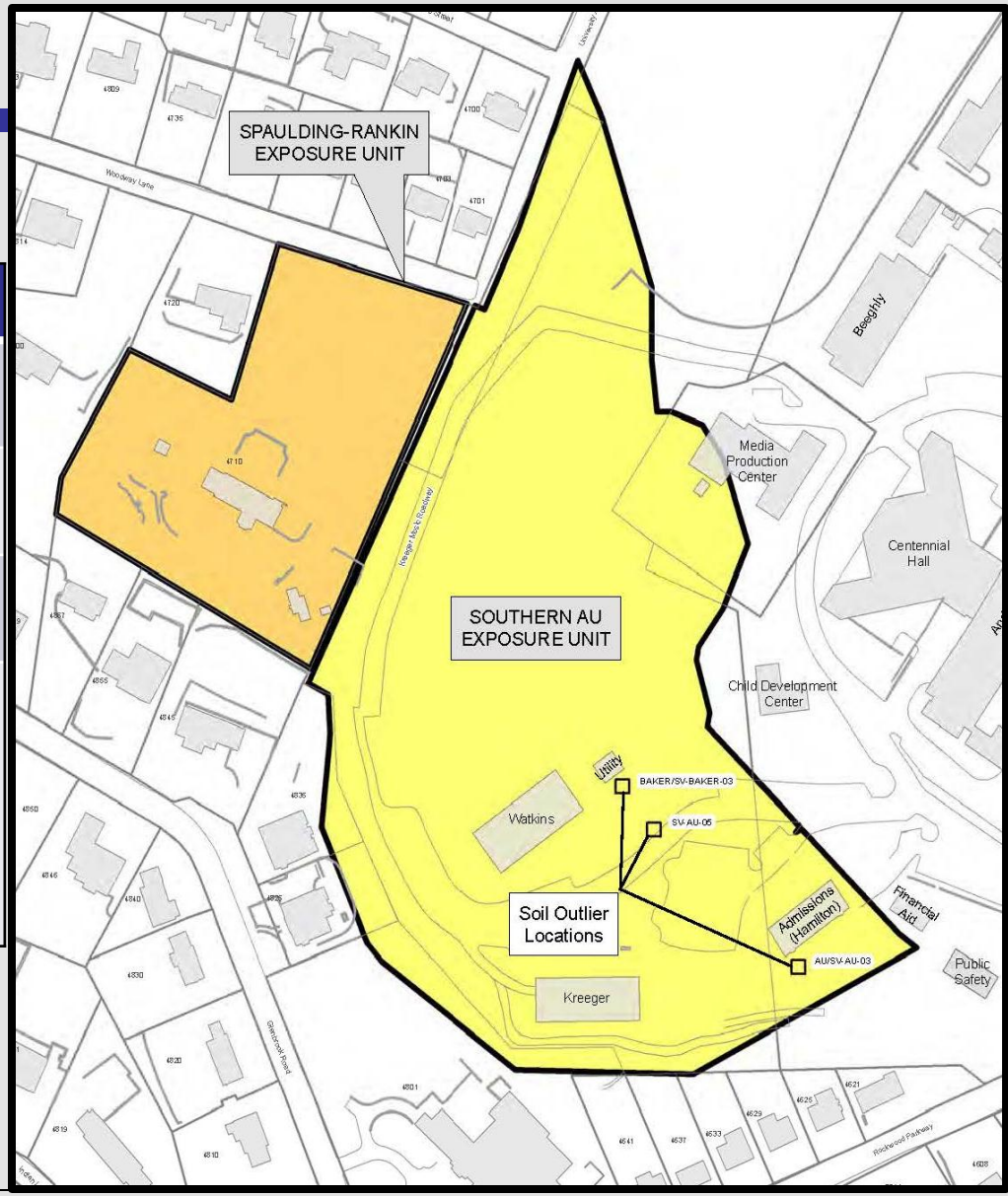
- **The RI recommends completion of an FS to analyze alternatives for mitigating the two primary problems identified:**
  - **Unacceptable human health risks in soil (residual chemical risks in soil from AUES activities)**
  - **Unacceptable explosive hazards**
- **The properties for which the RI recommends further work are shown on the figures.**

Spring Valley FUDS Site-Wide FS

Figure

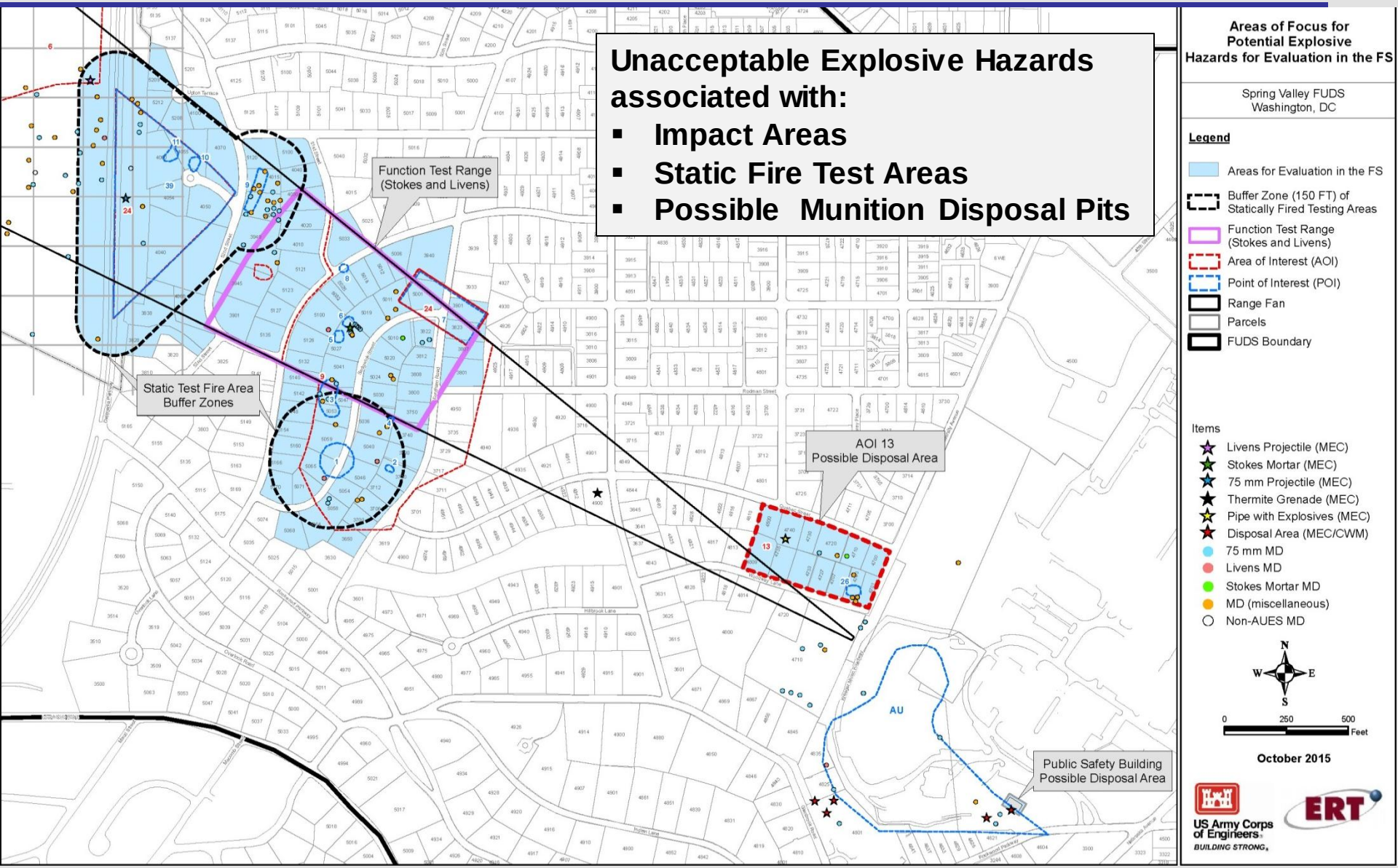
Areas of Potential Soil Risk

Exposure Unit	Conclusion	Risk Driver
SCRA	Non-carcinogenic Risk	Cobalt
SCRA Outliers	Non-carcinogenic Risk	Cobalt
Southern AU	Non-carcinogenic Risk	Cobalt
Southern AU Outliers	Non-carcinogenic and Carcinogenic Risk	Cobalt, Mercury, Vanadium, and Carcinogenic PAHs



Spring Valley FUDS Site-Wide FS

Figure – Areas of Potential Explosive Hazard



Spring Valley FUDS Site-Wide FS

2. Remedial Action Objectives

- **Remedial Action Objectives (RAOs) are remedial goals to be achieved**

For soil risks these RAOs include:

- For mercury and vanadium, prevent direct contact with soil having a non-carcinogenic hazard index (HI) exceeding 1. This will be reached by achieving an average concentration across the Exposure Unit (EU) for mercury and vanadium that results in an HI $\leq$ 1.
- For cobalt, prevent direct contact with soil having a non-carcinogenic HI exceeding 2. This will be reached by achieving an average concentration across the EU for cobalt that results in an HI $\leq$ 2.
- For carcinogenic Polycyclic Aromatic Hydrocarbons **(**PAHs), prevent direct contact with soil having a cancer risk in excess of 1×10^{-4}. This will be reached by achieving an average concentration across the EU, for each carcinogenic PAH, that results in a < 1 in 10,000 (10^{-4}) cancer risk.

Spring Valley FUDS Site-Wide FS

2. Remedial Action Objectives

- **For explosive hazards these RAOs include:**
  - **Reduce the potential for encountering MEC in the identified areas of potential explosive hazards.**
  - **On a site-wide basis, reduce the probability of residents/workers/visitors handling Munitions and Explosives of Concern (MEC) encountered within the Spring Valley FUDS.**

Spring Valley FUDS Site-Wide FS

2. Remedial Action Objectives

- **General Response Actions (GRAs) - Those broad categories of actions that must be taken to satisfy the RAOs**
  - **GRAs for mitigating unacceptable explosive hazards and unacceptable risks posed by contaminated soil include:**
    - **No Further Action (must be evaluated as a baseline condition)**
    - **Institutional Actions (such as Land Use Controls)**
    - **Containment**
    - **Treatment**

Spring Valley FUDS Site-Wide FS

3a. Identification and Screening of Technologies

- **Technologies to mitigate the identified problems are identified in this section. For soil risks, these include:**
  - **Soil Stabilization**
  - **Soil Washing**
  - **Phytoremediation**
  - **Excavation and Off-site Disposal**
- **At this stage, some of these were eliminated, screening out those technologies that are clearly ineffective or unworkable for the site.**
- **For the SVFUDS, soil stabilization and soil washing were eliminated due to limited favorable criteria and are not included in the detailed evaluation that follows.**

Spring Valley FUDS Site-Wide FS

4a. Development and Screening of Alternatives

- **Following that initial screen, the applicable GRA's and remaining technologies are combined to assemble alternatives that achieve RAOs. For soil risks, the identified remedial alternatives include:**
  - **Alternative 1: No Further Action (NFA)**
  - **Alternative 2: Land Use Controls (LUCs)**
  - **Alternative 3: Phytoremediation**
  - **Alternative 4: Excavation and Off-site Disposal**
- **The next screen is evaluation of the alternatives against three broad criteria: Effectiveness, Implementability, and Cost.**
- **The screening evaluation eliminated Alternatives 1 and 2, NFA and LUCs, from the detailed analysis in the next section because they failed key elements of the Effectiveness and Implementability criteria.**

Spring Valley FUDS Site-Wide FS

5a. Detailed Analysis of Alternatives

- **This section is a detailed analysis of remaining soil risk Alternatives 3 and 4. Each alternative was assessed against 9 evaluation criteria that were developed by the USEPA to address CERCLA requirements and technical and policy considerations.**
- **The nine criteria are divided into three categories:**
  - **Threshold:**
    - **Protection of human health and the environment**
    - **Compliance with Applicable or Relevant and Appropriate Requirements (ARARS)**
  - **Balancing:**
    - **Short term effectiveness**
    - **Long term effectiveness**
    - **Reduction of toxicity**
    - **Implementability**
    - **Cost**
  - **Modifying:**
    - **State acceptance**
    - **Community acceptance**

Spring Valley FUDS Site-Wide FS

5a. Detailed Analysis of Alternatives

- **Assessed as Favorable, Moderately Favorable, or Not Favorable.**
- **As part of the analysis, Alternatives 3 and 4 (Phytoremediation and Excavation/Disposal) were first individually assessed against the 9 criteria. Then the performance of each alternative relative to one another was evaluated to identify the relative advantages and disadvantages so that the key tradeoffs could be identified, and a preferred alternative selected.**
- ***Alternative 4, Excavation/Disposal*, was determined to be the most favorable remedial alternative to achieve the RAOs, meeting them in the shortest time with the fewest unknowns. It will address all contaminants under all site-specific conditions and it has been successfully conducted many times throughout the SVFUDS.**
- **Final formal selection of a preferred alternative will be proposed and documented in the forthcoming Proposed Plan.**

Spring Valley FUDS Site-Wide FS

5a. Detailed Analysis of Alternatives

Table 5.1: Summary of Detailed Analysis of Remaining Contaminated Soil Remedial Alternatives

	Screening Criterion	Alternative 3: Phytoremediation	Alternative 4: Excavation and Off-site Disposal
Threshold	Overall Protection of Human Health and Environment	●	●
	Compliance with ARARs	●	●
Balancing	Long-Term Effectiveness	◑	●
	Reduction of Toxicity, Mobility and Volume Through Treatment\1	○	○
	Short-Term Effectiveness	○	●
	Implementability	◑	●
	Technical Feasibility	◑	●
	Administrative Feasibility	◑	●
	Availability of Materials and Services	◑	●
	Cost\2	**$15,000 per grid\3**	**$30,000 per grid\3**
Modifying\4	State Acceptance	TBD	TBD
	Community Acceptance	TBD	TBD

● Favorable ('YES' for threshold criteria)

◑ Moderately Favorable

○ Not Favorable ('NO' for threshold criteria)

\1 – While both alternatives reduce toxicity, mobility, and volume at the property, the statutory preference is permanent reduction through treatment; therefore, assuming landfill disposal, this criterion is not assessed as 'Favorable'.

\2 - Costs are detailed in Appendix B.

\3 - Based on a 20 ft by 20 ft by 4 ft deep grid of contaminated soil.

\4 – The Modifying criteria of state and community acceptance are 'To Be Determined' following review and input from these parties.

Spring Valley FUDS Site-Wide FS

3b. Identification and Screening of Technologies

- **<u>For Explosive Hazards</u>, this section describes and establishes the current procedure, Digital Geophysical Mapping (DGM) followed by anomaly removal, as the technology historically used to mitigate explosive hazards.**
- **The current SVFUDS procedure is to use the EM61, an electromagnetic instrument, and the G-858, a magnetic instrument. Anomalies are classified using factors such as anomaly size and coincident signatures between instruments, placing them into one of four categories, A, B, C, and D, with 'A' most likely to represent a buried munition item.**
- **Supplemental use of Advanced Classification (AC) - new approach to estimate the depth, size, wall thickness, and shape of a buried item, allowing for a more informed decision as to whether a buried metal item is a munition (i.e. reduce the number of digs). AC will supplement the current procedures for some of the alternatives (depending on the Pilot Test results).**

Spring Valley FUDS Site-Wide FS

3b. Identification and Screening of Technologies

- **Rather than screening different Digital Geophysical Mapping (DGM) technologies, various ways of applying the above current SVFUDS procedure to the subject properties were reviewed, such as:**
  - **How much acreage to DGM on a given property**
  - **How many anomalies to dig on a given property**
  - **Properties with previous DGM/anomaly removal work**

Spring Valley FUDS Site-Wide FS

4b. Development and Screening of Alternatives

- **Remedial alternatives that achieve the RAOs for Explosive Hazards were developed by varying DGM coverage amount (acreage) and quantity of anomalies to dig, including:**
  - **Alternative 1: No Further Action (NFA)**
  - **Alternative 2: Land Use Controls (LUCs)**
  - **Alternative 3: Full DGM Coverage, Remove All Anomalies**
  - **Alternative 4: Full DGM Coverage, Remove Selected Anomalies**
  - **Alternative 5: Accessible Areas DGM, Remove All Anomalies**
  - **Alternative 6: Accessible Areas DGM, Remove Selected Anomalies**

Standards of DGM coverage and anomaly removal were defined.

Spring Valley FUDS Site-Wide FS

4b. Development and Screening of Alternatives

- **Alternative 3 means DGM'ing everything including driveways, cutting brush/trees/gardens as necessary (Full DGM), and digging every anomaly—for this alternative, AC is not needed to supplement the current method as all anomalies would be dug.**
- **Alternative 4 means Full DGM, supplemented by AC, to include driveways, cutting brush/trees/gardens as necessary, but only dig AC recommended anomalies).**
- **Alternative 5 means DGM of just the accessible areas (including hardscape) without cutting brush/trees/gardens, but dig every anomaly--for this alternative, AC is not needed as all anomalies would be dug).**
- **Alternative 6 means accessible areas DGM, supplemented by AC, of just the accessible areas (including hardscape) without cutting brush/trees/gardens, and only dig AC recommended anomalies).**

Spring Valley FUDS Site-Wide FS

4b. Development and Screening of Alternatives

- **The next screen was evaluation of the alternatives against the three broad criteria: Effectiveness, Implementability, and Cost.**
- **Alternatives 1 and 2 from the detailed analysis in the next section were eliminated because they failed key elements of the Effectiveness and Implementability criteria.**

Spring Valley FUDS Site-Wide FS

5b. Detailed Analysis of Alternatives

- **The four alternatives were individually assessed against the 9 criteria. Then the performance of each alternative relative to one another was evaluated.**
- ***Alternative 6, Accessible Areas DGM, Remove Selected Anomalies***, was determined to be the most favorable alternative to meet the RAOs. It is protective of human health and the environment, is compliant with ARARs, and will meet the RAOs in the shortest time period.
- **Final formal selection of a preferred alternative will be proposed and documented in the forthcoming Proposed Plan.**

Spring Valley FUDS Site-Wide FS

5b. Detailed Analysis of Alternatives

Table 5.2: Summary of Detailed Analysis of Remaining Explosive Hazards Remedial Alternatives

	Screening Criterion	Alternative 3: Full DGM Coverage, Remove All Anomalies	Alternative 4: Full DGM Coverage, Remove Selected Anomalies	Alternative 5: DGM of Accessible Areas, Remove All Anomalies	Alternative 6: DGM of Accessible Areas, Remove Selected Anomalies
Threshold	Overall Protection of Human Health and Environment	●	●	●	●
	Compliance with ARARs	●	●	●	●
Balancing	Long-Term Effectiveness	●	◑	◑	◑
	Reduction of Toxicity, Mobility and Volume Through Treatment\1	●	◑	◑	◑
	Short-Term Effectiveness	◑	◑	●	●
	Implementability	◑	◑	●	●
	Technical Feasibility	◑	◑	●	●
	Administrative Feasibility	◑	◑	●	●
	Availability of Materials and Services	●	●	●	●
	Cost\2	**$230,000 / property**	**$225,000 / property**	**$197,500 / property**	**$192,500 / property**
Modifying\3	State Acceptance	TBD	TBD	TBD	TBD
	Community Acceptance	TBD	TBD	TBD	TBD

● Favorable ('YES' for threshold criteria)

◑ Moderately Favorable

○ Not Favorable ('NO' for threshold criteria)

\1 – For MEC, this criterion addresses volume of MEC. The through treatment preference is met for anomalies removed in that they are rendered safe (no longer 'contaminants') prior to disposal.

\2 - Costs are based on a generic individual property that had no previous DGM/anomaly removal investigations. Details are provided in Appendix B.

\3 – The Modifying criteria of state and community acceptance are 'To Be Determined' following review and input from these parties.

Spring Valley FUDS
Tentative Schedule

Fall 2015	Feasibility Study to be finalized to evaluate alternatives for addressing any unacceptable risks or hazards identified in the Final RI Report.
2016	Pilot Project
Winter 2015/16	Prepare the Proposed Plan and start public comment period.
Summer 2016	Prepare and sign the Decision Document in Summer 2016.
~2017-2020	Begin remedial design/remedial action plan/conduct clean-up action.

Spring Valley FUDS
Restoration Advisory Board

Community Items

Spring Valley FUDS
Restoration Advisory Board

- **Reminders:**
  - **The next RAB meeting will be Tuesday, January 12th**

- **Upcoming Agenda Items**
  - **Suggestions?**

  - Site-Wide Proposed Plan
  - Pilot Project
  - Groundwater Remedial Investigation Report
  - 4825 Glenbrook Road Health Consultation Update (ATSDR) – TBD

Spring Valley FUDS
Restoration Advisory Board

- Public Comments

- Wrap-Up

U.S. Army Corps of Engineers
Spring Valley Restoration Advisory Board
St. David's Episcopal Church
Minutes of the November 2015 Meeting

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING	
Dan Noble	Military Co-Chair/USACE, Spring Valley MMRP Manager
Greg Beumel	Community Co-Chair
Linda Argo	At Large Representative – American University
Ralph Cantral	Community Member
Dr. Peter deFur	Environmental Stewardship Concepts/RAB TAPP Consultant
Mary Douglas	Community Member
Steve Hirsh	Agency Representative – US Environmental Protection Agency, Region III
William Krebs	Community Member
Lawrence Miller	Community Member
Lee Monsein	Community Member
Malcolm Pritzker	Community Member
James Sweeney	Agency Representative – Department of Energy & Environment
George Vassiliou	Community Member
John Wheeler	Community Member
RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING	
Mary Bresnahan	Community Member
Kathleen Connell	Community Member
Paul Dueffert	Community Member
Alma Gates	At Large Representative – Horace Mann Elementary School
Lee Monsein	Community Member
Tom Smith	Community Member
ATTENDING PROJECT PERSONNEL	
Alex Zahl	USACE, Spring Valley Technical Manager
Brenda Barber	USACE, Spring Valley Project Manager
Chris Gardner	USACE, Corporate Communications Office

Thomas Bachovchin	ERT, Spring Valley Project Manager
Carrie Johnston	Spring Valley Community Outreach Program
Lattie Smart	Spring Valley Community Outreach Program
Rebecca Yahiel	Spring Valley Community Outreach Program
HANDOUTS FROM THE MEETING	
I. Final Agenda for the November 10, 2015 RAB Meeting II. Army Corps of Engineers Presentation III. September and October 2015 Monthly Project Summaries IV. CERCLA Process Factsheet V. September 2015 *Corps'pondent* VI. Project Timeline	

AGENDA

Starting Time: The November 2015 Restoration Advisory Board (RAB) meeting began at 7:10 PM.

I. Administrative Items

A. Co-Chair Updates

Greg Beumel, Community Co-Chair, welcomed everyone and opened the meeting. He turned the meeting over to Dan Noble, Spring Valley Project Manager and Military Co-Chair.

D. Noble welcomed everyone to the RAB meeting and noted this is the last meeting for 2015. He reviewed the agenda including website usage, project funding status, updates on the groundwater investigation, 4825 Glenbrook Road, the Site-Wide Feasibility Study (FS).

1. Introductions

D. Noble introduced Thomas Bachovchin, Earth Resources Technology, Inc. (ERT) Spring Valley Project Manager presenting on the Site-Wide Feasibility Study (FS). He also introduced Chris Gardner, U.S. Army Corps of Engineers (USACE) Corporate Communication Office (CCO) presenting on the website statistics.

2. General Announcements

D. Noble reviewed website updates which included the September and October monthly project updates, the weekly 4825 Glenbrook Road updates and photos, the August Partnering meeting minutes, and the September RAB meeting minutes.

D. Noble briefly discussed a property where access was previously not provided to conduct arsenic soil screening. The Northwest Current newspaper published a list of the ten properties where access had not been granted. One of the property owners saw his address in the newspaper and

contacted USACE to conduct the screening soil sampling. This sampling was completed in October and the results indicated no arsenic contamination. There are now just nine residential properties that have not been sampled for arsenic.

Comment from John Wheeler, Community Member – The property owner was trying to sell his house; however he could not sell it because he did not have the sampling results comfort letter. J. Wheeler noted that he had previously spoken with the renter regarding sampling at the property; however, the property owner did not appear to be interested until the property went up for sale.

D. Noble acknowledged this and explained that the property owner had previously thought that the property was tested when a contractor came to the property for another purpose.

B. Task Group Updates

No task group updates were presented.

II. USACE Program Updates

Chris Gardner, USACE CCO, provided the review of website usage statistics.

D. Noble, Spring Valley Project Manager, provided a brief status update on the annual project funding and groundwater investigation.

Brenda Barber, Spring Valley Project Manager, provided an update on the activities at 4825 Glenbrook Road.

Thomas Bachovchin, ERT Spring Valley Project Manager, provided an overview of the Site-Wide FS document.

A. Website Overview

C. Gardner, USACE CCO noted that the purpose of this presentation was to provide the RAB with information regarding how many times documents are being accessed online in all the different locations they are housed. There are two sites that house Spring Valley project documents. ERT's Google Drive site (http://springvalley.ertcorp.com/) does not track statistics regarding how often documents are accessed and downloaded. This is a wide-spread frustration with users as indicated in online forums; however Google has not provided a fix. Therefore USACE does not have statistics regarding how often documents are accessed through Drive.

USACE is able to provide detailed statistics on usage of the USACE Spring Valley project website (http://www.nab.usace.army.mil/Home/SpringValley.aspx) and the access of documents posted to this site.

From 1 November 2014 to 30 October 2015 the USACE Baltimore District homepage was accessed 39,597 times. In that same timeframe, the Spring Valley Formerly Used Defense Site (FUDS) homepage was accessed 2,707 times. There are nine subpages within the Spring Valley FUDS website with approximately 180 documents available; ranging from the Draft Final Remedial Investigation (RI) Report to the January 2013 RAB meeting minutes.

The nine subpages have varying numbers of page views, indicative of the level of interest in the different project areas:

- 4825 Glenbrook Road (823 page views);
- Remedial Investigation (723 page views);
- Community Participation (448 page views);
- Monthly Updates (331 page views);
- Site-Wide (331 page views);
- History (173 page views);
- Corps'pondent newsletter (116 page views);
- Partners (116 page views); and
- Fact Sheets (34 page views).

The total number of page views for these subpages was 3,095 times. The page views for these subpages were counted independent from the page views of the Spring Valley FUDS homepage. The subpages are searchable; therefore if the key words for Spring Valley RI were input into a search engine, the subpage could be accessed directly without first going through the Spring Valley FUDS homepage. The page views of the home page and the RI page increased significantly in the Spring 2015 when the RI was made available to the public. The complete list of documents downloaded from the Spring Valley FUDS website is available for those interested. The top ten documents downloaded from the Spring Valley FUDS website in the last year were:

- Draft Final Site-Wide RI Report (944 times);
- 4825 Demolition and Disposal Plan (942 times);
- 4825 Site-Specific Public Protection Plan (548 times);
- January 2015 RAB Meeting Package (317 times)
- February 2015 Map of Feasibility Study (294 times);
- 4825 Glenbrook Road RI Report (Dated 2011) (283 times);
- Spring Valley Site-Wide Human Health Risk Assessment Work Plan (171 times);
- American University Experiment Station Brief History (Dated 1994) (128 times);
- Arsenic Remediation Map (Dated 2012) (118 times); and the
- Munitions and Explosives of Concern (MEC) Hazard Assessment (HA) for Glenbrook Road (107 times).

Comment from Allen Hengst, Audience Member – Another statistic that I would be interested in is where these hits originated from geographically.

C. Gardner responded that he would check into whether the website analytics include that information.

Question from Larry Miller, Community Member – Do you count evening visitors?

C. Gardner explained that the count included any visitors including USACE visitors.

B. Annual Project Funding

For Fiscal Year (FY) 2015, $3.561M was spent on Spring Valley FUDS project activities. The bulk of the funding ($2.46M) was expended on the military munitions response program (MMRP) portion of the project including the Site-Wide RI Report, conducting the Remedial Action (RA) at 4825 Glenbrook Road, stakeholder outreach, and site security. A total of $0.758M was spent on

hazardous toxic waste (HTW) project activities including the Site-Wide RI Report, the groundwater investigation, and a removal action at one property. The potentially responsible party (PRP) investigation expended $0.316M in FY 2015. Continued Technical Assistance for Public Participation (TAPP) funding for Dr. Peter deFur as the RAB's technical consultant totaled $0.027M for the year.

The major items for the MMRP program, funded at $6.722M in FY 2016 will be the continued RA at 4825 Glenbrook Road and the Pilot Study. Other activities will continue as well including the Site-Wide RI, FS, Proposed Plan (PP), stakeholder outreach, and site security. The HTW program is expected to expend about the same amount in FY 2016, at $0.605M, performing the same activities as in FY 2015. Additional funding is set aside for landscape reimbursement, should the need arise. A total of $0.06M and $0.03M is estimated for PRP and TAPP activities in FY 2016, respectively.

D. Noble reviewed the historical funding amounts for Spring Valley since 1993, noting the year with the highest project expenditure was 2014 at $33.28M spent. However in 2015 a total of $3.5M was spent. FY 2014 funding was used to front-load funding for the RA at 4825 Glenbrook Road in future FYs. Overall, a total of $266.843M has been spent by USACE on the Spring Valley FUDS project since 1993.

Question from J. Wheeler, Community Member – I noticed there was considerably less funding estimated for the PRP project for FY 2016. Does that mean it is nearing completion?

D. Noble responded that USACE is expecting to be nearly done with the PRP project in FY 2016. There are statutory guidelines on USACE if we plan to pursue it further. Part of the reason why there was more funding in FY 2015 for PRP was because a modification was issued to the contractor performing the work. No additional modifications are anticipated in FY 2016.

C. Groundwater Study

D. Noble provided a brief update on the groundwater study. The Army completed review of the Draft Groundwater RI report and the Draft Final was submitted the US Environmental Protection Agency (USEPA) Region III, the District Department of Energy and Environment (DOEE), as well as to the RAB TAPP Consultant, Dr. Peter deFur. Stakeholder review comments on the Draft Final report are expected to be complete in December 2015. USACE plans to provide a detailed briefing on the Groundwater RI at either the January or March RAB meeting including whether there are any identified issues that require further evaluation in a FS.

D. Glenbrook Road

In early October, crews began the final scraping of the areas fully excavated to competent saprolite under the Tent 2. All soil and bedrock has been transported to the federal property and will be stored there until shipment off-site.

After the final scraping was completed, Army geologists, in addition to contractor geologists, inspected the excavation area at the site and certified that the excavation to saprolite was complete. With the certification that competent saprolite was achieved on October 16, high probability excavation under Tent 2 was officially completed. Once USACE obtained confirmation that saprolite had been reached, the team laid out grids across the excavated area and collected

confirmation samples. All confirmation samples were cleared for low-level agent. The final stage of the sampling will provide the required data to ensure that no soil contamination remains under Tent 2. The samples are still undergoing detailed analysis using the Spring Valley parameters. The confirmation results are expected in late November.

The totals under Tent 2 included removal of 106 roll-offs (20 cubic yards each) of soil, 487 drums of soil, 19 roll-offs of rubble, and 226 drums of rubble. A total of 910 cubic yards was removed from under Tent 2. Approximately 58 lbs. of glass was recovered; all cleared headspace analysis. No intact glass containers were found. Five intact 75mm munitions debris (MD) items, one open cavity 75mm MD item, one intact metallic cylinder, and two 4.7 inch projectiles. Both 4.7 inch projectiles were empty and classified as material documented as safe (MDAS). During the Tent 2 excavations, there were no detections of chemical agent on the MINICAMS (near real time continuous air monitoring system) at the pre-filter (inlet to the Chemical Agent Filtration System, or CAFS).

The crew began preparations to move the tent to the third location on the property which includes temporarily backfilling part of the area under the Tent 2 location in order to stage Tent 3. All equipment used during high probability operations has been decontaminated and is being stored at the federal property until the tent is moved. Samples were taken of the inside walls of the tent to ensure that no contamination was located on the inside of the tent. The sampling confirmed no contamination. With this confirmation the crew began dismantling the tent fabric to allow for the tent structure to be moved in three sections to the Tent 3 location.

Since the team is not performing high probability operations during the tent move, the Shelter-in-Place system has been suspended from November to January. There will be no siren tests or test notification emails during these three months. Approximately 30 days prior to the start of the next phase (operations under Tent 3), USACE will begin testing the Shelter-in-Place system to ensure that it is fully functional and provide any necessary re-training for the residents within the Shelter-in-Place zone.

B. Barber reviewed the location of the third and final tent on the property. The primary efforts under the third tent will be to remove and excavate under the remaining portions of basement floor that had not previously been excavated under the first two tents (the remaining portion of Area E). Under the first tent location (Area F), 425 cubic yards were expected to be removed; however, the team removed 685 cubic yards upon completion of the excavation in that area. Areas D and E were calculated to have 935 cubic yards of soil to be removed under Tent 2 and Tent 3. Under Tent 2 a total of 910 cubic yards were removed which included all of Area D and a portion of Area E. The remaining portion of Area E will be removed during Tent 3 excavations. Some low probability excavations also remain in Area A and Area B of the property.

The team removed equipment from the tent, including lights, cameras, hoses, and excavator. Relocation activities include moving the Personal Decontamination Station (PDS), redress tent, and other support equipment and temporarily storing the equipment at the Federal Property. The crane is planned to be mobilized to the site in mid-November to the former front yard, which will then move the tent in three sections to the middle of the property. The crane will be located fully on the property; therefore, there will be no traffic interference on Glenbrook Road. Once the tent structure is relocated, the team will replace the 'skin' of the tent, reinstall equipment in the tent, re-align the CAFS ducting, and perform a smoke test to ensure negative pressure.

The schedule remains unchanged. High probability is scheduled to resume in Tent 3 in February 2016. All high probability excavations are scheduled to be complete by Winter 2016/2017. Final low probability excavations are planned to be completed in Winter/Spring 2017, followed by site restoration.

E. Site-Wide Feasibility Study

D. Noble briefly reviewed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process USACE is following for the soil remediation at the Spring Valley FUDS. This is the same process taken to get to the current RA at the 4825 Glenbrook Road site. The RI is completed and the Site-Wide RI Report is finalized. USACE is currently working on the Site-Wide FS. The FS takes the issues identified in the RI and looks at the different options available to address the issues including looking at remedial alternatives and comparing them according to USEPA's nine criteria. Based on the results of the FS, USACE will develop the PP which formally presents the Army's preferred alternative. D. Noble noted that the information presented by T. Bachovchin will include the results of the FS evaluation and show which alternatives will likely be the preferred alternative in the PP; however, the FS is still undergoing stakeholder review and PP is not yet available to formally select the preferred alternative.

T. Bachovchin reviewed the organization of the FS document which was prepared in accordance with Army and USEPA guidance: Introduction, Remedial Action Objectives (RAOs), Identification of Screening Technologies, Development of Screening Alternatives, and Detailed Analysis of Alternatives.

1. Introduction

The FS analyzes alternatives for mitigating the two primary problems identified in the Site-Wide RI: unacceptable human health risks in soil and unacceptable explosive hazards. T. Bachovchin reviewed the locations, referred to as exposure units (EU), where unacceptable human health risks in soil were identified: Spaulding Captain Rankin Area (SCRA), and Southern American University (AU). Cobalt is the risk driver for all locations, except outlier locations in the Southern AU EU which, in addition to cobalt, also had mercury, vanadium, and carcinogenic polycyclic aromatic hydrocarbons (PAHs). The areas associated with unacceptable explosive hazards include impact areas, static test fire areas and possible munition disposal pits. The areas cover about 100 properties in the neighborhood.

2. Remedial Action Objectives (RAOs)

RAOs are the remedial goals to be achieved for the problems identified in the RI. The detailed RAOs are also available for review in the RI document. The RAOs for mercury and vanadium are to prevent direct contact with soil having a non-carcinogenic hazard index (HI) exceeding 1. This will be reached by achieving an average concentration across the EU for mercury and vanadium that results in an HI < 1. The HI is a ratio of the concentration of a chemical in a given sample divided by the allowable concentration. If the HI is more than 1, this is generally unacceptable.

For cobalt the RAO is to prevent direct contact with soil having a non-carcinogenic HI exceeding 2. This will be reached by achieving an average concentration across the EU for cobalt that results in an HI < 2. The discussion of why USACE established the RAO of < 2 instead of < 1 is found in the RI report.

For carcinogenic PAHs, the RAO is to prevent direct contact with soil having a cancer risk in excess of $1x10^{-4}$. This will be reached by achieving an average concentration across the EU, for each carcinogenic PAH, that results in a less than 1 in 10,000 (10^{-4}) cancer risk.

The RAOs for the explosive hazards are not as quantifiable as those for soil risks. They include reducing the potential for encountering MEC in the identified areas of potential explosive hazards; and on a site-wide basis, reducing the probability of residents/workers/visitors handling MEC encountered with the Spring Valley FUDS.

The FS establishes general response actions (GRAs) which are broad categories of actions that must be taken to satisfy the RAOs. The GRAs for mitigating unacceptable explosive hazards and unacceptable risks posed by contaminated soil include no further action, institutional actions (i.e., land use controls), containment, and treatment. No further action is a required to be assessed in the FS as a baseline alternative. Institutional actions are either physical controls such as fencing around an area, or administrative controls such as deed restrictions and environmental covenants. An example of containment is preventing a groundwater contaminant from migrating beyond a certain area.

3a. Identification of Screening Technologies (Soil Risks)

Technologies to mitigate the identified soil risk problems are identified in this section of the FS. These technologies were evaluated previously for Spring Valley during the 2003 engineering evaluation/cost analysis for arsenic in soils, and for the most part, that analysis is still applicable to the current soil issue. For soil risks, technologies include soil stabilization which adds a binding agent to 'fix' the contaminant in the soil, soil washing which would physically remove the contaminant from the soil and then the soil would be placed back into its original location, phytoremediation which has been used previously in the FUDS, and excavation and off-site disposal.

Some of the technologies were screened out in this early stage since they were clearly ineffective or unworkable for the site. The technologies eliminated from further evaluation were soil stabilization and soil washing.

4a. Development and Screening of Alternatives (Soil Risks)

Following the initial screen of technologies, the applicable GRA and remaining technologies were combined to assemble alternatives that achieve the RAOs. For soil risks the alternatives include no further action, land use controls, phytoremediation, and excavation and off-site disposal. These alternatives were screened against three broad criteria: effectiveness, implementability, and cost. Effectiveness means how effective is the alternative at a protecting human health. Implementability refers to whether it can actually be implemented. This screening eliminated no further action and land use controls as alternatives because they failed key elements of the effectiveness and implementability screening criteria. No further action would not achieve the RAOs for soil, and land use controls (such as fencing) would not be desirable for property owners to have fencing preventing access to certain areas of their properties.

The final two remaining alternatives (phytoremediation and excavation) were carried through to the next stage of the process which is the detailed analysis of the alternatives against the USEPA nine criteria established to address CERCLA requirements and technical and policy considerations. The criteria are grouped in three major categories: Threshold, Balancing, and Modifying. The Threshold criteria include: protection of human health and the environment; and compliance with

applicable or relevant and appropriate requirements (ARARs). If the alternative fails either of the Threshold criteria, then it cannot be further considered as an alternative.

Balancing criteria include: short term effectiveness, long term effectiveness, reduction of toxicity, implementability, and cost. Short term effectiveness assesses how quickly the alternative becomes effective and long term effectiveness assesses whether the alternative ensures continued long-term achievement of RAOs. Reduction of toxicity evaluates whether the alternative would reduce toxicity of the contaminant. Note that for both phytoremediation and excavation/disposal, toxicity is not reduced, rather it is transferred. Implementability is the availability of materials and equipment to implement the alternative. Cost is the calculation of the overall financial cost to implement the alternative to achieve the RAO.

Modifying criteria are the final category, which include state acceptance and community acceptance of the alternatives. State or regulatory acceptance and community acceptance of the alternatives are gauged in the PP stage of the process through the public comment period, and are therefore not determined in the FS stage.

5a. Detailed Analysis of Alternatives (Soil Risks)

Both alternatives were evaluated against the nine criteria to be either favorable, moderately favorable, or not favorable. They were then ranked against each other: excavation and off-site disposal was ranked as more favorable than phytoremediation. It could be implemented within the shortest timeframe with the fewest unknowns. It will address all contaminants under site-specific conditions and it has been successfully conducted many times in the Spring Valley FUDS. Excavation and off-site disposal was not selected as the preferred alternative at this stage; formal selection of the preferred alternative will be made in the PP. While both alternatives passed the Threshold criteria, excavation and off-site disposal was assessed as favorable for all Balancing criteria except for reduction of toxicity. Phytoremediation was assessed as moderately favorable for all Balancing criteria except reduction of toxicity and short-term effectiveness since phytoremediation can take multiple years to complete. Long term effectiveness and implementability were moderately favorable because there are unknowns associated with whether the plants could treat the specific contaminants and whether a given plant could treat multiple identified contaminants.

3b. Identification and Screening of Technologies (Explosive Hazards)

A slightly different approach is taken in evaluating the alternatives to address the unacceptable explosives hazards as the technology has essentially already been established. Digital geophysical mapping (DGM) followed by anomaly removal is the technology historically used to mitigate explosive hazards. Approximately 50 of the 100 properties in the areas of potential unacceptable explosive hazards have already had DGM and anomaly investigation performed. The current Spring Valley FUDS procedure is to use the EM61 and the G-858 magnetometer to identify anomalies. Anomalies are then classified using factors such as anomaly size and coincident signatures between instruments, placing them into one of four categories: A, B, C, and D, with A being the most likely to represent a buried munition item. The anomaly review board then reviews the information and makes recommendations for which anomalies should be dug. The overall process has previously worked well at the Spring Valley FUDS. The FS looks at the supplemental use of Advanced Classification (AC) which is a new approach to estimate the depth, size, wall thickness, and shape of a buried item, therefore allowing a more informed decision as to whether a buried metal item is a munition. This would reduce the number of anomalies recommended for

excavation. AC would supplement the current procedures for some of the alternatives, depending on the results of the upcoming AC Pilot Test.

Rather than screening different DGM technologies, various ways of applying the current Spring Valley FUDS procedure supplemented with AC were reviewed. Approaches reviewed sought to address how much acreage needs to be DGM surveyed on a given property, how many anomalies should be dug on a given property in the RA phase, and what should be done on properties with previous DGM and anomaly investigation work to achieve the RAOs. As a result, remedial alternatives to achieve the RAOs were developed by varying the DGM coverage amount and the quantity of anomalies dug. The alternatives included: no further action; land use controls; full coverage DGM removing all anomalies; full coverage DGM removing selected anomalies; DGM of accessible areas, removing all anomalies; and DGM of accessible areas, removing selected anomalies.

Standards were defined for DGM coverage and the number of anomalies to remove. The standard which defines the level of anomaly removal refers to whether teams would remove every anomaly identified through traditional geophysical methods (i.e., all A, B, C and D anomalies) or reduce the number of excavations by removing those anomalies determined to not be munitions through the use of non-intrusive AC. The DGM coverage standards were defined as accessible areas or full DGM. Teams that performed previous DGM work on properties obtained coverage in most accessible areas. DGM of accessible areas in this RA phase would achieve more coverage than during the RI field activities and include DGM of accessible hardscape and cutting of some vegetation. Full coverage DGM would mean more cutting of brush, trees, and gardens, as well as DGM on hardscape. The standards were then applied in varying ways to the different alternatives.

Alternative 3 (full coverage DGM, removing all anomalies) means performing DGM on everything including driveways, cutting brush, trees and gardens as necessary and digging every anomaly. AC would not be applied to this alternative since all anomalies would be excavated.

Alternative 4 (full coverage DGM removing selected anomalies) means performing full coverage DGM as in Alternative 3 but only digging AC recommended anomalies.

Alternative 5 means performing DGM of just accessible areas including hardscape but without as much cutting of brush, trees and gardens, and then digging every anomaly. AC would not be applied to this alternative since all anomalies would be excavated.

Alternative 6 means conducting DGM in accessible areas as in Alternative 5 but only digging AC recommended anomalies.

4b. Development and Screening of Alternatives (Explosive Hazards)

No further action and land use controls do not pass the first broad screen for effectiveness, implementability and cost because they failed key elements of the effectiveness and implementability criteria.

5b. Detailed Analysis of Alternatives (Explosive Hazards)

The four remaining alternatives (Alternative 3, 4, 5, and 6 described above) were then individually assessed against the USEPA 9 criteria, then ranked against each other.

Alternative 6 (Accessible Areas DGM, Remove Selected Anomalies) was determined to be the most favorable alternative to achieve the RAOs. It is protective of human health and the

environment, is compliant with ARARs, and will meet the RAOs in the shortest amount of time. The formal selection of the preferred alternative will be proposed and documented in the PP.

In reviewing the alternatives against each other, Alternative 5 and Alternative 6 were identical in rankings in all areas except cost. The cost per property was determined to be slightly less expensive with Alternative 6 ($192,500) than Alternative 5 ($197,500). Alternatives 3 and 4 were less favorable because they were not only more expensive per property but also would take more time to achieve the RAOs and be hard to implement to actually obtain full coverage on every property.

It was noted that with regard to cost, the difference between removing selected anomalies and removing all anomalies would be dependent on the number of anomalies identified. If there are 10 identified anomalies on a property, there is not a major difference in cost; however if there are a few 100 identified anomalies the cost and level of effort would be significantly less if AC can be applied to reduce the number requiring excavation.

D. Noble noted that Alternative 6 was assessed as the most favorable base on the assumption that AC technology will work in the Spring Valley FUDS. If the pilot study determines that AC does not work in the Spring Valley FUDS, then Alternative 5 is likely the automatic fallback alternative.

T. Bachovchin further explained that if AC is determined to not be a favorable technology in Spring Valley, then both Alternative 6 and Alternative 4 would no longer be options.

Question from Paul Dueffert, Community Member - How do you find the anomalies?

T. Bachovchin reviewed the geophysical technology used to identify anomalies: EM61, G-858 and AC.

Question from P. Dueffert, Community Member – AC is another type of instrument used to reduce the number, right? It is another type of metal detector? How does it determine which anomalies are not hazards?

D. Noble briefly reviewed the AC technology and how it determines whether an anomaly is a munition, and noted that detailed information was provided to the RAB at the September meeting. The AC instrument is an electromagnetic (EM) instrument, like the EM61 which has been used extensively at the Spring Valley FUDS. The EM instrument pulses the ground with an EM pulse. If something conductive is underground, the EM pulse will create a current that flows in that object. The EM instrument then listens for the current induced by the EM pulse. It alternates between the pulsing and listening phases very quickly to determine the presence of conductive items in the ground. What is unique about AC is that it listens for the decay of the current after the EM pulse and can develop a decay curve. Each decay curve is unique to the item; different types of munition items have unique decay curves associated with them. Therefore the AC instrument can identify a buried item as a likely munition. If AC is operated over a tin can, the instrument can determine that the decay curve is not that of a munition item; therefore, it does not need to be excavated.

T. Bachovchin explained that there is a library of specific decay curve signatures collected by AC as it is used in various locations world-wide. As the library grows, AC becomes more useful in RIs and RAs.

Question from John Wheeler, Community Member – What do you mean when you say you dig up the anomalies? Do you mean you dig them with a shovel?

T. Bachovchin explained that when anomalies are dug, unexploded ordnance (UXO) technicians use hand-held geophysical instruments to reacquire the anomaly location then they carefully dig

to resolve the anomaly. Once the item is removed from the ground, the instrumentation is run back over the location to confirm that the signal was reduced to below the established standards for resolving anomalies.

Question from J. Wheeler, Community Member – How deep do these instruments detect?

D. Noble responded that the depth of detection is dependent on the size or number of items buried and the type of instrumentation used.

Question from J. Wheeler, Community Member – If there are just 10 anomalies on a property, is it still worth going back and doing AC at the property?

D. Noble replied that yes, it is still worth going back to the property and using AC because the EM61 and G-858 just identify the presence of a buried metallic item. With adding AC, the instrument provides a high degree of confidence as to the nature of the buried item. In assessing the decay curves with the library of decay curves associated with munitions, the technology can discriminate between munitions related anomalies and non-munitions related anomalies and consequently allow the team to only dig the items that have the decay curves of munitions.

T. Bachovchin added that the cost of digging up all 10 identified anomalies versus using AC to reduce the number requiring digging down to, for example, three items, might end up being about the same.

Comment from J. Wheeler, Community Member – It would be less disruptive to only dig three items instead of ten items.

T. Bachovchin confirmed this.

D. Noble explained that the reduced disruption to landscaping and hardscaping on a property as a result of using AC is a major reason for looking at using AC to achieve the RAOs.

Question from Larry Miller, Community Member – How many properties are there?

T. Bachovchin responded that there are about 100 properties.

Question from L. Miller, Community Member – The difference between the cost for implementing the alternatives would be multiplied across 100 properties? For example, it would cost $5,000 more per property to implement Alternative 3 versus Alternative 4?

T. Bachovchin responded that the costs in an FS should not be multiplied to estimate the total cost to do all 100 properties as there is no economy of scale built into the estimated cost. We know that Alternative 3 is generally more costly than Alternative 5, the primary costing difference being in the amount of DGM conducted. The FS guidance allows a standard of plus or minus 50% of the actual cost to remediate a given property. There are too many unknowns to provide a definitive cost.

Question from A. Hengst, Audience Member – Are the 99 properties the ones with the explosive hazards or do they include the ones with both chemical risks and explosive hazards?

T. Bachovchin explained the 100 properties are those that pose an explosive hazard. Additional information is available in the RI report.

Question from A. Hengst, Audience Member – The calculated costs in the FS are just ballpark estimates? Each property will be different and cost a different amount?

T. Bachovchin confirmed this. The costing was based on a generic property of a certain size with a certain number of anomalies. However, the reality is that only a certain percentage of the actual properties will require impacting a driveway or sidewalk, for example. These elements had to be estimated across all properties to derive a 'per' property cost.

Question from A. Hengst, Audience Member – The total for remedial action would be either $19.7M or $19.25M, correct?

T. Bachovchin re-emphasized that the per-property cost estimated in the FS does not account for economies of scale.

Question from Mary Douglas, Community Member – I can understand why Alternative 6 has been assessed as most favorable; however what is the marketability for the properties which this process will be applied to? Do they get a comfort letter if bushes were not disturbed during the remedial action? Does that call into question the thoroughness of the remedial action activities?

D. Noble explained that this question relates to accepting the determination that the alternatives presented passed the Threshold criteria. These technologies that reached the detailed analysis phase would meet those criteria (overall protection of human health and the environment, and compliance with ARARs). The community can comment in the PP that they do not agree that a certain alternative meets the Threshold criteria to successfully achieve the RAOs. If there is acceptance that these alternatives will achieve RAOs, then once the alternative is implemented at a property, a comfort letter could certainly be issued for that property.

D. Noble further noted that while the ideal approach would enable the Army to say there is nothing left; however, the Army acknowledges that is not feasible. Therefore the FS assesses what can be done that is achievable and acceptable in protecting human health and the environment.

Comment from J. Wheeler, Community Member – This would be similar to what was done with arsenic. Sampling was not performed on every square inch of ground at a property. Instead a statistical sampling was conducted to drive conclusions.

D. Noble confirmed that the sampling approach ensured achievement of a certain confidence level. The science is more developed in establishing confidence levels when it comes to soil contamination. With the explosive hazards, the science is not as developed so the Army cannot state that a certain confidence level has been achieved.

Question from M. Douglas, Community Member – I understand that PAHs are $1x10^{-4}$ but don't carcinogenic risks have a standard $1x10^{-6}$?

T. Bachovchin agreed and noted that EPA's acceptable risk range was $1x10^{-4}$ to $1x10^{-6}$. The goal is to achieve a less than 1 in 10,000 risk of cancer.

Question from M. Douglas, Community Member – You are just taking the lower end of the risk range then, the less protective end of the risk range?

T. Bachovchin confirmed that yes, the RAO was to reduce the risk to less than 1 in 10,000 cases instead of less than 1 in 1,000,000 cases.

S. Hirsh commented that there are other factors to consider. For example, what is the actual area that has the risk and what is the property it is on?

T. Bachovchin noted that areas of contamination would be removed in order to achieve a 1×10^{-4} applied across the entire exposure unit, not the individual sample.

D. Noble reviewed the schedule for addressing site-wide soil concerns at the Spring Valley FUDS. The FS is expected to be finalized in Fall 2015 to evaluate alternatives for addressing any unacceptable risks or hazards identified in the Final RI report. The Pilot Project will be conducted in 2016. The PP and public comment period are expected in Winter 2015/2016 and the Decision document is expected to be completed in Summer 2016. Remedial Design and RA activities are expected to start in 2017 and continue through 2020.

D. Noble noted that the 2020 date is an estimate and is only for site-wide soils. The schedule does not address the timeline for addressing groundwater concerns.

III. Community Items

No community items were presented.

IV. Open Discussion and Future RAB Agenda Development

A. Upcoming Meeting Topics

- Site-Wide Proposed Plan
- Introduction to the Groundwater RI
- 4825 Glenbrook Road Health Consultation Update (ATSDR)

B. Next Meetings:

RAB Meeting: Tuesday January 12, 2016

C. Open Discussion

D. Noble noted that the FS will proceed to finalization once stakeholder feedback is addressed. Formal selection of the preferred alternative will be presented in the PP which will be made available for a formal public comment period for the community to provide feedback on the selected alternatives.

Comment from J. Wheeler, Community Member - Another topic to add to upcoming meeting topics would be how the Army can access a property when a property owner does not permit access. He noted a previous RAB presentation given by USEPA Region III's Charlie Howland which had touched upon the topic and the USEPA's role.

D. Noble clarified that the Army does not have the authority to access a property where permission is not granted by the property owner. It would need to be an agency outside of the Army with the authority to do so.

Comment from J. Wheeler, Community Member – I recall from the presentation several years ago that the process to access a property when permission is not granted by the property owner, is not simple. It would be a good idea for the agency authorities to remind people of the process.

V. Public Comments

Comment from A. Hengst, Community Member – When the Northwest Current article was published in late July that listed the property addresses that had not granted access, it also mentioned that the Washington DC attorney general had been contacted and was looking into it. Would they have authority to do anything?

J. Sweeney responded that he thought the attorney general had responded to the Northwest Current and said that they did not intend to do anything at this time regarding accessing the properties, until the USACE and USEPA continue through the whole CERCLA process.

VI. Adjourn

The meeting was adjourned at 8:29 PM.